COMMUNICATION, EMOTIONS AND WELL-BEING IN EMOTIONALLY CHARGED WORKERS

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Development of Burnout Syndrome in Non-university Teachers: Influence of Demand and Resource Variables

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Psychosocial risks at work are an important occupational problem since they can have an impact on workers' health, productivity, absenteeism, and company profits. Among their consequences, burnout stands out for its prevalence and associated consequences. This problem is particularly noteworthy in the case of teachers. The aim of the study was to analyze the influence of some psychosocial factors (demand and resource variables) and risks in burnout development, taking into consideration the levels of burnout according to the Spanish Burnout Inventory (SBI). This paper contributes to advancing knowledge on this issue by analyzing the influence of work characteristics and personal characteristics on the progress of burnout. The sample consisted of 8,235 non-university teachers (2,268 men 27.5% and 5,967 women 72.5%), aged 22 to 70 ($M = 45.16$, $SD = 9.18$). For this purpose, statistical modeling by logistic regression was used. The results of this study showed that No burnout level was positively related with resources variables and negatively with demand variables. In the Medium-High levels and the higher levels of burnout (i.e., Profile 1 and Profile 2), there is a positive relation with demand variables and a negative one with resource variables. In conclusion, demand variables cause an increase in the burnout levels, influencing positively the movements between the levels of No burnout to Medium-High levels of burnout and Medium-High levels to Profile 1. At the same time, resource variables had a negative influence on burnout. However, the results in the movement between Profile 1 and Profile 2 were not expected. The variable Imbalance had a negative relationship with the movement between Profile 1 to Profile 2, and Social support and Autonomy at work had a positive relationship with this movement. Therefore, when professionals feel higher levels of burnout, lack of imbalance together with social support and autonomy could contribute to increased feelings of guilt and risk of higher burnout.

Keywords: burnout, job stress, psychosocial risks at work, emotional labor, teachers, feelings of guilt

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INTRODUCTION

In the last few years, working conditions have fundamentally changed, such as how production is organized, high levels of quantitative and qualitative demands, preference on multifunction workers, or instability in the working relationship (Mero, 2018). These changes and other factors have caused some consequences that have a negative effect on work demands,

such as emotional work (Junne et al., 2018), which has been gaining importance in recent years (Bhave and Glomb, 2016; Maxwell and Riley, 2017). Besides this, the change in conditions has caused an increase in psychosocial risk exposure, and the frequency of these factors can cause sick leave associated with work accidents or professional sickness (Fornell et al., 2018).

The increment of the psychosocial risks causes an increase in work-related stress (Junne et al., 2018). At present, work-related stress is one of the main workplace disorders of health and the main barrier to companies' and/or countries' growth (European Agency for Safety Health at Work, 2016). Therefore, work-related stress has consequences for the employees, their families, organizations, and countries (European Agency for Safety Health at Work, 2016). The costs to business and society are estimated to be in the billions of euros (European Agency for Safety Health at Work Eurofound, 2014).

In addition, several studies showed that work-related stress reduces social interaction, causes difficulties concentrating at work, produces physiological pain and cardiovascular problems, and increases mental illness in the form of depression and anxiety (Nielsen et al., 2018). Moreover, work-related stress has been related to the increase of turnover and absenteeism in the workplace, the decrease of the performance at work, or it may lead to the increase of workplace accidents (Nielsen et al., 2018).

A work-related stress consequence is burnout syndrome (Maslach et al., 2001; Elshaer et al., 2018). Burnout was defined by Maslach et al. (2001) as a psychological syndrome in response to chronic interpersonal and emotional stressors on the job. It is characterized to affect employees of the service sector such as teachers, police, nurses, doctors, etc. (Sarisik et al., 2019). The World Health Organization, following the International Classification of Disease (ICD) 11, defines burnout as a result of chronic workplace stress that the employees cannot manage (World Health Organization, 2019). Burnout is associated with different consequences such as absenteeism (Maslach, 2017; Gusy et al., 2019), health problems (Maslach, 2017; Simionato et al., 2019), increment in the mistakes during the shift (Stehman et al., 2019; Bakker and Wang, 2020), the job performance of the employee (Bakker and Demerouti, 2017; Bakker and Wang, 2020), and depression (Gil-Monte, 2012; Nagy et al., 2018; Hatch et al., 2019).

The prevalence of burnout in education oscillates between 11 and 35.5%, depending on the country and the study considered (Gil-Monte et al., 2011; Ratto et al., 2015; Villaverde et al., 2019). In Spain, several studies showed that 48% of educational professionals have high levels of burnout and 52% of educational professionals have moderate levels of burnout (Ruiz-Calzado, 2016). Other studies showed lower levels than the aforementioned; Unda et al. (2020) showed in their study a prevalence of burnout of 17.6%. "Some studies have related these levels of burnout in Spain to emotional variables such as Emotional exhaustion (Betoret, 2009) and Emotional intelligence (Puertas-Molero et al., 2018). Also, self-efficacy and coping resources play an important role in the management of factors such as work overload, role ambiguity and conflict, pressures of the teacher's role, inadequate resources, poor working conditions, lack of professional recognition, low remuneration, lack of involvement in decision making, lack of effective communication, staff conflicts, and pupil misbehavior (Betoret, 2009)."

Given this prevalence in recent years, the study of burnout in the education sector has become increasingly important (Kim and Burić, 2019; McLean, D., et al., 2019; Schonfeld et al., 2019). Most research has pointed out the importance of burnout on teachers (Kaur and Singh, 2014; Yerdelen et al., 2016; Salmela-Aro et al., 2019; Schonfeld et al., 2019; Mäkikangas et al., 2020; Pyhältö et al., 2021), considering it as a risk for teachers (Cecho et al., 2019) that can affect negatively their well-being (physically and psychologically) (Mousavy, 2014), effective teaching (Yerdelen et al., 2016), the interaction with students (Travers, 2001), their motivation for the job (McLean, L., et al., 2019), absenteeism (Makhdoom et al., 2019), depression (Martínez-Monteagudo et al., 2019), insomnia (Gu et al., 2020), or a decrease in the capacity to give support to the students (Jennings and Greenberg, 2009).

Several studies have focused on the study of specific burnout profiles in teachers (Salmela-Aro et al., 2019; Mäkikangas et al., 2020; Pyhältö et al., 2021). The present study uses as a framework, specifically, the model of Karasek (1979) in regard to the conception of the influence of demands and resources on the consequences of psychosocial risks, such as burnout. Also, regarding the characterization of burnout, the present study focuses on the model of Maslach and Jackson (1986), in conjunction with the model proposed by Gil-Monte (2012). Maslach and Jackson (1986) explained that burnout is formed by 3 dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment. Gil-Monte (2005) added to this three-dimensional model a new dimension, the Feeling of guilt (Gil-Monte, 2012; Maslach and Leiter, 2016; Rabasa et al., 2016). This model understands burnout as an emotional and cognitive deterioration that causes negative attitudes and behaviors toward clients or users of the organization as a coping strategy (Gil-Monte, 2005). From this model, Gil-Monte developed the Spanish Burnout Inventory (SBI) (Gil-Monte, 2011, 2019a) to evaluate the levels of burnout by 4 dimensions: Enthusiasm toward the job, Psychosocial exhaustion, Indolence, and Feelings of guilt. Enthusiasm toward the job is defined as the subject's desire to archive goals at work because it is a source of personal pleasure. Psychological exhaustion is defined as the appearance of emotions and physical exhaustion at work because the employees need to deal with clients with problems daily. Indolence is the appearance of negative attitudes of indifference and cynicism toward the organization's clients. And guilt is an appearance of guilt caused by the negative attitudes that the employee has developed for the work, especially toward the clients (Figueiredo-Ferraz et al., 2013). The combination of these components allows the identification of two burnout profiles and levels of severity of burnout between professionals (Gil-Monte, 2005).

Profile 1 includes subjects who report higher levels of psychosocial exhaustion, cynical behaviors—i.e., indolence—and cognitive deterioration but not higher feelings of guilt. So, it describes employees who suffer from stress and discomfort at work. In this profile, the cynical attitudes—i.e., indolence—are used as a coping strategy, and it allows the employee

to control the stress levels and their consequences. Profile 2 includes employees who present higher levels of psychosocial exhaustion, cynical behavior, and cognitive deterioration and the highest levels of feelings of guilt. These employees experience discomfort more seriously at work (Gil-Monte, 2012). Coping strategies based on cynical attitudes are not as effective as in Profile 1. In addition, cynical attitudes and indolence in the relationships at work as coping strategies are perceived as inadequate (Guidetti et al., 2018).

Alongside these burnout levels, it is possible to consider two other levels of burnout. On the one hand, there are people who do not suffer from burnout (people with high levels of enthusiasm toward the job and lowest levels of psychological exhaustion and indolence), which we will call No-Burnout. On the other hand, there are people who do not suffer burnout but are close to suffering it (workers with lower levels of enthusiasm toward the job and higher levels of psychological exhaustion, and low levels of indolence and guilt), which we will call Medium-High levels of burnout. Guidetti et al. (2018) found some profiles of burnout fitting these levels. The existence of these levels and profiles is key, given that each of the profiles requires different intervention patterns (Guidetti et al., 2018), as well as different levels of risk and different associated consequences for the worker, the company, and society as a whole (Jin et al., 2015; Abósa et al., 2019).

Despite their importance, Guidetti et al. (2018), in their study, did not analyze which variables predicted the appearance of one type of level of burnout or another, nor which variables predicted the change from one level to another. Therefore, the importance of burnout in teachers is clear, as well as the need to have levels that allow understanding and classification of the employees, focusing the coping strategies that the employees are using, thus focusing the resources that employees need to use depending on the case (Guidetti et al., 2018).

Although different studies highlight the importance that various factors can have in the appearance of burnout, no study analyzes which factors determine the greater probability of belonging to one level or another. Karasek model 1979 has the most theoretical and empirical support, and it is the one that currently has the most influence and attention. It explains work-related stress according to the imbalance between psychology demands at work (e.g., workload, interpersonal conflicts, imbalance, role ambiguity, and role conflict) and the control level or resources that the employee has (e.g., autonomy, feedback, etc.). Johnson and Hall (1988) added the variable social support as a third dimension of control. According to this model, the employee's health or well-being depends on the balance of the work demands and the personal resources that the employee has. When the demands are higher than the resources, it can cause a feeling of work-related stress by the employee. In addition, chronic work-related stress can cause burnout syndrome, which is able to appear as several disorders of health or psychosomatic symptoms.

The following demands stand out for their importance: interpersonal conflicts (Skaalvik and Skaalvik, 2007), workload (Alarcon, 2011), imbalance (Taris et al., 2001; Backhaus et al., 2018), role conflict, and role ambiguity (Alarcon, 2011). These demand variables are positively correlated with burnout (Backhaus et al., 2018; Engelbrecht et al., 2019; McCarty et al., 2019; Xu, 2019; Klein et al., 2020). Moreover, in recent years another demand has emerged amongst the others, emotional labor (Pisaniello et al., 2012; Yilmaz et al., 2015).

Skaalvik and Skaalvik (2007), in their study among teachers, showed that conflicts with parents and pupils were the conflicts that generate the most tension in teachers. The study found a negative relation between tension and self-efficacy and its manifestation in psychological exhaustion and depersonalization. On the other hand, Gonçalves et al. (2019) found a relationship between burnout and workload, and this variable was a predictor of emotional exhaustion. Unda (2010), in her study, found a negative relation with enthusiasm toward the job and positive relation with emotional exhaustion, guilt, and indolence. In addition, Xu (2019), in her study among education professionals, found a relation between role conflict and emotional exhaustion and depersonalization and added that role conflict would decrease the enthusiasm and energy for work. Also, Chung and Choo (2018), in their study, found a relationship between role ambiguity and emotional exhaustion, and it has a negative relation with personal accomplishment.

Finally, as previously stated, in recent years, emotional labor has increased its importance in the research (Pisaniello et al., 2012; Yilmaz et al., 2015). Several studies have shown the relationship between emotional labor and burnout (Pisaniello et al., 2012; Andela et al., 2015; Yilmaz et al., 2015). Yilmaz et al. (2015) that, in teachers, natural-felt emotions and surface acting predicted the burnout dimension, emotional exhaustion, and depersonalization. In addition, emotion suppression and emotion dissonance were related to burnout (Andela et al., 2015). Moreover, Pisaniello et al. (2012) found a positive relationship between surface acting and emotional exhaustion and depersonalization and a negative relation with personal accomplishment. Wegge et al. (2010), in their study, explained a positive relationship between emotional dissonance with emotional exhaustion and depersonalization and a negative relation with personal accomplishment.

Resource variables have been negatively related to burnout (Khan et al., 2018; Hatch et al., 2019). Resource variables highlighted are job autonomy, social support, and resources at work (Setti et al., 2016). Some variables, such as social support, are considered as a protective factor against burnout (Setti et al., 2016). Thus, an excess of demands will produce a negative consequence in the employee, as higher burnout, however having enough resources benefit the employee, decreasing the probability of having higher burnout (Hatch et al., 2019).

In addition, some sociodemographic variables can be related to burnout, such as sex (Lebares et al., 2018), age (LaFaver et al., 2018), and level of education (Langher et al., 2017; Smetackovaa, 2017). Sex is a variable widely studied in relation to burnout (Lebares et al., 2018). Different studies in teacher samples found that women have higher levels of burnout than men (Alavinia and Ahmadzadeh, 2012; Leineweber et al., 2013). In addition, a meta-analyses study showed that women are more likely to report burnout than men (Purvanova and Muros, 2010). Also, some studies showed that the variable age has a positive relation

with burnout -i.e., with increasing age comes increasing burnout. However, it changes when the employees become middle-aged, which decreases the levels of burnout (LaFaver et al., 2018). Different levels of education showed despairing results. Some studies did not find any difference between education levels (Smetackovaa, 2017), and other studies showed a higher level of burnout in secondary school (Langher et al., 2017).

The importance of burnout syndrome has been widely proved, especially in teachers. However, no study has been observed that analyzes the role of demands, resources, and sex, emphasizing the emotional burden of work in the appearance of different burnout levels. Neither has there been a study that analyzes which factors are more important when considering the move from one burnout profile to another. For all these reasons, the present study is particularly interesting when trying to fill this gap by analyzing the role played by the demands of work, resources, sex, age, and levels of education in the appearance of each burnout profile, considering the levels of guilt, and at the same time analyzing what factors could predict the evolution from more harmful profiles to healthier ones on teachers.

We hypothesized that:

Hypothesis 1: A significant positive relationship is expected between psychosocial demands at work and burnout, i.e., higher prevalence levels on demand variables will increase the probability to have higher levels of burnout (**Figure 1**).

Hypothesis 2: A significant negative relationship is expected between psychosocial resources at work and burnout, i.e., higher prevalence levels on resource variables will increase the probability to have lower levels of burnout (**Figure 1**).

Hypothesis 3: Higher levels on psychosocial demand variables will predict the move toward higher levels of burnout (No burnout → Medium-High levels → Profile 1 → Profile 2). At the same time, psychosocial resource variables will be predictors of the moves for healthier burnout levels (Profile 2 → Profile 1 → Medium-High level → No burnout) (**Figure 2**).

MATERIALS AND METHODS

Participants

A total of 8,235 non-university teachers of different levels of public education from the Community of Valencia (Spain) participated in this study (72.5% female). Aged: M_{age} = 45.16 years, SD = 9.18, Range: 22–70 years and with a seniority: $M_{seniority}$ = 17.41 years, SD = 10.33, Range: 0–45 years. The sample was distributed in 17.1% of kindergarten teachers, 39.9% primary school teachers, 43% secondary school teachers and trade school teachers, and 12.9% were other categories. The sample was selected by the Instituto Valenciano de Seguridad y Salud en el Trabajo (INVASSAT) (Valencian Health & Safety at the Workplace Institute). The inclusion criteria were: (a) to be working, not to be on sickness leave, (b) to belong to a school in the Valencian Community that is not a university, and (c) to accept to participate in the study.

In the cluster analyses, the total sample in each burnout level was: No burnout level, 3.536 teachers; Medium-High level, 3.887 teachers; Profile 1 level, 597 teachers; and Profile 2 level 215 teachers.

Instruments

The UNIPSICO questionnaire (Gil-Monte, 2016a,b) evaluates: Role ambiguity ($\alpha = 0.79$; $\omega = 0.75$; CI: 0.741–0.764) by 4 items inverse (e.g., "*I know what my responsibilities are*") (items were inversed to carry out the analyses to estimate Role ambigüity); Role conflict ($\alpha = 0.70$; $\omega = 0.71$; CI: 0.696–0.718) was composed of 5 items (e.g., "*I receive incompatible request from two or more people*"); Workload ($\alpha = 0.72$; $\omega = 0.740$; CI: 0.735–0.753) was evaluated by 6 items (e.g., "*Do you think you have to do a job that is too difficult for you?*"); Imbalance ($\alpha = 0.79$; $\omega = 0.80$; CI: 0.794–0.809) was evaluated by 5 items (e.g. "*I am rewarded very little for the effort I make at work*"); Interpersonal conflicts ($\alpha = 0.72$; $\omega = 0.72$; CI: 0.703–0.731) was composed of 6 items (e.g. "*How often do you have conflicts with your students*?"); Autonomy ($\alpha = 0.84$; $\omega = 0.81$; CI: 0.780–0.816) was evaluated by 5 items (e.g., "*I think my job gives me enough autonomy*"); Social support ($\alpha = 0.84$; $\omega = 0.88$; CI: 0.870–0.881) was composed of 6 items (e.g., "*How often do your supervisor helps you when problems arise at work?*"). Resources at work was evaluated by 7 items (e.g., To "*what extend in your workplace there are technological resources*") ($\alpha = 0.83$; $\omega = 0.80$; CI: 0.796–0.810). The items were answered on a scale of 5 points of frequency ranging from 0 (Never) to 4 (Very frequently: every day). Emotional labor (12 items, $\alpha = 0.79$; $\omega = 0.81$; CI: 0.799–0.814), employees' ability to cope in an effective way with the stressful situation because they can use their own coping resources and skills, was evaluated by a short version of the Frankfurt Emotion Work Scale (FEWS) (Zapf et al., 1999) taken from the adapted 21 items Spanish version (Ortíz et al., 2012), that evaluated 6 dimensions: Positive emotions (2 items, e.g., "*Requirement to express pleasant emotions to the pupils and their families*"), Negative emotions (2 items, e.g., "*Requirement to express unpleasant emotions to the pupils and their familiars*"), Neutral emotion (2 items, e.g., "*Requirement to be neutral and impartial with the pupils*"), Sensitivity requirements (2 items, e.g., "*Requirement to be sensitive to the feelings of pupils*"), Interaction control (2 items, e.g., "*Duration of the interaction independent of the customer's feelings*"), and Emotional dissonance (2 items, e.g., "*Can you interrupt an interaction with a customer?*").

Spanish Burnout Inventory (Gil-Monte, 2011; Figueiredo-Ferraz et al., 2013) has 20 items distributed in 4 dimensions; Enthusiasm toward the job, defined as the individual's desire to achieve goals at work as a source of personal pleasure (5 items; e.g., "*I find my work quite rewarding*"), this scale is similar to that of the Personal accomplishment of the MBI; Psychological exhaustion, defined as the appearance of emotional and physical exhaustion due to the necessity to deal with people or problems (4 items; e.g., "*I feel weighed down by my job*"), this scale is similar to that of the Emotional exhaustion of the MBI; and Indolence defined as the appearance of negative attitudes of indifference and cynicism toward the patients (6 items; "*I don't like taking care of some inmates*"), this scale is similar to that of the Depersonalization of the MBI. According to SBI Manual, global burnout is the mean of the 15 items from the subscales of Enthusiasm toward the job (reversed), Psychological exhaustion, and Indolence. This scale has correct reliability ($\alpha = 0.85$; $\omega = 0.81$; I CI: 805–0.823). In addition, Guilt was evaluated as a

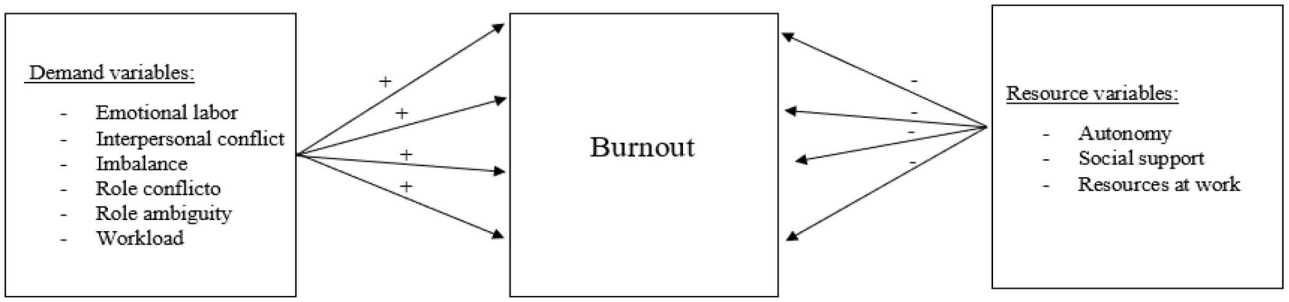

FIGURE 1 | Hypothesis 1 and 2.

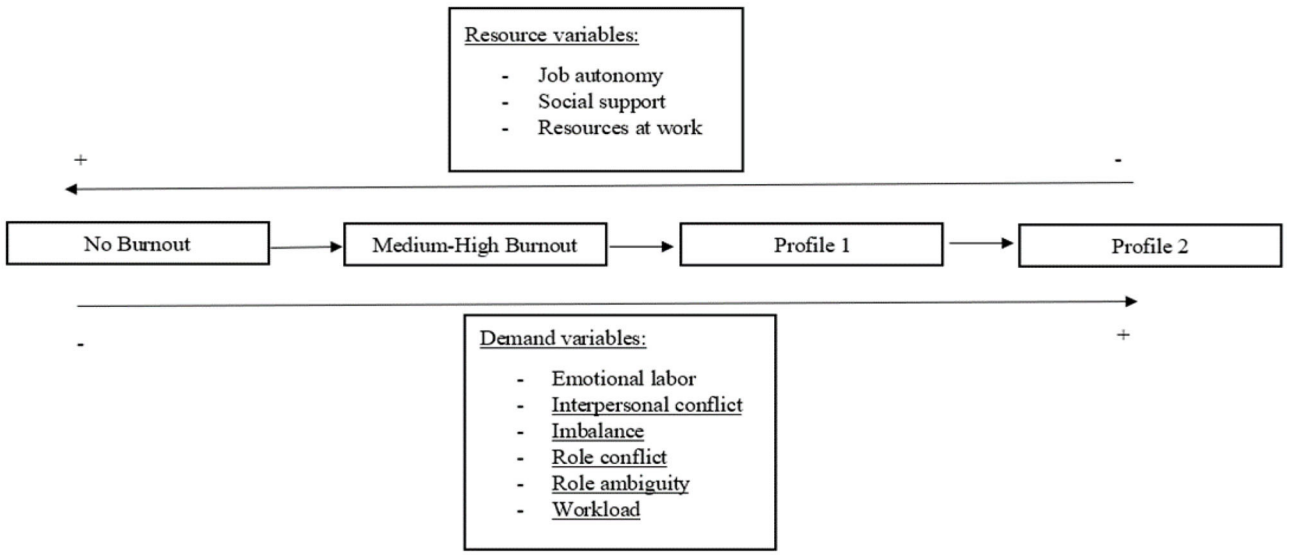

FIGURE 2 | Hypothesis 3.

subscale of SBI. It is evaluated by 5 items (e.g., "*I regret some of my attitude at work*") ($\alpha = 0.72$; $\omega = 0.73$; CI: 0.712–0.739). Low scores on Enthusiasm toward the job, along with high scores on Psychological exhaustion and Indolence, indicate high levels of burnout. Items are answered on a 5-point frequency scale, ranging from 0 to 4 (Never-Very frequently: Every day). Higher feelings of Guilt account for the difference between Profile 1 -i.e., high global burnout and low feelings of guilt- and Profile 2 -i.e., high global burnout and higher feelings of Guilt, values equal or higher than percentile 89th (see Data analysis section).

Procedure

This study respected the fundamental principles of the Declaration of Helsinki (World Medical Association, 2013), with particular emphasis on the anonymization of the data collected, confidentiality, and non-discrimination of participants. All the educational non-university centers in the Community of Valencia were asked to participate, and the teacher's collaboration was voluntary. Teachers were informed about the purpose of the study, the possible benefits, and possible consequences of their participation.

This study was part of a psychosocial assessment of the Instituto Valenciano de Seguridad y Salud en el Trabajo (INVASSAT). In all cases, regional government instructions were followed. Previously to start the assessment, the ethical department of this institution was consulted and concluded that as the participation was voluntary and the teachers just needed to answer an anonymous questionnaire, the research did not need to be checked by a bioethics committee. The data was collected between October 2015 and March of 2018 by employees working in the INVASSAT. The INVASSAT employees went to each educational center and informed the director, union representative, and teachers of each school of the procedure, explaining the confidentiality, anonymity, and privacy of the study. The INVASSAT employees convened a meeting with all the teachers of each school and explained the questionnaire. Then each teacher did the questionnaire individually. The questionnaire was done in the presence of the INVASSAT employees to answer any questions the teachers could have.

When the teachers finish the questionnaire, they gave them to the INVASSAT employee. The time of completion of the questionnaire was around an hour and a half.

Data Analysis

The present research is a correlational study. In order to achieve the objectives proposed in the study, the participants were first classified into 4 levels of burnout: No burnout, Medium-High levels of burnout, Profile 1 and Profile 2 of burnout. According to the SBI Manual (Gil-Monte, 2019a), there are 6 levels of burnout: (1) Very low level of burnout (values equal to or lower than percentile 10th), (2) Low levels of burnout (between percentile 10th to values equal to or lower than percentile 33rd), (3) Medium levels of burnout (between values of percentile 33rd to equal to or lower than percentile 66th), (4) High levels of burnout (values higher than percentile 66th to equal or lower than percentile 89th). These levels are the result of the mean of the 15 items of the SBI inventory's subscales Enthusiasm toward the job (reversed; 5 items), Indolence (6 items), and Psychological exhaustion (4 items) (5). Profile 1 (values higher than percentile 89th, i.e., critical levels of burnout, and Guilt values equal or lower than percentile 89th) and (6) Profile 2 (values higher than percentile 89th and Guilt values higher than percentile 89th, i.e., critical levels of burnout and critical levels of Guilt) (Gil-Monte, 2019a; Misiolek-Marín et al., 2020). In addition, to calculate Profile 1 and 2, it is being used to differentiate between both profiles the levels of Guilt. Thus, the clusters in our study were established according to the Manual instruction in:

- No burnout level: It was formed by Very low and Low levels of global burnout (in this level, teachers were included with percentiles between 0th and 33rd).
- Medium-High levels: It was formed by Medium and High levels of burnout (in this level, teachers were included with percentiles between 33rd and 89th).
- Profile 1: It was formed by critical levels of burnout but no critical levels of guilt (in this level, there were teachers with burnout percentiles higher than percentile 89th, and Guilt percentiles were equal or lower than percentile 89th).
- Profile 2: It was formed by critical levels of burnout and guilt (in this level, there were teachers with percentile higher than percentile 89th with guilt values higher than percentile 89th).

After distributing the subjects in the 4 levels of burnout, we proceeded to analyze the influence of the Sex, the Age and Level of education, resource variables, and demand variables on levels of burnout and to ascertain what factors explain the likelihood of a participant to be in 1 level rather than another. Firstly, ANOVA with Turkey *post-hoc* was made to compare differences in the demand and resources variables according to the different levels. Secondly, a logistic regression with three steps was carried out for the prediction of 4 levels of burnout. In the first step, the variables Sex, Age, and Level of education were introduced, then in the second step, demand variables were introduced (Emotional labor, Interpersonal conflict, Imbalance, Role conflict, Role ambiguity, and Workload). Finally, in the third step, the resource variables were introduced (Autonomy, Social support, and Resources at work). Thirdly, logistic regression was done to find the relevant factors that explain the likelihood of a participant to be in one level rather than another. Performing logistic regression by grouping and comparing the groups allows differences between such groups to be identified, and thus to know the difference that would explain the change from a group to another. Specifically, the change from No burnout level (percentile 0th to percentile 33rd) to Medium-High level (higher than percentile 33rd to percentile 89th); Medium-High level to Profile 1 level (higher percentile 89th with guilt values equal or lower than percentile 89th) and Profile 1 level to Profile 2 level (higher than percentile 89th with guilt values higher than percentile 89th) was compared. The variables Sex, Age, and Level of education were used to control the effect they had on the other variables.

RESULTS

First, to observe the differences in demands and resources depending on the levels of burnout, an ANOVA analysis with HDS Tukey *post-hoc* was performed. These results (**Table 1**) showed differences ($p < 0.001$). No study has been made that analyzes the role of demands with UNIPSICO dimensions according to the different levels of burnout. In reference to the F effect size (η_p^2), each variable had a moderate effect ($\geq$0.06) (Cárdenas and Arancibia, 2014), except the variables: Interpersonal conflicts, Role conflicts and Workload that could be considered big effect ($\geq$0.14) (Cárdenas and Arancibia, 2014) and Emotional labor that could be considered small effect ($\leq$0.01). In the *post-hoc* analyses, all the variables showed a significant effect ($p < 0.05$), except the Resources variables (Autonomy, Social support, and Resources at work) and the variable Emotional labor and Role conflict between variables Profile 1 and Profile 2 ($p > 0.05$). Therefore, the Resources variables did not have a significant influence on those levels of burnout. In *post-hoc* results, the Demand variables, with the exception of Emotional labor and Role conflict, showed a difference between the mean in all the levels of burnout (**Table 1**).

Then, the predictive capacity of demand variables and resource variables were analyzed on the 4 burnout levels (**Table 2**). In the first step, Sex, Age, and Level of education were included to control the size effect. On the other hand, the inclusion of demand variables (step 2) seemed to significantly improve the prediction of the model in all cases except Medium-High levels of burnout ($NR^2 = 0.01$ to $NR^2 = 0.04$) (which did not improve after the inclusion of any of the steps). In the second step, the inclusion of demands increased model prediction between 19% (Profile 1) and 26% (No burnout) in the other levels. R^2 of Nagelkerke increased from 0.04 to 0.30 in No burnout levels, from 0.04 to 0.23 in Profile 1, and from 0.01 to 0.23 in Profile 2. The inclusion of resource variables increased the prediction of the model in No burnout, Medium-High level and Profile 1. The Nagelkerke R^2 increased from 0.30 to 0.31 in No burnout level, from 0.04 to 0.05 in Medium-High level, and from 0.23 to 0.26 in Profile 1.

In the case of the results of No burnout level (**Table 2**), in the first step, the variables Age ($B = -0.02$) and Level of education ($B = -0.37$) were negative predictors of No burnout levels.

TABLE 1 | ANOVA between profiles and predictor.

	No burnout		Medium-High levels		Profile 1		Profile 2		$F_{(3, 8,231)}$	η_p^2	Power	1 vs. 2	1 vs. 3	1 vs. 4	2 vs. 3	2 vs. 4	3 vs. 4
	M	SD	M	SD	M	SD	M	SD									
EL	2.49	0.61	2.56	0.58	2.69	0.63	2.77	0.54	32.42***	0.01	1	***	***	***	***	***	
IC	0.45	0.43	2.83	0.46	0.98	0.56	1.24	0.63	462.20***	0.14	1	***	***	***	***	***	***
Imbalance	1.60	0.67	1.91	0.61	2.31	0.65	2.17	0.65	296.68***	0.10	1	***	***	***	***	***	*
RC	0.84	0.61	1.20	0.67	1.75	0.83	1.88	0.75	499.50***	0.15	1	***	***	***	***	***	
RA	3.48	0.55	3.15	0.64	2.79	0.78	2.61	0.82	382.21***	0.12	1	***	***	***	***	***	***
Workload	1.54	0.50	1.83	0.48	2.16	0.57	2.29	0.51	461.98***	0.14	1	***	***	***	***	***	**
SS	3.19	0.77	2.85	0.82	2.33	0.92	2.46	0.83	269.07***	0.09	1	***	***	***	***	***	
Autonomy	2.93	0.48	2.68	0.54	2.34	0.64	2.42	0.57	313.22***	0.10	1	***	***	***	***	***	
Resources	2.48	0.69	2.22	0.67	1.84	0.73	1.92	0.73	204.25***	0.07	1	***	***	***	***	***	

*EL, Emotional labor; IC, Interpersonal conflict; WO, Workload; SS, Social support; RC, Role conflict; RA, Role ambiguity; *p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001.*
1 vs. 2, No burnout vs. Medium-High levels; 1 vs. 3, No burnout vs. Profile 1; 1 vs. 4, No burnout vs. Profile 2; 2 vs. 3, Medium-High levels vs. Profile 1; 2 vs. 4, Medium-High levels vs. Profile 1; 3 vs. 4, Profile 1 vs. Profile 2.

In the second step, when demand variables were added to the analyses, the variables Age ($B = -0.02$), Level of education ($B = -0.34$), Emotional labor ($B = -0.17$), Interpersonal conflict ($B = -0.77$), Imbalance ($B = -0.45$), Role conflict ($B = -0.32$), Role ambiguity ($B = -0.73$), and Workload ($B = -0.75$) were predictors of No burnout levels. In the third step, the resource variables were added and the results showed that the demand variables Emotional labor ($B = -0.23$), Interpersonal conflict ($B = -0.72$), Imbalance ($B = -0.43$), Role conflict ($B = -0.23$), Role ambiguity ($B = -0.52$), and Workload ($B = -0.77$) predicted in a negative sense, while the resource variables Autonomy ($B = 0.52$) and Social support ($B = 0.12$) predicted in a positive sense belonging to that level of burnout. Likewise, the best predictors were Workload ($B = -0.77$) in a negative sense and Autonomy ($B = 0.52$) in a positive sense.

In the case of the results on Medium-High levels of burnout (**Table 2**), in the first step, Level of education ($B = 0.25$) was a predictor of Medium-High levels. In the second step, the variables Level of education ($B = 0.23$), Interpersonal conflict ($B = 0.11$), Imbalance ($B = 0.21$), Role conflict ($B = -0.08$), Role ambiguity ($B = 0.30$), and Workload ($B = 0.22$) were predictors of Medium-High levels of burnout. In the third step, resource variables were added to the analyses, and the results showed that the demand variables Imbalance ($B = 0.19$), Role ambiguity ($B = 0.20$), and Workload ($B = 0.22$) predicted in a positive sense, except Role conflict ($B = -0.13$) that predicted in a negative sense, while the resource variable Autonomy ($B = -0.21$) predicted in a negative sense the belonging to this level of burnout. Moreover, the best predictors were Workload ($B = 0.22$) and Role ambiguity ($B = 0.20$) in a positive sense and Autonomy ($B = -0.21$) in a negative sense.

On the other hand, with regard to the prediction for Profile 1 (**Table 2**), in the first step, the variables Age ($B = 0.02$) and Level of education ($B = 0.72$) were significant. Besides demand variables were added in the second step, the variables Age ($B = 0.02$), Level of education ($B = 0.65$), Emotional labor ($B = 0.21$), Interpersonal conflict ($B = 0.25$), Imbalance ($B = 0.72$), Role conflict ($B = 0.38$), Role ambiguity ($B = 0.59$), and Workload ($B = 0.62$) were predictors of this profile. In the third step, resources variables were added, and the results showed that the demand variables Emotional Labor ($B = 0.38$), Imbalance ($B = 0.64$), Role conflict ($B = 0.17$), Role ambiguity ($B = 0.23$), and Workload ($B = 0.66$) predicted in a positive sense, while the resources Social support ($B = -0.30$), Autonomy ($B = -0.68$) and Resources at work ($B = -0.21$) predicted in a negative sense the belonging to that level. Likewise, the best predictors were Workload ($B = 0.66$) and Imbalance ($B = 0.64$) in a positive sense and Autonomy ($B = -0.68$) in a negative sense.

In the case of Profile 2 (**Table 2**) the results showed that in the first step the variable Sex ($B = 0.31$) and Level of education ($B = 0.35$) were predictors of Profile 2. In the second step, when demand variables were added, the results showed that the variables Sex ($B = 0.34$), Age ($B = 0.02$), Emotional labor ($B = 0.54$), Interpersonal conflict ($B = 0.98$), Role conflict ($B = 0.30$), Role ambiguity ($B = 0.69$), and Workload ($B = 0.94$) were predictors of Profile 2. In the third step, when resource variables were added, the results showed that the demand variables Emotional labor ($B = 0.55$), Interpersonal conflict ($B = 0.98$), Role conflict ($B = 0.29$), Role ambiguity ($B = 0.66$), and Workload ($B = 0.93$) were positive predictors, while there were not any resources variables which acted as predictors. However, Sex ($B = 0.35$) and Age ($B = 0.02$) were positive predictors of this level of burnout. In addition, the best predictors were Interpersonal conflict ($B = 0.98$), and Workload ($B = 0.93$).

Finally, Sex, Age, Level of education, resources variables, and demand variables in the workplace that influenced the change from the lower levels of burnout (No burnout) to higher levels (Profile 2) were evaluated (**Table 3**). The results showed that all demand variables significantly influenced the moves between all burnout levels, with the exception of Emotional labor and Role conflict in the move from Profile 1 to Profile 2. In addition, the results were similar to resource variables. All results were significant, with the exception of the influence of Resources at work in the move from Profile 1 to Profile 2.

The variable Workload seemed to be the most influential predictor in the moves from No burnout to Medium-High levels ($B = 0.70$) and Medium-High levels to Profile 1 ($B = 0.67$). However, the variable Interpersonal conflict seemed to be the

TABLE 2 | Logistic regressions for no burnout, medium-high levels, profile 1, and profile 2.

Variable	No burnout (Low levels burnout)			Medium-High levels (medium levels Burnout)			Profile 1 (Critical levels of burnout and no critical levels of guilt)			Profile 2 (Critical levels of burnout and critical levels of guilt)		
	B	SE	Wald	B	SE	Wald	B	SE	Wald	B	SE	Wald
Step 1												
Sex	0.03	0.05	0.28	−0.04	0.05	0.71	−0.17	0.10	2.81	0.31	0.15	3.96*
Age	−0.02	0.003	56.57***	0.003	0.003	1.63	0.02	0.005	18.99***	0.02	0.008	3.75
L. of education	−0.37	0.03	117.10***	0.25	0.03	58.53***	0.72	0.08	88.78***	0.35	0.11	9.28**
NR^2		0.04			0.01			0.04			0.01	
Cox & snell R^2		0.03			0.009			0.02			0.003	
Step 2												
Sex	0.10	0.06	2.61	−0.06	0.05	1.36	−0.21	0.11	3.45	0.34	0.17	4.25*
Age	−0.02	0.003	50.38***	0.002	0.003	0.84	0.02	0.006	18.46***	0.02	0.009	4.26*
L. of education	−0.34	0.04	77.62***	0.23	0.03	44.07***	0.65	0.08	62.31***	0.20	0.12	2.78
EL	−0.17	0.05	12.88***	−0.003	0.04	0.006	0.21	0.09	5.01*	0.54	0.15	13.03***
IC	−0.77	0.07	131.46*	0.11	0.05	4.02*	0.25	0.10	6.16*	0.98	0.14	45.86***
Imbalance	−0.45	0.04	108.47***	0.21	0.04	30.40***	0.72	0.08	76.77***	−0.09	0.13	0.53
RC	−0.32	0.05	43.64***	−0.08	0.04	4.34*	0.38	0.08	25.99***	0.30	0.12	6.72**
RA	−0.73	0.05	221.65***	0.30	0.04	58.33***	0.59	0.07	70.13***	0.69	0.10	44.25***
Workload	−0.75	0.06	144.56***	0.22	0.05	16.62**	0.62	0.11	32.61***	0.94	0.17	30.93***
NR^2		0.30			0.04			0.23			0.23	
Cox & snell R^2		0.22			0.03			0.09			0.05	
Step 3												
Sex	0.08	0.06	1.57	−0.05	0.05	0.75	−0.13	0.11	1.33	0.35	0.17	4.39*
Age	−0.02	0.003	45.56***	0.002	0.003	0.50	0.02	0.006	17.66***	0.02	0.01	4.24*
L. of education	−0.35	0.04	79.16***	0.23	0.03	45.21***	0.68	0.08	66.51***	0.20	0.12	2.80
EL	−0.23	0.05	22.37***	0.02	0.04	0.33	0.38	0.09	15.71***	0.55	0.15	13.09***
IC	−0.72	0.07	110.27***	0.08	0.05	2.11	0.13	0.10	1.67	0.98	0.15	44.63***
Imbalance	−0.43	0.04	94.63***	0.19	0.04	24.88***	0.64	0.08	58.08***	−0.09	0.13	0.53
RC	−0.23	0.05	22.40***	−0.13	0.04	10.37***	0.17	0.08	4.52*	0.29	0.12	5.49*
RA	−0.52	0.05	96.61***	0.20	0.04	21.26***	0.23	0.08	8.39**	0.66	0.12	30.78***
Workload	−0.77	0.06	146.77***	0.22	0.05	16.35***	0.66	0.11	35.41***	0.93	0.17	29.93***
SS	0.12	0.04	10.04**	−0.05	0.03	2.33	−0.30	0.06	21.56***	0.04	0.10	0.15
Autonomy	0.52	0.06	80.48***	−0.21	0.05	18.90***	−0.68	0.09	52.88***	−0.13	0.15	0.79
Resources	0.06	0.04	2.22	−0.07	0.04	3.71	−0.21	0.08	6.99**	−0.02	0.12	0.03
NR^2		0.31			0.05			0.26			0.23	
Cox & snell R^2		0.23			0.03			0.10			0.05	

*Freedom degree = 1. PE&I, Psychological exhaustion & Indolence; PE&G, Psychological exhaustion & Guilt; PE, Psychological exhaustion; L. of education, Level of education; EL, Emotional labor; IC, Interpersonal conflict; SS, Social support; RC, Role conflict; RA, Role ambiguity; B, regression coefficient; SE, Standard Error. $NR^2 = R^2$ of Nagelkerke. *$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$.*

most influential predictor in the change from Profile 1 to Profile 2 ($B = 0.81$) (**Table 3**, Step 3). All of the variables showed an influence on the movement between levels of burnout according to the hypothesized effect; however, 3 exceptions were found in the change from Profile 1 to Profile 2: (a) Imbalance showed a negative and significant effect ($B = -0.61$), (b) Social support showed a positive and significant effect ($B = 0.35$) and (c) Autonomy showed a positive and significant effect ($B = 0.42$).

DISCUSSION

Despite the statistics and cost of the different international and national institutes (European Agency for Safety Health at Work, 2016) that refer to a high loss in economy and society because of psychosocial risk, there is hardly any research about the burnout levels and the different psychosocial variables that can predict the progress of severity of burnout. Likewise, there are not a lot of studies about the influence of these psychosocial variables on the burnout process. These studies could help to understand better the process and create different interventions to reduce the cost and improve the employee's health and safety. Thus, the purpose of this study was to identify the demands and resource predictors of each burnout profile. On the other hand, it was to know the influence of the different demands and resource variables on the movements of one profile to another. The first aim of the study was performed

TABLE 3 | Logistical regressions for the change of category.

Variable	No burnout→Medium-High levels			Medium-High levels→Profile 1			Profile 1→Profile 2		
	B	SE	Wald	B	SE	Wald	B	SE	Wald
Step 1									
Sex	−0.04	0.06	0.56	−0.12	0.11	1.21	0.46	0.18	6.27*
Age	0.01	0.003	24.88***	0.02	0.006	13.43***	−0.004	0.01	0.14
L. of education	0.37	0.04	103.18***	0.52	0.08	44.12***	−0.34	0.14	6.14*
NR^2		0.03			0.03			0.02	
Cox & snell R^2		0.02			0.02			0.01	
Step 2									
Sex	−0.10	0.06	2.52	−0.14	0.12	1.52	0.47	0.19	5.83*
Age	0.02	0.003	26.88***	0.03	0.006	18.36***	0.000	0.01	0.002
L. of education	0.36	0.04	77.55***	0.54	0.07	39.36***	−0.32	0.15	4.67*
EL	0.14	0.05	7.36**	0.25	0.10	6.72**	0.30	0.16	3.43
IC	0.65	0.07	83.38***	0.38	0.11	11.52***	0.69	0.16	17.55***
Imbalance	0.43	0.05	87.57***	0.63	0.09	49.60***	−0.61	0.15	17.71***
RC	0.22	0.05	19.18***	0.42	0.08	27.12***	0.01	0.13	0.01
RA	0.72	0.05	198.68***	0.52	0.08	45.86***	0.15	0.12	1.49
Workload	0.67	0.07	103.70***	0.65	0.12	30.87***	0.47	0.19	6.20*
NR^2		0.24			0.22			0.12	
Cox & snell R^2		0.18			0.12			0.08	
Step 3									
Sex	−0.08	0.07	1.35	−0.09	0.12	0.57	0.41	0.20	4.40*
Age	0.01	0.003	24.45***	0.03	0.006	16.46***	0.002	0.01	0.05
L. of education	0.37	0.04	78.69***	0.57	0.09	42.97***	−0.42	0.15	7.73**
EL	0.19	0.05	14.53****	0.42	0.10	16.95***	0.14	0.17	0.66
IC	0.59	0.07	66.32***	0.27	0.11	5.64**	0.81	0.17	22.17***
Imbalance	0.40	0.05	74.71***	0.55	0.09	38.12***	−0.61	0.15	16.39***
RC	0.13	0.05	6.45*	0.23	0.08	7.56**	0.22	0.14	2.40
RA	0.52	0.05	87.18***	0.22	0.09	6.48*	0.40	0.14	8.63**
Workload	0.70	0.07	107.91***	0.67	0.12	32.08***	0.47	0.19	5.30*
SS	−0.11	0.04	7.53**	−0.26	0.07	13.91***	0.35	0.12	8.01**
Autonomy	−0.52	0.06	71.46***	−0.56	0.10	31.88***	0.42	0.17	6.08*
Resources	−0.11	0.05	5.42*	−0.21	0.08	6.08*	0.19	0.14	1.85
NR^2		0.26			0.25			0.16	
Cox & snell R^2		0.19			0.14			0.11	

Freedom degree = 1. L. of education, Level of education; EL, Emotional labor; IC, Interpersonal conflict; SS, Social support; RC, Role conflict; RA, Role ambiguity; B, regression coefficient; SE, Standard Error. $NR^2 = R^2$ *of Nagelkerke..* $^*p \leq 0.05$; $^{**}p \leq 0.01$; $^{***}p \leq 0.001$.

through a cluster test, and the results showed that for the No burnout levels, each demand variable (Emotional labor, Interpersonal conflict, Imbalance, Role conflict, Role ambiguity, and Workload) were a negative sense predictor of this level, and resource variables (Social support and Autonomy) were a positive sense predictor of this type. In addition, variables Age and Level of education were a negative predictor of No burnout levels. In this case, the resource variables could be acting as protective variables, as other studies have shown (Setti et al., 2016; Khan et al., 2018). In addition, it shows the importance of having a healthy psychosocial environment at work, where the demands are controlled or are low, and resources are present.

Moreover, in the Medium-High burnout level, some demand variables (Imbalance, Role conflict, Role ambiguity, and Workload) and Autonomy were predictors. In particular, demand variables were a positive sense predictor, except Role conflict that was a negative predictor of Medium-High burnout level, and Autonomy was a negative sense predictor. Also, Level of education was a positive predictor of Medium-High burnout level.

Likewise, some demand variables (Emotional labor, Imbalance, Role conflict, Role ambiguity, and Workload) and resource variables (Social support, Autonomy, and Resources at work) predict Profile 1, specifically, demand variables except in a positive sense and resource variables in a negative sense. The

results showed that the variable Age is a predictor of Profile 1; to be older seems to predict burnout.

For Profile 2, some of the demand variables (Emotional labor, Interpersonal conflict, Role conflict, Role ambiguity, and Workload) were found as a positive predictor. In addition, the results showed that the variables Sex and Age are a predictor of Profile 2. In particular, being a woman seems to predict burnout. These results are similar to other researches (Alavinia and Ahmadzadeh, 2012; Leineweber et al., 2013; Nava and Páez, 2013).

Therefore, Hypothesis 1 and Hypothesis 2 were accepted. These results agree with some of the results of studies about the relationship between demand variables (Skaalvik and Skaalvik, 2007; Backhaus et al., 2018; Vullinghs et al., 2018) and resource variables (Khan et al., 2018) and burnout. They showed the importance of the demand variables in burnout prediction (Demerouti et al., 2001), increasing the probability of having the highest levels of burnout when there are high levels of demands (Emotional labor, Interpersonal conflict, Imbalance, Role conflict, Role ambiguity, and Workload). Furthermore, these results showed that the most important demand variable that predicts burnout in almost all cases was Workload. Thus, Workload should be controlled to reduce the probability to develop burnout.

The second aim of this study was to identify the influence of the predictors in the moves between levels of burnout. In the movements between levels of burnout, results showed that the demand variables were present in each movement. Moreover, the demand variable Interpersonal conflict showed the highest influence in the movement from Profile 1 to Profile 2, and the Workload variable showed the highest influence in the movements from No burnout to Medium-High level and from Medium-High level to Profile 1. All resource variables influenced all the movements between profiles, with the exception of Resources at work in the movement from Profile 1 to Profile 2. Therefore, the demand and resource variables were predictors of a change in the level of burnout. Workload was present in all cases. So, Hypothesis 3 is confirmed. However, the variable Imbalance has a negative influence in the change -i.e., lower levels of imbalance increasing levels of critical burnout. On the other hand, in the move from Profile 1 to Profile 2, the resource variables Social support and Autonomy were positively significant.

Furthermore, low levels of imbalance in conjunction with high levels of social support and autonomy influence the move from Profile 1 to Profile 2. This result can be explained because teachers with higher levels of burnout, when they perceive low levels of imbalance (e.g., *I receive a lot of compensation for the care and attention I give to my students* or *I am rewarded a lot of for the effort I make at work*), high levels of social support and high levels of autonomy might be attributing to themselves all the responsibility about their negative behavior toward the students. Because the organizational environment is supportive, their feelings of guilt rise up, increasing their burnout levels as well. This result gives a new view of the burnout process to understand the critical burnout levels, showing that feelings of guilt have an influence on the increment of the unhealthier burnout levels. These results will help to prevent and create intervention programs because Social support and Autonomy should not be used in the Profile 2 intervention. Some studies showed similar results in nurses where the Social support did not prevent burnout when there are high levels of Workload (Fong, 2016).

These results showed the importance of some resource variables as a protector variable on the no chronic burnout, and they could help to design an intervention plan to stop a person from developing a chronic burnout syndrome (e.g., Gil-Monte, 2019b). They also help to understand how burnout is changing from one statement to another.

This study could be helpful in understanding the variables that actually affect the different burnout levels, and it can be used to create a specific intervention for each profile. In addition, it shows which variables are important to reduce and prevent burnout syndrome. Social support should be used to prevent burnout, but it should not be used for chronic burnout intervention because this study showed that it would not help to improve the higher levels of burnout. The intervention for chronic burnout should focus on reducing some demand variables such as Workload and Interpersonal conflicts, but also reducing some resource variables such as Social support and Autonomy in the highest or critical levels of burnout. However, the intervention in low levels of burnout should focus on increasing some resource levels to prevent chronic levels of burnout.

Results from this study could help to design intervention programs that promote the health of the teachers. In addition, the prevention of burnout syndrome would help to reduce the social and organizational costs. Also, this study could help to understand how burnout syndrome develops and help future studies to know the important variables that influence burnout syndrome.

Our results provide useful data in terms of their practical implications since, on the one hand, they allow to identify the key elements of the burnout development process at different stages, highlighting those in which it would be convenient to intervene in order to prevent the onset of burnout (such as social support) or to prevent its worsening (such as autonomy), as well as important elements throughout the whole process (such as workload and interpersonal conflicts). We have also seen the importance of the element of guilt and how some factors are related to its development (such as social support). The present study allows to discern the key intervention factors depending on the characteristics of each particular case: if we want to prevent the development of burnout, if burnout already exists and we want to reduce its levels or prevent its worsening, if guilt is present or not, among others. The design of strategies adapted to the different cases allows these to be more efficient, optimizing the use of the resources that such strategies require.

This study is not without limitations. Firstly, a non-probabilistic method in a single region of Spain was used to get the sample, so it is difficult to generalize these results. Secondly, the results of this study were obtained with self-report. Therefore, it can produce some bias in the results. Thirdly, the variable Sex could contaminate the results as 72.5% of the sample were

women. Fourthly, the sample was collected for a long period of time that could negatively influence the results. Finally, the absence of longitudinal data does not allow causal inferences to be made; therefore, the predictions observed in our analyses are predictions of the statistical variance observed in the scores, which allows a better understanding of the role of some variables in the development or worsening of burnout, but they do not allow for a cause-and-effect interpretation. Future studies should consider these limitations and extend the sampling to other geographical and cultural contexts to replicate this study so it can be helpful to other professional areas. Likewise, it would be interesting to have other types of objective measures or those coming from external observers. Despite all this, the study is of special interest considering the large size of the sample under study, as well as the results obtained on the role that sociodemographic variables, demands, and resources have in the appearance of burnout, and something more novel, to know those variables that seem to be involved in the evolution toward more harmful profiles of burnout.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

This study respected the fundament principles of the Declaration of Helsinki (World Medical Association, 2013), with particular emphasis on the anonymization of the data collected, confidentiality and non-discrimination of participants. All the educational non-university centers in the Community of Valencia were asked to participate and the teacher's collaboration was voluntary. Teachers were informed about the purpose of the study, the possible benefits and possible consequences of their participation. This study was part of a psychosocial assessment of the Instituto Valenciano de Seguridad y Salud en el trabajo (INVASSAT). In all cases regional government instructions were followed. Previously to start the assessment, the ethical department of this institution was consulted and concluded that as the participation was voluntary and the teachers just needed to answer an anonym questionnaire, the research did not need to be checked by a bioethics committee.

AUTHOR CONTRIBUTIONS

AS-R and ML-P wrote the article and prepared to submit. PG-M got the sample and helped to write the article. All authors contributed to the article and approved the submitted version.

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REFERENCES

Abósa, A., Sevil-Serranoa, J., Haerensb, L., Aeltermanc, N., and García-Gonzáleza, L. (2019). Towards a more refined understanding of the interplay between burnout and engagement among secondary school teachers: a person-centered perspective. *Learn. Individ. Differ*. 72, 69–79. doi: 10.1016/j.lindif.2019.04.008

Alarcon, G. M. (2011). A meta-analysis of burnout with job demands, resources, and attitudes. *J. Vocat. Behav*. 79: 549–562. doi: 10.1016/j.jvb.2011.03.007

Alavinia, P., and Ahmadzadeh, T. (2012). Toward a reappraisal of the bonds between emotional intelligence and burnout. *Engl. Lang. Teach*. 5, 37–50. doi: 10.5539/elt.v5n4p37

Andela, M., Truchot, D., and Borteyrou, X. (2015). Emotional labour and burnout: some methodological consideration and refinements. *Can. J. Behav. Sci.* 47, 321–332. doi: 10.1037/cbs0000024

Backhaus, O., Hampel, P., and Dadaczynski, K. (2018). Effort-reward imbalance and burnout in German kindergarten educators. *Eur. J. Health Psychol*. 25, 73–82. doi: 10.1027/2512-8442/a000012

Bakker, A. B., and Demerouti, E. (2017). Job demands–resources theory: taking stock and looking forward. *J. Occup. Health Psychol*. 22, 273–285. doi: 10.1037/ocp0000056

Bakker, A. B., and Wang, Y. (2020). Self-undermining behavior at work: evidence of construct and predictive validity. *Int. J. Stress Manag*. 27, 241–251. doi: 10.1037/str0000150

Betoret, F. D. (2009). Self-efficacy, school resources, job stressors and burnout among Spanish primary and secondary school teachers: a structural equation approach. *Edu. Psychol*. 29, 45–68. doi: 10.1080/01443410802459234

Bhave, D. P., and Glomb, T. M. (2016). The role of occupational emotional labor requirements on the surface acting-job satisfaction relationship. *J. Manage*. 42, 722–741. doi: 10.1177/0149206313498900

Cárdenas, M., and Arancibia, H. (2014). Potencia estadística y cálculo del tamaño del efecto en G*Power: complementos a las pruebas de significación estadística y su aplicación en psicología. *Salud. Soc*. 5, 210–224. doi: 10.22199/S07187475.2014.0002.00006

Cecho, R., Švihrová, V., Cecho, D., Novák, M., and Hudečková, H. (2019). Exposure to mental load and psychosocial risks in kindergarten teachers. *Zdr Varst*. 58, 120–128. doi: 10.2478/sjph-2019-0016

Chung, Y., and Choo, H. (2018). A structural path to job satisfaction, burnout, and intent to leave among child protection workers: a South Korean study. *Child. Youth Serv. Rev*. 100, 304–312. doi: 10.1016/j.childyouth.2019.03.018

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demandsresources model of burnout. *J. Appl. Psychol*. 86, 499–512. doi: 10.1037/0021-9010.86.3.499

Elshaer, N. S., Moustafa, M. S., Aiad, M., and Ramadan, M. I. (2018). Job stress and burnout syndrome among critical care healthcare workers. *Bull. Alexand. Fact*. 54, 273–277. doi: 10.1016/j.ajme.2017.06.004

Engelbrecht, G. J., de Beer, L. T., and Schaufeli, W. B. (2019). The relationships between work intensity, workaholism, burnout, and self-reported musculoskeletal complaints. *Hum Fact Manage.* 30, 59–70. doi: 10.1002/hfm.20821

European Agency for Safety and Health at Work (2016). Second *European Survey of Enterprises on New and Emerging Risks (ESENER-2)*. Luxembourg: European Agency for Safety and Health at Work.

European Agency for Safety and Health at Work and Eurofound (2014). *Psychosocial Risks in Europe: Prevalence and Strategies for Prevention*. Luxembourg: European Agency for Safety and Health at Work.

Figueiredo-Ferraz, H., Gil-Monte, P. R., and Grau-Alberola, E. (2013). Psychometric properties of the "Spanish Burnout Inventory" (SBI): adaptation and validation in a Portuguese-speaking sample. *Eur. Rev. Appl. Psychol*. 63, 33–40. doi: 10.1016/j.erap.2012.08.003

Fong, C. M. (2016). Role overload, social support, and burnout among nursing educators. *J. Nurs. Educ.* 29, 102–108. doi: 10.3928/01484834-19900301-07

Fornell, B., Correa, M., del Amo, M. P. L., and Martín, J. J. (2018). influence of changes in the Spanish labor market during the economic crisis (2007–2011) on perceived health. *Qual. Life Res.* 27, 2095–2105. doi: 10.1007/s11136-018-1824-5

Gil-Monte, P. R. (2005). *El Síndrome de Quemarse por el Trabajo (burnout). Una Enfermedad Laboral en la Sociedad del Bienestar*. Madrid: Pirámide.

Gil-Monte, P. R. (2011). *CESQT. Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo. Manual.* Madrid: TEA Ediciones.

Gil-Monte, P. R. (2012). Influence of guilt on the relationship between burnout and depression. *Eur. Psychol.* 17, 231–236. doi: 10.1027/1016-9040/a000096

Gil-Monte, P. R. (2016a). La Batería UNIPSICO: propiedades psicométricas de las escalas que evalúan los factores psicosociales de demanda. *Arch. Prev. Riesgos Labor*. 19, 86–94. doi: 10.12961/aprl.2016.19.02.2

Gil-Monte, P. R. (2016b). La Batería UNIPSICO: propiedades psicométricas de las escalas que evalúan los factores psicosociales de recursos. *Arch. Prev. Riesgos Labor*. 19, 95–102. doi: 10.12961/aprl.2016.19.02.3

Gil-Monte, P. R. (2019a). *CESQT. Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo.* 2nd Edn. Madrid: TEA Ediciones.

Gil-Monte, P. R. (2019b). *Prevención y Tratamiento del Síndrome de Quemarse por el Trabajo (Burnout): Programa de Intervención*. Madrid: Pirámide.

Gil-Monte, P. R., Carlotto, M. S., and Gonçalves, S. (2011). Prevalence of burnout in a sample of Brazilian teachers. *Eur. J. Psychiatry* 25, 205–212. doi: 10.4321/S0213-61632011000400003

Gonçalves, A., Fontes, L., Simães, C., and Gomes, A. R. (2019). "Stress and burnout in health professionals," in *Occupational and Environmental Safety and Health*, eds P. Arezes et al. (Cham: Springer), 563–571.

Gu, Y., Wang, R., and You, X. (2020). Recovery experiences moderate the impact of work stressors on well-being: a two-wave study of preschool teachers. *J. Early Child Res.* 48, 189–202. doi: 10.1007/s10643-019-00994-w

Guidetti, G., Viotti, S., Gil-Monte, P. R., and Converso, D. (2018). Feeling guilty or not guilty. Identifying burnout profiles among Italian teachers. *Curr. Psychol.* 37, 769–780. doi: 10.1007/s12144-016-9556-6

Gusy, B., Lesener, T., and Wolter, C. (2019). Measuring well-being with the Utrecht work engagement scale – student form validation of a 9- and a 3-item measure of student engagement. *Eur. J. Health Psychol.* 26, 31–38. doi: 10.1027/2512-8442/a000027

Hatch, D. J., Potter, G. G., Martus, P., Rose, U., and Freude, G. (2019). Lagged versus concurrent changes between burnout and depression symptoms and unique contributions from job demands and job resources. *J. Occup. Health Psychol.* 24, 617–628. doi: 10.1037/ocp0000170

Jennings, P. A., and Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Rev. Educ. Res.* 79, 491–525. doi: 10.3102/0034654308325693

Jin, Y. Y., Noh, H., Shin, H., and Lee, S. M. (2015). A typology of burnout among Korean teachers. *Asia Pac. Educ. Res.* 24, 309–318. doi: 10.1007/s40299-014-0181-6

Johnson, J. V., and Hall, B. M. (1988). Job strain, work place social support and cardiovascular disease: a cross sectional study of a random sample of the Swedish working population. *Am. J. Public Health* 78 1338–1342. doi: 10.2105/AJPH.78.10.1336

Junne, F., Michaelis, M., Rothermund, E., Stuber, F., Gündel, H., Zipfel, S., et al. (2018). The role of work-related factors in the development of psychological distress and associated mental disorders: differential views of human resource managers, occupational physicians, primary care physicians and psychotherapists in Germany. *Int. J. Environ. Res. Public Health* 15, 559–576. doi: 10.3390/ijerph15030559

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: implications for job redesign. *Adm. Sci. Q.* 24, 285–308. doi: 10.2307/2392498

Kaur, B., and Singh, A. (2014). Burnout among elementary school teachers in context to sex and location of their schools. *Int. J. Educ. Manage. Stud.* 4, 47–51.

Khan, A., Teoh, K., Islam, S., and Hassard, J. (2018). Psychosocial work characteristics, burnout, psychosocial morbidity symptoms and early retirement intentions: a cross-sectional study of NHS consultant in the UK. *BMJ Open* 8:e018720. doi: 10.1136/bmjopen-2017-018720

Kim, L. E., and Burić, I. (2019). Teacher self-efficacy and burnout: determining the directions of prediction through an autoregressive cross-lagged panel model. *J. Educ. Psychol.* 11, 1661–1676. doi: 10.1037/edu0000424

Klein, C. J., Weinzimmer, L. G., Cooling, M., Lizer, S., Pierce, L., and Dalstrom, M. (2020). Exploring burnout and job stressors among advanced practice providers. *Nurs. Outlook* 68, 145–154. doi: 10.1016/j.outlook.2019.09.005

LaFaver, K., Miyasaki, J. M., Keran, C. M., Rheaume, C., Gulya, L., Levin, K. H., et al. (2018). Age and sex differences in burnout, career satisfaction, and well-being in US neurologists. *Neurology* 91, e1928–e1941. doi: 10.1212/WNL.0000000000006497

Langher, V., Caputo, A., and Ricci, M. E. (2017). The potential role of perceived support for reduction of special education teachers' burnout. *Int. J. Educ. Psychol.* 6, 120–147. doi: 10.17583/ijep.2017.2126

Lebares, C. C., Braun, H. J., Guvva, E. V., Epel, E. S., and Hecht, F. M. (2018). Burnout and gender in surgical training: a call to re-evaluate coping and dysfunction. *Am. J. Surg.* 216, 800–804. doi: 10.1016/j.amjsurg.2018.07.058

Leineweber, C., Baltzer, M., Magnusson Hanson, L. L., and Westerlund, H. (2013). Work–family conflict and health in Swedish working women and men: a 2-year prospective analysis (the SLOSH study). *Eur. J. Public Health* 23, 710–716. doi: 10.1093/eurpub/cks064

Makhdoom, I. F., Atta, M., and Malik, N. I. (2019). Counterproductive work behaviors as an outcome of job burnout among high school teachers. *Bull. Educ. Res.* 41, 79–92.

Mäkikangas, A., Leiter, M. P., Kinnunen, U., and Feldt, T. (2020). Profiling development of burnout over eight years: relation with job demands and resources. *Eur. J. Work Organ. Psychol.* doi: 10.1080/1359432X.2020.1790651. [Epub ahead of print].

Martínez-Monteagudo, M. C., Inglés, C. J., Granados, L., Aparisi, D., and García-Fernández, J. M. (2019). Trait emotional intelligence profiles, burnout, anxiety, depression, and stress in secondary education teachers. *Pers. Individ. Dif.* 142, 53–61. doi: 10.1016/j.paid.2019.01.036

Maslach, C. (2017). Finding solutions to the problem of burnout. *Consul. Psychol. J. Pract. Res.* 69, 143–152. doi: 10.1037/cpb0000090

Maslach, C., and Jackson, S. E. (1986). *Maslach Burnout Inventory*. Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., and Leiter, M. P. (2016). Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry* 15, 103–111. doi: 10.1002/wps.20311

Maslach, C., Schaufeliu, W. B., and Leiter, M. P. (2001). Job burnout. *Ann. Rev. Psychol.* 52, 397–422. doi: 10.1146/annurev.psych.52.1.397

Maxwell, A., and Riley, P. (2017). Emotional demands, emotional labour and occupational outcomes in school principals: modelling the relationships. *Educ. Manage. Admin. Leader.* 45, 484–502. doi: 10.1177/1741143215607878

McCarty, W. P., Aldirawi, H., Dewald, S., and Palacios, M. (2019). Burnout in blue: an analysis of the extent and primary predictors of burnout among law enforcement officers in the United States. *Police Qy* 22, 278–304. doi: 10.1177/1098611119828038

McLean, D., Eklund, K., Kilgus, S. P., and Burns, M. K. (2019). Influence of teachers burnout and self-efficacy on teacher-related variance in social-emotional and behavioural screening scores. *Am. Psychol. Assoc.* 34, 503–511. doi: 10.1037/spq0000304

McLean, L., Taylor, M., and Jimenez, M. (2019). Career choice motivations in teacher training as predictors of burnout and career optimism in the first year of teaching. *Teach. Educ.* 85, 204–214. doi: 10.1016/j.tate.2019.06.020

Mero, S. L. (2018). *The Exploration of How Legacy Employees Perceive and Experience an Outsourcing Transition*. San Diego, CA: Northcentral University,

Misiolek-Marín, A., Soto-Rubio, A., Misiolek, H., and Gil-Monte, P. R. (2020). Influence of burnout and feelings of guilt on depression and health in anesthesiologists. *Int. J. Environ. Res. Public Health* 17:9267. doi: 10.3390/ijerph17249267

Mousavy, S. (2014). Contribution of gender, marital status, and age to english language teachers' burnout. *Adv. Lang. Liter. Stud.* 5, 39–47. doi: 10.7575/aiac.alls.v.5n.6p.39

Nagy, G. A., Fang, C. M., Hish, A. J., Kelly, K., Nicchitta, C. V., Dzirasa, K., et al. (2018). Burnout and mental health problems in biomedical doctoral students. *CBE—Life Sci. Educ.* 18, 1–14. doi: 10.1187/cbe.18-09-0198

Nava, D. F., and Páez, J. A. R. (2013). Síndrome de quemarse por el trabajo en mujeres trabajadoras de la industria petrolera en México. *Rev. Cuba. Salud Trabajo* 14, 3–11.

Nielsen, K., Jørgensen, M. B., Milczarek, M., and Munar, L. (2018). *Healthy Workers, Thriving Companies: A Practical Guide to Well-Being at Work*. Luxembourg: European Agency for Safety and Health at Work.

Ortíz, S., Navarro, C., García, E., Ramis, C., and Manassero, M. A. (2012). Validación de la versión española de la escala de trabajo emocional de Frankfurt. *Psicothema* 24, 337–342.

Pisaniello, S. L., Winefield, H. R., and Delfabbro, P. H. (2012). The influence of emotional labour and emotional work on the occupational health and well-being of South Australian hospital nurses. *J. Vocat. Behav*. 80, 579–591. doi: 10.1016/j.jvb.2012.01.015

Puertas-Molero, P., Zurita-Ortega, F., Chacón-Cuberos, R., Martínez-Martínez, A., Castro-Sánchez, M., and González-Valero, G. (2018). An explanatory model of emotional intelligence and its association with stress, burnout syndrome, and non-verbal communication in the university teachers. *J. Clin. Med*. 7:524. doi: 10.3390/jcm7120524

Purvanova, R. K., and Muros, J. P. (2010). Gender difference in burnout: A meta-analysis. *J. Vocat. Behav*, 77, 168–185. doi: 10.1016/j.jvb.2010.04.006

Pyhältö, K., Pietarinen, J., Haverinen, K., Tikkanen, L., and Soini, T. (2021). Teacher burnout profiles and proactive strategies. *Euro. J. Psychol. Educ.* 36, 219–242. doi: 10.1007/s10212-020-00465-6

Rabasa, B., Figueiredo-Ferraz, H., Gil-Monte, P. R., and Llorca-Pellicer, M. (2016). The role of guilt in the relationship between teacher's job burnout syndrome and the inclination toward absenteeism. *Rev. Psicodidáct.* 21, 103–119. doi: 10.1387/RevPsicodidact.13076

Ratto, A., García, R. C., Silva, M. I., and González, M. C. (2015). Burnout syndrome and psychosocial factors in primary school teachers in Montevideo. *Cienc. Psicol.* 9, 273–281.

Ruiz-Calzado, I. (2016). Burnout en docentes de educación especial de Córdoba (españa). *Opción* 32, 569–588.

Salmela-Aro, K., Hietajärvi, L., and Lonka, K. (2019). Work burnout and engagement profiles among teachers. *Front. Psychol.* 10:2254. doi: 10.3389/fpsyg.2019.02254

Sarisik, M., Bogan, E., Zengin, B., and Dedeoglu, B. B. (2019). The impact of burnout on organizational commitment: a study of public sector employees in Turkey. *J. Glob. Busin. Insights* 4, 106–118. doi: 10.5038/2640-6489.4.2.1066

Schonfeld, I. S., Verkuilen, J., and Bianchi, R. (2019). An exploratory structural equation modelling bi-factor analytic approach to uncovering what burnout, depression and anxiety scales measure. *Psychol. Assess.* 31,1073–1079. doi: 10.1037/pas0000721

Setti, I., Lourel, M., and Argentero, P. (2016). The role of affective commitment and perceived social support in protecting emergency workers against burnout and vicarious traumatization. *Traumatology* 22, 261–270. doi: 10.1037/trm0000072

Simionato, G., Simpson, S., and Reid, C. (2019). Burnout as an ethical issue in psychotherapy. *Psychotherapy* 56, 470–482. doi: 10.1037/pst0000261

Skaalvik, E., and Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *J. Educ. Psychol.* 99, 611–625. doi: 10.1037/0022-0663.99.3.611

Smetackovaa, I. (2017). *Self-efficacy and Burnout Syndrome Among Teachers*. The European Journal of Social and Behavioural Sciences. Retrieved from https://www.futureacademy.org.uk/files/images/upload/ejsbs219.~pdf

Stehman, C. R., Testo, Z., and Gershaw, R. S. (2019). Burnout, drop out, suicide: physician loss in emergency medicine, part I. *West. J. Emerg. Med*. 20, 485–494. doi: 10.5811/westjem.2019.4.40970

Taris, T. W., Peeters, M. C., Le Blanc, P. M., Schreurs, P. J., and Schaufeli, W. B. (2001). From inequity to burnout: the role of job stress. *J. Occup. Health Psychol.* 6, 303–323. doi: 10.1037/1076-8998.6.4.303

Travers, C. J. (2001). "Stress in teaching: past, present, and future," in *Stress in the Workplace*, ed J. Dunham (Philadelphia, PA: Whurr Publishers, Ltd), 130–163.

Unda, S. (2010). Estudio de prevalencia del síndrome de quemarse por el trabajo (SQT) y su asociación con sobrecarga y autoeficacia en maestros de primaria de la Ciudad de México. *Cienc Trab* 35, 257–262.

Unda, S. U., Hernández-Toledano, R. A., and García-Arreola, O. (2020). Factores de riesgo psicosocial predictores del síndrome de quemarse por el trabajo (SQT) (Burnout) en docentes de bachillerato. *Inform. Psicol.* 119, 91–107.

Villaverde, D., Unda, S., Escotto, E. A., and Flores, R. (2019). Rasgos de personalidad predictores del síndrome de quemarse por el trabajo en profesores mexicanos. *Propós. Represent.* 7, 41–71. doi: 10.20511/pyr2019.v7n3.346

Vullinghs, J. T., De Hoogh, A. H., Den Hartog, D. N., and Boon, C. (2018). Ethical and passive leadership and their joint relationship with burnout via role clarity and role overload. *J. Bus. Ethics* 165, 1–15. doi: 10.1007/s10551-018-4084-y

Wegge, J., Van Dick, R., and von Bernstorff, C. (2010). Emotional dissonance in call centre work. *J. Manage. Psychol.* 25, 596–619. doi: 10.1108/02683941011056950

World Health Organization (2019). *International Classification of Disease*. Ginevra: World Health Organization.

World Medical Association (2013). Declaration of Helsinki: ethical principles for medical research involving human subjects. *J. Am. Med. Assis.* 310, 2191–2194. doi: 10.1001/jama.2013.281053

Xu, L. (2019). Teacher–researcher role conflict and burnout among Chinese university teachers: a job demand-resources model perspective. *Stud. Higher Educ.* 44, 903–919. doi: 10.1080/03075079.2017.1399261

Yerdelen, S., Sungur, S., and Klassen, R. M. (2016). Relationship between Turkish elementary science teachers occupational well-being and some contextual and demographic characteristics: a multivariate analyses. *Educ. Sci.* 41, 147–161. doi: 10.15390/EB.2016.4257

Yilmaz, K., Altinkurt, Y., Guner, M., and Sen, B. (2015). The relationship between teachers' emotional labor and burnout level. *Euras. J. Educ. Res.* 59, 75–90. doi: 10.14689/ejer.2015.59.5

Zapf, D., Vogt, C., Seifert, C., Mertini, H., and Isic, A. (1999). Emotion work as a source of stress: the concept and development of an instrument. *Eur. J. Work Organ. Psychol.* 8, 371–400. doi: 10.1080/135943299398230

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BRIEF RESEARCH REPORT
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Managing Teachers' Job Attitudes: The Potential Benefits of Being a Happy and Emotional Intelligent Teacher

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According to the broaden-and-build theory of positive emotions, the frequency of positive emotions is associated with the development of positive attitudes, cognitions, and behaviors in organizational contexts. However, positive and negative attitudes at work might also be influenced by different personal and job resources. While emotional intelligence has been significantly associated with positive job attitudes and personal well-being, no studies have yet examined the joint role of teacher happiness and emotional intelligence in key teacher job attitudes. The present study assesses whether emotional intelligence interacts with levels of teacher happiness to jointly explain important teacher job attitudes (i.e., job satisfaction and turnover intention). A total sample of 685 teaching professionals (431 female) filled out a battery of scales including subjective happiness, emotional intelligence, job satisfaction, and turnover intention. Our results revealed that subjective happiness was significantly associated with both higher job satisfaction and lower turnover intention. Likewise, emotional intelligence was positively related to happiness and job satisfaction, and negatively related to turnover intention. Finally, interaction analysis showed the main effects of happiness and emotional intelligence in explaining teacher job attitudes. Beyond the main effects, the interaction effects of happiness and emotional intelligence were significant in predicting all teachers' job attitude indicators, even controlling for the effects of their sociodemographic variables. This work expands our knowledge about the role of teachers' positive emotions in the development of positive work attitudes, and also supports the inclusion of emotional skills in future teacher preparation programs as resources to facilitate work-related well-being.

Keywords: subjective happiness, emotional intelligence, job satisfaction, turnover intention, school teacher

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INTRODUCTION

Teaching is one of the most emotionally demanding jobs available (Travers, 2017; Iriarte Redín and Erro-Garcés, 2020). Teachers are required to strive to meet rules concerning which emotions to display in each of the diverse social interaction scenarios that arise in their workplace, many of which are characterized by highly emotionally demanding tasks. These emotional challenges often cause them distress, frustration, emotional exhaustion, and turnover intention (Travers, 2017; Granziera et al., 2021).

In the teaching context, the promotion of emotional competences and well-being would be of relevance to improve their coping skills and job satisfaction, as well as the quality of learning processes and the emotional development of the students (Jennings and Greenberg, 2009; Iriarte Redín and Erro-Garcés, 2020). There is evidence showing that high positive affectivity and subjective well-being buffers the impact of strain, stress, and boredom at work, leading to positive work outcomes (Benevene et al., 2019; De Stasio et al., 2019). Furthermore, several meta-analyses and systematic reviews show that positive affects predict an increase in job satisfaction (Boehm and Lyubomirsky, 2008), job performance (Judge et al., 2001), and work-related behaviors (Vacharkulksemsuk and Fredrickson, 2013). Thus, positive affectivity and subjective happiness have been underscored as key predictors of desirable work-related outcomes (Vacharkulksemsuk and Fredrickson, 2013).

Fredrickson's broaden-and-build theory of positive emotions (Vacharkulksemsuk and Fredrickson, 2013) proposes that frequent positive emotions prompted by subjective happiness at work influences teachers' work outcomes. For example, experiencing positive affects at work facilitates social and attitudinal abilities, allowing workers to enhance their personal resources, including sensitivity, positive attitudes, cognitions, and behaviors about their workplace (Vacharkulksemsuk and Fredrickson, 2013). Experiencing positive emotions may prompt teachers to build positive emotional connections with students, parents, and/or teaching staff members, leading to positive thinking and problem solving that allow the teachers to effectively deal with some of the most typical conflicts in the classroom (Isen, 2009). Thus, positive affect strengthens teachers' emotional enthusiasm and organizational well-being through increased and improved social interaction and positive teacher self-efficacy beliefs (Benevene et al., 2019; De Stasio et al., 2019).

Positive attitudes at work might operate with different personal resources and individual dispositions to facilitate work-related functioning (Vacharkulksemsuk and Fredrickson, 2013). According to the moderator model of EI (Côté, 2014), it is expected that the effects of personal dispositions (such as happiness) on organizational outcomes (such as teachers' turnover intention and job satisfaction) may vary according to levels of EI. In other words, it is expected that teachers with high subjective well-being and a greater ability to manage potential incidents and stressful situations related to the emotional scope of their teaching work would have more positive work attitudes (i.e., higher job satisfaction and lower turnover intention) compared with those with low subjective well-being and low emotional competences.

In this line, a recent study has found that subjective happiness together with compassion were significant predictors of increased teacher work engagement (De Stasio et al., 2019). One of those potential resources might be emotional intelligence (EI). From an ability perspective, EI is composed of different emotional skills such as the ability to perceive and express, use, understand, and regulate one's own emotions and those of others (Mayer et al., 2016). EI is typically linked to personal well-being and positive organizational outcomes including higher job satisfaction and lower turnover intention (Côté, 2014; Miao et al., 2017). In addition, there is theoretical and empirical support showing that EI moderates the relationship between contextual and dispositional factors, and work criteria (Côté, 2014). For instance, according to the meta-analysis conducted by Joseph and Newman (2010), the association between EI and job performance was stronger in emotionally demanding jobs.

Although there is empirical evidence that both positive effects and EI predict more positive organizational outcomes and greater personal well-being, no previous studies have examined the joint contribution of teachers' happiness and EI in affecting key teacher job attitudes. Understanding how both of these resources act in combination would help shed light on the mechanisms underlying the improvement of work variables and employees' well-being in a way that would contribute to enhancing both organizational variables and workers' quality of life. Thus, the purpose of the present study is to assess whether teacher happiness interacts jointly with EI to explain relevant teacher job attitudes. Following the broaden-and-build theory of positive emotions (Vacharkulksemsuk and Fredrickson, 2013) and the moderator model of EI (Côté, 2014), we state the following research hypothesis:

Hypothesis 1: *EI would moderate the relationship between happiness and job satisfaction (H1a), so that individuals with higher scores of happiness and higher levels of EI would report higher levels of job satisfaction. Moreover, EI would moderate the relationship between happiness and turnover intention (H1b), so that individuals with higher scores of happiness and higher levels of EI would report lower levels of turnover intention.*

MATERIALS AND METHODS

Participants and Procedure

The study sample was comprised of 685 teaching professionals (62.9% female) working in childhood (15.2%), primary (36.1%), and secondary (48.8%) education in centers located in Southern Spain. The mean age was 44 years, with average teaching experience spanning 17 years. Most teachers (71.5%) had an indefinite contract at state-run institutions.

In line with previous studies, a student-recruited sampling method was used with the assistance of university students (e.g., Mérida-López et al., 2020). Teachers were informed that their participation was confidential and voluntary, and participants provided consent. Paper-and-pencil questionnaires were administered to the potential participants at school centers. The procedure was approved by the ethics committee of the University of Málaga (66-2018-H).

Regarding the instruments, well-validated measures were used. Happiness was measured with the Subjective Happiness Scale (SHS; Lyubomirsky and Lepper, 1999); this instrument is comprised of four items with a seven-point Likert-type scale. In this study, Cronbach's alpha was 0.78, which accords with results from the adaptation of the Spanish version of the scale (Extremera and Fernández-Berrocal, 2014). Overall EI was assessed with Wong and Law's Emotional Intelligence Test (WLEIS; Wong and Law, 2002). In line with prior research including the Spanish version of this instrument, Cronbach's alpha was 0.90 (Extremera et al., 2019). Job satisfaction was measured with an overall job satisfaction scale comprising five items with a seven-point Likert-type scale

(Judge et al., 1998). In line with the values regarding the Spanish version, Cronbach's alpha was 0.77 in this study (Extremera et al., 2018). Finally, turnover intention was assessed with the Occupational Withdrawal Intentions Scale (Hackett et al., 2001) comprising three items; Cronbach's alpha was 0.94 in line with previous studies with Spanish teacher samples (Mérida-López et al., 2020).

Analytical Strategy

First, Pearson correlations were used to test the associations among the main variables. Second, structural model was tested by structural equation modeling (SEM) to examine the main study hypotheses (H1a and H1b). The model was conceptualized by happiness, EI, and interaction product over job satisfaction or turnover intention. To reduce multicolinearity among interacting terms, we applied residual-centering procedure (Lance, 1988). Latent variables were defined by scale items following the full disaggregation approach (Bagozzi and Heatherton, 1994). A maximum likelihood approach was used, and to examine model fit indicators such as the Chi-square(χ^2)/df, comparative fit index (CFI), Tucker and Lewis index (TLI), and the root mean square error of approximation (RMSEA) were considered (Schermelleh-Engel et al., 2003). Gender, age, teaching level, and teaching experience were entered as covariates so that any potential confounding effects on the dependent variables (i.e., job satisfaction and turnover intention) were controlled.

TABLE 1 | Descriptive statistics and bivariate correlations.

	M (*SD*)	Alpha	1	2	3	4
1. Happiness	5.38 (0.92)	0.78				
2. Emotional intelligence	5.53 (0.69)	0.90	0.52**			
3. Job satisfaction	5.62 (0.94)	0.77	0.44**	0.44**		
4. Turnover intention	1.79 (1.65)	0.94	−0.20**	−0.19**	−0.41**	

**$p < 0.01$.

RESULTS

Table 1 illustrates the descriptive statistics, reliability coefficients, and correlations among the study variables. All the associations were significant and followed the expected direction. In sum, happiness was positively associated with EI and job satisfaction, and negatively related with turnover intention. On the other hand, EI was positively associated with job satisfaction and negatively linked with turnover intention. Finally, job satisfaction was negatively related with turnover intention.

SEM analysis using AMOS 20.0 was used to examine interaction effects model. Moderation model showed an excellent fit (χ^2/df = 2.26, CFI = 0.95, TLI = 0.95, and RMSEA = 0.04). **Figure 1** illustrates the main results. In sum, results indicated that the interaction between happiness and EI showed a significant effect on job satisfaction (b = −0.08, $p = 0.028$) and on turnover intention (b = 0.12, $p = 0.002$). In addition, happiness was associated with job satisfaction (b = 0.30, $p < 0.001$) and turnover intention (b = −0.13, $p = 0.037$), while the association of EI with job satisfaction (b = 0.38, $p < 0.001$) was significant, but association with turnover intention was not statistically

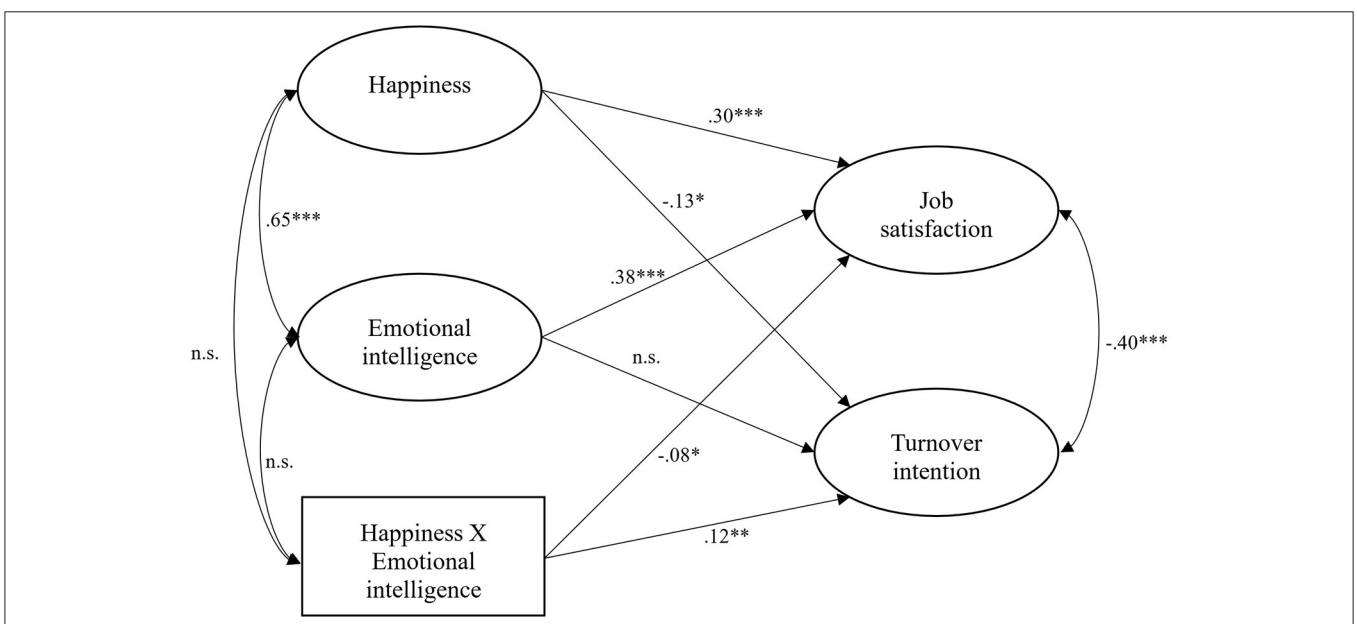

FIGURE 1 | Standardized coefficient estimates of hypothesized SEM. Covariates (i.e., sex, gender, educational level, and teaching experience) and items included in the latent variables have been omitted in the figure representation; n.s., non-significant. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

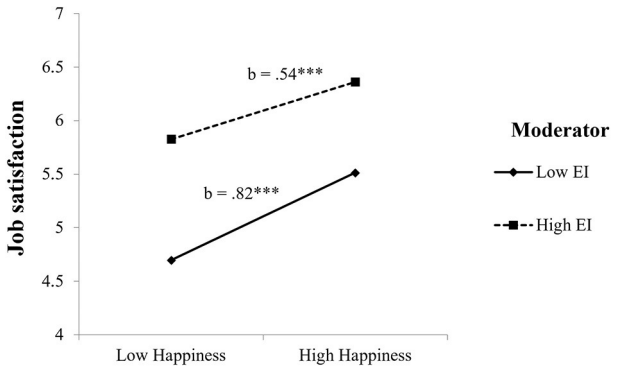

FIGURE 2 | Interaction between EI and happiness on job satisfaction. ***$p < 0.001$.

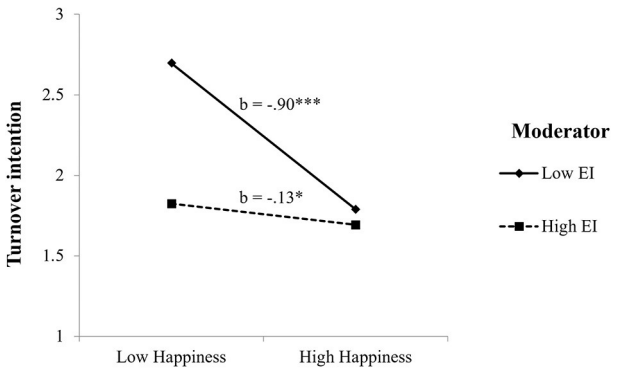

FIGURE 3 | Interaction between EI and happiness on turnover intention. ***$p < 0.001$, *$p < 0.05$.

significant. The percentages of variance explained were 41% for job satisfaction and 7% for turnover intention.

To illustrate the happiness × EI interactions for job satisfaction and turnover intention, two-way interactions with SEM results were computed (Preacher et al., 2006).

As shown in **Figure 2**, the highest mean scores in job satisfaction were found among teachers reporting high (vs. low) happiness and high (vs. low) EI.

With regard to turnover intention, as **Figure 3** shows, the results showed that the highest levels of turnover intention were found among those teachers with low (vs. high) happiness and low (vs. high) scores in EI.

DISCUSSION

The present study examined the link between teachers' subjective happiness and positive (i.e., job satisfaction) and negative (i.e., turnover intention) job attitudes, as well as the interactive role of EI in this association in a sample of Spanish teaching professionals. As expected, our results showed that both subjective happiness and EI were significantly associated with higher job satisfaction, as well as with lower turnover intention among teachers (Miao et al., 2017; De Stasio et al., 2019). Additionally, moderation analyses showed the main effects of happiness and EI in explaining teachers' job attitudes; in particular, happiness and EI predicted both higher job satisfaction and lower turnover intention. These results are in line with previous studies supporting that subjective well-being and EI predict higher job satisfaction and lower turnover intention (Boehm and Lyubomirsky, 2008; Vacharkulksemsuk and Fredrickson, 2013; Miao et al., 2017). Furthermore, and beyond the main effects, the interaction effects between happiness and EI were significant in predicting teachers' job attitudes, even when controlling for the effects of the sociodemographic and classic dimensions.

Regarding H1a, the results confirmed that happiness and EI interacted with each other to predict job satisfaction, so that teachers scoring high both in happiness and in EI reported the highest scores in job satisfaction. These results are similar to those of previous studies supporting the role of EI as a moderator variable modulating the effects of dispositional factors on work criteria (Côté, 2014). The current findings also support previous research showing that EI might act as a personal resource contributing to more positive work attitudes beyond the desirable effects of an intelligent and adaptive use of positive emotions on attitudes toward one's work (Tugade and Fredrickson, 2002). In our sample, teachers who were high in EI and happiness benefited from both resources and scored higher in job satisfaction than their counterparts with lower scores in these factors.

Concerning H1b, while non-significant main effects of EI on turnover intention were found, our results showed significant interactive effects of happiness with EI in predicting turnover intention. This may be explained in terms of the potential indirect mechanisms in the EI–job attitudes relationship, as suggested by Miao et al. (2017). Nonetheless, results indicated that those teachers with high scores in happiness and EI scored lower in turnover intention than their counterparts with low EI. These results are in agreement with Côté's moderator model (2014) and accord with prior empirical evidence on the moderating role of EI in the job attitudes–turnout intention (Mérida-López et al., 2020). Among teachers reporting high EI, there was a non-significant relationship between happiness and turnover intention. This finding may be explained by scrutinizing previous evidence suggesting that low levels of well-being and emotional deficits may relate to turnover intention; on the contrary, teachers with high EI may not necessarily display lower turnover intention, as this may depend on other factors such as the availability and quality of social and organizational resources at work (Miao et al., 2017).

Overall, our findings suggest that teachers experiencing high levels of happiness as well as perceiving themselves as emotionally intelligent may feel more capable of overcoming future teacher-related challenges and demands and that this may result in more positive attitudes toward their jobs and wider careers. The results from this study may add to the incipient literature on subjective well-being and dispositional factors as contributors to work-related well-being, as they show that happiness and EI may constitute beneficial and complementary resources that can influence teachers' perceptions of their work

(De Stasio et al., 2019). Thus, these preliminary findings may contribute to developing comprehensive models integrating the JD-R theory and the broaden-and-build theory of positive emotions to achieve a better understanding of teachers' well-being (Granziera et al., 2021).

Our findings have practical implications for the prevention of negative attitudes and development of positive ones among at-risk teachers. Future teacher recruitment and retention programs might examine levels of subjective happiness as a key factor for developing positive job attitudes, and also assess potential deficits in EI as a potential risk factor for maintenance of unfavorable teacher job attitudes. Similarly, health promotion programs for teachers should incorporate workshops regarding socioemotional competences focused on the promotion of well-being and of effective emotion regulation strategies, which would help them cope with teaching stressors; this would reduce the mental health risks associated with negative attitudes toward school and teaching, while improving the quality of teaching (Jennings and Greenberg, 2009). Our results suggest that EI training programs would complement positive psychology interventions at work, which may result in increased positive attitudes toward teaching. Current findings underline the value of developing future programs focusing on teachers' positive emotions, as well as on their emotional skills, in order to improve job attitudes (Tugade and Fredrickson, 2002). For instance, these interventions may focus on positive emotions at work, as well as on the development of emotional skills, thus, fostering teachers' communication skills, their understanding of emotional dynamics and their ability to anticipate the emotional reactions of others, and to manage emotions more effectively during tense encounters in the classroom or with parents (Vacharkulksemsuk and Fredrickson, 2013; Iriarte Redín and Erro-Garcés, 2020). Therefore, empirically based programs focused on the training of socioemotional competences (Vesely-Maillefer and Saklofske, 2018) and on teachers' well-being (Fernandes et al., 2019) are recommended as direct and systemic elements of teachers' professional development that enable them to feel better equipped to meet the challenges of their work.

This study presents several limitations. First, as it was based on a cross-sectional design, the interpretations of the associations are limited. Future studies should include longitudinal research designs to examine the causal directions of these relationships. Second, our sample only included primary and secondary education teachers. Further studies should explore these relationships, providing data on the potential differences across teaching levels (Iriarte Redín and Erro-Garcés, 2020). Likewise, future studies should examine integrative models, testing the interplay of subjective well-being indicators, such as happiness, and personal resources, such as EI, with relevant organizational-level predictors of job attitudes (Granziera et al., 2021). Third, all variables were assessed using self-report measures, which might lead to problems of common method variance and possible biases implicit in the use of self-report instruments. Future studies should employ performance measures of EI or interviews.

Despite the aforementioned limitations, the present study increases our knowledge of the specific contribution of EI and positive emotions in teachers to the enhancement of well-being and work-related criteria; it also suggests the joint incorporation of both emotional abilities and positive activities for optimal well-being in preparation programs for future teachers, as key resources to increase positive and reduce negative attitudes toward their workplace.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the dataset has been generated regarding a funded Research Project by Junta de Andalucia/FEDER funds (UMA18-FEDERJA-147). Requests to access the datasets should be directed to NE, nextremera@uma.es.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The Research Ethics Committee of the University of Malaga (66-2018-H). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MP-F, SM-L, and NE created and organized the study and collected the data. SM-L, NS-A, and NE analyzed the data. MP-F and SM-L wrote the first draft. NE critically reviewed the manuscript and provided constructive comments. All authors contributed to the article and approved the submitted version.

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REFERENCES

Bagozzi, R. P., and Heatherton, T. F. (1994). A general approach to representing multifaceted personality constructs: application to state self-esteem. *Struct. Equ. Model. A Multidiscip. J.* 1, 35–67. doi: 10.1080/10705519409539961

Benevene, P., De Stasio, S., Fiorilli, C., Buonomo, I., Ragni, B., Briegas, J. J. M., et al. (2019). Effect of teachers' happiness on teachers' health. The mediating role of happiness at work. *Front. Psychol.* 10:2449. doi: 10.3389/fpsyg.2019.02449

Boehm, J. K., and Lyubomirsky, S. (2008). Does happiness promote career success? *J. Career Assess.* 16, 101–116. doi: 10.1177/1069072707308140

Côté, S. (2014). Emotional intelligence in organizations. *Annu. Rev. Organ. Psychol. Organ. Behav.* 1, 459–488. doi: 10.1146/annurev-orgpsych-031413-091233

De Stasio, S., Fiorilli, C., Benevene, P., Boldrini, F., Ragni, B., Pepe, A., et al. (2019). Subjective happiness and compassion are enough to increase teachers' work engagement? *Front. Psychol.* 10:2262. doi: 10.3389/fpsyg.2019.02268

Extremera, N., and Fernández-Berrocal, P. (2014). The subjective happiness scale: translation and preliminary psychometric evaluation of a Spanish version. *Soc. Indic. Res.* 119, 473–481. doi: 10.1007/s11205-013-0497-2

Extremera, N., Mérida-López, S., Sánchez-Álvarez, N., Quintana-Orts, C., and Rey, L. (2018). "Eres feliz en tu trabajo? Propiedades psicométricas de la adaptación al castellano del Brief Job Satisfaction Measure," *Paper Presented at the II International Conference on Work Psychology and Human Resources*. Valencia.

Extremera, N., Rey, L., and Sánchez-Álvarez, N. (2019). Validation of the Spanish version of Wong Law Emotional Intelligence Scale (WLEIS-S). *Psicothema* 31, 94–100. doi: 10.7334/psicothema2018.147

Fernandes, L., Peixoto, F., Gouveia, M. J., Silva, J. C., and Wosnitza, M. (2019). Fostering teachers' resilience and well-being through professional learning: effects from a training programme. *Aust. Educ. Res.* 46, 681–698. doi: 10.1007/s13384-019-00344-0

Granziera, H., Collie, R., and Martin, A. (2021). "Understanding teacher wellbeing through job demands-resources theory," in *Cultivating Teacher Resilience. International Approaches, Applications and Impact*, ed C. F. Mansfield (Singapore: Springer), 229–244.

Hackett, R. D., Lapierre, L. M., and Hausdorf, P. A. (2001). Understanding the links between work commitment constructs. *J. Vocat. Behav.* 58, 392–413. doi: 10.1006/jvbe.2000.1776

Iriarte Redín, C., and Erro-Garcés, A. (2020). Stress in teaching professionals across Europe. *Int. J. Educ. Res.* 103:101623. doi: 10.1016/j.ijer.2020.101623

Isen, A. M. (2009). "A role for neuropsychology in understanding the facilitating influence of positive affect on social behavior and cognitive processes," in *Oxford Handbook of Positive Psychology*, eds S. J. Lopez and C. R. Snyder (New York, NY: Oxford University Press), 503–518.

Jennings, P. A., and Greenberg, M. T. (2009). The prosocial classroom: teacher social and emotional competence in relation to student and classroom outcomes. *Rev. Educ. Res.* 79, 491–525. doi: 10.3102/0034654308325693

Joseph, D. L., and Newman, D. A. (2010). Emotional intelligence: an integrative meta-analysis and cascading model. *J. Appl. Psychol.* 95, 54–78. doi: 10.1037/a0017286

Judge, T. A., Locke, E. A., Durham, C. C., and Kluger, A. N. (1998). Dispositional effects on job and life satisfaction: the role of core evaluations. *J. Appl. Psychol.* 83, 17–34. doi: 10.1037/0021-9010.83.1.17

Judge, T. A., Thoresen, C. J., Bono, J. E., and Patton, G. K. (2001). The job satisfaction-job performance relationship: a qualitative and quantitative review. *Psychol. Bull.* 127, 376–407. doi: 10.1037/0033-2909.127.3.376

Lance, C. E. (1988). Residual centering, exploratory and confirmatory moderator analysis, and decomposition of effects in path models containing interactions. *Appl. Psychol. Meas.* 12, 163–175. doi: 10.1177/014662168801200205

Lyubomirsky, S., and Lepper, H. S. (1999). A measure of subjective happiness: preliminary reliability and construct validation. *Soc. Indic. Res.* 46, 137–155. doi: 10.1023/A:1006824100041

Mayer, J. D., Caruso, D. R., and Salovey, P. (2016). The ability model of emotional intelligence: principles and updates. *Emot. Rev.* 8, 290–300. doi: 10.1177/1754073916639667

Mérida-López, S., Sánchez-Gómez, M., and Extremera, N. (2020). Leaving the teaching profession: examining the role of social support, engagement and emotional intelligence in teachers' intentions to quit. *Psychosoc. Interv.* 29, 141–151. doi: 10.5093/pi2020a10

Miao, C., Humphrey, R. H., and Qian, S. (2017). A meta-analysis of emotional intelligence and work attitudes. *J Occup Organ Psychol*, 90, 177–202. doi: 10.1111/joop.12167

Preacher, K. J., Curran, P. J., and Bauer, D. J. (2006). Computational tools for probing interaction effects in multiple linear regression, multilevel modeling, and latent curve analysis. *J. Educ. Behav. Stat.* 31, 437–448. doi: 10.3102/10769986031004437

Schermelleh-Engel, K., Moosbrugger, H., and Müller, H. (2003). Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measures. *MPR-Online* 8, 23–74.

Travers, C. (2017). "Current knowledge on the nature, prevalence, sources and potential impact of teacher stress," in *Educator Stress*, eds T. M. Mcintyre, S. E. Mcintyre, and D. J. Francis (Cham: Springer International Publishing), 23–54.

Tugade, M. M., and Fredrickson, B. L. (2002). "Positive emotions and emotional intelligence," in *Emotions and Social Behavior. The Wisdom in Feeling: Psychological proceSses in Emotional Intelligence*, eds L. F. Barrett and P. Salovey (New York, NY: The Guilford Press), 319–340.

Vacharkulksemsuk, T., and Fredrickson, B. L. (2013). "Looking back and glimpsing forward: the broaden-and-build theory of positive emotions as applied to organizations," in *Advances in Positive Organizational Psychology* (Emerald Group Publishing Limited), 45–60.

Vesely-Maillefer, A. K., and Saklofske, D. H. (2018). "Emotional intelligence and the next generation of teachers," in *Emotional Intelligence in Education: Integrating Research With Practice*, eds K. V. Keefer, J. D. A. Parker, and D. H. Saklofske (New York, NY: Springer), 377–402.

Wong, C. S., and Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: an exploratory study. *Leadersh. Q.* 13, 243–274. doi: 10.1016/S1048-9843(02)00099-1

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Affective Shifts Outside Work: Effects on Task Performance, Emotional Exhaustion, and Counterproductive Work Behavior

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Affective shifts have been linked to work attitudes and behaviors recently, but previous researches only focused on affective shift during work, with little attention to affective shifts outside work. Conservation of resources and personality system interaction theories are used to design a 2-week daily dairy study. Participants report how affective shifts outside work affect their subsequent-day task performance, emotional exhaustion, and CWB. As expected, findings indicate that shifts in affect outside work meaningfully impact job performance and work attitudes. That is, when both positive and negative affect upshift outside work, employees perform their tasks better but also experience increased emotional exhaustion. Practical implications and limitations are discussed.

Keywords: positive affect, negative affect, affective shift, task performance, emotional exhaustion

INTRODUCTION

Affect is defined as "a phase of neurobiological activity that is experienced as motivational and informational and that influences thought and action" (Izard, 2009, p. 3). *Positive affect* (PA) indicates positive feelings such as passion, relaxation, and pleasure; *negative affect* (NA) indicates negative feelings such as anger, guilt, and fear (Watson et al., 1988). Affect is known to influence work behaviors (Ashkanasy and Dorris, 2017), but researchers have always measured affect levels at specific timepoints. However, affect will change or shift over time, which leads to affective shift. Affective shift can be interpreted as the fluctuations of PA or NA within individual during a specific time period (Gross, 1998; Yang et al., 2016), which indicates that we should investigate how changing affect influences work performance.

Three particularly relevant published papers have explored how affective shifts occurring during work generate positive work outcomes. For example, Bledow et al. (2011) found that NA experienced in the morning positively relates to work engagement in the afternoon, but only if work engagement generates high PA. In a followup study, Bledow et al. (2013) demonstrated

that decreased NA coupled with increased PA generates high creativity. Yang et al. (2016) found that upshifted PA accompanied by downshifted NA predicted better organizational citizenship behavior (OCB), and upshifts in both PA and NA predicted better task performance. In all those studies, the authors calculated affective shift by measuring PA and NA twice daily and used the fluctuations between the two time points to represent affective shift (Bledow et al., 2013; Yang et al., 2016). They also focused on affective shifts during worktime only. Thus, we still lack understating toward affective shifts, about how affective shifts outside work influence work behaviors. After-work affective shift differs from after-work recovery. Affective shift indicates fluctuating emotions (Yang et al., 2016), while after-work *recovery* captures revitalization though leisure activities, with positive effects on next-day work performance (Sonnentag, 2003).

Though after-work recovery has been widely tested, we still lack researches investigating the effect of after-work affective shifts on work behaviors. More tests are needed regarding affective shift outside work. First, though affective shifts during work has been tested, there lacks researches concerning affective shifts outside work. PA and NA can spillover from work to home and vice versa (Kinnunen et al., 2014; Wei et al., 2018; Kopperud et al., 2020), so that affect experienced outside work could influence subsequent work performance (Judge and Ilies, 2004). We need to study how affective shifts outside work influence subsequent work behavior and performance.

In addition, Yang et al. (2016) overlooked emotional exhaustion as an important affect-related outcome variable. Indeed, affect state fluctuations can be emotionally exhausting (Ashkanasy and Dorris, 2017). Thus, affect-related research frameworks should always consider emotional exhaustion as an underlying influence on other outcome variables such as job satisfaction (Grandey and Gabriel, 2015).

Furthermore, Yang et al. (2016) investigated affective shifts only during work for influences on OCB, without considering an opposite performance outcome: counterproductive work behavior (CWB). From a definitional and empirical perspective, harmful CWBs and beneficial OCBs (Dalal, 2005) should both be considered when examining impacts of affective shifts during and after work. Task performance, OCB, and CWB are considered separate performance domains (Rotundo and Sackett, 2002), but to understand how outside-work affective shift impacts job performance, we include CWB and thus expand the limited focus on task performance and OCB (Yang et al., 2016).

We conducted this research to fill those gaps in understandings of affective shift. Drawing from conservation of resources (COR) theory (Hobfoll, 1989, 2002) and personality system interaction (PSI) theory (Kuhl, 2000), we examine our hypotheses regarding impacts of affective shift outside work on task performance, emotional exhaustion, and CWB. By offering a more balanced perspective regarding affective shift during and outside work, we make important theoretical contributions to the literature on affect shift, work behavior, and well-being. First, we extend the work of Yang et al. (2016) by providing empirical evidence showing how outside-work affective shift impacts job performance. We extend PSI theory by applying it to non-work situations and using resources' perspective to view activated subsystems from PSI theory. Second, our research also contributes to the literature on emotional exhaustion and CWB, which are both essential indicators of job performance in affect-related research (Rotundo and Sackett, 2002; Ashkanasy and Dorris, 2017). In simultaneously studying the effects of after-work PA and NA shifts, our research provides a finer grained picture of the powerful ways in which even after-work affective shift can influence these important work behaviors. Third, we use daily dairy study design and collect variables separated in timepoints. This allows us to establish temporal precedence and provide us stronger support for hypothesized causal relationships in correlational research. To better understand and visualize our hypotheses, we refer to the **Figure 1** of Yang et al. (2016) to draw our hypotheses. **Figure 1** lists our hypotheses.

THEORY AND HYPOTHESES

Affective Shift Outside Work

Conservation of resources theory (COR theory) basically assumes that people try to gain resources, to protect the resources they have, and to regain resources they have lost. Potential resource losses cause anxiety and stress, which then influence behaviors (Hobfoll, 1989, 2002). The relationship with stress has been widely identified in both work and non-work areas, such as emotional labor (Grandey and Gabriel, 2015), leadership (Usman et al., 2020), and recovery (Kinnunen et al., 2011).

The theory implies that work life potentially spills over to home life and vice-versa (Wei et al., 2018; Kopperud et al., 2020). Empirical studies have indicated that affect shift outside work influences next-day work attitudes and behaviors. For example, employees who engage in after-work recreation show better work performance and satisfaction, but employees who fail to participate in non-work activities show poorer work-related outcomes (Kinnunen et al., 2014). Employees who participate in after-work sporting or entertainment activities show decreased NA because they recover mental resources consumed during work (Grandey and Gabriel, 2015). They also gain PA that then spills over to their work life (Edwards and Rothbard, 2000).

Personality system interaction theory explains that self-regulation of affect has dynamic effects on cognition, motivation, and personality (Kuhl, 2000). The theory is usually applied to working contexts (e.g., Yang et al., 2016), but studies are increasingly showing that working and non-working contexts have closely related crossover and spillover effects (Williams and Alliger, 1994; Lin et al., 2017; Yang et al., 2018; Cluley and Hecht, 2019). For example, employees who showed helping behavior at work were more likely to feel PA that then caused them to be more supportive of their spouses (Lin et al., 2017). When rating family satisfaction and quality of family life, the most positive ratings came from spouses of employees who indicated having increased self-esteem because they had socially supportive servant leaders in the workplace (Yang et al., 2018). In contrast, distress experienced during family activities and family intrusions into work spilled over to perceptions of family interference with work (Williams and Alliger, 1994). Stress associated with

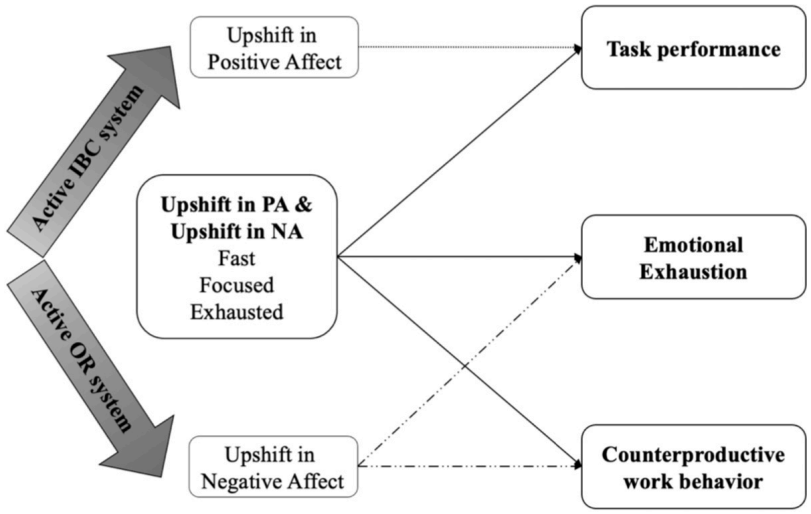

FIGURE 1 | Hypothese for the current study. Dotted line indicates Hypothese 1. Top dashed line indicates Hypothese 2. Bottom dashed line indicates Hypothese 3. Top solid line indicates Hypothese 4. Bottom solid line indicates Hypotheses 5 and 6.

families, spouses (Williams and Alliger, 1994), and children (Cluley and Hecht, 2019) were shown to increase work-family conflict and damage work outcomes (Wei et al., 2018; Kopperud et al., 2020). In addition, after-work recovery was shown to influence work-time performance or psychological variables such as work engagement, proactive behavior, and fatigue (Sonnentag, 2003; Kinnunen et al., 2011). In summary, studies suggest that work and non-work are inseperable and that PSI theory applies in both contexts.

Our hypotheses are based on COR theory (Hobfoll, 1989, 2002) and PSI theory (Kuhl, 2000). PSI theory identifies four automatic subsystems that motivate individual behaviors according to positive and NA (Kuhl, 2000). That is, individuals use the (1) intuitive behavior control system (IBC) to integrate wide information for rapid and intuitive problem solving; (2) objective recognition system (OR) to judge whether observations match previous representations or present new concepts; (3) intention memory system (IM) to make comprehensive plans and predict outcomes; (4) extension memory system (EM) to integrate stored representations of internal and external contexts with personal experiences and values. IBC and OR systems are lower-level systems, while IM and EM systems are higher-level systems. The subsystems have mutual influences (Kuhl, 2000).

Personality system interaction theory emphasizes that affective shift has specific impacts on each subsystem, ultimately enhancing or decreasing motivational regulation and leading to optimal or suboptimal behavior. **Figure 2** shows how affective shift relates to the four subsystems. Specifically, upshifts in PA activate the IBC system, so that the individual is motivated to use intuitive, rapid, divergent thinking. Downshifts in PA activate the IM system, so that the individual uses comprehensive thought, careful plans, and deliberate actions. Upshifts in NA activate the OR system, so that the invidual focuses on specific details before assuming threats and need for actions. Downshifts in NA activate the EM system, so that the individual focuses on the present and integrates information from different sources.

Affective Shift and Task Performance

We use both conservations of resources theory (Hobfoll, 1989, 2002) and PSI theory (Kuhl, 2000) to build our hypotheses. Task performance, an important indicator of job performance, refers to how well employees perform their roles and contribute to organizational development (Yang et al., 2016). COR theory (Hobfoll, 1989, 2002) explains that individuals who have high PA perform better because they are better able to acquire and accumulate resources, broaden their mindsets, adopt explorative behaviors, make remote associations (Hobfoll et al., 2018), be cognitively flexible, be explorative, master more skills, and devise more creative solutions (Conway et al., 2013). In addition, resource-rich individuals have greater resilience for recovering from negative stimuli such as conflict, frustration, or even the strain of positive activities (Hobfoll et al., 2018). For example, resilience is essential for service industry employees who must deal with frequent customer complaints and maltreatment. In addition, PSI theory explains that upshifted PA improves task performance by activating IBC systems that involve rapid and divergent learning, thinking, and problem solving; along with open-minded, explorative, and flexible mindsets (Lucas et al., 2014). Thus, we hypothesize that PA upshifts outside work replenish resources that are used to enhance job performance (Fredrickson, 1998):

Hypothesis 1: Shifts in PA outside work are positively correlated with task performance the next-day, such that upshifts in PA outside work will promote task performance.

Affective Shift and Emotional Exhaustion

Emotional exhaustion, the core dimension of job burnout, is a response to stress (Grandey, 2003) in which energy is depleted

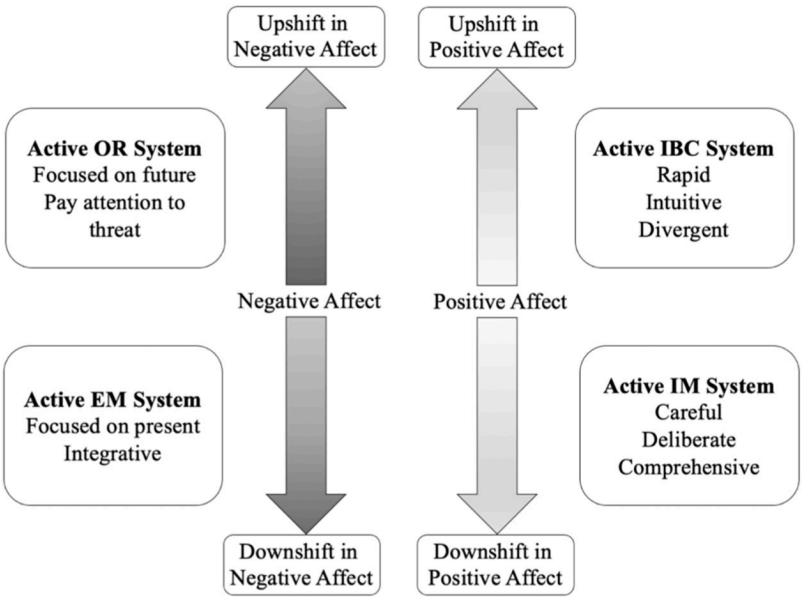

FIGURE 2 | Activation subsystem of affective shift in positive and negative affect from PSI theory.

and emotional resources dissipate (Cordes and Dougherty, 1993; Khan et al., 2019). Recall that COR theory identifies the need to acquire and preserve resources (Hobfoll, 1989, 2002). And the loss of resources in one domain causes a spiral of rapidly depleted resources in other domains (Usman et al., 2020). Thus, the resources consumed by NA upshifts would accelerate the loss of resources in other domains. NA upshifts are represented as emotionally exhausting as potential losses in evoking feelings of threat, reducing well-being, inducing dysfunctional thinking (Halbesleben et al., 2014; Hobfoll et al., 2018), and inhibiting abilities to cope with work demands.

Personality system interaction theory explains that NA upshifts activate the OR system linked with increased alertness, decreased goal desirability, increased disengagement, and attention to threats such as impending deadlines (Rothbard and Wilk, 2011). NA upshifts will cause individuals to ruminate about upcoming threats rather than take action against them, leading to anxiety, tension, and resource depletion. Thus, we hypothesize:

Hypothesis 2: Shifts in NA outside work are positively correlated with emotional exhaustion the next-day, such that upshifts in NA outside work will increase emotional exhaustion.

Affective Shift and Counterproductive Work Behavior

Counterproductive work behavior indicates the dark side of job performance dimensions (Rotundo and Sackett, 2002). That is, CWBs are intentional actions that damage organizational functions or member relationships (Spector and Fox, 2002). CWBs include actions such as theft, sabotage, overt anger, and passive-aggressive poor performance (Meier and Spector, 2013). CWB-I indicates interpersonally oriented CWB, such as gossip; CWB-O indicates organizationally oriented CWB such as taking prolonged breaks during work time (Robinson and Bennett, 1995; Bennett and Robinson, 2000).

Negative affect is strongly related to CWB. That is, employees with high NA are prone to CWB (Dalal, 2005), but to clarify the relationship between NA shift and CWB (Spector and Fox, 2002), we argue that upshifted NA leads to more CWB by consuming resources. To reiterate, COR theory explains that individuals strive to protect, acquire, and accumulate resources, but make stronger efforts to prevent losses. NA upshifts are consuming resources and accelerating the loss of resources in other domains (Usman et al., 2020). Depleted resources result in a loss of self-control. The increased potential for CWB can be exhilirating and self-reinforcing when it serves as retaliation against organizations or colleagues (Spector and Fox, 2002; Meier and Spector, 2013). In addition, PSI theory states that NA upshifts activate OR system, leading employees ruminate about upcoming threats rather than take action against them. In working situation, the rumination without action to solve upcoming threats may be considered as CWB. Thus, when after-work NA increases, employees will react to the loss of resources and decreased self-control by increasing next-day CWB, which leads to our third hypothesis:

Hypothesis 3: Shift in NA outside work is positively correlated with CWB the next-day, such that upshift in NA outside work will increase CWB.

Interplay of Affective Shifts

Personality system interaction theory (Kuhl, 2000) takes a new perspective by showing that affect undergoes changes rather than remaining constant, with differing interplaying patterns in the four subsystems (for specifics, see Yang et al., 2016). Yang et al. (2016) defined these four patterns as PA upshift and NA

downshift (pattern A), PA and NA upshifts (pattern B), PA downshift and NA upshift (pattern C), PA and NA downshifts (pattern D), respectively. For our purposes, however, we focus on the pattern B defined by Yang et al. (2016), which is the most common after-work PA and NA upshift patterns.

Outside work activities are essential for relaxing, recovering, and replenishing resources (Sonnentag, 2003) and thus increasing PA (Hobfoll et al., 2018). However, even during after-work hours, employees cannot psychologically detach or "switch off" because they are often assailed with work-related internet and instant messages. As they ruminate about work, they are likely to have upshifted NA (Casper and Sonnentag, 2019).

Positive affect upshift activates the IBC system governing intuitive, integrative information processing, encouraging the generation of solutions and actions for resolving problems (Kuhl, 2000). Indeed, PA upshifts have been shown to increase motivation, goal commitment (Ilies and Judge, 2005), and goal striving efforts (Locke and Latham, 2006). However, PA upshift also indicates self-satisfaction about having met goals, which may decrease effort (Carver and Scheier, 1990). At this point, NA upshift becomes important for activating OR systems that draw attention to possible threats (Kuhl, 2000; Rothbard and Wilk, 2011), such as deadlines. Thus, PA upshift without NA upshift may generate exploratory but impractical behaviors, whereas NA upshift without PA upshift may evoke anxiety but not goal desirability or effort.

Thus, PA and NA upshifts occurring simultaneously activate both IBC and OR systems. Activated IBC systems generate open-minded proposals for solutions and rapid actions. Activated OR systems focus the attention on threats, rapid action, and quick error correction. When employees have demanding/stressful work days, they often stay cognitively active and continue processing work-related information after work hours. They need time to unwind and to cease ruminating about work-related issues (Casper and Sonnentag, 2019). Thus, non-work time can be utilized to process work-related information. In addition, research of affective shift during work has shown that PA and NA upshifts during work could significantly predict better subsequent-day task performance (Yang et al., 2016).

We propose that NA upshifts will determine whether PA upshifts increase task performance. That is, when the IBC and OR systems are activated, employees will be focused on solutions and details and will perform their best, leading to our fourth hypothesis:

Hypothesis 4: Change in NA outside work moderates the relationship between change in PA outside work and task performance next-day. Specifically, an upshift in PA will positive correlated to task performance when there is a corresponding upshift in NA.

We have explained that simultaneous upshifts in PA and NA activate IBC and OR systems so that employees act rapidly and efficiently, promptly correct errors, and provide quality work. Beyond the positive outcomes, however, simultaneous PA and NA upshifts may have some negative outcomes in that rapid, high quality work is demanding and depletes resources, which then accelerates the loss of resources in other domains (Usman et al., 2020). Without adequate recovery, employees are eventually emotionally exhausted and no longer able to perform well (Hobfoll et al., 2018). Lacking resources, they will lack self-control (Vötter and Schnell, 2019). Such resource depletion is one of the best predictors of CWB (Dalal, 2005). Thus, we propose:

Hypothesis 5: Change in PA outside work moderates the relationship between change in NA outside work and emotional exhaustion next-day. Specifically, upshifted NA will be more positively related to emotional exhaustion when there is a upshift in PA outside work.

Hypothesis 6: Change in PA outside work moderates the relationship between change in NA outside work and CWB the next-day. Specifically, an upshift in NA will be more positively related to CWB when there is a corresponding upshift in PA.

METHOD

Participants and Procedure

In this study, our participants were call-center employees who routinely interact with customers and inevitably experience social conflicts that will evoke negative thoughts about work during non-work times (Volmer et al., 2012). They were ideal subjects to examine whether NA upshifts combined with PA upshifts will increase task performance. That is, whether activation of the IBC and OR systems will cause employees to focus on detailed solutions and perform their best.

We examined how after-work activities influence next-day attitudes at work (Judge and Ilies, 2004). In many professions, telework has blurred boundaries between activities that occur during and after work (Standen et al., 1999). Consequently, our study of call-center employees was appropriate because their work has clear boundaries: they work in specific offices, keep regular work hours, and use fixed-line telephones. We focused on affective shifts occurring between afternoons after work and mornings before work the next-day.

Serving as a liaison, the human resource manager of a telecommunications company in southern China independently and randomly selected 80 fulltime call-center employees. We then sent email invitations to introduce the project, explain the procedure, promise confidentiality, and offer rewards for participation.

Sixty-eight employees volunteered to participate, but only 64 provided usable data. First, they completed a pre-test capturing Big-5 personality traits, PA/NA traits, and demographics such as age and gender. During the two following weeks, they completed online surveys twice daily: once in the morning before starting work at approximately 8 a.m., and once at the end of the work day before leaving the office at approximately 5 p.m. We chose a 2-week period based on recommendations to record for 2 weeks to ensure "a stable and generalizable

estimate of social life" (Reis and Wheeler, 1991, p. 287). The research team transmitted online reminder messages before each scheduled survey. Following previous research (Bledow et al., 2013; Yang et al., 2016), we surveyed participants at 8 a.m. to measure the beginning-of-work timepoint and again at 5 p.m to measure the end-of-work timepoint. Participants completed both morning and afternoon surveys for an average of 10.72 days, generating 686 sets of matched morning and evening observations. To test our hypotheses, we used 622 matched sets of prior-afternoon, following-morning, and following-afternoon observations, 607 of which were complete and usable. Among the participants, 92% were women, averaging 29.78 years-old (SD = 3.49) and 15.21 years of education (SD = 1.64). Approximately 10% had high school diplomas; 46% had associate's degrees; 28% had bachelor's degrees; and 16% had graduate degrees.

Measures

All instructions and scale items were written in Chinese through a translation–back translation approach (Brislin, 1983). In the pre-test, participants reported their Big-5 personality traits, PA and NA traits, and demographics. During the morning surveys, they reported PA and NA states and the quality of sleep they attained the preceding night. During the afternoon surveys, they reported PA and NA states, emotional exhaustion, task performance, and CWBs.

PA/NA

We used the positive and negative affect scale (PANAS) (Watson et al., 1988) to measure PA and NA. The pre-test included ten items each for measuring general PA and NA. To increase participation and reduce survey fatigue in the diary studies, we selected three items for each dimension: *delighted*, *excited*, and *active* for PA; *angry*, *guilty*, and *upset* for NA. Researchers have found that using PANAS in daily surveys over 10 working days is suitable for ensuring compliance (Bledow et al., 2011, 2013; Yang et al., 2016). Participants reported their current feelings on a five-point scale from 1 (*not at all*) to 5 (*extremely*). For morning affect state, Cronbach's alpha averaged across 10 work days was 0.97 for PA and 0.77 for NA. For afternoon affect state, average alpha was 0.94 for PA, and 0.79 for NA. For affect trait, Cronbach's alpha was 0.87 for PA and 0.84 for NA.

For morning affect state, the multilevel alphas for PA were 0.92 at the within-person level and 0.99 at the between-person level; for NA they were 0.73 at the within-person level and 0.80 at the between-person level (Geldhof et al., 2014). For afternoon affect state, the multilevel alphas for PA were 0.91 at the within-person level and 0.97 at the between-person level; for NA they were 0.72 at the within-person level and 0.86 at the between-person level.

Emotional Exhaustion

Emotional exhaustion was measured using a nine-item scale developed by Maslach and Jackson (1984). Participants rated how extensively they agreed with item descriptions such as "The work I did today frustrated me." Responses were measured on a seven-point scale from 1 (*not at all*) to 7 (*extremely*). Cronbach's alpha across 10 days was 0.94. The multilevel alphas for emotional exhaustion were 0.92 at the within-person level and 0.96 at the between-person level.

Task Performance

Task performance was measured using a five-item scale developed by Janssen and Van Yperen (2004). Participants rated how extensively they agreed with items such as "Today I carried out all the responsibilities required by work," on a seven-point scale from 1 (*not at all*) to 7 (*extremely*). Cronbach's alpha across 10 days was 0.78. The multilevel alphas for task performance were 0.65 at the within-person level and 0.87 at the between-person level.

Counterproductive Work Behavior (CWB)

Counterproductive work behavior was measured using a 14-item scale with two dimensions, eight items for CWB-I and six items for CWB-O, developed by Dalal et al. (2009). Participants rated their agreement with items for CWB-I such as "Today I occasionally spoke ill of my supervisor/colleagues behind their backs" and with items for CWB-O such as "Sometimes I conduct sabotage during work," on a seven-point scale from 1 (*not at all*) to 7 (*extremely*). Cronbach's alpha across 10 days was 0.95.

Cronbach's alpha for CWBI across 10 days was 0.973; for CWBO it was 0.949. The multilevel alphas for CWBI were 0.94 at the within-person level and 0.99 at the between-person level. As for CWBO, multilevel alphas were 0.90 at the within-person level and 0.97 at the between-person level.

Control Variables

We considered age, gender, years of education, PA/NA traits, and sleep quality as control variables. Sleep quality was measured with a single-item, "How was your sleep last night?" on a five-point scale from 1 (*very poor*) to 5 (*very good*).

Construct Validity

To ensure that the variables were distinct constructs, we ran multilevel confirmatory factor analyses in Mplus 8.11 (Muthèn and Muthèn, 1998-2012). Results for a seven-factor model encompassing daily PA/NA, emotional exhaustion, performance, CWB and total PA/NA (PANAS) were, $\chi^2(899) = 8186.9$, $p < 0.001$, CFI = 0.76, RMSEA = 0.12, within-level SRMR = 0.10, between-level SRMR = 0.13. All factor loadings were significant. If we combine daily NA with emotional exhaustion, the six-factor model results were, $\chi^2(903) = 9297.6$, $p < 0.001$, CFI = 0.72, RMSEA = 0.12, within-level SRMR = 0.14, between-level SRMR = 0.13. Although the results are a poor fit for both models, the former seven-factor model fit better than the plausible alternative six-factor model combining NA and emotional exhaustion into one factor.

Analytic Strategies

To model the relations among within-individual affective shift, emotional exhaustion, task performance, and CWB, and to control for the effects of between-individual demographics and trait affect, we used hierarchical linear modeling (HLM) (Bryk and Raudenbush, 1992), which allows variables to be analyzed at multiple levels in a series of regression equations. Our first

level of analysis included the daily measures of state affect (PA and NA), emotional exhaustion, task performance, and CWBs. The second level of analysis included the measure of PA/NA trait and demographic variables. Thus, level-1 variables were nested within level-2 variables. All level-1 predictors were person mean-centered. All level-2 variables were grand-mean-centered.

To explore the main effect of affective shift, we put next-morning PA/NA into the model by controlling previous-afternoon PA/NA (Yang et al., 2016). To explore the interplay of affective shift, we calculated the standardized residual score for PA and NA first, and then group-mean-centered the residual score. Finally, we multiplied the PA residual score by the NA residual score and added the product into the model as a new variable. To calculate residual score, we regressed next-morning PA/NA on previous-afternoon PA/NA, although others (Bledow et al., 2013; Yang et al., 2016) measured PANAS twice each morning and twice at the end of work, and used the residual score change between morning and at the end of work to represent affect shift during work. Considering our focus on affective shift outside work, we also controlled for sleep quality to avoid possibilities that sleep may interfere with impacts of affect shift on work the next-day.

RESULTS

Correlation Analysis

Table 1 shows means, standard deviations, and correlations. We calculated day-level correlations by HLM (Raudenbush, 2004). Previous-afternoon PA was significantly positively correlated with next-morning PA ($r = 0.12$, $p < 0.01$); next-morning PA was significantly negatively correlated with next-morning NA ($r = -0.36$, $p < 0.01$); previous-afternoon PA was significantly negatively correlated with previous-afternoon NA ($r = -0.44$, $p < 0.01$); previous-afternoon NA was significantly positively correlated with next morning NA ($r = 0.26$, $p < 0.01$); previous afternoon NA was significantly negatively correlated with next-afternoon task performance ($r = -0.14$, $p < 0.01$); previous-afternoon and next-morning NA were significantly positively correlated with next-morning CWB-I and CWB-O ($r = 0.13$, $p < 0.01$; $r = 0.14$, $p < 0.01$; $r = 0.10$, $p < 0.05$; $r = 0.11$, $p < 0.01$).

Among the person-level variables, several significant correlations occurred. PA trait was significantly positively related to task performance ($r = 0.31$, $p < 0.01$) and significantly negatively related to both CWB-I and CWB-O ($r = -0.34$, $p < 0.01$; $r = -0.27$, $p < 0.05$). NA trait was significantly positively correlated with both CWB-I and CWB-O ($r = 0.27$, $p < 0.05$; $r = 0.28$, $p < 0.05$).

Test of Hypotheses

Via HLM, we tested the main effect and interplay of affective shift on task performance/emotional exhaustion/CWB by controlling for age, gender, years of education, and PA/NA trait. First, we set the null model. Second, we put PA/NA state of t_1 and t_2, control variables into the model to test the main effect. Third, we put the product of affective shift into the model to test the interplay.

TABLE 1 | Means, standard deviations, and correlations between focal variables.

		M	SD_1	SD_2	1	2	3	4	5	6	7	8	9	10	11	12	13
Level-1																	
1	Sleep quality	3.42	1.11														
2	PA (T1)	3.36	1.03		0.06												
3	NA (T1)	2.04	0.81		−0.10*	−0.44**											
4	PA (T2)	3.34	1.08		0.12**	0.12**	−0.05										
5	NA (T2)	1.99	0.79		−0.05	−0.10*	0.26**	−0.36**									
6	Task performance	5.36	1.01		0.05	0.02	−0.14**	0.07	−0.05								
7	Emotional exhaustion	4.11	1.36		−0.01	0.05	−0.05	0.01	0.07	−0.02							
8	CWB-I	2.03	1.17		−0.13**	−0.04	0.13**	−0.02	0.10*	−0.32**	0.03						
9	CWB-O	1.98	1.13		−0.13**	−0.03	0.14**	−0.07	0.11**	−0.38**	0.07	0.72**					
Level-2																	
10	Age	29.78		3.49	0.22	−0.02	−0.06	0.09	−0.18	−0.06	0.03	−0.01	−0.02				
11	Gender	–		–	0.05	0.22	−0.08	0.13	−0.09	−0.03	−0.11	−0.17	−0.11	−0.08			
12	Education	15.21		1.64	−0.19	−0.15	0.06	−0.13	0.11	−0.13	0.00	0.19	0.15	−0.04	−0.15		
13	PA (trait)	3.26		0.60	0.40**	0.34**	−0.11	0.37**	−0.19	0.31*	−0.18	−0.34**	−0.27*	−0.15	0.15	−0.16	
14	NA (trait)	2.75		0.64	−0.04	0.05	0.24	0.03	0.27*	0.00	0.19	0.27*	0.28*	−0.18	−0.10	0.04	−0.17

*Correlations above the diagonal represent the day level ($N_1 = 607$). Correlations below the diagonal represent the person level ($N_2 = 64$). Day level variables were aggregated across days to calculate person-level correlations. PA/NA state labeled t1 was measured the previous afternoon; t2 was measured the next morning; Women were coded as 0; men were coded as 1. "–" indicates values not available. *$p < 0.05$, **$p < 0.01$.*

TABLE 2 | Multilevel estimates for models predicting task performance.

	Step 1	Step 2	Step 3
Intercepts	5.38**	5.38**	5.40**
Level-1			
Sleep quality		0.07	0.07
PA (t1)		−0.03	−0.03
NA (t1)		−0.14**	−0.13*
PA (t2)		0.04	0.03
NA (t2)		−0.03	−0.04
δpa(residual) × δna(residual)			0.09*
Level-2			
Age		0.00	−0.00
Gender		−0.45	−0.41
Education		−0.05	−0.05
Positive affectivity		0.43**	0.45**
Negative affectivity		−0.03	−0.02
Variance			
σ^2	0.44	0.34	0.33
T_{00}	0.57**	0.56**	0.57**
T_{11}		0.15**	0.16**
R^2		0.23	
$R^2_{\text{level1interaction}}$			0.03

†$p < 0.1$, *$p < 0.05$, **$p < 0.01$. $R^2_{\text{Level}-1}$ = (σ^2 of Step 1–σ^2 of Step 2)/σ^2 of Step 1. $R^2_{\text{level}-1\text{interaction}}$ = (σ^2 of Step 2–σ^2 of Step 3)/σ^2 of Step 2.

Affective Shift Outside Work and Task Performance

The null model indicated between-person variance of $T_{00} = 0.57$ ($p < 0.001$) and within-person variance of $\sigma^2 = 0.44$: thus ICC = $T_{00}/(T_{00}+\sigma^2)$ = 0.57/(0.57+0.44) = 0.56. Significant between-person variance accounted for 56% of the variance in task performance.

Hypothesis 1 focused on how changes in PA outside work relate to subsequent-day task performance. Hypothesis 4 focused on how changes in PA and NA outside work interplay to affect subsequent-day task performance. **Table 2** shows how affective shift affected task performance. After controlling for age, gender, years of education, and PA/NA trait, outside-work PA change was positively related to next-day task performance (β = 0.10, $p < 0.05$): when PA upshifted outside work, next-day task performance increased, supporting hypothesis 1. Change in NA outside work was not significantly related to next-day task performance (β = 0.01, $p > 0.05$). $R^2_{\text{Level}-1} = 0.14$, indicating that affective shift explained 14% of variance in task performance. Furthermore, the interaction term of the residual scores of PA and NA significantly predicted next-day task performance (β = 0.11, $p < 0.01$). $R^2 = 0.01$, indicating that the interplay of affective shift explained 1% of task performance variance.

Figure 3 depicts simple slopes analysis. Under low outside-work NA changes (assessed 1 *SD* below the mean of residual NA values), outside-work PA changes were non-significantly related to next-day task performance (*slope* = −0.02, $t = -0.29$, $p > 0.05$); under high outside-work NA changes (assessed 1 *SD* above the mean of residual NA values), outside-work PA changes were significantly positively related to next-day task performance (*slope* = 0.20, $t = 3.65$, $p < 0.01$). The results indicated that outside-work NA changes moderate the relationship between outside-work PA changes and task performance. When both outside-work PA and NA were upshifted, employees showed the best task performance, supporting hypothesis 4.

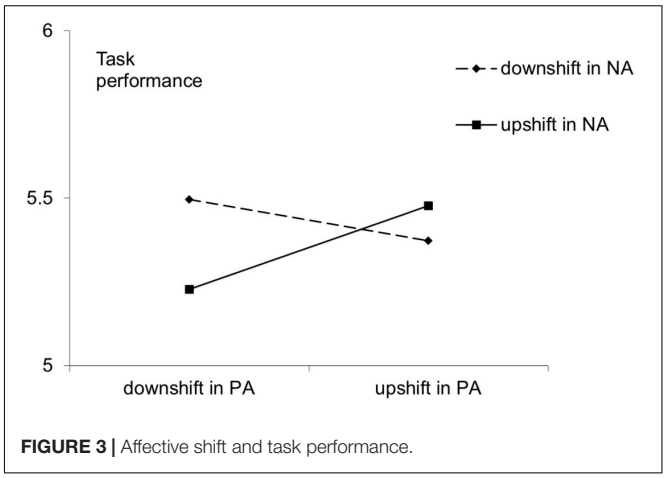

FIGURE 3 | Affective shift and task performance.

Affective Shift Outside Work and Emotional Exhaustion

Null model results indicated that between-person variance was $T_{00} = 1.21$ ($p < 0.01$), while within-person variance was $\sigma^2 = 0.69$, thus ICC = $T_{00}/(T_{00}+\sigma^2)$ = 1.21/(1.21+0.69) = 0.64, showing that between-person variance caused a significant 64% of the variance in emotional exhaustion.

Hypothesis 2 focused on how outside-work NA changes relate to subsequent-day emotional exhaustion. Hypothesis 5 focused on how outside-work changes in PA and NA interplay to affect subsequent-day emotional exhaustion. **Table 3** shows affective shift impacts on emotional exhaustion. After we controlled for age, gender, years of education, and PA/NA trait, outside-work NA change was not significantly related to next-day emotional exhaustion (β = 0.16, $p > 0.05$), nor was outside-work PA change related to next-day emotional exhaustion (β = 0.07, $p > 0.05$) $R^2_{\text{Level}-1} = 0.08$, indicating that the main effect of affective shift explained 8% of the variance of emotional exhaustion. Thus, hypothesis 2 was not supported. Furthermore, the interaction term of the residual scores of PA and NA significantly predicted next-day emotional exhaustion (β = 0.16, $p < 0.05$). $R^2_{\text{level}-1\text{interaction}} = 0.02$, indicating that the interplay of affective shift explained 2% of the variance of emotional exhaustion.

Simple slopes analysis (**Figure 4**) showed that under low outside-work PA changes (assessed 1 *SD* below the mean of residual PA values), outside-work NA changes were not significantly related to next-day emotional exhaustion (*slope* = 0.03, $t = 0.20$, $p > 0.05$). Under high outside-work PA changes (assessed 1 *SD* above the mean of residual PA values), outside-work NA changes were significantly positively related to next-day emotional exhaustion (*slope* = 0.34, $t = 3.59$, $p < 0.01$). The results indicated that outside-work PA changes could moderate the relationship between outside-work NA changes and emotional exhaustion. When both PA and NA were

TABLE 3 | Multilevel estimates for models predicting emotional exhaustion.

	Step 1	Step 2	Step 3
Intercepts	4.11**	4.11**	4.12**
Level-1			
Sleep quality		−0.02	−0.02
PA (t1)		0.04	0.03
NA (t1)		−0.09	−0.07
PA (t2)		0.07	0.08
NA (t2)		0.16†	0.18†
δpa(residual) × δna(residual)			0.17*
Level-2			
Age		0.01	0.01
Gender		0.03	−0.05
Education		−0.01	0.01
Positive affectivity		−0.38†	−0.44*
Negative affectivity		0.28	0.24
Variance			
σ^2	0.69	0.63	0.62
T_{00}	1.21**	1.21**	1.18**
T_{11}		0.18†	0.21†
$R^2_{Level-1}$		0.09	
$R^2_{level-1interaction}$			0.02

†$p < 0.1$, *$p < 0.05$, **$p < 0.01$. $R^2_{Level-1}$ = (σ^2 of Step 1–σ^2 of Step 2)/σ^2 of Step 1. $R^2_{level-1interaction}$ = (σ^2 of Step 2–σ^2 of Step 3)/σ^2 of Step 2.

TABLE 4 | Multilevel estimates for models predicting CWB-I.

	Step 1	Step 2	Step 3
Intercepts	2.00**	1.99**	2.00**
Level-1			
Sleep quality		−0.06	−0.06
PA (t1)		0.02	0.03
NA (t1)		0.13†	0.13†
PA (t2)		−0.01	−0.01
NA (t2)		0.12†	0.12†
δpa(residual) × δna(residual)			0.01
Level-2			
Age		−0.00	−0.00
Gender		−0.15	−0.14
Education		0.07	0.07
Positive affectivity		−0.54**	−0.54**
Negative affectivity		0.50**	0.51**
Variance			
σ^2	0.52	0.42	0.42
T_{00}	0.84**	0.69**	0.70**
T_{11}		0.05†	0.05
$R^2_{Level-1}$		0.19	
$R^2_{level-1interaction}$			

†$p < 0.1$, **$p < 0.01$. $R^2_{Level-1}$ = (σ^2 of Step 1–σ^2 of Step 2)/σ^2 of Step 1. $R^2_{level-1interaction}$ = (σ^2 of Step 2–σ^2 of Step 3)/σ^2 of Step 2.

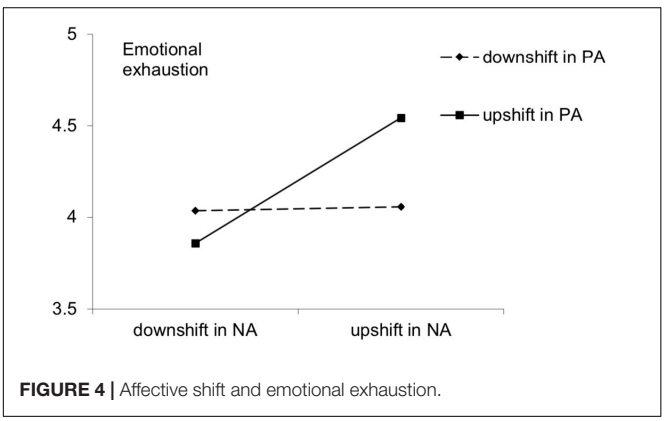

FIGURE 4 | Affective shift and emotional exhaustion.

upshifted outside work, participants felt the highest emotional exhaustion, supporting hypothesis 5.

Affective Shift Outside Work and CWB

Null model results indicated that between-person variance was $T_{00} = 0.84$ ($p < 0.01$), while within-person variance was $\sigma^2 = 0.52$; thus ICC = $T_{00}/(T_{00}+\sigma^2)$ = 0.84/(0.84+0.52) = 0.62, showing that between-person variance caused a significant 62% of CWB-I variance.

Hypothesis 3 focused on the relationship between changes in NA outside work and subsequent-day CWB. Hypothesis 6 focused on how changes in PA and NA outside work interplay to affect subsequent-day CWB. **Table 4** shows how affective shift impacted CWB-I. After we controlled for age, gender, years of education, and PA/NA traits, outside-work PA change was not significantly related to next-day CWB-I (β = −0.00, $p > 0.05$), nor was outside-work NA change in relation to next-day CWB-I (β = 0.11, $p > 0.05$). $R^2_{Level-1} = 0.14$, indicating that affective shift explained 14% of CWB-I variance. The interaction term of the residual scores of PA and NA could not significantly predict next-day CWB-I (β = 0.04, $p > 0.05$).

The null model indicated that between-person variance was $T_{00} = 0.82$ ($p < 0.01$), while within-person variance was $\sigma^2 = 0.45$; thus ICC = $T_{00}/(T_{00}+\sigma^2)$ = 0.82/(0.82+0.45) = 0.65, showing that between-person variance caused a significant 65% of variance in CWB-O.

Table 5 shows how affective shift impacted CWB-O. After we controlled for age, gender, years of education, and PA/NA trait, outside-work PA change was not significantly related to next-day CWB-O (β = −0.08, $p > 0.05$), nor was outside-work NA related to next-day CWB-O (β = 0.08, $p > 0.05$); $R^2_{Level-1} = 0.20$, indicating that the main effect of affective shift explained 20% of the variance of CWB-O. The interaction term of the residual scores of PA and NA could not significantly predict next-day CWB-O (β = 0.04, $p > 0.05$). Thus, hypotheses 3 and 6 were not supported.

DISCUSSION

In this study, we observe how shifts in PA and NA occurring outside work affect task performance, emotional exhaustion, and CWB at work the next-day. Specifically, we find that PA shift outside work is significantly correlated with next-day task performance and moderates the relationship between NA shift

TABLE 5 | Multilevel estimates for models predicting CWB-O.

	Step 1	Step 2	Step 3
Intercepts	1.96**	1.96**	1.96**
Level-1			
Sleep quality		−0.04	−0.03
PA (t1)		0.07	0.08*
NA (t1)		0.13†	0.13†
PA (t2)		−0.06	−0.07
NA (t2)		0.04	0.06
δpa(residual) × δna(residual)			−0.02
Level-2			
Age		0.00	0.00
Gender		−0.00	−0.01
Education		0.04	0.05
Positive affectivity		−0.51**	−0.49**
Negative affectivity		0.43**	0.46**
Variance			
σ^2	0.45	0.33	0.32
T_{00}	0.82**	0.73**	0.74**
T_{11}		0.07*	0.06*
$R^2_{Level-1}$		0.27	
$R^2_{level-1interaction}$			0.03

†$p < 0.1$, *$p < 0.05$, **$p < 0.01$. $R^2_{Level-1} = (\sigma^2$ of Step 1–σ^2 of Step 2)/σ^2 of Step 1. $R^2_{level-1interaction} = (\sigma^2$ of Step 2–σ^2 of Step 3)/σ^2 of Step 2.

and emotional exhaustion. Also, PA and NA shift outside work have significant interactive effects on task performance.

Considering affective shift during worktime significantly influences subsequent-day work attitudes and work behaviors (Yang et al., 2016), and affective shift is not limited in worktime (Judge and Ilies, 2004), thus, it's worthwhile to investigate affective shift outside work and the relationships with employees' subsequent well-being and productivity outcomes at work. We extend affective shift to non-work time, showing how affect shifts occurring during non-work life affect work life. That is, explore after-work affective shift for its main and interplay effect on task performance, emotional exhaustion, and CWB. About the interplay effect, we apply PA and NA upshifts (pattern B) from the affective shift model as detailed in Yang et al. (2016), and an extension of that model by introducing additional outcome variables as predicted by the COR theory. Consequently, our work makes theoretical and practical contributions.

Theoretical Implications

First, we demonstrate that affective shift outside work meaningfully impacts job performance. We provide the most recent empirical evidence upholding PSI theory arguments that PA and NA shifts could activate cognitive and behavioral subsystems that then influence work attitudes and behaviors. Although we find that PA shifts have main effects on task performance, PA and NA shifts fail to have significant main effects on emotional exhaustion or CWB. We have several explanations for those results. First, PSI theory explains that unidimensional affective shift motivates single systems only. Thus the limited effects fluctuate easily in response to external stimuli. Second, systems influence one another. Multi-systems have mutually constraining or facilitating cumulative effects. Third, our CWB results may show limited variance because participants may have avoided socially undersirable CWB.

Second, our results indicate that NA can have positive effects. When both PA and NA upshift, employees perform their best. High NA causes alertness, attention to detail, and rapid action. In our study context, call-center employees constantly solve customer problems. The company provides answers for dealing with regular questions, but detail-oriented employees provide the best service. The interplay of PA and NA shifts indicate that upshifted NA causes upshifted PA to be more positively related with task performance, while upshifted PA causes upshifted NA to be more positively related with emotional exhaustion. PSI theory (Kuhl, 2000) explains that simultaneous increases in PA and NA activate IBC and OR systems, so that employees work rapidly and well, but consumed resources lead to emotional exhaustion. The results fail to support our hypothesis regarding affective shift influences on CWB-I or CWB-O. However, PA negatively influenced CWB-O, while NA positively influenced both CWB-I and CWB-O. Thus CWB may be more susceptible to stable variables such as affective traits rather than to short-term affective shift.

Third, we explore how affective shift outside work impacts work attitudes and behaviors, we find that non-work upshift in both PA and NA can be emotionally exhausting but also improve task performance. Affect shift meaningfully impacted job performance, supporting our hypotheses that employees who enjoy upshifted PA will also acquire more resources, while those who suffer upshifted NA will consume more resources, with further negative effects on work attitudes and behaviors. Moreover, affective shift could motivate cognitive and behavioral subsystems, with influences on outcomes.

Limitations and Future Research

Our research has four limitations that should be addressed. First, study participants self-reported all variables, risking common method bias (Griffin et al., 2007). Our longitudinal research design somewhat decreased but did not erase common method bias.

Second, we controlled for sleep quality, but it was self-reported and measured by a single item. Considering that sleepers may subconsciously shift affect by processing affect events (Walker and van der Helm, 2009; Yang et al., 2016), sleep quality may be an essential antecedent of affect (Flueckiger et al., 2016). Thus, future research could use more specific measurements such as polysomnography machines that capture actual sleep duration and quality.

Third, we did not clarify the boundary distinguishing affect during work from affect outside work. Our call-center study participants used fixed-line telephones to handle both outgoing and incoming calls. Thus, their work–non-work boundaries were easily clarified. Future research could use greater precision for controlling how prior work events influence outside-work affect.

Fourth, using PSI theory to infer hypotheses, we cannot justify the specific differences between outside-work and during-work affective shifts. Though activated subsystems are the same in

upshifted PA and NA outside or during work, the antecedents may differ and patterns of resources from COR theory may vary (Hobfoll et al., 2018). For affective shift during work, there may be some work-related antecedents and resources are consumed no matter upshift in PA or NA. Whereas for affective shift outside work, there may be some non-work-related antecedents such as family activities, conflicts with spouse and so on. And resources are in a cycle of replenishment and consumption (Casper and Sonnentag, 2019). To show how outside-work and within-work affective shifts differ, future research could consider antecedents and use specific indicators to represent replenishment and consumption of resources.

Practical Implications

Our research has practical values. Call-center employees perform emotional work in communicating directly with customers. Our findings suggest that organizations should alleviate emotional exhaustion and evoke higher performance through interventions such as emotional writing workships and regular team-building activities.

CONCLUSION

In this study, we explore how affective shifts outside work impact task performance, emotional exhaustion, and CWB. We find that PA upshifts outside work are positively correlated with task performance (Hypothesis 1), that NA upshifts outside work can moderate the relationship between PA upshifts outside work and task performance (Hypothesis 4), and that PA upshifts outside work can moderate the relationship between NA upshifts outside work and emotional exhaustion (Hypothesis 5). Overall, the study indicates that affect shifts outside work have meaningful impacts on job performance and work attitudes. On a practical level, we show that human resource interventions must recognize that affect experienced after work has as much impact as affect experienced during work.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Department of Psychology. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

XQ: conceptualization, methodology, software, formal analysis, data curation, writing–original draft preparation, and writing–reviewing and editing. XY: conceptualization, resources, data curation, supervision, writing–reviewing and editing, project administration, and funding acquisition. QL: methodology, software, formal analysis, data curation, and writing–original draft preparation. All authors contributed to the article and approved the submitted version.

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REFERENCES

Ashkanasy, N. M., and Dorris, A. D. (2017). Emotions in the Workplace. *Annu. Rev. Organ. Psychol. Organ. Behav.* 4, 67–90. doi: 10.1146/annurev-orgpsych-032516-113231

Bennett, R. J., and Robinson, S. L. (2000). Development of a measure of workplace deviance. *J. Appl. Psychol.* 85, 349–360. doi: 10.1037/0021-9010.85.3.349

Bledow, R., Rosing, K., and Frese, M. (2013). A dynamic perspective on affect and creativity. *Acad. Manag. J.* 56, 432–450. doi: 10.5465/amj.2010.0894

Bledow, R., Schmitt, A., Frese, M., and Kühnel, J. (2011). The affective shift model of work engagement. *J. Appl. Psychol.* 96, 1246–1257. doi: 10.1037/a0024532

Brislin, R. W. (1983). Cross-cultural research in psychology. *Annu. Rev. Psychol.* 34, 363–400.

Bryk, A. S., and Raudenbush, S. W. (1992). *Hierarchical Linear Models: Applications and Data Analysis Methods*. Newbury Park, CA: Sage.

Carver, C. S., and Scheier, M. F. (1990). Origins and functions of positive and negative affect: a control-process view. *Psychol. Rev.* 97, 19–35. doi: 10.1037/0033-295x.97.1.19

Casper, A., and Sonnentag, S. (2019). Feeling exhausted or vigorous in anticipation of high workload? The role of worry and planning during the evening. *J. Occup. Organ. Psychol.* 92, 16–44. doi: 10.1111/joop.12290

Cluley, H., and Hecht, T. D. (2019). Micro work−family decision−making of dual−income couples with young children: what does a couple like us do in a situation like this? *J. Occup. Organ. Psychol.* 92, 1–15. doi: 10.1111/joop.12282

Conway, A. M., Tugade, M. M., Catalino, L. I., and Fredrickson, B. L. (2013). "The broaden-and-build theory of positive emotions: form, function, and mechanisms," in *The Oxford Handbook of Happiness*, eds S. A. David, I. Boniwell, and A. Conley Ayers (New York, NY: Cambridge University Press), 17–34.

Cordes, C. L., and Dougherty, T. W. (1993). A review and an integration of research on job burnout. *Acad. Manag. Rev.* 18, 621–656. doi: 10.5465/AMR.1993.9402210153

Dalal, R. S. (2005). A meta-analysis of the relationship between organizational citizenship behavior and counterproductive work behavior. *J. Appl. Psychol.* 90, 1241–1255. doi: 10.1037/0021-9010.90.6.1241

Dalal, R., Lam, H., Weiss, H. M., Welch, E. R., and Hulin, C. L. (2009). A within-person approach to work behavior and performance: concurrent and lagged citizenship-counterproductivity associations, and dynamic relationships with affect and overall job performance. *Acad. Manag. J.* 52, 1051–1066. doi: 10.5465/AMJ.2009.44636148

Edwards, J. R., and Rothbard, N. P. (2000). Mechanisms linking work and family: specifying the relationships between work and family constructs. *Acad. Manag. Rev.* 25, 178–199. doi: 10.2307/259269

Flueckiger, L., Lieb, R., Meyer, A. H., Witthauer, C., and Mata, J. (2016). The importance of physical activity and sleep for affect on stressful days: two intensive longitudinal studies. *Emotion* 16, 488–497. doi: 10.1037/emo0000143

Fredrickson, B. L. (1998). What good are positive emotions? *Rev. Gen. Psychol.* 2, 300–319. doi: 10.1037/1089-2680.2.3.300

Geldhof, G. J., Preacher, K. J., and Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychol. Methods* 19, 72–91. doi: 10.1037/a0032138

Grandey, A. A. (2003). When "the show must go on": surface acting and deep acting as determinants of emotional exhaustion and peer-rated service delivery. *Acad. Manag. J.* 46, 86–96. doi: 10.2307/30040678

Grandey, A. A., and Gabriel, A. S. (2015). Emotional labor at a crossroads: where do we go from here? *Annu. Rev. Organ. Psychol. Organ. Behav.* 2, 323–349. doi: 10.1146/annurev-orgpsych-032414-111400

Griffin, J. M., Greiner, B. A., Stansfeld, S. A., and Marmot, M. (2007). The effect of self-reported and observed job conditions on depression and anxiety symptoms: a comparison of theoretical models. *J. Occup. Health Psychol.* 12, 334–349. doi: 10.1037/1076-8998.12.4.334

Gross, J. J. (1998). The emerging field of emotion regulation: an integrative review. *Rev. Gen. Psychol.* 2, 271–299. doi: 10.1037/1089-2680.2.3.271

Halbesleben, J. R., Neveu, J. P., Paustian-Underdahl, S. C., and Westman, M. (2014). Getting to the "COR" understanding the role of resources in conservation of resources theory. *J. Manag.* 40, 1334–1364. doi: 10.1177/0149206314527130

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066x.44.3.513

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Rev. Gen. Psychol.* 6, 307–324. doi: 10.1037/1089-2680.6.4.307

Hobfoll, S. E., Halbesleben, J., Neveu, J. P., and Westman, M. (2018). Conservation of resources in the organizational context: the reality of resources and their consequences. *Annu. Rev. Organ. Psychol. Organ. Behav.* 5, 103–128. doi: 10.1146/annurev-orgpsych-032117-104640

Ilies, R., and Judge, T. A. (2005). Goal regulation across time: the effects of feedback and affect. *J. Appl. Psychol.* 90, 453–467. doi: 10.1037/0021-9010.90.3.453

Izard, C. E. (2009). Emotion theory and research: highlights, unanswered questions, and emerging issues. *Annu. Rev. Psychol.* 60, 1–25. doi: 10.1146/annurev.psych.60.110707.163539

Janssen, O., and Van Yperen, N. W. (2004). Employees' goal orientations, the quality of leader-member exchange, and the outcomes of job performance and job satisfaction. *Acad. Manag. J.* 47, 368–384. doi: 10.2307/20159587

Judge, T. A., and Ilies, R. (2004). Affect and job satisfaction: a study of their relationship at work and at home. *J. Appl. Psychol.* 89, 661–673. doi: 10.1037/0021-9010.89.4.661

Khan, M. A. S., Du Jianguo, A. M., Saleem, S., Boamah, K. B., Javed, U., and Usman, M. (2019). Rejuvenating the concept of work alienation through job demands-resources model and examining its relationship with emotional exhaustion and explorative and exploitative learning. *Psychol. Res. Behav. Manag.* 12, 931–941. doi: 10.2147/PRBM.S204193

Kinnunen, U., Feldt, T., Siltaloppi, M., and Sonnentag, S. (2011). Job demands-resources model in the context of recovery: testing recovery experiences as mediators. *Eur. J. Work Organ. Psychol.* 20, 805–832. doi: 10.1080/1359432x.2010.524411

Kinnunen, U., Rantannen, J., Mauno, S., and Peeters, M. (2014). "Work-family interaction," in *An introduction to Contemporary Work Psychology*, eds M. C. W. Peeters, J. De Jonge, and T. Taris (Hoboken, NJ: John Willey & Sons), 267–290.

Kopperud, K. H., Nerstad, C. G. L., and Dysvik, A. (2020). Should I stay or should I go? the role of motivational climate and work-home spillover for turnover intentions. *Front. Psychol.* 28:1107. doi: 10.3389/fpsyg.2020.01107

Kuhl, J. (2000). The volitional basis of personality systems interaction theory: applications in learning and treatment contexts. *Int. J. Educ. Res.* 33, 665–703. doi: 10.1016/S0883-0355(00)00045-8

Lin, K. J., Ilies, R., Pluut, H., and Pan, S. Y. (2017). You are a helpful co-worker, but do you support your spouse? a resource-based work-family model of helping and support provision. *Organ. Behav. Hum. Decis. Process.* 138, 45–58. doi: 10.1016/j.obhdp.2016.12.004

Locke, E. A., and Latham, G. P. (2006). New directions in goal-setting theory. *Curr. Dir. Psychol. Sci.* 15, 265–268. doi: 10.1111/j.1467-8721.2006.00449.x

Lucas, C. G., Bridgers, S., Griffiths, T. L., and Gopnik, A. (2014). When children are better (or at least more open-minded) learners than adults: developmental differences in learning the forms of causal relationships. *Cognition* 13, 284–299. doi: 10.1016/j.cognition.2013.12.010

Maslach, C., and Jackson, S. E. (1984). Burnout in organizational settings. *Appl. Soc. Psychol. Annu.* 5, 133–153.

Meier, L. L., and Spector, P. E. (2013). Reciprocal effects of work stressors and counterproductive work behavior: a five-wave longitudinal study. *J. Appl. Psychol.* 98, 529–540. doi: 10.1037/e577572014-355

Muthèn, L. K., and Muthèn, B. O. (1998-2012). *Mplus User's Guide*, 7th Edn. Los Angeles, CA: Muthèn & Mutheìn. doi: 10.1037/a0031732

Raudenbush, S. W. (2004). *HLM 6: Hierchical Linear and Nonlinear Modeling*. Lincolnwood, Ill: Scientific Software Int. Inc.

Reis, H. T., and Wheeler, L. (1991). Studying social interaction with the Rochester Interaction Record. *Adv. Exp. Soc. Psychol.* 24, 269–318. doi: 10.1016/S0065-2601(08)60332-9

Robinson, S. L., and Bennett, R. J. (1995). A typology of deviant workplace behaviors: a multidimensional scaling study. *Acad. Manag. J.* 38, 555–572. doi: 10.2307/256693

Rothbard, N. P., and Wilk, S. L. (2011). Waking up on the right or wrong side of the bed: start-of-workday mood, work events, employee affect, and performance. *Acad. Manag. J.* 54, 959–980. doi: 10.5465/amj.2007.0056

Rotundo, M., and Sackett, P. R. (2002). The relative importance of task, citizenship, and counterproductive performance to global ratings of job performance: a policy-capturing approach. *J. Appl. Psychol.* 87, 66–80. doi: 10.1037/0021-9010.87.1.66

Sonnentag, S. (2003). Recovery, work engagement, and proactive behavior: a new look at the interface between nonwork and work. *J. Appl. Psychol.* 88, 518–528. doi: 10.1037/0021-9010.88.3.518

Spector, P. E., and Fox, S. (2002). An emotion-centered model of voluntary work behavior. *Hum. Resource Manag. Rev.* 12, 269–292. doi: 10.1016/s1053-4822(02)00049-9

Standen, P., Daniels, K., and Lamond, D. (1999). The home as a workplace: work–family interaction and psychological well-being in telework. *J. Occup. Health Psychol.* 4, 368–381. doi: 10.1037/1076-8998.4.4.368

Usman, M., Ali, M., Yousaf, Z., Anwar, F., Waqas, M., and Khan, M. A. S. (2020). The relationship between laissez−faire leadership and burnout: mediation through work alienation and the moderating role of political skill. *Can. J. Admin. Sci.* 37, 423–434. doi: 10.1002/cjas.1568

Volmer, J., Binnewies, C., Sonnentag, S., and Niessen, C. (2012). Do social conflicts with customers at work encroach upon our private lives? A diary study. *J. Occup. Health Psychol.* 17, 304–315. doi: 10.1037/a0028454

Vötter, B., and Schnell, T. (2019). Bringing giftedness to bear: generativity, meaningfulness, and self-control as resources for a happy life among gifted adults. *Front. Psychol.* 10:1972. doi: 10.3389/fpsyg.2019.01972

Walker, M. P., and van der Helm, E. (2009). Overnight therapy? The role of sleep in emotional brain processing. *Psychol. Bull.* 135, 731–748. doi: 10.1037/a0016570

Watson, D., Clark, L. A., and Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *J. Pers. Soc. Psychol.* 54, 1063–1070. doi: 10.1037/0022-3514.54.6.1063

Wei, H., Zhu, J., Li, H., and Bilimoria, D. (2018). A cross-level study on family involvement and job satisfaction. *Front. Psychol.* 9:1547. doi: 10.3389/fpsyg.2018.01547

Williams, K. J., and Alliger, G. M. (1994). Role stressors, mood spillover, and perceptions of work-family conflict in employed parents. *Acad. Manag. J.* 37, 837–868. doi: 10.5465/256602

Yang, L., Simon, L. S., Wang, L., and Zheng, X. (2016). To branch out or stay focused? Affective shifts differentially predict organizational citizenship behavior and task performance. *J. Appl. Psychol.* 101, 831–845. doi: 10.1037/apl0000088

Yang, Z., Zhang, H., Kwan, H. K., and Chen, S. (2018). Crossover effects of servant leadership and job social support on employee spouses: the mediating role of employee organization-based self-esteem. *J. Bus. Ethics* 147, 595–604. doi: 10.1007/s10551-015-2943-3

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The Role of Personal Biological Resource in the Job Demands-Control-Support Model: Evidence From Stress Reactivity

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Job resources can buffer the deleterious effect of adverse work environments. Extant studies on the interaction pattern between job resources and adverse environments were confined to the diathesis stress model. This traditional perspective has received the challenge from the differential susceptibility model and the vantage sensitivity model. Additionally, stress reactivity may be one of the important job resources at the personal biological level, but its moderating role was short of empirical research. This study aimed to examine how stress reactivity interacts with work environments in predicting job burnouts among 341 Chinese hospital female nurses. This study selected job control and job support representative of supportive environments and psychological demands representative of an adverse environment and the cortisol content in 1-cm hair segment as a biomarker to assess individual's stress reactivity in 1 month. The nurses self-reported their work environments and job burnouts and provided 1-cm hair segments closest to the scalp. Hair cortisol content was measured with high-performance liquid chromatography-tandem mass spectrometry. The interaction pattern was examined with multiple linear regressions and the analysis of region of significance (RoS). The regression revealed that the interaction of hair cortisol content with job control could positively predict professional efficiency among nurses, with psychological demands could negatively predict emotional exhaustion, and with coworker support could negatively predict professional efficiency. The RoS analysis revealed that nurses with high cortisol levels had not only significantly higher professional efficiency than those with low cortisol levels in high job control but also significantly lower professional efficiency in low job control. Nurses with high cortisol levels had significantly higher emotional exhaustion than those with low cortisol levels in low psychological demands. Nurses with low cortisol levels had not only significantly higher professional efficiency than those with high cortisol levels in high coworker support but also significantly lower professional efficiency in low coworker support. The interaction patterns of stress reactivity with both job control and coworker support were consistent

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with the differential susceptibility model, but the interaction between stress reactivity and psychological demands supported the vantage sensitivity model.

Keywords: psychological demands, job control, social support, job burnouts, stress reactivity, hair cortisol content, hospital nurses

INTRODUCTION

Numerous studies have well documented that adverse work environments can have detrimental effects on the employee's well-being, health, and work-related outcomes (Salvagioni et al., 2017). Among various outcomes, job burnouts are the typical fatigue and exhaustion syndromes that are elicited by adverse work environments, such as high job demands (Demerouti et al., 2001; Halbesleben and Buckley, 2004). The deleterious effect of high job demands is considered to be buffered by sufficient job resources as emphasized in the job demands-resources (JDR) model (Bakker and Demerouti, 2007) and high job control and more social support as emphasized in the job demands-control (JDC) model (Karasek, 1979; van der Doef and Maes, 1998) and the job demands-control-support (JDCS) model (Johnson and Hall, 1988; van der Doef and Maes, 1998). That is, not all employees are to the same extent susceptible to the deleterious influences of high job demands. For example, employees with more job resources have been considered to be more resistant to stress exposure in the workplace than their colleagues with fewer job resources, showing lower levels of adverse outcomes in the identical adverse work environment (Bakker et al., 2005). However, most extant empirical studies focused on the buffering role of the external organizational resources related to job characteristics in the workplace, such as social support from coworkers and supervisors, work autonomy, quality of the relationship with the supervisor, and performance feedback (Demerouti et al., 2001; Bakker et al., 2003, 2005; Johnson and Spector, 2007). Comparatively limited studies had examined the buffering role of personal mental resources, such as optimism, extraversion, compassion satisfaction, dispositional punishment and reward sensitivity, organization-based self-esteem, emotional intelligence, self-efficacy, self-control capacity, political skill, and recovery experience as resource replenishment (Jex and Elacqua, 1999; Van Yperen and Snijders, 2000; Mkikangas and Kinnunen, 2003; Johnson and Spector, 2007; Chi et al., 2011; Pugh et al., 2011; Tremblay and Messervey, 2011; Schreurs et al., 2014; Diestel et al., 2015; Gu and You, 2019; Usman et al., 2020). To date, there are a few studies exploring the buffering effect of personal biological resources, such as sleep quality (Diestel et al., 2015) and stress reactivity (Deng et al., 2020).

On the other hand, regarding the buffering role of job resources in adverse work environments, extant studies focused on the interaction showing the pattern that is consistent with the diathesis stress model, such as the interaction between fewer job resources and highly stressful work environments (Bakker et al., 2005). This traditional focus has received the challenge from other interaction patterns as outlined in the differential susceptibility model and the vantage sensitivity model, which were developed by Belsky et al. (Belsky et al., 2007; Belsky and Pluess, 2009; Ellis et al., 2011; Pluess and Belsky, 2013) for explaining children's susceptibility to environmental influences. However, there are a few studies exploring the interaction patterns that follow the two novel models. Additionally, previous studies were mostly confined to the adverse and pathogenic responses (e.g., emotional exhaustion) to adverse work environments under the frame of the JDC model or the JDCS model (Johnson and Hall, 1988; van der Doef and Maes, 1998) and the JDR model (Bakker and Demerouti, 2007). Notably, the presence of adverse environments and negative work-related outcomes is not equivalent to the absence of supportive environments and adaptive outcomes in work environments. However, there are few studies addressing the adaptive work-related response of individuals with high-risk traits (or fewer protective factors) in a supportive work environment with high job controllability or more social support, which may be supplied by the organization through the interior reform, such as adjustment on employee's working position. Currently unknown is whether the work-related responses to a supportive environment differ in individuals with more and fewer protective factors, especially for job resources at the personal biological level (i.e., stress reactivity here). Therefore, the current study aimed to examine which model the interaction patterns between work environments and stress reactivity as personal biological resources supports across adverse and supportive environments and across maladaptive and adaptive outcomes for fully understanding the importance of the biological processes in the employee's responses to work environments.

BACKGROUND

Stress Reactivity as Personal Biological Resources

As protective factors, job resources refer to those physical, psychological, social, or organizational aspects of the job that may be functional in achieving work goals, or reduce job demands at the associated physiological and psychological costs, or stimulate personal growth and development (Demerouti et al., 2001). Job resources contain external resources (e.g., organizational and social resources) and internal personal resources (Xanthopoulou et al., 2007). Personal resources that are closely related to resiliency belong to aspects of the self at the cognitive level, emotional level, and biological level including individuals' sense of their ability to control and impact upon their environment successfully (Hobfoll, 2002; Hobfoll et al., 2003), such as cognitive features and action patterns. Stress reactivity may be one of the important personal biological resources, with high level indicative of high susceptibility to the influences of work environment because it has been conceptualized as a highly biological sensitivity to

context (Boyce and Ellis, 2005). The hypothalamic-pituitary-adrenal (HPA) axis is one of the stress-sensitive nervous systems that help organs adapt to stressful events (Spiga et al., 2014). The activity of the HPA axis reflects individual's stress reactivity (Obradovi et al., 2010). Recently, a pilot study has demonstrated that the HPA activity (or stress reactivity) as personal biological resources can play a moderating role as personal mental resources do (Deng et al., 2020). However, the recent study only investigated the interaction of the HPA activity (or stress reactivity) with emotional labor (a special aspect of job demands) in predicting job burnouts. Therefore, it needs to extend the moderating role of stress reactivity to more generalized stressful work environments from other aspects of high job demands or low job controllability or less social support.

Three Models on the Interaction Patterns

The diathesis stress model suggests that in adverse environments, individuals with high-risk traits (e.g., insufficient personal resources, risk gene, and higher stress reactivity) display higher vulnerability than those with low-risk traits, being more liable to develop various maladaptive outcomes (e.g., emotional exhaustion), but there are no differences between the two groups in supportive environments (Belsky and Pluess, 2009). The differential susceptibility model proposes that individuals with certain traits will be more vulnerable to an adverse environment, following the worse outcomes, but benefit from a supportive environment, resulting in better outcomes (Belsky and Pluess, 2009). The vantage sensitivity model posits that individuals with vantage sensitivity characteristics display better adaptation in a supportive environment than the other individuals because they are likely to be more sensitive to the positive contexts, but there are no differences between the two groups in an adverse environment (Pluess and Belsky, 2013). The patterns of the three interaction models can be elucidated with the analysis of region of significance (RoS) and the proportion of interaction (PoI) index and the proportion affected (PA) index (Roisman et al., 2012). However, the interaction pattern between personal biological resources and work environments was not further confirmed with the analysis of RoS in a recent study demonstrating a moderating role of stress reactivity as personal biological resources in the relationship between stress reactivity and emotional labor (Deng et al., 2020). Therefore, it needs to follow the approach strategy and to further elucidate the interaction pattern between stress reactivity and work environments in terms of the analysis of RoS in combination with the PoI index and the PA index.

THE PRESENT STUDY

The present study aimed to examine how work environments interact with stress reactivity in predicting work-related outcomes. Under the frame of the JDCS model, psychological demands as the existence of socially "objective" environments is representative of an adverse environment, and worker's decision latitude (or job control) and social support at the work environment are representative of supportive environments (Johnson and Hall, 1988; Xie, 1996; Karasek et al., 1998). Therefore, this study selected psychological demands, job control, and job support as work environmental factors, emotional exhaustion and depersonalization as examples of negative outcomes, and professional efficiency as an example of positive outcome. The cortisol content in 1-cm hair segment was utilized as a biomarker to assess the individual's stress reactivity in 1 month, which is the period that most psychological measurements cover. This is because cortisol as an end product of the HPA axis is a biomarker of the HPA activity (Spiga et al., 2014) and also one of the reliable biomarkers for assessing an individual's stress reactivity (Obradovi et al., 2010). Salivary cortisol was used to estimate an individual's stress reactivity (Obradovi et al., 2010, 2015). If the growth rate of hair shaft is 1 cm per month, the cortisol content in the 1-cm hair segment would reliably reflect the HPA activity over 1 month or the accumulative reactivity to daily stressful events over 1 month (Russell et al., 2012) compared with salivary and urinary cortisol levels, reflecting an acute and a short-term activity of the HPA axis over several minutes, several hours, and up to 1 day (Dickerson and Kemeny, 2004). This study focused on Chinese hospital nurses who suffered from high job stresses and job burnouts and had relatively low job satisfaction (Wu et al., 2018).

Previous studies had demonstrated that stress reactivity could moderate the relationship between environmental factors and adolescents' psychological adaptations (Wiel et al., 2004; Obradovi et al., 2010, 2015; Owens et al., 2018; Xu et al., 2019) and the relationship between emotional labor and job burnouts (Deng et al., 2020). Thus, we hypothesized that hair cortisol levels (or stress reactivity) could moderate the relationship between environmental factors and work-related outcomes among Chinese nurses. Moreover, we proposed three alternative hypotheses based on the aforementioned three models. From the perspective of the differential susceptibility model, we expected that nurses with high hair cortisol levels (or high stress activity) might be more vulnerable to adverse environments (e.g., highly stressful demands, low controllability, and less support) but benefit from supportive environments (e.g., low stressful job demands, high job controllability, and more support) because of their high susceptibility to the influences of work environment. In other words, high hair cortisol level was a plastic factor (i.e., it was not only a risk factor in the context of adverse environments but also a promoting factor in supportive environments). From the vantage sensitivity perspective, we expected that nurses with high hair cortisol levels might display better adaptation in a supportive environment than those with a low stress reactivity, but there was no difference in adverse environments between the two groups, or that high hair cortisol level was a vantage sensitivity characteristic. From the diathesis stress perspective, we expected that nurses with high hair cortisol levels might suffer from more maladaptation in adverse environments than those with low hair cortisol levels, but there was no difference in supportive environments between them, or that high stress reactivity was a risk factor.

MATERIALS AND METHODS

Participants

This study recruited female nurses through posting the advertisement in Tencent's WeChat and QQ groups. Initially, 495 female nurses were randomly recruited during September 2017–January 2018 from the nine hospitals that are near our university in Nanjing city, China. All participants provided written informed consent before inclusion. Among them, 452 nurses (91.31%) completed the questionnaires including demographic information, job content questionnaire, job burnouts, and job satisfactions, and 408 nurses (82.42%) provided their hair strands and the hair-related information. Here, 67 participants (13.54%) were excluded. The exclusion criteria were obese (body mass indexes ≥30); alcoholics; smokers; shorter hair strands (<1 cm); dyed, permed, or bleached hair; diseases (e.g., canker sores and inflammation); or medicine intake (e.g., glucocorticoid and antibiotics drugs), which might influence the contents of cortisol in hair (Wosu et al., 2013). Finally, 341 nurses (68.89%) participated in the present study. This study followed the Declaration of Helsinki and was approved by the Health Science Research Ethics Board of Southeast University.

The 341 nurses worked in different types of departments: emergency department (32.55%), intensive care unit (ICU; 15.25%), emergency intensive care unit (EICU; 7.62%), rehabilitation department (12.02%), radiotherapy department (7.92%), department of medical psychology (8.80%), and others (15.84%) including struma department, pediatrics, orthopedics, neurology, neurosurgery, internal medicine, endocrine department, dental department, Chinese medicine surgery, and operating theater over the past 1 year. Of those, 48.99% nurses served as a nurse for less than 5 years, 32.26% for 5–15 years, and 18.77% over 15 years. Among them, 31.96% nurses were junior nurses, 46.92% were senior nurses, and 21.11% were charge nurses and over. Income of 3.81% nurses was less than 2,000 RMB per month, 21.11% earned between 2,001 and 3,000 RMB per month, 52.20% earned between 3,001 and 5,000 RMB per month, and 22.87% earned over 5,001 RMB per month. In addition, 90.03% nurses were in the 8-h three-shift scheduling and 9.97% nurses were in the 12-h two-shift scheduling.

Procedures

The participants self-reported their demographic information including nurses' working department, professional titles, working duration as a nurse, the monthly income and shift scheduling pattern, and their psychological states including job characteristics and job burnouts over the past 1 month. Two weeks after the questionnaire's collection, hair samples (over 20 mg in weight) were collected by the well-trained research assistants to match the psychological data in time span. The delay in hair sampling was recommended by LeBeau et al. (2011), who thought that 1–3 mm of the hair strands are embedded in the skin and the 1–2-mm hair strands closest to the scalp cannot be completely cut with scissors if the hair growth rate is 1 cm per month (Pragst and Balikova, 2006). The collected hair samples were sealed with foil to avoid direct irradiation from sunlight and then were stored in a dry and dark environment at room temperature until the analysis.

Measures

Psychological and Social Characteristics of Jobs

The job characteristics were measured with subscales of five-item psychological demands, nine-item job control (or decision latitude), four-item supervisor support, and four-item coworker support in the job content questionnaire (JCQ) developed by Karasek (1985) and translated into the Chinese version by Cheng et al. (2003). Job control subscale consists of six-item skill discretion, such as "My job requires that I learn new things" and three-item decision authority, such as "My job allows me to make a lot of decision on my own." The sample item in psychological demands is "My job requires working very fast," in supervisor support is "My supervisor pays attention to what I am saying," and in coworker support is "People I work with are friendly." Each item is rated on a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Each scale was estimated with a sum of weighted item scores according to the user's guide (Karasek, 1985), higher scores indicating higher stress for psychological demands, but lower scores indicating higher stress for the other three job characteristics. The scale was proven to have good reliability and validity in Chinese workers (Xie, 1996; Cheng et al., 2003). In the present study, the Cronbach's alpha coefficient was 0.70, 0.81, 0.85, and 0.87 for the four subscales.

Job Burnout

Job burnout was measured with Maslach Burnout Inventory-General Survey (MBI) developed by Schaufeli et al. (1996) and translated into Chinese by Li and Shi (2003). The Chinese version of MBI includes 16 items assessing the frequency of nurses' experiencing burnout and consists of three subscales measuring emotional exhaustion (five items), depersonalization (five items), and professional efficiency (six items). Each item is rated on a 7-point Likert scale ranging from 1 (never) to 7 (always), higher scores indicating heavier burnout for emotional exhaustion and depersonalization but lower scores indicating heavier burnout for professional efficiency. The scale was proven to have good reliability and validity in Chinese workers (Li and Shi, 2003). In the present study, average score for each subscale was utilized, and the Cronbach's alpha coefficient was 0.95, 0.82, and 0.86 for the three subscales.

The Analysis of Hair Cortisol Contents

The detailed procedures of analyzing hair cortisol contents (HCCs) were described elsewhere (Chen et al., 2019). Briefly, the 1-cm hair strands closest to the scalp were treated by a standard protocol: washing with methanol, cutting into pieces, incubation in methanol, centrifugation, solid-phase extraction, and drying with pure nitrogen gas. The dried residue was redissolved in 50-μl methanol for cortisol analysis that was done on a Qtrap 3200 liquid chromatography-tandem mass spectrometer (ABI, United States). Cortisol was ionized with an atmosphere

pressure chemical ionization and identified in positive ion mode using multiple reactions monitoring mode. The assay method had good linearity in the range of 0.8–250.0 pg/mg, showing the square coefficient of correlation at more than 0.99. It also had good sensitivity, accuracy, and precision, showing limits of detection and quantitation at 0.3 and 0.8 pg/mg, intra-day and inter-day coefficients of variation less than 15%, and recovery ranging between 85 and 115% (Chen et al., 2019), which fit the requirements of hair cortisol measurement.

Data Preparation and Analysis Procedures

Prior to analyses, all variables were examined for accuracy of data entry, missing data, data normality, and common method bias. Data were analyzed by the statistical package SPSS 22.0 for Windows. Confirmatory factor analysis was performed by Lisrel 8.70. Percentages of missing data were less than 1.0% for all the predictive and outcome variables, and there were no missing data for the moderating variable. Missing data for all the predictive and outcome variables were handled using the expectation-maximization algorithm (Schafer and Graham, 2002). The data distribution normality was examined with one-sample Kolmogorov-Smirnov test. HCC showed non-normal distribution ($p < 0.001$) with a skewness at 5.636 ± 0.132 and a kurtosis at 40.683 ± 0.263 and became normally distributed ($p = 0.200$) with a skewness at 0.130 ± 0.132 and a kurtosis at 1.139 ± 0.263 after a log-transformation that could effectively reduce the skewness and kurtosis. The log-transformed HCC data were used for the next analyses including Pearson's correlation and the hierarchical multiple regression.

RESULTS

Descriptive Statistics

Harman's single-factor test was performed to assess the common method variance biases (Podsakoff et al., 2003). The items on job control and emotional exhaustion did not generate the unique factor with the explained variance more than 40% (30.32% as examined with an exploratory factor analysis through principal components extraction) and did not converge on a single factor [χ^2/df = 8.138, goodness-of-fit index (GFI) = 0.741, comparative fit index (CFI) = 0.755, Tucker-Lewis index (TLI) = 0.731, root mean square error of approximation (RMSEA) = 0.145 as tested with a confirmatory factor analysis]. Similarly, the items on the other predictors and the outcome variables did not generate a single factor. All the items on the four job characteristics and job burnouts also did not generate a single factor. It was thus assumed that the common method variance bias was not serious in this study.

As listed in **Table 1**, job control and supervisor support were significantly and negatively correlated with emotional exhaustion and depersonalization (*p*s < 0.05) and positively correlated with professional efficiency (*p*s < 0.05). Psychological demands were significantly and positively correlated with emotional exhaustion and depersonalization (*p*s < 0.05) but not with professional efficiency ($p > 0.05$). Coworker support was significantly and negatively correlated with depersonalization

TABLE 1 | Means, standard deviations, and Pearson correlation coefficients for job characteristics, hair cortisol content, and job burnouts ($n = 341$).

S. No.		1	2	3	4	5	6	7	8
1.	Job control	-							
2.	Psychological demands	−0.202**	-						
3.	Supervisor support	0.404**	−0.075	-					
4.	Coworker support	0.268**	0.061	0.510**	-				
5.	HCC[a]	0.079	−0.040	0.039	0.000	-			
6.	Emotional exhaustion	−0.250**	0.470**	−0.147**	−0.089	−0.045	-		
7.	Depersonalization	−0.315**	0.298**	−0.223**	−0.179**	−0.040	0.658**	-	
8.	Professional efficiency	0.240**	−0.062	0.116*	0.120*	0.034	−0.034	−0.163**	-
	M[b]	62.38[c]	33.69[d]	11.84	12.51	3.3	3.42	2.45	4.12
	SD[b]	8.38[c]	6.93[d]	1.84	1.50	0.3–49.6	1.51	1.33	1.24

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

[a]*HCC refers to hair cortisol content. HCC is log-transformed for Pearson correlation analysis.*

[b]*HCC is presented as median and range (pg/mg) because HCC showed non-normal distribution and the other variables are presented as M and SD, where M is mean and SD is standard deviation.*

[c]*The score of job control in the next regression analysis was calculated as a standard score according to the formula, standard score = (the actual score−24)/(96–24).*

[d]*The score of job control in the next regression analysis was calculated as a standard score according to the formula, standard score = (the actual score−12)/(48–12).*

($p < 0.05$) and positively with professional efficiency ($p < 0.05$) but not with emotional exhaustion ($p > 0.05$). HCC was not correlated with job characteristics and job burnouts ($ps > 0.05$). Additionally, work duration as a nurse was significantly and negatively correlated with supervisor support and coworker support ($r = -0.189$, $p < 0.001$ and $r = -0.172$, $p = 0.001$) and positively with professional efficiency ($r = 0.152$, $p = 0.005$) but not with job control, psychological demands, HCC, and the other burnouts ($ps > 0.115$). There were significant differences among different working departments in psychological demands, emotional exhaustion, and depersonalization ($F_{6, 334} = 9.168$, $p < 0.001$; $F_{6, 334} = 6.642$, $p < 0.001$; $F_{6, 334} = 4.879$, $p < 0.001$) but no differences in the other job characteristics, HCC, and professional efficiency ($ps > 0.119$). There were significant differences between two shift schedule patterns in psychological demands, emotional exhaustion, and depersonalization ($F_{1, 339} = 4.834$, $p = 0.029$; $F_{1, 339} = 5.201$, $p = 0.023$; $F_{1, 339} = 4.318$, $p = 0.038$) but no differences in the other job characteristics, HCC, and professional efficiency ($ps > 0.250$).

The Interaction Patterns Between Job Characteristics and Hair Cortisol Content

A total of 12 four-step moderated hierarchical regressions were conducted to examine the interactive effects between job characteristics and HCC on job burnouts. Demographic variables (i.e., working department, shift schedule pattern, and working duration as a nurse) were entered into the regression at Step 1. Job characteristics as the predictor were separately entered into the equation at Step 2. HCC as the moderator was entered at Step 3. Lastly, the interaction term between job characteristics and HCC was separately entered at Step 4. The amount of an additional explained variance was estimated after each step. Prior to the regression analyses, the moderator and all the independent variables except for type variables were centralized to effectively reduce multicollinearity (Aiken and West, 1991). The present 12 models had no serious collinearity as examined by the collinearity diagnoses where the tolerance was more than 0.2 and variance inflation factor was less than 5 for all the regression equations (Fox, 1991). In order to further explore the nature and directionality of the significant interactions, the simple slopes analyses in which the effects of higher and lower levels (i.e., 1 *SD* above the mean and 1 *SD* below the mean, *M*+1 *SD* and *M*−1 *SD*) of job characteristics were done in female nurses with higher and lower HCC levels (i.e., *M*+1 *SD* and *M*−1 *SD*) were performed according to the procedures proposed by Aiken and West (1991). The RoS approach was conducted to elucidate whether the interaction between job characteristics and HCC follows the differential susceptibility model or the vantage sensitivity model. The RoS was calculated from −2 SD to +2 SD from the means of job characteristics in terms of the probing interaction procedure developed by Hayes and Matthes (2009). The interaction patterns are determined according to the criteria based on RoS, PoI index, and PA index (Roisman et al., 2012).

The regression analysis revealed that job control was negatively associated with emotional exhaustion and depersonalization ($ps < 0.001$) and positively with professional efficiency ($p < 0.001$) as listed in **Table 2**. Psychological demands were positively associated with emotional exhaustion and depersonalization ($ps < 0.001$), but not with professional efficiency ($p > 0.05$) as listed in **Table 3**. Supervisor support was negatively associated with emotional exhaustion and depersonalization ($p < 0.01$ and $p < 0.001$) and positively associated with professional efficiency ($p < 0.01$) as listed in **Table 4**. Coworker support was negatively associated with depersonalization ($p < 0.001$) and positively associated with professional efficiency ($p < 0.01$), but not with emotional exhaustion ($p > 0.05$) as listed in **Table 5**. HCC was not associated with job burnouts ($ps > 0.05$). Additionally, Fisher *Z* test revealed that emotional exhaustion was more sensitive to psychological demands than depersonalization and professional efficiency ($Z = 2.512$ and $Z = 5.109$, $ps < 0.05$) and depersonalization than professional efficiency ($Z = 2.597$, $p < 0.05$). Among the three burnout syndromes, there were no differences in the sensitivity to the other three predictors, job control, coworker support, and supervisor support ($ps > 0.05$).

Notably, the interaction of HCC with job control could positively predict professional efficiency ($p < 0.05$) as listed in **Table 2**, with psychological demands could negatively predict emotional exhaustion ($p < 0.05$) as listed in **Table 3**, and with coworker support could negatively predict professional efficiency ($p < 0.05$) as listed in **Table 5**. Moreover, the influence of job characteristics on nurses' job burnouts varied across different HCC levels as demonstrated by simple slopes analyses. As shown in **Figure 1**, the positive influence of job control on professional efficiency was stronger in nurses with high cortisol levels than those with low cortisol levels ($B = 3.474$ vs. $B = 1.433$), although the influence was significant for nurses in both groups ($p < 0.001$ and $p < 0.05$). The RoS approach further revealed that nurses with high cortisol levels had significantly higher professional efficiency than those with low cortisol levels in the context of higher job control above 0.982 SD from the mean (see the right shaded area in **Figure 1**) and had significantly lower professional efficiency in the context of lower job control below −1.247 SD from the mean (see the left shaded area in **Figure 1**), but the two groups had no difference in the region between −1.247 and 0.982 SD from the mean of job control. The PoI index was 0.62, and the PA index was 0.51. These results indicated that the interaction between job control and HCC supports the differential susceptibility model.

As shown in **Figure 2**, a weaker influence of psychological demands on emotional exhaustion was observed in nurses with high cortisol levels than those with low cortisol levels ($B = 3.240$ vs. $B = 5.604$), although the positive influence was significant for both groups ($ps < 0.001$). The RoS results further revealed that nurses with high cortisol levels had significantly higher emotional exhaustion than those with low cortisol levels in the context of lower psychological demands below −0.340 SD from the mean (see the left shaded area in **Figure 2**), but the two groups had no difference in the context of higher psychological demands above −0.340 SD until +2 SD from the mean of psychological demands. The PoI index was 0.24,

TABLE 2 | Multiple linear regression results of job control, hair cortisol content, and their interaction against job burnouts (n = 341).

	Independent variable	**Emotional exhaustion**				**Depersonalization**				**Professional efficiency**			
	Predictive variable	ΔR^2	β	***B***	***SE***	ΔR^2	β	***B***	***SE***	ΔR^2	β	***B***	***SE***
Step 1	Demographic variables[a]	0.111***				0.084***				0.045[d]			
	ICU		0.227***	0.955	0.265		0.244***	0.901	0.236		−0.162*	−0.556	0.224
	EICU		0.173**	0.983	0.345		0.174**	0.868	0.307		−0.068	−0.317	0.293
	Emergency department		0.322***	1.066	0.217		0.242***	0.703	0.193		−0.070	−0.189	0.184
	Radiotherapy department		0.039	0.251	0.360		−0.029	−0.162	0.321		−0.069	−0.363	0.306
	Psychology department		0.055	0.370	0.376		0.092	0.544	0.335		−0.061	−0.340	0.319
	Rehabilitation department		0.031	0.144	0.277		0.089	0.364	0.247		−0.032	−0.124	0.235
	Shift pattern		0.070	0.353	0.278		0.057	0.251	0.247		−0.008	−0.033	0.236
	Working duration		−0.026	−0.005	0.011		0.024	0.004	0.010		0.127*	0.022	0.010
Step 2	Job control	0.049***	−0.224***	−2.901	0.661	0.088***	−0.301***	−3.410	0.575	0.053***	0.233***	2.462	0.561
Step 3	HCC[b]	0.002	0.041	0.185	0.233	0.001	−0.034	−0.134	0.203	0.000	0.010	0.037	0.197
Step 4	JC × HCC[c]	0.001	0.031	1.049	1.722	0.001	−0.027	−0.783	1.500	0.012*	0.112*	3.055	1.059

ΔR^2 is the change of R square, β is standardized regression coefficients, B is unstandardized regression coefficients, and SE is standard error of mean (the same below).

**$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.*

[a]*Demographic variables include type variables, working department and shift pattern (i.e., the 8-h three-shift or 12-h two-shift scheduling pattern) and continuous variable (i.e., working duration as a nurse). Because working department containing seven types of departments was a dummy variable, intensive care unit (ICU), emergency intensive care unit (EICU), emergency department, radiotherapy department, department of medical psychology (psychology department), and rehabilitation department is coded as 1 in turns while the other departments as a reference is coded as 0. The 8-h three-shift and 12-h two-shift scheduling patterns are coded as 0 and 1, respectively.*

[b]*HCC refers to hair cortisol content.*

[c]*JC × HCC refers to the interaction between job control and hair cortisol content.*

[d]*$p = 0.054$.*

TABLE 3 | Multiple linear regression results of psychological demands, hair cortisol content, and their interaction against job burnouts (n = 341).

	Independent variable	Emotional exhaustion				Depersonalization				Professional efficiency			
	Predictive variable	ΔR^2	β	B	SE	ΔR^2	β	B	SE	ΔR^2	β	B	SE
Step 1	Demographic variables[a]												
Step 2	PD[b]	0.145***	0.412***	4.328	0.540	0.049***	0.240***	2.207	0.511	0.002	−0.045	−0.387	0.500
Step 3	HCC[c]	0.003	0.054	0.246	0.219	0.001	−0.039	−0.156	0.207	0.001	0.025	0.092	0.203
Step 4	PD × HCC[d]	0.013*	−0.116*	−3.538	1.460	0.000	−0.016	−0.419	1.395	0.000	−0.004	−0.097	1.366

*$p < 0.05$; ***$p < 0.001$.

[a]*Demographic variables show the same results as* **Table 2**.

[b]*PD refers to psychological demands.*

[c]*HCC refers to hair cortisol content.*

[d]*PD × HCC refers to the interaction between psychological demands and hair cortisol contents.*

TABLE 4 | Multiple linear regression results of supervisor support, hair cortisol content, and their interaction against job burnouts (n = 341).

	Independent variable	Emotional exhaustion				Depersonalization				Professional efficiency			
	Predictive variable	ΔR^2	β	B	SE	ΔR^2	β	B	SE	ΔR^2	β	B	SE
Step 1	Demographic variables[a]												
Step 2	Supervisor support	0.026**	−0.165**	−0.136	0.043	0.050***	−0.228***	−0.165	0.038	0.023**	0.157**	0.106	0.037
Step 3	HCC[b]	0.001	0.032	0.146	0.236	0.002	−0.045	−0.178	0.207	0.000	0.020	0.073	0.200
Step 4	SS × HCC[c]	0.000	−0.015	−0.045	0.155	0.006	−0.080	−0.205	0.136	0.003	−0.058	−0.138	0.132

**$p < 0.01$; ***$p < 0.001$.

[a]*Demographic variables show the same results as* **Table 2**.

[b]*HCC refers to hair cortisol content.*

[c]*SS × HCC refers to the interaction between supervisor support and hair cortisol content.*

TABLE 5 | Multiple linear regression results of coworker support, hair cortisol content, and their interaction against Maslach job burnouts (n = 341).

	Independent variable	Emotional exhaustion				Depersonalization				Professional efficiency			
	Predictive variable	ΔR^2	β	B	SE	ΔR^2	β	B	SE	ΔR^2	β	B	SE
Step 1	Demographic variables[a]												
Step 2	Coworker support	0.007[d]	−0.088[d]	−0.089	0.053	0.030***	−0.176***	−0.156	0.047	0.022**	0.150**	0.124	0.045
Step 3	HCC[b]	0.001	0.024	0.108	0.238	0.003	−0.056	−0.221	0.209	0.001	0.027	0.100	0.200
Step 4	CS × HCC[c]	0.002	−0.042	−0.145	0.182	0.000	0.021	0.065	0.160	0.013*	−0.114*	−0.325	0.102

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
[a]*Demographic variabl;s showed the same results as* **Table 2**.
[b]*HCC refers to hair cortisol content.*
[c]*CS × HCC refers to the interaction between coworker support and hair cortisol contents.*
[d]$p = 0.097$.

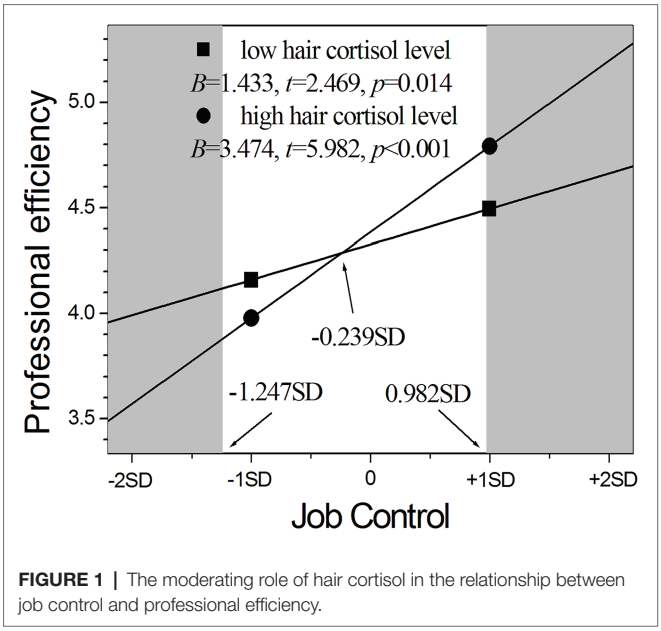

FIGURE 1 | The moderating role of hair cortisol in the relationship between job control and professional efficiency.

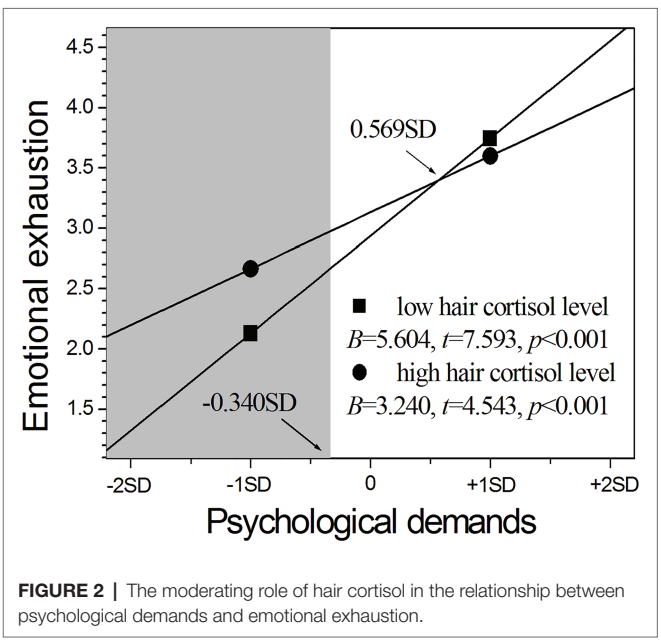

FIGURE 2 | The moderating role of hair cortisol in the relationship between psychological demands and emotional exhaustion.

and the PA index was 0.47. These results seem to indicate that the interaction between psychological demands and HCC follows the vantage sensitivity model.

As shown in **Figure 3**, the stronger influence of coworker support on professional efficiency existed in nurses with low cortisol levels (B = 0.236, p < 0.001) than those with high cortisol levels (B = 0.019, p > 0.05). The RoS results further revealed that nurses with low cortisol levels had significantly higher professional efficiency than those with high cortisol levels in the context of higher coworker support above 1.069 SD from the mean (see the right shaded area in **Figure 3**) and had significantly lower professional efficiency in the context of lower coworker support below −0.643 SD from the mean

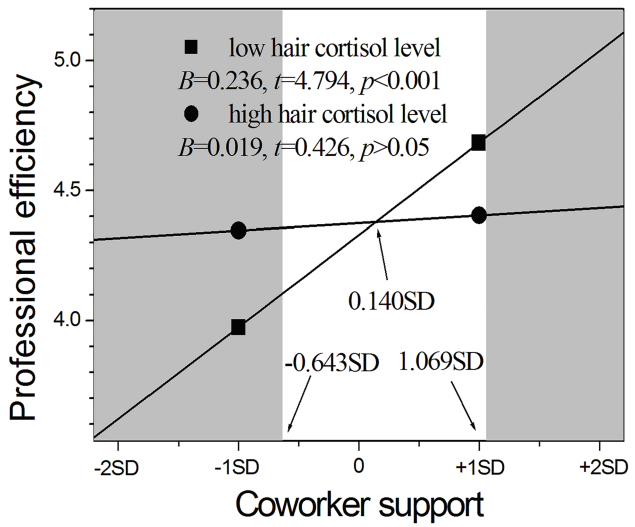

FIGURE 3 | The moderating role of hair cortisol in the relationship between coworker support and professional efficiency.

(see the left shaded area in **Figure 3**), but the two groups had no difference in the region between −0.643 SD and 1.069 SD from the mean of coworker support. The PoI index was 0.43, and the PA index was 0.42. These results indicated that the interaction between coworker support and HCC supports the differential susceptibility model.

DISCUSSION

This study confirmed that the interaction patterns of stress reactivity with job control and coworker support among Chinese hospital nurses follow the differential susceptibility model and that the interaction between stress reactivity and psychological demands supports the vantage sensitivity model. These results extended the interaction pattern between job resources and work environments from the traditional perspective of the diathesis stress model to the novel perspectives of the differential susceptibility model and the vantage sensitivity model when the focus was expanded from the adverse and pathogenic responses in adverse environments to the adaptive responses in supportive environments. These results also provided another evidence for the extension of the JDR model to personal biological resources from social and organizational resources and personal mental resources, together with a recent finding that the interaction patterns between stress reactivity and emotional labor might follow the differential susceptibility model or the vantage sensitivity model (Deng et al., 2020).

In predicting nurses' professional efficiency, both job control and coworker support showed the same interaction patterns with stress reactivity, which was consistent with the differential susceptibility model. Specifically, nurses with high hair cortisol levels had significantly higher professional efficiency than those with low cortisol levels in the context of high job control and had significantly lower professional efficiency in the context of low job control. Nurses with low cortisol levels had significantly higher professional efficiency than those with high cortisol levels in the context of high coworker support and had significantly lower professional efficiency in the context of low coworker support. These results indicated that for nurses' professional efficiency, high hair cortisol level was the plasticity factor in the context of job control, i.e., a high hair cortisol level was a promoting factor in the context of high job control and a risk factor in low job control. Whereas low hair cortisol level was the plasticity factor in the context of coworker support, i.e., a low hair cortisol level was a promoting factor in more coworker support and a risk factor in the context of less coworker support. It was apparent that stress reactivity showed the moderating role differing between job control and coworker support in their association with professional efficiency. As mentioned in the *Introduction*, stress reactivity is a highly biological sensitivity to context (Boyce and Ellis, 2005). Thus, compared with those with a low stress reactivity, individuals with a high stress reactivity were possibly more sensitive to the stressful context related to job demands in workplace environments, thereby being in the allostasis with high frequency according to allostatic load theory (McEwen, 2003), and being highly susceptible to the environmental factors in the workplace. Indeed, nurses with a high stress reactivity received stronger positive influence from job control, showing high professional efficiency with high job controllability and low professional efficiency with low job controllability. On the other hand, because of their high sensitivity to stressful context in the workplace, they would be partial to put more physical and mental resources in coping with primary job stress from highly stressful job demands (e.g., job uncontrollability and psychological demands). Thus, they would put fewer resources in coping with secondary job demands in other aspects of job characteristics (e.g., coworker support) according to the conversation of resources model (Hobfoll, 1998), thereby be relatively insensitive to secondary job demands. As a result, they received weaker influence from coworker support. In contrast, because of their relatively low sensitivity to job stress, nurses with a low stress reactivity would consume fewer resources in coping with highly stressful job demands, thereby keeping more resources to put into other job demands. Therefore, they received stronger positive influence from coworker support, showing high professional efficiency with high coworker support and low professional efficiency with low coworker support.

Except for the three interactions mentioned above, the other interactions between stress reactivity and job characteristics were not significant. This might be because there is a mismatch among stress reactivity, other job characteristics, and job burnouts in the emotional, cognitive, and biological levels. For example, hair cortisol was not related to job characteristics and job burnouts in this study, although hair cortisol is proven to be closely associated with emotional, spiritual, and sociopsychological stress in a previous study (Russell et al., 2012). Hair cortisol as a biomarker of stress reactivity is considered to mainly reflect personal resources at the biological

level (Boyce and Ellis, 2005). As discussed above, three subscales of MBI burnouts give the fatigue and exhaustion syndromes at the emotional, cognitive, and behavioral level (Schutte et al., 2000), respectively. Psychological demands, job control, supervisor support, and coworker support are psychological and social characteristics of jobs (Karasek, 1985). The explanation needs to be examined in future research.

Practical Implications

The role of stress reactivity in moderating the relationships between job characteristics and job burnouts gave practical implication that managers should consider the interindividual differences in personal biological resources (e.g., stress reactivity) and make the differential protocol when they provide interventions that improve nurses' efficacy in dealing with their job-related demands and shaping nurses' outcomes. For example, this study found that high stress reactivity was the plasticity factor for professional efficiency in the context of job control, but low stress reactivity was the plasticity factor in the context of coworker support. In order to improve nurses' professional efficiency, managers should provide the position with high job controllability for individuals with a high stress reactivity but provide high coworker support for individuals with a low stress reactivity. Similarly, low stress reactivity as the vantage sensitivity characteristic of emotional exhaustion in the context of psychological demands implied that managers should weaken psychological demands for individuals with a high stress reactivity in order to reduce nurses' emotional exhaustion.

Strength, Limitations, and Future Research

The strength in the current study was to utilize hair cortisol level as a biomarker of stress reactivity in 1 month rather than the traditional biomarkers, such as salivary cortisol level. Hair cortisol level is a biomarker more reliably assessing the long-term activity of the HPA axis or stress reactivity (Russell et al., 2012) than urinary and salivary cortisol levels reflecting the acute and short-term activity of the HPA axis over several hours and up to 1 day (Dickerson and Kemeny, 2004). Moreover, it shows high consistency with the average level of multiple-day salivary cortisol levels within 1 month (Zhang et al., 2018; Chen et al., 2019). Additionally, cortisol level in 1-cm hair segment could better match the time span of the psychological states including job characteristics and job burnouts over the past 1 month if the hair growth rate is 1 cm per month.

The current study has several limitations. Firstly, the current cross-sectional design limited the understanding of the causality between variables, although job characteristics were hypothesized as independent variables, hair cortisol level as a moderator, and job burnouts as dependent variables. The future research should be based on a longitudinal study for examining causal relationships. Secondly, this study utilized only hair cortisol level as the biomarker of long-term stress reactivity. In the future, other biomarkers of stress reactivity would be worthy of consideration for the generalization of stress reactivity as job resources at the personal biological level. Thirdly, this study did not examine other job demands, such as physical demands, task complexity, and job security. Finally, this study was based on a homogeneous sample, Han Chinese female nurses in city hospitals, China. In short, for the generalization of the results, future research should cover more job characteristics and be conducted on a heterogeneous sample including other occupations and other ethnic groups in China and other countries.

CONCLUSION

Stress reactivity could moderate associations of psychological demands, job control, and coworker support with job burnouts among Chinese hospital nurses. Specifically, the interaction of HCC with job control could positively predict professional efficiency, with psychological demands could negatively predict emotional exhaustion, and with coworker support could negatively predict professional efficiency. The interaction patterns of stress reactivity with both job control and coworker support were consistent with the differential susceptibility model, but the interaction between stress reactivity and psychological demands supported the vantage sensitivity model. For nurses' professional efficiency, high stress reactivity was the plasticity factor in the context of job control, but low stress reactivity was the plasticity factor in the context of coworker support. For emotional exhaustion, low stress reactivity was the vantage sensitivity characteristic in the context of psychological demands. These results would be helpful in understanding more fully the importance of biological processes that interact with the work environmental influences in employees' dealing with job-related demands and shaping employees' outcomes.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Health Science Research Ethics Board of Southeast University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors had substantial intellectual contributions to this study as follows. HD contributed to the conceptualization, data analysis, writing and editing, and funding acquisition. YZ, HW, and YL contributed to the data analysis and writing and editing. XQ contributed to the conceptualization, data collection, and funding acquisition. JL contributed to the methodology and funding acquisition. CJ contributed to the data collection and funding acquisition. All authors contributed to the article and approved the submitted version.

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REFERENCES

Aiken, L. S., and West, S. G. (1991). Multiple regression: testing and interpreting interactions. *Eval. Pract.* 45, 119–120. doi: 10.1057/jors.1994.16

Bakker, A. B., and Demerouti, E. (2007). The Job Demands-Resources model: state of the art. *J. Manag. Psychol.* 22, 309–328. doi: 10.1108/02683940710733115

Bakker, A. B., Demerouti, E., and Euwema, M. C. (2005). Job resources buffer the impact of job demands on burnout. *J. Occup. Health Psychol.* 10, 170–180. doi: 10.1037/1076-8998.10.2.170

Bakker, A. B., Demerouti, E., Taris, T. W., Schaufeli, W. B., and Schreurs, P. J. G. (2003). A multigroup analysis of the job demands-resources model in four home care organizations. *Int. J. Stress. Manag.* 10, 16–38. doi: 10.1037/1072-5245.10.1.16

Belsky, J., Bakermans-Kranenburg, M. J., and Van Ijzendoorn, M. H. (2007). For better and for worse: differential susceptibility to environmental influences. *Curr. Dir. Psychol. Sci.* 16, 300–304. doi: 10.1111/j.1467-8721.2007.00525.x

Belsky, J., and Pluess, M. (2009). Beyond diathesis stress: differential susceptibility to environmental influences. *Psychol. Bull.* 135, 885–908. doi: 10.1037/a0017376

Boyce, W. T., and Ellis, B. J. (2005). Biological sensitivity to context: I. An evolutionary-developmental theory of the origins and functions of stress reactivity. *Dev. Psychopathol.* 17:271. doi: 10.1017/s0954579405050145

Chen, Z., Zhang, Q., Chen, S., Wang, W., and Deng, H. (2019). Determination, intercorrelation and intraindividual stability of five steroids in hair, saliva and urine among Chinese college students. *Steroids* 149:108418. doi: 10.1016/j.steroids.2019.05.010

Cheng, Y., Luh, W. M., and Guo, Y. L. (2003). Reliability and validity of the Chinese version of the Job Content Questionnaire in Taiwanese workers. *Int. J. Behav. Med.* 10, 15–30. doi: 10.1207/S15327558IJBM1001_02

Chi, N. W., Grandey, A. A., Diamond, J. A., and Krimmel, K. R. (2011). Want a tip? Service performance as a function of emotion regulation and extraversion. *J. Appl. Psychol.* 96, 1337–1346. doi: 10.1037/a0022884

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499

Deng, H., Wu, H., Qi, X., Jin, C., and Li, J. (2020). Stress reactivity influences the relationship between emotional labor strategies and job burnouts among Chinese hospital nurses. *Neural Plast.* 2020, 1–13. doi: 10.1155/2020/8837024

Dickerson, S. S., and Kemeny, M. E. (2004). Acute stressors and cortisol responses: a theoretical integration and synthesis of laboratory research. *Psychol. Bull.* 130, 355–391. doi: 10.1037/0033-2909.130.3.355

Diestel, S., Rivkin, W., and Schmidt, K. H. (2015). Sleep quality and self-control capacity as protective resources in the daily emotional labor process: results from two diary studies. *J. Appl. Psychol.* 100, 809–827. doi: 10.1037/a0038373

Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., and Van Ijzendoorn, M. H. (2011). Differential susceptibility to the environment: an evolutionary–neurodevelopmental theory. *Dev. Psychopathol.* 23, 7–28. doi: 10.1017/S0954579410000611

Fox, J. (1991). *Regression Diagnostics: An Introduction*. Newbury Park, CA: Sage.

Gu, Y., and You, X. (2019). Recovery experiences buffer against adverse well-being effects of workplace surface acting: a two-wave study of hospital nurses. *J. Adv. Nurs.* 76, 209–220. doi: 10.1111/jan.14236

Halbesleben, J. R. B., and Buckley, M. R. (2004). Burnout in organizational life. *J. Manag.* 30, 859–879. doi: 10.1016/j.jm.2004.06.004

Hayes, A. F., and Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behav. Res. Methods* 41, 924–936. doi: 10.3758/BRM.41.3.924

Hobfoll, S. E. (1998). Stress, culture, and community: the psychology and philosophy of stress. *Br. J. Med. Psychol.* 31, 254–262. doi: 10.1037/h0087094

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Rev. Gen. Psychol.* 6, 307–324. doi: 10.1037/1089-2680.6.4.307

Hobfoll, S. E., Johnson, R. J., Ennis, N., and Jackson, A. P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. *J. Pers. Soc. Psychol.* 84, 632–643. doi: 10.1037/0022-3514.84.3.632

Jex, S. M., and Elacqua, T. C. (1999). Self-esteem as a moderator: a comparison of global and organization-based measures. *J. Occup. Organ. Psychol.* 72, 71–81. doi: 10.1348/096317999166509

Johnson, J. V., and Hall, E. M. (1988). Job strain, work place social support, and cardiovascular-disease-a cross-sectioonal study of a random sample of the Swedish working population. *Am. J. Public Health* 78, 1336–1342. doi: 10.2105/AJPH.78.10.1336

Johnson, H. A. M., and Spector, P. E. (2007). Service with a smile: do emotional intelligence, gender and autonomy moderate the emotional labor process? *J. Occup. Health Psychol.* 12, 319–333. doi: 10.1037/1076-8998.12.4.319

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain-Implications for job redesign. *Adm. Sci. Q.* 24, 285–308. doi: 10.2307/2392498

Karasek, R. (1985). Job Content Instrument Questionnaire and User's Guide, Version 1.1. Department of Industrial and Systems Engineering. University of Southern California.

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., and Amick, B. (1998). The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristics. *J. Occup. Health Psychol.* 3, 322–355. doi: 10.1037/1076-8998.3.4.322

Kristensen, T. S., Borritz, M., and Christensen, E. V. B. K. (2005). The Copenhagen Burnout Inventory: a new tool for the assessment of burnout. *Work Stress.* 19, 192–207. doi: 10.1080/02678370500297720

LeBeau, M. A., Montgomery, M. A., and Brewer, J. D. (2011). The role of variations in growth rate and sample collection on interpreting results of segmental analyses of hair. *Forensic Sci. Int.* 210, 110–116. doi: 10.1016/j.forsciint.2011.02.015

Li, C., and Shi, K. (2003). The influence of distributive justice and procedural justice on job burnout. *Acta Psychol. Sin.* 35, 677–684. doi: 10.1023/A:1022289509702

McEwen, B. S. (2003). Mood disorders and medical illness: mood disorders and allostatic load. *Biol. Psychiatry* 54, 200–207. doi: 10.1016/S0006-3223(03)00177-X

Mkikangas, A., and Kinnunen, U. (2003). Psychosocial work stressors and well-being: self-esteem and optimism as moderators in a one-year longitudinal sample. *Personal. Individ. Differ.* 35, 537–557. doi: 10.1016/S0191-8869(02)00217-9

Obradovi, J., Bush, N. R., Stamperdahl, J., Adler, N. E., and Boyce, W. T. (2010). Biological sensitivity to context: the interactive effects of stress reactivity and family adversity on socioemotional behavior and school readiness. *Child Dev.* 81, 270–289. doi: 10.1111/j.1467-8624.2009.01394.x

Obradovi, J., Portilla, X. A., and Ballard, P. J. (2015). Biological sensitivity to family income: differential effects on early executive functioning. *Child Dev.* 87, 374–384. doi: 10.1111/cdev.12475

Owens, S. A., Helms, S. W., Rudolph, K. D., Hastings, P. D., Nock, M. K., and Prinstein, M. J. (2018). Interpersonal stress severity longitudinally predicts adolescent girls' depressive symptoms: the moderating role of subjective and HPA Axis stress responses. *J. Abnorm. Child Psychol.* 47, 895–905. doi: 10.1007/s10802-018-0483-x

Pluess, M., and Belsky, J. (2013). Vantage sensitivity: individual differences in response to positive experiences. *Psychol. Bull.* 139, 901–916. doi: 10.1037/a0030196

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Pragst, F., and Balikova, M. A. (2006). State of the art in hair analysis for detection of drug and alcohol abuse. *Clin. Chim. Acta* 370, 17–49. doi: 10.1016/j.cca.2006.02.019

Pugh, S. D., Groth, M., and Hennig-Thurau, T. (2011). Willing and able to fake emotions: a closer examination of the link between emotional dissonance and employee well-being. *J. Appl. Psychol.* 96, 377–390. doi: 10.1037/a0021395

Roisman, G. I., Newman, D. A., Fraley, R. C., Haltigan, J. D., and Haydon, K. C. (2012). Distinguishing differential susceptibility from diathesis–stress: recommendations for evaluating interaction effects. *Dev. Psychopathol.* 24, 389–409. doi: 10.1017/S0954579412000065

Russell, E., Koren, G., Rieder, M., and Van Uum, S. (2012). Hair cortisol as a biological marker of chronic stress: current status, future directions and unanswered questions. *Psychoneuroendocrinology* 37, 589–601. doi: 10.1016/j.psyneuen.2011.09.009

Salvagioni, D. A. J., Melanda, F. N., Mesas, A. E., González, A. D., and Andrade, S. M. D. (2017). Physical, psychological and occupational consequences of job burnout: a systematic review of prospective studies. *PLoS One* 12:e0185781. doi: 10.1371/journal.pone.0185781

Schafer, J. L., and Graham, J. W. (2002). Missing data: our view of the state of the art. *Psychol. Methods* 7, 147–177. doi: 10.1037/1082-989X.7.2.147

Schaufeli, W., Leiter, M., Maslach, C., and Jackson, S. (1996). *Maslach Burnout Inventory -- General Survey (GS)*. Palo Alto, CA: Consulting Psychologists Press.

Schreurs, B., Guenter, H., Hülsheger, U., and van Emmerik, H. (2014). The role of punishment and reward sensitivity in the emotional labor process: a within-person perspective. *J. Occup. Health Psychol.* 19, 108–121. doi: 10.1037/a0035067

Schutte, N., Toppinen, S., Kalimo, R., and Schaufeli, W. (2000). The factorial validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across occupational groups and nations. *J. Occup. Organ. Psychol.* 73, 53–66. doi: 10.1348/096317900166877

Spiga, F., Walker, J. J., Terry, J. R., and Lightman, S. L. (2014). HPA axis-rhythms. *Compr. Physiol.* 4, 1273–1298. doi: 10.1002/cphy.c140003

Tremblay, M. A., and Messervey, D. (2011). The Job Demands-Resources model: Further evidence for the buffering effect of personal resources. *SAJIP* 37, 876–886. doi: 10.4102/sajip.v37i2.876

Usman, M., Ali, M., Yousaf, Z., Anwar, F., Waqas, M., and Khan, M. A. S. (2020). The relationship between laissez-faire leadership and burnout: Mediation through work alienation and the moderating role of political skill. *Can. J. Adm. Sci.* 37, 423–434. doi: 10.1002/cjas.1568

van der Doef, M., and Maes, S. (1998). The Job Demand Control (-Support) model and physical health outcomes: a review of the strain and buffer hypothesis. *Psychol. Health* 13, 909–936. doi: 10.1080/08870449808407440

Van Yperen, N. W., and Snijders, T. A. B. (2000). A multilevel analysis of the demands–control model: Is stress at work determined by factors at the group level or the individual level? *J. Occup. Health Psychol.* 5, 182–190. doi: 10.1037/1076-8998.5.1.182.

Wiel, N. M. H., Goozen, S. H., Matthys, W., Snoek, H., and Engeland, H. V. (2004). Cortisol and treatment effect in children with disruptive behavior disorders: a preliminary study. *J. Am. Acad. Child Adolesc. Psychiatry.* 43, 1011–1018. doi: 10.1097/01.chi.0000126976.56955.43

Wosu, A. C., Valdimarsdóttir, U., Shields, A. E., Williams, D. R., and Williams, M. A. (2013). Correlates of cortisol in human hair: implications for epidemiologic studies on health effects of chronic stress. *Ann. Epidemiol.* 23, 797.e792–811.e792. doi: 10.1016/j.annepidem.2013.09.006

Wu, X. J., Li, J. Q., Liu, G., Liu, Y., Cao, J., and Jia, Z. X. (2018). The effects of emotional labor and competency on job satisfaction in nurses of China: a nationwide cross-sectional survey. *Int. J. Nurs. Sci.* 5, 383–389. doi: 10.1016/j.ijnss.2018.08.001

Xanthopoulou, D., Bakker, A. B., Demerouti, E., and Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *Int. J. Stress. Manag.* 14, 121–141. doi: 10.1037/1072-5245.14.2.121

Xie, J. L. (1996). Karasek's model in the People's Republic of China: effects of job demands, control, and individual differences. *Acad. Manag. J.* 39, 1594–1618. doi: 10.2307/257070

Xu, Y., Liu, Y., Chen, Z., Zhang, J., Deng, H., and Gu, J. (2019). Interaction effects of life events and hair cortisol on perceived stress, anxiety, and depressive symptoms among Chinese adolescents: testing the differential susceptibility and diathesis-stress models. *Front. Psychol.* 10:297. doi: 10.3389/fpsyg.2019.00297

Zhang, Q., Chen, Z., Chen, S., Yu, T., Wang, J., Wang, W., et al. (2018). Correlations of hair level with salivary level in cortisol and cortisone. *Life Sci.* 193, 57–63. doi: 10.1016/j.lfs.2017.11.037

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Positive Psychological Capital as a Predictor of Satisfaction With the Fly-In Fly-Out Model

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The flexibility of markets and international agreements have lured a growing number of companies to expand their business beyond frontiers in search for new markets and a bigger business network. Specifically, expatriates became keystones to implant and promote the so desired expansion into international markets, Particularly, Fly-in fly-out (FIFO) flexpatriates. Although FIFO work practices are widely used, little is known about how to promote these professionals' perceived job satisfaction (JS) across the course of their work cycles. That is why the goal of our research is to test the positive psychological capital (PsyCap) applicability to Portuguese FIFO flexpatriates. In the midst of the positive psychology theories, Luthans et al. (2007b) underline that workers are the psychological capital of any organization. Therefore, the development of the PsyCap becomes crucial and also contributes to the promotion of JS, nowadays a construct intertwined with well-being. As such, we developed and applied a HERO–(hope, self-efficacy, resilience, and optimism)–micro-intervention in order to assess whether it moderated the relationship between a FIFO flexpatriates PsyCap and their JS. The research took place over three distinct moments, both PsyCap and JS were measured before and after the HERO micro-intervention, and again 3 months later. The data collected shows that a positive correlation exists between FIFO flexpatriates PsyCap and JS. Moreover, our results pointed out that the micro-intervention enhanced FIFO flexpatriates PsyCap, and also showed that this increase lasted over (at least) 3 months.

Keywords: FIFO, job satisfaction, micro-intervention, positive psychological capital, well-being

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INTRODUCTION

Fly-in fly-out is a model of international work applied to organizational flexpatriates with permanent residence in the country of origin; it is defined by frequent temporary journeys abroad (no more than 6 months) working for a company to perform management and/or formation jobs, to develop specific projects or to fill in the flexibility demands of the company (Torkington et al., 2011; Pini and Mayes, 2012; Brook et al., 2020).

However, the type of functions performed by FIFO flexpatriates and the constant distance from their families and friends' raises concerns about health and safety, disturbances in social and family life, quality of work, effects on productivity performance, and job dissatisfaction. These

workers have higher levels of stress, anxiety, and depression than the general population (Albrecht and Anglim, 2018; Center for Transformative Work Design (CTWD), 2018). Periods of medical discharge and frequent turnover, therefore, is considered to be in the best interest of companies to develop and apply strategies to promote the well-being of these workers. Organizations need to not only address the non-financial needs of their workers, but also to look to the development of their perceived support, job satisfaction (JS), and adjustment to the FIFO lifestyle (Brook et al., 2020). In practice, when an environment is challenging, people need additional resources (Basinska and Rozkwitalska, 2020).

In recent years it has become clear from the trends appearing in this literature that there are interventions that can help prevent widespread and escalating problems, intervention options that could assist once an issue arises, and intervention options for follow-up and improvements (Brook et al., 2020).Our study followed the theories of Fred Luthans et al., who combined theories of positivist psychology with the concepts of business management. In an increasingly competitive world the workers performance and workforce are the companies' positive psychological capital (PsyCap). This mental potentiality was central in our study to understand the way in which company's employees can develop the desirable positive psychological states and defining which techniques and methods work best when applied locally.

Positive psychological capital can be enhanced through the superior basic construct PsyCap that integrates four other constructs: hope, self-efficacy, resilience, and optimism (Luthans et al., 2015). The four constructs are considered to be state-like and, as such, capable of being developed (Luthans et al., 2007a) and altered. These four PsyCap constructs can contribute to an explanatory style through internalized perceptions of being in control. Each of the four capacities interacts with each other in order to create a unique way of acting (Luthans et al., 2007b).

According to Donaldson et al. (2020) positive organizational psychology interventions that target and improve hope, efficacy, resilience, and optimism (HERO) can be highly effective and a robust way to improve well-being and positive functioning at work across diverse geographical regions and cultures. In their study the authors found that PsyCap is strongly associated with workplace proactivity, proficiency, adaptivity, and overall work performance across 15 nations.

Following this, we assume that FIFO workers can see their resilience threatened by the loss of the social environment familiar to them; however, they can resort to hope in order to create new ways to face obstacles and rebuild their social relationships (Luthans et al., 2007b). Flexpatriates can enhance their resilience, analyzing the present unstable situation as being only temporary and/or transitory. This way of looking at the situation makes them aware of the need of some adjustment skills on their part for everything to go smoothly, which, in turn, will contribute to increase their resilience and performance, and leading to a new way of facing similar situations. Therefore, general well-being and JS are harnessed. Those who show a high PsyCap are flexible and adaptable to the changing needs of their jobs, while at the same time their PsyCap helps them maintain good levels of competence and well-being.

As PsyCap establishes itself in organizations, the question arises whether if the acquired skills are long lasting or deteriorate over time and requiring new interventions. We believe that PsyCap is a dynamic strategy in terms of creating resources to face the challenges imposed by the job requirements.

Studies carried out so far by different authors, in different environments and cultures, indicate that PsyCap can be used and adapted to cultural differences, so it can be used in the most diverse countries and cultures (Luthans et al., 2007b), which was verified in the Portuguese case.

In the same measure, and taking into account the same theories of positive psychology, we consider that JS is an essential factor for the well-being of workers and their good performance. It is also important for companies to take into account the degree of satisfaction of their workers in order to ensure a good performance in their functions, enhancing and optimizing the capacities of the business environment.

The present research intended to understand the relationship between the PsyCap and JS and more specifically understand if a micro-intervention to promote the employees PsyCap HERO (developing internal strategies to deal with and overcome adverse situations at a professional and personal level) would positively reflect on their JS degree. We used the guidelines provided by Luthans et al. (2007a), adapting the micro-intervention to the Portuguese organizational reality and to the specificity of FIFO demands.

The aim is to verify if this micro-formation method, already validated and tested in different professional contexts and particularly in an organizational environment, is also applicable to FIFO flexpatriates, contributing to JS and, subsequently, to the employees well-being in general.

To the purpose of this research, following Luthans and Youssef (2004), Luthans et al. (2007a), PsyCap means a positive psychological individual state regarding goals, defined by the self-efficacy to use the necessary effort, optimism about present and future success, hope to create pathways, and resilience to cope with obstacles and challenges. The definition of JS was constructed based on a broad approach to the classical definitions (Hoppock, 1935; Herzberg, 1964; Locke, 1969, 1976; Smith et al., 1969; Spector, 1985, 1997, 2006, 2012; Weiss and Brief, 2001)[1] and the more recent studies on well-being (Diener et al., 1997[2]; Diener, 2000; Judge and Klinger, 2008[3]; Siqueira and Padovam, 2008; Diener et al., 2009; Youssef-Morgan and Luthans, 2015[4]). JS is an individual emotional and cognitive evaluation regarding all aspects concerning the person's job that reflects itself on the person's attitudes toward the job and company and on the general well-being of the person.

[1]Consulted in Judge and Locke (1993), MacDonald and MacIntyrem (1997), Santos and Mourão (2011), Guedes (2012), Spector (2012), Dalal (2013), Brenke (2015), Souza et al. (2015), and Sibhoko (2017).

[2]Consulted in Youssef-Morgan and Luthans (2015).

[3]Consulted in Siqueira and Padovam (2008).

[4]Consulted in Arcidiacono and Martino (2016).

TABLE 1 | Sociodemographic characteristics of participants at baseline.

	CG (*n* = 75% and 52.4%)		EG (*n* = 68% and 47.6%)	
	N	**%**	**N**	**%**
Gender				
Male	54	72.0	58	85.3
Female	21	28.0	10	14.7
Total	75	100.0	68	100.0
Age				
30 years or less	5	6.7	9	13.2
Between 31 and 40 years	32	42.7	32	47.1
Between 41 and 50 years	24	32.0	17	25.0
51 years or more	14	18.7	10	14.7
Total	75	100.0	68	100.0
Marital status				
Single	23	30.7	13	19.1
Married	30	40.0	36	52.9
Divorced	12	16.0	5	7.4
Registered partnership	10	13.3	14	20.6
Total	75	100.0	68	100.0
Education				
Graduation	15	20.0	12	17.6
Specialization	31	41.3	12	17.6
Post-graduation	8	10.7	5	7.4
MA	10	13.3	8	11.8
Other	11	14.7	31	45.6
Total	75	100.0	68	100.0
Job				
Director	9	12.0	4	5.9
Advanced engineer	3	4.0	2	3.5
Engineer/Level A Specialist/Supervisor	17	22.7	20	29.4
Manager/Business Manager/Specialist/Technician	24	32.0	9	13.2
Maintenance technician	17	22.7	33	48.5
Assistant/Clerk	5	6.7	0	0.0
Total	75	100.0	68	100.0
Years working for the organization				
5 years or less	13	17.3	11	16.8
Between 6 and 10 years	20	26.7	23	30.1
Between 11 and 15 years	15	20.0	14	20.3
16 years or more	27	36.0	20	32.9
Total	75	100.0	68	100.0
Years on current job				
5 years or less	19	25.3	17	25.0
Between 6 and 10 years	27	36.0	29	42.6
11 years or more	29	38.7	22	32.4
Total	75	100.0	68	100.0
Years under FIFO				
5 years or less	21	28.0	16	23.5
Between 6 and 15 years	28	37.3	32	47.1
16 years or more	26	34.7	20	29.4
Total	75	100.0	68	100.0

MATERIALS AND METHODS

Participants

A total of 143 Portuguese FIFO flexpatriate workers from two multinational companies (energy/IT and lifts/freight elevators), with a shared parent country cultural background and working in partnership to operate in complementary industrial areas, were randomly divided into two groups: control group (CG) with 75 participants and experimental group (EG) with 68 participants. The two groups were identical (see **Table 1**).

Methodology

This study is of a quantitative nature (Quivy and Campenhoudt, 1992), specifically the study was designed using a quasi-experimental longitudinal methodology. It intended to answer the question. Can a micro intervention influence the relationship between PsyCap and JS? In order to answer this question three hypotheses were developed.

Hypothesis 1

PsyCap positively influences JS of FIFO flexpatriates.

Hypothesis 2

A HERO micro intervention moderates the relation between a FIFO flexpatriate PsyCap and JS PSYCAP.

Hypothesis 3

The positive influence of the HERO micro intervention to increase the FIFO flexpatriate PsyCap lasts, at least, for 3 months.

To corroborate them, we followed the experimental plan depicted on the procedure section (see **Figure 1**).

Measurement

In Addition to the Basic Characterization Variables

Demographic characteristics (gender, age, marital status, education, and job), job description (years working in the company and at a specific job) and specific FIFO characteristics (years working as flexpatriate and time spent away from home)–the following two variables were also assessed.

Job satisfaction survey

Job satisfaction was assessed using the JS Survey developed by Spector (1985), which is a 36-item on a 6-point scale survey

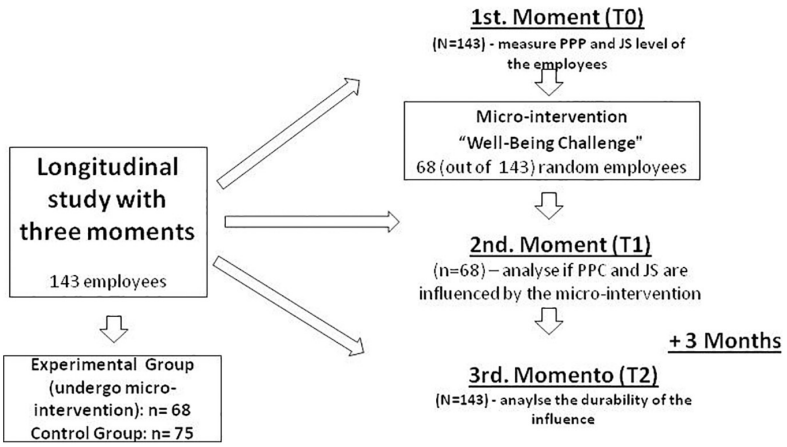

FIGURE 1 | Experimental plan.

measuring 9 job dimensions and global JS. The coefficient alpha for global scale was 0.98 and 0.88 for salary, 0.90 for promotion, 0.90 for supervision, 0.84 for fringe benefits, 0.88 for contingency rewards, 0.89 for colleagues, and 0.90 for job nature.

PsyCap questionnnaire

The PsyCap Questionnaire developed by Luthans et al. (2007a) consists of 24 items on a 6-point scale to assess hope, self-efficacy, optimism, and resilience. The coefficient alpha for global scale was 0.98. Subscales values are 0.97 for self-efficacy, 0.96 for hope, 0.94 for resilience, and 0.95 for optimism.

Normality

The normality of the data distribution was analyzed using the kolmogorov-smirnov (KS) test, which is based on the comparison of the expected values (referred to as theoretical distribution) with the observed values (referred to as empirical distribution), and for equal or greater samples to 30. This test not only reveals a high sensitivity to the sample size, but it also systematically indicates the rejection of the hypothesis of normal distribution (Martinez and Ferreira, 2007).

One of the proposals found in the literature to overcome this situation is the use of the central limit theorem, which consists of two processes of division. On the one hand, the value of the skewness coefficient (Skewness) is divided by its standard error (Standard Error of Skewness). On the other hand, the value of the kurtosis coefficient (Kurtosis) is also divided by its standard error (Standard Error of Kurtosis). When the results of these processes are within the reference range [-1.96; 1.96], we can say that the distribution is approximately normal.

A detailed analysis of the distribution of the data that make up the global scales, as well as the dimensions that compose them, shows that the coefficients of asymmetry and kurtosis are within the reference ranges for an approximately normal distribution (see **Table 2**).

TABLE 2 | Asymmetry and kurtosis coefficients (global scales and subscales).

Dimensions	KS	CS	CK
PSYCAP (global scale)	0.130**	1.15	−1.31
Self-efficacy	0.161**	1.26	−1.86
Hope	0.145**	1.10	−1.89
Resilience	0.125**	1.31	−1.87
Optimism	0.129**	1.31	−1.67
JS (global scale)	0.081*	1.95	−1.45
Payment	0.109**	1.40	−0.59
Specials	0.125**	1.20	−1.17
Supervision	0.115**	0.83	−1.78
Fringe Benefits	0.119**	1.27	−1.00
Contingent rewards	0.120**	1.92	−0.49
Operating conditions	0.146**	1.49	−0.56
Contributors	0.107**	1.38	−1.83
Nature of work	0.114**	1.36	−1.95
Communication	0.118**	1.62	−0.85

*$p < 0.05$; **$p < 0.001$; *KS, Kolmogorov-Smirnov; CS, Skewness coefficient; CK, Kurtosis coefficient.*

FIFO Flexpatriates Satisfaction

Furthermore, two specific FIFO questions were contemplated in this study. These regarded their level of satisfaction with frequent journeys and their level of satisfaction with nights spent abroad.

Procedure

The research was developed in three distinct moments. All participants completed the pre-test survey (moment 1 = T0) and then the participants assigned to the EG completed a 3-h micro-intervention (see **Table 3**) that aimed at for an increase in FIFO flexpatriates PsyCap. Prior to the intervention, the importance of positive and negative emotions on job performance and satisfaction were explained, as well as the goal of the intervention. After the intervention, all the participants assigned to EG completed the post-test survey (moment 2 = T1). 3 months later, all participants (EG and CG) completed the survey again (moment 3 = T2). These procedures are depicted in **Figure 1**.

TABLE 3 | Micro-intervention "Well-Being Challenge."

Steps	Tools
Introduction	• Promote well-being • Promote job performance and satisfaction
Goal definition	• Think SMART • Individual goals • Stepping
Group discussion	• Critical thinking • Alternative pathways
Past success	• Agency • Relevant models • Persuasion and positive feedback
Managing tasks	• Reinforcement of positive traits • Overcoming of personal shortcomings • Understanding the role of fear and illusion
Sum of the session so far	• Critical thinking and consolidation of self-efficacy, hope and optimism strategies
Steps of the way	• Foreseeing, preventing and overcoming obstacles
Intermission	
Possible scenarios	• Brainstorming • Agency • Using HERO to succeed
Conclusion	• What have we learned? • What tools have been acquired?

Statistical Analyses

Statistical analyses using SPSS (descriptive analysis and inferential analysis) were performed. To test Hypothesis 1, PsyCap positively influences JS of FIFO flexpatriates, Pearson Correlations were carried out. To test Hypothesis 2, A HERO micro intervention positively moderates the relation between a FIFO flexpatriate PsyCap and JS, regression analyses were performed to test the moderating effect of the intervention on the relationship between PsyCap and JS. Finally, to test Hypothesis 3, the positive influence of the HERO micro intervention to increase the FIFO flexpatriate PsyCap lasts, at least, for 3 months, a *t*- test was performed for paired samples that aimed to assess the behavior of employees in two distinct moments.

RESULTS

The data collected through the instruments described above were analyzed with IBM's Statistical Package (SPSS) and produced the following results.

FIFO Flexpatriates PsyCap Influence on Job Satisfaction

The association between the variables under study is shown in **Table 4** for all testing moments.

The correlations between PsyCap and JS, at T0 (before HERO), suggest that the higher the PsyCap levels, the more satisfied the participants are with their job ($r = 0.876$, $p < 0.001$). This association continues at T1 (after HERO), despite being weaker ($r = 0.380$, $p < 0.001$), and intensifies again ($r = 0.520$, $p < 0.001$) at T2 (3 months after the IM).

TABLE 4 | Correlations for study variables.

	1	2	3	4	5	6
(1) PSYCAP_T0	–					
(2) JS_T0	0.876**	–				
(3) PSYCAP_T1	0.452**	0.415**	–			
(4) JS_T1	−0.220	0.021	0.380**	–		
(5) PSYCAP_T2	0.277*	0.251*	0.726**	0.395**	–	
(6) JS_T2	−0.036	0.209	0.269*	0.679**	0.520**	–

*Note: **p < 0:01, *p < 0:05.*

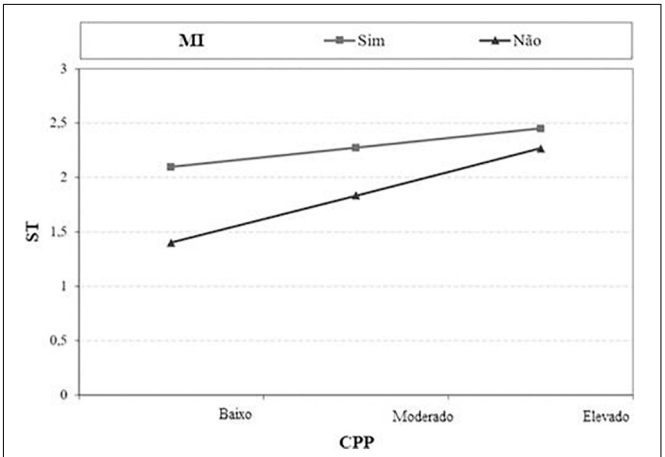

FIGURE 2 | Correlation between micro-intervention, PPC, and JS. MI, micro-intervention; ST, job satisfaction; CPP, PPC Sim = Yes; Não, no; Baixo, low; Moderado, moderate; Elevado, high.

A HERO Micro Intervention Moderates the Relation Between a FIFO Flexpatriate PsyCap and Job Satisfaction

In order to test the second hypothesis, it is important to know the moderating role of the HERO intervention performed, in the relationship between the PsyCap and the JS. To this end, the moderating variable was transformed into a dummy (0 = No and 1 = Yes), with 1 being the reference category.

To facilitate the interpretation of the data, the CPP and ST were recoded according to the midpoint of the scale, culminating in three reference points. Thus, it was considered that the moderate level of PsyCap corresponds to the value of the mean ($M = 4.82$; $SD = 0.44$), more or less a standard deviation [4.38 to 5.26], the low level oscillates between 1 and 4.37, and the between 5.27 and 6.0. The same procedure was followed for JS ($M = 4.31$; $SD = 0.48$), with the following values being obtained: low satisfaction varies between 1 and 3.82; moderate satisfaction between 3.83 and 4.79; and high satisfaction between 4.80 and 6.0.

The linear model explains 48.8% (adjusted $R^2 = 0.488$, $p < 0.001$) of the variation in the JS level, the same being significant [$F(3,139) = 46,177$, $p < 0.001$]. The significant interaction effect ($t = -2,556$, $p < 0.001$), points to the existence of moderation. In addition to this finding, we can say that moderation reveals a negative effect ($B = -0.423$) on JS.

Consequently, it is concluded that the intensity of the relationship between the constructs decreases in the participants who did not attend the HERO micro intervention.

The interaction effect is negative, because when employees do not attend HERO, the effect of PsyCap on JS is smaller. It was also possible to verify that PsyCap ($\beta = 0.630$, $t = 7{,}243$, $p < 0.001$) has a significant effect on JS, both in the CG and in the EG. However, for the employees who were the target of HERO (GE), this effect is bigger. The results obtained also demonstrate that HERO also has a positive impact on JS ($\beta = 0.438$, $t = 4{,}515$, and $p < 0.001$) (see **Figure 2**).

In view of the above, we can conclude that, after the HERO micro intervention, the levels of PsyCap and JS differ significantly depending on the group to which the participants belong, with the mean values of the EG being higher than those of the CG. The results also reveal the existence of a positive association between the PsyCap and JS. It is also concluded that the HERO micro intervention performed moderates the relationship between the PsyCap and the JS.

Duration of the Positive Influence of the HERO Micro Intervention on FIFO Flexpatriates PsyCap and Job Satisfaction

In view of the above and taking into account the goals of this study, it was important to assess whether the PsyCap and JS of the participants belonging to the EG increased over the various moments of evaluation. For this purpose, we used paired samples *t*-tests.

The results obtained, which can be analyzed in **Table 5**, make it evident that there are statistically significant differences in the PsyCap [T0: $t(67) = -9{,}656$, $p < 0.001$; T1: $t(67) = -10{,}671$, $p < 0.001$; T2: $t(67) = -5{,}607$, $p < 0.001$] and in JS [T0: $t(67) = -10{,}595$, $p < 0.001$; T1: $t(67) = -12{,}323$, $p < 0.001$; T2: $t(67) = -2.145$, $p < 0.05$] between all the evaluated moments. Furthermore, it is possible to notice that from one moment to the next the average values increased for both variables. FIFO flexpatriates satisfaction with frequent journeys and nights spent abroad.

Comparing the results obtained on the first and third moments (see **Table 6**), we understand that the levels of satisfaction of the EG rise significantly from the first moment (before the micro-intervention) to the third moment (3 months after the micro-intervention). On the contrary, the CG similar results in both moments (slightly lower values, statistically not relevant).

DISCUSSION

Concerning the PSYCAP influence on the degree of JS of flexpatriates under FIFO the study shows that the higher the levels of PSYCAP, the higher the degree of JS of workers. This is evident, with different correlation levels, in all moments of

TABLE 5 | Fly-in fly-out flexpatriates mean and standard deviation over time.

	EG						CG			
	T0		T1		T2		T0		T2	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*A*	*SD*
Positive psychological capital (global)	3.51	1.04	4.60	0.43	4.82	0.44	3.46	0.95	3.37	0.96
Job satisfaction (global)	3.11	0.74	4.21	0.43	4.31	0.48	3.33	0.84	3.28	0.82

TABLE 6 | Satisfaction with journeys and nights spent abroad.

	EG		CG			
	M	*DP*	*M*	*DP*	*t-test*	*Sig.*
T0						
Satisfaction with journeys	3.32	0.93	3.21	1.09	−0.643	0.521
Satisfaction with nights spent abroad	3.13	1.12	3.15	1.04	0.078	0.938
T2						
	EG		CG			
	M	*DP*	*M*	*DP*	*t-test*	*Sig.*
Satisfaction with journeys	4.32	0.76	3.12	1.06	−7.640	0.000**
Satisfaction with nights spent abroad	4.34	0.80	3.10	1.05	−7.819	0.000**

*Note: **p < 0:01.*

research. The positive correlation between PsyCap and JS is stronger within the EG and its influence decays more rapidly on the flexpatriates included on the CG not subjected to the micro-intervention. These results are in conformity with the studies developed by Luthans et al. (2004, 2006, 2007a,b, 2008, 2010, 2015), Luthans and Youssef-Morgan (2017), Lucas et al. (2014), and Alexandre (2017). The research conducted by Serrão (2018) also concluded a positive influence in the work environment, although not specifically with JS. Consequently, our study disproves many researchers (Côté and Morgan, 2002) who doubt the relationship between PsyCap and JS.

We ascertained that the micro-intervention has a moderation function between PsyCap and JS. The variation on the degree of JS demonstrated by both groups (EG and CG) shows that the members of the EG who completed the micro-intervention reveal a stronger correlation between PsyCap and JS and a higher degree of JS. After the micro-intervention, the average values increase for the global scales of PsyCap and JS, but also for the majority of subscales on both constructs. The studies conducted by Dello Russo and Stoykova (2015), Lucas (2015), and Neves (2016) reached the same conclusions.

Therefore, we determined that the effect of PsyCap improvement on JS is highly influenced by the micro-intervention. On the first moment of research, the average values on both groups are consistent. Nevertheless, on the second moment, after the intervention, the differences between both groups are significant. The average values of the EC are higher than those of the CG, confirming the validity and importance of these micro-interventions on the organizations. The results obtained show the validity of these micro-interventions as a useful tool for Human Resources in the Portuguese culture and professional environments, as also attested by the studies of Rego et al. (2010) and Antunes et al. (2017).

The positive influence of the micro-intervention on JS lasts at least 3 months, as proved by the survey made on the third moment of research; Dello Russo and Stoykova (2015) have already suggested this trend. The same is true concerning specific aspects of FIFO work. The participants assigned to the EG reveal a higher degree of JS with the journeys and nights spent abroad than the participants included in the CG.

The higher PsyCaps are self-efficacy and hope on the first moment, but on the third moment is resilience. The most valued JS dimension in all moments is supervision, although colleagues, and communication and work nature are also relevant to the participants. The PsyCap with the most impact on JS on the second moment is resilience and 3 months later (third moment) is optimism.

LIMITATIONS

This kind of study always has a number of limitations regarding the sample and its representativeness and homogeneity. Although we try to diminish this situation, the sample we depend on was acquired in the two companies where we developed the research. Their representativeness is, of course, questionable and impossible to put to a strength test because there are no available data in Portugal considering flexpatriates. However, we try to guarantee certain homogeneity of both the experimental and CGs, although, also in this area, we are once again limited to the companies' availability.

Also, it is recognized that the size of the present sample may have limited some of the analyses that we intended to conduct. For this reason, it is recommended that future studies include larger samples and consider the differences between individuals, for example with regard to age and professional function.

Considering that both PsyCap and JS involve subjective factors, such as personality traits and psychological characteristics, it would have been relevant to compare the results of the quantitative study with a qualitative approach. However, as this was not essential for the proposed objectives, we chose not to take this path.

IMPLICATIONS

The objective of this research has always had in mind the JS and well-being of corporate employees inserted in the specific international work regime that we conceptualize as FIFO. In this sense, more important were the results obtained regarding flexpatriates in particular, which have implications for the health promotion and well-being and proved to be very promising regarding the use of this type of micro-interventions to improve, among other factors, the daily professional and personal life of employees covered by FIFO.

Our findings have several implications regarding the use of micro-interventions in companies to validate and value their PsyCap, this is, in fact, the added value and advantage they have to face today's extremely competitive and constantly changing market.

This study is part of a broader panorama of interest in promoting and increasing PsyCap in the professional sphere, promoting health in the workplace and, simultaneously, in the most recent desire to study the specificities of international work and the FIFO work model in particular, contributing to systematically compile the range of coverage it has and the different types of work it can encompass within its specific work model.

Finally, we highlight the link that can be established between PsyCap and JS. The present study clearly reveals a relationship between both constructs and, in our view, the fundamental importance of developing both simultaneously.

CONCLUSION

All evidence collected and analyzed suggests that the answer to the key question that guided the first steps of our work is that the improvement of the PsyCap through the promotion of micro-interventions positively influences the level of JS of the flexpatriates with their jobs in general and with the considered specificities of the FIFO job model. We were able to corroborate our first hypothesis, providing evidence that the PsyCap is a predictor of JS. The second hypothesis was also corroborated, because the medium levels of both global scales of PsyCap and JS increase with the experimental group

after the micro-intervention, whereas the same levels remain similar within the CG (without micro-intervention. At last, the data collected on the third moment corroborated the third hypothesis as well, considering that the positive influence of the micro-intervention lasted at least 3 months. Although a lot is yet to be investigated, our study contributed with data to support the importance of micro-interventions to improve the PsyCap and we developed an instrument for the Human Resources Management to apply with international job models, specifically the FIFO model, in the organizational environment in Portugal.

Future studies may not only confirm our findings, but also use them to improve and deepen the content of micro-intervention, dedicating them specifically to FIFO, a work model whose negative psychological effects have not yet been fully investigated and deepened. We opted for the experimental method to fully enjoy the benefits in control and producing specific, relevant, and consistent results, ensuring the possibility of their replication and comparison with other studies that we hope may follow our effort.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

This study was carried out in accordance with the recommendations of ISCSP University with informed consent from all subjects.

AUTHOR CONTRIBUTIONS

NS performed the study and drafted the manuscript, under orientation by ML and SG. SG prepared the SPSS datasets analyzed by NS. All authors contributed to the article and approved the submitted version.

REFERENCES

Alexandre, N. C. (2017). *O impacto da felicidade e do capital psicológico positivo nas atitudes e nos comportamentos dos colaboradores*. [Unpublished master dissertation]. Politécnico de Leiria, Leiria.

Albrecht, S. L., and Anglim, J. (2018). Employee engagement and emotional exhaustion of fly-in-fly-out workers: a diary study. *Austr. J. Psychol.* 70, 66–75. doi: 10.1111/ajpy.12155

Antunes, A. C., Caetano, A., and Cunha, M. P. (2017). Reliability and construct validity of the portuguese version of the psychological capital questionnaire. *Psychol. Rep.* 7, 1–17. doi: 10.17575/rpsicol.v33i2.1421

Arcidiacono, C., and Martino, S. D. (2016). A critical analysis of happiness and well-being. Where we stand now, where we need to go. *Commun. Psychol. Glob. Perspect. CPGP* 2, 6–35.

Basinska, B. A., and Rozkwitalska, M. (2020). Psychological capital and happiness at work: the mediating role of employee thriving in multinational corporations. *Curr. Psychol.* 2, 1–14. doi: 10.1007/s12144-019-00598-y

Brenke, K. (2015). The vast majority of employees in Germany are satisfied with their jobs. *DIW Econom. Bull.* 5, 429–436.

Brook, E., Freeman, M., and Ditchburn, G. (2020). The impact of fly-in, fly-out (FIFO) on the health and well-being of employees: what organisations can do to mitigate the risks and improve outcomes. *APPEA J.* 60, 397–402. doi: 10.1071/aj19146

Center for Transformative Work Design (CTWD) (2018). *Code of Practice: Mentally Healthy Workplaces for Fly-in Fly-out (FIFO) Workers in the Resources and Construction Sectors. Review Submission by the Centre for Transformative Work Design at the University of Western Australia. April 2018*. Perth, WA: University of Western Australia.

Côté, S., and Morgan, L. (2002). A longitudinal analysis of the association between emotion regulation, job satisfaction, and intentions to quit. *J. Organ. Behav.* 23, 947–962. doi: 10.1002/job.174

Dalal, R. S. (2013). *Job Attitudes: Cognition and Affect. In Weiner, I.B. Handbook of Psychology*. Hoboken, NJ: John Wiley & Sons Inc. doi: 10.1002/9781118133880.hop212014

Dello Russo, S., and Stoykova, P. (2015). Psychological capital intervention (PCI): a replication and extension. *Hum. Resour. Dev. Q.* 26, 329–347. doi: 10.1002/hrdq.21212

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *Am. Psychol.* 55, 34–43.

Diener, E., Scollon, C. N., and Lucas, R. E. (2009). "The evolving concept of subjective well-being: The multifaceted nature of happiness," *Assessing Well-Being: The Collected Works of Ed Diener*, ed. E. Diener (Berlin: Springer Science), 67–100.

Diener, E., Suh, E., and Oishi, S. (1997). Recent findings on subjective well-being. *Indian J. Clin. Psychol.* 24, 25–41.

Donaldson, S. I., Chan, L. B., Villalobos, J., and Chen, C. L. (2020). The generalizability of HERO across 15 nations: positive psychological capital (PsyCap) beyond the US and Other WEIRD Countries. *Int. J. Environ. Res. Public Health* 17:9432. doi: 10.3390/ijerph17249432

Guedes, B. M. (2012). *Stresse em Expatriados – Transpor as Fronteiras de si*. Master thesis. Lisboa: Universidade Lusófona de Humanidades e Tecnologias.

Herzberg, F. (1964). The motivation-hygiene concept and problems of manpower. *Pers. Admin.* 27, 3–7.

Hoppock, R. (1935). *Job Satisfaction*. New York: Harper.

Judge, T. A., and Klinger, R. (2008). "Job satisfaction: Subjective well-being at work," in *The Science of Subjective Well-Being*, eds M. Eid and R. J. Larsen (New York, NY: Guilford Press), 393–413.

Judge, T. A., and Locke, E. (1993). Effect of dysfunctional thought processes on subjective well-being and job satisfaction. *J. Appl. Psychol.* 78, 475–490. doi: 10.1037/0021-9010.78.3.475

Locke, E. A. (1969). What is job satisfaction? *Organ. Behav. Hum. Decis. Process* 4, 309–336.

Locke, E. A. (1976). "The nature and causes of job satisfaction," in *Handbook of Industrial and Organizational Psychology*, ed. M. D. Dunnette (Chicago, IL: Rand McNally). 1297–1343.

Lucas, C. P. (2015). *A Promoção do Capital Psicológico, Work Engagement e Saúde Mental de Trabalhadores*. [Unpublished master dissertation]. Instituto Superior de Ciências Sociais e Políticas, Universidade de Lisboa, Lisboa.

Lucas, H. M., Mónico, L. S., and Castro, F. V. (2014). Psychological capital of individuals: what contributions for organizations? *INFAD Rev. Psicol.* 1, 417–426. doi: 10.17060/ijodaep.2014.n1.v5.701

Luthans, F., and Youssef, C. M. (2004). Human, social, and now positive psychological capital management: investing in people for competitive advantage. *Manag. Depart. Facul. Publ.* 4, 1–26.

Luthans, F., and Youssef-Morgan, C. M. (2017). Psychological capital: an evidence-based positive approach. *Annu. Rev. Organ. Psychol. Organ. Behav.* 4, 339–366. doi: 10.1146/annurev-orgpsych-032516-113324

Luthans, F., Avey, J., and Patera, J. (2008). Experimental analysis of a web-based training intervention to develop positive psychological capital. *Acad. Manag. Learn. Educ.* 7, 209–221. doi: 10.5465/amle.2008.32712618

Luthans, F., Avey, J., Avolio, B., and Peterson, S. (2010). The development and resulting performance impact of positive psychological capital. *Manag. Dep. Facul. Public.* 10:157. doi: 10.1002/hrdq.20034

Luthans, F., Avey, J., Avolio, B., Norman, S., and Combs, G. (2006). Psychological capital development: toward a micro-intervention. *J. Organ. Behav.* 27, 387–393. doi: 10.1002/job.373

Luthans, F., Avolio, B., Avey, J., and Norman, S. (2007a). Positive psychological capital: measurement and relationship with performance and satisfaction. *Leaders. Instit. Facul. Publicat.* 60, 541–572. doi: 10.1111/j.1744-6570.2007.00083.x

Luthans, F., Luthans, K. W., and Luthans, B. C. (2004). Positive psychological capital: beyond human and social capital. *Bus. Horiz.* 41, 45–50. doi: 10.1016/j.bushor.2003.11.007

Luthans, F., Youssef, C. M., and Avolio, B. J. (2007b). *Psychological Capital: Developing the Human Competitive Edge*. Oxford: Oxford University Press.

Luthans, F., Youssef-Morgan, C. M., and Avolio, B. J. (2015). *Psychological Capital and Beyond*. New York, NY: Oxford University Press.

MacDonald, S., and MacIntyrem, P. (1997). The generic job satisfaction scale: scale development and its correlates. *Empl. Assist. Q.* 13, 1–16. doi: 10.1300/j022v13n02_01

Martinez, L., and Ferreira, A. (2007). *Análise de Dados com SPSS*. Forte da Casa: Escolar Editora.

Neves, A. (2016). *Capital Psicológico Positivo e Auto-Liderança: Um Estudo com Intervenção Formativa*. [Unpublished master dissertation]. Instituto Superior de Ciências Sociais e Políticas, Universidade de Lisboa, Lisboa.

Pini, B., and Mayes, R. (2012). Gender, emotions and fly-in fly-out work. *Austr. J. Soc. Issue.* 47, 71–86. doi: 10.1002/j.1839-4655.2012.tb00235.x

Quivy, R., and Campenhoudt, L. V. (1992). *Manual de Investigação em Ciências Sociais*. Lisboa: Gradiva.

Rego, A., Marques, C., Leal, S., Sousa, F., and Cunha, M. P. (2010). Psychological Capital and Performance of Civil Servants: exploring neutralizers in the context of an appraisal system. *Int. J. Hum. Resour. Manag.* 21:488459. doi: 10.1080/09585192.2010.488459

Santos, J. R., and Mourão, L. (2011). Impacto do treinamento como variável preditora da satisfação com o trabalho. *FEAUSP Rev. Administr.* 46, 305–318. doi: 10.5700/rausp1014

Serrão, A. C. (2018). *Capital Psicológico Positivo: Um Estudo Sobre a Propagação e Contágio Entre Líderes e Liderados*. [Unpublished master dissertation]. Instituto Superior de Ciências Sociais e Políticas, Universidade de Lisboa, Lisboa.

Sibhoko, O. (2017). *An investigation Into Employee Job Satisfaction and its Impacton Organizational Effectiveness*. Master thesis. Durban: Durban University of Technology.

Siqueira, M. M. M., and Padovam, V. A. R. (2008). Bases teóricas de bem-estar subjetivo, bem-estar psicológico e bem-estar no trabalho. *Psicol. Teor. Pesqu.* 24, 201–209. doi: 10.1590/s0102-37722008000200010

Smith, P. C., Kendall, L. M., and Hulin, C. L. (1969). *The Measurement of Satisfaction in Work and Retirement*. Chicago, IL: Rand McNally.

Souza, A. C., Milani, D., and Costa Alexandre, N. M. (2015). Adaptação cultural de um instrumento para avaliar a satisfação no trabalho. *Rev. Brasil. Saúde Ocupac.* 15, 219–227. doi: 10.1590/0303-76570001 13715

Spector, P. E. (1985). Measurement of human services staff satisfaction: development of the job satisfaction survey. *Am. J. Commun. Psycol.* 13, 693–713. doi: 10.1007/bf00929796

Spector, P. E. (1997). *Job satisfaction: Application, Assessment, Causes, and consequences*, Vol. 3. Thousand Oaks, CA: Sage.

Spector, P. E. (2012). *Industrial and Organizational Psychology: Research and Practice*. Hoboken, NJ: John Wiley & Sons.

Spector, P. E. (2006). *Industrial and Organizational Psychology: Research and Practice*. Hoboken, NJ: John Wiley & Sons Inc.

Torkington, A. M., Larkins, S., and Gupta, T. S. (2011). The psychosocial impacts of fly-in fly-out and drive-in drive-out mining on mining employees: a qualitative study. *Austr. J. Rural Health* 19, 135–141. doi: 10.1111/j.1440-1584.2011.01205.x

Weiss, H. M., and Brief, A. P. (2001). *Affect at Work: A Historical Perspective*, in *Emotions at work: Theory, research, and applications for management*, eds R. L. Payne and C. L. Cooper (Hoboken, NJ: John Wiley & Sons), 133–172.

Youssef-Morgan, C. M., and Luthans, F. (2015). Psychological capital and well-being. *Stress Health* 31, 180–188. doi: 10.1002/smi.2623

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Effects of Passive Leadership in the Digital Age

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Organizations must adapt to the trend of digitalization. Nowadays, social media engagement editors play an increasingly crucial role for organizational growth and prosperity in the digital age. Engagement editors are usually tasked to perform the functions of marketing, content production, and data analysis. They have to manage online communities on behalf of the organization, and encounter online audiences' frequent toxic and aggressive behaviors. Engagement editors thus are prone to emotional stress. Substantial literature has examined the influence of leadership style on employee performance. However, passive leadership is rarely studied. This research investigates (1) whether passive leadership would negatively affect engagement editors' performance (i.e., online interaction with audiences); and (2) how the negativity would be ameliorated by certain organizational policies (i.e., job autonomy) and their individual attributes (i.e., employee resilience) from the conservation of resource perspective. We surveyed 122 engagement editors and used the smartPLS 3.2.9 to analyze the data. This research provides important theoretical and practical implications.

Keywords: social media, online emotional labor, passive leadership, job autonomy, resilience

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INTRODUCTION

The advance of digital technologies has ushered in digital transformation to many industries. One of the major changes is an emerging role, known as the engagement editor (Powers, 2015). Engagement editors are principally tasked to interact with online audience of an organization to promote the organization's digital presence, and ultimately, to increase its sales revenues or profits. The market demand for engagement editors is getting strong. In 2014, 80% of Fortune's Top 500 companies in the US have set up Facebook fan pages that are managed by social media engagement editors (Barnes and Lescault, 2014). This number climbs to 90% in 2017 (Clement, 2019).

Social media platforms afford organizations with two-way, real-time communication functionalities. Engagement editors thus can represent organizations to interact with their clients virtually, enabling organizations to get better insights about their clients' needs and expectations. However, cyberbullying is becoming a serious concern and becomes part of reality at work for engagement editors. In the face of netizens' verbal and emotional attacks, engagement editors are required to manage their feelings to express organizationally desired emotions (Grandey, 2000). This could be emotionally exhausted and requires substantial personal resources to cope with (Hochschild, 2012). Leadership can be an important source of resources that could support (or deplete) engagement editors.

The literature has identified different leadership styles (Bass and Avolio, 1990). Among them, passive leadership is the least studied (Eisenbeiß and Brodbeck, 2014). Passive leadership refers to a pattern of inaction and disengagement on the part of the management (Derue et al., 2011). Passive leadership is common in the workplace, with at least 20 percent of employees experiencing such practices by management (Aasland et al., 2010). However, issues related to passive leadership are often ignored. For example, Martinko et al. (2013) identify multiple types of abusive behaviors by supervisors, but do not recognize passive leadership as one of them. It is generally argued that the management does not intend to harm employees or organizations under most circumstances, and therefore passive leadership could not cause much harm to the organization (Barling and Frone, 2017).

In fact, under passive leadership, employees could suffer role overload, ambiguity, and conflict due to the lack of guidance and coordination (Hinkin and Schriesheim, 2008; Skogstad et al., 2014). Among the limited literature, Christie and Barling (2009) found that employees' long exposure to passive leadership could cause chronic stress, and difficulty regaining personal control of their work. Based on the perspective of conservation of resources (COR), we argue that leadership is an important factor that can act to facilitate or inhibit employees' resource gain to perform and to cope with their job demands and challenges (Hobfoll, 2002, 2011).

This study aims to study how passive leadership could negatively influence emotional labors and how the negativity of passive leadership can be ameliorated by both organizational and individual resources, i.e., job autonomy and employee resilience. We integrate literatures on leadership and work stress to develop our research model (Wang et al., 2019). We find that passive leaders can directly cause poor employee performance and indirectly cause it due to role overload perceived by employees. However, employee personal resource of resilience can help reduce the negativity of passive leadership. On the other hand, the organizational resource of job autonomy can negatively moderate the relationship between role overload and employee performance. This means that when job autonomy is high role overload does less harm to employee performance.

The remainder of the paper is organized as follows. The next section reviews the literature and develops a research model that outlines how passive leadership negatively influences engagement editors' performance and how job autonomy (i.e., organizational resource) and employee resilience (i.e., individual resource) help ameliorate the negativity. The method is described next and the results follow. The paper ends with a discussion of the results and implications for research and practice.

BACKGROUND LITERATURE

Social media have become the most commonly used communication channels for contemporary organizations. Increasing organizations employ social media to build or maintain both online and offline relationship with their clients. The news industry is no exception. It is found that news organizations use social media to build and maintain a huge fan/follower base (PewResearchCenter, 2010). Indeed, people, especially the millennial generation, increasingly rely on their social networks to access information and news (Hermida et al., 2012; Mitchell et al., 2013).

Technological functionalities of social media enable two-way interaction between audiences and news organizations. For example, audiences can comment, like, share, or even co-create news content on social media platforms (e.g., via uploading videos or photos). Another example is the function of tagging. Tagging allows the archival of specific knowledge domains, and facilitates the collective reuse of said knowledge (Majchrzak et al., 2013). Audience participation enabled by social media has disrupted the long-established professional norms of journalism which emphasizes the gatekeeping and agenda-setting role of journalism (Heinonen, 2011). Many seasoned journalists express difficulty in adapting to new practices associated with social media, including managing online communities for effective news production and dissemination (Kenney et al., 2000).

News organizations increasingly see their audiences as active participants. The role of engagement editors is thus created to exploit social media and manage their active audiences to news organizations' benefits. Unlike traditional journalists, engagement editors mainly work virtually. Their daily job may include monitoring and analyzing website traffic, interacting with their digital audiences, and organizing online/offline activities to further engage their audiences (Kenski and Stroud, 2006; Lin, 2006).

The most important task of engagement editors is to interact and maintain good relationship with fans and followers virtually. Engagement editors are thus required to have professional knowledge of journalism, and demonstrate empathy and excellent negotiation skills to manage customer relationships (Aldoory, 2005; L'Etang and Pieczka, 2006). However, to meet their job requirements, they often have to bear the brunt of their audience's reaction, stage inauthentic feelings, or even learn to please fans (Phillips and Young, 2009). This can easily deplete engagement editors' personal resources.

CONSERVATION OF RESOURCES THEORY

According to the conservation of resources theory (COR), performing tasks and coping with stressful situations require personal resources, such as time, physical energy, emotional energy, or attention (Hobfoll, 1988, 2001, 2002). However, these resources are limited. Individuals thus will strive to acquire and maintain their personal resources to continuously meet their job requirements, such as via rest or food intake. When sufficiently drained, individuals will not be able to perform. Therefore, if the organization can provide resources or support, it will help replenish or protect employees' personal resources and thus increase their work outputs. For example, organizations can create a friendly and collaborative work environment that is conducive to the gain or protection of employees' personal resources or the avoidance of the loss of valued resources.

Passive Leadership

Passive leaders ignore their responsibilities and do not empower employees (Hamidifar, 2014). They do not deal with employee issues and workplace problems until it is too late. This makes it almost impossible to foster or reinforce appropriate behavior at the workplace (Derue et al., 2011). Passive leaders thus are likely to cause employee confusion, role conflict, workplace bullying and uncivil behaviors, resulting in psychological distress, work fatigue and burnout (Skogstad et al., 2007; Harold and Holtz, 2015). Further, passive leaders can reduce employees' trust and create unfair feelings (Holtz and Hu, 2017). They can bring significant harm, especially to employees' roles and conflicts, well-being, work attitude, and organizational commitment (Judge and Piccolo, 2004; Derue et al., 2011; Zineldin and Hytter, 2012; Jackson et al., 2013; Skogstad et al., 2014; Buch et al., 2015).

Given that the engagement editor is an emerging category of role in organizations, job descriptions, rules and role expectations are not fully developed yet. This can create stressful situations. Passive leaders could further deplete or drain engagement editors' personal resources by causing more confusion, conflicts and mistrust. As engagement editors lose control of their personal resources, they will not be able to perform their jobs and reduce interaction with fans to conserve personal resources. Therefore, we propose that:

Hypothesis 1: Passive leadership will reduce engagement editors' online interaction with fans and followers.

Role Overload

Employees experience role overload when job demands and responsibilities exceed their abilities (Bolino and Turnley, 2005). Role overload is closely related to work stress as employees are pressured by too much responsibility and commitments (Brown et al., 2005). Role overload thus could trigger negative attitudes in employees, reduce job performance and organizational commitment, and cause absence (Rodell and Judge, 2009; Jensen et al., 2013). Role overload is more salient a stressor than role ambiguity and conflict (Narayanan et al., 1999; Mulki et al., 2008; Gurbuz et al., 2013).

Employees must fulfill the demands of both their job and organizational roles to meet the expectations of the organization (Welbourne et al., 1998). Employees on the frontline must also satisfy the needs of customers (Crawford et al., 2010; Chiu et al., 2015). Role overload thus could come from diverse sources (Mulki et al., 2006).

With the advance of digital technologies, the highly interactive, real-time online environment forces front-line employees, such as engagement editors, to shoulder more responsibilities and suffers more role overload as they have to meet expectations of diverse stakeholders within a short timeframe (e.g., customers) (Itani and Inyang, 2015; Yang et al., 2015). For example, when pieces of sensitive news are broadcasted, some audiences or online haters may react irrationally and bombard engagement editors with unfriendly messages or even personal attacks. However, passive leaders tend to turn a blind eye to the situation and leave engagement editors to deal with those haters by themselves. Without a proper role script to follow, this thus increases engagement editors' workload because they have to explore methods to handle those issues and at the same time, to avoid punishment. Therefore, we propose that:

Hypothesis 2: Passive leadership will increase engagement editors' role workload.

For engagement editors, role overload would negatively affect their online interaction with fans. The online interaction defines customer experiences with the organization engagement editors represent. This may involve engagement editors' attitudes and behaviors toward fans and the interactive formats adopted (Karatepe et al., 2005). Quality online interaction requires mutual trust between engagement editors and customers (Ekinci and Dawes, 2009). Role overload depletes engagement editors' cognitive and emotional resources, such as empathy and kindness. They thus will not be able to behave compassionately, helpfully and professionally (Jha et al., 2017). Therefore, we propose that:

Hypothesis 3: Role overload will reduce engagement editors' online interaction with fans and followers.

Passive leaders keep supervisor-employee interaction to a minimum, as they would not provide employees with instruction, feedback, or support (Skogstad et al., 2007; Buch et al., 2014). They are both unethical and uncaring, and can easily trigger negative emotions and bring about stress among engagement editors (Einarsen et al., 2007). Since passive leaders rarely involve in task planning or interacting with their subordinates, they can bring about more stress and aggravate engagement editors' already demanding work, leading to more role overload in engagement editors (Skogstad et al., 2007; Buch et al., 2014; Barling and Frone, 2017; Vullinghs et al., 2018). Consequently, engagement editors would reduce interaction with fans to preserve their personal resources. Therefore, we propose that:

Hypothesis 4: Role overload will mediate the negative relationship between passive leadership and engagement editors' online interaction with fans and followers.

Job Autonomy

Job autonomy refers to employees' discretionary power that is granted by organizations to perform tasks at their own pace and in their own ways. Therefore, an employee can choose to not follow the prescribed working schedule, and has the power to make discretionary decisions about how they will execute their jobs (Ilies et al., 2005). Job autonomy is particularly important in a highly variable work environment (Troyer et al., 2000). This is because job autonomy grants employees the freedom to decide how they would like to complete tasks and to adapt to the changing work environment. Job autonomy thus has a positive impact on performance, creativity, and knowledge sharing (Morgeson et al., 2005; Pee and Lee, 2015; Llopis and Foss, 2016), and can reduce job uncertainty (Idaszak and Drasgow, 1987).

Job autonomy is a crucial organizational resource that helps alleviate the negative effects of work stress (Abraham, 2000; Grandey et al., 2005; Goussinsky, 2011). Job autonomy allows employees to effectively deploy and seek resources themselves. When there is low job autonomy, mistakes or errors are less tolerated (Fuller et al., 2010; Liu et al., 2011). The negative effect

of role overload thus is likely to be reinforced. Conversely, when employees have job autonomy, they are more likely to learn from their mistakes and errors without being punished (Dierdorff and Morgeson, 2007; Liu et al., 2011). As engagement editors work with high role overload, job autonomy not only reduces perceived work stress, but also creates a fault-tolerant space, thereby motivating engagement editors to adapt their behaviors to interact with fans. We thus propose:

Hypothesis 5: Job autonomy will negatively moderate the relationship between role overload and engagement editors' online interaction with fans and followers.

Resilience

Workplace pressure is inevitable. Yet, individuals react to pressure differently. Resilient people, after a brief interruption by a tense situation, can return to normal and maintain their mental health (Luthar et al., 2000; Bonanno, 2005). American Psychological Association defines resilience as "adaptation to adversity, trauma, sources of significant stress, such as family and relationship issues, health issues or workplace and financial stress." (Southwick et al., 2017) defined resilience as the ability to regain balance following exposure to adverse events. In the face of high-pressure situations, resilient people can develop a response strategy and resist the adverse conditions to construct the future. Masten et al. (1990) emphasize that resilience is a dynamic process in which individuals interact with the environment (Norris et al., 2008) also argue that resilience is a potential outcome after employee survive stressful events. Therefore, resilience is not only a psychological trait that leads to positive outcomes, but also can be altered and cultivated (Robertson et al., 2015).

Management can play an important role to help enhance employee resilience, such as via setting a role model (Grotberg, 2003). However, passive leaders tend to set a role model who avoids and ignores problems, and evade their responsibilities. Over time, employees thus develop a similar coping strategy, making them prone to more stress and helplessness in the face of problems. Therefore, we hypothesize:

Hypothesis 6: Passive leadership will reduce engagement editors' resilience.

Resilient people are more likely to adapt to changes to achieve high job performance, despite adverse conditions such as long working hours, poor working conditions, and complex and challenging environments (Sonnenfeld and Ward, 2008; Carucci, 2017). Resilient people are better at regulating their own emotion, controlling impulse and adjusting goals; they are also more likely to demonstrate empathy, pragmatic optimism and high self-efficacy (Mourlane, 2020). With high resilience, engagement editors thus can maintain quality interaction with fans, regardless of the sometimes toxic online environment. Therefore, we hypothesize:

Hypothesis 7: Engagement editors' resilience will increase their online interaction with fans and followers.

Resilience can be seen as one kind of personal resources that individuals can use consciously to create positive emotions (Handley et al., 2004) and change their thoughts and behaviors (Masten, 2001; Tugade and Fredrickson, 2004). Therefore, adverse conditions, such as time pressure or demanding work responsibility, can be reinterpreted as either a challenge or a threat. Resilient individuals will take those conditions as a challenge and increase their inputs or commitment to overcome the challenge (Crawford et al., 2010). Over time, they can turn such conscious strategizing into an automated process (Bargh and Chartrand, 1999). Whenever difficult situations occur, resilient people can easily initiate positive responses (Isen and Diamond, 1989). In contrast, adverse conditions are likely to induce negative emotions, such as fear, anxiety and anger within individuals lacking resilience, further depleting their personal resources and leading to their reduction in work commitments (Erez and Isen, 2002; May et al., 2004).

When supervised by a passive leader, engagement editors face the dilemma of job demand being greater than resources. Resilient engagement editors are likely to initiate positive emotions and look for other sources for replenishing personal resources (e.g., peers, friends). They thus can prevent depletion of personal resources and maintain quality interaction with fans. In contrast, without resilience, engagement editors will have to simultaneously deal with the passive leader, its attendant negative emotion and stress, and job demands. This thus could drain their personal resources to the point that they feel burnout. We thus hypothesize:

Hypothesis 8: Resilience will mediate the relationship between passive leadership and engagement editors' online interaction with fans and followers.

Our research model is exhibited in **Figure 1**.

METHODOLOGY

A survey questionnaire was administered to collect data. Our measures were principally derived from existing scales and adapted to suit the research context. To better comprehend social media engagement editors' work context and process, we also interviewed 2 engagement editors and 3 managers in a social media news organization in Taiwan. After compiling an English version of the questionnaire, we translated the survey items into Chinese. Two bilingual scholars next verified and refined the translation accuracy of the survey items. The Chinese version of the draft questionnaire was then pretested with 2 senior news editors for examining its face and content validity, resulting in modification of the wording of some items. We operationalized all constructs using multi-item reflective measures with a five-point Likert scale anchored from "strongly disagree" to "strongly agree." The measures are discussed below and shown in **Appendix A**.

We measured *passive leadership* using four items to assess the extent to which individual engagement editors perceive that supervisors withdraw from making decisions and managerial activities (Kelloway et al., 2006). *Job autonomy* was measured by four items which assess the extent to which individual engagement editors have discretion to make decisions about their work (Breaugh, 1985). *Role overload* was measure by three items that are adapted from Bolino and Turnley (2005), assessing the extent to which employees feel that there are too many responsibilities or activities expected of them in light of the

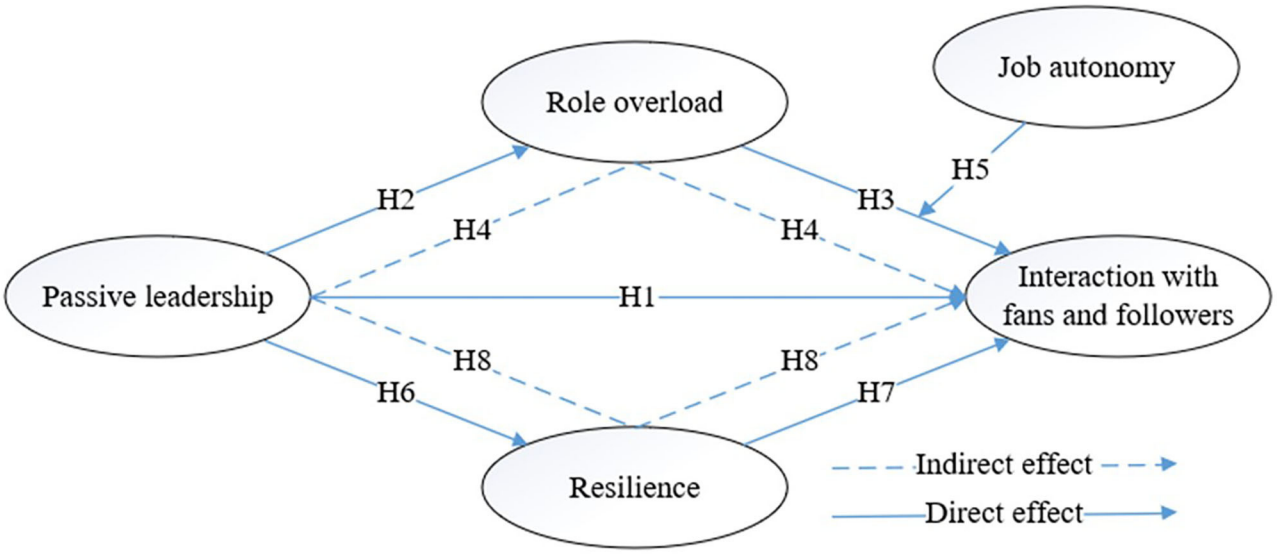

FIGURE 1 | Research model.

time available, their abilities, and other constraints. *Resilience* was measured by four items adapted from Stephens et al. (2013). We assessed *online interaction with fans and followers* with four items adapted from Liu (2003). Finally, we control *years in managing online communities* that may influence the levels of interactivity.

Sample and Data Collection

A cross-sectional survey for social media engagement editors was administrated to collect data from the top 30 online news firms based on the Year 2018 of the Top sites in Taiwan, published by Alexa Internet, Inc. We first emailed the top managers of these firms to obtain permission to survey their social media engagement editors. Nineteen firms, including top 1 to top 11, allowed us to distribute questionnaire to their engagement editors. We finally distributed our questionnaire to all their 200 social media engagement editors and collected their responses in person. One hundred and twenty-two responses were returned and valid for subsequent analysis. This yielded an effective response rate of 61%. **Table 1** exhibits the characteristics of the sample. Among the respondents, 71% were <30 years old, and 70% had experiences in managing online communities for <3 years. Our data demonstrate that social media engagement editing is still in its adolescence in the news industry in Taiwan, given most respondents are relatively junior and young.

TABLE 1 | Profile of the respondents ($N = 122$).

	No.	%
Gender		
Male	43	35
Female	79	65
Ages		
20–25	43	35
26–30	44	36
31-35	22	18
36–40	6	5
40 above	7	6
Year(s) of experience in managing online communities		
<1 year	24	20
1–3 years	61	50
3–5 years	26	21
5–7 years	8	7
More than 7 years	3	2

Data Analysis

We conducted a PLS structural equation model (PLS–SEM) testing to validate our measures and test hypotheses. The software used is SmartPLS Version 3.2.9.

Assessment of Common Method Variance

To assess common method variance (CMV), we conducted a Harmon's single-factor test (Podsakoff et al., 2003). As expected, we were able to extract four factors with eigenvalues of >1 which collectively accounted for 68.82% of the variance in the data, with the first factor accounting for 37.07% of said variance. This demonstrates that CMV is not a serious concern. We also incorporated a latent marker variable (MLMV) in our survey to correct for CMV when using PLS (Chin et al., 2012). This approach requires collecting multiple items that have no nomological relationship with the research items. We followed the guidelines introduced by Chin et al. (2012) and selected the items used to measure "trying new features" in Microsoft Office (Sun, 2012) as the MLMV. We then could conduct the construct level correction (CLC) to partial out the CMV effects at the structural model (Chin et al., 2012). CLC involves creating

TABLE 2 | Inter-construct correlations, reliability measures, and HTMT ($N = 122$).

Construct	Items	Cronbach's α	ρ_A	CR.	AVE.	1	2	3	4	5
Passive leadership	3	0.9	0.9	0.94	0.84	**0.92**				
Job autonomy	3	0.72	0.75	0.84	0.63	−0.14 (0.25; [0.1, 0.49])	**0.79**			
Role overload	3	0.85	0.87	0.91	0.77	0.44 (0.50; [0.30,0.68])	−0.17 (0.25; [0.09,0.57])	**0.88**		
Resilience	3	0.6	0.63	0.79	0.56	−0.23 (0.32; [0.14, 0.58])	0.43 (0.66; [0.34, 0.69])	0.05 (0.17; [0.12, 0.48])	**0.75**	
Interaction with fans and followers	4	0.83	0.85	0.89	0.66	−0.36 (0.42; [0.22, 0.60])	0.1 (0.14; [0.09, 0.34])	−0.19 (0.21; [0.12, 0.43])	0.31 (0.42; [0.20, 0.70])	**0.82**

Note: (1) Square roots of average variance extracted are shown on the diagonal with bold font; (2) HTMT and their 95% CI are shown in parentheses (HTMT; 95% CI, two-tailed test); (3) The 95% CI of HTMT are estimated by 5,000 bias-corrected and accelerated bootstrapping with confidence intervals bias corrected (Henseler et al., 2016).

as many CMV control constructs as there are constructs in the research model. Each CMV control uses the same entire set of MLMV items. The CMV construct was modeled as impacting each model construct. As such, more accurate estimates of the structural paths can be obtained (Chin et al., 2012).

Measurement Model Evaluation

We assessed construct validity and reliability according to the guidelines by Henseler et al. (2016) and Hair et al. (2017). Outer loadings for all items were higher than 0.7 and were significant at 1% level except for four items (please see **Appendix A**). We delete the items of passive leadership and job autonomy, but we only delete the worse loading item (0.57) and keep the better loading item (0.617) of resilience in order to keep content validity (Hair et al., 2017). The rho_A, composite reliability (CR) and Cronbach's alpha estimates, reported in **Table 2**, were above 0.7 for all constructs, indicating good internal consistency and the reliability of the scales (Henseler et al., 2016; Hair et al., 2017), except for resilience (Cronbach's alpha = 0.6; rho_A = 0.63). Considering the exploration nature of this study, such values of Cronbach's alpha and rho_A are acceptable. We further assessed the convergent validity of our constructs based on average variance extracted (AVE). The AVE of each construct exceeded the minimum threshold value of 0.5 (Henseler et al., 2016; Hair et al., 2017). The combined results demonstrated sufficient convergent validity of the constructs.

Discriminant validity is established when (1) items load more highly on the construct that they are intended to measure than on other constructs, (2) the square root of the AVE by each construct is larger than the inter-construct correlations (Hair et al., 2017), and (3) heterotrait-monotrait ratio of correlation (HTMT) is significantly smaller than 1. Cross-loadings were computed by calculating the correlations between a latent variable's component scores and the manifest indicators of other latent constructs (Hair et al., 2017). Without exception, all items loaded more highly on their own construct than on other constructs (see **Appendix B**). As shown in **Table 2**, the square root of the AVE for each construct was greater than the correlations between the construct and other constructs, indicating that all the constructs shared more variances with their indicators than with other constructs. All HTMT values, also shown in **Table 2**, were significantly smaller than 1 with 95% CI, indicating clear distinction between two constructs. Thus, our measures exhibited sufficient discriminant validity.

Structural Model

We first assessed multi-collinearity by examining each set of predictor constructs separately for each subpart of the research model (Hair et al., 2017). In our model, all the variance inflation factors (VIF) of endogenous constructs are <1.71 which is well below the cutoff value of 5 (Hair et al., 2017), indicating no multi-collinearity problem in our model.

To assess the significance of the path coefficients in the inner model, SmartPLS was applied to generate 10,000 samples using a bootstrapping technique with the PLS algorithm, no sign changes, a path weighting scheme, and a bias-corrected and accelerated CI. We also use Lohmoeller settings for initial weights (Hair et al., 2017). We applied the two-stage approach to create the interaction term with the standardized approach suggested by Hair et al. (2017) for testing the moderating effects. The full model has an R^2 of 27.4% for the interaction with fans and followers, 19.6 for role overload, and 27.5% for resilience. **Figure 2** shows the results of structural model estimation.

We first examined the direct effects of our research model. The results show that passive leadership has significant negative effect on the interaction with fans and followers (support H1: $p < 0.01$). Our analysis also reveals that passive leadership positively influences role overload (support H2: $p < 0.01$), but negatively influences resilience (support H6: $p < 0.01$). While role overload does not reduce the interaction with fans and followers (reject H3: $p > 0.05$), resilience positively affects the interaction with fans and followers (support H7: $p < 0.01$). Job autonomy negatively moderates the relationship between role overload and the interaction with fans and followers (support H5: $p < 0.05$). We further compared the R^2 of the models with and without the moderator (i.e., 27.4% & 22%) to calculate f^2 to determine the effect size of the moderator (i.e., job autonomy). We find that f^2 is 0.0744, indicating a small to medium effect (the values of 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects) (Hair et al., 2017). Finally, the effect of the control variable on interaction is insignificant (i.e., the years of managing online communities).

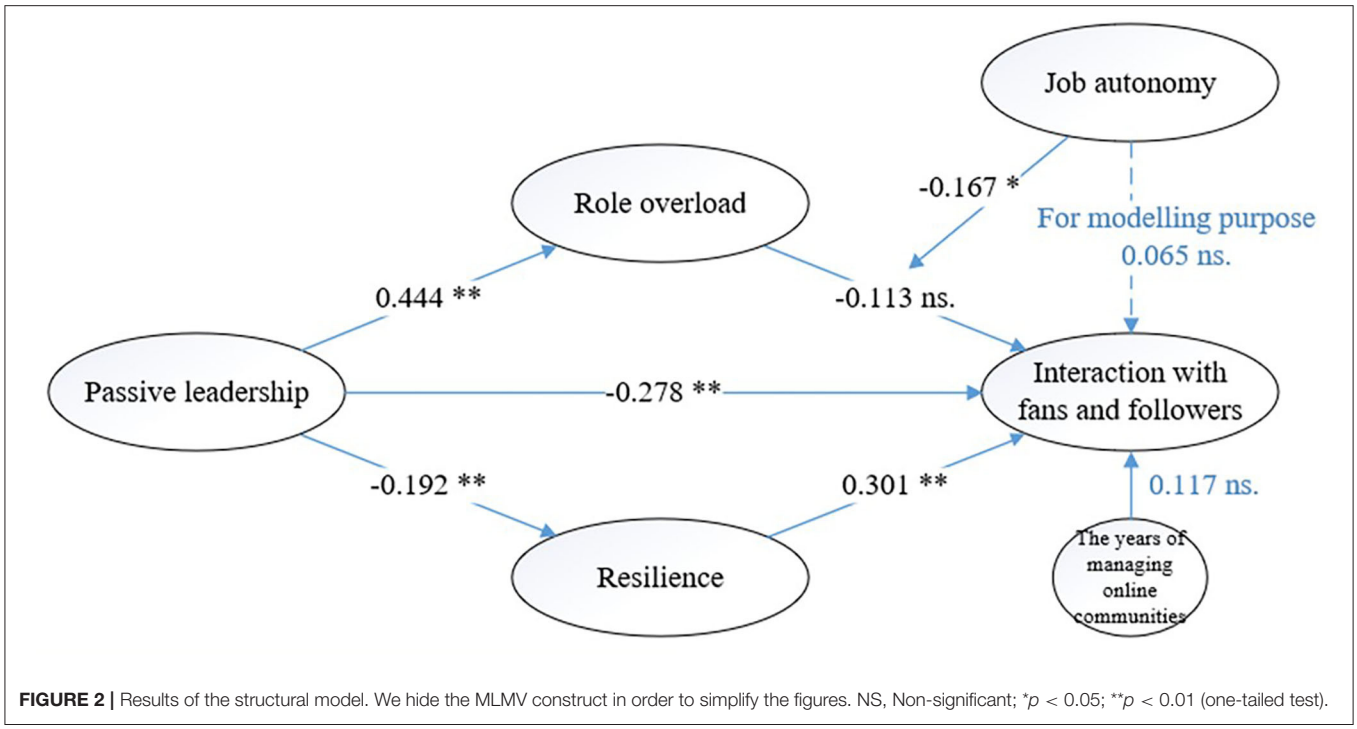

FIGURE 2 | Results of the structural model. We hide the MLMV construct in order to simplify the figures. NS, Non-significant; *$p < 0.05$; **$p < 0.01$ (one-tailed test).

TABLE 3 | Significance of single-mediator paths.

Row	Path	c	α	β	c'	αβ	Bootstrap 95% CI	Type
1	Passive leadership -> role overload -> interaction	−0.35 (0.00)	0.44 (0.00)	−0.04 (0.70)	−0.35 (0.00)	0.02	−0.11, 0.11	No mediation
2	Passive leadership -> resilience -> interaction	−0.31 (0.00)	−0.24 (0.00)	0.24 (0.00)	−0.31 (0.00)	−0.05	−0.14, −0.01	Partial mediation

c, the total effect of independent variable on dependent variable; α, the effect of independent variable on mediating variable; β, the effect of mediating variable on dependent variable when controlled independent variable; c', the effect of independent variable on dependent variable when controlled mediating variable t values shown in parenthesis.

To test mediating effect of role overload and resilience, we followed the guidelines suggested by Zhao et al. (2010) for justifying full or partial mediation: we conducted the mediation regression method with bias corrected bootstrap approach for examining the significance of indirect paths. We then adopted the simple mediation model (Preacher and Hayes, 2004; Hayes, 2013) to test the indirect paths with single mediators in the model. Because these approaches are regression based, we used PLS algorithm to obtain latent variables of the research constructs as inputs for performing the mediation regression method and 5,000 resampling on SPSS macros provided by Hayes (2013). Based on these procedures, all indirect paths can be tested reliably and validly.

Table 3 summarizes the results of the mediation model. As suggested by Zhao et al. (2010), we first examined the significance of indirect effects. The results indicate that the indirect effect of passive leadership on the interaction with fans and followers through role overload is insignificant at $p > 0.05$ level since zero is included in the 95% confidence interval (CI). The indirect effect of passive leadership on the interaction with fans and followers through resilience is significant at $p < 0.05$ level since zero is excluded in the 95% CI. We then examined the significance of direct effect from independent variable to dependent variable with the mediator controlled in order to justify full or partial mediation (see column c' in **Table 3**). Consequently, while resilience partially mediates the relationship between passive leadership and the interaction with fans and followers (support H8), role overload fails to ameliorate the negative relationship between passive leadership and the interaction with fans and followers (reject H4).

IMPLICATIONS AND CONCLUSION

Interaction with fans is among the major tasks of engagement editors. The results show that passive leadership reduces engagement editors' interaction with fans. Prior research focused on negative impacts of passive leadership on internal organization, such as unclear roles, employee well-being, work attitude and organizational commitment (Zineldin and Hytter, 2012; Skogstad et al., 2014; Buch et al., 2015). Our study provides support for more negative effects of passive leadership, including role overload and reduced interaction with fans/customers. The reduced interaction with fans/customers indicates that passive leadership can create a spillover effect beyond organizational

boundaries in the digital age, i.e., by reducing employees' online interaction with fans and followers. In the case of the engagement editor on social media platforms, interaction with fans create a public discourse that, to some extent, projects the organization's image and position to their stakeholders. If supervisors withdraw from their managerial duties, employees would be both physically and mentally exhausted, leading to reduced online interaction with clients and poor projection of the organizational image.

This study also demonstrates that resilience is effective in alleviating negative impacts of passive leadership. Resilient employees tend to see negative factors as challenges. They thus strive to overcome impediments when interacting with fans. Indeed, emotional workers, such as engagement editors and frontline employees, have to bear the brunt of their clients/fans, their job thus can be highly emotion-taxing and requires the development of a customer-oriented attitude and a strong concern for their customers (Yoo and Arnold, 2016). Further, because resilience predisposes employees to interpret negative factors in a positive light, resilience is more likely to foster positive emotions and thoughts in employees, leading to more resources gained. The initial resource (i.e., resilience) thus may beget further resource gain, leading to "gain spirals" (Hobfoll, 2001). Future studies may examine whether and how resilience facilitates employees to gain more resources. In practice, organizations can enhance employee resilience through human management measures, including training on emotional management, enhanced self-esteem, internal reflection and problem-solving skills (Ungar, 2004). As a result, employees can automate the positive reaction and emotional regulation when encountering difficult customers or stakeholders online.

In addition, job autonomy, one kind of resources, can reduce the stress induced by excessive organizational control and monitoring (Holman et al., 2002). Job autonomy is particularly important for the online environment due to it being highly unpredictable and dynamic. When facing abusive customers, job autonomy allows engagement editors to choose appropriate responses and reduce emotional dissonance between their real emotions and organizationally desired ones (Abraham, 2000). Therefore, job autonomy is particularly important because all situational contingencies cannot be designed in organizational control. For example, when there has been an attack occurring, any missteps taken by engagement editors may incur even more attacks. The easiest way is thus to stop responding to save personal resources (i.e., organizationally undesired response). To prevent engagement editors' undesired passive reaction like this or "surface acting" (e.g., a cynical or detached response to fans or followers) (Yoo and Arnold, 2016), organizations can allow job autonomy with enabling control to ensure that employees self-goals are consistent with the organizational goals (i.e., saving personal resources as well as effective online interaction) (Adler and Borys, 1996; Liu and Chua, 2020). Enabling control involves the provision to employees of contingent information and the right to make decisions themselves. As such, employees can feel safe to take creative, effective action independently or in collaboration with each other (Liu and Chua, 2020). Employees thus would not act at the cost of organizational benefits (e.g., reduce performance to save personal resources).

Finally, the strong direct effect of passive leadership on online interaction after considering the mediation effects of role overload and employee resilience suggests that there might be other unidentified factors that mediate the relationship between passive leadership and online employee performance (Preacher and Hayes, 2008). For example, mistrust and unfair feelings (Holtz and Hu, 2017) may be potential mediators that influence online interaction. More research is needed to uncover various routes through which passive leadership leads to decreased performance.

This study has some limitations. First, this study conducted a cross-sectional survey. Our conclusion thus is only tentative. Second, this paper adopts perceptual measures that may not accurately reflect the true relationships between the constructs. We thus conducted a Harmon's single-factor test which indicates this limitation is not serious, and we also included a marker variable to partial out CMV. Third, we only study social media engagement editors in the news industry. Future studies may consider other industries with a similar focus on online customer engagement (e.g., online retailing). This may enhance generalizability of our results.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The ethics sanction of this study was granted by the Human Research Ethics Committee at National Cheng Kung University in Taiwan (NO: 109-506). The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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REFERENCES

Aasland, M. S., Skogstad, A., Notelaers, G., Nielsen, M. B., and Einarsen, S. (2010). The prevalence of destructive leadership behaviour. *Br. J. Manage.* 21, 438–452. doi: 10.1111/j.1467-8551.2009.00672.x

Abraham, R. (2000). Organizational cynicism: bases and consequences. *Genet. Soc. Gen. Psychol. Monogr.* 126, 269–292.

Adler, P. S., and Borys, B. (1996). Two types of bureaucracy: Enabling and coercive. *Adm. Sci. Q.* 41, 61–89. doi: 10.2307/2393986

Aldoory, L. (2005). A (re) conceived feminist paradigm for public relations: A case for substantial improvement. *J. Commun.* 55, 668–684. doi: 10.1111/j.1460-2466.2005.tb03016.x

Bargh, J. A., and Chartrand, T. L. (1999). The unbearable automaticity of being. *Am. Psychol.* 54, 462–479. doi: 10.1037/0003-066X.54.7.462

Barling, J., and Frone, M. R. (2017). If only my leader would just do something! Passive leadership undermines employee well-being through role stressors and psychological resource depletion. *Stress Health* 33, 211–222. doi: 10.1002/smi.2697

Barnes, N. G., and Lescault, A. M. (2014). *The 2014 Fortune 500 and Social Media: LinkedIn Dominates as Use of Newer Tools Explodes. US*. Retrieved from: http://www.umassd.edu/cmr/socialmediaresearch/2014fortune500/ (accessed June 12, 2017).

Bass, B. M., and Avolio, B. J. (1990). *Transformational Leadership Development: Manual for the Multifactor Leadership Questionnaire*. Palo Alto, CA: Consulting Psychologists Press.

Bolino, M. C., and Turnley, W. H. (2005). The personal costs of citizenship behavior: The relationship between individual initiative and role overload, job stress, and work-family conflict. *J. Appl. Psychol.* 90, 740–748. doi: 10.1037/0021-9010.90.4.740

Bonanno, G. A. (2005). Resilience in the face of potential trauma. *Curr. Dir. Psychol. Sci.* 14, 135–138. doi: 10.1111/j.0963-7214.2005.00347.x

Breaugh, J. A. (1985). The measurement of work autonomy. *Hum. Relat.* 38, 551–570. doi: 10.1177/001872678503800604

Brown, S. P., Jones, E., and Leigh, T. W. (2005). The attenuating effect of role overload on relationships linking self-efficacy and goal level to work performance. *J. Appl. Psychol.* 90, 972–979. doi: 10.1037/0021-9010.90.5.972

Buch, R., Kuvaas, B., Dysvik, A., and Schyns, B. (2014). If and when social and economic leader-member exchange relationships predict follower work effort. *Leadership Organization Dev. J.* 35, 725–739. doi: 10.1108/LODJ-09-2012-0121

Buch, R., Martinsen, Ø. L., and Kuvaas, B. (2015). The destructiveness of laissez-faire leadership behavior: The mediating role of economic leader-member exchange relationships. *J. Leadership Organizational Stud.* 22, 115–124. doi: 10.1177/1548051813515302

Carucci, R. (2017). *How Corporate Values Get Hijacked and Misused*. Available online at: https://hbr.org/2017/05/how-corporate-values-get-hijacked-and-misused (accessed October, 2019).

Chin, W. W., Thatcher, J. B., and Wright, R. T. (2012). Assessing common method bias: Problems with the ULMC technique. *MIS Q.* 36, 1003–1019. doi: 10.2307/41703491

Chiu, S.-F., Yeh, S.-P., and Huang, T. C. (2015). Role stressors and employee deviance: the moderating effect of social support. *Personnel Rev.* 44, 308–324. doi: 10.1108/PR-11-2012-0191

Christie, A. M., and Barling, J. (2009). Disentangling the indirect links between socioeconomic status and health: The dynamic roles of work stressors and personal control. *J. Appl. Psychol.* 94, 1466–1478. doi: 10.1037/a0016847

Clement, J. (2019). *Most Popular Social Networks Used by Inc. 500 Companies in 2017*. Available online at: https://www.statista.com/statistics/626872/fortune-500-corporate-social-media-usage/ (accessed October, 2019).

Crawford, E. R., LePine, J. A., and Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: a theoretical extension and meta-analytic test. *J. Appl. Psychol.* 95, 834–848. doi: 10.1037/a0019364

Derue, D. S., Nahrgang, J. D., Wellman, N., and Humphrey, S. E. (2011). Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Pers. Psychol.* 64, 7–52. doi: 10.1111/j.1744-6570.2010.01201.x

Dierdorff, E. C., and Morgeson, F. P. (2007). Consensus in work role requirements: the influence of discrete occupational context on role expectations. *J. Appl. Psychol.* 92, 1228–1241. doi: 10.1037/0021-9010.92.5.1228

Einarsen, S., Aasland, M. S., and Skogstad, A. (2007). Destructive leadership behaviour: A definition and conceptual model. *Leadersh. Q.* 18, 207–216. doi: 10.1016/j.leaqua.2007.03.002

Eisenbeiß, S. A., and Brodbeck, F. (2014). Ethical and unethical leadership: A cross-cultural and cross-sectoral analysis. *J. Business Ethics* 122, 343–359. doi: 10.1007/s10551-013-1740-0

Ekinci, Y., and Dawes, P. L. (2009). Consumer perceptions of frontline service employee personality traits, interaction quality, and consumer satisfaction. *Service Indust. J.* 29, 503–521. doi: 10.1080/02642060802283113

Erez, A., and Isen, A. M. (2002). The influence of positive affect on the components of expectancy motivation. *J. Appl. Psychol.* 87, 1055–1067. doi: 10.1037/0021-9010.87.6.1055

Fuller, J. B., Hester, K., and Cox, S. S. (2010). Proactive personality and job performance: Exploring job autonomy as a moderator. *J. Manage. Issues* 22, 35–51.

Goussinsky, R. (2011). Customer aggression, emotional dissonance and employees' well-being. *Int. J. Q. Serv. Sci.* 3, 248–266. doi: 10.1108/17566691111182825

Grandey, A. A. (2000). Emotional regulation in the workplace: A new way to conceptualize emotional labor. *J. Occup. Health Psychol.* 5, 95–110. doi: 10.1037/1076-8998.5.1.95

Grandey, A. A., Fisk, G. M., Mattila, A. S., Jansen, K. J., and Sideman, L. A. (2005). Is service with a smile enough? Authenticity of positive displays during service encounters. *Organizational Behav. Human Decision Process.* 96, 38–55. doi: 10.1016/j.obhdp.2004.08.002

Grotberg, E. H. (2003). *Resilience for Today: Gaining Strength from Adversity*. Westport, CT: Greenwood Publishing Group.

Gurbuz, S., Turunc, O., and Celik, M. (2013). The impact of perceived organizational support on work-family conflict: Does role overload have a mediating role? *Econ. Indust. Democracy* 34, 145–160. doi: 10.1177/0143831X12438234

Hair, J. F., Hult, G. T. M., Ringle, C., and Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) (Second Edition ed.)*. Los Angeles, CA: SAGE Publications, Inc.

Hamidifar, F. (2014). A study of the relationship between leadership styles and employee job satisfaction at IAU in Tehran, Iran. *AU-GSB E-JOURNAL*, 3, 45–58.

Handley, I. M., Lassiter, G. D., Nickell, E. F., and Herchenroeder, L. M. (2004). Affect and automatic mood maintenance. *J. Exp. Soc. Psychol.* 40, 106–112. doi: 10.1016/S0022-1031(03)00086-6

Harold, C. M., and Holtz, B. C. (2015). The effects of passive leadership on workplace incivility. *J. Organ. Behav.* 36, 16–38. doi: 10.1002/job.1926

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. New York, NY: The Guilford Press.

Heinonen, A. (2011). The journalist's relationship with users. *Particip. J.* 2, 34–55. doi: 10.1002/9781444340747.ch3

Henseler, J., Hubona, G., and Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Indust. Manage. Data Syst.* 116, 2–20. doi: 10.1108/IMDS-09-2015-0382

Hermida, A., Fletcher, F., Korell, D., and Logan, D. (2012). Share, like, recommend: Decoding the social media news consumer. *J. Stud.* 13, 815–824. doi: 10.1080/1461670X.2012.664430

Hinkin, T. R., and Schriesheim, C. A. (2008). An examination of nonleadership: From laissez-faire leadership to leader reward omission and punishment omission. *J. Appl. Psychol.* 93, 1234–1248. doi: 10.1037/a0012875

Hobfoll, S. E. (1988). *The Ecology of Stress*. New York, NY: Taylor & Francis.

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Appl. Psychol.* 50, 337–421. doi: 10.1111/1464-0597.00062

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Rev. Gene. Psychol.* 6, 307–324. doi: 10.1037/1089-2680.6.4.307

Hobfoll, S. E. (2011). Conservation of resource caravans and engaged settings. *J. Occup. Organ. Psychol.* 84, 116–122. doi: 10.1111/j.2044-8325.2010.02016.x

Hochschild, A. R. (2012). *The Managed Heart: Commercialization of Human Feeling*. California, CA: Univ of California Press. doi: 10.1525/9780520951853

Holman, D., Chissick, C., and Totterdell, P. (2002). The effects of performance monitoring on emotional labor and well-being in call centers. *Motiv. Emot.* 26, 57–81. doi: 10.1023/A:1015194108376

Holtz, B. C., and Hu, B. (2017). Passive leadership: Relationships with trust and justice perceptions. *J. Manag. Psychol.* 32, 119–130. doi: 10.1108/JMP-02-2016-0029

Idaszak, J. R., and Drasgow, F. (1987). A revision of the job diagnostic survey: elimination of a measurement artifact. *J. Appl. Psychol.* 72, 69–74. doi: 10.1037/0021-9010.72.1.69

Ilies, R., Morgeson, F. P., and Nahrgang, J. D. (2005). Authentic leadership and eudaemonic well-being: Understanding leader-follower outcomes. *Leadersh. Q.* 16, 373–394. doi: 10.1016/j.leaqua.2005.03.002

Isen, A. M., and Diamond, G. A. (1989). "Affect and automaticity," in *Unintended Thought,* eds J. S. Uleman and J. A. Bargh (New York, NY: Guilford Press).

Itani, O. S., and Inyang, A. E. (2015). The effects of empathy and listening of salespeople on relationship quality in the retail banking industry. *Int. J. Bank Market.* 33, 692–716. doi: 10.1108/IJBM-06-2014-0076

Jackson, T. A., Meyer, J. P., and Wang, X.-H. (2013). Leadership, commitment, and culture: A meta-analysis. *J. Leadership Organizational Stud.* 20, 84–106. doi: 10.1177/1548051812466919

Jensen, J. M., Patel, P. C., and Messersmith, J. G. (2013). High-performance work systems and job control: Consequences for anxiety, role overload, and turnover intentions. *J. Manage.* 39, 1699–1724. doi: 10.1177/0149206311419663

Jha, S., Balaji, M., Yavas, U., and Babakus, E. (2017). Effects of frontline employee role overload on customer responses and sales performance. *Eur. J. Mark.* 51, 282–303. doi: 10.1108/EJM-01-2015-0009

Judge, T. A., and Piccolo, R. F. (2004). Transformational and transactional leadership: A meta-analytic test of their relative validity. *J. Appl. Psychol.* 89, 755–768. doi: 10.1037/0021-9010.89.5.755

Karatepe, O. M., Yavas, U., and Babakus, E. (2005). Measuring service quality of banks: Scale development and validation. *J. Retail. Consumer Serv.* 12, 373–383. doi: 10.1016/j.jretconser.2005.01.001

Kelloway, E. K., Mullen, J., and Francis, L. (2006). Divergent effects of transformational and passive leadership on employee safety. *J. Occup. Health Psychol.* 11, 76–86. doi: 10.1037/1076-8998.11.1.76

Kenney, K., Gorelik, A., and Mwangi, S. (2000). Interactive features of online newspapers. First *Monday* 5:720. doi: 10.5210/fm.v5i1.720

Kenski, K., and Stroud, N. J. (2006). Connections between Internet use and political efficacy, knowledge, and participation. *J. Broadcast. Electron. Media* 50, 173–192. doi: 10.1207/s15506878jobem5002_1

L'Etang, J., and Pieczka, M. (2006). *Public Relations: Critical Debates and Contemporary Practice*. Oxfordshire: Routledge.

Lin, H.-F. (2006). Understanding behavioral intention to participate in virtual communities. *CyberPsychol. Behav.* 9, 540–547. doi: 10.1089/cpb.2006.9.540

Liu, D., Zhang, S., Wang, L., and Lee, T. W. (2011). The effects of autonomy and empowerment on employee turnover: Test of a multilevel model in teams. *J. Appl. Psychol.* 96, 1305–1316. doi: 10.1037/a0024518

Liu, G. H., and Chua, C. E. (2020). The reinforcing effects of formal control enactment in complex IT projects. *J. Assoc. Inform. Syst.* 21, 312–340. doi: 10.17705/1jais.00603

Liu, Y. (2003). Developing a scale to measure the interactivity of websites. *J. Advert. Res.* 43, 207–216. doi: 10.2501/JAR-43-2-207-216

Llopis, O., and Foss, N. J. (2016). Understanding the climate-knowledge sharing relation: The moderating roles of intrinsic motivation and job autonomy. *Eur. Manage. J.* 34, 135–144. doi: 10.1016/j.emj.2015.11.009

Luthar, S. S., Cicchetti, D., and Becker, B. (2000). Research on resilience: Response to commentaries. *Child Dev.* 71, 573–575. doi: 10.1111/1467-8624.00168

Majchrzak, A., Faraj, S., Kane, G. C., and Azad, B. (2013). The contradictory influence of social media affordances on online communal knowledge sharing. *J. Comp. Media. Commun.* 19, 38–55. doi: 10.1111/jcc4.12030

Martinko, M. J., Harvey, P., Brees, J. R., and Mackey, J. (2013). A review of abusive supervision research. *J. Organ. Behav.* 34, S120–S137. doi: 10.1002/job.1888

Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *Am. Psychol.* 56, 227–238. doi: 10.1037/0003-066X.56.3.227

Masten, A. S., Best, K. M., and Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Dev. Psychopathol.* 2, 425–444. doi: 10.1017/S0954579400005812

May, D. R., Gilson, R. L., and Harter, L. M. (2004). The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *J. Occup. Organ. Psychol.* 77, 11–37. doi: 10.1348/096317904322915892

Mitchell, A., Kiley, J., Gottfried, J., and Guskin, E. (2013). *The Role of News on Facebook*. Available online at: https://www.journalism.org/2013/10/24/the-role-of-news-on-facebook/ (accessed October, 2019).

Morgeson, F. P., Delaney-Klinger, K., and Hemingway, M. A. (2005). The importance of job autonomy, cognitive ability, and job-related skill for predicting role breadth and job performance. *J. Appl. Psychol.* 90:399. doi: 10.1037/0021-9010.90.2.399

Mourlane, D. (2020). *Resilienz: die unentdeckte Fähigkeit der wirklich Erfolgreichen*. Dubai: Business Village.

Mulki, J. P., Jaramillo, F., and Locander, W. B. (2006). Emotional exhaustion and organizational deviance: Can the right job and a leader's style make a difference? *J. Bus. Res.* 59, 1222–1230. doi: 10.1016/j.jbusres.2006.09.001

Mulki, J. P., Lassk, F. G., and Jaramillo, F. (2008). The effect of self-efficacy on salesperson work overload and pay satisfaction. *J. Personal Sell. Sales Manage.* 28, 285–297. doi: 10.2753/PSS0885-3134280305

Narayanan, L., Menon, S., and Spector, P. (1999). A cross-cultural comparison of job stressors and reactions among employees holding comparable jobs in two countries. *Int. J. Stress Manag.* 6, 197–212. doi: 10.1023/A:1021986709317

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., and Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *Am. J. Community Psychol.* 41, 127–150. doi: 10.1007/s10464-007-9156-6

Pee, L. G., and Lee, J. (2015). Intrinsically motivating employees' online knowledge sharing: Understanding the effects of job design. *Int. J. Inf. Manage.* 35, 679–690. doi: 10.1016/j.ijinfomgt.2015.08.002

PewResearchCenter (2010). *Understanding the Participatory News Consumer*. Available online at: https://www.journalism.org/2010/03/01/understanding-participatory-news-consumer/ (accessed October, 2019).

Phillips, D., and Young, P. (2009). *Online Public Relations: A Rractical Guide to Developing an Online Strategy in the World of Social Media*. London: Kogan Page Publishers.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Powers, E. (2015). *The Rise of the Engagement Editor and What it Means. Media Shift*. Available online at: http://mediashift.org/2015/08/the-rise-of-the-engagement-editor-and-what-it-means/ (accessed October 20, 2019).

Preacher, K. J., and Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behav. Res. Methods* 36, 717–731. doi: 10.3758/BF03206553

Preacher, K. J., and Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* 40, 879–891. doi: 10.3758/BRM.40.3.879

Robertson, I. T., Cooper, C. L., Sarkar, M., and Curran, T. (2015). Resilience training in the workplace from 2003 to 2014: A systematic review. *J. Occup. Organ. Psychol.* 88, 533–562. doi: 10.1111/joop.12120

Rodell, J. B., and Judge, T. A. (2009). Can good stressors spark bad behaviors? The mediating role of emotions in links of challenge and hindrance stressors with citizenship and counterproductive behaviors. *J. Appl. Psychol.* 94, 1438–1451. doi: 10.1037/a0016752

Skogstad, A., Einarsen, S., Torsheim, T., Aasland, M. S., and Hetland, H. (2007). The destructiveness of laissez-faire leadership behavior. *J. Occup. Health Psychol.* 12:80. doi: 10.1037/1076-8998.12.1.80

Skogstad, A., Hetland, J., Glas,ø, L., and Einarsen, S. (2014). Is avoidant leadership a root cause of subordinate stress? Longitudinal relationships between laissez-faire leadership and role ambiguity. *Work Stress* 28, 323–341. doi: 10.1080/02678373.2014.957362

Sonnenfeld, J., and Ward, A. (2008). Firing back: How great leaders rebound after career disasters. *Organ. Dyn.* 21, 1477–7282. doi: 10.1108/dlo.2007.08121ead.002

Southwick, F. S., Martini, B. L., Charney, D. S., and Southwick, S. M. (2017). "Leadership and resilience," in *Leadership Today*, eds J. Marques and S. Dhiman (New York, NY: Springer), 315–333. doi: 10.1007/978-3-319-31036-7_18

Stephens, J. P., Heaphy, E. D., Carmeli, A., Spreitzer, G. M., and Dutton, J. E. (2013). Relationship quality and virtuousness: Emotional carrying capacity

as a source of individual and team resilience. *J. Appl. Behav. Sci.* 49, 13–41. doi: 10.1177/0021886312471193

Sun, H. (2012). Understanding user revisions when using information system features: Adaptive system use and triggers. *MIS Q.* 36, 453–478. doi: 10.2307/41703463

Troyer, L., Mueller, C. W., and Osinsky, P. I. (2000). Who's the boss? A role-theoretic analysis of customer work. *Work Occupations* 27, 406–427. doi: 10.1177/0730888400027003007

Tugade, M. M., and Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *J. Personal. Soc. Psychol.* 86, 320–333. doi: 10.1037/0022-3514.86.2.320

Ungar, M. (2004). *Nurturing Hidden Resilience in Troubled Youth*. Toronto, ON: University of Toronto Press. doi: 10.3138/9781442677975

Vullinghs, J. T., De Hoogh, A. H., Den Hartog, D. N., and Boon, C. (2018). Ethical and passive leadership and their joint relationships with burnout via role clarity and role overload. *J. Business Ethics* 165, 719–733. doi: 10.1007/s10551-018-4084-y

Wang, C. H., Liu, G. H. W., Lee, N. C. A., and Chen, K. C. (2019). "Passive leadership and online interaction: the mediating effects of job autonomy and employee resilience," in *The 23rd Pacific Asia Conference on IS* (Xi'an).

Welbourne, T. M., Johnson, D. E., and Erez, A. (1998). The role-based performance scale: Validity analysis of a theory-based measure. *Acad. Manage. J.* 41, 540–555. doi: 10.2307/256941

Yang, Y., Lee, P. K., and Cheng, T. (2015). Operational improvement competence and service recovery performance: The moderating effects of role stress and job resources. *Int. J. Product. Econ.* 164, 134–145. doi: 10.1016/j.ijpe.2015.03.014

Yoo, J., and Arnold, T. J. (2016). Frontline employee customer-oriented attitude in the presence of job demands and resources: The influence upon deep and surface acting. *J. Serv. Res.* 19, 102–117. doi: 10.1177/1094670515589956

Zhao, X., Lynch, J. G., and Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *J. Consumer Res.* 37, 197–206. doi: 10.1086/651257

Zineldin, M., and Hytter, A. (2012). Leaders' negative emotions and leadership styles influencing subordinates' well-being. *Int. J. Human Res. Manage.* 23, 748–758. doi: 10.1080/09585192.2011.606114

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APPENDIX A. MEASUREMENT ITEMS

Constructs	Measurement items	References
Passive leadership	My supervisor… 1 Spends his/her time trying to 'put out fires'. 2 Fails to intervene until problems become serious. 3 Fails to follow-up requests for assistance. • *Makes clear what I can expect to receive, if my performance meets designated standards. (deleted).*	Kelloway et al., 2006
Job autonomy	1 I am free to decide how to go about getting my work done. 2 I am able to decide for myself what my objectives are. 3 I am able to affect other people's evaluation on me, so that I know how to emphasize the importance of myself. • *I am able to decide for myself when to do my work. (deleted.)*	Breaugh, 1985
Role overload	1 The amount of work I am expected to do is too great. 2 I never seem to have enough time to get everything done at work. 3 It often seems like I have too much work for one person to do.	Bolino and Turnley, 2005
Resilience	1 I am getting better at my work because I learn from my mistakes. 2 I see challenges as an opportunity to learn. 3 I find ways to handle unexpected situations. • *Dealing with difficult colleagues (or situations) enables me to grow. (deleted).*	Stephens et al., 2013
Online interaction with fans and followers	1 Our fan page is effective in gathering visitors' feedback. 2 Our fan page facilitates two-way communication between itself and the visitors. 3 Our fan page listens to visitors. 4 Our fan page gives visitors the opportunity to talk back.	Liu, 2003

APPENDIX B. CROSS LOADINGS

	Passive leadership (PL)	Job autonomy (JA)	Role overload (RO)	Resilience (RE)	Online interaction with fans and followers (OI)
PL1	**0.92**	−0.08	0.38	−0.21	−0.35
PL2	**0.93**	−0.08	0.38	−0.17	−0.34
PL3	**0.89**	−0.23	0.45	−0.23	−0.31
JA1	−0.17	**0.74**	−0.23	0.18	0.05
JA2	−0.25	**0.82**	−0.22	0.41	0.08
JA3	0.02	**0.82**	−0.02	0.37	0.09
RO1	0.42	−0.17	**0.88**	−0.01	−0.17
RO2	0.35	−0.14	**0.84**	0.07	−0.05
RO3	0.39	−0.14	**0.91**	0.08	−0.24
RE1	−0.22	0.41	−0.09	**0.6**	0.13
RE2	−0.19	0.27	0.04	**0.78**	0.3
RE3	−0.12	0.31	0.13	**0.84**	0.24
OI1	−0.31	0.03	−0.2	0.23	**0.83**
OI2	−0.25	0.05	−0.08	0.21	**0.84**
OI3	−0.33	0.09	−0.14	0.32	**0.85**
OI4	−0.27	0.18	−0.19	0.22	**0.73**

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Emotional Intelligence and Well-Being of Special Education Teachers in China: The Mediating Role of Work-Engagement

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The well-being of special education teachers is key to their mental health and also influences the development of their students. This study aimed to investigate the psychological mechanism of the well-being of special education teachers in China, where they are maximum in number. We explored the role of emotional intelligence (EI) and work engagement on the well-being of teachers. A total of 496 Chinese special education teachers participated in the current study. Results suggested that (1) the EI and work engagement were positively associated with the well-being of special education teachers; and that (2) work engagement played a mediating role on EI and well-being of special education teachers. To promote the well-being of special education teachers, suggestions for policymakers and schools are discussed.

Keywords: well-being, special education teachers, work engagement, emotional intelligence, China

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INSTRUCTION

Teaching is a highly emotional profession associated with high levels of stress that may be the cause of job dissatisfaction, psychological disorders, and reduced well-being (Chang, 2009; Brackett et al., 2010; Keller et al., 2014). Teachers frequently have to cope with stressful situations that can affect their well-being at work. Well-being is an important factor to reduce the intention of teachers to leave the career (Li, 2013), which affects the level of mental health, job performance, and professional identity of special education teachers (Ma and Deng, 2019; Wang, 2017), and therefore it has become an important reference for measuring the stability of the teaching team to a certain extent and has become an important part of professional development of teachers (Holmes, 2005; Lam, 2019). Besides, the level of well-being of the teachers within schools has been found to be linked to pupil performance (Briner and Dewberry, 2007), which implies that improving well-being among employees has benefits not only for the employees themselves, but also for the success of the organization (Giorgi et al., 2011).

Special education teachers face greater professional pressure in teaching (Major, 2012; Shyman, 2011), especially for those in China, working in the special education schools that have a separate curricular standard, evaluation, administration, and so on (Fu et al., 2019). Although influenced by the philosophy of inclusive education from the western countries, special education schools are still the main educational places for children with disabilities in China. There were 2,192 special

education schools in China in 2019, where 28.87% of students with disabilities were studying and 62,400 special education teachers were teaching (The Ministry of Education of China, 2020). An empirical study shows that Chinese special education teachers experience lower professional well-being than the regular school teachers (Zhao and Huang, 2015). It has been found that 25.63% of the special education teachers in China are having psychological problems, which is not only higher than that for general teachers in primary and secondary schools, but also much higher than that for the normal population of 5% (Tian et al., 2009). Furthermore, the psychological problems of special education teachers contribute to their higher job burnout and lower well-being (Zhang and Wei, 2014). Aiming to improve the quality of special education, the Chinese government has attached an increasing importance to the development of special education teachers and has issued a series of important policy documents to improve the positive professional experience of teachers, and ultimately benefited students with special needs in the last decade. Therefore, exploring the well-being of special education teachers in China with the largest special education system and analyzing the influence paths will help the government and the society to take measures needed to improve the well-being of special education teachers and contribute to the policy.

The Impact of Emotional Intelligence on the Well-Being of Teachers

Emotional intelligence (EI) is the ability of an individual to identify her/his own emotions and emotions of others, and thus to form a favorable relationship with others (Salovey and Mayer, 1990). Based on the Conservation of Resources (COR) Theory (Hobfoll, 1989, 2001), EI can be regarded as an internal (emotional) resource, which could effectively explain the asymmetric relationship between EI and its outcome variables (Liao and Yan, 2014). Teachers experience a wide range of positive and negative emotions when teaching students (Brackett and Katulak, 2006). The nature of their job requires dealing with their own emotions as well as that of students, parents, colleagues, and administrators. EI has been seen as an important factor within the teaching profession and some relevant evidence have shown that the EI trait is likely to be one of the personality characteristics that possibly affect the experience of burnout and job satisfaction in teachers (e.g., Chan, 2004, 2006), while some other studies in the literature have shown that EI is a major resource for teaching professionals due to its associations with burnout and psychological distress (Mérida-López and Extremera, 2017; Mérida-López et al., 2017). In fact, EI is increasingly playing a crucial role in the occupational health models of teachers (Taris et al., 2017), which is related to higher satisfaction with life (Landa et al., 2006), increased teaching satisfaction (Yin et al., 2013), and more positive attitudes toward teaching (Mérida-López and Extremera, 2017).

Every day, special education teachers at work must apply their EI to interpret situational cues and decide how best to feel and respond. EI can help to change the attitudes and behaviors of employees at work, thereby increasing job satisfaction (Lee and Ok, 2012). Special education teachers with high-perceived EI are likely to experience less burnout, and thus greatly improve their job-related well-being (Li, 2016).

The Relationship Between Work Engagement and the Well-Being of Teachers

Work engagement is a positive affective–emotional state and sense of accomplishment that includes three dimensions: vigor, dedication, and absorption (Schaufeli and Bakker, 2010). Work engagement has been frequently studied through the job demands–resources model developed by Bakker and Demerouti (2007), and becomes essential when studying subjective well-being at work (Bakker and Oerlemans, 2011). There are many advantages to people who have high level of work engagement. Engaged teachers are believed to be less prone to burnout and associated health problems (Hakanen et al., 2006), thus linking level of engagement inversely with teacher attrition. Simply put, engaged teachers are less likely to quit the profession or require expensive support for health-related problems. Developing a better understanding of the engagement of teachers at work may lead to insight into ways to enhance the well-being of teachers and to build the effectiveness of teachers in the classroom.

Previous studies indicated that well-being and work engagement are positively associated, and they impacted each other (Shimazu and Schaufeli, 2009; Shimazu et al., 2012; Upadyaya and Salmela-Aro, 2013). Special education teachers face high stress due to the limitations of students in the development of intellectual, physical, social, and emotional aspects resulting in their slow progress, while parents demanded quick results (Lestari and Sawitri, 2017). Besides the influence of students, special education teachers in China who lack practical training and professional skills, working in schools with high student–faculty ratios and insufficient facilities (Lai et al., 2016), are in severe stress. Heavy workload can make special education teachers unenergetic and not enjoy their job, which indicates a low work engagement (Chen et al., 2010). It has been demonstrated that there is a positive relationship between work engagement and well-being of general teachers (Klassen et al., 2012), while a few scholars have explored this key topic regarding special education teachers.

The Impact of Work Engagement Between EI and Well-Being

Consistent with the JD–R model, social and personal resources such as EI would moderate the associations between job demands and organizational outcomes. Accordingly, EI as a personal resource might energize employees, encourage their persistence, and make them focus on their efforts. In other words, these emotional resources might foster engagement in terms of vigor (energy), dedication (persistence), and absorption (focus) (Demerouti et al., 2001; Extremera et al., 2012; Bakker et al., 2014). Positive links between EI and teacher engagement have been consistently reported (Pena et al., 2012). EI is considered as an antecedent of work engagement (Bakker et al., 2014). The EI of special education teachers has a significant positive predictive

effectiveness for work engagement (Li, 2016). Besides, research finds that positive EI can enhance well-being by increasing the work engagement of teachers (Brunetto et al., 2012; Bermejo-Toro et al., 2016).

Despite the progress in recent research with regard to measuring the well-being of special education teachers and exploring the relationship among the EI, work engagement, and well-being of special education teachers, some literature gaps still exist. First, the investigation of well-being of special education teachers in developing countries is limited. China, with more than 58,000 special education teachers, is a natural laboratory for conducting preliminary research on the well-being of special education teachers, which may contribute to the international research on the topic. Second, although there is some literature on the relationship between the EI and well-being with regard to the special education teachers, there have been only a few attempts to examine the interrelationship among the EI, work engagement, and well-being of special education teachers.

To address these gaps, in the present study we explored the level of well-being of Chinese special education teachers and the relationship of EI, work engagement, and well-being, especially the effect of work engagement between EI and well-being. Based on the conceptual framework and the empirical evidence collected in the literature review, three hypotheses are proposed to be tested with our survey data.

H1: EI has a positive effect on the well-being of Chinese special education teachers.

H2: Work engagement has a positive impact on the well-being of special education teachers in China.

H3: Work engagement plays a mediating role on the relationship between EI of Chinese special education teachers and their well-being.

MATERIALS AND METHODS

Participants and Procedure

Data were collected online though questionnaires from 67 special education schools in five provinces in Mainland China. Participants were eliminated according to the criteria that the same number of questionnaires were more than 90%. A total of 496 valid questionnaires were collected, with a recovery rate of 97.64%.

Measures

Emotional Intelligence Scale

This study adopted the EI scale compiled by Wong and Law (2002). The scale consists of 12 items (e.g., "I have a good understanding of my emotions." and "I really understand how I feel.") on a 5-point Likert-type scale, from "totally inconsistent" to "very consistent." The higher the score, the higher the EI.

Work Engagement Scale

The UWES Work Engagement Scale developed by Schaufeli et al. (2002a,b), was used in this study. The Chinese version was revised by Zhang and Gan (2005). It contains tripartite: vitality (six items), dedication (five items), and focus (six items). It requires respondents to use a 5-point Likert scale to evaluate the extent to which they experience these feelings, from "totally inconsistent" to "very consistent." The higher the score, the higher the level of work input.

General Well-Being Scale

The scale is a formulaic test tool developed by the National Center for Health Statistics to evaluate the statements of happiness by the subjects. The scale was revised by Duan (1996). The revised scale has 18 items, including six factors: worry about health, energy, satisfaction and interest in life, melancholy or happy mood, control of emotion and behavior, relaxation, and tension. It requires respondents to use a 5-point Likert scale to evaluate the extent to which they experience these feelings, from "totally inconsistent" to "very consistent." There are nine questions in the reverse scorecard. The higher the score, the higher the general well-being.

Data Analysis

In the analysis, the valid sample size is 496. EI, work engagement, and overall well-being were the observed variables. The standard score of each dimension was taken as the value of each observation variable. To test whether work engagement plays a mediating role in EI and general well-being, the mediation model was applied using the PROCESS SPSS computing tool.

RESULTS

Descriptive Statistics

The sample consisted of 78.23% women and 21.77% men. There were 22.18% of the sample of low teaching experience—up to 3 years of teaching, 12.5% of the participants with 3–5 years of teaching experience, and 16.33% of the respondents having 6–10 years of teaching experience, and the rest (48.99%) have the high teaching experience—more than 10 years of teaching.

The reliability of the questionnaire is calculated using the Cronbach alpha coefficient. Confirmatory factor analysis was conducted to test item factor loading. The reliability and factor-loading range of each questionnaire are shown in **Table 1**.

Correlations Among EI, Work Engagement, and General Well-Being

The study also investigated the relationship among all variables. To this aim, Kendall's tau-b correlation

TABLE 1 | Questionnaire reliability and factor loading.

Variable	Cronbach's alpha	Factor loading
Emotional intelligence	0.945	0.694–0.815
Work engagement	0.956	0.634–0.848
General well-being	0.858	0.369–0.796

TABLE 2 | Variables descriptive and correlative statistics.

Variable	$M \pm SD$	1	2	3
Emotional intelligence	45.81 ± 7.13	1		
Work engagement	62.92 ± 11.68	0.52**	1	
General well-being	75.57 ± 13.54	0.30**	0.31**	1

**$p < 0.01$.

TABLE 3 | Confirmatory factor analysis of each scale.

CFA	CFI	TLI	RMSE	SRMR
Work engagement	0.92	0.91	0.09	0.05
General well-being	0.83	0.79	0.09	0.06
Emotional intelligence	Just identified			

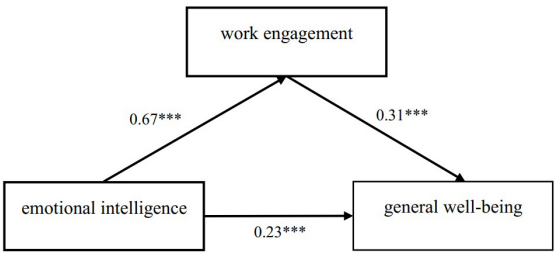

FIGURE 1 | Work engagement as a mediator between emotional intelligence and general well-being. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

coefficient measure was conducted on EI, work engagement, and general well-being responses. Variables with descriptive and correlation statistics are presented in **Table 2**.

As **Table 2** indicates, there were positive correlation coefficients between EI, work engagement, and general well-being. EI was significantly associated with work engagement ($r = 0.52$, $p < 0.01$) and general well-being ($r = 0.30$, $p < 0.01$). Meanwhile, work engagement was significantly associated with general well-being ($r = 0.31$, $p < 0.01$). Therefore, it can be inferred that the higher the EI or the work engagement, the higher the general well-being.

The Mediation Effect of Work Engagement

Confirmatory factor analysis was conducted to test the latent structure of each scale. As show in **Table 3**, all single-factor models achieved the acceptable model fit.

Then Structural Equation Model was conducted to explore the role of EI and work engagement on general well-being. The model shows that work engagement mediates the influence of EI on general well-being (see **Figure 1**).

The standard score of each dimension is taken as the value of each observation variable. We tested whether work engagement plays a mediating role in EI and general well-being (see **Table 4**). The result showed that the model had a direct role on the influence of EI on general well-being, and an indirect path from EI to work engagement, and then from work engagement to general well-being. The total effect = 0.44, the direct effect = 0.23, the indirect effect = 0.21, and 95% percentile bootstrap confidence intervals = (0.12, 0.29); this interval does not include 0, indicating that the mediating effect is significant.

DISCUSSION

The study was carried out in a sample of Chinese special education teachers to explore the influencing factors of their well-being and understanding the roles of EI and work engagement.

Correlation analyses confirmed that there is a positive correlation between EI, work engagement, and general well-being. The positive association between EI and work engagement of special education teachers is consistent with previous studies by Lestari and Sawitri (2017) and Li (2016). Those studies about special education teachers indicated that high spirit and work engagement of teachers are directed by their high EI. For special education teachers reported high scores in EI, they perceived themselves as doing well in managing self-relevant information, in regulating optimism/mood, and in repairing emotions by themselves, and also as doing moderately well in managing emotions of others (Platsidou, 2010), who would control themselves at work better and experience less distress (Nikolaou and Tsaousis, 2002). A high-trait EI is important in facilities work engagement and promoting professionals' well-being. People with EI have motivation and experience positive emotions by cleverly managing their emotions. The experience of positive emotion with resilience can help special education teachers to be more involved in their work. That it EI of special education teachers contribute to their work engagement. High work engagement is shown by persistent efforts of teachers in finding teaching methods for students, a sense of pride in their work, and passion to help the students. In addition, to teach students with basic instruction, students also need to be guided to develop their talents. Special education teachers of high EI desire to help children with special needs so they can be independent and also empathize with the children, where they understand the difficulties of the students. In addition, they can also face and deal with misbehavior of children that may be impolite, and avoid negative feelings. Thus, special education teachers with a high EI can transmit their confidence to work enthusiastically and bond with their work.

Second, we found that the EI of teachers has an affirmative effect on their well-being. That is, Chinese special education teachers with a high ability of emotion perception have a higher experience of subjective well-being. It is in line with and strengthens further the results obtained among teachers by Tan (2019) and Blasco-Belled et al. (2020). The studies showed that the ability to perceive, understand, and regulate one's own emotions and that of others is necessary to develop in order to achieve better emotional and personal well-being. That is high levels of EI resulting in greater well-being (Fernández-Berrocal et al., 2017). For this reason, enhancing

TABLE 4 | Mediation analyses on emotional intelligence and general well-being (5000 bootstraps).

Independent variable (IV)	Dependent variable (DV)	Mediator (M)	Effect of IV on M		Effect of M on DV		Effect of IV on DV		Direct effect		Indirect effect		Total effect	
			Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	95% CI	Coefficient	SE
Emotional intelligence	General well-being	Work engagement	0.67***	0.03	0.31***	0.05	0.23***	0.05	0.23***	0.05	0.21***	0.12, 0.29	0.44***	0.04

***$p < 0.001$.

individual EI will promote social–emotion competence and well-being. EI may act to influence or moderate how individuals monitor and display their emotions. Especially mood repair is a positive predictor for well-being. Austin et al. (2008) suggested that individuals with high EI are less likely to express superficial emotions merely because it is expected of them, but instead they channel them appropriately and express them overtly. For the special education teachers, EI is a kind of emotion regulation benefit to their well-being. The ability to regulate or manage one's emotions and to express them in a manner that suits specific situations is a kind of strategy to handle with their work stress and interpersonal adaptation. Teachers of that ability are likely to experience higher well-being. Chinese special education teachers with high EI can perceive some subtle emotions around well, and deal with the discomfort caused by negative emotions randomly. Special education highly demands teachers to cooperate with other stakeholders, including general education teachers, parents, school administrators, and others, which make the ability to understand others and reasoning accurately is critical. Besides, special education teachers may face various emotional distress by heavy work load and limited progress of students with disabilities (Fu et al., 2019), which requires them to have high skills to release their own negative emotions in a reasonable way to reduce their inner depression and improve their own happiness.

Pearson's correlation revealed that there is a positive correlation between work engagement and subjective well-being of special education teachers. The positive correlation between work engagement and well-being is consistent with previous studies about special education by Fu et al. (2020). The higher the work engagement is, the higher the subjective well-being would be. When people are engaged in an activity whose task difficulty is equivalent to that of a skill, they should devote themselves to the activity and pay high attention to it, so as to achieve a kind of psychological experience when the activity and consciousness are fused, the sense of time disappears, and the state of selflessness is achieved. When an individual is in the process of work, the rich internal and external work resources can stimulate the positive working state of an individual and lead him to the psychological state of work engagement, which is conducive to the realization of work goals, and the individual can experience positive emotions and work satisfaction. The sense of mastery is a good experience for a happy life, which helps to improve the subjective well-being of individuals.

The regression analysis demonstrated that the levels of well-being were significantly predicted only by certain factors of work engagement. It is found that work engagement as an intermediary factor affects EI and well-being. That means the well-being of special education teachers can be influenced by work engagement through EI. Specifically, special teachers with a higher level of work engagement can make more frequent use of EI in their work, and maintain the satisfaction and happiness experience brought by mobilizing more psychological resources to manage and using their emotions. While special teachers with lower level of work engagement use less EI in their work, they experience

less happiness due to less sense of gain from work involvement and feelings of efficacy in dealing with emotional problems.

Practical Implication

First, take several measures to cultivate the EI ability of special education teachers. EI as a main protective factor of work engagement and well-being of special education teachers should be promoted. First, they have to master interpersonal communication skills to improve the ability of emotional perception and expression. The emotional expression of special education teachers not only has a great impact on their EI, but also has an important impact on students. Bad language habits will hinder the emotional cognition and experience of students, affect the interest of students in learning, and thus affect the teaching ability of teachers and classroom teaching effect. Therefore, special education teachers should reflect on the characteristics of their own emotional expression, appropriate use of action, expression vivid, accurate transmission of information to students, and effectively improve the ability of emotional control and use. Second, we should pay attention to empathy and improve the ability of emotional assessment and communication. Special education teachers have a high level of empathy, which is conducive to the positive emotional interaction between teachers and students, and deepens the emotional experience of each other, and promotes the smooth development of various educational and teaching works. Therefore, teachers should take the initiative to break the traditional concept of teacher–student hierarchy, establish a democratic and equal relationship between teachers and students, guide the emotional experience of students with personal emotional charm, at the same time, they should care about students, love students, learn to put themselves in the perspective of students to transpose thinking, understand students, patiently communicate and guide, nourish the heart of students with tolerance and understanding, and stimulate their enthusiasm and self-motivation, correct their deviation and misunderstanding. In addition, special education teachers should learn how to regulate and control emotions and enhance the ability of emotion management. Children with disabilities may have problems in action or communication, which need to be dealt with by special education teachers as a daily work. A teacher, who is naturally a role model, should be good at using reason to control emotions. Of course, improving the EI of special education teachers not only relies on the teachers themselves, but also the educational administrative departments and schools that should raise their awareness, attach importance to further study and training of special education teachers, actively carry out the psychological health education of teachers, and promote the professional development of special education teachers through internal and external forces.

Second, the positive emotional experience of special education teachers and improvement in their well-being needs attention. The well-being of special education teachers is relatively low. To improve the professional happiness of special education teachers, we can start from the following aspects: first, create a relaxed and warm education environment. Special education schools should start with creating a relaxed and warm working environment, give teachers certain rights of self-development, improve welfare, and formulate a fair and reasonable school management system. Second, we should pay attention to the physical and mental health of special education teachers and provide various support systems for them. Finally, the prestige and social status of special education teachers should be improved. Although in recent years, the state has paid more and more attention to special children and special education, but the social respect and attention to special education and special education teachers are insufficient. Therefore, governments at all levels can ensure the economic and social status of special education teachers by introducing relevant policies and regulations. At the same time, with the help of traditional media and network, we should vigorously publicize the significance of special education, create good public opinion for the development of special education, and improve the social reputation of special education teachers.

Third, the work engagement of special education teachers in their daily work may have mediating effect between EI and general well-being, which should be increased. By improving the working status and experience of teachers in their work practice, their well-being can be improved, and the positive impact of EI on the happiness of special education teachers can be improved. In order to stimulate the willingness and autonomy of special education teachers to actively participate and invest in work, it is necessary to establish an effective incentive mechanism. External material incentive and internal motivation are commonly used as individual incentive. Therefore, we can start from the following two aspects: on one hand, improve the welfare of special education teachers. Maslow's hierarchy of needs theory also points out that material needs are the first needs of human beings. Only under the premise of satisfying such low-level needs can individuals pursue higher-level needs. On the other hand, we should stimulate the internal working motivation of special education teachers. Special education teachers' recognition of their own professional development and the sense of happiness from professional development are important factors affecting their work engagement. Therefore, school administrators should provide teachers with more opportunities for further study and learning, and build an internal communication platform so that teachers can get more motivation for professional development.

Limitations and Future Research

Eventually, after integrating the relationships among EI, work engagement, and well-being, the tests, comparisons, and analyses with structural equation modeling revealed the relevant influence paths and direct and indirect effects. However, this research has several limitations. First, although the sample was diverse on the location of special education teachers, the uneven development of the economy and special education may influence the report of teachers on well-being. Future research could select a more representative group of special education teachers to deeply analyze their characteristics in well-being. Second, would the difference between eastern and western culture enhance the distinct development and performance of EI and well-being? For teachers in China, who experience different interactive

relationships, and renqing and mianzi in Chinese society affect their EI and well-being, which is worthy of further discussion.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of Beijing Normal University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

WF designed the study, collected the data, and wrote the manuscript. WT analyzed the data and revised the manuscript. CW and SL wrote the manuscript. YW critically revised the manuscript for important intellectual content. All authors contributed to the article and approved the submitted version.

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REFERENCES

Austin, E. J., Dore, C. P., and O'Donovan, K. M. (2008). Association of personality and emotional intelligence with display rule perceptions and emotional labour. *Pers. Individ. Differ.* 44, 679–688. doi: 10.1016/j.paid.2007.10.001

Bakker, A. B., and Demerouti, E. (2007). The job demands-resources model: state of the art. *J. Manage. Psychol.* 22, 309–328. doi: 10.1108/02683940710733115

Bakker, A. B., Demerouti, E., and Sanz-Vergel, A. I. (2014). Burnout and work engagement: the JD–R approach. *Ann. Rev. Organ. Psychol. Organ. Behav.* 1, 389–411. doi: 10.1146/annurev-orgpsych-031413-091235

Bakker, A. B., and Oerlemans, W. (2011). "Subjective well-being in organizations," in *Handbook of Positive Organizational Scholarship*, eds K. Cameron and G. Spreitzer (New York, NY: Oxford University Press), 179–189. doi: 10.1093/oxfordhb/9780199734610.013.0014

Bermejo-Toro, L., Prieto-Ursúa, M., and Hernández, V. (2016). Towards a model of teacher well-being: personal and job resources involved in teacher burnout and engagement. *Educ. Psychol.* 36, 481–501. doi: 10.1080/01443410.2015.1005006

Blasco-Belled, A., Rogoza, R., Torrelles-Nadal, C., and Alsinet, C. (2020). Emotional intelligence structure and its relationship with life satisfaction and happiness: new findings from the bifactor model. *J. Happiness Stud.* 21, 2031–2049. doi: 10.1007/s10902-019-00167-x

Brackett, M. A., and Katulak, N. A. (2006). "Emotional intelligence in the classroom: skill-based training for teachers and students," in *Applying Emotional Intelligence: A Practitioner's Guide*, eds J. Ciarrochi and J. D. Mayer (New York, NY: Psychology Press), 1–27.

Brackett, M. A., Palomera, R., Mojsa-Kaja, J., Reyes, M. R., and Salovey, P. (2010). Emotion regulation ability, burnout, and job satisfaction among British secondary school teachers. *Psychol. Sch.* 47, 406–417. doi: 10.1002/pits.20478

Briner, R., and Dewberry, C. (2007). *Staff Well-Being is Key to School Success. Work life Support*. Available online at: https://www.teachertoolkit.co.uk/wp-content/uploads/2014/07/5902birkbeckwbperfsummaryfinal.pdf (accessed November 20, 2020).

Brunetto, Y., Teo, S. T., Shacklock, K., and Farr-Wharton, R. (2012). Emotional intelligence, job satisfaction, well-being and engagement: explaining organisational commitment and turnover intentions in policing. *Hum. Resour. Manag. J.* 22, 428–441. doi: 10.1111/j.1748-8583.2012.00198.x

Chan, D. W. (2004). Perceived emotional intelligence and self-efficacy among Chinese secondary school teachers in Hong Kong. *Pers. Individ. Differ.* 36, 1781–1795. doi: 10.1016/j.paid.2003.07.007

Chan, D. W. (2006). Emotional intelligence and components of burnout among Chinese secondary school teachers in Hong Kong. *Teach. Teach. Educ.* 22, 1042–1054. doi: 10.1016/j.tate.2006.04.005

Chang, M.-L. (2009). An appraisal perspective of teacher burnout: examining the emotional work of teachers. *Educ. Psychol. Rev.* 21, 193–218. doi: 10.1007/s10648-009-9106-y

Chen, L., Fu, N., and Wang, R. (2010). The predictive effect of work resources on work engagement of special education teachers. *Chin. J. Special Educ.* 115, 48–54. doi: 10.3969/j.issn.1007-3728.2010.01.010

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499

Duan, J. H. (1996). Trial results and analysis of total happiness scale in Chinese college students. *Chin. J. Clin. Psychol.* 4, 56–57.

Extremera, N., Sánchez-García, M., Durán, M., and Rey, L. (2012). Examining the psychometric properties of the utrecht work engagement scale in two Spanish multi-occupational samples. *Int. J. Select. Assess.* 20, 105–110. doi: 10.1111/j.1468-2389.2012.00583.x

Fernández-Berrocal, P., Gutiérrez-Cobo, M. J., Rodriguez-Corrales, J., and Cabello, R. (2017). Teachers' affective well-being and teaching experience: the protective role of perceived emotional intelligence. *Front. Psychol.* 8:2227. doi: 10.3389/fpsyg.2017.02227

Fu, W., Pan, Q., Zhang, C., and Cheng, L. (2020). Influencing factors of Chinese special education teacher turnover intention: understanding the roles of subject well-being, social support, and work engagement. *Int. J. Dev. Disabil.* 1–12. doi: 10.1080/20473869.2020.1780553

Fu, W., Tang, W., Xue, E., Li, J., and Shan, C. (2019). The mediation effect of self-esteem on job-burnout and self-efficacy of special education teachers in Western China. *Int. J. Dev. Disabil.* 67, 1–10. doi: 10.1080/20473869.2019.1662204

Giorgi, G., Arenas, A., and Leon-Perez, J. M. (2011). An operative measure of workplace bullying: the negative acts questionnaire across italian companies. *Ind. Health* 49, 686–695. doi: 10.2486/indhealth.ms1287

Hakanen, J. J., Bakker, A. B., and Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *J. Sch. Psychol.* 43, 495–513. doi: 10.1016/j.jsp.2005.11.001

Hobfoll, S. E. (1989). Conservation of resources. A new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037//0003-066x.44.3.513

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: advancing conservation of resources theory. *Appl. Psychology Int. Rev.* 50, 337–370. doi: 10.1111/1464-0597.00062

Holmes, E. A. (2005). *Teacher Well-Being: Looking After Yourself and Your Career in the Classroom*, 1st Edn. London: Routledge. doi: 10.4324/9780203465400

Keller, M. M., Chang, M. L., Becker, E. S., Goetz, T., and Frenzel, A. C. (2014). Teachers' emotional experiences and exhaustion as predictors of emotional labor in the classroom: an experience sampling study. *Front. Psychol.* 5:1442. doi: 10.3389/fpsyg.2014.01442

Klassen, R. M., Aldhafri, S., Mansfield, C. F., Purwanto, E., and Woods-Mcconney, A. (2012). Teachers' engagement at work: an international validation study. *J. Exp. Educ.* 80, 317–337. doi: 10.1080/00220973.2012.678409

Lai, F. T., Li, E. P., Ji, M., Wong, W. W., and Lo, S. K. (2016). What are the inclusive teaching tasks that require the highest self-efficacy? *Teach. Teach. Educ.* 59, 338–346. doi: 10.1016/j.tate.2016.07.006

Lam, B. H. (2019). *Social Support, Well-being, and Teacher Development*. Singapore: Springer. doi: 10.1007/978-981-13-3577-8_8

Landa, J. M. A., López-Zafra, E., De Antoñana, R. M., and Pulido, M. (2006). Perceived emotional intelligence and life satisfaction among university teachers. *Psicothema* 18(Suppl.), 152–157.

Lee, J. J., and Ok, C. (2012). Reducing burnout and enhancing job satisfaction: critical role of hotel employees' emotional intelligence and emotional labor. *Int. J. Hospital. Manag.* 31, 1101–1112. doi: 10.1016/j.ijhm.2012.01.007

Lestari, S. D., and Sawitri, D. R. (2017). Correlation between emotional intelligence and work engagement of special school teachers. *Adv. Sci. Lett.* 23, 3480–3482. doi: 10.1166/asl.2017.9139

Li, Y. (2013). Relationship between teachers' job performance and turnover intention in special schools of the southwest region: intermediation of the sense of occupational well-being. *J. Suihua Univ.* 33, 14–19.

Li, Y. Z. (2016). On the relationship between special education teachers' emotional intelligence and work engagement. *Chin. J. Spec. Educ.* 187, 56–63. doi: 10.3969/j.issn.1007-3728.2016.01.009

Liao, H. H., and Yan, A. M. (2014). The effects moderators and mechanism of emotional labor. *Adv. Psychol. Sci.* 22, 1504–1512. doi: 10.3724/SP.J.1042.2014.01504

Ma, Y., and Deng, M. (2019). The relationship between social support and job performance of special education teachers: mediating role of occupational well-being. *J. Mod. Spec. Educ.* 25–32+38.

Major, A. E. (2012). Job design for special education teachers. *Curr. Issues Educ.* 15, 1–9.

Mérida-López, S., and Extremera, N. (2017). Emotional intelligence and teacher burnout: a systematic review. *Int. J. Educ. Res.* 85, 121–130. doi: 10.1016/j.ijer.2017.07.006

Mérida-López, S., Extremera, N., and Rey, L. (2017). Emotion-regulation ability, role stress and teachers' mental health. *Occup. Med.* 67, 540–545. doi: 10.1093/occmed/kqx125

Nikolaou, I., and Tsaousis, I. (2002). Emotional intelligence in the workplace: exploring its effects on occupational stress and organizational commitment. *Int. J. Organ. Anal.* 10, 327–342. doi: 10.1108/eb028956

Pena, M., Rey, L., and Extremera, N. (2012). Life satisfaction and engagement in elementary and primary educators: differences in emotional intelligence and gender. *Rev. Psicodid.* 17, 341–360.

Platsidou, M. (2010). Trait emotional intelligence of Greek special education teachers in relation to burnout and job satisfaction. *Sch. Psychol. Int.* 31, 60–76. doi: 10.1177/0143034309360436

Salovey, P., and Mayer, J. D. (1990). Emotional intelligence. *Imag. Cogn. Pers.* 9, 185–211. doi: 10.2190/DUGG-P24E-52WK-6CDG

Schaufeli, W. B., and Bakker, A. B. (2010). "Defining and measuring work engagement: bringing clarity to the concept," in *Work Engagement: A Handbook of Essential Theory and Research*, eds A. B. Bakker and M. P. Leiter (London: Psychology Press), 10–24. doi: 10.4324/9780203853047

Schaufeli, W. B., Martínez, I. M., Marques Pinto, A., Salanova, M., and Bakker, A. B. (2002a). Burnout and engagement in university students: a cross-national study. *J. Cross Cult. Psychol.* 33, 464–481. doi: 10.1177/0022022102033005003

Schaufeli, W. B., Salanova, M., González-Romá, V., and Bakker, A. B. (2002b). The measurement of engagement and burnout: a two sample confirmatory factor analytic approach. *J. Happiness Stud.* 3, 71–92. doi: 10.1023/A:1015630930326

Shimazu, A., and Schaufeli, W. B. (2009). Is workaholism good or bad for employee well-being? The distinctiveness of workaholism and work engagement among Japanese employees. *Ind. Health* 47, 495–502. doi: 10.2486/indhealth.47.495

Shimazu, A., Schaufeli, W. B., Kubota, K., and Kawakami, N. (2012). Do workaholism and work engagement predict employee well-being and performance in opposite directions? *Ind. Health* 50, 316–321. doi: 10.2486/indhealth.ms1355

Shyman, E. (2011). Examining mutual elements of the job strain model and the effort—reward imbalance model among special education staff in the USA. *Educ. Manag. Admin. Leadersh.* 39, 349–363. doi: 10.1177/1741143210393995

Tan, C. C. (2019). *Research on the Relationship among Occupational Stress, Emotional Intelligence and Vocational Happiness of Primary and Secondary School Teachers*. Master thesis. Changsha: Hu Nan Normal University.

Taris, T. W., Leisink, P. L. M., and Schaufeli, W. B. (2017). "Applying occupational health theories to educator stress: contribution of the job demands-resources model," in *Educator Stress. Aligning Perspectives on Health, Safety and Well-Being*, eds T. McIntyre, S. McIntyre, and D. Francis (Cham: Springer), 237–259. doi: 10.1007/978-3-319-53053-6_11

The Ministry of Education of China (2020). *2019 National Statistical Bulletin on Education Development*. Available online at: http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202005/t20200520_456751.html (accessed March 20, 2020).

Tian, X. H., Zhou, H. Y., and Chen, D. W. (2009). A survey on emotional labor of special education teachers. *Chin. J. Spec. Educ.* 110, 52–58. doi: 10.3969/j.issn.1007-3728.2009.08.009

Upadyaya, K., and Salmela-Aro, K. (2013). Development of school engagement in association with academic success and well-being in varying social contexts: a review of empirical research. *Eur. Psychol.* 18, 136–147. doi: 10.1027/1016-9040/a000143

Wang, X. (2017). *Professional Identity, Professional Well-being and Their Relationship with Job Involvement of Special Education Teachers.* Master thesis. Chongqing: Xi Nan University.

Wong, C. S., and Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: an exploratory study. *Leadersh. Q.* 13, 243–274. doi: 10.1016/S1048-9843(02)00099-1

Yin, H. B., Lee, J. C. K., and Zhang, Z. H. (2013). Exploring the relationship among teachers' emotional intelligence, emotional labor strategies and teaching satisfaction. *Teach. Teach. Educ.* 35, 137–145. doi: 10.1016/j.tate.2013.06.006

Zhang, Y., and Wei, X. (2014). The relationships among general well-being, job burnout and mental health of special education teachers in Sichuan province. *J. School. Stud.* 11, 70–75. doi: 10.3969/j.issn.1005-2232.2014.05.009

Zhang, Y. W., and Gan, Y. Q. (2005). The Chinese Version of utrecht work engagement scale: an examination of reliability and validity. *Chin. J. Clin. Psychol.* 13, 268–270+281. doi: 10.3969/j.issn.1005-3611.2005.03.005

Zhao, B., and Huang, Y. X. (2015). Comparative study of occupational well-being of teachers from special education schools and regular schools. *J. Mod. Spec. Educ.* 5, 56–61.

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Association Between Fear of COVID-19 and Emotional Distress in Nurses With Mediating Role of Socio-Demographic Features

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Objectives: To determine the predictive association between fear of COVID-19 and emotional distress (depression, anxiety, and stress) in frontline and non-frontline nurses. To explore the mediating role of socio-demographic features.

Methods: Correlational cross-sectional research design was implied. A total of 500 on-duty male and female, frontline and non-frontline, nurses were included from five major hospitals in Gujrat (Aziz Bhatti Shaheed Hospital, City Hospital, Doctors Hospital, Akram Hospital, and Gujrat Hospital). Fear of COVID-19 scale and the Urdu version of depression, anxiety, and stress scale - 21 (DASS-21) were used to measure variables of interest. Descriptive statistics, structural equation modeling (SEM), linear regression, and *t*-test were carried out using Statistical Package for Social Sciences (SPSS) 21.

Result: Structural equation modeling (SEM) revealed a significant predictive link between fear of COVID-19 and depression, anxiety, and stress (goodness of model fit; NFI = 0.93, GFI = 0.914, AGFI = 0.93, CFI = 0.936, and IFI = 0.936). Furthermore, a significant mediating effect of certain demographic features was discovered by SEM (CMIN/DF = 1.11, NFI = 0.94, TLI = 0.98, GFI = 0.08, AGFI = 0.93, RMSEA = 0.029, CFI = 0.99, and IFI = 0.99). Results of linear regression analysis also revealed a momentous predictive association between fear of COVID-19 and emotional distress ($R = 0.860$). In comparative analysis, the results of t-test explored the statistical significant difference in fear of COVID-19 and emotional distress between frontline (mean = 25.775, 36.147 and SD = 1.75, 2.23) and non-frontline nurses (mean = 21.702, 27.353 and SD = 4.607, 10.212), with $t_{(130)}$ =7.111, 6.92.

Conclusion: Managing the mediating effect of demographic characteristics and reducing the fear of COVID-19 can help nurses to overcome emotional distress, such as depression, anxiety, and stress. Further, this will increase the productivity among nurses.

Keywords: COVID-19, emotional distress, linear aggression, structural equation modeling, depression, anxiety, stress, socio-demographic features

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INTRODUCTION

Coronavirus disease (COVID-19) is an illness which unsympathetically affected public health and overall circumstance across the border. In November 2019, a sickness resembling pneumonia appeared in Wuhan, China, which was later named by the World Health Organization (WHO) as Coronavirus Disease 2019 or COVID-19. Fear of COVID-19 has been interpreted as a perceived threat to the disease, which has produced significant financial destruction and crushed the community mental health in several nations (WHO, 2020).

According to the National Institute of Health Islamabad (2020), in Pakistan, the Ministry of Health, the government of Pakistan in Karachi, and the Pakistan Federal Ministry of Health in Islamabad first reported two cases of COVID-19 on February 26, 2020. At present, the number of cases has escalated and created the worst situation. Among the provinces of Pakistan, the highest number of cases was reported in Punjab and Sindh (Waris et al., 2020). Gujrat district reported the highest number of confirmed cases among all the districts in Punjab. The first case of COVID-19 was reported on March 16, 2020, and a total of 104 cases were reported in a single day on July 9, 2020 (Imtiaz et al., 2020).

It is useful to discuss the services of nurses and other medical personnel during the pandemic because around the world they have been playing an important part in the times of pandemic and crisis. In Pakistan, 63 healthcare workers lost their lives fighting the COVID-19 pandemic (Tribune, 2020). International Council of Nurses (ICN) has highlighted the services that nurses provide under life-threatening conditions during a crisis and in adverse circumstances. The extraordinary burden created by the epidemic on every nation's healthcare structure has presented numerous trials to the nurses and other medical workers, which may cause disturbances to their mental health and overall work performance by creating depressive, anxious, and stressful situations (Mo et al., 2020). So, it is vital to preserve the emotional and mental fitness of the healthcare staff and nurses (Catton, 2020; Mo et al., 2020). Studies investigating mental health problems and the associated factors among the frontline nurses during an outbreak are very essential to plan the strategies needed to combat emotional distress. Subsequently, studies exploring the nursing labor force during the COVID-19 pandemic are of paramount importance (Thapa et al., 2020). This is because nurses who have worked with COVID-19 patients are more vulnerable to experience emotional distress that is a negative emotional reaction such as depression, anxiety, and stress (Kameg, 2020). Another mental health study involving 1146 medical staff from Indonesia, India, Singapore, Malaysia, and Vietnam found a high prevalence of stress disorders with a low diagnosis of depression and anxiety. Non-medically trained workers experienced a higher level of mental health concerns compared to medically trained workers (Chew et al., 2020a).

A survey conducted on 906 medical staff revealed a momentous relation between COVID-19 and mental health outcomes in healthcare staff. Further, it was reported that 5.3% of the participants exhibited moderate to very severe levels of depression, 8.7% of the participants showed moderate to profound levels of anxiety, 2.2% of the participants showed moderate to extremely severe levels of stress, and 3.8% of the participants exhibited moderate to severe levels of emotional distress (Chew et al., 2020b). Additionally, a greater occurrence of emotional distress, such as anxiety and depression, was observed among nurses who worked with COVID-19 patients when compared to other medical workforces (Pappa et al., 2020).

Another study in Italy measured the levels of stress, depression, and anxiety in healthcare workers during the COVID-19 outbreak. The study concluded that the protective measures against the effects of mental health in the general population are well-known, but there is still a lack of research on the outcomes with regard to the medical staff. Furthermore, the study found that ∼10% of the frontline medical workers reported moderate to very severe indications of depression, anxiety, and stress during the COVID-19 outbreak (Lenzo et al., 2021).

A study conducted among Pakistani medical workers has found that the fear of COVID-19 causes a high level of anxiety among medical personnel and patients with hepatitis. This study shows that the promotion of stable mental health plays an important role in boosting the immune system, and further demands the need for positive steps to be taken to reduce such epidemics and anxiety among medical workers (Rafique et al., 2021).

Socio-demographic features are among the strongest determinants of people's attitude toward their physical and mental health (Parra, 1985). Findings have revealed that during the COVID-19 outbreak, demographic characteristics such as age, education, socio-economic status, and nature of job are highly significant to account for the negative effects on psychological health (Holmes et al., 2020).

All over the world, various studies have explored the effect of COVID-19, but unfortunately only a few researches have revealed the role of demographics in emotional problems among medical workers, arising due to the fear of COVID-19 (Thapa et al., 2020). To bridge this gap, the current study aims to explore a predictive association between the fear of COVID-19 and emotional distress among frontline and non-frontline nurses with the mediating role of demographic characteristics. This study therefore looks at the health professionals, counselors, authorities involved in nursing training, policy makers, and senior medical workers who are concerned about protecting and enhancing the emotional and mental health of nurses by reducing the fear of COVID-19 and other mediating factors.

The proposed model of this study is presented in **Figure 1**.

METHOD

Research Design

This is a cross-sectional study, which involves exploring and accumulating data about a study populace at one point in time. Cross-sectional design has been labeled as portraits of the inhabitants about which data is collected (Lavrakas, 2012).

Population, Sample, and Location of Study

This study was conducted in Gujrat, Pakistan during the period from February 15 to October 13, 2020. The population of study included all the men and women employees working as full-time (regular employees) and part-time (contractual employees)

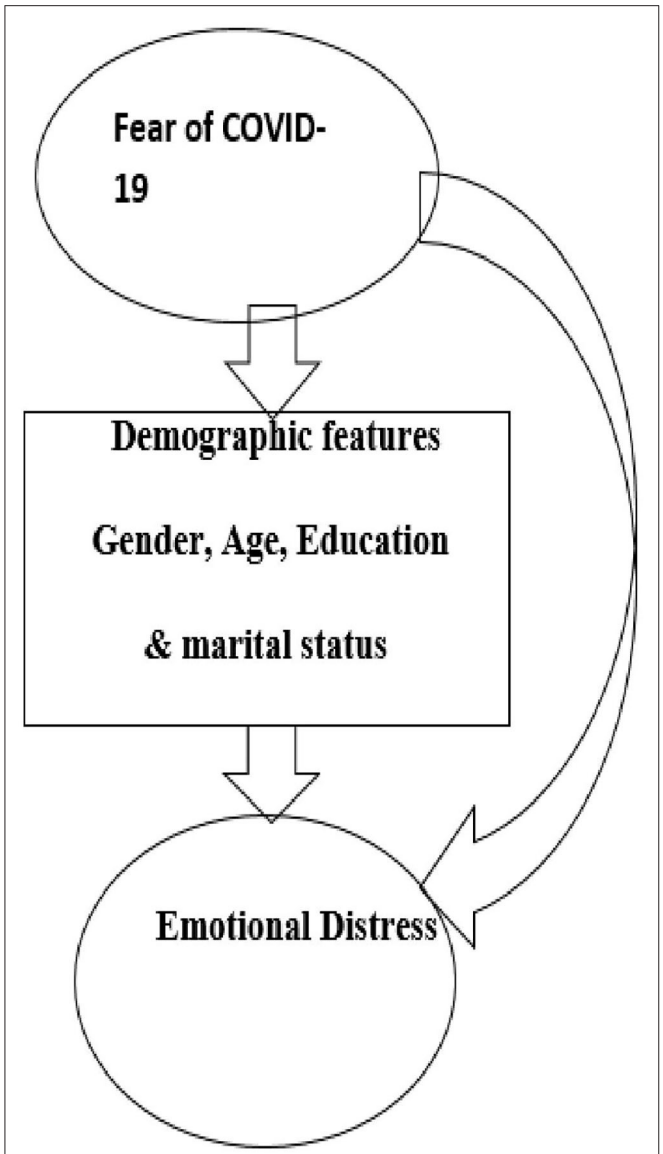

FIGURE 1 | Representation of proposed model of this study.

nursing staff in public and private sector hospitals in Gujrat, Pakistan during the COVID-19 pandemic. The sample of study comprised 500 nurses, including 200 frontline and 300 non-frontline nurses, in Gujrat, Pakistan. Data was collected from all the available full-time and daily wage nursing staff, both men and women, from five major hospitals in Gujrat (Aziz Bhatti Shaheed Hospital, City Hospital, Doctors Hospital, Akram Hospital, and Gujrat Hospital). As only these five hospitals provided services during the first spike of COVID-19, all the nursing staff from these hospitals were included in the present study.

Instrument of Study

Instrument of study comprises two parts. In the first part, a self-constructed demographic information sheet was used for inquiring information regarding gender, age, education, marital status, duty timings, job status, and attending to COVID-19 patients.

In the second part, fear of COVID-19 scale and depression, anxiety, and stress scale - 21(DASS-21) were administered to measure the variables of interest. Fear of COVID-19 scale was used to measure the fear of COVID-19 in nurses (Ahrsu et al., 2020). It is a 7-item scale measuring two dimensions of fear. Items 1, 2, 4, and 5 gauge emotional fear reaction, while items 3, 6, and 7 measure symptomatic reaction of fear. Score range is 7–35; a high score depicts a high level of fear, while a low score depicts a low level of fear regarding COVID-19. In the current study, reliability for the fear of COVID-19 scale is 0.75. On the other hand, Urdu version of DASS-21 translated by Aslam (2007) was used to measure emotional distress. DASS-21, which was used in the current study, is a brief and more comprehensive form of DASS-42 (Aslam, 2007). DASS-21, which is a 21-items scale, measures three dimensions of emotional distress (depression, anxiety, and stress). Each sub-scale contains seven items. In the current study, a high internal consistency of the scale with a Cronbach's alpha of 0.85 was reported. The use of DASS-21 was reported by different studies during the COVID-19 outbreak in Asia. A longitudinal survey was conducted to study the psychological health of 1738 participants from 190 cities in China during the COVID-19 outbreak. Mental health of the participants was measured using the DASS-21. It was clarified that DASS-21 is grounded on a multi-dimensional model of pathology with a number of features including a holistic distress paradigm (Wang et al., 2020a). Similarly, a cross-section study in Philippines discovered the psychological effects of COVID-19 using DASS-21, which is a brief and comprehensive measure to gauge psychological and emotional distress (Tee et al., 2020).

Procedure

Procedure implemented in this study was observed and sanctioned by the Advanced Studies and Research Board (ASRB), University of Gujrat, Pakistan. All commendations of the panel were assimilated in the current investigation. The setting of current study included five big public and private hospitals in the district of Gujrat, Pakistan (Aziz Bhatti Shaheed Hospital, City Hospital, Doctors Hospital, Akram Hospital, and Gujrat Hospital). Prior to approaching the participants of study, consent was taken from the concerned authorities of the respective hospitals from where the samples were to be drawn, and a list of names and contact numbers of the nursing staff was also taken from those hospitals. After obtaining an online informed consent from the participants, the researchers electronically collected data on above said instruments according to the availability of participants. This study approached 500 participants, of which 65 participants declined to participate due to their unwillingness. To ensure the accuracy of data, the participants were educated about the aim of research, its implication, and voluntary basis of the study.

Ethical Consideration

This study was conducted in accordance with the ethical guidelines of Human Research Committee, University of Gujrat, Pakistan. The participants were briefed about the purpose of

TABLE 1 | Demographic profile of participants ($N = 500$).

Variables		Categories frequencies	Percentage
Gender	Male	145	29
	Female	355	71
Age	25–35	210	42
	36–45	250	50
	46–55	40	8
Education	Matriculation	108	21.6
	Intermediate	192	38.4
	Bachler	188	37.6
	Master	12	2.4
Nature of job	Full time	330	66
	Part Time	170	34
Attended COVID-19 patient	Yes	200	40
	No	300	60

TABLE 2 | Descriptive statistics of the variables of the study ($N = 500$).

Variables	*N*	Minimum	Maximum	Mean	*SD*
Fear of COVID-19	500	11.29	28.71	23.92	3.92
Emotional- Distress (DASS)	500	7.00	38.10	32.15	8.30

TABLE 3 | Cronbach's alpha scores for each measurement.

Measurement	No of items	Cronbach's alpha scores
Fear Of COVID-19	07	0.75
DASS	21	0.85

study and the complete procedure, and it was made clear that their participation in the study was completely voluntary. Prior to data collection, a written informed consent was obtained from each participant. Further, the confidentiality and privacy of data were ensured to the participants.

Statistical Analysis

Statistical analysis was performed by Statistical Package for Social Sciences (SPSS, 23Version) and Analysis of Moment Structure (AMOS 21 Version). Descriptive statistics was used to describe data in the form of frequencies, percentage, and graphical representation. In inferential statistics, SEM was used to check the overall model fitness of data and predictive association between fear of COVID-19 and emotional distress in nurses. Further, simple linear regression analysis was performed to check the portion of variation in emotional distress explained by fear of COVID-19, whereas in comparative analysis, independent sample *t*-test was applied to investigate statistical significant difference between frontline and non-frontline nurses with regard to fear of COVID-19 and emotional distress.

RESULTS

Frequencies and the percentage of demographic characteristics of the participants were computed. Majority of the participants were women (71%) compared to men (29%), and the age category with the highest score was 36–45 years, as 250 participants (50%) belonged to this age group. Among the remaining, 210 participants (42%) belonged to the age range of 25–35 years, while 40 participants (8%) belonged to the age range of 46–55 years. In terms of educational qualification, 38.4% of the participants had completed inter-level education, while only 2.4% (12 participants) were highly qualified. The number of participants with full-time employment were 330 (66%), while the remaining 170 participants (34%) were employed in part-time jobs. It was also revealed that 200 participants (40%) had worked with COVID-19 patients and 300 participants (60%) had not attended to such patients (**Table 1**).

Means and standard deviations (SD) of the variables of the study were computed. The mean score for the fear of COVID-19 scale was 23.92 and SD was 3.92, which was above the average score. For the emotional distress (DASS-21) scale, the composite score was 32.15 and SD was 8.30 (**Table 2**).

To identify internal consistency of the data in the current study, reliability analysis was performed to find Cronbach's alpha. Based on the analysis, reliability score for fear of COVID-19 scale was 0.75, while the scale of emotional distress (DASS) showed a Cronbach's alpha value of 0.85. So, the reliability analysis of both measurements (0.75 and 0.85) revealed high internal consistency of scales in the current study (**Table 3**).

This study identified that fear of COVID-19 was a significant predictor of stress, depression, and anxiety in nurses. Furthermore, regression weights indicated that fear of COVID-19 accounted for 34% variance in depression, 62% in anxiety, and 70% in stress, respectively (**Figure 2**).

SEM was implied to check the predictive association between fear of COVID-19 and sub-scales of DASS (depression, anxiety, and stress). The result showed the goodness of model fit as the values of NFI = 0.93, GFI = 0.914, AGFI = 0.93, CFI = 0.936, and IFI = 0.936 were highly acceptable. The results of the SEM model showed a significant predictive association between fear of COVID-19 and depression, anxiety, and stress. Furthermore, the model of study is accepted (**Table 4**).

Findings of this study specified a significant mediating role of demographic characteristics, such as gender, age, education, and marital status, in the predictive association between fear of COVID-19 and emotional distress in nurses (**Figure 3**).

SEM was implied to check the predictive association between fear of COVID-19 and emotional distress and the mediating role of socio-demographic variables. The result displayed goodness of fit indicators for the planned SEM model as the values CMIN/DF = 1.11, NFI = 0.94, TLI = 0.98, GFI = 0.08, AGFI = 0.93, RMSEA = 0.029, CFI = 0.99, and IFI = 0.99 were highly acceptable. Further, the results of the SEM model showed a strong predictive association between fear of COVID-19 and emotional distress and the link was mediated by socio-demographic variables such as gender, age, education, and marital status. Hence, the model of study is accepted (**Table 5**).

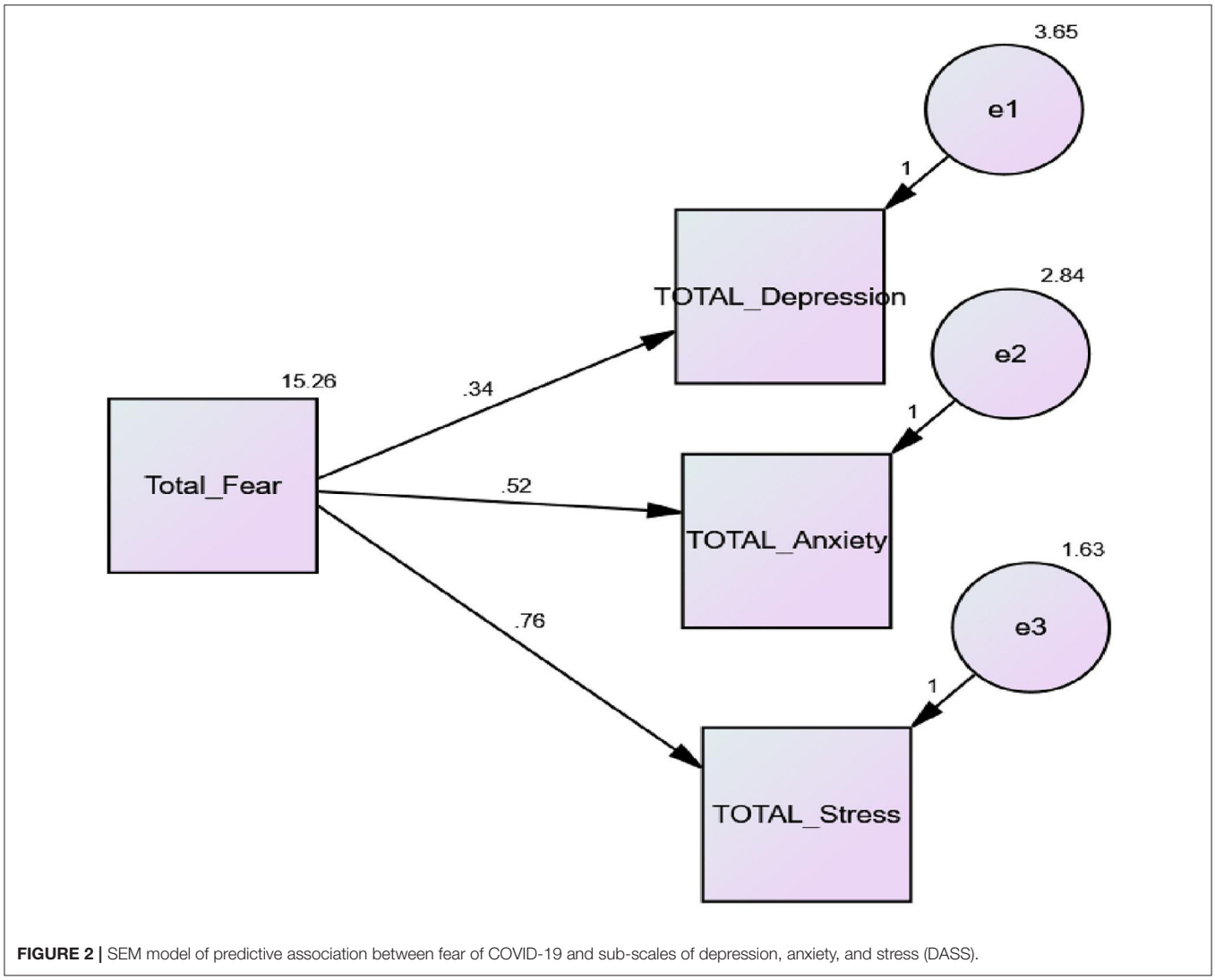

FIGURE 2 | SEM model of predictive association between fear of COVID-19 and sub-scales of depression, anxiety, and stress (DASS).

TABLE 4 | Model fit summary of structural equation modeling ($N = 500$).

NFI	GFI	AGFI	CFI	IFI
0.93	0.914	0.93	0.936	0.936

A simple linear regression was carried out to predict emotional distress based on fear of COVID-19. Fear of COVID-19 is an independent variable, whereas emotional distress is a dependent variable. A significant regression equation was found $F_{(1,130)} = 797.027$, $p < 0.001$ with an R^2 value of 0.860. The results specified that the model explained 86% of the variance and that the model was significant. Furthermore, participants predicted emotional distress is equal to $-14.865 + 1.964$ (fear of COVID-19) and emotional distress was measured in the terms of depression, anxiety, and stress. Participant's emotional distress increased by 1.964 when fear of COVID-19 increased. So, it was found that fear of COVID-19 significantly predicted emotional distress ($\beta 1 = 1.97$, $p < 0.001$).

The final predictive model was: $-14.85 + (-1.95^*$ fear of COVID-19) (**Table 6**).

Independent sample t-test was conducted to compare the fear of COVID-19 and emotional distress between nurses who worked and those who did not work with COVID-19 patients. The result showed a statistically significant difference at the 0.001 level of significance, between the nurses who worked (mean = 25.775, 36.147 and SD = 1.75, 2.23) and those who did not work with COVID-19 patients (mean = 21.702, 27.353 and SD = 4.607, 10.212), with $t_{(498)} = 7.111$, 6.92, respectively. Overall results revealed that the nurses who worked with COVID-19 patients had a high level of fear of COVID-19 and emotional distress (mean = 25.775, 36.147 and SD = 1.75, 2.23) compared to nurses who did not work with COVID-19 patients (mean = 21.702, 27.353 and SD = 4.607, 10.212) (**Table 7**).

Multiple regression analysis was implied to check the predictive effect of gender on fear of COVID-19 and emotional distress. The result depicted that there was no predictive effect of gender on fear of COVID-19 and emotional distress (**Table 8**).

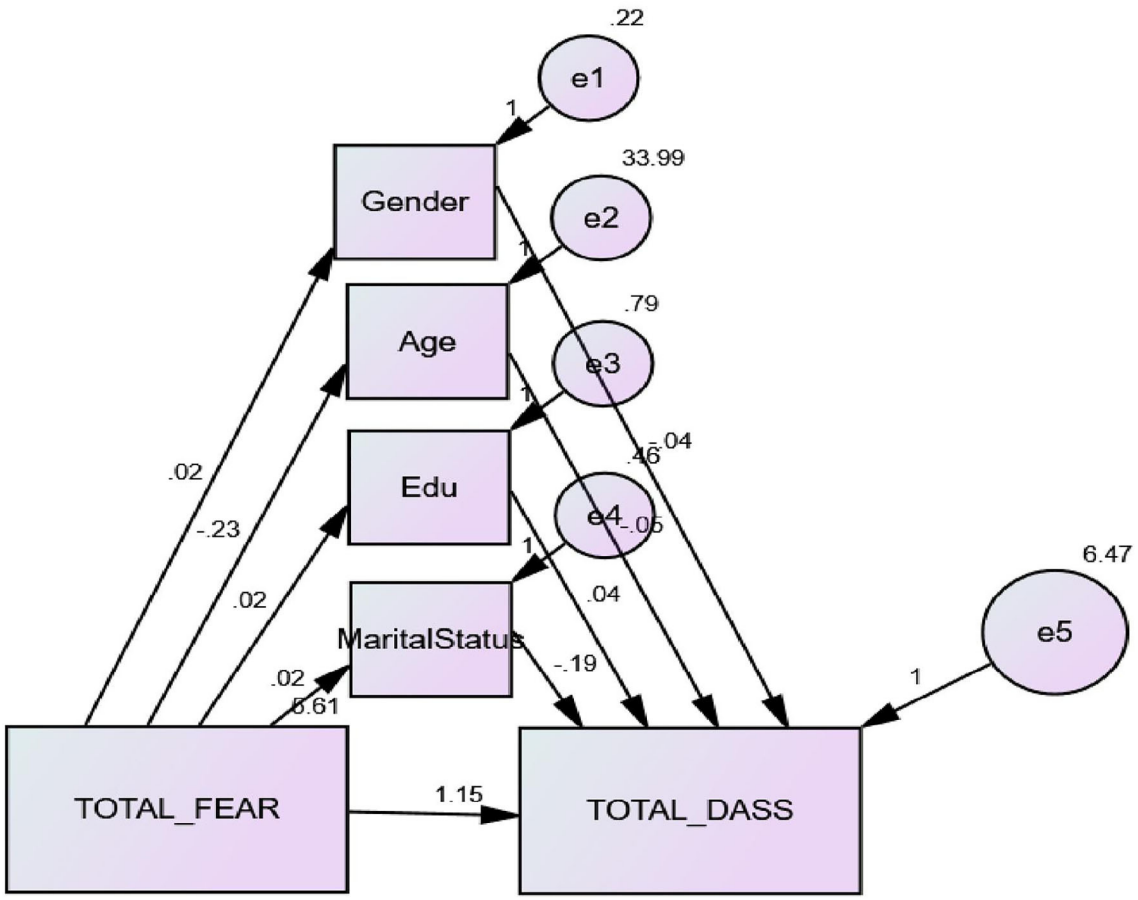

FIGURE 3 | Mediation model of predictive association between study variables ($N = 500$).

TABLE 5 | Model fit summary of structural equation modeling ($N = 500$).

CMIN/DF	NFI	TLI	GFI	AGFI	RMSEA	CFI	IFI
1.11	0.94	0.98	0.98	0.93	0.029	0.99	0.99

TABLE 6 | Fear of COVID-19 as the predictor of emotional distress among nurses ($N = 500$).

Variables	*β*	SE	*β*	*R*	*R*-square	*p*-value
Constant	−14.846	1.687				
Fear of COVID-19	1.964	0.070	0.927	0.927	0.860	0.000

$p < 0.001$.

To identify the predictive association between fear of COVID-19 and emotional distress (depression, anxiety, and stress), linear regression was implied. The results showed a significant predictive association between fear of COVID-19 and emotional distress (stress, depression, and anxiety) in nurses. Moreover, the above statistics depicted that fear of COVID-19 explained 55% variation in depression, 66% variation in anxiety, and 49% variation in stress (**Table 9**).

DISCUSSION

This study was conducted during the peak of COVID-19 pandemic in Pakistan, and hence the outcomes of the current study provide the first insight about the predictive role of fear of COVID-19 on depression, anxiety, and stress in nurses. Nurses were the most vulnerable group during that time and there was a dire need to explore the fear of COVID-19 and emotional distress. A study documented that frontline medical workers were at highest risk to experience psychological problems because they directly treated COVID-19 patients and frequently observed distressed and deceased patients, which impacted their psychological well-being (Ahrsu et al., 2020). A similar study was conducted on emotional distress and mental health issues in medical workers of Singapore during the COVID-19 outbreak. Findings of this study highlighted that mental health problems were mostly faced by untrained non-medical workers when compared to trained medical workers. This was because training and counseling enhanced the coping abilities and stress

TABLE 7 | Comparison of fear of COVID-19 and emotional distress between nurses who worked and did not work with COVID-19 patients ($N = 500$).

Outcome	Group									
	Attended COVID-19 patient			Not attended COVID-19 patient						
	M	*SD*	*N*	*M*	*SD*	*N*	95% CI for mean difference	*t*	Df	*p*
Fear of COVID-19	25.775	1.75	200	21.702	4.60	200	6.3476, 11.241	7.11	498	.000
DASS	36.147	2.23	300	27.353	10.2	300	2.910, 5.236	6.92	498	.000

p < 0.001.

management skills in medical workers, which further helped to reduce the risk of various mental health problems (Satici et al., 2020; Tan et al., 2020).

In the present study, emotional distress was measured in terms of depression, anxiety, and stress. The results of SEM revealed that the fear of COVID-19 played a key role in determining depression, anxiety, and stress in nurses. This is because fear of COVID-19 is one of the major causes of emotional distress. Furthermore, the results of linear regression analysis also depicted that 86% of the change in emotional distress was attributed to the fear of COVID-19 in nurses. Among the limited studies available on the population of nurses, this association was also proved by prior studies comprising the general public. For example, a cross-sectional study of 175 nurses in Lahore, Pakistan, measured the levels of stress, depression, and anxiety using DASS-21. This study showed that high levels of fear of COVID-19 were powerfully associated with negative emotional responses such as anxiety, depression, and stress. Furthermore, this study suggested that there was an urgent need for effective mental health training and counseling programs to promote mental health and diminish the chronic effects of COVID-19 pandemic (Riaz et al., 2021). A recent study revealed that a fear of COVID-19 had a substantial progressive association with emotional distress (anxiety, depression, and stress; Bakioglu et al., 2020).

Current study added new knowledge about some demographic features which served as a mediating factor in the predictive association between fear of COVID-19 and emotional distress. Some important demographics such as age, education, and marital status play a significant mediating role in enhancing the above said predictive association. However, this study represented no predictive effect of gender on fear of COVID-19 and emotional distress. Thus, by controlling and managing the relevant demographic features, fear of COVID-19 can be reduced which would be helpful to lessen the emotional distress in nurses. Prior studies confirmed the finding of the current study; for instance, a cross-sectional study comprising 600 participants in China aimed to measure the emotional state of the community and associated features during the COVID-19 outbreak. Self-rating anxiety and depression scales identified high levels of emotional distress such as depression and anxiety. Further analysis on demographic variables revealed high levels of anxiety and depression among women when compared to men, and participants with higher educational qualifications showed a minimum risk of mental health problems compared to the less educated participants (Authors and Wang, 2020). Consistent with the present study, a recent study identified no gender effect on fear of COVID-19 (Levkovich et al., 2021). Consequences of another study proved the mediating role of education between fear of COVID-19 and mental health problems. Furthermore, the effect on the mental health of women was higher compared to men (Wang et al., 2020b). One more study in Italy was conducted to measure psychological distress due to COVID-19 among medical and emergency workers. This study used Emergency Stress Questionnaire (ESQ) and Traumatic Stress Scale (TSS) to measure the level of stress. The consequences of this research underlined that nurses and surgeons showed greater levels of emergency stress than medical workers working in emergency situations. Furthermore, demographics such as experience of working with COVID-19 patients, gender, and unpredicted occasions appeared as threat features for emergency stress (Vagni et al., 2020).

Existing study recruited the sample of frontline and non-frontline nurses to comparatively explore the fear of COVID-19 and emotional distress. A statistically significant difference was found in the level of fear of COVID-19 and emotional distress between frontline and non-frontline nurses. Findings suggested

TABLE 8 | Summary of multiple regression analysis between gender, fear of COVID-19, and emotional distress ($N = 500$).

Variables	*β*	SE	*β*	*R*	*R*-square	*p*-value
Constant (Gender)	−0.874	1.529			−0.050	0.569
Fear of Covid-19	1.963	0.070			0.927	0.463
R	0.050					
R^2	0.003					
ΔR	−0.005					
F	0.326					

TABLE 9 | Fear of COVID-19 as the predictor of emotional distress (depression, anxiety, and stress) in nurses ($N = 500$).

Variables	*β*	SE	*β*	*R*	R-square	*p*-value
Depression	1.766	0.687	0.721	0.721	0.553	0.000
Anxiety	1.675	0.711	0.827	0.581	0.660	0.000
Stress	1.544	0.523	0.827	0.581	0.494	0.000

p < 0.001.

that the level of fear of COVID-19 and emotional distress was higher in frontline nurses compared to non-frontline nurses. A similar cross-sectional study identified a significant relationship between fear of COVID-19 and psychological distress in frontline nurses as compared to non-frontline nurses and the general population. Thus, bigger consideration should be rewarded to the emotional glitches of the health care workforce (Li et al., 2020). Moreover, a review paper identified that the extensive outbreak of COVID-19 has been linked with emotional distress and psychological ailments among people, particularly in the medical workforces and among nurses who work as frontline fighters handling the cases of COVID-19 (Jillian Mock, 2020). As nurses who worked with COVID-19 patients are directly involved in treatment, the danger of them contracting COVID-19 is greater than other medical workers. This may affect their mental state by increasing anxiety or the horror of being infected or the thought of unintentionally contaminating others. Additionally, social isolation and public separation may strengthen suspicions in nurses, causing distress to their overall mental health and job performance (Maben and Bridges, 2020). Remarkably, the prolonged use of mask contributed to social stigmatization and emotional distress related to COVID-19, since patients with pre-existent facial dermatoses experienced flares that were detrimental to the overall quality of life [use of masks related to COVID-19 increases the severity of both acne (Masked) and rosacea (mask rosacea)] (Damiani et al., 2021). Furthermore, continuous emotional distress, COVID-phobia, and social pressure also decrease the adherence to the therapies for chronic diseases (Bragazzi et al., 2020). A study of mental health of medical workers from Singapore suggested that training of healthcare workers and implementation of different psychological interventions, such as cognitive behavior therapy, can help in managing psychological distress, and people can fight the long-lasting effects of this pandemic simply by consolidating the psychological protection (Ho et al., 2020).

LIMITATION

This study is based on 500 nurses from only five hospitals in Gujrat, because during the COVID-19 lockdown, only these hospitals were allowed to provide services to all the patients including COVID-19 patients in Gujrat. So, the findings could not be generalized to the staff of other hospitals. During the horrible situation of COVID-19, the healthcare staff were experiencing very tough work schedules. Hence, it was very difficult for researchers to reach the targeted population and collect data, as the participants did not cooperate for online survey which was the first option to be explored with this population.

CONCLUSION

The outcome of the present study exposed that the fear of COVID-19 was a powerful predictor of emotional distress in nurses. Furthermore, the demographic features (gender, age, education, and marital status) were significant predictors of the fear of COVID-19 and emotional distress. Additionally, the comparison between frontline and non-frontline nurses indicated that frontline nurses (who worked with COVID-19 patients) displayed a high level of fear of COVID-19 and emotional distress compared to non-frontline nurses (who did not work with COVID-19 patients).

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Advance Study and Research Board (ASRB) University of Gujrat, Gujrat, Pakistan. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MA: conception, data collection, analysis, and write-up. MR: data collection and write-up. ZB: revision and analysis. All authors contributed to the article and approved the submitted version.

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REFERENCES

Ahrsu, D. K., Lin, C., Imani, V., Saffari, M., Griffiths, M. D., and Pakpour, A. H. (2020). The fear of COVID-19 scale: development and initial validation. *Int. J. Mental Health Addict.* 270:8. doi: 10.1007/s11469-020-00270-8

Aslam, N. (2007). *Psychological Disorders and Resilience in Earthquack Effected Individuals.* (M.phil dissertation). National Institute of psychology, Quaid-i-Azam University, Islamabad, Pakistan.

Authors, A., and Wang, Y. (2020). *Study on the Public Psychological States and Its Related Factors During the Outbreak of Coronavirus Disease 2019 (COVID-19) in Some Regions of China*. Available online at: https://www.tandfonline.com/doi/full/10.1080/13548506.2020.1746817 (accessed August 23, 2020).

Bakioglu, F., Korkmaz, O., and Ercan, H. (2020). Fear of COVID-19 and positivity: mediating role of intolerance of uncertainty, depression, anxiety, and stress. *Int. J. Mental Health Addict.* 20:331. doi: 10.1007/s11469-020-00331-y

Bragazzi, N. L., Riccò, M., Pacifico, A., Malagoli, P., Kridin, K., Pigatto, P., et al. (2020). COVID-19 knowledge prevents biologics discontinuation: data from an Italian multicenter survey during RED-ZONE declaration. *Dermatol. Ther.* 33:e13508. doi: 10.1111/dth.13508

Catton, H. (2020). Global challenges in health and health care for nurses and midwives everywhere. *Int. Nurs. Rev.* 67, 4–6. doi: 10.1111/inr.12578

Chew, N., Lee, G., Tan, B., Jing, M., Goh, Y., Ngiam, N., et al. (2020a). A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. *Brain Behav. Immun.* 88, 559–565. doi: 10.1016/j.bbi.2020.04.049

Chew, N., Ngiam, J. N., Tan, B. Y., Tham, S. M., Tan, C. Y., Jing, M., et al. (2020b). Asian-Pacific perspective on the psychological well-being of healthcare workers during the evolution of the COVID-19 pandemic. *BJPsych Open* 6:e116. doi: 10.1192/bjo.2020.98

Damiani, G., Gironi, L. C., Grada, A., Kridin, K., Finelli, R., Buja, A., et al. (2021). COVID-19 related masks increase severity of both acne (maskne) and rosacea (mask rosacea): multi-center, real-life, telemedical, and observational prospective study. *Dermatol. Ther.* 2021:e14848. Advance online publication. doi: 10.1111/dth.14848

Ho, C. S., Chee, C. Y., and Ho, R. C. (2020). Mental health strategies to combat the psychological impact of COVID-19 beyond Paranoia and Panic. *Ann. Acad. Med. Singapore* 49, 155–160. doi: 10.47102/annals-acadmedsg.202043

Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., et al. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatry 7*, 547–560. doi: 10.1016/S2215-0366(20)30168-1

Imtiaz, A., Dawn.com, Ali Shah, S., and Siddiqui, N. (2020). *Pakistan Confirms First Two Cases of Coronavirus, Govt Says 'No Need to Panic'*. Available online at: https://www.dawn.com/news/1536792 (accessed August 23, 2020).

Jillian Mock (2020). *Stories by Jillian Mock*. Available online at: https://www.scientificamerican.com/author/jillian-mock/ (accessed August 23, 2020).

Kameg, B. N. (2020). Psychiatric-mental health nursing leadership during coronavirus disease 2019 (COVID-19). *J. Psychiatric Mental Health Nurs.* 2020:12662. doi: 10.1111/jpm.12662

Lavrakas, P. J. (2012). *Encyclopedia of Survey Research Methods*. Available online at: http://srmo.sagepub.com/view/encyclopedia_of_survey_researchmethods/n120.xml (accessed March 24, 2020).

Lenzo, V., Quattropani, M. C., Sardella, A., Martino, G., and Bonanno, G. A. (2021). Depression, anxiety, and stress among healthcare workers during the COVID-19 outbreak and relationships with expressive flexibility and context sensitivity. *Front. Psychol.* 12:623033. doi: 10.3389/fpsyg.2021.623033

Levkovich, I., Shinan-Altman, S., Essar Schvartz, N., and Alperin, M. (2021). Depression and health-related quality of life among elderly patients during the COVID-19 pandemic in Israel: a cross-sectional study. *J. Primary Care Commun. Health* 2021:2150132721995448. doi: 10.1177/2150132721995448

Li, Z., Ge, J., Yang, M., Feng, J., Qiao, M., Jiang, R., et al. (2020). Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav. Immun.* 88, 916–919. doi: 10.1016/j.bbi.2020.03.007

Maben, J., and Bridges, J. (2020). *Covid-19: Supporting Nurses' Psychological and Mental Health*. Available online at: https://onlinelibrary.wiley.com/doi/abs/10.1111/jocn.15307 (accessed August 23, 2020).

Mo, Y., Deng, L., Zhang, L., Lang, Q., Liao, C., Wang, N., et al. (2020). Work stress among Chinese nurses to support Wuhan in fighting against COVID-19 epidemic. *J. Nurs. Manag.* 28, 1002–1009. doi: 10.1111/jonm.13014

Pappa, S., Ntella, V., Giannakas, T., Giannakoulis, V. G., Papoutsi, E., and Katsaounou, P. (2020). Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *SSRN Electr. J.* 2020:3594632. doi: 10.2139/ssrn.3594632

Parra, F. (1985). Social tolerance of the mentally ill in the Mexican American Community. *Int. J. Soc. Psychiatr.* 31, 37–45. doi: 10.1177/002076408503100104

Rafique, S., Khan, M. S., Unar, R., Wajid, M., Waheed, A., and Umar, A. (2021). Evaluation of mental health and anxiety level among hepatitis C patients during COVID-19 pandemic in Pakistan. *Egypt. Liver J.* 11:9. doi: 10.1186/s43066-021-00120-9

Riaz, B., Rafai, W. A., Ussaid, A., Masood, A., Anwar, S., Baig, F. A., et al. (2021). The psychological impact of COVID-19 on healthcare workers in Pakistan. *Fut. Healthcare J.* 8, e293–e298. doi: 10.7861/fhj.2020-0193

Satici, B., Gocet-Tekin, E., Deniz, M. E., and Satici, S. A. (2020). Adaptation of the fear of COVID-19 scale: its association with psychological distress and life satisfaction in Turkey. *Int. J. Mental Health Addict.* 20:294. doi: 10.1007/s11469-020-00294-0

Tan, B., Chew, N., Lee, G., Jing, M., Goh, Y., Yeo, L., et al. (2020). Psychological impact of the COVID-19 pandemic on health care workers in Singapore. *Ann. Intern. Med.* 173, 317–320. doi: 10.7326/M20-1083

Tee, M. L., Tee, C. A., Anlacan, J. P., Aligam, K., Reyes, P., Kuruchittham, V., et al. (2020). Psychological impact of COVID-19 pandemic in the Philippines. *J. Affective Disord.* 277, 379–391. doi: 10.1016/j.jad.2020.08.043

Thapa, B., Gita, S., Chatterjee, K.,., and Devrani, A. (2020). Impact of COVID-19 on the mental health of the society & HCW (healthcare workers): a systematic review. *Int. J. Sci. Healthcare Res.* 5, 234–240.

Tribune (2020). *Fighting the Endless Battle Against Covid-19*. Available online at: https://tribune.com.pk/story/2256592/fighting-the-endless-battle-against-covid-19 (accessed August 24, 2020).

Vagni, M., Maiorano, T., Giostra, V., and Pajardi, D. (2020). Coping with COVID-19: emergency stress, secondary trauma and self-efficacy in healthcare and emergency workers in Italy. *Front. Psychol.* 11:566912. doi: 10.3389/fpsyg.2020.566912

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., et al. (2020b). Immediate psychological responses and associated factors during the initial stage of the 2019 Coronavirus disease (COVID-19) epidemic among the general population in China. *Int. J. Environ. Res. Public Health* 17, 17–29. doi: 10.3390/ijerph17051729

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R. S., et al. (2020a). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain Behav. Immun.* 87, 40–48. doi: 10.1016/j.bbi.2020.04.028

Waris, A., Atta, U., Ali, M., Asmat, A., and Baset, A. (2020). *COVID-19 Outbreak: Current Scenario of Pakistan*. Available online at: https://www.sciencedirect.com/science/article/pii/S2052297520300330 (accessed August 22, 2020).

WHO (2020). *Coronavirus Disease 2019 (COVID-19)*. World Health Organization. Available online at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200322-sitrep-62-covid-19.pdf?sfvrsn=f7764c46_2 (accessed August 22, 2020).

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The Influence Mechanism of Supervisor Developmental Feedback on the Enactment of Employees' Creative Ideas: A Moderated Chain Mediation Model Based on Psychological Empowerment

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Employees' creative idea enactment is critical for organizational creativity assessment and innovation implementation. In the paper, we want to develop and verify a moderated chain mediation model to explore the impact of supervisor developmental feedback on the enactment of employees' creative ideas, and to investigate the moderating role of psychological empowerment further. Hierarchical regression analyses of the multi-time data from 375 employees in China indicate that positive emotions and work engagement, respectively mediate the relationship between supervisor developmental feedback and employees' creative idea enactment. Simultaneously, positive emotions and work engagement form chain mediation between supervisor developmental feedback and creative idea enactment. Besides, we find that psychological empowerment negatively moderates the relationship between supervisor developmental feedback and employees' positive emotions, as well as moderates the chain mediating effect of this paper. The present study not only contributes to the literature on feedback and innovation, but also provides practical guidance on how to seek remedies to facilitate employees' creative idea enactment from the perspective of human resource management.

Keywords: supervisor developmental feedback, positive emotions, work engagement, psychological empowerment, enactment of employees' creative ideas

INTRODUCTION

In the hypercompetitive environment, creative idea, as the hallmarks of contemporary business, is regarded as the significant source of competitive advantage (Sachpazidu-Wojcicka, 2017; Li et al., 2019). Nevertheless, employees judge whether an idea is creative or novel is subjective, and if creative ideas are not appraised or appreciated by supervisors, the organization's innovation would lose the opportunity to be implemented (Harvey, 2014; Mueller et al., 2017). Faced with this situation, recent documents have proposed the concept of creative idea enactment, which not only could reflect the novelty, uniqueness, and value of ideas to achieve greater

mutual understanding and recognition, but also promote the supervisor's assessment of creativity and trigger the implementation of innovative decisions (Lu et al., 2019). Idea enactment refers to the vivid illustration of abstract creative ideas in more tangible forms using PowerPoint presentations, demos, or other physical objects, such as animating boards, mockups, drawings, and experimental simulations (Lu et al., 2019). Different from the connotation of creativity (Amabile et al., 2005; Liu et al., 2020), the enactment of creative ideas focuses on the practicality and feasibility of creative ideas (Harvey, 2014; Lee and Farh, 2019; Lu et al., 2019). Therefore, owing to creative idea enactment closely relates to the supervisor's assessment of creativity and the core competitiveness of the company, it is imperative to seek remedies to accelerate the enactment of employees' creative ideas in the context of practitioners lamenting the slow pace of organizational innovation.

Creative idea enactment not only requires intense cognitive, psychological, and physical efforts on the part of the individual, but also expects circumstantial conditions conducive to innovation (Knippenberg and Hirst, 2020). As a key resource of the company, employees are faced with pervasive uncertainty during the period of globalization countercurrent and epidemic control. Hence, human resource management (HRM) practitioners place enduring importance on suggestions that encourage employees to obtain feedback from supervisors, which furnish employees with pivotal information on how to effectively perform their duties or perceive threats (Harrison and Dossinger, 2017; Bak, 2020; Kim and Kim, 2020). In literature, scholars demonstrated that the supervisor developmental feedback could affect subordinate task performance (Zheng et al., 2015), innovative behavior (Su et al., 2019; Li et al., 2021), and employee voice (Zhang et al., 2019). Obviously, the existing literature has paid insufficient attention to the catalyzing factors of the enactment of creative ideas (Lu et al., 2019), let alone the relationship between supervisor developmental feedback and employees' creative idea enactment. Hence, considering the pivotal role of feedback and idea enactment in organizational practice and a scarcity of relevant literature (Harvey, 2014; Lu et al., 2019), this study attempts to replenish the previous studies by clarifying the psychological process by which supervisor developmental feedback influences the enactment of employees' creative ideas.

Returning to the Chinese context, the supervisor developmental feedback is bound to penetrate into the behavior of employees' creative idea enactment. In China, the communication methods of supervisor are relatively subtle, and supervisor rarely directly provide feedback valence, such as praise or criticism (Zhang et al., 2017), while as a form of unclear expression of feedback valence, supervisor developmental feedback has been favored by managers in China (Zheng et al., 2015). Generally speaking, supervisor developmental feedback is a form of feedback that stimulates subordinates' work attitudes and behaviors. It not only effectively boosts the improvement of employees' intrinsic motivation to irritate their interest in the task itself, but also provides employees with directions for future learning and innovation (Li et al., 2021). In other words, unlike the traditional feedback that only provides employees' past working behaviors or results, the constructive (as opposed to evaluative or threatening), behavioral focused, and learning-oriented developmental feedback from supervisors is more likely to promote employees to ameliorate or break through their existing jobs (Su et al., 2019), thus facilitating the enactment of creative ideas. It is worth emphasizing that insights of Harvey (2014) on boosting team creativity proposed that enacting ideas by producing physical objects could further aid creative synthesis, and enacting ideas is usually regarded as an implementation activity that occurs at a later stage of the innovation process. Therefore, it is reasonably believed that the enactment of employees' creative ideas could be promoted and driven by supervisor developmental feedback.

Understanding the psychological process of the enactment of employees' creative ideas is a matter of great concern. It has been corroborated by previous studies that the affective events theory (AET) is utilized to interpret how workplace events affect employees' job-related attitudes and behavior through emotions (Weiss and Cropanzano, 1996; Madrid et al., 2019). Based on this logic, supervisor developmental feedback cultivates a creativity-supportive content, and this kind of work-related identification shapes the positive emotions of employees, such as enthusiasm, excitement, and alertness (Zhang et al., 2019). According to the Broaden-and-Build Theory (BBT), individual positive emotions maintain their creative behavior and prosocial actions by expanding one's momentary thought-action repertoires and psychological resources (Amabile et al., 2005; George and Zhou, 2007). At the same time, Eva et al. (2019) identify that supervisor developmental feedback as also a valuable resource, which helps employees adjust their behavior in line with organizational expectations and recommendations, thereby enhancing their work engagement level. While employees with high levels of work engagement have the psychological flexibility to generate novel ideas (Orth and Volmer, 2017; Maden-Eyiusta, 2021), and perform well in extensive information search and problem-solving (Bhatnagar, 2012), which would be instrumental in boosting the enactment of creative ideas. In addition, psychological literature has found that positive emotions capture a series of personal characteristics, such as low stress, high life satisfaction, and better mental health (Fredrickson et al., 2008), which would guide people to effectively adapt and adjust their thinking patterns to cope more successfully with stress and obstructive events (Conner and Silvia, 2015). In practical work, individuals with high positive emotions have the enthusiasm, vitality, and nerve to overcome obstacles at work, and then emerge higher work engagement (Ouweneel et al., 2012; Gloria and Steinhardt, 2017; Buric and Macuka, 2018). Therefore, the present paper proposes a chain mediation model to test the positive influence of supervisor developmental feedback on employees' creative idea enactment through positive emotions and work engagement.

However, the process of employees' emotional responses and subsequent behavior triggered by workplace events would be disturbed by personal characteristics (Weiss and Cropanzano, 1996), while psychological empowerment is a psychological state that exists within individuals, reflecting a positive orientation

towards job roles (Thomas and Velthouse, 1990). Individuals with different levels of psychological empowerment have inconsistent demands for external resources and knowledge (Audenaert et al., 2017; Kang et al., 2020), leading them to perceive different intensities of emotions or other psychological responses from feedback. For instance, Hong and Gajendran (2018) suggest that psychological empowerment moderates the relationship between certain organizational variables and employee behavior, which makes the hypothetical development of our paper traceable. Thus, we regard psychological empowerment as a psychological state which may be relatively independent of supervisor feedback, and it interferes with the positive emotion intensity and the related chained mediating effect in the relationship between supervisor development feedback and the enactment of employees' creative ideas.

With the work above, we have summarized several possible marginal contributions. Firstly, by assessing the relationship between supervisor developmental feedback and creative idea enactment through establishing a multi-level theoretical model, the present article seeks to address theoretical gaps and advance the extant knowledge. Using social exchange theory and the Pygmalion effect (Zhou and George, 2001), we deduce for the first time a concise and coherent theoretical explanation of the connection between supervisor development feedback and creative idea enactment. Social exchange theory is considered to interpret the resource-feedback processes during which recipients may implement constructive improvements by absorbing more momentous feedback from their supervisors (Cropanzano et al., 2017; Eva et al., 2019). The meaning of the Pygmalion effect in psychology is that the higher the expectations of people, the better they perform (Szumski and Karwowski, 2019). According to this logic, supervisor developmental feedback reflects the supervisor's expectations of subordinates, while in turn, employees' motivation for experimentations and creative attempts would be enhanced according to the principle of reciprocity (Zhang et al., 2017). The pioneering study would deepen the understanding of the emergence and propagation of supervisor developmental feedback. Secondly, in terms of research content, we provide a research framework of the "main effect test – chain mediation test." This framework emphasizes the psychological process in which the supervisor development feedback influences the enactment of creative ideas, that is, positive emotions and work engagement play a chained mediating role between the two. Lastly, this paper deepens our knowledge of the moderating role of psychological empowerment by testing the extent to which it moderates positive emotional response to supervisor feedback and testing whether it moderates the chained mediating effect we proposed. This article aims to provide theoretical reference and practical enlightenment for how to facilitate employees' creative idea enactment. Based on the above analysis, we generate the following four questions (Qs):

Q1: How does the supervisor developmental feedback affect the enactment of employees' creative ideas?
Q2: How do positive emotions and job engagement, respectively, interfere with the relationship between supervisor developmental feedback and the enactment of employees' creative ideas?
Q3: Do positive emotions and work engagement play a chained mediating role in the influence of supervisor developmental feedback on employees' creative idea enactment?
Q4: How does psychological empowerment interfere with the complex influence mechanism of supervisor developmental feedback on the enactment of employees' creative ideas?

The remainder of the present paper is arranged as follows. In Section 2, we mainly elaborate on the hypothesis development. Section 3 primarily describes the method, while Section 4 presents the results of this article. Lastly, Section 5 offers the discussion, including conclusions, theoretical implications, practical implications, limitations, and future research.

HYPOTHESIS DEVELOPMENT

Supervisor Developmental Feedback and the Enactment of Employees' Creative Ideas

Supervisor developmental feedback is the extent to which supervisors promote employees' learning, development, and improvement by providing valuable information to employees (Zhou, 2003). According to the research of Zhou (2003), supervisor developmental feedback holds three distinctive features. First, it belongs to information-based feedback rather than control-based feedback, because it provides employees with valuable and beneficial information. Consequently, it cultivates a creativity-supportive content, in which there is no mandatory requirement for employees' goals at work. Second, it has a future-oriented attribute, aiming to help employees learn, develop, and make improvements. Third, although supervisor developmental feedback implies both positive feedback information and negative evaluation information, it focuses on the transmission of information related to task improvement rather than the positive and negative feedback valence. These characteristics reflect the widespread functionality and universal importance of supervisor developmental feedback in organizational activities.

Research on social exchange theory and Pygmalion Effect provides a direct basis for understanding how supervisor developmental feedback facilitates the enactment of employees' creative ideas. Social exchange theory is widely used in the field of social psychology, which means that human behavior is dominated by a certain kind of exchange activity that can bring rewards (Cropanzano et al., 2017; Montani et al., 2017). The exchange relationship between supervisors and employees would lead to high-level employee innovative behavior. The emergence of supervisor developmental feedback creates a situation where the exchange party provides constructive resources. To maintain and strengthen such social exchange relationship, employees devote more energy and time to respond to the supervisors' feedback, thereby enhancing employees'

intrinsic motivation to exceed the basic requirements stipulated in their contract (Li et al., 2011; Eva et al., 2019; Su et al., 2019). Meanwhile, the Pygmalion Effect suggested that positive external expectations improved individual performance (Tierney and Farmer, 2004). Supervisor developmental feedback reflects the supervisor's expectations and commitment to employees' development and personalization. According to the principle of reciprocity, employees understand supervisor developmental feedback broadly within or outside the scope of the task, and could maintain cognitive vigilance, modify practical actions when necessary, seek opportunities to improve technical methods, and even exceed work requirements.

Through the above comprehensive analysis, we contend that supervisor developmental feedback plays a crucial role in persuading employees to enact creative ideas. First, exposure to developmental and surprising feedback is conducive to cultivating employees' divergent thinking as a way of reciprocating for the positive treatment they have received from the supervisors (Zhang et al., 2017). Then, the harmonious team climate created by supervisor developmental feedback strengthens employees' psychological safety. This could fundamentally reduce employees' fear of engaging in transformational work and help them form positive expressions of creative ideas (Wu and Parker, 2017; Tu et al., 2019). Finally, from the perspective of work dynamics, supervisor developmental feedback could further unlock information resources, which makes employees not only limited to the generation of creative ideas (Zhang et al., 2019), but also helps employees show the feasibility and potential value of their creative ideas in the form of physical carriers. Therefore, the following hypothesis was proposed:

> *Hypothesis* 1: Supervisor developmental feedback relates positively to the enactment of employees' creative ideas.

Mediating Influence of Positive Emotions

The feedback employees receive from their supervisors are intuitively mirrored in their emotions and professional practices. Positive emotion is a short-lived positive evaluative status, with cognitive and neurological elements. The specific aspects to which employees respond to positive emotions are recognition and achievement (Tepper et al., 2018), while such events are more likely to arise in a resourceful job, with a high level of task significance, autonomy, and feedback (Nifadkar et al., 2012). The essence of supervisor developmental feedback is to express the boss's concern about the work and needs of followers, aiming to enhance subordinates' positive emotions by improving subordinates' happiness and work enthusiasm. For example, Zhang et al. (2019) hold that supervisor developmental feedback signals to employees that their supervisors support and cherish the benefits they bring to the company, and discover a positive relationship between day-level supervisor developmental feedback and day-level positive affect. Hence, supervisor developmental feedback would induce employees' positive emotions.

Positive emotions are expected to facilitate the enactment of employees' creative ideas. Emotions are essentially a synthesis of physiology, psychology, and sensation (Mann, 1999), and if employees share positive emotions related to innovation, they are likely to develop a favorable motivational orientation toward it and behavioral readiness for implementing it. Studies have shown that employees in a positive mood display fluid ideation, divergent thinking, flexible categorization, and perform well on perceptive problems, unusual word associations, and heuristic problem-solving tasks (George and Zhou, 2007; Torres et al., 2019). Emotion regulation strategies that belong to the category of positive emotions (Denier et al., 2020) help irritate the individual's creative development. Further, BBT helps to understand the influence of positive emotions on employees' creative idea enactment (Fredrickson, 1998). According to this view, positive emotions not only encourage individuals to build up personal resources such as knowledge and social support, but also enable individuals to perform more creative behaviors by expanding cognition and action range. In general, these statements suggest that positive emotions incite employees' creative idea enactment because positive emotions have the function of affecting information processing and working memory.

Affective events theory points out that there is a complete mechanism chain of "events-emotions-attitude and behavior" in the organization. Namely, events in the workplace indirectly affect employees' work attitudes and behaviors by triggering different emotional reactions (Weiss and Cropanzano, 1996). Existing research has already used this theoretical mechanism to investigate how authentic leadership could facilitate employees' creativity by stimulating employees' positive emotions (Rego et al., 2014). Therefore, we believe that supervisor developmental feedback, as a momentous event in the workplace, tends to change the mental state of employees when stimulating employees to enact ideas, that is, to boost their positive emotions at work. Then, we offered the following assumption:

> *Hypothesis* 2: Positive emotions play a mediating role between supervisor developmental feedback and employees' creative idea enactment.

Mediating Influence of Work Engagement

Theory of Planned Behavior and the Job Demands-Resources Model highlights that feedback is one of the considerable factors that affect employee performance. Theoretically, the higher the degree to which a person is identified psychologically with his work, the more work he participates in (Lesener et al., 2019). However, this closely relies on an ecosystem of external feedback from various sources, such as from supervisors, coworkers, or critical clients (Schaufeli et al., 2002). The Theory of Planned Behavior reminds us that the employees' organizational behavior depends on their attitude and perception of the surrounding environment (Arain et al., 2020). Supervisor developmental feedback conveys constructive signals for the development of the company to employees (Zhou and George, 2001), and in such a supportive environment, employees have the ability to master detailed information of job responsibilities, reduce ambiguity and uncertainty by clarifying performance standards, thereby increasing their level of work engagement

(Eva et al., 2019). Besides, the Job Demands-Resources Model proposed that capturing and storing resources, such as training, rewards, and feedback are requisite conditions for employees to devote to their work (Bakker and Demerouti, 2017; Knight et al., 2017; Wingerden et al., 2017; Radic et al., 2020). Once these resources are provided, work engagement is more likely to occur. Following this logic, as a form of constructive feedback, supervisor developmental feedback is helpful to actively guide subordinates to recognize goals, correct deviations, improve methods, and enhance professional engagement (Menguc et al., 2013). Thus, supervisor developmental feedback is presumed to positively affect work engagement.

Besides, we posit that a high level of work engagement would stimulate the enactment of creative ideas. There are three reasons. Firstly, employees immersed in the job held higher vitality, engendering plenty of energy and good mental toughness (Black et al., 2017). Vitality is a positive emotion related to work, which promotes people to discover and generate original ideas (Kwon and Kim, 2020), thereby indirectly increasing the possibility of enacting ideas. Secondly, creative cognition needs to integrate three processes of problem identification, information search, and creativity generation (Biennewies and Gromer, 2012), while dedicated employees have a strong sense of responsibility and initiative to identify problems and search for information more effectively at work, leading to propose creative solutions (Bhatnagar, 2012). Finally, in addition to devoting themselves to existing jobs, dedicated employees undertake diversified advantages, such as withstanding more failures, having mental resilience to generate novel ideas, and seeking opportunities to excel (Orth and Volmer, 2017). These diversified advantages help employees increase their determination to overcome difficulties and enhance the possibility and strategic fit of enacting ideas. To sum up, it is plausible to predict that supervisor developmental feedback is assumed to positively affect creative idea enactment by increasing employees' work engagement. Therefore, the following assumption was put forward:

> *Hypothesis* 3: Work engagement plays a mediating role between supervisor developmental feedback and the enactment of employees' creative ideas.

The Chained Mediating Effect of Positive Emotion and Work Engagement

Positive emotions are expected to initiate employees in being engaged in the work, and we thus strive to integrate positive emotions and work engagement into a broader framework. To accomplish this integration, we have synthesized relevant literature and applied BBT. Work engagement is described as a motivational concept that is associated with the fulfillment of personal aspirations (Schaufeli et al., 2002; Schaufeli and Bakker, 2010). In the literature, employees' psychological state, including emotions (such as high energy, excitement, pleasure, pride, etc.) caused by workplace events has a positive function on work completion (Conner and Silvia, 2015). The uniqueness of BBT lies in the introduction of two critical assumptions, "Broaden hypothesis" and "Build hypothesis." "Broaden hypothesis" argues that positive emotions enable an individual to tap into a wider range of thoughts by momentarily expanding one's thinking and attention. In turn, "Build hypothesis" points out that these broadened outlooks may challenge difficult problems by establishing consequential personal resources, and enable individuals to obtain happiness and success from them (Ouweneel et al., 2012). In other words, positive emotions are proven to expand people's thought-action combinations and to "build" personal resources, like hope, which in turn lead to a state of well-being, like participation (Buric and Macuka, 2018). Evidence has shown that employees who experience positive emotions are full of enthusiasm, vigor, and courage to devote extra effort to the job (Gloria and Steinhardt, 2017; Young et al., 2018), because they exhibit higher levels of resilience and fewer symptoms of burnout.

Upon the analysis above, we propose a chain mediation effect between supervisor developmental feedback and the enactment of employees' creative ideas. Namely, supervisor developmental feedback could increase employees' positive emotions, and positive emotions are positively related to work engagement by broadening one's thinking and accumulating more resources, ultimately facilitating vivid presentation of creative ideas. Therefore, the following assumption was made:

> *Hypothesis* 4: Positive emotions and work engagement play a chain mediating role in the relationship between supervisor developmental feedback and employees' creative idea enactment.

The Moderating Role of Psychological Empowerment

The intensity of positive emotion that an individual perceives from feedback is subject to the interference of individual characteristics. The AET states that employees' emotional perception in the workplace may be influenced by their characteristics, while psychological empowerment refers to people's various psychological states stemming from environmental differences, which affect individual characteristics (Smith et al., 2019). Specifically, psychological empowerment consists of four core cognitions of work: competence, meaning, self-determination, and impact (Spreitzer, 1995; Matsuo, 2021). Previous research has generally linked psychological empowerment to significant employee outcomes in the team (Hartmann et al., 2018; Garcia-Juan et al., 2020). Schermuly and Meyer (2016) proposed that there was a negative correlation between psychological empowerment and feelings of depression. They also mentioned that accepting positive feedback stimulated the competence dimension of psychological empowerment, thereby allowing individuals to gain more resources to feel more impactful. Thus, we argue that psychological empowerment should not be isolated from feedback research.

The effectiveness of the supervisor developmental feedback is a dynamic process, where the feedback process needs to fit subordinates and the environment to achieve effective results. Psychological empowerment makes employees feel more "empowered" and motivates them to change their inner beliefs and attitudes (Spreitzer, 1995). Supervisor developmental feedback

provides a creativity-supportive context that enables individuals to generate better creative solutions, which is in line with the characteristics of highly empowered employees, that is, they value organizational goals and implement positive behaviors. When employees' psychological empowerment is high, employees have sufficient centripetal force and competitiveness to increase positive emotions at work, implement independent actions, and overcome psychological barriers to expertise seeking (Hong and Gajendran, 2018; Garcia-Juan et al., 2020). As a result, such employees perceive weaker positive emotions from supervisor developmental feedback. Conversely, employees with low psychological empowerment lack confidence to complete tasks and the internal drive to work, thus they perceive stronger positive emotions from supervisor developmental feedback, and believe that they can change the working environment. In contrast, supervisor developmental feedback is more effective in motivating followers with low psychological empowerment, because these followers pay more attention to the acquisition of professional knowledge and resources (Chen et al., 2019). Therefore, this study considers psychological empowerment as a moderator and presumes that the positive effect of supervisor developmental feedback on positive emotions would be further weakened by psychological empowerment.

Through the above theoretical derivation, we conjecture that highly empowered employees perceive higher work meaning and self-determination. These advantages of highly empowered employees greatly decrease the extent to which individuals obtain positive emotional experience from supervisor developmental feedback, thereby reducing the indirect influence of supervisor developmental feedback on creative idea enactment through positive emotions and work engagement. Thus, we developed the following hypothesis:

> *Hypothesis* 5: Psychological empowerment negatively moderates the relationship between supervisor developmental feedback and positive emotions.
> *Hypothesis* 6: Psychological empowerment negatively moderates the chain mediation effect of positive emotions and work engagement between supervisor developmental feedback and the enactment of employees' creative ideas.

Our research model is captured in **Figure 1**.

MATERIALS AND METHODS

Research Methods

Since questionnaire survey is a relatively popular research technique, which has been widely used in studies of different industries and diverse fields (Zhong et al., 2018; Belad and Joumni, 2020; Zyl et al., 2021), this article adopted the method of a questionnaire survey to collect the original data. Subsequently, we conducted a quantitative study, listing descriptive statistical analysis and hierarchical regression analysis in turn. During the questionnaire survey, online data collection was applied for two major reasons, first, it holds various advantages, such as high quality, low cost, and high speed (Rasool et al., 2021). For example, respondents are more likely to make true answers to privacy and sensitive questions, and information transmission and feedback are both faster and more efficient. Second, the data collection in this article was carried out during the COVID-19 pandemic, when a majority of employees were telecommuting or working from home. Refer to the research of Samma et al. (2020) and Rasool et al. (2021); this article explains in detail the questionnaire development, samples, and data collection.

Questionnaire Development

To measure variables reliably and effectively, a questionnaire comprised of 40 items was preliminarily designed according to classical studies in related fields. All variables were measured using a five-point Likert scale where "1" meant strongly disagree and "5" meant strongly agree, and respondents were invited to rate the statement from strongly disagree to strongly agree. Consistent with previous research (Liang et al., 2019), all items were translated from English to Chinese following the translation/back-translation procedure. Notably, a pilot investigation was performed to verify the reliability and validity of the instrument: We distributed questionnaires to 10 professors in related fields and 10 corporate managers (who have extensive organizational management experience and are familiar with this research topic) to obtain feedback on the instrumental design. It ultimately led to several minor changes in the item wording and language logic. In a word, the questionnaire survey of this article was logically clear and feasible, and was described in detail in **Appendix A**.

Sample

The sample of this survey comprised six emerging companies located in Shaanxi and Henan provinces, China, and these companies cover diverse industries with high demand for innovation, including communications, healthcare, and the Internet. The reason for choosing companies in these two cities is that these enterprises are easy to get in touch and maintain communication through social relations, and the contact information of the target interviewees obtained is true and reliable. Sample 1 ($N = 116$) consisted of employees of a healthcare company. The sample contained 65 males (56 per cent) and 51 females (44 per cent). The core business of this company is the technical development, technical consulting, technical training of medical and healthcare products, as well as the development, promotion, and database maintenance of medical software. Sample 2 ($N = 78$) consisted of employees of an Internet technology company. The sample included 52 males (67 per cent) and 26 females (33 per cent). Most employees have a master's degree and the mean age is 28 years. The main activities of the employees are computer integration and the development and sale of software and hardware. No redundant introduction to other samples.

Data Collection

To ensure the quality of the data obtained, the drafted guidelines explained to the interviewees that the purpose of this survey

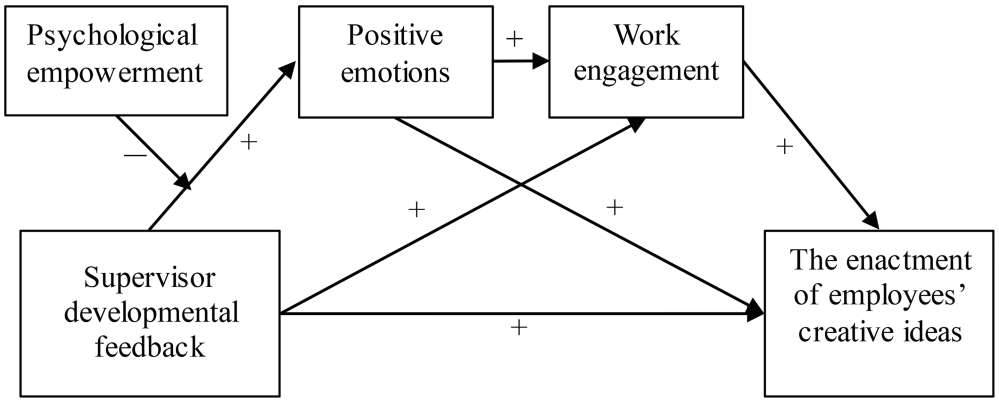

FIGURE 1 | The hypothesized model.

was only for academic research, the answers could be withdrawn at any time, and anonymity and confidentiality were guaranteed at the beginning of each investigation section. In the preliminary study, we used the convenience sampling method in non-probability sampling because this method allows researchers to gain necessary data and research trends (Samma et al., 2020). Notably, before formal data collection, this paper conducted a pre-test. In this process, 80 questionnaires were obtained, and the analysis results indicated that these questionnaires passed the reliability and validity tests.

Next, we performed a two-time survey to formally collect data. Theoretically, to achieve a 95% confidence rate, the sample size should be greater than 300. Considering that there may exist invalid responses to the questionnaire, we distributed 600 questionnaires during the first survey. Specifically, at time one, employees were asked to provide demographic information and to rate the level of feedback they received from their supervisors. A total of 600 questionnaires were returned at this stage, of which 518 were valid questionnaires, resulting in an effective response rate of 86.33%. One month later, 518 respondents who responded to the first survey were asked to report their emotional state and the level of work engagement. A total of 397 valid questionnaires were obtained, with an effective response rate of 76.64%. The reason for using multi-time and multi-source data is that data from common sources may exaggerate the correlation between variables, leading to biased conclusions (Li et al., 2018; Su et al., 2019).

Variables and Measurement

Supervisor Developmental Feedback

Using the scale developed by Zhou (2003) to measure supervisor developmental feedback. The measurement standard contains three items: "My immediate supervisor often gives me developmental feedback," "The focus of feedback given to me by my superior is to help me learn and improve," and "Supervisor feedback provides me with useful information on how to improve my work performance." The average of these three items forms the supervisor developmental feedback scale. Lastly, the Cronbach's alpha for this measure was 0.834, which was higher than the critical value of 0.7, indicating that the items used in our research instrument were valid.

Positive Emotions

Positive emotions were assessed utilizing the classic questionnaire instruments (Tellegen et al., 1999). These five items were expressed as follows: "in the past few weeks, my work had made me feel "strong, excited, interested, enthusiastic, and determined." The Cronbach's α for the positive emotion scale was 0.886. The items adopted in the research were considered quite valid because their Cronbach's α value was higher than the standard 0.70.

Work Engagement

Work engagement was measured using the Utrecht Work Engagement Scale designed by Schaufeli et al. (2002). This scale has three dimensions and finally contains 17 items. The sample items are: "When I get up in the morning, I feel like going to work," "I am proud of the work that I do," "I feel happy when I am working intensely," and so on. The Cronbach's α for this measure was 0.910. Given that the standard value of Cronbach's α is 0.70 or higher, we have ample reasons to believe that the items used in our instrument were valid.

The Enactment of Creative Ideas

Drawing on the research of Lu et al. (2019), three items were used to assess the enactment of creative ideas. This scale asks participants a question, "how frequently do you engage in the following behaviors when you try to provide a creative idea to your supervisor," and these three behaviors are: "Illustrate your ideas to the supervisor through written descriptions, PowerPoint presentations, drawings, or storyboards," "Conduct experimental simulations yourself to prove whether the creative ideas are feasible," and "Develop a prototype or other sample to prove the value of the creative ideas." The items we used in the research instrument were valid because the value of Cronbach's α was 0.784, which was higher than the critical value of 0.7.

Psychological Empowerment

Based on the research of Spreitzer (1995), a translation of the entire 12-item questionnaire was used to assess psychological empowerment. The scale consists of four dimensions with three items each: meaning, competence, self-determination, and impact. Sample items are "I can decide for myself how to do my job" (self-determination, $\alpha = 0.84$), "The work I do is meaningful to me" (meaning, $\alpha = 0.87$), "I have a great deal of control over what happens in the department" (impact, $\alpha = 0.86$), and "I am confident about my ability to do my job" (competence, $\alpha = 0.82$). The Cronbach's α for the psychological empowerment scale was 0.850. The standard value of Cronbach's α was 0.70 or higher, thus, the items utilized in our research instrument were fairly valid.

Participants' Characteristics

Our questionnaire was distributed to 600 employees of SMEs, and a total of 397 valid responses were used for the analysis of this article. The socio-demographic characteristics of the participants were summarized from four aspects. In this study, 54.2% of participants were male. In terms of education, 78.6% had a bachelor's degree or above, of which 30.5% had a master's degree and 3.0% had a doctoral degree. Respondents with other educational backgrounds accounted for 21.4%. The age distribution of the investigators was that 16.6% of those aged 25 and under, 74.8% of those aged 26–35, 7.6% of those aged 36–45, and 1.0% of those aged 46 and over, reflecting that the investigators were highly educated and younger. There were 156 respondents with a working age of 3 years and below, accounting for 39.3%, 104 of respondents had worked for 3–5 years, accounting for 26.2% of the total sample, and respondents who have worked for more than 5 years accounted for 34.5%. The detailed socio-demographic characteristics are shown in **Table 1**.

Following previous research (Dimotakis et al., 2017; Gloria and Steinhardt, 2017), we created a demographic similarity measure that included followers' gender (male = 1, female = 0), age (25 years old and below = 1, 26–35 years old = 2, 36–45 years old = 3, and 46 years old and above = 4), work tenure (3 years and less = 1, 3–5 years = 2, 5–10 years = 3, and 10 years or more = 4), and education (1 = undergraduate, 2 = undergraduate, 3 = master's degree, and 4 = doctoral degree) to improve the accuracy of hypothesis testing.

TABLE 1 | The detailed socio-demographic characteristics of respondents. (*N* = 397).

Characteristics	Category	Frequency (*n*)	Percentage (%)
Gender	Male	215	54.2
	Female	182	45.8
Working experience	3 years and below	156	39.3
	3–5 years	104	26.2
	Above 5 years	137	34.5
Education	Bachelor's degree	179	45.1
	Master's degree	121	30.5
	Doctor's degree	12	3.0
	Others	85	21.4
Age	25 years old and below	66	16.6
	26–35 years old	297	74.8
	36–45 years old	30	7.6
	46 years old and above	4	1.0

Analytical Strategy

We first used the three-step test method of Baron and Kenny (1986) to shed light on the mediating role of positive emotions and work engagement in the relationship between supervisor development feedback and employees' creative idea enactment. The specific operation was to use SPSS to perform a hierarchical regression analysis which is widely used in many quantitative studies (Peltokorpi and Hasu, 2016; Ugur et al., 2018). First, we took the supervisor developmental feedback and other control variables as a whole to perform regression (see model 5 in **Table 2**). Then, we included potential mediators into the model (see models 6 and 7 in **Table 2**). Finally, we entered independent variables and the two mediators as a block (see model 8 in **Table 2**). According to the research of Preacher and Hayes (2004), bootstrap methods in virtue of the PROCESS program in SPSS were used to further verify the existence of the chain mediating effect. Bootstrapping is especially advantageous in this research because indirect effects usually do not comply with a normal distribution and the sample size we used is relatively small. We bootstrapped with 5,000 in the study to produce bias-corrected CIs of yield 95%, and the chained mediating effect was significant if the CI excluded 0.

Then, model 83 in PROCESS macro of SPSS was performed to test the moderated chain mediation model. Only when the CI does not include 0, can psychological empowerment moderate the chained mediating effect of positive emotions and work engagement between supervisor developmental feedback and employees' creative idea enactment. All independent variables were grand-mean centered in statistical analysis.

RESULTS

Validity of Scales

The present study, respectively performed tests of content validity, convergent validity, and discriminant validity. First, the measurement of main variables came from relatively mature scales in academia and was widely applied in Chinese management situations (Zhang et al., 2017; Su et al., 2019), which meant that our scale had good content validity. Secondly, we found that AVE values of the five variables of supervisor developmental feedback, positive emotions, work engagement, employees' creative idea enactment, and psychological empowerment were 0.637, 0.602, 0.549, 0.548, and 0.660, respectively, which were greater than the critical value of 0.5, indicating that the five variables had good convergent validity. Finally, confirmatory factor analyses (CFA) were conducted by using a weighted least squares means and variance-adjusted (WLSMV) estimator in Mplus7.2, and relevant results were presented in **Table 3**. Compared with one-factor model, two-factor model, three-factor model, and four-factor model, the proposed five-factor model yielded a good fit to the data ($\chi^2 = 610.864$, df = 289, $\chi^2/df = 2.114$, CFI = 0.956, GFI = 0.902, IFI = 0.956,

TABLE 2 | Hierarchical regressions for main variables.

Variables	Positive emotions		Work engagement		Enactment of employees' creative ideas			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Gender	−0.01	−0.09	−0.02	−0.02	−0.09	−0.09	−0.08	−0.08
Age	−0.04	−0.14	−0.06	−0.05	−0.12	−0.11	−0.10	−0.10
Work tenure	0.03	0.05	0.03	0.03	0.05	0.04	0.04	0.04
Education	0.01	0.12	0.07	0.07	0.09	0.09	0.07	0.08
SDF	0.53***	0.41***	0.40***	0.27***	0.51***	0.37***	0.43***	0.33***
positive emotions				0.25***		0.26***		0.22***
work engagement							0.21***	0.16***
PS		−0.06**						
SDF × PS		−0.09**						
R^2	0.28	0.30	0.18	0.22	0.29	0.34	0.33	0.36
ΔR^2	—	0.02	—	0.04	—	0.05	0.04	0.07
F	29.1***	23.1***	16.3***	18.1***	30.8***	32.4***	30.3***	30.2***

SDF represents supervisor developmental feedback; EECI represents enactment of employees' creative ideas; and PS represents psychological empowerment.
$^{**}p < 0.01$; $^{***}p < 0.001$.

TABLE 3 | The result of confirmatory factor analysis ($N = 397$).

Factors	χ^2	df	χ^2/df	CFI	GFI	IFI	TLI	RMSEA
Five-factor model (SDF; PE; WE; EECI; PS)	610.864	289	2.114	0.956	0.902	0.956	0.910	0.054
Four-factor model (SDF + PE; WE; EECI; PS)	756.896	293	2.583	0.937	0.858	0.937	0.964	0.064
Three-factor model (SDF + PE + WE; EECI; PS)	826.094	296	2.791	0.927	0.843	0.928	0.867	0.068
Two-factor model (SDF + PE + WE+EECI; PS)	859.223	298	2.883	0.923	0.834	0.923	0.822	0.070
Single-factor model (SDF + PE + WE+EECI+ PS)	1067.394	299	3.570	0.895	0.791	0.895	0.79	0.091

SDF represents supervisor developmental feedback; PE represents positive emotions; WE represents work engagement; EECI represents enactment of employees' creative ideas; and PS represents psychological empowerment.

TLI = 0.910, and RMSEA = 0.054), implying that respondents could distinguish all constructs clearly.

Common Method Bias Checks

To address concerns over common method bias, several procedural remedies of anonymous filling, cross-temporal surveys, and the setting of mutually exclusive items were adopted in the process of data collection. However, the problem of common method bias may exist due to the single source of the questionnaire, then we conducted Harmon's one-factor test using PSSS22.0. The result revealed that the first principal component factor before rotation explained 29.4% of the total variation, which was lower than the recommended value of 50%, further reflecting that common method variance was unlikely to be a serious problem in our data.

Descriptive Statistics and Correlations Among Variables

Table 4 displayed the means, SDs, and correlations of all variables. According to the table, the mean value of SDF is 2.94, with a SD of 0.887, indicating that the dispersion of supervisor developmental feedback is large. The average value of EECI is 3.17, with a SD of 0.893, which demonstrates that the level of creative idea enactment is relatively high. An inspection of the correlations showed that supervisor developmental feedback had a significant positive impact on positive emotion ($\gamma = 0.411$, $p < 0.001$), work engagement ($\gamma = 0.436$, $p < 0.001$), and the enactment of employees' creative ideas ($\gamma = 0.449$, $p < 0.001$). Meanwhile, positive emotions ($\gamma = 0.429$, $p < 0.001$) and work engagement ($\gamma = 0.369$, $p < 0.001$) were positively related to the enactment of creative ideas, respectively. Besides, there was a significant positive correlation between positive emotions and work engagement ($\gamma = 0.452$, $p < 0.001$). Hence, the results of correlation analysis were consistent with our theoretical expectations, then, subsequent hierarchical regression analysis can be promoted.

Hypotheses Testing

Table 2 provided the results of hierarchical regression analysis. Hypothesis 1 predicted a positively direct effect of supervisor developmental feedback on the enactment of employees' creative ideas. Model 5 of **Table 2** showed that supervisor developmental

TABLE 4 | Descriptive analysis and correlations among variables.

S.No	Variables	1	2	3	4	5	6	7	8	9
1	Gender	1								
2	Age	−0.004	1							
3	Work tenure	0.002	0.314**	1						
4	Education	0.104*	0.282*	0.166*	1					
5	SDF	−0.089	0.044	0.039	0.106*	1				
6	Positive emotions	−0.084	−0.006	0.004	0.035	0.411**	1			
7	Work engagement	−0.068	0.012	0.008	0.047	0.436**	0.452**	1		
8	EECI	−0.103*	0.015	0.020	0.098	0.449**	0.429**	0.369**	1	
9	PS	−0.086	−0.017	−0.031	0.043	0.363**	0.344**	0.441**	0.466**	1
	Mean	0.54	2.51	2.07	2.18	2.94	3.03	3.18	3.17	3.24
	SD	0.496	0.517	1.059	0.779	0.887	0.775	0.829	0.893	0.951

SDF represents supervisor developmental feedback; EECI represents enactment of employees' creative ideas; and PS represents psychological empowerment.
$^{*}p<0.05$; $^{**}p<0.01$.

feedback was significantly related to employees' creative idea enactment ($\beta=0.51$, $p<0.001$), thus supporting Hypothesis 1.

Our paper adopted the three-step procedure of Baron and Kenny (1986) for justifying the mediation effect. Firstly, supervisor developmental feedback should be significantly associated with the enactment of employees' creative ideas. Secondly, after adding mediating variables, the association between mediating variables and creative idea enactment should be significant. Finally, the indirect impact of supervisor developmental feedback on employees' creative idea enactment must be significant as well. As model 6 of **Table 2** showed, when adding positive emotions to model 5, it significantly predicted the enactment of employees' creative ideas ($\beta=0.26$, $p<0.001$), meanwhile, the effect of supervisor developmental feedback on employees' creative idea enactment was still significant ($\beta=0.37$, $p<0.001$). Hence, positive emotions partially mediated the influence of supervisor developmental feedback on the enactment of employees' creative ideas, supporting Hypothesis 2. Similarly, Model 7 in **Table 2** stated that there was a significant indirect effect for work engagement in the relationship between supervisor developmental feedback and creative idea enactment. Hence, Hypothesis 3 was supported. Furthermore, supervisor developmental feedback, positive emotion, and work engagement were included in the regression model at the same time, and it was found that all three of them still had a significant positive effect on the enactment of employees' creative ideas ($\beta=0.33$, $p<0.001$; $\beta=0.22$, $p<0.001$; $\beta=0.16$, $p<0.001$). Hypothesis 4 was preliminarily supported.

Using a bootstrap estimation procedure to confirm the significance of mediating effect and the chained mediating effect. The results were shown in **Table 5**. As **Table 5** presented, supervisor developmental feedback had a significant indirect effect on the enactment of creative ideas *via* positive emotions, and the 95% CI excluded zero [index = 0.1178, CI = (0.0539, 0.1882)]. The mediating effect of work engagement was significant as well, and zero was not contained in the 95% CIs [index = 0.0426, CI = (0.0152, 0.0837)]. Meanwhile, positive emotions and work engagement had a significant chained mediating effect between supervisor developmental feedback and employees' creative idea enactment, with the 95% CI excluded zero [index = 0.0213, CI = (0.0073, 0.0438)]. Therefore, Hypothesis 2, Hypothesis 3, and Hypothesis 4 were confirmed again. Moreover, the single-mediation effect of positive emotion was stronger than the single-mediation effect of work engagement and the chained mediating effect, while the difference between the single-mediation effect of work engagement and the chained mediating effect was not significant [CI = (−0.0602, 0.0006)].

TABLE 5 | Conditional indirect effects of the chained mediation analyses.

Path	Indirect effects	Boot SE	95% CIs	Percentage of total effect
Ind1: SDF-PE-EECI	0.1178	0.0339	(0.0539, 0.1882)	23.14%
Ind2: SDF-WE-EECI	0.0426	0.0171	(0.0152, 0.0837)	8.34%
Ind3: SDF-PE-WE-EECI	0.0213	0.0091	(0.0073, 0.0438)	4.17%
Ind1-Ind2	0.0751	0.0403	(0.0008, 0.1595)	-
Ind1-Ind3	0.0965	0.0373	(0.0266, 0.1739)	-
Ind2-Ind3	0.0214	0.0149	(−0.0602, 0.0006)	-

SDF represents supervisor developmental feedback; PE represents positive emotions; WE represents work engagement; and EECI represents enactment of employees' creative ideas.

Next, Model 2 in **Table 2** presented that the interaction term for supervisor developmental feedback and psychological empowerment was significant in predicting positive emotions ($\beta=-0.09$, $p<0.01$). Hence, psychological empowerment had a negative moderation effect on the relationship between supervisor developmental feedback and positive emotions, supporting Hypothesis 5. **Figure 2** illustrated the nature of the interaction term by using simple slopes for high and low values of psychological empowerment (mean value plus/minus one SD). As saw in **Figure 2**, the relationship between supervisor developmental feedback and positive emotions was stronger when psychological empowerment was low and weaker yet still positive when psychological empowerment was high.

The results of the moderated chained mediating effect obtained by running PROCESS macro were shown in **Table 6**.

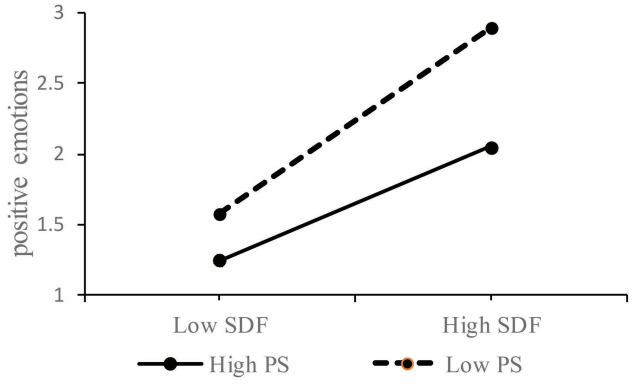

FIGURE 2 | The moderating effect of psychological empowerment on the influence of supervisor developmental feedback on positive emotions. SDF represents supervisor developmental feedback; PS represents psychological empowerment.

TABLE 6 | Indirect effects of the moderated chained mediation analyses.

	Indirect effects	Boot SE	95% CIs
−1 SD below the mean	0.0331	0.0348	(0.0163, 0.0538)
Mean	0.0246	0.0293	(0.1042, 0.2209)
+1 SD above the mean	0.0162	0.0311	(0.0043, 0.0390)

The moderated effect was shown at 1 SD above the mean, the mean, and 1 SD below the mean. The results displayed that when psychological empowerment took a low value, the mediating effect of supervisor developmental feedback on employee's creative idea enactment through positive emotions and work engagement was 0.0331, and the 95% CI excluded zero [index = 0.0331, CI = (0.0163, 0.0538)]. When psychological empowerment took a high value, the mediating effect of supervisor developmental feedback on the enactment of employee's creative idea was reduced to 0.0162, and the 95 percent CI did not contain zero [index = 0.0162, CI = (0.0043, 0.0390)]. The difference between the chain mediation effect value when psychological empowerment was high and the chain mediation effect value when psychological empowerment level was low was −0.0169, with the CI did not contain zero [CI = (0.0021, 0.0340)]. Taken together, psychological empowerment negatively moderates the chained mediating effect of positive emotions and work engagement between supervisor developmental feedback and the enactment of employees' creative ideas. Hypothesis 6 was fully supported.

DISCUSSION

Supervisor developmental feedback and employee innovation have attracted the attention of individual researchers. Nevertheless, scant quantitative studies pay attention to the enactment of employees' creative ideas. This is the first study to examine the influence of supervisor developmental feedback on the enactment of employees' creative ideas, and is also the first study to link feedback with the enactment of ideas through employees' psychological feelings and workplace attitudes.

First, the research results show that there is a positive correlation between supervisor developmental feedback and the enactment of employees' creative ideas. This supports Hypothesis 1. Although the result has not been confirmed in previous studies, several related studies furnish a strong logical basis for it. That is, Li et al. (2021) accentuated that supervisor developmental feedback facilitates employees' innovative behavior, while Harvey (2014) highlighted that the enactment of innovative ideas is considered a pivotal part of employees' creative process. This finding is also supported by social exchange theory (Cropanzano et al., 2017). Once the supervisor developmental feedback is accepted by the employees, it is easier for these recipients to find and solve the problems at work.

Secondly, the outcomes of this paper point out that positive emotions play a mediating role between supervisor developmental feedback and the enactment of employees' creative ideas. Hypothesis 2 is thus verified. This result fits well with the AET, that is, organization members have emotional experiences in the events experienced in the workplace, and in turn, the emotions perceived by employees affect their attitudes and behaviors (Madrid et al., 2019). Meanwhile, BBT also supports this result, which corroborates an intuition that in a highly uncertain and innovative environment, employees with positive emotions have the confidence to find creative approaches (Amabile et al., 2005).

Thirdly, the findings also indicate that work engagement plays mediating role between supervisor developmental feedback and employees' creative idea enactment. Hypothesis 3 is confirmed. Previous studies have similar confirmations. For instance, Eva et al. (2019) emphasized that supervisor feedback stimulates employees' innovative behaviors by reducing employees' sense of psychological contract violation or enhancing employees' work engagement. Based on the Theory of Planned Behavior and the Job Demands-Resources Model, Afsar et al. (2020) and Mubarak et al. (2021) demonstrated that work engagement is a pivotal catalyzing factor in boosting innovative behavior.

Fourthly, the present paper confirms the chained mediating role of positive emotions and work engagement in the relationship between supervisor developmental feedback and employees' creative idea enactment, which supports Hypothesis 4. This endorsed the argument of Wu and Wu (2019) that positive emotion is a psychological state generated by emotional changes, which could boost the innovation behavior by increasing employees' work engagement.

Finally, our results reveal that psychological empowerment not only negatively moderates the relationship between supervisor developmental feedback and positive emotions, but also negatively moderates the chained mediating effect of positive emotions and work engagement. Both Hypothesis 5 and Hypothesis 6 are established. This result is in line with the logic of the AET, namely, the intensity of emotional response that employees perceive from workplace events is interfered by individual characteristics which of course also contains the degree of individual psychological empowerment.

Conclusion

The conclusions of this article are as follows: First, the presented model acknowledges that supervisor developmental feedback relates positively to employees' creative idea enactment. As expected, employees who receive developmental feedback from their superiors are motivated to demonstrate abstract creative ideas through animations or other physical objects (models, drawings, and posters) to reduce the uncertainty of these ideas and enhance mutual identification with feedback providers. In addition, supervisor developmental feedback stimulates the enactment of creative ideas by enhancing employees' positive emotions or work engagement. Simultaneously, positive emotions and work engagement form a chained mediation between supervisor developmental feedback and employees' creative idea enactment. The unique learning and future orientation of developmental feedback effectively regulate the internal motivation of employees and enhance the positive feelings and enthusiasm of subordinates to change the status quo, thereby facilitating employees to depict the specific form, applicability, and function of innovative ideas through visual or physical support. Lastly, psychological empowerment weakens the positive impact of supervisor developmental feedback on employees' positive emotions, and the higher the level of psychological empowerment, the weaker the indirect effect of supervisor developmental feedback on the enactment of creative ideas through positive emotions and work engagement. It is enlightening that psychological empowerment is salient in changing individuals' emotional responses to the same stimuli.

Theoretical Implications

The empirical analysis provided four meaningful theoretical implications. The first contribution is dedicated to enriching innovation and HRM literature by integrating valuable findings regarding the relationship between supervisor developmental feedback and creative idea enactment into a coherent theoretical model. Most prior studies about HRM focused on organizational commitment, job satisfaction, and public service motivation (Bakker and Demerouti, 2017), relatively few studies investigated the enactment of creative ideas. Meanwhile, in contrast to the broad concept of employee creativity, creative idea enactment is easier to attract the assessment of managers and demonstrates the specificity, novelty, and value of ideas (Lu et al., 2019). Hence, this study investigated the role of supervisor developmental feedback in facilitating employees' creative idea enactment for the first time. Some innovation literature has witnessed the theoretical development of the relationship between supervisor developmental feedback and organizational innovation (Su et al., 2019; Li et al., 2021), which provides a logical basis for our study's theoretical derivation. In short, the study helped to shift the dominant focus in the creativity literature from idea generation to idea enactment because enacting ideas was a momentous yet neglected question that offered meaningful insights above and beyond the generation of creative ideas.

Our second contribution attempts to extend the research on the antecedent variables of positive emotions and work engagement by explaining the influence mechanism of supervisor developmental feedback on employees' creative idea enactment. Recently, Su et al. (2019) pointed out that a key mediating mechanism through which supervisor developmental feedback was associated with employee's innovative behavior was employee's creative self-efficacy. Bak (2020) noted that trust in supervisors mediated the effect of supervisor feedback on innovative work behavior. However, the underlying psychological mechanism explaining the connection between supervisor feedback and creative idea enactment has not been tested in previous studies. Addressing this limitation, the present study used AET to reveal the mediating role of positive emotions between supervisor developmental feedback and the enactment of creative ideas. This deepened the understanding of the antecedents of employees' creative idea enactment from a psychological level. Similarly, leveraging the theory of planned behavior and the JD-R model, we developed a conceptual framework that related supervisor developmental feedback, work engagement (the psychological recognition of work), and the enactment of creative ideas. It is no doubt that our final findings enrich the relevant literature on work engagement (Eva et al., 2019).

The third contribution of this paper was to demonstrate the complex structure and dynamic mechanism between supervisor developmental feedback and employees' creative idea enactment by constructing a chained mediation model. Departing from the previous focus on the analysis of a single intermediary variable (Eva et al., 2019; Xu et al., 2019), this article highlighted the multi-level dynamic variation of innovation in organizations, and built an in-depth transmission mechanism of "supervisor developmental feedback-positive emotions-work engagement-enactment of employees' creative ideas." This was a momentous yet neglected phenomenon. Previous research did not consider work engagement as a possible mechanism for positive emotions to influence innovation. From a theoretical standpoint, individuals who have experienced more positive emotions consequently achieve enhanced adaptation to stressful situations and enhance their work engagement (Gloria and Steinhardt, 2017; Young et al., 2018). Therefore, this article expanded the research on the catalytic factors of idea enactment by constructing a chain mediation model.

The fourth contribution came from the exploratory examination of the boundary conditions between supervisor developmental feedback and positive emotions. There have been pieces of research on the main-effect relationship between feedback and emotions (Zhang et al., 2019), paying inadequate attention on the corresponding boundary conditions. To make up for the deficiencies of these studies, we conjectured that employees exerted positive emotions toward the organizations in response to favorable treatment from their supervisor, whereas this process differed depending on the level of employee's psychological empowerment. Then, we proposed a framework that incorporated the interactions between psychological empowerment and supervisor developmental feedback, both of which should be well-coordinated to fuel the enactment of creative ideas. Therefore, by introducing a moderating variable, this study enriched the literature related to psychological empowerment.

Practical Implications

Combining the main research conclusions, several management practice enlightenments are put forward.

First, to improve the opportunities for employees to enact creative solutions, corresponding organizational system settings should be implemented in the management process, namely, the supervisor regularly provides developmental feedback to employees. Scholars have recommended that organizations ought to implement training programs to instill in leaders the ability to execute developmental feedback. Meanwhile, organizations must pay heightened attention to the quality of the supervisor's feedback content. Followers would take innovative steps only when supervisors learn to calibrate their feedback instructions in a way that meets their subordinates' needs.

Secondly, cultivating a positive emotional atmosphere and enhancing employees' enthusiasm for work should not be ignored by organizations since it is not comprehensive to solely rely on the effect of supervisor developmental feedback to impel the enactment of creative ideas. Organizations may benefit by establishing a workplace that enhances employees' positive emotions and work enthusiasm. In the context of Chinese organizations, supervisors have paid uneven attention to various work resources or personal emotions, and they do not pay enough attention to employee voice, physical health, and mental state. Therefore, fostering employees' positive emotions to enact their creative ideas must be included in the organization's agenda. Positive emotions could be stimulated by strengthening cultural construction or creating a relaxed, free, happy, and confident emotional atmosphere within the organization. In a similar vein, idea enactment is difficult to happen unless the organization's employees are actively engaged in work and have the responsibility to quickly incubate or nourish these ideas (Bhatnagar, 2012; Orth and Volmer, 2017). In such, organizations are encouraged to make employees understand the value of individuals, personal training, and promotion opportunities to enhance work enthusiasm and loyalty to the collective, so as to proactively depict creative ideas.

Finally, blindly seeking to enhance employees' level of psychological empowerment is not always conducive to the organization's innovative activities. The establishment of an overall coordination mechanism for supervisor developmental feedback and employee's psychological empowerment to maximize the effect of enacting creative ideas is a topic worth noting for enterprises. The results articulate that employees with low levels of psychological empowerment seem to have a heightened sensitivity to positive emotions and psychological empowerment negatively moderates the chained mediating effect of positive emotions and work engagement. As a result, managers must understand the level of followers' psychological empowerment, which enlightens them when more attention should be paid to the balance of psychological empowerment.

Limitations and Future Research

We acknowledge several limitations of our study that suggest directions for future research. First, the sample size we use is relatively small, which raises concerns about the robustness of our analysis results. Thus, future research could choose more representative and broader research objects. Although the results of CFA supported the construct distinctiveness of different measures, common method variance may still artificially affect the overall results (Li et al., 2018).

Another limitation has to do with the conceptualization of creative idea enactment. Our examination was rooted in a concept of idea enactment of Lu et al. (2019), which extended the idea of packaging to the creative realm. This concept has come under criticism, specifically, although it was able to gauge respondents' willingness to implement creative ideas in the experimental studies, it is impossible to prove the actual implementation of specific projects. Future research might try to trace ideas from the proposal supported by employees, all the way to the actual implementation of the creative idea. Having said that, theorists who discussed organizational innovation proposed that innovation was a cyclic and recursive process, including the ideas' generation, evaluation, and implementation (Harvey, 2014). Thus, a feasible solution is that future research might take time issues into account and investigate how idea enactment in the form of prototypes co-evolves over time to achieve the ultimate implementation.

The third limitation was that our study focused on a limited collection of proximal and distal consequences of supervisor developmental feedback. Further intra-individual examination of the consequences of supervisor developmental feedback needed and received is warranted. Existing research has proved that many factors could affect subordinates' innovative behaviors, such as organizational justice, personal creativity goal, work-unit climates for innovation, or unconstrained knowledge sharing which also have been proven to affect subordinates' innovative behaviors (Gong et al., 2017; Marshall et al., 2019; Akram et al., 2020). Hence, there is a compelling theoretical basis for developing and testing other plausible mediating models that link momentary supervisor developmental feedback and the enactment of creative ideas. Besides, feedback diversity would be high when an idea receives feedback from a diverse and heterogeneous group of supervisors (Zhu et al., 2019). We failed to analyze the influence of the supervisor's feedback on creative idea enactment from the perspectives of the diversity of feedback or the constructive degree of the feedback, but this was a possible area for future research. Furthermore, it would be productive for future research to reveal potential boundary conditions of the influence of positive emotions on the creative idea enactment based on factors such as psychological health or team member learning.

Finally, due to the time constraints of an investigation, we are unable to measure more specific cognitive and behavioral processes and other micro-intervention mechanisms that could influence the idea enactment, which is a possible field for future research. More informal forums could be employed in the process of accelerating creative ideas, which might enhance the prospects of creative ideas or be particularly suitable in later stages of the idea execution. Despite these limitations, our paper reveals that supervisor developmental feedback has undoubtedly established a psychologically safe environment in which employees' positive emotions and work engagement are

encouraged, thereby facilitating the enactment of personal creative ideas.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The study procedures were approved by the Ethics Committee of Xidian University. All procedures performed in research involving human participants were in accordance with the ethical standards of the Institutional and/or the National Research Committee.

AUTHOR CONTRIBUTIONS

JL was responsible for data collection. HL wrote the manuscript, designed the basic model, and analyzed the data. All authors contributed to the article and approved the submitted version.

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REFERENCES

Afsar, B., Al-Ghazali, B. M., Cheema, S., and Javed, F. (2020). Cultural intelligence and innovative work behavior: the role of work engagement and interpersonal trust. *Eur. J. Innov. Manag.* 24, 1082–1109. doi: 10.1108/EJIM-01-2020-0008

Akram, T., Lei, S., Haider, M. J., and Hussain, S. T. (2020). The impact of organizational justice on employee innovative work behavior: mediating role of knowledge sharing. *J. Innov. Knowl.* 5, 117–129. doi: 10.1016/j.jik.2019.10.001

Amabile, T. M., Barsade, S. G., and Staw, M. (2005). Affect and creativity at work. *Adm. Sci. Q.* 50, 367–403. doi: 10.2189/asqu.2005.50.3.367

Arain, G. A., Bhatti, Z. A., Ashraf, N., and Fang, Y. H. (2020). Top-down knowledge hiding in organizations: an empirical study of the consequences of supervisor knowledge hiding among local and foreign workers in the middle east. *J. Bus. Ethics* 164, 611–625. doi: 10.1007/s10551-018-4056-2

Audenaert, M., Vanderstraeten, A., and Buyens, D. (2017). When affective well-being is empowered: the joint role of leader-member exchange and the employment relationship. *Int. J. Hum. Resour. Manag.* 28, 2208–2227. doi: 10.1080/09585192.2015.1137610

Bak, H. U. (2020). Supervisor feedback and innovative work behavior: the mediating roles of trust in supervisor and affective commitment. *Front. Psychol.* 11:559160. doi: 10.3389/fpsyg.2020.559160

Bakker, A. B., and Demerouti, E. (2017). Job demands-resources theory: taking stock and looking forward. *J. Occup. Health Psychol.* 22, 273–285. doi: 10.1037/ocp0000056

Baron, R. M., and Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* 51, 1173–1182. doi: 10.1037/0022-3514.51.6.1173

Belad, F., and Joumni, H. (2020). Behavioral attitudes towards energy saving: empirical evidence from France. *Energy Policy* 140:111406. doi: 10.1016/j.enpol.2020.111406

Bhatnagar, J. (2012). Management of innovation: role of psychological empowerment, work engagement and turnover intention in the Indian context. *Int. J. Hum. Resour. Manag.* 23, 928–951. doi: 10.1080/09585192.2012.651313

Biennewies, C., and Gromer, M. (2012). Creativity and innovation at work: the role of work characteristics and personal initiative. *Psicothema* 24, 100–105. doi: 10.1177/0146167211424418

Black, J. K., Balanos, G. M., and Whittaker, A. C. (2017). Resilience, work engagement and stress reactivity in a middle-aged manual worker population. *Int. J. Psychophysiol.* 116, 9–15. doi: 10.1016/j.ijpsycho.2017.02.013

Buric, I., and Macuka, I. (2018). Self-efficacy, emotions and work engagement among teachers: a two wave cross-lagged analysis. *J. Happiness Stud.* 19, 1917–1933. doi: 10.1007/s10902-017-9903-9

Chen, F. Y., Chen, H., Yang, J. H., Long, R. Y., and Li, W. B. (2019). Impact of regulatory focus on express packaging waste recycling behavior: moderating role of psychological empowerment perception. *Environ. Sci. Pollut. Res.* 26, 8862–8874. doi: 10.1007/s11356-019-04416-7

Conner, T. S., and Silvia, P. J. (2015). Creative days: a daily diary study of emotion, personality, and everyday creativity. *Psychol. Aesthet. Creat.* 9, 463–470. doi: 10.1037/aca0000022

Cropanzano, R., Anthony, E. L., Daniels, S. R., and Hall, A. V. (2017). Social exchange theory: a critical review with theoretical remedies. *Acad. Manag. Ann.* 11, 479–516. doi: 10.5465/annals.2015.0099

Denier, E., Thapa, S., and Tay, L. (2020). Positive emotions at work. *Annu. Rev. Organ. Psychol.* 7, 451–477. doi: 10.1146/annurev-orgpsych-012119-044908

Dimotakis, N., Mitchell, D., and Maurer, T. (2017). Positive and negative assessment center feedback in relation to development self-efficacy, feedback seeking, and promotion. *J. Appl. Psychol.* 102, 1514–1527. doi: 10.1037/apl0000228

Eva, N., Meacham, H., Newman, A., Schwarz, G., and Tham, T. L. (2019). Is coworker feedback more important than supervisor feedback for increasing innovative behavior. *Hum. Resour. Manag.* 58, 383–396. doi: 10.1002/hrm.21960

Fredrickson, B. L. (1998). What good are positive emotions. *Rev. Gen. Psychol.* 2, 300–319. doi: 10.1037/1089-2680.2.3.300

Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., and Finkel, S. M. (2008). Open hearts build lives: positive emotions, induced through loving-kindness meditation, build consequential personal resources. *J. Pers. Soc. Psychol.* 95, 1045–1062. doi: 10.1037/a0013262

Garcia-Juan, B., Escrig-Tena, A. B., and Roca-Puig, V. (2020). Psychological empowerment: antecedents from goal orientation and consequences in public sector employees. *Rev. Public. Pers. Adm.* 40, 297–326. doi: 10.1177/0734371X18814590

George, J. M., and Zhou, J. (2007). Dual tuning in a supportive context: joint contributions of positive mood, negative mood, and supervisory behaviors to employee. *Creat. Acad. Manag. J.* 50, 605–622. doi: 10.5465/AMJ.2007.25525934

Gloria, C. T., and Steinhardt, M. A. (2017). The direct and mediating roles of positive emotions on work engagement among postdoctoral fellows. *Stud. High. Educ.* 42, 2216–2228. doi: 10.1080/03075079.2016.1138938

Gong, Y. P., Wu, J. F., Song, L. J. W., and Zhang, Z. (2017). Dual tuning in creative processes: joint contributions of intrinsic and extrinsic motivational orientations. *J. Appl. Psychol.* 102, 829–844. doi: 10.1037/apl0000185

Harrison, S. H., and Dossinger, K. (2017). Pliable guidance: a multilevel model of curiosity, feedback seeking, and feedback giving in creative work. *Acad. Manag. J.* 60, 2051–2072. doi: 10.5465/amj.2015.0247

Hartmann, P., Apaolaza, V., and D'Souza, C. (2018). The role of psychological empowerment in climate-protective consumer behaviour: An extension of the value-belief-norm framework. *Eur. J. Mark.* 52, 392–417. doi: 10.1108/EJM-01-2017-0080

Harvey, S. (2014). Creative synthesis: exploring the process of extraordinary group creativity. *Acad. Manag. Rev.* 39, 324–343. doi: 10.5465/amr.2012.0224

Hong, W., and Gajendran, R. S. (2018). Explaining dyadic expertise use in knowledge work teams: An opportunity–ability–motivation perspective. *J. Organ. Behav.* 39, 796–811. doi: 10.1002/job.2286

Kang, H., Kim, W. G., Choi, H. M., and Li, Y. (2020). How to fuel employees' prosocial behavior in the hotel service encounter. *Int. J. Hosp. Manag.* 84:102333. doi: 10.1016/j.ijhm.2019.102333

Kim, Y. J., and Kim, J. (2020). Does negative feedback benefit (or harm) recipient creativity? The role of the direction of feedback flow. *Acad. Manag. J.* 63, 584–612. doi: 10.5465/amj.2016.1196

Knight, C., Patterson, M., and Dawson, J. (2017). Building work engagement: a systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *J. Organ. Behav.* 38, 792–812. doi: 10.1002/job.2167

Knippenberg, D. V., and Hirst, G. (2020). A motivational lens model of person × situation interactions in employee creativity. *J. Appl. Psychol.* 105, 1129–1144. doi: 10.1037/apl0000486

Kwon, K., and Kim, T. (2020). An integrative literature review of employee engagement and innovative behavior: revisiting the JD-R model. *Hum. Resour. Manag. Rev.* 30:100704. doi: 10.1016/j.hrmr.2019.100704

Lee, S. M., and Farh, C. (2019). Dynamic leadership emergence: differential impact of members' and peers' contributions in the idea generation and idea enactment phases of innovation project teams. *J. Appl. Psychol.* 104, 411–432. doi: 10.1037/apl0000384

Lesener, T., Gusy, B., and Wolter, C. (2019). The job demands-resources model: a meta-analytic review of longitudinal studies. *Work Stress.* 33, 76–103. doi: 10.1080/02678373.2018.1529065

Li, Z. Q., Duan, C. Q., Lyu, Z., and Xu, X. (2021). Why and when supervisor developmental feedback impact innovative behavior: perspective of self-regulation theory. *Sustain. For.* 13:9190. doi: 10.3390/su13169190

Li, N., Harris, T. B., Boswell, W. R., and Xie, Z. T. (2011). The role of organizational insiders' developmental feedback and proactive personality on newcomers' performance: an interactionist perspective. *J. Appl. Psychol.* 96, 1317–1327. doi: 10.1037/a0024029

Li, Q., She, Z. L., and Yang, B. Y. (2018). Promoting innovative performance in multidisciplinary teams: the roles of paradoxical leadership and team perspective taking. *Front. Psychol.* 9:1083. doi: 10.3389/fpsyg.2018.01083

Li, G. P., Wang, X. Y., Su, S. B., and Su, Y. (2019). How green technological innovation ability influences enterprise competitiveness. *Technol. Soc.* 59:101136. doi: 10.1016/j.techsoc.2019.04.012

Liang, J., Shu, R., and Farh, C. I. (2019). Differential implications of team member promotive and prohibitive voice on innovation performance in research and development project teams: a dialectic perspective. *J. Organ. Behav.* 40, 91–104. doi: 10.1002/job.2325

Liu, X., Liao, H., Derfler-Rozin, R., Zheng, X. M., Wee, E. X. M., and Qiu, F. (2020). In line and out of the box: how ethical leaders help offset the negative effect of morality on creativity. *J. Appl. Psychol.* 105, 1447–1465. doi: 10.1037/apl0000489

Lu, S., Bartol, K. M., Venkataramani, V., Zheng, X. M., and Liu, X. (2019). Pitching novel ideas to the boss: The interactive effects of employees' idea enactment and influence tactics on creativity assessment and implementation. *Acad. Manag. J.* 62, 579–606. doi: 10.5465/amj.2016.0942

Maden-Eyiusta, C. (2021). Role conflict, role ambiguity, and proactive behaviors: does flexible role orientation moderate the mediating impact of engagement. *Int. J. Hum. Resour. Manag.* 32, 2829–2855. doi: 10.1080/09585192.2019.1616590

Madrid, H. P., Niven, K., and Vasquez, C. A. (2019). Leader interpersonal emotion regulation and innovation in teams. *J. Occup. Organ. Psychol.* 92, 787–805. doi: 10.1111/joop.12292

Mann, S. (1999). Emotion at work: to what extent are we expressing, suppressing, or faking it? *Eur. J. Work Organ. Psychol.* 8, 347–369. doi: 10.1080/135943299398221

Marshall, D. R., Davis, W. D., Dibrell, C., and Ammeter, A. P. (2019). Learning off the job: examining part-time entrepreneurs as innovative employees. *J. Manag.* 45, 3091–3113. doi: 10.1177/0149206318779127

Matsuo, M. (2021). Antecedents of psychological empowerment: the effects of developmental experience, learning goal orientation and authenticity. *Asia Pac. J. Hum. Resour.* 59, 44–62. doi: 10.1111/1744-7941.12228

Menguc, B., Auh, S., Fisher, M., and Haddad, A. (2013). To be engaged or not to be engaged: the antecedents and consequences of service employee engagement. *J. Bus. Res.* 66, 2163–2170. doi: 10.1016/j.jbusres.2012.01.007

Montani, F., Courcy, F., and Vandenberghe, C. (2017). Innovating under stress: The role of commitment and leader-member exchange. *J. Bus. Res.* 77, 1–13. doi: 10.1016/j.jbusres.2017.03.024

Mubarak, N., Khan, J., Yasmin, R., and Osmadi, A. (2021). The impact of a proactive personality on innovative work behavior: the role of work engagement and transformational leadership. *Leadersh. Org. Dev. J.* 42, 989–1003. doi: 10.1108/LODJ-11-2020-0518

Mueller, J., Melwani, S., Loewenstein, J., and Deal, J. (2017). Reframing the decision-makers' dilemma: towards a social context model of creative idea recognition. *Acad. Manag. J.* 61, 94–110. doi: 10.5465/amj.2013.0887

Nifadkar, S., Tsui, A. S., and Ashforth, B. E. (2012). The way you make me feel and behave: supervisor-triggered newcomer affect and approach-avoidance behavior. *Acad. Manag. J.* 55, 1146–1168. doi: 10.5465/amj.2010.0133

Orth, M., and Volmer, J. (2017). Daily within-person effects of job autonomy and work engagement on innovative behaviour: The cross-level moderating role of creative self-efficacy. *Eur. J. Work Organ. Psychol.* 26, 601–612. doi: 10.1080/1359432X.2017.1332042

Ouweneel, E., Blanc, P., Schaufeli, W. B., and Wijhe, C. V. (2012). Good morning, good day: a diary study on positive emotions, hope, and work engagement. *Hum. Relat.* 65, 1129–1154. doi: 10.1177/0018726711429382

Peltokorpi, V., and Hasu, M. (2016). Transactive memory systems in research team innovation: a moderated mediation analysis. *J. Eng. Technol. Manag.* 39, 1–12. doi: 10.1016/j.jengtecman.2015.11.001

Preacher, K. J., and Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behav. Res. Methods Instrum. Comput.* 36, 717–731. doi: 10.3758/BF03206553

Radic, A., Arjona-Fuentes, J. M., Ariza-Montes, A., Han, H., and Law, R. (2020). Job demands-job resources (JD-R) model, work engagement, and well-being of cruise ship employees. *Int. J. Hosp. Manag.* 88:102518. doi: 10.1016/j.ijhm.2020.102518

Rasool, S. F., Wang, M. S., Tang, M. Z., Saeed, A., and Iqbal, J. (2021). How toxic workplace environment effects the employee engagement: the mediating role of organizational support and employee wellbeing. *Int. J. Environ. Res. Public Health* 18:2294. doi: 10.3390/ijerph18052294

Rego, A., Sousa, F., Marques, C., and Cunha, M. P. E. (2014). Hope and positive affect mediating the authentic leadership and creativity relationship. *J. Bus. Res.* 67, 200–210. doi: 10.1016/j.jbusres.2012.10.003

Sachpazidu-Wojcicka, K. (2017). Innovation as a determinant of the competitiveness of polish enterprises. *Oecon. Copernic.* 8, 287–299. doi: 10.24136/oc.v8i2.18

Samma, M., Zhao, Y., Rasool, S. F., Han, X., and Ali, S. (2020). Shahz exploring the relationship between innovative work behavior, job anxiety, workplace ostracism, and workplace incivility: empirical evidence from small and medium sized enterprises (SMEs). *Health* 8:508. doi: 10.3390/healthcare8040508

Schaufeli, W. B., and Bakker, A. B. (2010). Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J. Organ. Behav.* 25, 293–315. doi: 10.1002/job.248

Schaufeli, W. B., Salanova, M., González-Romá, V., and Bakker, A. B. (2002). The measurement of engagement and burnout: a two sample confirmatory factor analytic approach. *J. Happiness Stud.* 3, 71–92. doi: 10.1023/A:1015630930326

Schermuly, C. C., and Meyer, B. (2016). Good relationships at work: the effects of leader–member exchange and team–member exchange on psychological empowerment, emotional exhaustion, and depression. *J. Organ. Behav.* 37, 673–691. doi: 10.1002/job.2060

Smith, T. A., Chen, G., Kirkman, B. L., Zhang, P. C., Lemoine, G. J., and Farh, J. L. (2019). Multiple team membership and empowerment spillover effects: can empowerment processes cross team boundaries. *J. Appl. Psychol.* 104, 321–340. doi: 10.1037/apl0000336

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: dimensions, measurement, and validation. *Acad. Manag. J.* 38, 1442–1465. doi: 10.2307/256865

Su, W., Lin, X., and Ding, H. (2019). The influence of supervisor developmental feedback on employee innovative behavior: a moderated mediation model. *Front. Psychol.* 10:1581. doi: 10.3389/fpsyg.2019.01581

Szumski, G., and Karwowski, M. (2019). Exploring the pygmalion effect: the role of teacher expectations, academic self-concept, and class context in students' math achievement. *Contemp. Educ. Psychol.* 259:101787. doi: 10.1016/j.cedpsych.2019.101787

Tellegen, A., Watson, D., and Clark, L. A. (1999). On the dimensional and hierarchical structure of affect. *Psychol. Sci.* 10, 297–303. doi: 10.1111/1467-9280.00157

Tepper, B., Dimotakis, N., Lambert, L., Koopman, J., Matta, F. K., Park, H. M., et al. (2018). Examining follower responses to transformational leadership from a dynamic, person-environment fit perspective. *Acad. Manag. J.* 61, 1343–1368. doi: 10.5465/amj.2014.0163

Thomas, K. W., and Velthouse, B. A. (1990). Cognitive elements of empowerment: an "interpretive" model of intrinsic task motivation. *Acad. Manag. Rev.* 15, 666–681. doi: 10.5465/AMR.1990.4310926

Tierney, P., and Farmer, S. M. (2004). The pygmalion process and employee creativity. *J. Manag.* 30, 413–432. doi: 10.1016/j.jm.2002.12.001

Torres, E. N., Wei, W., Hua, N., and Chen, P. J. (2019). Customer emotions minute by minute: how guests experience different emotions within the same service environment. *Int. J. Hosp. Manag.* 77, 128–138. doi: 10.1016/j.ijhm.2018.06.021

Tu, Y. D., Lu, X. X., Choi, J. N., and Guo, W. (2019). Ethical leadership and team-level creativity: mediation of psychological safety climate and moderation of supervisor support for creativity. *J. Bus. Ethics* 159, 551–565. doi: 10.1007/s10551-018-3839-9

Ugur, M., Churchill, S. A., and Solomon, E. (2018). Technological innovation and employment in derived labour demand models: a hierarchical meta-regression analysis. *J. Econ. Surv.* 32, 50–82. doi: 10.1111/joes.12187

Weiss, H. M., and Cropanzano, R. (1996). Affective events theory: a theoretical discussion of the structure, causes and consequences of affective experiences at work. *Res. Organ. Behav.* 18, 1–74. doi: 10.1177/030639689603700317

Wingerden, J. V., Derks, D., and Bakker, A. B. (2017). The impact of personal resources and job crafting interventions on work engagement and performance. *Hum. Resour. Manag.* 56, 51–67. doi: 10.1002/hrm.21758

Wu, C. H., and Parker, S. K. (2017). The role of leader support in facilitating proactive work behavior: a perspective from attachment theory. *J. Manag.* 43, 1025–1049. doi: 10.1177/0149206314544745

Wu, T. J., and Wu, Y. J. (2019). Innovative work behaviors, employee engagement, and surface acting: a delineation of supervisor-employee emotional contagion effects. *Manag. Decis.* 57, 3200–3216. doi: 10.1108/MD-02-2018-0196

Xu, X., Liu, W. H., and Gursoy, D. (2019). The impacts of service failure and recovery efforts on airline customers' emotions and satisfaction. *J. Travel Res.* 58, 1034–1051. doi: 10.1177/0047287518789285

Young, H. R., Glerum, D. R., Wang, W., and Joseph, D. L. (2018). Who are the most engaged at work? A meta-analysis of personality and employee engagement. *J. Organ. Behav.* 39, 1330–1346. doi: 10.1002/job.2303

Zhang, J., Gong, Z. X., Zhang, S. Y., and Zhao, Y. J. (2017). Impact of the supervisor feedback environment on creative performance: a moderated mediation model. *Front. Psychol.* 8:256. doi: 10.3389/fpsyg.2017.00256

Zhang, Z., Zhang, L., Zheng, J., Cheng, B., and Rahmadani, V. G. (2019). Supervisor developmental feedback and voice: relationship or affect, which matters. *Front. Psychol.* 10:1755. doi: 10.3389/fpsyg.2019.01755

Zheng, X. S., Diaz, I., Jing, Y., and Chiaburu, D. S. (2015). Positive and negative supervisor developmental feedback and task-performance. *Leadersh. Org. Dev. J.* 36, 212–232. doi: 10.1108/LODJ-04-2013-0039

Zhong, Z. Q., Hu, D. H., Zheng, F., Ding, S. Q., and Luo, A. J. (2018). Relationship between information-seeking behavior and innovative behavior in Chinese nursing students. *Nurs. Educ. Today* 63, 1–5. doi: 10.1016/j.nedt.2018.01.004

Zhou, J. (2003). When the presence of creative coworkers is related to creativity: role of supervisor close monitoring, developmental feedback, and creative personality. *J. Appl. Psychol.* 88, 413–422. doi: 10.1037/0021-9010.88.3.413

Zhou, J., and George, J. M. (2001). When job dissatisfaction leads to creativity: encouraging the expression of voice. *Acad. Manag. J.* 44, 682–696. doi: 10.2307/3069410

Zhu, H. Z., Kock, A., Wentker, M., and Leker, J. (2019). How does online interaction affect idea quality? The effect of feedback in firm-internal idea competitions. *J. Prod. Innov. Manag.* 36, 24–40. doi: 10.1111/jpim.12442

Zyl, L., Oort, A. V., Rispens, S., and Olckers, C. (2021). Work engagement and task performance within a global Dutch ICT-consulting firm: The mediating role of innovative work behaviors. *Curr. Psychol.* 40, 4012–4023. doi: 10.1007/s12144-019-00339-1

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

APPENDIX A

Research instrument.

	Supervisor developmental feedback
1.	My immediate supervisor often gives me developmental feedback.
2.	The focus of feedback given to me by my superior is to help me learn and improve.
3.	Supervisor feedback provides me with useful information on how to improve my work performance.
	Positive emotions
4.	My job made me feel strong.
5.	My job made me feel excited.
6.	My job made me feel interested.
7.	My job made me feel enthusiastic.
8.	My job made me feel determined.
	Work engagement
9.	When I get up in the morning, I feel like going to work.
10.	At my work, I feel energetic.
11.	At my work, I always persevere, even when things do not go well.
12.	I can work continuously for very long periods at a time.
13.	At my job, I am very resilient, mentally.
14.	At my job, I feel strong and vigorous.
15.	For me, my job is very challenging.
16.	My job inspires me.
17.	I am enthusiastic about my job.
18.	I am proud of the work that I do.
19.	I find that the work I do is full of meaning and purpose.
20.	When I am working, I forget everything else around me.
21.	Time flies when I am working.
22.	I get carried away when I am working.
23.	It is difficult to detach myself from my job.
24.	I am immersed in my work.
25.	I feel happy when I am working nervously.
	The enactment of creative ideas
26.	I frequently illustrate my ideas to the supervisor through written descriptions, PowerPoint presentations, drawings or storyboards.
27.	I tend to perform experimental simulations to verify the feasibility of the creative ideas.
28.	I develop a prototype or other sample to prove the value of the creative ideas.
	Psychological empowerment
29.	The work I do is very important to me.
30.	My job activities are personally meaningful to me.
31.	The work I do is meaningful to me.
32.	I am confident about my ability to do my job.
33.	I am self-assured about my capabilities to perform my work.
34.	I have mastered the skills necessary for work.
35.	I have a lot of autonomy to decide how to do my job.
36.	I can decide on my own how to go about doing my work.
37.	I have considerable opportunity for independence and freedom in how I do my job.
38.	My impact on what happens in my department is large.
49.	I have a great deal of control over what happens in my department.
40.	I have significant influence over what happens in my department.

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Adaptation and Validation of the Spanish Version of the Instrument to Evaluate Nurses' Attitudes Toward Communication With the Patient for Nursing Students

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Communication is essential to the quality of care and patient satisfaction. It has been linked to positive patient outcomes, increased engagement, improved health outcomes, and safe practices. Given these benefits and the association between attitudes and behaviors, as behaviors can be predicted by studying attitudes, assessing attitudes of nursing students toward patient communication is critical for future nursing professionals. For this purpose, the main aim of this study was to adapt and validate an instrument to measure nurses' attitudes toward communication (ACO) for nursing students. The ACO with patients was analyzed. Then, differences in the dimensions of the instrument (ACO) for nursing students according to an academic course and the correlations were calculated. A cross-sectional study was carried out in a convenience sample of 1,417 nursing students from five universities in the Valencian Community (Spain) during the 2018/2019 academic year and 83.8% (1,187) were women. The reliability was analyzed by using Cronbach's alpha and composite reliability (CR). Analysis of construct validity was performed with exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The instrument adapted from nurses to nursing students was composed of 25 items grouped in three dimensions: affective, cognitive, and behavioral. The psychometric properties suggested that the instrument ACO for nursing students was reliable and valid. The ACO of nursing students was positive with high levels in cognitive and behavioral dimensions, while scores were worst in the affective component. The second-year nursing students showed more positive attitudes in the affective dimension, while in the cognitive and behavioral dimensions, the most positive attitudes were found in the first year. In the correlations, the behavioral

and cognitive dimensions showed a significant, positive, and very high correlation. These findings should be considered in developing academic plans to improve the effectiveness of the communication education process of the students to increase the quality of patient care and well-being of nursing students.

Keywords: attitude, communication, construct validation, nursing students, psychometric properties

INTRODUCTION

The importance of communication is reflected in the theories and models of nursing that support the professional practice; in this sense, the Theory of Human Caring proposed by Jean Watson (Watson, 2018) highlights the importance of open communication with the patient and his/her family in the care process. In the care process according to Watson, the nurse should interact with "the person" rather than with "the patient," understand their beliefs, emotions, feelings, and fears, without forgetting their individuality and knowledge (Foronda et al., 2016; Wei and Watson, 2019). Communication is vital in all the areas of nursing care: prevention, treatment, rehabilitation, education, and health promotion (Kourkouta and Papathanasiou, 2014); it is a process by which information is exchanged and shared during interventions performed with the patient (Hannawa et al., 2015). In short, it is the essence of the relationship with the patient to create a positive interpersonal relationship, exchange information and make appropriate decisions related to treatment and care (Grassi et al., 2015), and sharing of ideas, thoughts, feelings, and needs with another person (Xie et al., 2013). All the nurses are expected to be competent in communication (Mullan and Kothe, 2010), i.e., able to communicate effectively with patients, their families, and other members of the healthcare team (Claramita et al., 2016).

Nurse-patient communication is ultimately an interpersonal communication in which an exchange of information is carried out between the patient and the professional from a comprehensive and holistic view of the person, which allows knowing their real needs and, therefore, to establish a therapeutic relationship. Therapeutic communication between nurse and patient is considered the basis of nursing care (Abdolrahimi et al., 2017a); it is patient-centered and involves physiological, psychological, environmental, and spiritual aspects of the patient (Peplau, 1991). It is based on understanding and addressing the situation of the patient, including relevant life circumstances, beliefs, perspectives, concerns, and needs in order to plan appropriate patient care (Cusatis et al., 2020). Therapeutic communication is essential to the quality of care and satisfaction of the patient (Finke et al., 2008; Kourkouta and Papathanasiou, 2014; Finney Rutten et al., 2015; Banerjee et al., 2016; Gillett et al., 2016; Howick et al., 2018). It has been linked to positive patient outcomes, increased engagement, improved health outcomes (Kitson et al., 2014; Burgener, 2020), safe practices (Lin et al., 2017), and decrease the emotional burden on both the nurses and families (Charlton et al., 2008; Wittenberg et al., 2017). From the perspective of patients, it enhances the trusting relationship that can be built with nurses and facilitates decision-making (Rosemond et al., 2017). In addition, effective communication among multidisciplinary team members is critical to the effectiveness of healthcare teams and can be related to the quality of care and job satisfaction of the nurses (Gausvik et al., 2015). Communication errors can increase the incidence of adverse events and cause various harm to patients (Li et al., 2019). World Health Organization (2017) identifies communication as an essential tool of patient safety culture and a cause of delay in treatment, medication errors, and incorrect procedures (The Joint Commission, 2016).

Given the benefits of therapeutic communication for good care, for safe, and quality practice (Boschma et al., 2010; Finney Rutten et al., 2015), it is critical to address these issues in nursing students as future nursing professionals (Grant and Jenkins, 2014). Literature shows that communication can be a challenge for nurses and nursing students (Suzuki et al., 2014), as studies assess communication skills showing that these skills are poor among nurses (Hemsley et al., 2012; Shorey et al., 2018). Other studies have shown that communication skills are also deficient among nursing students such that they are a problem for their well-being (Satu et al., 2013). Students identified numerous barriers to effective communication, including reluctance to engage with patients or families, difficulty in initiating or sustaining conversation, feeling devalued, frightened, fearful, or anxious, and continuing to worry about their performance after the interaction is over (Beckstrand et al., 2012; Banerjee et al., 2016; Lin et al., 2017). Previous studies indicate that interventions to teach nurse-patient communication skills focus on more difficult clinical interactions (MacLean et al., 2017), mental health patients (Sarikoc et al., 2017), palliative care (Coyle et al., 2015), hence these are more studied areas. However, communication skills in general care settings with patients are equally important (Chan, 2014).

Therapeutic communication is based on the knowledge, attitudes, and skills of the patient and nurse that lead to patient understanding and participation (Abdolrahimi et al., 2017b). Despite this, most studies have focused on communication skills, communication knowledge, and medical students (Epstein et al., 2010; Škodová et al., 2018). There is not a comprehensive assessment of attitudes in the communication of nursing students before they are exposed to real human interactions during their clinical practice (Foronda et al., 2016). Therefore, studying attitude toward communication (ACO) in nursing students is important based on the "Theory of Reasoned Action" (Ajzen and Fishbein, 1980) because of the relationship between attitudes and the behavior of individuals. According to this theory, a change in behavior can be induced by a change in the attitude of the person and can predict behaviors by studying attitudes (Ajzen, 1991). The behavioral component of attitudes is a manifestation of the underlying cognitive and

affective components (Anvik et al., 2007). This aspect is very important in nursing students because assessment of ACO allows identification of negative attitudes and perception of communication is an unimportant part of effective healthcare, which could negatively influence the effectiveness of the educational process (Škodová et al., 2018) in the integration of communicative knowledge and skills in nursing students (Fukada, 2018). In addition, studying ACO within the care process helps to evaluate the interpersonal communication of the nurse with the patient (Chan, 2017) in order to be able to adapt strategies and their effectiveness (Grant and Jenkins, 2014) to increase the quality of patient care and well-being of nursing students (Satu et al., 2013). Considering the importance of ACO in nursing students and there are no instruments for its assessment, it would be important to develop validated instruments to evaluate ACO with the patient (MacLean et al., 2017; Levett-Jones et al., 2019).

The literature provides scarce studies on the reliability and validity of the instruments used (Grant and Jenkins, 2014; Gutiérrez-Puertas et al., 2020) on ACO skills in nursing students; the Communication Skills Attitude Scale (CSAS) (Škodová et al., 2018) was originally developed to measure the ACO skills in medical students (Rees et al., 2002). Others measure communication competencies of nursing students such as the Interpersonal Communication Assessment Scale (ICAS) (Klakovich and dela Cruz, 2006) and the ACO of the nurses with patients (Giménez-Espert and Prado-Gascó, 2018), with adequate psychometric properties. So, in this study, the main aim of an adaptation and validation of this instrument in nursing students was performed. Thus, the ACO with patients in a sample of nursing students was analyzed. Finally, differences in the dimensions of the instrument (ACO) for nursing students according to an academic course and the correlations were calculated.

MATERIALS AND METHODS

Participants and Study Settings

A cross-sectional study was carried out in a convenience sample of 1,417 nursing students from five universities in the Valencian Community (Spain). The nursing degree in Spain includes four full-time academic years with 240 European Credit Transfer System (ECTS) at 60 ECTS per year (1 credit representing between 25 and 30 h of student work). After completing the program, the student obtains a degree in nursing and can practice in Spain and in the European Union countries.

Data Collection

The inclusion criteria were students enrolled in the nursing degree of the universities participating who gave their consent for participation after receiving information about this study. The anonymity and confidentiality of the information provided were indicated. The self-report instrument was completed in the classroom by the participants, which lasted around 10 min. The data collection phase was developed during the 2018/2019 academic year.

Instrument

Attitudes Toward Communication of Nurses with the patient (ACO) (Giménez-Espert and Prado-Gascó, 2018) to measure the ACO of the nurses with the patient (intellectual property registered at the University of Valencia on 08/04/2019, registration number: UV-MET-201917R). The instrument is based on Rosenberg and Hovland's (1960) three-dimensional model of attitude: affective, cognitive, and behavioral. The attitude components were related to the most important communicative moments of the hospitalization process (Duhamel and Talbot, 2004): admission, procedure, and discharge. The three communicative moments were related to the nursing interventions according to the Nursing Interventions Classification (NIC) (Bulechek, 2009). Finally, from this classification, the following interventions with their corresponding activities were selected and related to the three components of the attitude: nursing care at admission (7,310), teaching: procedure/treatment (5,618), and discharge planning (7,370). The instrument was composed of 25 items, grouped in three dimensions: Affective, related to situations and to admission, procedure, and discharge of the patient that generate anxiety in nurses (12 items, Cronbach's $\alpha = 0.95$, e.g., *"I'm nervous when I inform the patient and/or family about how they can help in recovery"*); behavioral, related to what nurses usually do with respect to the patient and/or family member regarding checking to understand information on admission, encouraging questions, aspects related to orientation in the unit (visiting hours, routines), reinforcing, facilitating and clarifying information to the patient to obtain informed consent, checking to understand information on discharge and its implementation, allowing time for questions, and how to collaborate during the procedure. It is that which we can observe and allows us to deduce the other two (9 items, Cronbach's $\alpha = 0.92$, e.g., *"I usually encourage the patient and/or family ask me when I provide information at the time of admission to the unit"*); and cognitive, refers to the importance for nurses: orientation of the patient and/or family in the unit, information that can help in recovery, information on discharge care, and finally collaboration with other members of the healthcare team (4 items, Cronbach's $\alpha = 0.85$, e.g., *"It is necessary to inform the patient and/or family about how they can help in recovery")*. A five-point Likert scale was used ranging from 1 = strongly disagree to 5 = strongly agree. High scores in all the dimensions correspond to positive ACO, except in the affective dimension where lower scores indicate more positive ACO, as it is an inverted dimension when considering the stress produced by communication. The original instrument showed adequate psychometric properties (Giménez-Espert and Prado-Gascó, 2018) and was modified for nursing students "Although I am a student now, I believe that when I practice as a nurse." In this study, the student-adapted version of the instrument had acceptable reliability (Cronbach's $\alpha = 0.84$) (intellectual property registered at the University of Valencia on 30/07/2020, registration number: UV-MET-202044R).

Design: Instrument Adaptation Process

The instrument adaptation process was performed in three stages:

Stage 1: adaptation

The international methodological standards for the adaptation of an instrument established by the International Test Commission (2017) were followed in the adaptation of the ACO of the nurses with the patient instrument for nursing students.

Stage 2: content validity process

The items were evaluated by a panel of experts and in a pilot sample of 100 nursing students to assess content validity, according to the accuracy, clarity, legibility, and relevance of each item of the instrument (Polit and Beck, 2008). The experts were five nurses with at least 10 years of clinical experience, training and research in the field (Polit and Beck, 2008). The content validity index (CVI) was calculated, and the criteria for inclusion of the item were that the CVI was larger than 0.80 (Lynn, 1986). Moreover, the comments of the nursing students and the experts were analyzed, and there were no items unclear or controversial. According to these results, the 25 items were maintained in the final version of the instrument.

Stage 3: statistical analyses and psychometric properties

The Statistical Package for the Social Sciences (SPSS) software (version 22), the EQS software (Structural Equation Modeling software, version 6.2) (Bentler, 2004), and the FACTOR software (Lorenzo-Seva and Ferrando, 2006) were used to perform the statistical analyses of this study. First, descriptive analysis of every item (mean and SD) and observations of the item-total correlation coefficients. The reliability was also analyzed by using Cronbach's alpha and composite reliability (CR). Analysis of construct validity was performed with exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The convergent validity was assessed by using the results of the CFA, while for discriminant validity, the average variance extracted (AVE) test was used (Fornell and Larcker, 1981).

The adequacy of the proposed models by CFA was tested with the significance of χ^2 (Bentler, 2004). The coefficients of the goodness of fit, the non-normed fit index (NNFI), the comparative fit index (CFI), and the incremental fit fix (IFI) values > 0.90 were considered as a good fit (McCallum and Austin, 2000). Finally, the root mean square error of approximation (RMSEA) was calculated, and it was required to be <0.08 to considered as a good fit (Browne and Cudeck, 1993).

The ANOVA was calculated to search for differences between academic year and the ACO dimensions for nursing students. The correlations were analyzed by using Pearson's correlation coefficient.

RESULTS

Sample Characteristics

The age of the participants ranges from 18 to 55 years (M = 21.80, *SD* = 5.34). According to the distribution by sex, 83.8% are women (*n* = 1,187) and 16.2% are men (*n* = 230). According to the course of study, the distribution observed is as follows: 29.6% first, 25% second, 23.8% third, and 21.6% fourth.

Psychometric Evaluation of the Instrument

Analysis of the Items and Reliability

The attitudes toward communication instrument for nursing students is composed of 25 items distributed in three dimensions. **Table 1** shows items grouped according to the dimension. In addition, the table collects for all the items such as the mean (M), SD, item-total correlation (rjx), and Cronbach's alpha, if that item is eliminated (α-x). The ACO instrument for nursing students as a whole shows acceptable reliability (α = 0.84).

Construct Validity: Factor Analysis (Exploratory Factor Analysis and Confirmatory Factor Analysis)

An EFA was performed to examine how the items are distributed without any restriction. An EFA was performed following the process recommended by Lloret-Segura et al. (2014) by using the unweighted least squares method and normalized direct oblimin rotation. To determine the number of common factors in which the items are grouped, parallel analysis was used.

The EFA performed by using the FACTOR program (Lorenzo-Seva and Ferrando, 2006) with the 25 items of the ACO instrument for nursing students recommended the grouping of the items into two common factors. It was decided to check the fit of the factorial structure set on the three dimensions since it was difficult to interpret the two-factor factorial solution theoretically.

TABLE 1 | Analysis of the attitudes toward communication (ACO) for nursing students items: Mean (M), SD, item-total correlation (r_{jx}), and Cronbach's alpha if it eliminates the element (α -x).

Complete instrument (α = 0.84)	*M*	*SD*	r_{jx}	α -x
ACO 1	1.95	0.99	0.36	0.83
ACO 2	1.65	0.89	0.32	0.83
ACO 3	1.82	0.93	0.43	0.83
ACO 4	1.74	0.92	0.30	0.84
ACO 5	1.49	0.80	0.38	0.83
ACO 6	1.65	0.87	0.40	0.83
ACO 7	1.58	0.86	0.38	0.83
ACO 8	1.42	0.78	0.25	0.84
ACO 9	1.57	0.85	0.29	0.84
ACO 10	1.61	0.84	0.34	0.83
ACO 11	1.40	0.74	0.35	0.83
ACO 12	1.84	0.99	0.36	0.83
ACO 13	4.41	1.10	0.28	0.84
ACO 14	4.50	0.87	0.37	0.83
ACO 15	4.59	0.84	0.44	0.83
ACO 16	4.57	0.82	0.39	0.83
ACO 17	4.62	0.79	0.41	0.83
ACO 18	4.67	0.75	0.46	0.83
ACO 19	4.65	0.75	0.45	0.83
ACO 20	4.67	0.71	0.41	0.83
ACO 21	4.59	0.77	0.45	0.83
ACO 22	4.68	0.72	0.45	0.83
ACO 23	4.77	0.65	0.47	0.83
ACO 24	4.76	0.67	0.46	0.83
ACO 25	4.77	0.68	0.46	0.83

After the application of the EFA fixed to three factors, it was not necessary to suppress any item since the saturations were higher than 0.40, maintaining the scale at 25 items. The fit of this solution was adequate with an RMSR value of 0.03 (<0.50; Harman, 1980) and a goodness of fit index (GFI) index of 0.99 (>0.95; Tanaka and Huba, 1989). The Kaiser–Meyer–Olkin (KMO) index of sampling adequacy also presented an optimal value (KMO = 0.93; 95% CI 0.918–0.920) and Bartlett's test of sphericity was significant ($\chi^2 = 13836.6$; df = 300; $p \leq 0.001$). The variance explained by the three factors was 78%.

Once the EFA was performed, CFA was completed to check the factor structure extracted by the EFA. This model presents adequate fit ($\chi^2 = 2347.59$; df = 272; $p < 0.05$; NNFI = 0.91; CFI = 0.92; IFI = 0.92; and RMSEA = 0.07 (95% CI = 0.076–0.082). Convergent validity showed that the items of the instrument were correlated with the latent variables (affective, behavioral, and cognitive). The loadings of each item were higher (>0.70; Anderson and Gerbing, 1988) except in items (ACO4 $\lambda = 0.67$, ACO8 $\lambda = 0.66$, ACO12 $\lambda = 0.61$, and ACO13 $\lambda = 0.58$). In every case, the T values for the variables ranged from 20.13 to 48.81 ($t > 1.96$) and were significant at the 0.05 level. The CR and the AVE for each dimension: affective CR = 0.98; AVE = 0.58, behavioral CR = 0.97; AVE = 0.53, and cognitive CR = 0.96, AVE = 0.82; CR (>0.70; Nunnally, 1978) and AVE (≥0.50; Fornell and Larcker, 1981; **Table 2**).

TABLE 2 | Results of the CFA with factor loadings, composite reliability, and average variance extracted from ACO for nursing students.

Items		Factor loading	CR	AVE
	Dimension 1 affective		0.98	0.58
ACO 1		0.72		
ACO 2		0.77		
ACO 3		0.79		
ACO 4		0.67		
ACO 5		0.84		
ACO 6		0.83		
ACO 7		0.85		
ACO 8		0.66		
ACO 9		0.73		
ACO 10		0.74		
ACO 11		0.73		
ACO 12		0.61		
	Dimension 2 behavioral		0.97	0.53
ACO 13		0.58		
ACO 14		0.73		
ACO 15		0.85		
ACO 16		0.82		
ACO 17		0.85		
ACO 18		0.89		
ACO 19		0.85		
ACO 20		0.83		
ACO 21		0.82		
	Dimension 3 cognitive		0.96	0.82
ACO 22		0.87		
ACO 23		0.92		
ACO 24		0.93		
ACO 25		0.89		

CFA, confirmatory factor analysis; ACO, attitudes toward communication; CR, composite reliability; AVE, average variance extracted.

Attitudes Toward the Communication of Nursing Students With the Patient, Relationships Between the Academic Course, and Correlations Between Dimensions of Attitudes Toward Communication Instrument for Nursing Students

Analysis of attitudes toward patient communication of nursing students provided the following results: behavioral (M = 4.56; *SD* = 0.69) and cognitive (M = 4.73; *SD* = 0.47) showed the highest scores, meanwhile the dimension related to affective communication (M = 1.65; *SD* = 0.77) had the lowest average score.

Then, we analyzed the relationships between the academic course and the ACO dimensions by using the ANOVA analyses with the Bonferroni *post hoc* test to determine the differences between the variables.

In relation to the academic course (first, second, third, and fourth courses), the results of the ANOVA statistically significant differences in all the dimensions of the ACO instrument for nursing students were observed (**Table 3**). Statistically significant differences in the Bonferroni *post hoc* tests in the affective dimension were reported between the second and the other courses, with higher differences in the second-year students. With respect to the cognitive and behavioral dimensions, statistically significant differences were shown between first-, second-, and fourth-year students, with the highest values in first-year students.

Finally, correlations between the different dimensions of the ACO instrument for nursing students were tested. In the case of the affective dimension, statistically significant, negative and low correlations were observed with the behavioral ($r = -0.32$; $^*p \leq 0.05$) and cognitive ($r = -0.36$; $^*p \leq 0.05$) dimensions. The behavioral and cognitive dimensions showed a significant, positive, and very high correlation ($r = 0.90$; $^*p \leq 0.05$).

TABLE 3 | Items of the ACO scale adapted for nursing students according to the academic course.

ACO dimensions	First (SD)	Second (SD)	Third (SD)	Fourth (SD)	F	*p*-value
Affective	1.56 (0.54)	1.82 (0.82)	1.55 (0.57)	1.65 (0.68)	12.8	0.000***
Cognitive	4.85 (0.47)	4.69 (0.75)	4.77 (0.58)	4.70 (0.74)	4.8	0.000***
Behavioral	4.66 (0.53)	4.49 (0.76)	4.57 (0.66)	4.39 (0.82)	9.2	0.003**

$^*p \leq 0.05$; $^{**}p \leq 0.01$; $^{***}p \leq 0.001$.

DISCUSSION

This study showed the adaptation and validation of the instrument to measure the ACO of nursing students. Analysis of the 25 items demonstrated an adequate contribution to the overall scale. The reliability of the construct showed an acceptable

coefficient (Cronbach's α = 0.84) above the minimum value (>0.70) indicated in the literature (Nunnally, 1978) and did not appear to be improved by removing any of the items. As for the construct validity of the scale, the EFA results showed that the 25 items of the variance explained by the three factors was 78%, RMSR value of 0.03 (<0.50; Harman, 1980), and a GFI index of 0.99 (>0.95; Tanaka and Huba, 1989). This indicated an adequate fit, CFA also replicated that structure, and presented an adequate fit (χ^2 = 2347.59; df = 272; p < 0.05; NNFI = 0.91; CFI = 0.92; IFI = 0.92; and RMSEA = 0.07). The RMSEA was 0.07, which agrees with the optimal values fit criteria (≤ 0.08) (Browne and Cudeck, 1993). Similarly, the remaining indices showed a good fit: NNFI = 0.91; CFI = 0.92; and IFI = 0.92 (values over 0.90 indicate an adequate fit) (McCallum and Austin, 2000). Overall, the obtained psychometric properties suggest that the instrument is reliable and valid, which justifies its use to assess ACO in nursing students. These results are relevant because communication is a core competence in nursing students (Chang and Chang, 2021) and behaviors can be predicted by studying attitudes. Then, assessing the ACO for nursing students with the patient is critical as future nursing professionals. Studying the development and modification of attitudes involve exposure to new information (theory lessons, the importance of communication, benefits, and communicative moments), imposed behavioral change (experiential lessons, communication behavioral, and role play), and an increase in self-knowledge (answering an instrument increasing the awareness of the students of their attitudes). Increased knowledge and awareness of their attitudes and behaviors may have already contributed to changing attitudes in nursing students (Koponen et al., 2012). Despite the importance of attitudes in predicting behaviors, no studies have been found assessing ACO in nursing students (MacLean et al., 2017; Levett-Jones et al., 2019), but on communication skills, communication knowledge, and in medical students (Epstein et al., 2010; Škodová et al., 2018; Givron and Desseilles, 2021). Therefore, it is essential to have instruments with adequate psychometric properties to be aware of the attitudes in order to improve negative attitudes and contribute to the development of training programs adapted to the real needs of nursing students.

With respect to the attitudes of nursing students, it seems to indicate positive ACO with the patient. The dimensions with the highest scores were cognitive and behavioral, while scores were worst in the affective component. The affective component showed an inverted dimension when subjects were asked about communication anxiety. These results were in the same line as the Giménez-Espert and Prado-Gascó (2018) study carried out with a sample of the nurse. This can be explained by the fact that the three attitude components are related, since the experienced feeling (emotional dimension) is mainly based on knowledge (cognitive dimension) and actions are guided by feelings and by knowledge (behavioral dimension) (Fishbein and Cappella, 2006; Ertz et al., 2016).

According to the academic course of nursing students, the ANOVA statistically significant differences in all the dimensions of instrument ACO were found. The second-year nursing students showed more positive attitudes in the affective dimension, while in the cognitive and behavioral dimension, the most positive attitudes were found in the first-year students. These findings are consistent with previous studies, showing that communicative attitudes become more negative over time because students may be exposed to more negative communicative experiences, as they get older and may also experience difficulties with increasingly demanding communicative situations (Clark et al., 2012). Due to the curriculum demands and time constraints, it leads to prioritizing clinical skills over interpersonal skills (Cusatis et al., 2020). In addition, the upper class nursing students have already had experiences with the professional world during their clinical practice, which implies exposure to communicate complex situations, human suffering, without adequate educational preparation and support (Ward et al., 2012).

Finally, in the correlations, the behavioral and cognitive dimensions showed a significant, positive, and very high correlation, according to the literature (Rosenberg and Hovland, 1960; Ajzen, 1991). Communication is essential for the quality of care and satisfaction of the patient (Finke et al., 2008; Kourkouta and Papathanasiou, 2014; Finney Rutten et al., 2015; Banerjee et al., 2016; Gillett et al., 2016; Howick et al., 2018) and for the effectiveness of healthcare teams, it can be related to the quality of care and job satisfaction of healthcare workers, such as nurses (Gausvik et al., 2015). Moreover, the influence of knowledge and attitudes on communication is evident (Mullan and Kothe, 2010); therefore, it is necessary to deepen the study of the ACO of nursing students.

In spite of the advantages of this study, several limitations were present. Nevertheless, because the sampling was not probabilistic and the subjects were exclusively from Valencian Community, the results should be generalized with caution. A large sample of nursing students was used in this study. Future studies would be interesting to extend this study to other populations in Spain and in other Spanish-speaking countries. Another limitation is related to the use of self-reports to collect data, and they can introduce bias through the phenomenon of social desirability (Rammstedt et al., 2017). In future research, it would be advisable to combine the results on another type of instrument completed by others and/or with external objective measures, perform a comparison to another measure gold standard, and potential outcome to nursing students' attitude to communication with patients.

Hence, the importance of analyzing the ACO in nursing students generates a need for reliable and validated instruments. In conclusion, the existence of appropriate instruments allows the measurement of the ACO, evaluating educational needs, developing interventions adapted to real needs, and assessing the interventions developed to improve the ACO in nursing students. These findings should be considered in developing academic plans to improve the effectiveness of the communication education process of the students to increase the quality of patient care and well-being of the nursing students.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Human Research Ethics Committee of the University of Valencia H1529396558647. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MCG-E, SM, DP, and VP-G made a substantial contribution to the concept, design of the work, acquisition, analysis, and interpretation of data, drafted the manuscript and revised it critically for important intellectual content, and participated sufficiently in the work to take public responsibility for appropriate portions of the content. All authors contributed to the manuscript and approved the submitted version.

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REFERENCES

Abdolrahimi, M., Ghiyasvandian, S., Zakerimoghadam, M., and Ebadi, A. (2017a). Antecedents and consequences of therapeutic communication in Iranian nursing students: a qualitative research. *Nurs. Res. Pract.* 2017:4823723. doi: 10.1155/2017/4823723

Abdolrahimi, M., Ghiyasvandian, S., Zakerimoghadam, M., and Ebadi, A. (2017b). Therapeutic communication in nursing students: a Walker & Avant concept analysis. *Electron. Physician* 9, 4968–4977. doi: 10.19082/4968

Ajzen, I. (1991). The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* 50, 179–211.

Ajzen, I., and Fishbein, M. (1980). "Predicting and understandingconsumer behavior: attitude-behavior correspondence," in *Under-standing Attitudes and Predicting Social Behavior*, eds I. Ajzen and M. Fishbein (Hoboken, NJ: Prentice Hall), 148–172.

Anderson, J. C., and Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychol. Bull.* 103, 411–423. doi: 10.1037/0033-2909.103.3.411

Anvik, T., Gude, T., Grimstad, H., Baerheim, A., Fasmer, O. B., Hjortdahl, P., et al. (2007). Assessing medical students' attitudes towards learning communication skills–which components of attitudes do we measure? *BMC Med. Educ.* 7:4. doi: 10.1186/1472-6920-7-4

Banerjee, S. C., Manna, R., Coyle, N., Shen, M. J., Pehrson, C., Zaider, T., et al. (2016). Oncology Nurses'. *Nurse Educ. Pract.* 16, 193–201. doi: 10.1016/j.nepr.2015.07.007

Beckstrand, R. L., Collette, J., Callister, L., and Luthy, K. E. (2012). Oncology nurses' obstacles and supportive behaviors in end-of-life care: providing vital family care. *Oncol. Nurs. Forum* 39, E398-E406. doi: 10.1188/12.ONF.E398-E406

Bentler, P. M. (2004). *EQS 6 Structural Equations Modeling Software*. Encino: Multivariate Software.

Boschma, G., Einboden, R., Groening, M., Jackson, C., MacPhee, M., Marshall, H., et al. (2010). Strengthening communication education in an undergraduate nursing curriculum. *Int. J. Nurs. Educ. Scholarsh.* 7:28. doi: 10.2202/1548-923X.2043

Browne, M. W., and Cudeck, R. (1993). "Alternative ways of assessing model fit," in *Testing Structural Equation Models*, eds K. A. Bollen and J. S. Long (Newbury Park, CA: Sage), 136–162.

Bulechek, G. M. (2009). *Clasificación de Intervenciones de Enfermería (NIC). [Nursing Intervention Classification (NIC)]*. Barcelona: Elsevier Health Sciences.

Burgener, A. M. (2020). Enhancing communication to improve patient safety and to increase patient satisfaction. *Health Care Manag.* 39, 128–132. doi: 10.1097/HCM.0000000000000298

Chan, E. A. (2014). Cue-responding during simulated routine nursing care: a mixed method study. *Nurse Educ. Today* 34, 1057–1061. doi: 10.1016/j.nedt.2014.02.010

Chan, Z. C. (2017). A qualitative study on communication between nursing students and the family members of patients. *Nurse Educ. Today* 59, 33–37. doi: 10.1016/j.nedt.2017.08.017

Chang, H. Y., and Chang, H. L. (2021). A virtual simulation-based educational application about complementary and alternative medicine: a pilot study of nurses' attitudes and communication competency. *Nurse Educ. Today* 97:104713. doi: 10.1016/j.nedt.2020.104713

Charlton, C. R., Dearing, K. S., Berry, J. A., and Johnson, M. J. (2008). Nurse practitioners' communication styles and their impact on patient outcomes: an integrated literature review. *J. Am. Acad. Nurse Pract.* 20, 382–388. doi: 10.1111/j.1745-7599.2008.00336.x

Claramita, M., Tuah, R., Riskione, P., Prabandari, Y. S., and Effendy, C. (2016). Comparison of communication skills between trained and untrained students using a culturally sensitive nurse-client communication guideline in Indonesia. *Nurse Educ. Today* 36, 236–241. doi: 10.1016/j.nedt.2015.10.022

Clark, C. E., Conture, E. G., Frankel, C. B., and Walden, T. A. (2012). Communicative and psychological dimensions of the KiddyCAT. *J. Commun. Disord.* 45, 223–234. doi: 10.1016/j.jcomdis.2012.01.002

Coyle, N., Manna, R., Shen, M. J., Banerjee, S. C., Penn, S., Pehrson, C., et al. (2015). Discussing death, dying, and end-of-life goals of care: a communication skills training module for oncology nurses. *Clin. J. Oncol. Nurs.* 19, 697–702. doi: 10.1188/15.CJON.697-702

Cusatis, R., Holt, J. M., Williams, J., Nukuna, S., Asan, O., Flynn, K. E., et al. (2020). The impact of patient-generated contextual data on communication in clinical practice: a qualitative assessment of patient and clinician perspectives. *Patient Educ. Couns.* 103, 734–740. doi: 10.1016/j.pec.2019.10.020

Duhamel, F., and Talbot, L. R. (2004). A constructivist evaluation of family systems nursing interventions with families experiencing cardiovascular and cerebrovascular illness. *J. Fam. Nurs.* 10, 12–32. doi: 10.1177/1074840703260906

Epstein, R. M., Fiscella, K., Lesser, C. S., and Stange, K. C. (2010). Why the nation needs a policy push on patient-centered health care. *Health Aff.* 29, 1489–1495. doi: 10.1377/hlthaff.2009.0888

Ertz, M., Karakas, F., and Sarigöllü, E. (2016). Exploring pro-environmental behaviors of consumers: an analysis of contextual factors, attitude, and behaviors. *J. Bus. Res.* 69, 3971–3980. doi: 10.1016/j.jbusres.2016.06.010

Finke, E. H., Light, J., and Kitko, L. (2008). A systematic review of the effectiveness of nurse communication with patients with complex communication needs with a focus on the use of augmentative and alternative communication. *J. Clin. Nurs.* 17, 2102–2115. doi: 10.1111/j.1365-2702.2008.02373.x

Finney Rutten, L. J., Agunwamba, A. A., Beckjord, E., Hesse, B. W., Moser, R. P., and Arora, N. K. (2015). The relation between having a usual source of care and ratings of care quality: does patient-centered communication play a role? *J. Health Commun.* 20, 759–765. doi: 10.1080/10810730.2015.1018592

Fishbein, M., and Cappella, J. N. (2006). The role of theory in developing effective health communications. *J. Commun.* 56, S1–S17. doi: 10.1111/j.1460-2466.2006.00280.x

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.2307/3151312

Foronda, C., MacWilliams, B., and McArthur, E. (2016). Interprofessional communication in healthcare: an integrative review. *Nurse Educ. Pract.* 19, 36–40. doi: 10.1016/j.nepr.2016.04.005

Fukada, M. (2018). Nursing competency: definition, structure anddevelopment. *Yonago Acta Med.* 61, 1–7. doi: 10.33160/yam.2018.03.001

Gausvik, C., Lautar, A., Miller, L., Pallerla, H., and Schlaudecker, J. (2015). Structured nursing communication on interdisciplinary acute care teams improves perceptions of safety, efficiency, understanding of care plan and teamwork as well as job satisfaction. *J. Multidiscip. Healthc.* 8, 33–37. doi: 10.2147/JMDH.S72623

Gillett, K., O'Neill, B., and Bloomfield, J. G. (2016). Factors influencing the development of end-of-life communication skills: a focus group study of nursing and medical students. *Nurse Educ. Today* 36, 395–400. doi: 10.1016/j.nedt.2015.10.015

Giménez-Espert, M. C., and Prado-Gascó, V. J. (2018). The development and psychometric validation of an instrument to evaluate nurses' attitudes towards communication with the patient (ACO). *Nurse Educ. Today* 64, 27–32. doi: 10.1016/j.nedt.2018.01.031

Givron, H., and Desseilles, M. (2021). Longitudinal study: impact of communication skills training and a traineeship on medical students' attitudes toward communication skills. *Patient Educ. Couns.* 104, 785–791. doi: 10.1016/j.pec.2020.09.010

Grant, M. S., and Jenkins, L. S. (2014). Communication education for pre-licensure nursing students: literature review 2002-2013. *Nurse Educ. Today* 34, 1375–1381. doi: 10.1016/j.nedt.2014.07.009

Grassi, L., Caruso, R., and Costantini, A. (2015). Communication with patients suffering from serious physical illness. *Adv. Psychosom. Med.* 34, 10–23. doi: 10.1159/000369050

Gutiérrez-Puertas, L., Márquez-Hernández, V. V., Gutiérrez-Puertas, V., Granados-Gámez, G., and Aguilera-Manrique, G. (2020). Educational interventions for nursing students to develop communication skills with patients: a systematic review. *Int. J. Environ. Res. Public Health* 17:2241. doi: 10.3390/ijerph17072241

Hannawa, A. F., García-Jiménez, L., Candrian, C., Rossmann, C., and Schulz, P. J. (2015). Identifying the field of health communication. *J. Health Commun.* 20, 521–530. doi: 10.1080/10810730.2014.999891

Harman, H. H. (1980). *Análisis factorial moderno [Modern factor analysis]*. Chicago, IL: The University Of Chicago Press.

Hemsley, B., Balandin, S., and Worrall, L. (2012). Nursing the patient with complex communication needs: time as a barrier and a facilitator to successful communication in hospital. *J. Adv. Nurs.* 68, 116–126. doi: 10.1111/j.1365-2648.2011.05722.x

Howick, J., Moscrop, A., Mebius, A., Fanshawe, T. R., Lewith, G., Bishop, F. L., et al. (2018). Effects of empathic and positive communication in healthcare consultations: a systematic review and meta-analysis. *J. R. Soc. Med.* 111, 240–252. doi: 10.1177/0141076818769477

International Test Commission (2017). *The ITC Guidelines for Translating and Adapting Tests (Second edition)*. Available online at: www.InTestCom.org (accessed February 21, 2021).

Kitson, A. L., Muntlin Athlin, Å, Conroy, T., and International Learning Collaborative (2014). Anything but basic: nursing's challenge in meeting patients' fundamental care needs. *J. Nurs. Scholarsh.* 46, 331–339. doi: 10.1111/jnu.12081

Klakovich, M. D., and dela Cruz, F. A. (2006). Validating the interpersonal communication assessment scale. *J. Prof. Nurs.* 22, 60–67. doi: 10.1016/j.profnurs.2005.12.005

Koponen, J., Pyörälä, E., and Isotalus, P. (2012). Comparing three experiential learning methods and their effect on medical students' attitudes to learning communication skills. *Med. Teach.* 34, e198–e207. doi: 10.3109/0142159X.2012.642828

Kourkouta, L., and Papathanasiou, I. (2014). Communication in nursing practice. *Mater. Sociomed.* 26, 65–67. doi: 10.5455/msm.2014.26.65-67

Levett-Jones, T., Cant, R., and Lapkin, S. (2019). A systematic review of the effectiveness of empathy education for undergraduate nursing students. *Nurse Educ. Today* 75, 80–94. doi: 10.1016/j.nedt.2019.01.006

Li, Y., Wang, X., Zhu, X. R., Zhu, Y. X., and Sun, J. (2019). Effectiveness of problem-based learning on the professional communication competencies of nursing students and nurses: a systematic review. *Nurse Educ. Pract.* 37, 45–55. doi: 10.1016/j.nepr.2019.04.015

Lin, M. F., Hsu, W. S., Huang, M. C., Su, Y. H., Crawford, P., and Tang, C. C. (2017). I couldn't even talk to the patient': barriers to communicating with cancer patients as perceived by nursing students. *Eur. J. Cancer Care* 26:e12648. doi: 10.1111/ecc.12648

Lloret-Segura, S., Ferreres-Traver, A., Hernández-Baeza, A., and Tomás-Marco, I. (2014). El análisis factorial exploratorio de los ítems: una guía práctica, revisada y actualizada. [Exploratory item factor analysis: a practical guide revised and updated]. *Anales de Psicología* 30, 1151–1169. doi: 10.6018/analesps.30.3.199361

Lorenzo-Seva, U., and Ferrando, P. J. (2006). FACTOR: a computer program to fit the exploratory factor analysis model. *Behav. Res. Methods* 38, 88–91. doi: 10.3758/BF03192753

Lynn, M. R. (1986). Determination and quantification of content validity. *Nurs. Res.* 35, 382–386.

MacLean, S., Kelly, M., Geddes, F., and Della, P. (2017). Use of simulated patients to develop communication skills in nursing education: an integrative review. *Nurse Educ. Today* 48, 90–98. doi: 10.1016/j.nedt.2016.09.018

McCallum, R. C., and Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annu. Rev. Psychol.* 51, 201–226. doi: 10.1146/annurev.psych.51.1.201

Mullan, B. A., and Kothe, E. J. (2010). Evaluating a nursing communication skills training course: the relationships between self-rated ability, satisfaction, and actual performance. *Nurse Educ. Pract.* 10, 374–378. doi: 10.1016/j.nepr.2010.05.007

Nunnally, J. (1978). *Psychometric Theory*. New York, NY: McGraw-Hill.

Peplau, H. E. (1991). *Interpersonal Relations in Nursing: A Conceptual Frame of Reference for Psychodynamic Nursing*. New York, NY: Springer Publishing Company.

Polit, D. F., and Beck, C. T. (2008). *Nursing Research: Generating and Assessing Evidence for Nursing Practice*, 8th Edn. Philadelphia: Lippincott Williams and Wilkins.

Rammstedt, B., Danner, D., and Bosnjak, M. (2017). Acquiescence response styles: a multilevel model explaining individual-level and country-level differences. *Pers. Individ. Dif.* 107, 190–194. doi: 10.1016/j.paid.2016.11.038

Rees, C., Sheard, C., and Davies, S. (2002). The development of a scale to measure medical students' attitudes towards communication skills learning: the communication skills attitude scale (CSAS). *Med. Educ.* 36, 141–147. doi: 10.1046/j.1365-2923.2002.01072.x

Rosemond, C., Hanson, L. C., and Zimmerman, S. (2017). Goals of care or goals of trust? how family members perceive goals for dying nursing home residents. *J. Palliat. Med.* 20, 360–365. doi: 10.1089/jpm.2016.0271

Rosenberg, M. J., and Hovland, C. I. (1960). "Cognitive, affective and behavioral components of attitudes," in *Attitude Organization and Change: An Analysis of Consistency Among Attitude Components*, eds M. J. Rosenberg and C. I. Hovland (New Haven: Yale University Press).

Sarikoc, G., Ozcan, C. T., and Elcin, M. (2017). The impact of using standardized patients in psychiatric cases on the levels of motivation and perceived learning of the nursing students. *Nurse Educ. Today* 51, 15–22. doi: 10.1016/j.nedt.2017.01.001

Satu, K. U., Leena, S., Mikko, S., Riitta, S., and Helena, L. K. (2013). Competence areas of nursing students in Europe. *Nurse Educ. Today* 33, 625–632. doi: 10.1016/j.nedt.2013.01.017

Shorey, S., Kowitlawakul, Y., Devi, M. K., Chen, H. C., Soong, S. K. A., and Ang, E. (2018). Blended learning pedagogy designed for communication module

among undergraduate nursing students: a quasi-experimental study. *Nurse Educ. Today* 61, 120–126. doi: 10.1016/j.nedt.2017.11.011

Škodová, Z., Bánovèinová, L., and Bánovèinová, A. (2018). Attitudes towards communication skills among nursing students and its association with sense of coherence. *Kontakt* 20, e17–e22.

Suzuki, E., Azuma, T., Kobiyama, A., Takayama, Y., Sato, Y., Maruyama, A., et al. (2014). *Situations Among Novice Nurses and Preceptor: They Cannot Be Assertive*. Available online at: https://sigma.nursingrepository.org/handle/10755/335454 (accessed February 1, 2021).

Tanaka, J. S., and Huba, G. H. (1989). A general coefficient of determination for covariance structure models under arbitrary GLS estimation. *Br. J. Math. Stat. Psychol.* 42, 233–239. doi: 10.1111/j.2044-8317.1989.tb00912.x

The Joint Commission (2016). *Sentinel Event Statistics Data – Event Type by Year (1995–Q2—2016)*. Available online at: https://www.jointcommission.org/se_data_event_type_by_year_/ (accessed January 15, 2021).

Ward, J., Cody, J., Schaal, M., and Hojat, M. (2012). The empathy enigma: an empirical study of decline in empathy among undergraduate nursing students. *J. Prof. Nurs.* 28, 34–40. doi: 10.1016/j.profnurs.2011.10.007

Watson, J. (2018). *Unitary caring science: Philosophy and Praxis of Nursing*. Boulder, CO: University Press of Colorado.

Wei, H., and Watson, J. (2019). Healthcare interprofessional team members'. *Int. J. Nurs. Sci.* 6, 17–23. doi: 10.1016/j.ijnss.2018.12.001

Wittenberg, E., Ragan, S. L., and Ferrell, B. (2017). Exploring nurse communication about spirituality. *Am. J. Hosp. Palliat. Care* 34, 566–571. doi: 10.1177/1049909116641630

World Health Organization (2017). *Patient Safety: Making Healthcare Safer. Licence: CC, BY-NC-SA3.0, IGO*. Available online at: https://apps.who.int/iris/handle/10665/255507 (accessed January 27, 2021).

World Medical Association (2013). "Ethical principles for medical research involving human subjects," in *Proceedings of the 64th WMA General Assembly October 2013*, Fortaleza.

Xie, J., Ding, S., Wang, C., and Liu, A. (2013). An evaluation of nursing students'. *Nurse Educ. Today* 33, 823–827. doi: 10.1016/j.nedt.2012.02.011

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Relationship Between Emotional Labor and Mental Health in Preschool Teachers: Mediation of Psychological Capital

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This study explored the relationship among the emotional labor, psychological capital, and mental health of preschool teachers. A questionnaire survey was conducted on 411 preschool teachers in China. The results revealed the following: (1) One emotional labor strategy (Surface acting) had a significant negative effect on mental health, whereas two emotional labor strategies (expression of naturally felt emotions and deep acting) had significant positive effects. (2) The psychological capital of preschool teachers had a complete mediation on the relationship between expression of naturally felt emotions and mental health and between the deep acting and mental health.

Keywords: preschool teachers, emotional labor, mental health, psychological capital, mediation

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INTRODUCTION

Mental health is crucial to quality of teachers. Teachers' mental health has a strong effect on students and even the entire field of education (Kovess-Masfety et al., 2007; Harding et al., 2019). Good mental health refers to an individual having no mental illness and having positive emotions, psychology, or traits, enabling the individual to feel secure in their physical, psychological, and social relationships (Diener and Seligman, 2002; Seligman, 2003; Keyes, 2005). Young children have the specific traits of cognitive infantilism, poor emotional regulation, and low socialization, which are the reasons for the particularity and high pressure of preschool teachers' work. Teachers must meet the current urgent requirements developing of preschool education in China. Additionally, immense work pressure and challenges endangering the physical and mental health of preschool teachers affect the quality of life and level of commitment of these teachers to their work and may profoundly affect the development of young children (Buettner et al., 2016; Edward, 2016; Jeon et al., 2019). Consequently, the factors affecting preschool teachers' mental health and the mechanisms behind these effects must be investigated to determine how the mental health of preschool teachers can be improved and thus promote the integral development of preschool education.

Many factors affect mental health of preschool teachers, and multiple studies have reported that emotional labor is a crucial factor affecting mental health (Liu et al., 2004; McLean and Connor, 2015; Katz et al., 2016). Emotional labor is the third kind of labor, other than physical labor and intellectual labor, and refers to the emotional management that an individual must perform to display an acceptable facial or physical expression in a work context to earn a reward (Hochschild, 1979; Brotheridge and Grandey, 2002; Grandey, 2003). Some studies argue that emotional labor is performed through three strategies: surface acting, which refers to only the regulation of expressions and behaviors to conform with an organization's requirements but does

not involve a change in inner feelings and is thus a disguise; the expression of naturally felt emotions, in which emotional labor is conducted automatically and emotions are revealed naturally and without the need for conscious effort; and deep acting, in which the individual manages his or her emotional state through active thinking, introduced imaginings, and memory so their internal feelings conform to the feelings expressed in the emotional expressions expected in the organization, thus producing an internally and externally consistent performance (Ashforth and Humphrey, 1993; Diefendorff et al., 2005). Researchers have demonstrated the negative effects of emotional labor at work on mental health (Kim et al., 2017; Han et al., 2018). Some studies have further shown that surface acting negatively affects mental health; greater emotional labor triggers greater work stress, which then affects mental health (Mann and Cowburn, 2005; Mesmer-Magnus et al., 2012). Philipp and Schüpbach (2010) discovered that emotional labor has a critical effect on teachers' health, and deep acting especially benefits their mental health. Furthermore, in their study on staff in the service industry, Huang et al. (2010) discovered that surface acting negatively affected mental health whereas deep acting and expression of naturally felt emotions positively affected mental health. These studies have indicated that emotional labor affects mental health. For preschool teachers, emotional labor has the traits of long duration, high intensity, diverse emotional interactions, and painstaking effort (Yin and Lee, 2012; Zhang et al., 2020); consequently, the effect of emotional labor on the mental health of preschool teachers must be investigated to determine whether any mediators affect this relationship.

During work, employees with positive psychological capital typically have higher work positivity, which has a positive effect on their physical and mental health (Lee et al., 2016; Idris and Manganaro, 2017). Psychological capital is a type of positive psychological state experienced during growth and development; it provides an individual with emotional support and psychological energy and can weaken the adverse effects of negative emotions, positively affecting the development of the individual (Luthans et al., 2007a; Ke et al., 2009). Luthans et al. (2007b) have defined that there are four dimensions to psychological capital: self-efficacy, which is the confidence to undertake and invest the necessary effort to complete challenging tasks; optimism, which is having hope regarding current work and maintaining an attitude of positivity about future success; hope, which is the belief that success can be earned through continued hard work toward goals; and resilience, which is the character traits of perseverance and rebounding when faced with problems and adversity to achieve success. Some studies have reported that individuals with more stable psychological capital have better mental health, indicating that psychological capital has a positive effect on mental health (Psilopanagioti et al., 2012; Krasikova et al., 2015; Liu et al., 2015). Estiri et al. (2016) conducted a study investigating human resource management in hospitals and found that the psychological capital of nurses was a significant predictor of their mental health. Some studies have demonstrated that psychological capital is often a critical mediator in studies about emotional labor (Yin et al., 2018; Barbaranelli et al., 2019; Peng et al., 2019). Other studies have reported that psychological capital has a mediating effect in studies about mental health (Cole et al., 2009; Dewal and Kumar, 2017). Therefore, the present study hypothesized that psychological capital is a mediator worth considering, and in terms of emotional labor, increasing the psychological capital of preschool teachers will positively affect their mental health.

In this study, the Stress–Strain–Outcome (S-S-O) model proposed by Koeske and Koeske (1993) was employed as the theoretical basis of the study framework. The S-S-O model is used to explain the route that the stress encountered by the individual passes through to affect the individual's psychology and behavior. Here, stress refers to a difficult and challenging objective existence; stress triggers strain in the individual, and that strain refers to the individual's ability to instinctively judge the situation, which in turn affects the outcome. In the present study, emotional labor refers to a type of challenging labor that preschool teachers undergo while providing educational services to children, and psychological capital is the psychological resources and skills of preschool teachers instinctively responding to their work. On the basis of the S-S-O model, this study proposed that emotional labor, psychological capital, and mental health can be respectively viewed as the stress, strain, and outcome in the model; emotional labor stimulates psychological capital in preschool teachers, which indirectly affects their mental health.

In conclusion, this study investigates the relationship between emotional labor and mental health among preschool teachers and identifies the mediation of psychological capital in that relationship. This study had two major objectives: (1) to explore the relationship between emotional labor and mental health in preschool teachers and (2) to examine whether psychological capital mediates this relationship.

Relationship Between Emotional Labor and Mental Health

Kim et al. (2017), who investigated firefighters, found that emotional labor had a significant positive effect on mental health and that mental health plans that reduce work stress and emotional labor and strengthen adaptability are critical to improving mental health. Edward et al. (2017) study of nurses found that emotional labor could inspire the personal mental health. Shu et al. (2017), in a study of nurses, discovered that the surface acting of emotional labor strategy has a significant negative effect on self-assessed anxiety in mental health, whereas deep acting had a significant positive effect on self-assessed anxiety. Researchers have identified that surface acting had a negative predictive effect on mental health of employees, whereas deep acting and expression of naturally felt emotions had positive predictive effects (Huang et al., 2010; Park et al., 2019). Summarizing these arguments, this study posited the following hypothesis:

H1: Emotional labor has a negative effect on mental health in preschool teachers.

Relationship Between Emotional Labor and Psychological Capital

Jun (2017) found a significant correlation between emotional labor and positive psychological capital in a study of nurses. Mao and Mo (2014) discovered that for elementary school teachers, positive correlations existed between psychological capital and the emotional labor of deep acting and between psychological capital and expression of naturally felt emotions. Fu (2015) investigated preschool teachers and discovered that the emotional labor of deep acting had a significant positive effect on psychological capital. Aziz et al. (2018), in their study of professional workers, reported that surface acting was inversely correlated with psychological capital, whereas deep acting was positively correlated with psychological capital. Yin et al. (2017) investigated elementary school teachers and found that deep acting and expression of naturally felt emotions could increase the teachers' efficacy. The following hypothesis was thus posited:

H2: Emotional labor has a positive effect on psychological capital in preschool teachers.

Relationship Between Psychological Capital and Mental Health

Kuo et al. (2010) discovered that psychological capital was significantly correlated with mental health level, and psychological capital was a predictor of the various dimensions of mental health, such as emotional balance, internal control, and psychological conflict. Selvaraj and Bhat (2018) argued that cultivating positive psychological advantages in college students (e.g., hope, efficacy, adaptability, and optimism) can significantly raise their mental health level. Erkutlu (2014) discovered that teachers with higher psychological capital had better mental health. Van Der Meulen et al. (2018) reported that psychological capital can protect against mental health disorders to a certain extent and may even be a corrective. Taxer and Frenzel (2015) discovered that self-efficacy among teachers had a positive effect on mental health. Therefore, the following hypothesis was posited:

H3: Psychological capital has a positive effect on mental health in preschool teachers.

Relationship Between Emotional Labor, Psychological Capital, and Mental Health

Hur et al. (2016) investigated airline service personnel and found that psychological capital played a mediating role between organizational justice and emotional labor, and positive psychological capital had significant effects on surface acting and deep acting. Yin et al. (2018) determined that among corporate employees, psychological capital had a mediating effect in the relationship between deep acting and emotional fatigue. A study on preschool teachers by Peng et al. (2019) indicated psychological capital found that psychological capital partially mediated the effects of the three types of emotional labor strategy (surface acting, expression of naturally felt emotions, and deep acting) on work burnout. Dewal and Kumar (2017) discovered that psychological capital has mediating effects on the relationship between Big Five personality traits and mental health in entrepreneurs. This literature review indicates that in preschool teachers, emotional labor affects psychological capital, and psychological capital affects mental health and may have a mediating effect between emotional labor and mental health. Therefore, the following hypothesis was posited:

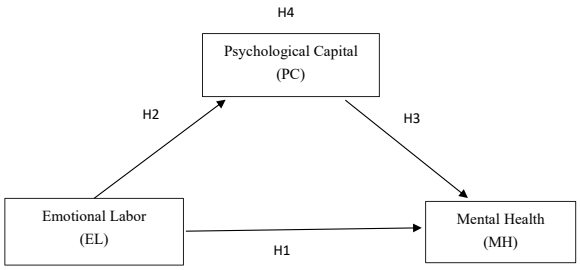

FIGURE 1 | Research model. Emotional Labor (EL) includes three strategies: EL1, surface acting; EL2, expression of naturally felt emotions; EL3, deep acting.

H4: Psychological capital has a mediation on the relationship between emotional labor and mental health in preschool teachers.

METHODOLOGY

Research Model

In this study, the relationship between emotional labor and mental health in preschool teachers and the mediation of psychological capital in this relationship were investigated using emotional labor as the independent variable, mental health is the dependent variable, and psychological capital as the mediator (**Figure 1**).

Sample

Tinsley and Tinsley (1987) recommend that the size of the pretest sample should be five times the number of items in the scale employed that contains the most items. The Adult mental health scale (Tseng et al., 2014) was the scale with maximum number of items that was used in this study (28 items); therefore, 158 preschool teachers were selected as the pretest sample. According to the recommendations of Gorsuch (1983), the official sample size for the study should be no fewer than five times the number of total questionnaire items; this study employed 58 items in total, and by using convenience sampling from schools willing to collaborate with the researchers, 411 preschool teachers from the Guangdong province of China were selected as the study participants. Preschool teachers in the current study referred the educators who provided enlightenment education to children aged 3–6 (Ayers, 1989; Wang et al., 2020). These teachers completed the questionnaire on wjx.cn between November 2018 and February 2019; 411 valid surveys were collected. The demographics of the respondents were as follows: 22 men (5.4%) and 398 women (94.6%); and 197 married

respondents (47.9%) and 214 unmarried respondents (52.1%). In terms of education level, 97 respondents had graduated from high school or technical secondary school (23.6%), 204 had graduated from junior college (49.6%), and 110 participants had an undergraduate or higher degree (26.8%). Regarding teaching experience, 236 respondents had 5 or fewer years of teaching experience (57.4%), 50 respondents had 6–10 years of experience (12.2%), 31 respondents had 11–15 years (7.5%), 48 respondents had 16–20 years, and 46 respondents had 21 or more years of experience (11.2%). Public preschool teachers comprised 43.3% of the sample (n = 178), whereas private preschool teachers comprised 56.7% (n = 233).

Research Instruments

Emotional Labor Strategy Scale

Emotional labor strategy scale which was developed by Diefendorff et al. (2005), is a 14-item self-report scale that measures three emotional labor strategies: surface acting, expression of naturally felt emotions, and deep acting. The scale was scored using a 5-point Likert scale (1 = completely disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = completely agree). The sum of all item scores was the total emotional labor score; a higher score indicated a higher level of emotional labor. The Cronbach's α, denoting internal consistency, of the pretest scale used in this study was 0.816, and items with factor loading lower than 0.40 were eliminated through exploratory factor analysis. One item was eliminated, leaving 13 items. The fit indexes for the confirmatory factor analysis results for the formal scale were as follows: χ^2/df = 4.659, GFI = 0.904, NFI = 0.844, IFI = 0.873, NNFI = 0.839, CFI = 0.872, and RMSEA = 0.940. Therefore, the model fit met or approached the standard (Hair et al., 1998).

PsyCap Questionnaire

This study used the PsyCap questionnaire (PCQ-24) of Luthans et al. (2007a). The 24 items in the questionnaire assess self-efficacy, hope, optimism, and resiliency dimensions. The scale was scored using the same 5-point Likert scale used for the Emotional Labor Scale. The sum of all item scores was the total psychological capital score, and a higher score indicated a higher level of psychological capital. The Cronbach's α of the pretest questionnaire used in this study was 0.967, and items with factor loading lower than 0.40 were eliminated through exploratory factor analysis. Six items were eliminated, leaving 18 items. The fitting indexes for the confirmatory factor analysis results were as follows: χ^2/df = 2.618, GFI = 0.907, NFI = 0.935, IFI = 0.959, NNFI = 0.951, CFI = 0.959, and RMSEA = 0.063. Therefore, the model fit met the standard (Hair et al., 1998).

Adult Mental Health Scale

This study employed the Adult mental health scale designed by Tseng et al. (2014), which comprises 28 items covering five dimensions—somatic symptoms, anxiety, social undermining, depression, and positive mentality. For consistent scoring, positive mentality was changed to negative mentality. The scale was scored using the same 5-point Likert scale as for the other two measures. The sum of all item reverse scores was the total mental health score, and a higher score indicated a higher level of mental health. The Cronbach's α of the pretest scale used in this study was 0.959, and items with factor loading lower than 0.40 were eliminated through exploratory factor analysis. One item was eliminated, leaving 27 items. The fitting indexes for the confirmatory factor analysis results were as follows: χ^2/df = 2.338, GFI = 0.883, NFI = 0.904, IFI = 0.943, NNFI = 0.936, CFI = 0.943, and RMSEA = 0.057. Therefore, the model fit met the standard (Hair et al., 1998).

Statistical Analysis Method

Data were analyzed using the package SPSS and AMOS. Descriptive statistics, Cronbach's α, and Pearson correlation were performed using SPSS. Confirmatory factor analysis, structural equation modelling (SEM) and bootstrapping were performed using AMOS.

RESULTS

Common Method Deviation Control and Verification

In this study, data were collected through a questionnaire; common method bias may thus have occurred. To test for common method bias, strict program controls were adopted during the questionnaire process, and it was emphasized that the survey results would be used only for academic research and the survey responses would be anonymous and confidential. Furthermore, Harman's single-factor test was used in the data analysis process to test for common method bias (Harman, 1967). Factor analysis of unrotated factors revealed that the first factor explained only 29.889% of the variance, which was lower than the 40% critical standard value; therefore, this study did not have any severe common method biases.

Descriptive Statistics and Correlation Analysis for Each Variable

Ranked in order from highest to lowest score, the strategies of emotional labor in preschool teachers were expression of naturally felt emotions [mean (M) = 3.654, standard deviation (SD) = 0.679], deep acting (M = 3.604, SD = 0.767), and surface acting (M = 2.692, SD = 0.785); this revealed that the preschool teachers more often used expression of naturally felt emotions and deep acting in their emotional labor at work, using surface acting less often. The preschool teachers' average psychological capital (M = 3.711, SD = 0.574) was higher than the median score (3), indicating that the preschool teachers had above-average psychological capital. Their average mental health score (M = 3.782, SD = 0.660) was also higher than the median value (3), demonstrating that the preschool teachers had above-average mental health.

See **Table 1**. A significant negative correlation was discovered between surface acting and mental health (r = –0.123, $p < 0.05$), a significant positive correlation between deep acting and mental health (r = 0.186, $p < 0.01$), and a significant positive correlation between expression of naturally felt emotions and mental health

TABLE 1 | Descriptive statistics and correlation analysis.

Variable	*M*	SD	EL1	EL2	EL3	PC	MH
EL1	2.692	0.785	1				
EL2	3.654	0.679	0.014	1			
EL3	3.604	0.767	0.348**	0.414**	1		
PC	3.711	0.574	0.052	0.545**	0.497**	1	
MH	3.782	0.659	–0.123*	0.225**	0.186**	0.431**	1

n = 411; EL1, surface acting; EL2, expression of naturally felt emotions; EL3, deep acting; PC, psychological capital; MH, mental health.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

($r = 0.225$, $p < 0.01$). Surface acting was not significantly correlated with psychological capital ($r = 0.052$, $p > 0.05$), deep acting was significantly positively correlated with psychological capital ($r = 0.497$, $p < 0.01$). Expression of naturally felt emotions was significantly positively correlated with psychological capital ($r = 0.545$, $p < 0.01$). Psychological capital and mental health were significantly positively correlated ($r = 0.431$, $p < 0.01$). Most of the variables considered in this study exhibited significant correlations, and the correlation coefficients were all in the range –0.123 to 0.545, which did not indicate collinearity problems. Regression analysis was thus applicable.

Structural Model

Hayes and Rockwood (2017) revealed that bootstrapping is an effective and accurate mediation test method. Therefore, SEM and bootstrapping were the primary statistical analysis methods to verify the mediation in the current study. The adoption of SEM suggests using three or more observed variables for each latent variable (Russell et al., 1998). Taking psychological capital as an example, the questionnaire included four dimensions: self-efficacy, hope, optimism, and resiliency. The current study adopted these four dimensions as observed variables of latent variables. Considering mental health as an example, the scale included five dimensions: somatic symptoms, anxiety, social undermining, depression, and positive mentality, and the current study adopted these five dimensions as observed variables of latent variables. However, the emotional labor strategy scale was divided into three different strategies: surface acting, expression of naturally felt emotions, and deep acting. Therefore, emotional labor strategy cannot be aggregated into one latent variable and must be regarded as three latent variables. The current study adopted items as the observed variables of these three latent variables. In the current study, the thresholds set for a good model fit as follows: $\chi^2/df < 5$ (Schumacker and Lomax, 2012), GFI $\geqq 0.800$, IFI $\geqq 0.800$, TLI $\geqq 0.800$, CFI $\geqq 0.800$ (Gefen et al., 2000), RMSEA $\leqq 0.100$ (Browne and Cudeck, 1993).

The current study evaluated structural models in three steps. In the first step, we observed at the direct association between emotional labor and mental health. We discovered a significant negative association between surface acting and mental health ($\beta = -0.201$, $p < 0.010$), a significant positive correlation between expression of naturally felt emotions and mental health ($\beta = 0.123$, $p < 0.050$), and deep acting and mental health ($\beta = 0.133$, $p < 0.05$). The R^2 value for this model was 0.146. The fit indices—$\chi^2/df = 3.781$, GFI = 0.885, IFI = 0.879, TLI = 0.856, CFI = 0.878, and RMSEA = 0.082—revealed that a satisfactory model fit was achieved. Thus, H1 was supported partially.

In the second step, we established a structural model—mediational model (**Figure 2**), in which psychological capital was introduced as the mediator of the relationship between emotional labor and mental health. The fit indices—$\chi^2/df = 3.315$, GFI = 0.871, IFI = 0.899, TLI = 0.882, CFI = 0.898, and RMSEA = 0.075—revealed that the structural model exhibited a satisfactory fit, suggesting that the psychological capital as a mediator of the relationship between emotional labor and mental health was crucial.

Finally, we performed bootstrapping by specifying a sample of size 2,000 in AMOS to examine the significance of the mediator. The results of the mediational model (**Table 2**) revealed that after the inclusion of the mediator, the indirect effects of the relationship between surface acting (EL1) and mental health ($\beta = -0.035$, and 95% confidence interval did overlap with zero) exerted no mediation. However, the indirect effects of the relationship between expression of naturally felt emotions (EL2) and mental health ($\beta = -0.159$, and 95% confidence interval did no overlap with zero) as well as deep acting (EL3) and mental health ($\beta = 0.281$, and 95% confidence interval did not overlap with zero) indicated a significant mediation. Furthermore, the direct effects of the relationship between expression of naturally felt emotions (EL2) and mental health ($\beta = 0.026$, and 95% confidence interval did overlap with zero) as well as deep acting (EL3) and mental health ($\beta = -0.070$, and 95% confidence interval did overlap with zero). Therefore, psychological capital exhibited a complete mediation on the relationship between expression of naturally felt emotions (EL2) and mental health and deep acting (EL3) and mental health.

CONCLUSION AND DISCUSSION

Among Preschool Teachers, Surface Acting Had Significant Negative Effect on Mental Health, Whereas Deep Acting and Expression of Naturally Felt Emotions Had Significant Positive Effect

The results of this study revealed that among preschool teachers, surface acting lowers mental health, whereas deep acting and expression of naturally felt emotions improve mental health. This is consistent with the findings of Huang et al. (2010) and Philipp and Schüpbach (2010). If preschool teachers adopt surface acting, they disguise and control their actual emotions to different degrees so they can display the emotions required in the kindergarten setting. Especially when teachers need to express negative emotions in order to express emotions not consistent with their actual emotions, surface acting for long periods of time triggers psychological discomfort and leads to mental health problems. Preschool teachers who express their naturally felt emotions have a more natural and sincere experience and express the emotions needed in a preschool

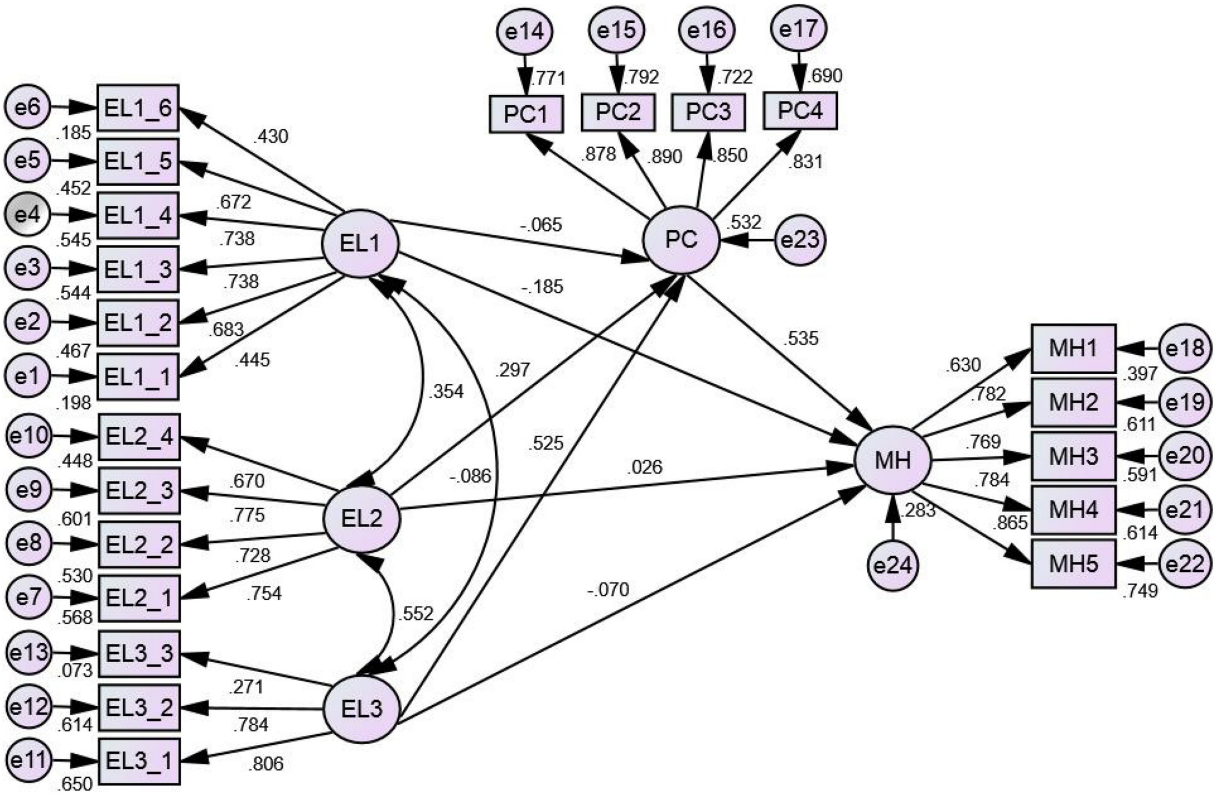

FIGURE 2 | Structural model—Mediational model. EL1, surface acting; EL2, expression of naturally felt emotions; EL3, deep acting; PC, psychological capital; MH, mental health.

environment; this strategy of emotional work enables preschool teachers to maintain a better mental state and has a positive effect on mental health. Preschool teachers using deep acting express emotions that are internally and cognitively consistent with the emotional expressions required by the environment of kindergarten; this helps maintain the teachers' passion for their careers and improves their mental health.

Expression of Naturally Felt Emotions and Deep Acting Have Significant Positive Effect on Psychological Capital in Preschool Teachers

The study findings demonstrated that expression of naturally felt emotions and deep acting increase psychological capital in preschool teachers. This is consistent with the findings of Fu (2015) and Aziz et al. (2018). Preschool teachers who use the expression of naturally felt emotions strategy do not need to disguise or suppress their emotions and do not expend too much physical or mental energy, which has a positive effect on psychological capital. It would be preschool teachers express emotions such as enthusiasm, optimism, and kindness naturally when facing lovely children, which strengthens the psychological capital of preschool teachers. In addition, Those using deep acting must expend more effort on emotion and mental energy regulation, but deep acting increases inner harmony, which improves work performance and increases psychological capital. The possible reason is that preschool teachers were usually able to adjust internal cognition, change emotional expression based on the noble professional image and professional ethics of teachers, then strengthen the psychological capital of preschool teachers.

Psychological Capital Complete Mediating the Relationship Between Expression of Naturally Felt Emotions and Mental Health and Between Deep Acting and Mental Health

The study findings further revealed the mechanism through which emotional labor affects mental health. Expression of naturally felt emotions and deep acting were discovered to affect mental health through psychological capital. Accordingly, Preschool teachers would adopt two strategies of emotional labor to affect mental health through the complete mediation of psychological capital. Firstly, preschool teachers adopt expression of naturally felt emotions to express true emotional state exactly with the emotional requirement of kindergarten. The work expression of revealed naturally would strengthen the psychological capital of preschool teachers and improve their mental health. Secondly, preschool teachers adopt deep acting to manage internal emotional states through active thinking,

introducing imagination, memory, so that their inner feelings are accord with the requirement of kindergarten to achieve a emotional consistent of internal and external, would also strengthen the psychological capital of preschool teachers, which improves their mental health. This is resemblance to the findings of past empirical studies, verified that psychological capital plays a crucial and vital mediating role on the relationship between related variables of emotional labor and mental health (Dewal and Kumar, 2017; Yin et al., 2018; Peng et al., 2019).

This is in agreement with the S-S-O model of Koeske and Koeske (1993). The S-S-O model associates stress with outcome. Stress is generated by environmental demands that affect individuals.The unbalanced feelings between personal motivation and environmental demands that is perceived as irritating, troublesome or destructive. Preschool teachers might have unbalanced feelings due to the imbalance between personal responsibility or mission and the requirements of kindergarten managers or expectations of child's parents. Therefore, emotional labor in this study can be regarded as a kind of stress. As advocated by the S-S-O model, stress causes strain, which affects the individual emotional and psychological response. Emotional labor of preschool teachers triggers a positive mental state to provide emotional support and mental energy such as optimism, resilience, hope. Therefore, psychological capital can be regarded as a kind of strain to improve the mental health of preschool teachers. In preschool education, either of deep acting or expression of naturally felt emotions affects teachers' consumption of psychological resources and affects mental health through changes in psychological capital. In consequence, the study proposes a research framework with psychological capital as mediation to explore the relationship between emotional labor and mental health of preschool teachers. In addition to extending the application of the S-S-O model in empirical research, it also enhances the richness of preschool education practice.

TABLE 2 | Direct and indirect effects and 95% confidence intervals.

Path relationship	Estimate	95% Lower	95% Upper
Standardized direct effects			
EL1 → PC	–0.065	–0.192	0.047
EL2 → PC	0.297	0.114	0.461
EL3 → PC	0.525	0.346	0.690
PC → MH	0.535	0.370	0.710
EL1 → MH	–0.185	–0.321	–0.047
EL2 → MH	0.026	–0.142	0.189
EL3 → MH	–0.070	–0.270	0.128
Standardized Indirect Effects			
EL1 → PC→ MH	–0.035	–0.111	0.024
EL2 → PC→ MH	0.159	0.067	0.265
EL3 → PC→ MH	0.281	0.165	0.456

Empirical 95% confidence interval does not overlap with zero indicates significant statistically; n = 411 (bootstrapping by specifying a sample of size 2,000); EL1, surface acting; EL2, expression of naturally felt emotions; EL3, deep acting; PC, psychological capital; MH, mental health.

SUGGESTIONS

Encourage Preschool Teachers to Adopt Appropriate Emotional Labor Strategies

This study discovered that in preschool teachers, surface acting has a negative predictive effect on mental health, whereas deep acting and expression of naturally felt emotions have positive predictive effects. Therefore, this study presented the following suggestions for Kindergartens and Education sector:

Education sector is recommended to include a course on emotional management and mental relief as mandatory classes in the 18 h of professional training for preschool teachers, this course could improve preschool teachers' emotional self-awareness and self-management skills and help them acquire emotional labor strategies. They could be taught to avoid surface acting at work and instead use deep acting and expression of naturally felt emotions.

Kindergartens should organize group activities of quality development actively to improve the expression of deep acting and expression of naturally felt emotions, such as enthusiasm, optimism, love, trust, kindness, and friendliness. Through group activities, create a working atmosphere of mutual help, improve the sense of belonging of preschool teachers, and thus love preschool education and the kindergarten where they are located.

Preschool teachers should pay attention to their individual growth and career development, tapping into their inner sense of mission and potential and adjusting their emotional labor. These measures would promote mental health, enabling preschool teachers to confront their work and life with a positive, sunny attitude.

Reinforce Psychological Capital Training for Preschool Teachers

In this study, preschool teachers' psychological capital was found to have complete mediation on the relationship between deep acting and mental health and that between expression of naturally felt emotions and mental health. Therefore, this study presented the following suggestions:

Government departments for education should formulate preschool education policies that increase psychological capital for preschool teachers, reinforce the self-efficacy, hope, optimism, and resiliency of preschool teachers through the reward design process, organization of training programs with manager awareness.

Kindergartens should implement psychological capital training of teachers to optimize their mental health, such as organizing group-style assistance and intervention in psychological capital activities. Kindergartens should provide opportunities for preschool teachers to participate in management decision-making and improve their sense of accomplishment.

Preschool teachers should attend community, kindergarten teacher exchanges and family activities to expand their social exchange, and reasonable planning of life, leisure and sports time, increasing their psychological capital and bolstering their mental health.

RESEARCH LIMITATIONS AND FUTURE DIRECTIONS

This study only obtained 411 valid questionnaires from Guangdong province of China for analysis that suggested future researchers can expand the sample size or analyze and compare different regions to understand the differences. The effect of emotional labor on preschool teachers' mental health was investigated through a cross-sectional study. In the future, researchers can conduct a longitudinal study to conduct more in-depth investigations. The method of data collection in this study was a questionnaire, and researchers could instead use case studies or qualitative research methods to more broadly discuss the variables considered in this study and expand on the study's findings. On the basis of this study, a moderated mediation model can be considered by adding other relevant variables such as workplace social support (Ju et al., 2015), or school climate (McLean et al., 2017). More rigorously, future research can consider adding relevant contextual variables for discussion, such as urban/rural or kindergarten size, etc., to deepen the analysis of research results.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

YH: conceptualization, methodology, investigation, formal analysis, writing—original draft, and visualization. J-HH: supervision. J-HH and JZ: writing—review and editing. All authors contributed to the article and approved the submitted version.

REFERENCES

Ashforth, B. E., and Humphrey, R. H. (1993). Emotional labor in service roles: the influence of identity. *Acad. Manage. Rev.* 18, 88–115. doi: 10.2307/258824

Ayers, W. (1989). *The Good Preschool Teacher*. New York, NY: Teachers College Press.

Aziz, S., Widis, A., and Wuensch, K. (2018). The association between emotional labor and burnout: the moderating role of psychological capital. *Occup. Health Sci.* 2, 365–383. doi: 10.1007/s41542-018-0029-1

Barbaranelli, C., Paciello, M., Biagioli, V., Fida, R., and Tramontano, C. (2019). Positivity and behaviour: the mediating role of self-efficacy in organisational and educational settings. *J. Happiness Stud.* 20, 707–727. doi: 10.1007/s10902-018-9972-4

Brotheridge, C. M., and Grandey, A. A. (2002). Emotional labor and burnout: comparing two perspectives of "people work". *J. Vocat. Behav.* 60, 17–39. doi: 10.1006/jvbe.2001.1815

Browne, M. W., and Cudeck, R. (1993). Alternative ways of assessing model fit. *Sage Focus Edn.* 154, 136–284.

Buettner, C. K., Jeon, L., Hur, E., and Garcia, R. E. (2016). Teachers' social–emotional capacity: factors associated with teachers' responsiveness and professional commitment. *Early Educ. Dev.* 27, 1018–1039. doi: 10.1080/10409289.2016.1168227

Cole, K., Daly, A., and Mak, A. (2009). Good for the soul: the relationship between work, wellbeing and psychological capital. *J. Socioecon.* 38, 464–474. doi: 10.1016/j.socec.2008.10.004

Dewal, K., and Kumar, S. (2017). The mediating role of psychological capital in the relationship between big five personality traits and psychological well-being: a study of Indian entrepreneurs. *Indian J. Posit. Psychol.* 8, 500–506.

Diefendorff, J. M., Croyle, M. H., and Gosserand, R. H. (2005). The dimensionality and antecedents of emotional labor strategies. *J. Vocat. Behav.* 66, 339–357. doi: 10.1016/j.jvb.2004.02.001

Diener, E., and Seligman, M. E. (2002). Very happy people. *Psychol. Sci.* 13, 81–84.

Edward, K., Hercelinskyj, G., and Giandinoto, J. A. (2017). Emotional labour in mental health nursing: an integrative systematic review. *Int. J. Ment. Health Nurs.* 26, 215–225. doi: 10.1111/inm.12330

Edward, L. N. (2016). Looking after the teachers: exploring the emotional labour experienced by teachers of looked after children. *Educ. Psychol. Pract.* 32, 54–72. doi: 10.1080/02667363.2015.1112256

Erkutlu, H. (2014). Exploring the moderating effect of psychological capital on the relationship between narcissism and psychological well-being. *Procedia Soc. Behav. Sci.* 150, 1148–1156. doi: 10.1016/j.sbspro.2014.09.130

Estiri, M., Nargesian, A., Dastpish, F., and Sharifi, S. M. (2016). The impact of psychological capital on mental health among Iranian nurses: considering the mediating role of job burnout. *Springerplus* 5, 1377–1378. doi: 10.1186/s40064-016-3099-z

Fu, C. S. (2015). The effect of emotional labor on job involvement in preschool teachers: verifying the mediating effect of psychological capital. *Turk. Online J. Educ. Technol.* 14, 145–156.

Gefen, D., Straub, D., and Boudreau, M. (2000). Structural equation modeling and regression: guidelines for research practice. *Commun. Assoc. Inf. Syst.* 4, 1–77.

Gorsuch, R. L. (1983). *Factor Analysis*, 2nd Edn. Hillsdale, NJ: Erlbaum.

Grandey, A. A. (2003). When "the show must go on": surface acting and deep acting as determinants of emotional exhaustion and peer-rated service delivery. *Acad. Manage. J.* 46, 86–96. doi: 10.5465/30040678

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, R. L. (1998). *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Han, K. M., Shin, C., Yoon, H. K., Ko, Y. H., Kim, Y. K., and Han, C. (2018). Emotional labor and depressive mood in service and sales workers: Interactions with gender and job autonomy. *Psychiatry Res.* 267, 490–498. doi: 10.1016/j.psychres.2018.06.044

Harding, S., Morris, R., Gunnell, D., Ford, T., Hollingworth, W., Tilling, K., et al. (2019). Is teachers' mental health and wellbeing associated with students' mental health and wellbeing? *J. Affect. Disord.* 242, 180–187. doi: 10.1016/j.jad.2018.08.080

Harman, D. (1967). A single factor test of common method variance. *J. Psychol.* 35, 359–378.

Hayes, A. F., and Rockwood, N. J. (2017). Regression-based statistical mediation and moderation analysis in clinical research: observations, recommendations, and implementation. *Behav. Res. Ther.* 98, 39–57.

Hochschild, A. R. (1979). Emotion work, feeling rules, and social structure. *Am. J. Sociol.* 85, 551–575.

Huang, M. E., Wu, Z. Q., and Tang, G. Q. (2010). How does personality relate to mental health in service industry setting? The mediating effects of emotional labor strategies. *Acta Psychol. Sin.* 42, 1175–1189. doi: 10.3724/SP.J.1041.2010.01175

Hur, W. M., Rhee, S. Y., and Ahn, K. H. (2016). Positive psychological capital and emotional labor in Korea: the job demands-resources approach. *Int. J. Hum. Resour. Manage.* 27, 477–500. doi: 10.1080/09585192.2015.1020445

Idris, A. M., and Manganaro, M. (2017). Relationships between psychological capital, job satisfaction, and organizational commitment in the Saudi oil and petrochemical industries. *J. Hum. Behav. Soc. Environ.* 27, 251–269. doi: 10.1080/10911359.2017.1279098

Jeon, L., Buettner, C. K., Grant, A. A., and Lang, S. N. (2019). Early childhood teachers' stress and children's social, emotional, and behavioral functioning. *J. Appl. Dev. Psychol.* 61, 21–32. doi: 10.1016/j.appdev.2018.02.002

Ju, C., Lan, J., Li, Y., Feng, W., and You, X. (2015). The mediating role of workplace social support on the relationship between trait emotional intelligence and teacher burnout. *Teach. Teach. Educ.* 51, 58–67.

Jun, S. Y. (2017). Influences of burnout, emotional labor, and positive psychological capital on job satisfaction of nurses. *J. Korean Acad. Nurs. Adm.* 23, 201–210. doi: 10.11111/jkana.2017.23.2.201

Katz, D. A., Greenberg, M. T., Jennings, P. A., and Klein, L. C. (2016). Associations between the awakening responses of salivary α-amylase and cortisol with self-report indicators of health and wellbeing among educators. *Teach. Teach. Educ.* 54, 98–106. doi: 10.1016/j.tate.2015.11.012

Ke, J. L., Sun, J. M., and Li, Y. R. (2009). Psychological capital: Chinese Indigenous Scale's development and its validity comparison with the Western scale. *Acta Psychol. Sin.* 41, 875–888. doi: 10.3724/SP.J.1041.2009.00875

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *J. Consult. Clin. Psychol.* 73, 539–548. doi: 10.1037/0022-006X.73.3.539

Kim, Y. J., Kim, J. H., and Shim, G. S. (2017). The relationship among job stress, emotional labor, resilience and mental health in firefighters. *J. Korea Converg. Soc.* 8, 379–389. doi: 10.15207/JKCS.2017.8.12.379

Koeske, G. F., and Koeske, R. D. (1993). A preliminary test of a stress-strain-outcome model for reconceptualizing the burnout phenomenon. *J. Soc. Serv. Res.* 17, 107–135. doi: 10.1300/J079v17n03_06

Kovess-Masfety, V., Rios-Seidel, C., and Sevilla-Dedieu, C. (2007). Teachers' mental health and teaching levels. *Teach. Teach. Educ.* 23, 1177–1192. doi: 10.1016/j.tate.2006.07.015

Krasikova, D. V., Lester, P. B., and Harms, P. D. (2015). Effects of psychological capital on mental health and substance abuse. *J. Leadersh. Organ. Stud.* 22, 280–291. doi: 10.1177/1548051815585853

Kuo, Z., Sai, Z., and Yinghong, D. (2010). Positive psychological capital: measurement and relationship with mental health. *Stud. Psychol. Behav.* 8, 58–64.

Lee, S. H., Park, J. Y., Lee, K. M., Shin, E. H., Park, J. M., Nam, H., et al. (2016). The convergence effects of commitment of organization and positive psychological capital in nurse on burnout. *J. Dig. Converg.* 14, 335–345. doi: 10.14400/JDC.2016.14.6.335

Liu, L., Wen, F., Xu, X., and Wang, L. (2015). Effective resources for improving mental health among Chinese underground coal miners: perceived organizational support and psychological capital. *J. Occup. Health* 57, 58–68. doi: 10.1539/joh.14-0082-OA

Liu, Y., Perrewé, P. L., Hochwarter, W. A., and Kacmar, C. J. (2004). Dispositional antecedents and consequences of emotional labor at work. *J. Leadersh. Organ. Stud.* 10, 12–25. doi: 10.1177/107179190401000402

Luthans, F., Avolio, B. J., Avey, J. B., and Norman, S. M. (2007a). Positive psychological capital: measurement and relationship with performance and satisfaction. *Pers. Psychol.* 60, 541–572. doi: 10.1111/j.1744-6570.2007.00083.x

Luthans, F., Youssef, C. M., and Avolio, B. J. (2007b). *Psychological Capital: Developing the Human Competitive Edge*, Vol. 198. Oxford: Oxford University Press.

Mann, S., and Cowburn, J. (2005). Emotional labour and stress within mental health nursing. *J. Psychiatr. Ment. Health Nurs.* 12, 154–162. doi: 10.1111/j.1365-2850.2004.00807.x

Mao, J. P., and Mo, T. Y. (2014). Relationship among psychological capital, emotional labor strategies and job burnout of primary and secondary school teachers. *Teach. Educ. Res.* 26, 22–28.

McLean, L., Abry, T., Taylor, M., Jimenez, M., and Granger, K. (2017). Teachers' mental health and perceptions of school climate across the transition from training to teaching. *Teach. Teach. Educ.* 65, 230–240. doi: 10.1016/j.tate.2017.03.018

McLean, L., and Connor, C. M. (2015). Depressive symptoms in third−grade teachers: relations to classroom quality and student achievement. *Child Dev.* 86, 945–954. doi: 10.1111/cdev.12344

Mesmer-Magnus, J. R., DeChurch, L. A., and Wax, A. (2012). Moving emotional labor beyond surface and deep acting: a discordance–congruence perspective. *Organ. Psychol. Rev.* 2, 6–53. doi: 10.1177/2041386611417746

Park, H., Oh, H., and Boo, S. (2019). The role of occupational stress in the association between emotional labor and mental health: a moderated mediation model. *Sustainability* 11:1886. doi: 10.3390/su11071886

Peng, J., He, Y., Deng, J., Zheng, L., Chang, Y., and Liu, X. (2019). Emotional labor strategies and job burnout in preschool teachers: psychological capital as a mediator and moderator. *Work* 63, 335–345. doi: 10.3233/WOR-192939

Philipp, A., and Schüpbach, H. (2010). Longitudinal effects of emotional labour on emotional exhaustion and dedication of teachers. *J. Occup. Health Psychol.* 15, 494–504. doi: 10.1037/a0021046

Psilopanagioti, A., Anagnostopoulos, F., Mourtou, E., and Niakas, D. (2012). Emotional intelligence, emotional labor, and job satisfaction among physicians in Greece. *BMC Health Serv. Res.* 12:463. doi: 10.1186/1472-6963-12-463

Russell, D. W., Kahn, J. H., Spoth, R., and Altmaier, E. M. (1998). Analyzing data from experimental studies: a latent variable structural equation modeling approach. *J. Couns. Psychol.* 45, 18–29. doi: 10.1037/0022-0167.45.1.18

Schumacker, R. E., and Lomax, R. G. (2012). *A Beginner's Guide to Structural Equation Modeling*. Mahwah, NJ: Erlbaum.

Seligman, M. E. (2003). Fundamental assumptions. *Psychologist* 16, 126–143.

Selvaraj, P. R., and Bhat, C. S. (2018). Predicting the mental health of college students with psychological capital. *J. Ment. Health* 27, 279–287. doi: 10.1080/09638237.2018.1469738

Shu, L. I., Yang, L., Zhang, S., and Qin, X. U. (2017). Research on relationship among nurses' emotional labor, workgroup emotional climate and mental health level. *Chin. J. Pract. Nurs.* 33, 1899–1903.

Taxer, J. L., and Frenzel, A. C. (2015). Facets of teachers' emotional lives: a quantitative investigation of teachers' genuine, faked, and hidden emotions. *Teach. Teach. Educ.* 49, 78–88. doi: 10.1016/j.tate.2015.03.003

Tinsley, H. E., and Tinsley, D. J. (1987). Uses of factor analysis in counseling psychology research. *J. Couns. Psychol.* 34, 414–424. doi: 10.1037/0022-0167.34.4.414

Tseng, J. M., Huang, T. W., Lu, H. C., Lin, P. J., and Lee, M. Y. (2014). Meta analysis for mental health constructs and measurement models verification. *Psychol. Test.* 61, 1–26.

Van Der Meulen, E., Van Der Velden, P. G., Setti, I., and Van Veldhoven, M. J. (2018). Predictive value of psychological resilience for mental health disturbances: a three-wave prospective study among police officers. *Psychiatry Res.* 260, 486–494. doi: 10.1016/j.psychres.2017.12.014

Wang, L., Dang, R., Bai, Y., Zhang, S., Liu, B., Zheng, L., et al. (2020). Teacher qualifications and development outcomes of preschool children in rural China. *Early Child. Res. Q.* 53, 355–369.

Yin, H., Huang, S., and Lee, J. C. K. (2017). Choose your strategy wisely: examining the relationships between emotional labor in teaching and teacher efficacy in Hong Kong primary schools. *Teach. Teach. Educ.* 66, 127–136. doi: 10.1016/j.tate.2017.04.006

Yin, H., and Lee, J. C. K. (2012). Be passionate, but be rational as well: emotional rules for Chinese teachers' work. *Teach. Teach. Educ.* 28, 56–65. doi: 10.1016/j.tate.2011.08.005

Yin, H., Wang, W., Huang, S., and Li, H. (2018). Psychological capital, emotional labor and exhaustion: examining mediating and moderating models. *Curr. Psychol.* 37, 343–356.

Zhang, L., Yu, S., and Jiang, L. (2020). Chinese preschool teachers' emotional labor and regulation strategies. *Teach. Teach. Educ.* 92:103024. doi: 10.1016/j.tate.2020.103024

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Stress and Turnover Intentions Within Healthcare Teams: The Mediating Role of Psychological Safety, and the Moderating Effect of COVID-19 Worry and Supervisor Support

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Employees at healthcare organizations are experiencing more stress than ever given the current COVID-19 pandemic. Different types of stress are affecting diverse organizational outcomes, including the employees' voluntary turnover. This is the case of cognitive stress, a type of stress that affects how individuals process information, which can influence employees' turnover intentions. In this study, we look at the mechanisms that can reduce the adverse effects of cognitive stress on turnover intentions, particularly the role of employees' perceived psychological safety (i.e., how safe they perceive the interactions with their colleagues are). We hypothesize that psychological safety mediates the relationship between cognitive stress and turnover intentions, and COVID-19 worry and supervisor support moderate the relationship between cognitive stress and psychological safety. To test our hypothesis, we invited two public health care organizations in Chile to join this study. In total, we obtained a sample of 146 employees in 21 different teams. Using a multilevel model, we found that psychological safety prevents the harmful effects of cognitive stress on employees' turnover intentions. In addition, while COVID-19 worry can worsen the relationship between cognitive stress and psychological safety, supervisor support only directly affects psychological safety. This study contributes to expanding the stress and psychological safety literature and informs practitioners in healthcare organizations about how to deal with cognitive stress in the "*new normality*" that the pandemic has brought.

Keywords: psychological safety, turnover intentions, COVID-19, cognitive stress, supervisor support

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INTRODUCTION

The COVID-19 pandemic has placed health professionals all over the world in an unprecedented situation, working under extreme pressures, both physically and psychologically (Greenberg et al., 2020; Howe et al., 2020). The new reality that the pandemic has brought has generated consequences that both organizations and individuals must face. Many people are adjusting to

the new organizational demands the pandemic has caused while hoping to *"return to normal"* as soon as possible. However, the implications of these demands have provoked a much greater change, in which a more aptly named *"new normality"* has arisen. For example, the World Health Organization (WHO) has encouraged organizations to generate a work plan based on shifts and working from home, among other practices, to increase social distancing and prevent the spread of the virus (Pan American Health Organization, 2020). The changes have affected employees' job security, financial stability, and work-family balance, especially among healthcare workers. More importantly, a less mentioned consequence has been the emotional impact that these changes have generated in employees, especially the stress they face when it comes time to go to work.

Work stress is one of the organizational responses that most impacts workers' mental and physical health, especially in service organizations (Kim et al., 2011). González et al. (2004) found that, on comparing the stress level between health and non-health workers, the former workers suffer from more stress. In this respect, even before the COVID-19 pandemic, health care professionals were already working in high stress environments. Long hours and shift work, intensive job demands, lack of adequate resources, and fatigue are among the typical factors that make healthcare organizations environments where stress, emotional exhaustion and burnout prevail (Rice et al., 2014; Zhou and Chen, 2021). In some situations, low wages, professional invalidation, and limited career progression intensify the problem, decreasing the job satisfaction and leading workers to leave their organizations (Rice et al., 2014). Unfortunately, the COVID-19 pandemic has put these workers in an even worse situation (Greenberg et al., 2020). During the pandemic, the fear of becoming infected and dying from the virus, along with the fear of infecting family, friends, and colleagues (Monterrosa-Castro et al., 2020), has been a factor that has caused important emotional consequences in workers and increased their level of stress. The stress caused by work exhaustion and overload, often a product of long shifts and the need to cover for the absence of peers, negatively affects the quality and stability of the organization and can lead to greater dissatisfaction and intentions to leave their job (Kim et al., 2011). Stress can have significant effects on work performance, but much more importantly, on the attitudes that the workers have concerning their job stability.

Staff turnover in health care has important consequences for the organizations and the provision of quality care for patients (Gamero-Burón, 2010; Ravangard et al., 2019; Sharif et al., 2021). Hwang and Chang (2008) explain that high turnover in health care implies additional costs for human resource management and recruitment (e.g., in time and effort to employ new staff and train them for their job). Furthermore, turnover also increases the pressure on staff to work above and beyond their contracted hours, leading to errors and a decreased morale of the remaining staff (Fasbender et al., 2019). For these reasons, turnover intentions—a precursor of turnover itself (Lee and Kim, 2020)—have gained important attention throughout the years, as it could be crucial for the organizations' productivity and the workers' well-being.

Turnover intention refers to employees' awareness or thoughts about leaving their job (Akgunduz and Eryilmaz, 2018). Previous research has provided evidence that a stressful working culture and increasing job demands are major contributing factors that increase employees' intentions to leave their job (Buchbinder et al., 2001). An overburdened system, lack of support at work—especially from the supervisors, and scarce resources directly affect the emotional well-being of the employees, and certainly reduce their motivation (Flinkman et al., 2008). Therefore, the relationship between stress and turnover intentions for health care professionals needs to be revisited in the context of the current sanitary situation. By understanding this relationship, organizations can take actions to support their employees, improve their well-being, and maintain their productivity in this "*new normality*."

To face workers' stress and the constant changes associated with the sanitary crisis, organizations must place emphasis on the organizational processes that increase workplace stability for workers and their capacities to cope with the crisis (Lee, 2021; Oksanen et al., 2021). In this context, the individual perceptions of the workers with respect to safety in their workplace become more relevant. By feeling safe in the work environment and not exposed to inter-personal risks, workers can feel less stress and reduce the emotional and cognitive consequences it brings. In particular, psychological safety can be an important mechanism to reduce stress by creating a climate of trust and risk-free communication. Psychological safety refers to workers' perception of how workmates can respond to the risky behaviors that interpersonal situations imply (Edmondson, 1999; Carmeli and Zisu, 2009; Frazier et al., 2017). In this way, psychological safety could translate into a mechanism that reduces workers' stress, diminishing the negative attitudes toward their work position, that is, their intentions to leave the job.

Thus, to advance in understanding the relationship between stress and voluntary turnover, this work seeks to investigate the role of psychological safety as a mechanism that reduces the negative effects of stress on turnover intention. In particular, we focus on cognitive-type of stress, i.e., stress that generates cognitive deficits in information processing (Amirkhan et al., 2018), as this has important consequences in high-intensity jobs (Mauno et al., 2019). Cognitive stress can have significant effects on work performance, caused by the wear and tear of cognitive functions such as memory and concentration (Kalakoski et al., 2020). Therefore, our research questions are as follows: *Does psychological safety have a mediating effect between cognitive stress and workers' turnover intention? If it does, what factors could increase or decrease psychological safety?*

Given that psychological safety could positively impact the relationship between stress and workers' turnover intention, knowing the factors that worsen or benefit psychological safety is vital. On one hand, we evaluate the effect that worry about COVID-19 would have as a moderator between stress and psychological safety. Workers that are more worried about the consequences of COVID-19 in their lives could experience greater cognitive stress that could, in consequence, diminish their perception of psychological safety. Worry about the effects of

COVID-19 has been shown to impact workers' well-being in many aspects (Greenberg et al., 2020).

On the other hand, the organizational capacity to manage dynamics that favor a climate of psychological safety for employees could become a factor that reduces the consequence of stress in workers and allows them to feel safer when working with others (Lee, 2021). In particular, we evaluate the effect of supervisor support as a possible counter to the harmful effects of stress on perceived psychological safety. Perceiving greater support from a supervisor translates into a belief that the organization values the contributions of its employees and is concerned about their well-being (Eisenberger et al., 2002) and, therefore, could increase the perception of interpersonal safety. Previous studies on psychological safety indicate that factors such as leadership and organizational norms signal what is expected and acceptable within the organization and therefore affect how individuals perceive their work environment as safe for self-expression. In this sense, a leadership style that values the contribution of others is related to higher employee expectations that expressing oneself is acceptable in the organization (Kim, 2019). This study attempts to understand the association between cognitive-type stress and workers' turnover intention, the possible mediating effect of perceived psychological safety and the potential moderation of worry about COVID-19 and supervisor support in the relationship between cognitive stress and psychological safety. This study aims to contribute to understanding workers' stress in healthcare organizations, especially in the sanitary context we are facing, as well as the factors that increase/diminish those effects and their consequences in the turnover of workers. Thus, we first explain the primary relationships between the aforementioned variables to then develop hypotheses among them. Later, the hypotheses are tested on a sample of 146 workers distributed in 21 teams in different healthcare organizations. Finally, we discuss the results and implications of our findings.

THEORETICAL FRAMEWORK

Psychological Safety Between Stress and Turnover Intention

Stress has been considered a complex psychological state that is produced in the interaction between the individual and the situation, in which the individual faces an imbalance between the demands of the situation and his or her capacity to respond to them (Di Martino, 1992; Cox, 1993; Gamero-Burón, 2010). These signs grow in work contexts where the rhythm of work is intensified and accelerated (Mauno et al., 2019), as is the case in healthcare organizations during the current sanitary crisis. A study done on health professionals in 34 hospitals in China reported that 50.4% of the workers had depressive symptoms, 44.6% anxiety, 34% insomnia, and 71.5% had some type of adverse reaction due to stress, where those most affected were workers who offer frontline medical attention to patients linked to COVID-19 (Wang et al., 2020). Specifically, an important manifestation of stress in these contexts is expressed in difficulties of a cognitive type (Amirkhan et al., 2018). Problems including difficulties in remembering work business, indifference toward tasks, information overload, and deterioration of the capacity to concentrate (Kalakoski et al., 2020) present themselves as manifestations of stress in these organizations.

The evidence has shown that stress does not only affect the quality of service or task performance in workers, but also can translate into negative attitudes toward the job, threatening job stability and increasing the intentions to leave the organization (Kim et al., 2011). Turnover intention is described as the conscious and deliberate freedom to leave an organization (Guimaraes, 1997). The relationship between the stress of the employees and turnover intentions has been an important focus for administrators and researchers (Qureshi et al., 2013). Different studies have attempted to identify the stress factors that have the strongest relationship with turnover intention, given that the emotional state of the workers has a considerable influence on turnover in the workplace (Wofford et al., 1999).

Today, the COVID-19 pandemic has increased the importance of understanding the effects of stress in organizations. Although it is known that greater stress increases workers' turnover intentions, the factors that diminish these negative effects of stress are less well known, particularly how these can be effective in the current context of change that the sanitary crisis has brought. Therefore, organizations must use different management tools to avoid stress and decrease workers' turnover intentions, such as creating a climate that encourages workers to express their difficulties and struggles, i.e., a psychologically safe climate.

Conservation of resources theory proposes a valuable insight into the resources that allow for coping with stress, such as leadership, social support, and resilience (Wright and Cropanzano, 1998). From this theoretical perspective, psychological safety becomes a positive resource that could help people to overcome anxiety and defensiveness, ultimately, relieving stress (Zhou and Chen, 2021). Psychological safety is known as the shared belief that an organization is safe in terms of assuming interpersonal risks (Edmondson, 1999). By providing a feeling of safety, employees can strive to change their behavior to meet the organizational challenges of a changing environment (Edmondson and Lei, 2014). Precisely, psychological safety promotes the idea that individuals focus on their work goals, experience fewer distractions, and solve problems more effectively, and thereby increasing their confidence to contribute significantly to organizational outcomes (Ayala Calvo and García, 2018; Zhou and Chen, 2021).

Psychological safety has been demonstrated to have positive impacts in the workplace (Frazier et al., 2017; Newman et al., 2017), including greater job stability, as well as increasing the workers' capabilities to cope with crises (Lee, 2021; Oksanen et al., 2021). Even though it is traditionally seen as a variable at a group level, the origins of psychological safety point to workers' individual perceptions and how safe they feel when they interact with others (see Kahn, 1990; Schein, 1993). These differences in focus have led to the construct being relevant on different levels (see Frazier et al., 2017). However, all coincide that a high level of psychological safety minimizes the perceptions of psychosocial risk in the workplace.

In healthcare organizations, psychological safety becomes more relevant as these are high-intensity environments, where interdisciplinary work is carried out daily, and mistakes can be made from exhaustion or miscommunication (Hunt et al., 2021). A lack of psychological safety can cause important negative consequences in the service to the clients and even more in the care of the patients (Edmondson, 1999). It has been demonstrated that in an environment of low psychological safety, employees do not speak up or ask for help when they need it because of fear of demonstrating weakness, damaging their reputation or threatening their job status (Ilies et al., 2010). On the contrary, a workplace with adequate levels of psychological safety would generate a greater openness for employees to express their fears and difficulties, with less concern for being rejected or of possible reprisals or consequences in their job status (Hunt et al., 2021). This opening generated by psychological safety could be crucial for workers to express the difficulties generated by stress at work. In the context of the current sanitary crisis, it has been revealed that to generate a work environment of greater well-being, it is necessary for employees to be able to communicate their concerns with tranquility and safety (Lee, 2020).

The individual perceptions of how psychologically safe the workplace will be is essential for workers to recognize and share opportunely when they need help and if they are having difficulties with current job demands (Edmondson, 1999). The way employees perceive their workplace will directly influence their capacity to function effectively, even more when they are part of a high-intensity work environment (Rantanen et al., 2021). When workers feel stressed or present difficulties produced by stress, how safe they perceive their workplace and the relationships with others in the organization can have substantial impacts on their well-being (Ilies et al., 2010; Zhao et al., 2020). For instance, when the stress is of a cognitive type and thus affects functions that are essential in performing tasks, such as concentration or their ability to use their knowledge (Sindi et al., 2017; Rantanen et al., 2021), being able to count on an environment that allows an open expression of these difficulties can be essential to increase their positive attitudes toward their job and the organization.

The importance of psychological safety in healthcare organizations (Edmondson and Lei, 2014; Zhao et al., 2020) makes it relevant to study how this can influence workers' well-being. Although the cognitive alterations produced by stress in high-intensity work surroundings can lead workers to increase their desire to leave the organization, perceiving a psychologically safe environment could counteract those desires and thus, reduce turnover intentions. Therefore, we propose that,

Hyp 1: Psychological Safety mediates the effect between cognitive stress and turnover intentions.

Worsening Psychological Safety: The Role of Worry Over COVID-19

The consequences of the COVID-19 pandemic have not only affected people medically, but have also had an important impact in workers' mental health (Zhou and Guo, 2021). The outbreak of an infectious disease like COVID-19 has increased people's stress levels, primarily through the anxiety generated by the uncertainty of the situation (Roy et al., 2020). This anxiety has worry as its main cognitive component (Lee, 2020), impacting directly on the well-being of health professionals (García-Iglesias et al., 2020; Perera et al., 2021). Unfortunately, in the context of change and rapid adaptation that the pandemic has brought to organizations, the workers' mental well-being and particularly their worries have not always been a concern for the authorities (Zhou and Guo, 2021).

Different studies have demonstrated that the main concerns of health workers in contexts of the current COVID-19 pandemic are related to the fear of becoming infected and transmitting it to relatives or friends (Esteban-Carranza et al., 2021; Sahashi et al., 2021). It has been argued that this worry increases stress and imposes a significant emotional load on employees that is translated into greater difficulties in performing their jobs (Esteban-Carranza et al., 2021). The anxiety that emanates from the worry about the pandemic is harmful for the health and subjective well-being of workers (Malone and Wachholtz, 2018), affecting how people face interpersonal and professional relationships (Zhou and Guo, 2021). Dollard and Bakker (2010) argue that not managing concerns or not paying attention to the fears that workers face, means that they hide them instead of expressing them. Thus, worries about COVID-19 can become an underlying threat to people and an important source of additional stress in their lives.

The worry about the effects of COVID-19 in their lives and the increasing stress that arises from the nature of their task and the changing environment can affect how workers perceive their relationships with others and the risk of expressing their opinions or insecurities to them. Worry about COVID-19 can be understood as a cognitive and emotional process that can have consequences on workers' mental health (Cedeño et al., 2020). Added to the stress experienced by workers, worry about COVID-19 could affect job perception and the relationships the workers have (Prieto-Callejero et al., 2020). Jun et al. (2021) suggest that the current worries about COVID-19 reduce the attention and cognitive capacity that must necessarily be used in important tasks. In the case of cognitive stress, the loss of concentration, distraction, or confusion (Jun et al., 2021) could be boosted by the anxiety of becoming infected or infecting others with the virus and the concern about the consequences of this situation. Therefore, worry about COVID-19 could be related to greater cognitive stress, i.e., lack of attention and cognitive difficulties in job performance, which leads to greater fear of expressing those concerns openly and relating freely with colleagues in the workplace. Thus, we propose that:

Hyp 2: When employees are more worried about COVID-19, the negative effect of cognitive stress on psychological safety will be stronger.

Improving Psychological Safety: The Support Role of the Supervisor

During crisis contexts, as is the case of the current pandemic, leaders acquire a fundamental role in helping employees to

overcome latent threats and fears (Ehlers and Clark, 2000). Even though the relationship between supervisors and employees changes all the time, the perception of the employees with regard to the support offered by supervisors in their tasks has important implications in employees performing their tasks efficiently (Shamir, 2011). Supervisor support is related to meeting goals and analyzing errors (Guchait et al., 2016) and increasing organizational commitment and job satisfaction (Gagnon and Michael, 2004; Carmeli and Zisu, 2009).

Some researchers have argued that the perceived supervisor support, in stressful contexts, brings with it a greater sensation of well-being and positive psychological results which allow workers to perform adequately (Aldamman et al., 2019). The support of the supervisor is transformed into a resource that allows stressful events to be processed from another perspective, seeing, for example, these situations as possible experiences for growth and development (Guchait et al., 2016; Singh et al., 2018). Thus, some researchers have already linked supervisor support in the current context of sanitary crisis with the control and mitigation of stress in workers, showing that it has positive effects in reducing stress (Andrades-Tobar et al., 2021). Supervisor support allows the reduction of employees' emotional exhaustion, given that it diminishes the uncertainty they feel about COVID-19, and, in this way, they can manage their cognitive resources to reach their objectives (Vinokur and van Ryn, 1993; Charoensukmongkol and Phungsoonthorn, 2020). Therefore, supervisor support has also been linked to controlling the symptoms of cognitive stress in highly demanding jobs (Rantanen et al., 2021).

The change in working conditions in healthcare organizations produced by the pandemic has led leaders to have a fundamental role in guaranteeing that tasks and services are adequately carried out. Along these lines, leaders can directly contribute to creating positive surroundings with a sensation of psychological safety and lower levels of anxiety when it comes to explaining to the employees the nature of the job they do and the possibility that things can move away from what is expected (Edmondson and Lei, 2014). The sources of perceived support that are centered in a fair deal in the process of work and open communication with employees promote the psychological well-being workers need to face current changes in their workplace (for example, staggered shifts, telework, work overload) in the best way possible during the COVID-19 pandemic (Lee, 2021). Different studies have demonstrated that supervisor support is one of the organizational practices that encourages psychological safety, as it is when workers feel supported by their supervisor that the climate at work, satisfaction with the organizational surroundings, and commitment improve (Carmeli and Zisu, 2009; Chas and Fontela, 2013; Contreras et al., 2021; Del Estal-García and Melián-González, 2021).

Psychological safety, therefore, is formed through the interaction between the members of a team and its leader and is profoundly influenced by the support of supervision (Liu et al., 2020). By demonstrating individual consideration toward the employees and granting additional training and support in meeting goals and job responsibilities (Liaw et al., 2010; Lee, 2021), supervisors will contribute to the emotional and cognitive consequences of stress in the employees being less noticeable. In contexts where job demands and requirements have increased, feeling the supervisor's support will reduce cognitive stress symptoms and thus improve the perception of psychological safety. Thus, we propose that:

> *Hyp 3: When supervisors are perceived as supportive, the negative effect of cognitive stress on psychological safety will be weakened.*

The hypotheses are summarized in **Figure 1**.

MATERIALS AND METHODS

Sample and Procedure

The hypotheses were tested using data on 146 members working in 21 teams in two public hospitals in a southern region of Chile. The hospitals are the only public medical centers in the region, so both received our invitation to participate in the study together with the corresponding documents about the procedures and the ethical guidelines. Both hospitals accepted our invitation, allowing one of the researchers to approach certain teams and invite them to join this study. Due to the protocols and restrictions given the sanitary situation of the hospitals, teams were approached by convenience, privileging administrative teams. Therefore, the sample is non-probabilistic. According to Fritz and MacKinnon (2007), for a mediation analysis with bias-corrected bootstrap and a medium to high effects, a sample of 115 participants is adequate (see **Table 1**, HM—Bias-corrected Bootstrap, p. 237).

Participants work full time on administrative and healthcare-related tasks. Given the nature of their tasks, the teams require intense coordination and communication of their members with each other. Employees were invited to participate in this study without being offered any type of compensation. Before completing the survey, the research team required the participants' consent and informed them that the study and the consent had been approved by the research ethics committee at the University where one of the authors of this paper is employed.

In total, surveys were distributed to 156 employees from 21 teams. However, due to missing data, 10 respondents were excluded. While 89% of the participants work on administrative duties, 11% of the participants work in healthcare functions. Teams range from 3 to 13 members, with an average of 7.43 members (SD = 3.44). Among the respondents, 82 were female (53%). In terms of age, 30% of the participants were between 18 and 30 years of age, 43% were between 31 and 40 years of age, 18% were between 41 and 50 years of age, and the remaining 9% were above 50 years of age. Regarding tenure, 20% of the participants have been in their organization less than 1 year, 22% between 1 and 3 years, 13% between 3 and 5 years, and the remaining 46% above 5 years.

Measures

Cognitive stress was measured with a 3-item scale of cognitive stress developed by Madrid (2020). Participants were asked to what extent they (1) "*have problems concentrating*"; (2) "*have difficulties remembering things*"; and (3) "*have*

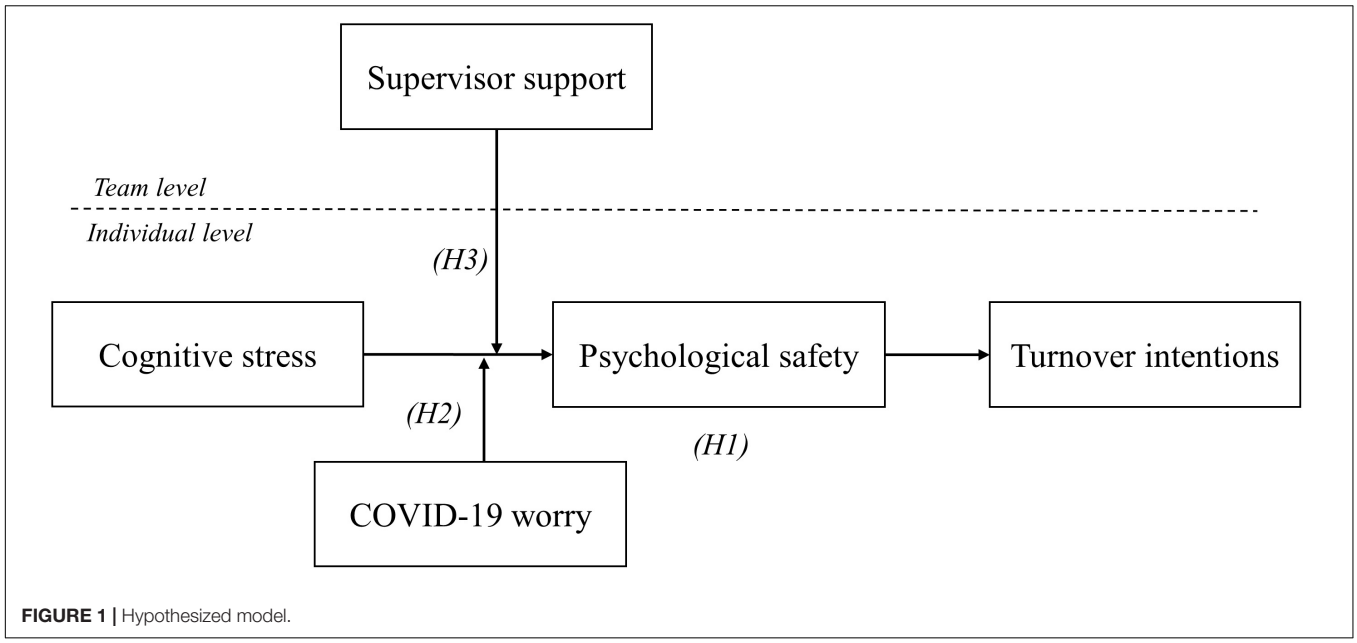

FIGURE 1 | Hypothesized model.

TABLE 1 | Confirmatory factor analysis hypothesized model vs. alternative model.

Factor structure model	χ^2(*df*)	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$ (*df*)
Four factor model (hypothesized): Psychological safety, cognitive stress, turnover intentions, and supervisor support	162.68 (84)	0.93	0.92	0.08	0.06	
Three factor model (alternative): Psychological safety and supervisor support constrained as one factor	222.364 (87)	0.89	0.86	0.1	0.09	59.68 (3)
Two factor model (alternative): Psychological safety and supervisor support constrained as one factor and cognitive stress and turnover intentions constrained as one factor	372.3 (105)	0.76	0.72	0.15	0.13	209.62 (5)

N = 145. All χ^2 and $\Delta\chi^2$ values are significant at $p < 0.05$. CFI, comparative fit index; TLI, Tucker-Lewis index; SRMR, standardized root-mean-square residual; RMSEA, root-mean-square error of approximation.

trouble keeping their attention on their tasks." Answers range from 1 (*never*) to 5 (*always*). The Cronbach's alpha for this scale was 0.86.

Psychological safety was measured with a 5-item scale adapted from Edmondson's (1999) psychological safety scale. Items include "*If you make a mistake in this team, it is often held against you*," and "*It is safe to take risks on this team*." Answers ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). The Cronbach's alpha for this scale was 0.71. We decide not to aggregate the measure of psychological safety at the team level, as our aim was to capture the individuals' perception of safety and ability to manage change while working with members of their teams. As Newman et al.'s (2017) meta-analysis confirmed, an important number of studies have used individually held rather than aggregate perceptions to capture psychological safety.

Supervisor support was measured with the 4-item scale from Haynes et al. (1999). Participants were asked ranging from 1 (*to a very little extent*) to 5 (*to a great extent*), how much their immediate supervisors (1) "*encourage you to give your best effort?*" (2) "*help you with a difficult task at work?*" (3) "*offer new ideas for solving job-related problems?*" and (4) "*encourage those who work for him/her to work as a team?*" The Cronbach's alpha for this scale was 0.94.

To compose a team level measure of Supervisor Support we checked the within-group homogeneity and between-group heterogeneity. We calculated the $rwg_{(j)}$ to assess within-group homogeneity (James et al., 1993), the intraclass correlation coefficient (ICC[1]) to understand the proportion of the variance that is explained by team membership, and the ICC[2] to assess the reliability of the team means for the study variables (Bliese, 2000; Shieh, 2016). The scores for Supervisor Support are above accepted cut-off values (George, 1990), $rwg_{(j)}$ = 0.83 (SD = 0.22), ICC[1] = 0.39, and ICC[2] = 0.83. Therefore, we proceeded to aggregate the scores to create a team level measure of Supervisor support.

COVID-19 worry was measured using a single item validated by the United Kingdom Office of National Statistics population surveys (Office for National Statistics [ONS], 2020): "*How worried or unworried are you about the effect that COVID-19-19 is having on your life right now?*" Answers ranged from 1 (*Not at all worried*) to 5 (*Very Worried*). As Fisher et al. (2016) argued, single-item measures can offer important advantages to capture conflicting constructs while minimizing non-response bias.

Turnover intentions were measured with the 3-item scale developed by Colarelli (1984). Example items include "*I frequently think of quitting my job*" and "*I will be working for this organization one year from now*" (reverse scored). Answers ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). The Cronbach's alpha for this scale was 0.77. Measurements of turnover intentions were non-independent in teams, ICC[1] = 0.07, $F_{(20,\ 135)} = 1.51$, $p < 0.10$. Teams were also somewhat distinguishable by their average level of turnover intentions, ICC[2] = 0.34.

Control Variables

We also accounted for three different types of individual characteristics which might impact psychological safety and turnover intentions: gender (1 = *female*, 0 = *male*), age, and tenure. Since we could expect differences in turnover intentions depending on the responsibilities of the employees, that is, whether they have other people in charge, we also controlled by whether participants have or not a managerial role (1 = *manager role*, 0 = *no manager role*). We finally control for the nature of the task of the participants (1 = *healthcare tasks*, 0 = *administrative tasks*).

Analytic Strategies

We calculate descriptive statistics and correlations using the psych package in R (Revelle, 2021). Before testing the hypotheses, we perform a Confirmatory Factor Analysis (CFA). This analysis allows to check the fit of the observed data to the proposed scales mentioned in the measures section (Mueller and Hancock, 2001).

Furthermore, due to the hierarchical organization of the data, we tested the hypotheses with mixed models using the lme4 package (Bates et al., 2014) of the R environment. The analysis spanned two levels: the individual level and the team level. We fitted simple models and added random effects to identify the best fitting model by comparing model fit indices (i.e., the Akaike information criterion (AIC) and Bayesian information criterion (BIC) criteria). The random intercept-and-slope model did not fit the data better than the random-intercept-only model, $\Delta\chi^2(2) = 0.03$, $p = 0.98$. Hence, we employed a random-intercept-only model for further hypothesis testing.

In addition, we used the package mediation (Tingley et al., 2014) to test the indirect effect of psychological safety on the relationship between stress and turnover intentions as proposed in Hypothesis 1.

Confirmatory Factor Analysis

Confirmatory factor analyses[1] were conducted to examine whether employees' scores on their self-report measures (i.e., psychological safety, cognitive stress, supervisor support, and turnover intentions) captured distinctive constructs. The hypothesized four-factor model was specified by loading indicators on their respective latent variables, and the correlations among latent variables were freely estimated. The results showed that the four-factor model fits the data well, $\chi^2(84, N = 145) = 162.68$, comparative fit index (CFI) = 0.93, Tucker—Lewis index (TLI) = 0.92, standardized root-mean-square residual (SRMR) = 0.06, and root-mean-square error of approximation (RMSEA) = 0.08. The indicators all significantly loaded on their respective latent factors. As an additional test, we compared the hypothesized four-factor model with several alternative models, as shown in **Table 1**. All the alternative models fit the data significantly worse than the four-factor model. Therefore, we can conclude that the measures reported by employees captured distinct constructs in this study.

[1]To perform the confirmatory factor analysis, we used Lavaan package of the R environment (Rosseel, 2012).

RESULTS

The means, standard deviations, and bivariate correlations among the studied variables are shown in **Table 2**. At the individual level, cognitive stress is positively correlated with employees' turnover intentions ($r = 0.22$, $p < 0.05$), while psychological safety is negatively correlated with individuals' turnover intentions ($r = -0.36$, $p < 0.01$) and cognitive stress ($r = -0.27$, $p < 0.01$). The magnitude of the correlation coefficients suggested that these relationships were generally moderate to medium (Hemphill, 2003). These results mirrored findings from previous research that found moderate correlations between psychological safety and turnover intentions, and stress and turnover intentions (Mosadeghrad, 2013; Kruzich et al., 2014; Kirk-Brown and van Dijk, 2016). Before further analysis, we mean-centered the independent variables.

Hypothesis Testing

Hypothesis 1 predicted that psychological safety will mediate the effect of stress on turnover intentions. First, results in Model 1 (**Table 3**) show that stress has a positive and significant direct effect on turnover intentions ($b = 0.23$; SE = 0.09, $p < 0.05$, 95% BTCI = [0.03, 0.41]). From Model 2 in **Table 3**, we found that stress has a negative and significant effect on psychological safety ($b = -0.20$; SE = 0.07, $p < 0.01$, 95% BTCI = [−0.35, −0.05]). Model 3 in **Table 3** shows that when together, stress has a positive yet not significant effect on turnover intentions ($b = 0.17$; SE = 0.09, $p > 0.05$, 95% BTCI = [−0.01, 0.34]), while psychological safety has a negative and significant effect on turnover intentions ($b = -0.36$; SE = 0.10, $p < 0.001$, 95% BTCI = [−0.58, −0.17]). To confirm a mediation effect, we followed Hayes (2018a,b) suggestions and tested a potential indirect effect through bootstrapping estimation of a confidence interval. If the confidence interval does not include zero, then we could confirm the existence of a mediation. Our results support an indirect mediation effect of stress on turnover intentions via psychological safety (b = 0.07; 95% BTCI = [0.01, 0.15]), as the bootstrapped confidence interval does not include zero. We found that roughly 30% of the effect from stress on turnover intentions goes through psychological safety. Hence, these results support Hypothesis 1.

Hypotheses 2 and 3 propose a moderation effect of worry about COVID-19 and supervisor support, respectively, on the effect of stress on psychological safety. Model 2 in **Table 4**

TABLE 2 | Descriptive statistics and correlations.

	Average	SD	1	2	3	4	5	6	7	8	9	10
Level 1—Individual level												
1. Gender (1 = Female)	0.54	0.50										
2. Age	2.05	0.90	0.14									
3. Tenure	2.86	1.20	0.05	0.48								
4. Manager role (1 = Yes)	0.22	0.42	−0.01	**0.21***	**0.26****							
5. Healthcare role (1 = Yes)	0.12	0.32	0.03	0.10	−0.01	**0.32****						
6. Turnover intentions	2.11	0.98	−0.12	−0.11	−0.01	−0.03	0.00	(0.77)				
7. Cognitive stress	2.31	0.86	0.08	0.03	0.11	−0.02	**0.17***	**0.22***	(0.86)			
8. Psychological safety	3.91	0.79	0.04	−0.07	**−0.17***	0.04	0.00	**−0.36****	**−0.27****	(0.71)		
9. COVID-19 worry	4.13	0.86	−0.02	0.13	0.05	−0.08	**0.12***	0.05	0.08	0.01	—	
Level 2—Team level												
10. Supervisor support	3.90	0.79										(0.94)

*N level 1 = 146. N level 2 = 21. *p < 0.05; **p < 0.01. Internal consistency coefficients, Cronbach's alphas are reported in the parentheses on the diagonal.*

TABLE 3 | Multilevel mediation analysis random-intercept-only model.

	Model 1				Model 2				Model 3			
	DV: Turnover intentions				DV: Psychological safety				DV: Turnover intentions			
	Est.	SE	95% BTCI		Est.	SE	95% BTCI		Est.	SE	95% BTCI	
1. Intercept	2.25***	(0.14)	1.95	2.56	−0.12	(0.12)	−0.36	0.14	2.20***	(0.13)	1.97	2.45
2. Age	−0.13	(0.10)	−0.32	0.05	−0.003	(0.08)	−0.16	0.16	−0.14	(0.10)	−0.34	0.04
3. Tenure	0.04	(0.08)	−0.10	0.20	−0.1	(0.06)	−0.22	0.04	0.01	(0.08)	−0.15	0.17
4. Gender (1 = Female)	−0.25	(0.16)	−0.53	0.03	0.2	(0.13)	−0.04	0.45	−0.18	(0.15)	−0.48	0.08
5. Manager role (1 = Yes)	−0.05	(0.21)	−0.49	0.37	0.17	(0.17)	−0.17	0.48	0.02	(0.20)	−0.43	0.45
6. Healthcare role (1 = Yes)	−0.003	(0.32)	−0.63	0.64	−0.08	(0.28)	−0.64	0.42	−0.03	(0.30)	−0.61	0.50
7. Cognitive stress	0.23*	(0.09)	0.03	0.41	−0.20**	(0.07)	−0.35	−0.05	0.17	(0.09)	−0.01	0.34
8. Psychological safety									−0.36***	(0.10)	−0.58	−0.17
AIC	430.49				366.43				423.65			
BIC	457.46				393.40				453.62			
Pseudo-R-squared[a]	0.07				0.08				0.15			
Log likelihood	−206.24				−174.21				−201.82			
Num. obs.	146				146				146			
Num. groups	21				21				21			
Var: Team (Intercept)	0.08				0.01				0.03			
Var: Residual	0.84				0.51				0.80			

		95% BTCI	
	Est.	Lower	Upper
Indirect effect	0.07	0.01	0.15
Direct effect	0.17	−0.02	0.35
Total effect	0.24	0.05	0.42
Proportion mediated	0.30		

****p < 0.001; **p < 0.01; *p < 0.05. BTCI, 95% Bootstrap Confidence Interval using 10,000 samples. [a]We estimated the overall variance explanation of the random-intercept-only models with the pseudo-R-squared for generalized mixed-effect models (Nakagawa et al., 2017).*

shows the results for the moderating effect of COVID-19 worry on the relationship between stress and psychological safety (Hypothesis 2). The interaction of stress and COVID-19 worry has a negative and significant effect on psychological safety ($b = -0.19$; SE = 0.09, $p < 0.05$, 95% BTCI = [−0.38, −0.01]), after controlling for supervisor support. The interaction of COVID-19 on the effect of stress on psychological safety is illustrated in **Figure 2**. Higher levels of stress combined with a deep worry for COVID-19 will have a more negative effect on the team members psychological safety.

TABLE 4 | Multilevel moderation analysis random-intercept-only model.

	Model 1				Model 2				Model 3			
	DV: Psychological safety				DV: Psychological safety				DV: Psychological safety			
	Est.	SE	95% BTCI		Est.	SE	95% BTCI		Est.	SE	95% BTCI	
Level 1—Individual												
1. Intercept	−0.14	(0.11)	−0.34	0.06	−0.16	(0.11)	−0.37	0.05	−0.13	(0.11)	−0.33	0.07
2. Age	0.01	(0.08)	−0.14	0.17	0.03	(0.08)	−0.12	0.19	0.01	(0.08)	−0.14	0.17
3. Tenure	−0.08	(0.06)	−0.21	0.04	−0.08	(0.06)	−0.20	0.04	−0.08	(0.06)	−0.20	0.05
4. Gender (1 = Female)	0.21	(0.12)	−0.05	0.45	0.25*	(0.13)	0.00	0.49	0.21	(0.13)	−0.04	0.45
5. Manager role (1 = Yes)	0.16	(0.16)	−0.15	0.48	0.21	(0.16)	−0.11	0.53	0.16	(0.17)	−0.13	0.49
6. Healthcare role (1 = Yes)	0.11	(0.23)	−0.35	0.58	0.08	(0.23)	−0.38	0.54	0.11	(0.23)	−0.34	0.53
7. COVID-19 worry	0.03	(0.07)	−0.13	0.16	0.02	(0.07)	−0.12	0.16	0.03	(0.07)	−0.11	0.18
8. Cognitive stress	−0.18*	(0.08)	−0.31	−0.03	−0.14	(0.08)	−0.29	0.00	−0.17*	(0.08)	−0.32	−0.02
9. Cognitive stress * COVID-19 worry					−0.19*	(0.09)	−0.38	−0.01				
Level 2—Team												
10. Supervisor support	0.35***	(0.10)	0.16	0.53	0.36***	(0.10)	0.17	0.55	0.34***	(0.10)	0.16	0.55
Cross-level interaction												
11. Cognitive stress * Supervisor support									0.05	(0.11)	−0.17	0.28
AIC	360.83				3361.65				365.23			
BIC	393.65				397.45				401.03			
Pseudo-R-squared[a]	0.20				0.23				0.20			
Log likelihood	−169.42				−168.82				−170.62			
Num. obs.	146				146				146			
Num. groups: TEAM	21				21				21			
Var: Team (Intercept)	0.024				0.027				0.026			
Var: Residual	0.510				0.497				0.512			

****p < 0.001; *p < 0.05. BTCI, 95% Bootstrap Confidence Interval using 10,000 samples. [a]We estimated the overall variance explanation of the random-intercept-only models with the pseudo-R-squared for generalized mixed-effect models (Nakagawa et al., 2017).*

Regarding Hypothesis 3, Model 3 in **Table 4** shows the results for the moderating effect of supervisor support on the relationship between stress and psychological safety. Supervisor support does not moderate the effect of stress on psychological safety ($b = 0.05$; SE = 0.11, $p > 0.05$, 95% BTCI = [−0.17, 0.28]), yet it has a positive and significant direct effect on psychological safety ($b = 0.34$; SE = 0.10, $p < 0.001$, 95% BTCI = [0.16, 0.55]), after controlling for stress.

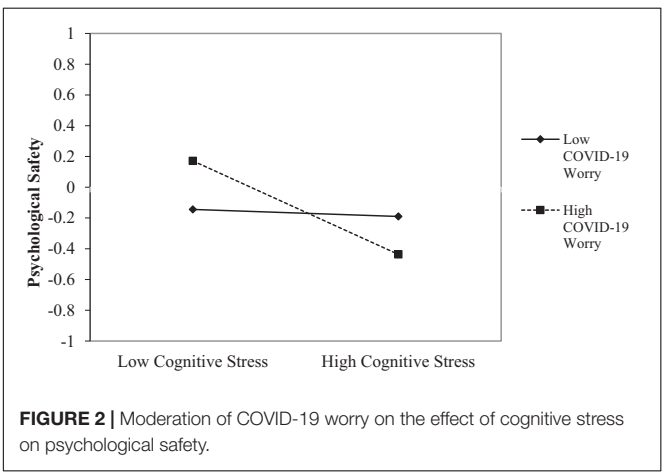

FIGURE 2 | Moderation of COVID-19 worry on the effect of cognitive stress on psychological safety.

Therefore, although our results support Hypothesis 2, we could not confirm Hypothesis 3. **Table 5** summarizes the tested and confirmed hypotheses.

DISCUSSION

This study aimed to understand the effect of cognitive stress on turnover intentions as well as the mediating effect of perceived psychological safety in this relationship, in addition to determining whether supervisor support and COVID-19 worry have a moderating role in the effect of cognitive stress on psychological safety.

The results of the multilevel mixed models show that perceived psychological safety mediates the relationship between cognitive stress and turnover intentions. Furthermore, we found that COVID-19 worry moderates the relationship between cognitive stress and perceived psychological safety, such that higher COVID-19 worry worsened the relationship between cognitive stress and psychological safety. Although not expected, we did not find evidence of the moderation of supervisor support on the relationship between cognitive stress and perceived psychological safety. However, we did find a direct and positive effect of supervisor support on the psychological safety perceptions.

TABLE 5 | Summary of hypotheses and results.

	Hypotheses	Results
1	*Psychological Safety mediates the effect between cognitive stress and turnover intentions.*	Confirmed
2	*When employees are more worried about COVID-19, the negative effect of cognitive stress on psychological safety will be stronger.*	Confirmed
3	*When supervisors are perceived as supportive, the negative effect of cognitive stress on psychological safety will be weakened.*	Not confirmed

The results of the mediating analysis confirm that higher perceived psychological safety prevents the negative effects of cognitive stress on turnover intentions, thus confirming our first hypothesis. Therefore, we contribute to the literature on stress as we explore a potential mechanism that can prevent its negative effects on employees' attitudes toward their job. These results are consistent with previous research (Edmondson, 1999; Frazier et al., 2017; Lee, 2021), which states that an individual's perceptions of psychological safety reduce the potential risk associated with interacting with others at work and, in particular, the potential adverse effects that stress could have when working with others. Considering psychological safety as a mechanism that prevents the negative consequences of stress at work offers important opportunities to deal with cognitive stress, especially regarding the immediate effects that this has, such as loss of concentration, distraction, or confusion (Jun et al., 2021). In situations that create or reinforce cognitive stress for employees, processing information and performing tasks will be more challenging (Amirkhan et al., 2018; Kalakoski et al., 2020); hence creating an environment that allows employees to express their difficulties and challenges when performing their tasks increases the opportunities to take action and allows employees to perform their jobs accordingly. Psychological safety can become an important mechanism to manage and counteract the stressful consequences of the current sanitary crisis and the constant change the "*new normality*" (Oksanen et al., 2021) has brought to organizations.

The relationship between stress and turnover intention is not always straightforward because it depends on the employees' perceptions of threats (Sindi et al., 2017). Psychological safety can explain why employees' stress changes according to the context in which they perform their jobs, such that on many occasions being in an environment that allows them to express themselves freely and without fear of being embarrassed or punished can reduce their negative attitudes toward their job (Frazier et al., 2017).

Our results also contribute to a better understanding of how stress, particularly cognitive type stress, affects turnover intentions. Most studies on stress and its effects on turnover intentions focus on a chronic type of stress, particularly burnout (Hayes et al., 2012; Chênevert et al., 2021); and fewer have addressed the relationship with cognitive symptoms of stress (e.g., working memory difficulties, indifference to work, information overload and impaired concentration) (Rantanen et al., 2021). Cognitive stress has significant effects on the quality of attention and the performance of workers at healthcare organizations, as it increases the likelihood of errors at work and impairs the sense of self-efficacy, which has also been linked to increased intentions to quit (Buchbinder et al., 2001).

Our study also tested the potential moderating effects of COVID-19 worry and supervisor support on the relationship between cognitive stress and psychological safety. While we found that COVID-19 worry worsens the adverse effects of cognitive stress on employees' perceptions of psychological safety, we could not prove that supervisor support had a moderating effect on this relationship.

In situations that generate high stress, as is the case of the COVID-19 pandemic, the levels of anxiety that people experience are translated into a great concern about the potential negative effects that these could for them and their surroundings. Such a situation creates a context where stress (of any type) is more likely to increase. As Jun et al. (2021) argued, stress creates an automatic sense of anxiety and concern, affecting the cognitive control required for performing tasks and functions. The fear and the insecurities that emerge in situations characterized by high distress (as it is the case of the pandemic for healthcare workers) reinforce those threats that employees perceive of being rejected or judged by their peers because they cannot perform their task as they would be in a normal situation (Ilies et al., 2010). Therefore, the employees' perceptions of psychological safety are affected, creating an environment where workers cannot give the best. Furthermore, these negative consequences could affect the employees' attitudes toward their job, increasing their turnover intentions in the long-term.

Although we could not confirm that supervisor support moderated the relationship between cognitive stress and perceived psychological safety, we found that supervisor support has an important contribution in creating a psychologically safe environment. That is, our results show a direct and positive effect of supervisor support on perceived psychological safety. The literature on supervisor support for stress management is nascent (Horan et al., 2018). Most of the studies have attempted to show that low levels of supervisor support contribute to increased stress and even turnover, paying less attention to the moderating effects on these variables and other organizational processes (Bélanger et al., 2015; Meral et al., 2018). In this respect, the lack of the moderation effect can be explained in two ways. First, for supervisor support to be effective in reducing employees' stress, supervisors should be concerned about their workers' stress levels specifically and make stress management a priority (Kath et al., 2012). Effective stress management will only be possible when direct actions are taken in order to alleviate the factors that cause stress in the employees and the work environment. Precisely, Lee (2021) states that supervisor support becomes an organizational resource only once it means that employees feel listened to and considered. Alternatively, for cognitive type stress, a more task-focused supervisor support could diminish the employees' concerns regarding their job. Higher orientation, attention, and

feedback from the supervisor to workers in relation to their work tasks can be more effective rather than a general support (Eisenberger et al., 2002).

Previous studies have also confirmed the association between supervisor support and psychological safety (Edmondson and Lei, 2014). Supervisors can enhance open communication and facilitate employees to express their concerns (Singh et al., 2018). Systematic support from supervisors to employees enhances the knowledge of the current conditions that the employees are undergoing at work, whilst at the same time reducing the uncertainty that a crisis or constant change could create (Singh et al., 2018). Although we could not prove that supervisor support can be necessary for reducing the negative effects of cognitive stress on psychological safety, increasing the support that supervisors give to employees in the context of the COVID-19 pandemic can certainly make them feel safe to express their concerns and difficulties.

Overall, our findings provide evidence of cognitive stress's consequences for employees working at healthcare organizations in situations of high distress, as it is the case of the current pandemic. Although not as evident as other types of stress, cognitive difficulties that arise from the anxiety that employees experience at work can seriously undermine their relationships with colleagues and, most importantly, their attitude toward their job. Therefore, we contribute to the stress literature by showing concrete evidence of how cognitive stress affects turnover intentions in healthcare organizations. Furthermore, our findings also contribute to the psychological safety literature by providing direct evidence of how cognitive stress affects employees' perceptions of psychological safety and, at the same time, how psychological safety can counteract the negative effects of stress on turnover intentions. Psychological safety is a crucial variable for increasing learning, engagement, and performance among workers (Frazier et al., 2017), especially in the constant change that organizations experience. We also tested two variables that have a contingent effect on the relationship between stress and psychological safety, showing how COVID-19 worry combines with stress to undermine psychological safety perceptions. Finally, we tested our hypotheses in a sample collected during the crisis that COVID-19 has brought to the healthcare organizations. Therefore, we capture real-time perceptions and emotions of the employees in these organizations.

IMPLICATIONS AND CONCLUSION

The study results point out that the employees' cognitive stress has a significant impact on their intentions to leave the organization. Health care workers are consistently exposed to factors that produce stress (e.g., overload, lack of adequate resources, exhaustion, etc.), and it is undeniable that the COVID-19 pandemic has increased the sources of stress. The constant threat of the consequences of the virus and the emotional exhaustion that carries have direct effects on the employees' capacity to use their knowledge, perform their tasks according to expectations and collaborate with others. Therefore, in these times of change, healthcare organizations should look deeper at the consequences of stress and the mental health of their employees and the processes that reduce their impact on the employees' work and well-being, e.g., psychological safety.

As the results of this study show, psychological safety can play an important role in preventing the negative consequences of cognitive stress on turnover intentions. Prior to the pandemic, Nembhard and Edmondson (2006) found that within health care teams, psychological safety is a key factor to promote workers speaking up and learning behaviors. Practitioners in the field of people management in healthcare organizations should bear in mind that psychological safety could be an important factor in creating a safe and protected environment for the employees to express their concerns. More importantly, in this "new normality," psychological safety can be a catalyst of important organizational processes, by contributing to reducing employees' dissatisfaction with their job (as reflected in less intentions to leave their organization).

Managers should place emphasis on the practices that increase psychological safety. First, reducing the threat that COVID-19 presents for employees can have important effects in reducing the negative effects of cognitive stress on psychological safety as our study shows. For instance, Khan (2021) shows that social media disinformation has a positive relationship with the threat of COVID-19 in healthcare workers. By introducing reliable sources and clear communication, managers can help to reduce employees worries about the pandemic. Further, promoting social distance, and utilizing alternative channels for work and communication (e.g., webinars, social media platforms, and video calls) can also contribute to the feelings of safety for the employees. The threat that COVID-19 presents for health care workers should continue to be studied as its effects on different spheres are still uncertain. Future research can include other individual differences as moderators of the worry for the COVID-19, such as personality and locus of control.

Second, supervisor support can directly increase psychological safety. By training supervisors to give better support to employees and creating a climate with open communication and receptiveness of employees' concerns, health care organizations can promote a climate of psychological safety. It is also essential that the supervisor support is persistent and inclusive (Nembhard and Edmondson, 2006). Supervisors should accompany the workers throughout their difficulties, encourage open communication and reduce the barriers that make employees feel excluded. Future research could look more in detail at the role of specific types of supervision in the relationship between stress and psychological safety, especially in emotionally challenging situations. When interpreting and generalizing the study's results, caution should be kept in mind in light of the following limitations. First, we applied a single questionnaire to collect the employees' perceptions of the main variables. This can give way to certain biases of desirability and self-report. Future studies should consider longitudinal samples, where the temporal aspects of the variables under study are considered. Second, this study was conducted in only two healthcare organizations in Chile which we accessed by

convenience; this may affect the generalizability of the findings to other countries and the general population. However, our results still pose significant contributions for healthcare organizations' managers and how they can deal with employees' stress in the current sanitary situation and the "new normality." Third, for this study we measured supervisor support in a general way and given our findings, future studies should consider the specific type of support given by the supervisor. Other variables related to the supervisor's well-being and leader characteristics can also help to understand how they can contribute to reducing employees' stress and promote psychological safety at work. Finally, although this study was implemented during the COVID-19 sanitary crisis, our results can also offer important guidelines for the management of public health organizations outside the context of the pandemic. Healthcare organizations are emotionally charged environments, where stress is inherent to the work that employees perform on a day-to-day basis.

To sum up, in this study, we aimed to understand the effects of cognitive stress on turnover intentions, showing that psychological safety can indeed prevent the adverse effects of stress on turnover intentions. We further found that COVID-19 worry increases the harmful effects of cognitive stress on psychological safety. Therefore, we found that psychological safety needs to be considered within healthcare organizations, especially during the pandemic, as this can help to reduce part of the stress that employees at these organizations experience. We trust that the knowledge elaborated here will be informative for practitioners in these organizations to look after the well-being of the employees during these times of change.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Comité de ética de la Universidad Católica de la Santísima Concepción (Número 19-2020). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MH and FT-M contributed equally to the conception, design of the study, data collection, analysis, and writing of the manuscript. KO collected part of the data and contributed to the writing of the manuscript. All authors reviewed, read, and approved the submitted version.

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REFERENCES

Akgunduz, Y., and Eryilmaz, G. (2018). Does turnover intention mediate the effects of job insecurity and co-worker support on social loafing? *Internat. J. Hospit. Manag.* 68, 41–49. doi: 10.1016/j.ijhm.2017.09.010

Aldamman, K., Tamrakar, T., Dinesen, C., Wiedemann, N., Murphy, J., Hansen, M., et al. (2019). Caring for the mental health of humanitarian volunteers in traumatic contexts: the importance of organizational support. *Eur. J. Psychotraumat.* 10:1694811. doi: 10.1080/13032917.2015.1020504

Amirkhan, J. H., Landa, I., and Huff, S. (2018). Seeking signs of stress overload: Symptoms and behaviors. *Internat. J. Stress Manag.* 25, 301–311. doi: 10.1037/str0000066

Andrades-Tobar, M., García, F. E., Concha-Ponce, P., Valiente, C., and Lucero, C. (2021). Predictores de síntomas de ansiedad, depresión y estrés a partir del brote epidémico de COVID-19. *Revista de Psicopatología y Psicología Clínica* 26, 13–22. doi: 10.5944/rppc.28090

Ayala Calvo, J. C., and García, G. M. (2018). Hardiness as moderator of the relationship between structural and psychological empowerment on burnout in middle managers. *Journal of Occupational and Organizational Psychology* 91, 362–384. doi: 10.1111/joop.12194

Bates, D., Mächler, M., Bolker, B., and Walker, S. (2014). Fitting linear mixed-effects models using lme4. *J. Stat. Softw.* 67, 1–48.

Bélanger, J., Pierro, A., Barbieri, B., De Carlo, N. A., Falco, A., and Kruglanski, A. W. (2015). One size doesn't fit all: the influence of supervisors' power tactics and subordinates' need for cognitive closure on burnout and stress. *Eur. J. Work Org. Psychol.* 25, 287–300. doi: 10.1080/1359432x.2015.1061999

Bliese, P. D. (2000). "Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis," in *Multilevel Theory, Research, and Methods in Organizations. Foundations, Extensions, and New Directions*, eds K. J. Klein and S. W. J. Kozlowski (San Francisco: Jossey-Bass), 349–381.

Buchbinder, S. B., Wilson, M., Melick, C. F., and Powe, N. R. (2001). Primary care physician job satisfaction and turnover. *Am. J. Manag. Care* 7, 701–716.

Carmeli, A., and Zisu, M. (2009). The relational underpinnings of quality internal auditing in medical clinics in Israel. *Soc. Sci. Med.* 68, 894–902. doi: 10.1016/j.socscimed.2008.12.031

Cedeño, N. J., Cuenca, M. F., Mojica, A. D., and Portillo, M. T. (2020). Afrontamiento del COVID-19: estrés, miedo, ansiedad y depresión. *Enfermería Investiga* 5, 63–70. doi: 10.31243/ei.uta.v5i3.913.2020

Charoensukmongkol, P., and Phungsoonthorn, T. (2020). The effectiveness of supervisor support in lessening perceived uncertainties and emotional exhaustion of university employees during the COVID-19 crisis: the constraining role of organizational intransigence. *J. Gen. Psychol.* 148, 431–450. doi: 10.1080/00221309.2020.1795613

Chas, R. G., and Fontela, E. N. (2013). Apoyo percibido del supervisor, capacidad política de los ingenieros y resultados. *Revista Europea de Dirección y Economía de la Empresa* 22, 11–20. doi: 10.1016/j.redee.2012.05.007

Chênevert, D., Kilroy, S., Johnson, K., and Fournier, P. L. (2021). The determinants of burnout and professional turnover intentions among Canadian physicians: application of the job demands-resources model. *BMC Health Serv. Res.* 21, 1–10. doi: 10.1186/s12913-021-06981-5

Colarelli, S. M. (1984). Methods of communication and mediating processes in realistic job previews. *J. Appl. Psychol.* 69:633. doi: 10.1037/0021-9010.69.4.633

Contreras, F., Abid, G., Govers, M., and Elahi, N. S. (2021). Influence of support on work engagement in nursing staff: The mediating role of possibilities for professional development. *Acad. Rev. Latinoam. de Administ.* 34, 122–142. doi: 10.1108/ARLA-04-2020-0057

Cox, T. (1993). *Stress research and stress management: Putting Theory to Work*, Vol. 61. Sudbury: HSE Books.

Del Estal-García, M. C., and Melián-González, S. (2021). Motivación por el servicio público de los profesionales de los centros de atención primaria: ¿qué es más

importante el entorno o el apoyo directivo? *Atencion Primaria* 53:101995. doi: 10.1016/j.aprim.2021.101995

Di Martino, V. (1992). *Occupational Stress: A preventive approach in OIT Conditions of Work Digest*, Vol. 11. Geneva: OIT, 3–21.

Dollard, M. F., and Bakker, A. B. (2010). Psychosocial safety climate as a precursor to conducive work environments, psychological health problems, and employee engagement. *J. Occupat. Org. Psychol.* 83, 579–599. doi: 10.1348/096317909X470690

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administ. Sci. Q.* 44, 350–383. doi: 10.2307/2666999

Edmondson, A. C., and Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Ann. Rev. Org. Psychol. Org. Behav.* 1, 23–43. doi: 10.1146/annurev-orgpsych-031413-091305

Ehlers, A., and Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behav. Res. Therapy* 38, 319–345. doi: 10.1016/S0005-7967(99)00123-0

Eisenberger, R., Stinglhamber, F., Vandenberghe, C., Sucharski, I. L., and Rhoades, L. (2002). Perceived supervisor support: contributions to perceived organizational support and employee retention. *J. Appl. Psychol.* 87, 565–573. doi: 10.1037/0021-9010.87.3.565

Esteban-Carranza, R. F., Mamani-Benito, O. J., Rodriguez-Alarcon, J. F., Corrales-Reyes, I. E., and Farfán-Solís, R. (2021). Escala de preocupación por el contagio de la COVID-19 en personal de la salud peruano. *Rev. Colomb. Psiq.* 50, 65–152. doi: 10.1016/j.rcp.2021.03.006

Fasbender, U., Van der Heijden, B. I., and Grimshaw, S. (2019). Job satisfaction, job stress and nurses' turnover intentions: The moderating roles of on-the-job and off-the-job embeddedness. *J. Adv. Nurs.* 75, 327–337. doi: 10.1111/jan.13842

Fisher, G. G., Matthews, R. A., and Gibbons, A. M. (2016). Developing and investigating the use of single-item measures in organizational research. *J. Occupat. Health Psychol.* 21, 3–23. doi: 10.1037/a0039139

Flinkman, M., Laine, M., Leino-Kilpi, H., Hasselhorn, H. M., and Salanterä, S. (2008). Explaining young registered Finnish nurses' intention to leave the profession: a questionnaire survey. *Internat. J. Nurs. Stud.* 45, 727–739. doi: 10.1016/j.ijnurstu.2006.12.006

Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., and Vracheva, V. (2017). Psychological safety: a meta-analytic review and extension. *Person. Psychol.* 70, 113–165. doi: 10.1111/peps.12183

Fritz, M. S., and MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychol. Sci.* 18, 233–239. doi: 10.1111/j.1467-9280.2007.01882.x

Gagnon, M. A., and Michael, J. H. (2004). Outcomes of perceived supervisor support for wood production employees. *Forest Prod. J.* 54, 172–177.

Gamero-Burón, C. (2010). Evaluación del coste por pérdida de jornadas laborales asociado al estrés laboral: propuesta para España. *Estud. de Econ. Apl.* 28, 1–20.

García-Iglesias, J. J., Gómez-Salgado, J., Martín-Pereira, J., Fagundo-Rivera, J., Ayuso-Murillo, D., Martínez-Riera, J. R., et al. (2020). Impacto del SARS-CoV-2 (Covid-19) en la salud mental de los profesionales sanitarios: una revisión sistemática. *Rev. Española Salud Pública* 94, 1–20.

George, J. M. (1990). Personality, affect, and behavior in groups. *J. Appl. Psychol.* 75, 107–116. doi: 10.1037/0021-9010.75.2.107

González, A. A. L., García, M. H., Palmer, M. A. M., Mesquida, M. V., Pareda, A. M. S., and Fuenmayor, N. M. (2004). Estudio del estrés laboral en Baleares aplicando el cuestionario desequilibrio esfuerzo-recompensa. *Med. Balear* 19, 26–30.

Greenberg, N., Docherty, M., Gnanapragasam, S., and Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ* 368, 1–4. doi: 10.1136/bmj.m1211

Guchait, P., Lee, C., Wang, C. Y., and Abbott, J. L. (2016). Impact of error management practices on service recovery performance and helping behaviors in the hospitality industry: The mediating effects of psychological safety and learning behaviors. *J. Hum. Resourc. Hospit. Tour.* 15, 1–28. doi: 10.1080/15332845.2015.1008395

Guimaraes, T. (1997). Assessing employee turnover intentions before/after TQM. *Internat. J. Q. Reliab. Manag.* 14, 46–63. doi: 10.1108/02656719710156770

Hayes, L. J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., et al. (2012). Nurse turnover: a literature review–an update. *Internat. J. Nurs. Stud.* 49, 887–905. doi: 10.1016/j.ijnurstu.2011.10.001

Hwang, J. I., and Chang, H. (2008). Explaining turnover intention in Korean public community hospitals: occupational differences. *Internat. J. Health Plan. Manag.* 23, 119–138. doi: 10.1002/hpm.862

Hayes, A. F. (2018a). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. London: Guilford publications.

Hayes, A. F. (2018b). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. *Comm. Monogr.* 85, 4–40. doi: 10.1080/03637751.2017.1352100

Haynes, C. E., Wall, T. D., Bolden, R. I., Stride, C., and Rick, J. E. (1999). Measures of perceived work characteristics for health services research: test of a measurement model and normative data. *Br. J. Health Psychol.* 4, 257–275. doi: 10.1348/135910799168614

Hemphill, J. F. (2003). Interpreting the magnitudes of correlation oefficients. *American Psychologist* 58, 78–79. doi: 10.1037/0003-066X.58.1.78

Horan, K. A., Moeller, M. T., Singh, R. S., Wasson, R., O'Brien, W. H., Matthews, R. A., et al. (2018). Supervisor support for stress management and intervention process. *Internat. J. Workplace Health Manag.* 11, 260–272. doi: 10.1108/IJWHM-12-2017-0113

Howe, D. C., Chauhan, R. S., Soderberg, A. T., and Buckley, M. R. (2020). Paradigm shifts caused by the COVID-19 pandemic. *Org. Dyn.* 49:4. doi: 10.1016/j.orgdyn.2020.100804

Hunt, D. F., Bailey, J., Lennox, B. R., Crofts, M., and Vincent, C. (2021). Enhancing psychological safety in mental health services. *Internat. J. Ment. Health Syst.* 15, 1–18. doi: 10.1186/s13033-021-00439-1

Ilies, R., Dimotakis, N., and De Pater, I. E. (2010). Psychological and physiological reactions to high workloads: implications for well-being. *Person. Psychol.* 63, 407–436. doi: 10.1111/j.1744-6570.2010.01175.x

James, L. R., Demaree, R. G., and Wolf, G. (1993). rwg: An assessment of within-group interrater agreement. *J. Appl. Psychol.* 78, 306–309. doi: 10.1037/0021-9010.78.2.306

Jun, J., Toh, Y. N., Sisk, C. A., Remington, R. W., and Lee, V. G. (2021). Do concerns about COVID-19 impair sustained attention? *Cogn. Res.* 6, 1–15. doi: 10.1186/s41235-021-00303-3

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Acad. Manag. J.* 33, 692–724. doi: 10.5465/256287

Kalakoski, V., Selinheimo, S., Valtonen, T., Turunen, J., Käpykangas, S., Ylisassi, H., et al. (2020). Effects of a cognitive ergonomics workplace intervention (CogErg) on cognitive strain and well-being: a cluster-randomized controlled trial. *BMC Psychol.* 8, 1–16. doi: 10.1186/s40359-019-0349-1

Kath, L. M., Stichler, J. F., and Ehrhart, M. G. (2012). Moderators of the negative outcomes of nurse manager stress. *J. Nurs. Adm.* 42, 215–221. doi: 10.1097/NNA.0b013e31824ccd25

Khan, A. N. (2021). Misinformation and work-related outcomes of healthcare community: sequential mediation role of COVID-19 threat and psychological distress. *J. Community Psychol.* doi: 10.1002/jcop.22693

Kim, N. Y. (2019). Linking individuation and organizational identification: mediation through psychological safety. *J. Soc. Psychol.* 160, 216–235. doi: 10.1080/00224545.2019.1644279

Kim, H., Ji, J., and Kao, D. (2011). Burnout and physical health among social workers: A three-year longitudinal study. *Soc. Work* 56, 258–268. doi: 10.1093/sw/56.3.258

Kirk-Brown, A., and van Dijk, P. (2016). An examination of the role of psychological safety in the relationship between job resources, affective commitment and turnover intentions of Australian employees with chronic illness. *Internat. J. Hum. Resour. Manag.* 27, 1626–1641. doi: 10.1080/09585192.2015.1053964

Kruzich, J., Mienko, J., and Courtney, M. (2014). Individual and work group influences on turnover intention among public child welfare workers: The effects of work group psychological safety. *Child. Youth Serv. Rev.* 42, 20–27. doi: 10.1016/j.childyouth.2014.03.005

Lee, H. (2021). Changes in workplace practices during the COVID-19 pandemic: the roles of emotion, psychological safety and organization support. *J. Org. Effect.* 8, 97–128. doi: 10.1108/JOEPP-06-2020-0104

Lee, S. A. (2020). Coronavirus Anxiety Scale: a brief mental health screener for COVID-19 related anxiety. *Death Stud.* 44, 393–401. doi: 10.1080/07481187.2020.1748481

Lee, E. K., and Kim, J. S. (2020). Nursing stress factors affecting turnover intention among hospital nurses. *Internat. J. Nurs. Pract.* 26:e12819. doi: 10.1111/ijn.12819

Liaw, Y., Chi, N., and Chuang, A. (2010). Examining the mechanisms linking transformational leadership, employee customer orientation, and service performance: the mediating roles of perceived supervisor and coworker support. *J. Bus. Psychol.* 25, 477–492. doi: 10.1007/s10869-009-9145-x

Liu, C. E., Yu, S., Chen, Y., and He, W. (2020). Supervision incivility and employee psychological safety in the workplace. *Internat. J. Env. Res. Public Health* 17, 840–854. doi: 10.3390/ijerph17030840

Madrid, H. P. (2020). *Escala de estrés cognitivo en español*. Available from https://www.hectormadrid.cl/materiales-de-investigacion (Retrieved December 2020)

Malone, C., and Wachholtz, A. (2018). The relationship of anxiety and depression to subjective well-being in a mainland Chinese sample. *J. Relig. Health* 57, 266–278. doi: 10.1007/s10943-017-0447-4

Mauno, S., Minkkinen, J., Tsupari, H., Huhtala, M., and Feldt, T. (2019). Do older employees suffer more from work intensification and other intensified job demands? Evidence from upper white-collar workers. *Scand. J. Work Org. Psychol.* 4, 1–13. doi: 10.16993/sjwop.60

Meral, E. L. C. I., Yildiz, B., and Karabay, M. E. (2018). How burnout affects turnover intention? The conditional effects of subjective vitality and supervisor support. *Internat. J. Org. Leadership* 7, 47–60. doi: 10.19236/IJOL.2018.01.04

Mosadeghrad, A. M. (2013). Occupational stress and turnover intention: implications for nursing management. *Internat. J. Health Policy Manag.* 1, 169–176. doi: 10.15171/ijhpm.2013.30

Monterrosa-Castro, A., Dávila-Ruiz, R., Mejía-Mantilla, A., Contreras-Saldarriaga, J., Mercado-Lara, M., and Florez-Monterrosa, C. (2020). Estrés laboral, ansiedad y miedo al COVID-19 en médicos generales colombianos. *MedUNAB* 23, 195–213. doi: 10.29375/01237047.3890

Mueller, R., and Hancock, G. (2001). "Factor Analysis and Latent Structure: Confirmatory Factor Analysis," in *International Encyclopedia of Social and Behavioral Sciences*, eds N. J. Smelser and P. B. Baltes (Oxford: Pergamon), 5239–5244. doi: 10.1016/B0-08-043076-7/00426-5

Nakagawa, S., Johnson, P. C. D., and Schielzeth, H. (2017). The coefficient of determination R^2 and intra-class correlation coefficient from generalized linear mixed-effects models revisited and expanded. *J. R. Soc. Interface* 14:20170213. doi: 10.1098/rsif.2017.0213

Nembhard, I. M., and Edmondson, A. C. (2006). Making it safe: The effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams. *J. Org. Behav.* 27, 941–966. doi: 10.1002/job.413

Newman, A., Donohue, R., and Eva, N. (2017). Psychological safety: A systematic review of the literature. *Hum. Resour. Manag. Rev.* 27, 521–535. doi: 10.1016/j.hrmr.2017.01.001

Office for National Statistics [ONS] (2020). *Coronavirus and the social impacts on Great Britain*. Available from, https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/27november2020 (accessed date 27november2020)

Oksanen, A., Oksa, R., Savela, N., Mantere, E., Savolainen, I., and Kaakinen, M. (2021). COVID-19 crisis and digital stressors at work: a longitudinal study on the Finnish working population. *Comput. Hum. Behav.* 122, 1–47. doi: 10.1016/j.chb.2021.106853

Pan American Health Organization (2020). *Consideraciones psicosociales y de salud mental durante el brote de Covid-19. Biblioteca Digital OPS*. Washington, D.C: Pan American Health Organization

Perera, B., Wickramarachchi, B., Samanmalie, C., and Hettiarachchi, M. (2021). Psychological experiences of healthcare professionals in Sri Lanka during COVID-19. *BMC Psychol.* 9, 1–9. doi: 10.1186/s40359-021-00526-5

Prieto-Callejero, B., Gómez-Salgado, J., Alvarado-Gómez, F., Dias, A., and Ruiz-Frutos, C. (2020). Revisión sistemática de la reducción de efectos emocionales negativos en trabajadores de respuesta a emergencias y desastres mediante técnicas de catarsis. *Archivos de Prevención de Riesgos Laborales* 23, 52–67. doi: 10.12961/aprl.2020.23.01.05

Qureshi, M. I., Iftikhar, M., Abbas, S. G., Hassan, U., Khan, K., and Zaman, K. (2013). Relationship between job stress, workload, environment and employees turnover intentions: What we know, what should we know. *World Appl. Sci. J.* 23, 764–770. doi: 10.5829/idosi.wasj.2013.23.06.313

Rantanen, J., Lyyra, P., Feldt, T., Villi, M., and Parviainen, T. (2021). Intensified Job Demands and Cognitive Stress Symptoms: The Moderator Role of Individual Characteristics. *Front. Psychol.* 12:1168. doi: 10.3389/fpsyg.2021.607172

Ravangard, R., Dianat, S., and Shokrpour, N. (2019). The Factors Affecting Hospital Employees' Turnover Intentions: A Case of Iran. *Health Care Manag.* 38, 166–178. doi: 10.1097/HCM.0000000000000258

Revelle, W. (2021). *psych: Procedures for Psychological, Psychometric, and Personality Research. Northwestern University, Evanston, Illinois. R package version 2.1.9*.

Rice, V., Glass, N., Ogle, K., and Parsian, N. (2014). Exploring physical health perceptions, fatigue and stress among health care professionals. *J. Multidiscipl. Healthcare* 7, 155–161. doi: 10.2147/JMDH.S59462

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.6. *J. Stat. Softw.* 48, 1–36.

Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., and Kaushal, V. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian J. Psychiatry* 51, 1–7. doi: 10.1016/j.ajp.2020.102083

Sahashi, Y., Endo, H., Sugimoto, T., Nabeta, T., Nishizaki, K., Kikuchi, A., et al. (2021). Worries and concerns among healthcare workers during the coronavirus 2019 pandemic: a web-based cross-sectional survey. *Hum. Soc. Sci. Comm.* 8, 1–8. doi: 10.1057/s41599-021-00716-x

Schein, E. H. (1993). How can organizations learn faster? The challenge of entering the green room. *Sloan Manag. Rev.* 34, 85–92.

Shamir, B. (2011). Leadership takes time: Some implications of (not) taking time seriously in leadership research. *Leadership Q.* 22, 307–315. doi: 10.1016/j.leaqua.2011.02.006

Sharif, S. P., Bolt, E. E. T., Ahadzadeh, A. S., Turner, J. J., and Nia, H. S. (2021). Organisational support and turnover intentions: A moderated mediation approach. *Nursing Open* 8, 3606–3615. doi: 10.1002/nop2.911

Shieh, G. (2016). Choosing the best index for the average score intraclass correlation coefficient. *Behav. Res. Methods* 48, 994–1003. doi: 10.3758/s13428-015-0623-y

Sindi, S., Kåreholt, I., Solomon, A., Hooshmand, B., Soininen, H., and Kivipelto, M. (2017). Midlife work-related stress is associated with late-life cognition. *J. Neurolol.* 264, 1996–2002. doi: 10.1007/s00415-017-8571-3

Singh, B., Shaffer, M. A., and Selvarajan, T. T. (2018). Antecedents of organizational and community embeddedness: the roles of support, psychological safety, and need to belong. *J. Org. Behav.* 39, 339–354. doi: 10.1002/job.2223

Tingley, D., Yamamoto, T., Hirose, K., Keele, L., and Imai, K. (2014). mediation: R Package for Causal Mediation Analysis. *J. Stat. Softw.* 59, 1–38. doi: 10.18637/jss.v059.i05

Vinokur, A. D., and van Ryn, M. (1993). Social support and undermining in close relationships: their independent effects on the mental health of unemployed persons. *J. Person. Soc. Psychol.* 65, 350–359. doi: 10.1037/0022-3514.65.2.350

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., et al. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Internat. J. Env. Res. Public Health* 17, 1–25. doi: 10.3390/ijerph17051729

Wright, T. A., and Cropanzano, R. (1998). Emotional exhaustion as a predictor of job performance and voluntary turnover. *J. Appl. Psychol.* 83, 486–493. doi: 10.1037/0021-9010.83.3.486

Wofford, J. C., Goodwin, V. L., and Daly, P. S. (1999). Cognitive-affective stress propensity: a field study. *J. Org. Behav.* 20, 687–707. doi: 10.1002/(SICI)1099-1379(199909)20:5<687::AID-JOB926<3.0.CO;2-5

Zhao, F., Ahmed, F., and Faraz, N. A. (2020). Caring for the caregiver during COVID-19 outbreak: Does inclusive leadership improve psychological safety and curb psychological distress? A cross-sectional study. *Internat. J. Nurs. Stud.* 110, 1–11. doi: 10.1016/j.ijnurstu.2020.103725

Zhou, H., and Chen, J. (2021). How Does Psychological Empowerment Prevent Emotional Exhaustion? Psychological Safety and Organizational Embeddedness as Mediators. *Front. Psychol.* 12:2945. doi: 10.3389/fpsyg.2021.546687

Zhou, M., and Guo, W. (2021). Social factors and worry associated with COVID-19: Evidence from a large survey in China. *Soc. Sci. Med.* 277:113934. doi: 10.1016/j.socscimed.2021.113934

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