



Patterns of Teachers' Occupational Well-Being During the COVID-19 Pandemic: Relations to Experiences of Exhaustion, Recovery, and Interactional Styles of Teaching

Sanni Pöysä^{1*}, Eija Pakarinen¹ and Marja-Kristiina Lerkkanen^{1,2}

¹Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland, ²Norwegian Centre for Learning Environment and Behavioural Research in Education, University of Stavanger, Stavanger, Norway

OPEN ACCESS

Edited by:

Sina Fackler,
Leibniz Institute for Educational
Trajectories (LG), Germany

Reviewed by:

Xiaoyu Lan,
University of Padua, Italy
María Isabel de Vicente-Yagüe Jara,
University of Murcia, Spain

*Correspondence:

Sanni Pöysä
sanni.poyasa@jyu.fi

Specialty section:

This article was submitted to
Educational Psychology,
a section of the journal
Frontiers in Education

Received: 24 April 2021

Accepted: 21 June 2021

Published: 02 July 2021

Citation:

Pöysä S, Pakarinen E and
Lerkkanen M-K (2021) Patterns of
Teachers' Occupational Well-Being
During the COVID-19 Pandemic:
Relations to Experiences of
Exhaustion, Recovery, and
Interactional Styles of Teaching.
Front. Educ. 6:699785.
doi: 10.3389/feduc.2021.699785

This study examined profiles of teachers' occupational well-being during the COVID-19 pandemic. The data were collected from 279 Finnish primary school teachers during the spring of 2020. Four groups of teachers were identified by using Latent Profile Analysis: 1) teachers with mediocre stress and work engagement (34.4%); 2) teachers with mediocre stress and lowest work engagement (11.5%); 3) teachers with highest stress and work engagement (26.5%); and 4) teachers with lowest stress and highest work engagement (27.6%). The findings indicated that teachers' occupational well-being was individually constructed, and there was a diversity with ways how negative and positive aspects of occupational well-being were drawn into patterns. The profile groups were further analyzed with respect to teachers' experiences of emotional exhaustion, recovery from work, and interactional styles of teaching. The results revealed that during the first few months of the COVID-19 pandemic many teachers experienced occupational stress as well as some increase in stress due to the pandemic. In addition, the findings provided new insights concerning how teachers' work engagement was perhaps not severely affected during the first few months of the pandemic, and on how different teaching styles were associated specifically with different aspects of occupational well-being.

Keywords: teachers' occupational well-being, COVID-19, stress, vigor, dedication, interactional styles of teaching, exhaustion, recovery

INTRODUCTION

When teachers around the globe faced new challenges and unexpected changes in their work due to the outbreak of the COVID-19 pandemic in the Spring of 2020, the field of education shared their concerns about the well-being of teachers. The concern was reasonable, as a considerable body of literature indicates that teachers' occupational well-being is crucial for the sake of themselves as well as for their students (e.g., Skaalvik and Skaalvik, 2016; Madigan and Kim, 2020). The negative aspects of occupational well-being, such as experiences of work-related stress or emotional exhaustion are, indeed, burden for teachers (Chaplain, 2008; Ferguson et al., 2012). Previous studies have also suggested that teachers' higher work-related stress is associated with students' lower educational outcomes (Herman et al., 2018), and that experiences of stress and exhaustion are connected with decreased job satisfaction and increased motivation to leave the teaching profession (Klassen and

Chiu, 2010; Skaalvik and Skaalvik, 2014; Skaalvik and Skaalvik, 2016). The positive aspects of occupational well-being may, however, provide protection against the elements that are harming the well-being (Bermejo-Toro et al., 2016). Experiences of work engagement and professional competence, for example, have been associated with increased job satisfaction and commitment with work (Hakanen et al., 2006; Klassen and Chiu, 2010) as well as better job performance (Bakker and Bal, 2010).

In March 2020, the World Health Organization declared that COVID-19 was a global pandemic. To ensure the safety of teachers and their students, different types of remote learning were quickly adapted into use; for example, many governments in Europe chose to proceed with curriculum-based learning by utilizing online approaches (UNESCO, UNICEF, and the World Bank, 2020; United Nations, 2020). Recent studies have demonstrated that during the time of school closures, teachers had to cope with several stressors, such as experiences of uncertainty or increased workload (Kim and Asbury, 2020; MacIntyre et al., 2020), and teachers experienced substantial levels of stress (MacIntyre et al., 2020). At the same time, however, teachers also found some benefits from the situation. It has been suggested, for example, that teachers felt that the time of school closures increased the trust between parents and teachers, which may also prove beneficial when the pandemic is over (Kim and Asbury, 2020).

The present study focused on the positive as well as negative aspects of teachers' occupational well-being during the COVID-19 pandemic. To reach some novel insights on teachers' occupational well-being, a person-oriented approach was utilized to identify subgroups of teachers based on their experiences of work-related stress and experiences of increased stress due to the COVID-19 pandemic along with their work engagement. The subgroups were subsequently analyzed in order to examine whether the subgroups would differ in their emotional exhaustion, recovery from work, as well as interactional styles of teaching.

Teachers' Occupational Well-Being

Teachers' occupational well-being is a complex phenomenon, which can be approached from several different points of views (see Cumming, 2017). On one hand, the field of education has learned about teachers' occupational well-being by focusing on experiences that diminish well-being, such as work-related stress, emotional exhaustion, or burnout (e.g., Montgomery and Rupp, 2005; Foley and Murphy, 2015). On the other hand, valuable knowledge has been obtained by examining experiences that may strengthen well-being, such as work engagement (Bakker et al., 2007; Granziera and Perera, 2019), coping strategies (Parker and Martin, 2009), or recovery from work (Virtanen et al., 2020). However, an increasing number of studies have approached occupational well-being by also focusing on different negative and positive aspects simultaneously (e.g., Bermejo-Toro et al., 2016; Parker et al., 2012), because this provides an opportunity to obtain versatile knowledge of this complex phenomenon. This decision was made in the present study as well by examining work-related stress and increase of stress due to the COVID-19

pandemic along with core aspects of work engagement, vigor and dedication as features of occupational well-being.

Teachers' occupational stress can be defined as unpleasant and negative emotions (e.g., tension, restlessness, anxiety, frustration, or nervousness) resulting from some aspect of their work as a teacher (Kyriacou, 2001; Elo et al., 2003; Eddy et al., 2019). The existing literature indicates that teachers typically report high levels of occupational stress (Kyriacou, 2001), and teaching is actually recognized as a profession with higher than average stress when comparing the levels of work-related stress across occupations (Johnson et al., 2005). Previous literature have named several stressors, such as time pressure and workload or lack of administrative support that may hinder teachers' occupational well-being (e.g., Ferguson et al., 2012; Skaalvik and Skaalvik, 2009; Skaalvik and Skaalvik, 2016).

A wide range of research has suggested that stress may have an effect on teachers' well-being in numerous ways (see McIntyre et al., 2017). In addition, teachers' occupational stress may act as a strain for their students as well. In previous literature, teachers' higher stress has been associated with, for example, students' lower educational outcomes (Herman et al., 2018) and poorer quality of teacher-student relationships (Whitaker et al., 2015). Moreover, there is widespread agreement that teachers' prolonged stress may lead to experiences of emotional exhaustion, which is also one of the critical components of burnout syndrome (e.g., Maslach et al., 2001; Schaufeli and Salanova, 2014; Skaalvik and Skaalvik, 2016). Therefore, acknowledging teacher's experiences of work-related stress is particularly important.

Work engagement, which represents a positive aspect of teachers' occupational well-being, is defined as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli et al., 2002, p. 74). Teachers experiencing high levels of *vigor* have high levels of energy and mental resilience while working. They are also willing to invest effort in their work, and they are persistent when facing the difficulties. Moreover, previous literature has suggested that vigor can be seen as the opposite of exhaustion (Schaufeli et al., 2002; Schaufeli and Bakker, 2010). *Dedication*, in turn, is related to teachers' involvement with work as well as with their sense of significance, enthusiasm, inspiration, pride, and challenge with respect to their working. *Absorption*, by contrast, refers to being fully concentrated and deeply engrossed in work. According to Gonzales-Roma et al. (2006), vigor and dedication are considered the core dimensions of work engagement, and were therefore included in the current study.

The extent to which employees experience work engagement can be observed to be drawn from job-related and personal resources along with demands related to work (Bakker and Demerouti, 2007). This view is highlighted in the Job Demands-Resources model (e.g., Demerouti et al., 2001), which posits that employees' occupational well-being may be produced by demands and resources that determine the working conditions typical for specific occupations (Bakker and Demerouti, 2007; Bakker et al., 2007). Studies conducted among educators have recognized that the stressors, such as workload and students' misbehavior, are somewhat typical

work-related demands (Hakanen et al., 2006). Conversely, work-related resources are more affirmative experiences, such as experiences of supervisory support, job control, a supportive climate, and appreciation (Hakanen et al., 2006; Bakker et al., 2007). Ways of recovering from work (Virtanen et al., 2020), the coping strategies the teacher uses (Aulén et al., 2021), and experiences of relatedness and emotional closeness with students (Spilt et al., 2011; Klassen et al., 2012), in turn, can represent personal resources. The different resources are particularly relevant under stressful conditions, as they are positively related to teachers' work engagement (e.g., Bermejo-Toro et al., 2016), and they may even act as a buffer against the negative impacts of work-related demands (Bakker et al., 2007).

In previous literature, several positive consequences of work engagement have been identified both at the individual and organizational levels. Teachers' work engagement has been positively associated, for example, with their satisfaction with work (Perera et al., 2018; Granziera and Perera, 2019), their organizational commitment (Hakanen et al., 2006), as well as higher relatedness with their students (Klassen et al., 2012). In addition, engaged teachers typically have better job performance (Bakker and Bal, 2010), and use more heterogeneous array of teaching practices (Addimando, 2019). It is also possible that teachers' work engagement is reflected in their interactional styles of teaching, that is, adjusting the levels of affection and control toward their students (for more about teaching styles, see Kuntsche et al., 2006; Walker, 2008). According to Bakker and Demerouti (2008), better job performance being associated with work engagement might be partly due to experiences of better psychological and physical health as well as more positive emotions typical for engaged workers. Thus, work engagement can be seen as crucial element of teachers' occupational well-being, and attention should be given on work-related resources, particularly when there is increase in work-related demands.

The COVID-19 Pandemic and Teachers' Occupational Well-Being

According to United Nations (2020), by mid-April of 2020, 94% of the world's student population were affected by the COVID-19 pandemic through school closures. In most countries, students' learning continued via various remote learning options, based on usage of online platforms, television, take-home packages, and radio (UNESCO, UNICEF, and the World Bank, 2020). In Finland, where the current study took place, the shift to remote learning was sudden. The Finnish Government (2020a) established that during school closures, schools would operate under "exceptional arrangements". Usage of online platforms was presented as an example, but not as a requirement. Thus, schools and teachers were autonomous with respect to how the remote teaching was executed. In comprehensive education, different combinations of real-time teaching via online platforms and provision of assignments along with focused feedback were widely used (Vuorio et al., 2021).

From the perspective of teachers' occupational well-being, it should be noted that the sudden shift to remote teaching as well as teaching itself during the COVID-19 pandemic may have caused

some changes in the demands teachers faced in their work. Not all teachers were provided with support during the sudden changes nor with requirements that the situation created for the teachers (cf. UNESCO, UNICEF, and the World Bank, 2020). In addition, UNESCO (2021) has stated that confusion and stress for teachers was one of the adverse consequences of school closures. Recent findings support this view, such as MacIntyre et al. (2020), who found that teachers experienced substantial levels of stress during school closures (see also Salmela-Aro et al., 2020; Collie, 2021). Li et al. (2020) found that the prevalence of anxiety among teachers was almost three times more common during the COVID-19 pandemic than had been reported previously.

Studies examining teacher well-being during the COVID-19 pandemic have identified different stressors as well as work-related demands and resources from the time of school closures. For instance, results obtained by Collie (2021) indicate that during school closures, autonomy-thwarting leadership was related to teachers' increased experiences of emotional exhaustion, while autonomy-supportive leadership increased workplace buoyancy, which in turn decreased teachers' somatic burden, stress, and emotional exhaustion. Moreover, Kim and Asbury (2020) concluded that teachers' experiences of uncertainty about the situation and worry they had for vulnerable students were the central stressors during the first six weeks of the lockdown. MacIntyre et al. (2020) reported, instead, that teachers' experiences of workload, worry about their families' health, and loss of control over work were the three most significant stressors. Nevertheless, occupational well-being of teachers during the COVID-19 pandemic should be examined further by the focusing on different patterns of their well-being (i.e., by utilizing person-oriented approach). While the traditional variable-oriented approach provides valuable information on the associations between measured variables, it does not consider that populations are heterogeneous regarding the associations between predictive and outcome variables (Laursen and Hoff, 2006; Eye et al., 2006). To examine teachers' occupational well-being in a more nuanced manner, a person-oriented approach can be adopted, first, to identify subgroups of individuals who share similarities in their occupational well-being, and, second, to examine associations between predictive and outcome variables within each identified subgroup (Bergman and Trost, 2006; Laursen and Hoff, 2006).

At this point, the existing literature provides only a few studies in where the person-oriented approach has been utilized to examine teachers' occupational well-being during the COVID-19 pandemic. A recent study by Salmela-Aro et al. (2020) utilized a person-oriented approach to examine teachers' and principals' occupational well-being during school closures. By focusing on burnout as a negative aspect of well-being and work engagement as a positive aspect of well-being, they identified four well-being profiles among teachers. The results demonstrated that up to 21% of teachers belonged to groups in where well-being was somewhat dominated by burnout. They also found that teachers' risk for burnout increased due to stress related to the COVID-19 pandemic. In the present study, teachers' occupational well-being was assessed with work engagement and experiences of occupational stress instead of work engagement and burnout.

This decision was made because when stress is seen as a precursor of burnout (e.g., Schaufeli and Salanova, 2014), it is possible that some teachers might have experienced severe stress during school closures without yet reaching a burnout syndrome. Therefore, stress was seen as a central feature of the occupational well-being during the first months of when the COVID-19 pandemic caused changes into teachers' work. In addition, the present study sought out to provide a unique view on how teacher occupational well-being during school closures would be related to teachers' recovery from work and interactional styles of teaching.

The Present Study

As teaching is a highly stressful occupation (Kyriacou, 2001; Johnson et al., 2005), and substantial levels of stress have been associated with the COVID-19 pandemic (MacIntyre et al., 2020), the present study was designed to reach a more comprehensive understanding on teachers' occupational well-being during the first few months of the COVID-19 pandemic. By appreciating the view that occupational well-being simultaneously consists of negative as well as positive experiences, the present study examined work-related stress and the increase in stress due to the COVID-19 pandemic along with vigor and dedication (i.e., the core dimensions of work engagement). A person-oriented approach was utilized in order to obtain novel insights on teachers' diverse experiences on occupational well-being. Thus, the following research questions and hypotheses were formulated:

1. What kind of subgroups can be identified based on teachers' occupational well-being assessed through self-reported work-related stress, experiences of increased stress due the COVID-19 pandemic, as well as vigor, and dedication? Based on previous findings describing different well-being profiles among teachers (Herman et al., 2018; Salmela-Aro et al., 2020), it was expected that several distinct subgroups would be identified (Hypothesis 1).
2. To what extent do the identified subgroups differ in teachers' self-reported emotional exhaustion, recovery from work, and interactional styles of teaching? First, as vigor has been seen as an opposite of exhaustion (Schaufeli and Bakker, 2010) and previous literature have indicated positive relations between teachers' stress and exhaustion (e.g., Skaalvik and Skaalvik, 2016), it was expected that subgroups would differ with respect to teachers' experiences of emotional exhaustion (Hypothesis 2a). Second, based on prior findings suggesting that recovery from work is associated well-being (Virtanen et al., 2020), it was expected that subgroups would differ with respect to teachers' recovery from work (Hypothesis 2b). Finally, while the lack of similar studies hampers setting a specific hypothesis concerning the differences between profile groups with respect to interactional styles of teaching, based on prior findings suggesting that different aspects of teachers' occupational well-being are generally associated with ways in which the teachers teach (Addimando, 2019; Bakker and Bal, 2010; Whitaker et al., 2015) and experiences of relatedness with their students (Klassen et al., 2012), it was expected that subgroups

would differ with respect to interactional styles of teaching as well (Hypothesis 2c).

MATERIALS AND METHODS

Participants and Procedure

The data for the present study were collected as part of the larger The Effects of Teacher-Student Interactions on Child Outcomes: Behavioral and Psychophysiological Mechanisms (ETSIC) study (Lerkkanen and Pakarinen, 2016–2021) in the Spring of 2020. The ethical approval provided by the ethical committee of the University of Jyväskylä was received prior to commencing the study, and the permits to execute data collection in three municipalities located in different parts of Finland were asked and granted from local education authorities before contacting the teachers. Teachers in these three municipalities were approached via e-mail by asking whether they would agree to answer a questionnaire concerning their occupational well-being and teaching practices. Within the same e-mail, the privacy notices of the study were delivered as attached. Participation was voluntary and anonymous, and none of the contacting with the teachers were done via school administrative staff.

The participants were 279 teachers (77.8 female; 22.2% male) working as class teachers for grades 1–6 of primary school during the 2019–2020 academic year, including during national school closures due to the COVID-19 pandemic. The vast majority (98.2%) of the teachers had a masters' degree and were qualified class teachers. Participants' age ranged between 24 and 65 years ($M = 42.52$ years; $SD = 9.85$; $Md = 36$), and work experience ranged between 0 and 37 years ($M = 14.75$ years; $SD = 10.23$ years; $Md = 13$ years).

Measures

Teachers' Occupational Stress

Two separate single-item questions were utilized to measure teachers' occupational stress. First, to measure the extent of teachers' occupational stress, teachers were asked to answer the following question on a scale from 1 (*not at all*) to 6 (*very much*): "Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of stress these days?" (Elo et al., 2003). The previous literature has verified that this single-item stress measure drawn from the Occupational Stress Questionnaire is a valid to identify occupational wellness (Elo et al., 2003; see also; Eddy et al., 2019). Second, teachers' occupational stress due to the COVID-19 pandemic was measured with a single item composed for the present study. Teachers were asked to answer the following item on a scale from 1 (*not at all*) to 4 (*entirely*): "To what extent has the increase in your occupational stress been due to the COVID-19 situation?"

Work Engagement

Teachers' work engagement was measured using the Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2002; Seppälä et al., 2009). Six items of the UWES were utilized to measure the

two core dimensions of work engagement: vigor (3 items, $\alpha = 0.81$; e.g., “At my work, I feel bursting with energy”), and dedication (3 items, $\alpha = 0.86$; e.g., “I am enthusiastic about my job”). Teachers were asked to answer based on a 7-point Likert scale (1 = *never*; 7 = *daily*). Based on norm scores drawn across occupations (Schaufeli and Bakker, 2004), vigor is considered high when the average value for the dimension is between 5.81 and 6.65, and dedication is considered high when the average value for the dimension is between 5.71 and 6.69.

Emotional Exhaustion

Teachers’ emotional exhaustion was measured with a shortened Finnish version of the Bergen Burnout Inventory (Salmela-Aro et al., 2011). In the present study, three items which constitute the sub-scale of emotional exhaustion were used ($\alpha = 0.78$; e.g., “I am snowed under with work”). Teachers were asked to answer on a scale from 1 (*completely disagree*) to 6 (*strongly agree*).

Recovery From Work

Teachers’ recovery experiences were measured using the Recovery Experience Questionnaire (Sonnetag and Fritz, 2007, see also; Siltaloppi et al., 2011). Teachers were asked to respond to 15 items with respect to their off-job time. The scale included four sub-scales: psychological detachment (four items, $\alpha = 0.86$; e.g., “I don’t think about work at all”), relaxation (three items, $\alpha = 0.80$; e.g., “I do relaxing things”), mastery (four items, $\alpha = 0.89$; e.g., “I seek out intellectual challenges”), and control (four items, $\alpha = 0.83$; e.g., “I take care of things the way that I want them done”). Teachers’ answers ranged from 1 (*totally agree*) to 5 (*totally disagree*).

Teacher Interactional Styles

Teachers’ interactional styles of teaching were measured utilizing the Teachers Interactional Style Scale (Aunola et al., 2005; see also; Pakarinen et al., 2010). Teachers were asked to rate items comprising their affection (eight items, $\alpha = 0.84$; e.g., “I respect the opinion of the students in my group”), behavioral control (three items, $\alpha = 0.76$; e.g., “Students have to learn that rules are important in our group”), and psychological control (four items, $\alpha = 0.77$; e.g., “Students in my class should know how much I sacrifice for them”) towards their students. Teachers answers ranged from 1 (*does not fit me at all*) to 5 (*fits me very well*).

Statistical Analyses

A person-oriented approach with a latent profile analysis (LPA) (Vermunt and Magison, 2002; Lubke and Muthen, 2005) was applied in the present study. LPA is a model-based variant of traditional cluster analysis, in which the aim is to identify clusters of individuals (i.e., subgroups) based on observed continuous variables (Nylund-Gibson and Masyn, 2016). The advantage of this kind of analytical approach is that the data can be approached by recognizing that populations are not necessarily heterogeneous in terms of how the measured variables are related to possible outcomes (Bergman and Trost, 2006; Laursen and Hoff, 2006).

During the enumeration process, a series of LPAs are performed to examine different profile solutions with different number of profiles in order to conclude the best fitting solution based on the fit indices as well as theoretical and practical considerations. The fit indices used in the present study were log-likelihood (log L), Akaike information criterion (AIC), Bayesian information criterion (BIC), and adjusted Bayesian information criterion (ABIC), as well as Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test and adjusted Lo-Mendell-Rubin (LMR) test. The LPA with the lowest log L, AIC, BIC, and ABIC values is considered to provide a good fit to the data (e.g., Nylund et al., 2007). With VLMR and LMR tests, $p > 0.05$ indicates that the model with one less profile should be rejected in favor of the estimated model (Lo et al., 2001).

In the present study, LPAs were conducted by utilizing teachers’ self-ratings on their work-related stress and experiences of increased stress due the COVID-19 situation as well as vigor and dedication (i.e., the core dimensions of work engagement) in order to identify subgroups of teachers with similar patterns of their occupational well-being. The LPAs were executed using the Mplus statistical package (version 7.4; Muthén and Muthén, 1998–2017). With the Auxiliary function and the three-step procedure, analyses comparing teachers’ emotional exhaustion, recovery from work, and teachers’ interactional styles between the identified profile groups were carried out using multinomial regression analyses and pairwise comparisons along with LPAs. In addition, to validate the chosen profile solution, one-way analyses of variance (ANOVAs) and pairwise comparisons were conducted using the SPSS package in terms of the criterion variables.

RESULTS

Descriptive Statistics

Descriptive statistics of the criterion variables (Table 1) suggested that participating teachers experienced, on average, occupational stress to some extent or quite a lot, and they reported that the COVID-19 situation was to some extent the reason for their increased stress. In addition, based on norm scores drawn across occupations (Schaufeli and Bakker, 2004), teachers reported, on average, high and average levels of work engagement. Correlations calculated for the criterion variables (Table 1) suggested, first, a moderate positive correlation between the two negative aspects of occupational well-being (i.e., occupational stress and occupational stress due to the COVID-19 pandemic). Second, a strong positive correlation was found between the two positive aspects of occupational well-being (i.e., vigor and dedication). Positive and negative aspects of occupational well-being were not statistically significantly correlated or correlations were very weak.

Profile Groups Based on Teachers’ Occupational Well-Being

Following the first research question, LPAs were conducted to examine what kind of subgroups based on teachers’ occupational

TABLE 1 | Descriptive statistics and correlation matrix for aspects of teachers' occupational well-being (n = 279).

	M (SD)	Min	Max	1	2	3	4
1. Occupational stress	3.56 (1.29)	1	6		0.43*	-0.22*	-0.11
2. Occupational stress due to the COVID-19 pandemic	2.29 (0.85)	1	4			0.07	0.21*
3. Vigor	5.69 (0.99)	2	7				0.86*
4. Dedication	5.89 (0.99)	2	7				

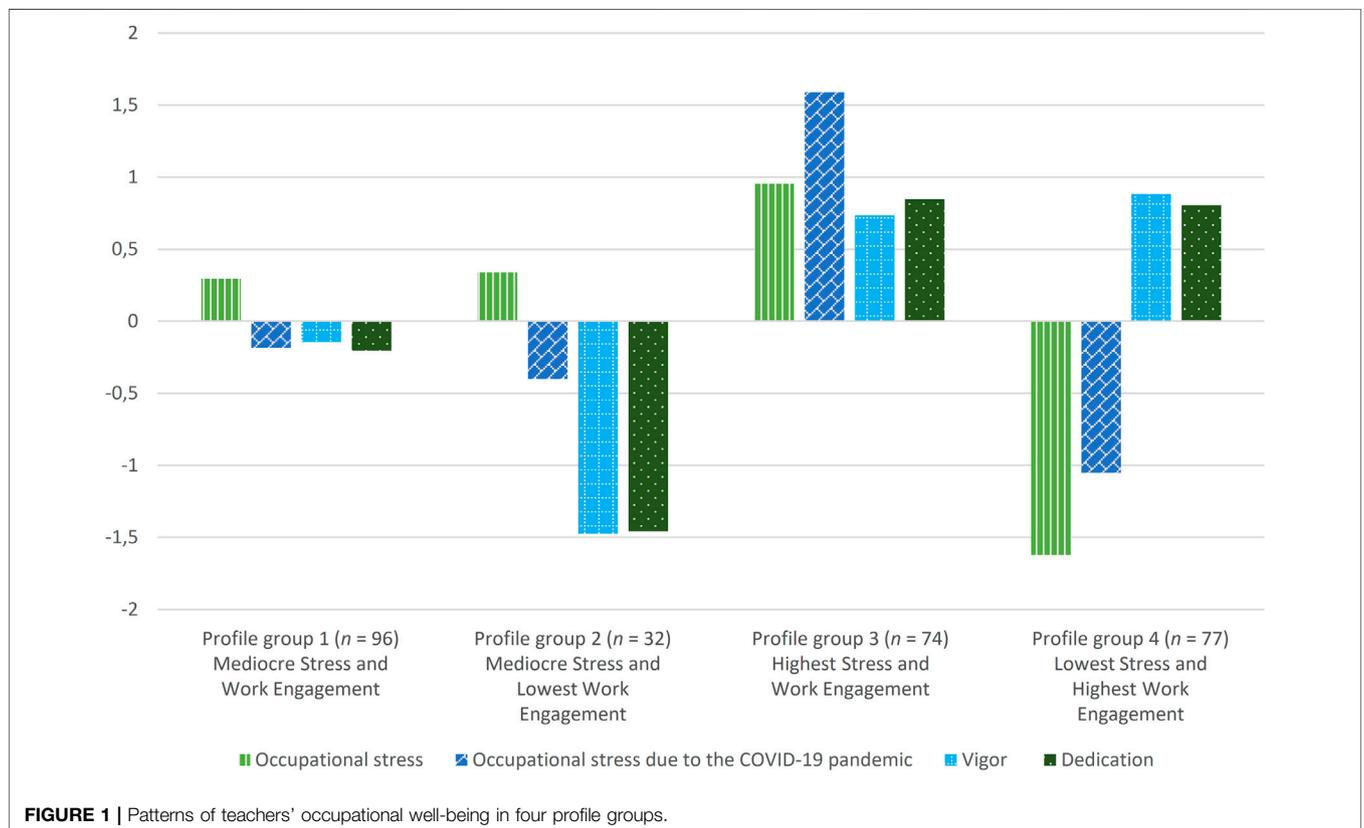
Occupational stress: 1 (not at all) to 6 (very much); Occupational stress due to the COVID-19 pandemic: 1 (not at all) to 4 (entirely); Vigor and Dedication (the core dimensions of Work engagement): 1 (never) to 7 (daily).

*p = 01.

TABLE 2 | Fit indices for the series of latent profile analyses (LPAs).

Number of profiles	Log L	AIC	BIC	ABIC	pVLMR	pLMR	n
1	-1,601.92	3,219.83	3,248.88	3,223.52			279
2	-1,486.80	2,999.60	3,046.80	3,005.58	0.011	0.012	71/208
3	-1,420.20	2,876.39	2,941.76	2,884.68	0.001	0.001	141/33/105
4	-1,394.75	2,835.50	2,919.02	2,846.09	0.020	0.023	96/32/74/77
5	-1,374.16	2,804.33	2,906.00	2,817.21	0.199	0.210	53/32/55/79/60
6	-1,354.90	2,775.80	2,895.63	2,790.99	0.202	0.210	5/74/59/29/55/57
7	-1,332.45	2,740.90	2,878.89	2,758.39	0.057	0.061	5/55/38/47/27/46/60

log L, log-likelihood; AIC, akaike information criterion; BIC, bayesian information criterion; ABIC, adjusted bayesian information criterion; VLMR, vuong-lo-mendell-rubin likelihood ratio test; LMR, adjusted lo-mendell-rubin test.



well-being can be identified. The features of occupational well-being included in the LPAs were the teachers' work-related stress and increase in stress due to the COVID-19 pandemic along with

vigor and dedication (i.e., the core dimensions of work engagement). The LPAs demonstrated that fit indices of log L, BIC, ABIC, and AIC decreased when number of profiles

TABLE 3 | Differences in teachers' occupational well-being between the profile groups.

	Profile group 1	Profile group 2	Profile group 3	Profile group 4	ANOVA	Pairwise comparison
	Mediocre stress and work engagement (<i>n</i> = 96)	Mediocre stress and lowest work engagement (<i>n</i> = 32)	Highest stress and work engagement (<i>n</i> = 74)	Lowest stress and highest work engagement (<i>n</i> = 77)		
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>F</i> _(3,275)	
Occupational stress	3.81 (1.12)	3.84 (1.11)	4.27 (1.21)	2.47 (0.70)	39.68***	1, 2, 3 > 4
Occupational stress due to the COVID-19 pandemic	2.18 (0.74)	2.06 (0.76)	3.16 (0.55)	1.70 (0.54)	69.00***	1, 2, 4 < 3 / 1 > 4
Vigor	5.27 (0.48)	3.75 (0.65)	6.27 (0.49)	6.45 (0.47)	271.55***	1, 3, 4 > 2 / 1 < 3, 4
Dedication	5.41 (0.47)	3.96 (0.62)	6.63 (0.99)	6.59 (0.42)	349.43***	1, 3, 4 > 2 / 1 < 3, 4

Occupational stress: 1 (not at all) to 6 (very much); Occupational stress due to the COVID-19 pandemic: 1 (not at all) to 4 (entirely); Vigor and Dedication (the core dimensions of work engagement): 1 (never) to 7 (daily); Pairwise comparisons reported between groups in which differences are statistically significant at $p < 0.001$ with ANOVA post hoc Dunnett correction. *** $p < .001$.

increased without providing a point of elbowing (Table 2). With VLMR and LMR tests, the p -values lower than 0.05 suggested that up to four-profile solution, the model with one less profile could be rejected in favor of the estimated model. Therefore, as the four-profile solution was also theoretically and practically reasonable, it was determined to provide the most optimal fit with the data.

In the four-profile solution (Figure 1; Table 3), profile group 1 was the largest and it applied to 34.4% of teachers ($n = 96$). This profile group was composed of teachers experiencing mediocre levels of occupational stress as well as work engagement, leading the profile to be named *Mediocre Stress and Work Engagement*. Profile group 2 was the smallest group and it applied to 11.5% of teachers ($n = 32$). This group was comprised of teachers experiencing somewhat mediocre levels of occupational stress along with lowest self-ratings concerning their work engagement. Therefore, profile group 2 was named *Mediocre Stress and Lowest Work Engagement*. With respect to size of the groups, the last two profile groups, profile group 3 and profile group 4, were quite similar to each other. Profile group 3 applied to 26.5% of teachers ($n = 74$), and it was composed of teachers experiencing highest level of occupational stress and highest increase in their stress due to COVID-19 pandemic along with highest vigor and dedication. Based on that, profile group 3 was named *Highest Stress and Work Engagement*. The last profile group, profile group 4, applied to 27.6% of teachers ($n = 77$). It was composed of teachers experiencing the lowest levels of occupational stress while sharing the highest levels of work engagement with profile group 3. Therefore, profile group 4 was named *Lowest Stress and Highest Work Engagement*.

The results of one-way analyses of variance (ANOVAs) suggested that within the four-profile solution, the profile groups differed from each other with respect to the criterion variables on which the LPAs were based on (Table 3). The results of pairwise comparisons disclosed unique and distinctive features within each profile (Figure 1; Table 3). For example, while profile groups 3 and 4 shared highest values in teachers' work engagement, teachers in these two groups differed significantly

in their occupational stress (Table 3). Therefore, patterns of occupational well-being were not identical to each other between different profile groups.

Differences in Teachers' Emotional Exhaustion Between the Profile Groups

Multinomial regression analysis with pairwise comparisons suggested differences in teachers' emotional exhaustion between the profile groups (Table 4). Teachers identified as having the highest levels of stress and increase in stress due to the COVID-19 situation along with the highest levels of vigor and dedication (i.e., profile group 3) reported significantly higher levels of emotional exhaustion than teachers in the other profile groups. On the contrary, teachers identified as having the lowest levels of stress along with the highest levels of vigor and dedication (i.e., profile group 4), reported significantly lower levels of emotional exhaustion than teachers in other profile groups. Conversely, teachers identified as having similar levels of occupational stress but different levels in their work engagement (i.e., profile groups 1 and 2) did not differ significantly in their emotional exhaustion.

Differences in Teachers' Recovery From Work Between the Profile Groups

Differences in teachers' recovery experiences were examined with the multinomial regression analysis and pairwise comparisons. The results indicated that with respect to three out of four subscales of teachers' recovery from work (i.e., psychological detachment, relaxation, and mastery), the identified subgroups did not significantly differ from each other. With respect to the sub-scale of control, teachers identified as having lowest occupational stress and highest work engagement (i.e., profile group 4), reported significantly higher level of control than teachers in profile group 1 (i.e., *Mediocre Stress and Work Engagement*; $\beta = 1.08$, $p = 0.026$) or in profile group 2 (i.e., *Mediocre Stress and Lowest Work Engagement*; $\beta = 1.11$, $p = 0.006$).

TABLE 4 | Mean levels of emotional exhaustion and estimates of pairwise comparison analyses between the groups.

	M(SD)	Estimates based on paired group comparisons		
		Profile group 2	Profile group 3	Profile group 4
Mediocre stress and work engagement (Profile group 1; $n = 96$)	3.92 (1.09)	ns	-0.94**	0.68**
Mediocre stress and lowest work engagement (Profile group 2; $n = 32$)	3.89 (1.29)		-0.99**	0.64*
Highest stress and work engagement (Profile group 3; $n = 74$)	4.40 (1.01)			1.62***
Lowest stress and highest work engagement (Profile group 4; $n = 77$)	2.91 (1.01)			

Range from 1 (completely disagree) to 6 (strongly agree).

*** $p < .001$.

** $p < .005$.

* $p = .029$.

Ns, non-significant.

Differences in Teachers' Interactional Styles of Teaching Between the Profile Groups

The results of multinomial regression analysis and pairwise comparisons suggested some differences between profile groups with respect to teachers' self-reported interactional styles. Statistically significant differences were found concerning subscales of affection and behavioral control, but not for the psychological control.

With respect to the sub-scale of affection, the results indicated that profile groups 1 and 2 (i.e., *Mediocre Stress and Work Engagement*, and *Mediocre Stress and Lowest Work Engagement*, respectively) did not differ from each other, nor did the Profile groups 3 and 4 (*Highest Stress and Work Engagement*, and *Lowest Stress and Highest Work Engagement*, respectively). However, teachers experiencing mediocre stress along with mediocre or lowest levels of work engagement (i.e., profile groups 1 and 2) reported significantly lower affection with their students than teachers in profile group 3 (*Highest Stress and Work Engagement*; $\beta = -2.44$, $p = 0.006$; $\beta = -3.28$, $p < 0.001$, respectively) or in profile group 4 (*Lowest Stress and Highest Work Engagement*; $\beta = -2.19$, $p = 0.004$; $\beta = -3.03$, $p = 0.001$, respectively) did. In other words, teachers experiencing highest work engagement along with either highest stress (i.e., profile group 3) or lowest stress (i.e., profile group 4) reported the highest levels of affection with their students.

The results also indicated that teachers identified as having the highest stress and work engagement (i.e., profile group 3) reported higher behavioral control than teachers in profile groups 1, 2, and 4 did ($\beta = 1.30$, $p = 0.022$; $\beta = 1.33$, $p = 0.040$; $\beta = 1.783$, $p = 0.005$, respectively). No other differences between profile groups were found with respect to the behavioral control.

DISCUSSION

The present study examined teachers' occupational well-being during the first few months of the COVID-19 pandemic. The study contributes to the literature by utilizing person-oriented approach to identify subgroups of teachers with different profiles

of occupational well-being during an exceptional time when the teachers around the globe faced new challenges and unexpected changes in their work. In order to appreciate the complexity of the reality, both negative and positive aspects of occupational well-being were simultaneously examined through teachers' self-ratings of work-related stress and increase of stress due to the COVID-19 pandemic as well as the core dimensions of work engagement (i.e., vigor and dedication). Along with identifying subgroups based on the occupational well-being, the findings contribute to the literature also by providing a unique view on how these identified subgroups differed with respect to teachers' emotional exhaustion, recovery from work, and interactional styles of teaching.

First, as expected (Hypothesis 1), several distinct subgroups based on teachers' occupational well-being during the COVID-19 pandemic were identified. Within the present four-profile solution, 34.4% of teachers were identified with *Mediocre Stress and Work Engagement* (profile group 1), 11.5% of teachers were identified with *Mediocre Stress and Lowest Work Engagement* (profile group 2), 26.5% of teachers were identified with *Highest Stress and Work engagement* (profile group 3), and 27.6% of teachers were identified with *Lowest Stress and Highest Work Engagement* (profile group 4). In other words, there were some teachers who displayed a pattern where higher levels of work engagement (representing the positive aspect of occupational well-being) were accompanied by lower levels of stress (representing the negative aspect of occupational well-being); however, some teachers also displayed a pattern in which work engagement and occupational stress both remained at relatively high or average levels.

The presence of different patterns for teachers' occupational well-being can be seen to concur with the complexity of the phenomenon. While there are no prior studies with exactly the same set of factors from which the present profile analysis was drawn from, somewhat similarly formed patterns of teachers' occupational well-being have been found previously in studies focusing on well-being with respect to experiences of stress and coping with stress before the COVID-19 pandemic (Herman et al., 2018) and with respect to work burnout and engagement before (Salmela-Aro et al., 2019) and during (Salmela-Aro et al., 2020) the COVID-19 pandemic. It seems that while negative and

positive aspects of occupational well-being may be reciprocally connected to each other, the level of occupational stress does not necessarily determine the level of work engagement or vice versa. This could perhaps be due to individual differences in ways how teachers' job-related and personal resources can outweigh the work-related demands (e.g., Bakker and Demerouti, 2007; Berjemo-Toro et al., 2016).

It is common that teachers report high levels of occupational stress (Kyriacou, 2001; Travers, 2017), and recent studies indicate that during the time of school closures following the COVID-19 pandemic, teachers were also stressed because of the situation (MacIntyre et al., 2020; Collie, 2021). The results indicate that the increase in stress due to the COVID-19 pandemic was particularly high among the teachers identified with highest stress and work engagement (i.e., profile group 3). Only less than one third of the teachers were identified with a profile in which the level of occupational stress was somewhat low, and the teachers had reported that the COVID-19 pandemic had resulted less than some increase in their stress (i.e., profile group 4). Thus, the rest of the teachers (72.4% in total) belonged to profiles in which occupational stress was higher than average (i.e., profile groups 1, 2, and 3). Therefore, the present findings can be seen to compliment previous literature by concurring that the first few months of the COVID-19 pandemic may have been stressful time for the teachers (MacIntyre et al., 2020; Collie, 2021). However, while many teachers reported being quite stressed, the findings also complemented the previous literature by illustrating that there was also more than one quarter of teachers who did not experience high levels of occupational stress nor more than somewhat minor increase in their stress due to the COVID-19 pandemic. Thus, it should be noted that occupational stress remains as an individual experience during exceptional times, such as during a global pandemic. Acknowledging these individual experiences is central to providing administrative and personal support for occupational well-being.

Interestingly, the present findings also indicated that during the first few months of the COVID-19 pandemic, most of the teachers reported of being, on average, relatively highly engaged with their work. Based on the norm scores suggested for the UWES measure (Schaufeli and Bakker, 2004), teachers identified with highest work engagement (i.e., profile groups 3 and 4) assessed their experiences of vigor and dedication with values that can be interpreted as high. Teachers identified with mediocre work engagement (i.e., profile group 1), in turn, reported average levels of vigor and dedication, while teachers identified with lowest work engagement (i.e., profile group 2) experienced only low levels.

Second, as expected (Hypothesis 2a), most of the subgroups differed with respect to teachers' experiences of emotional exhaustion. Teachers identified with lowest stress and highest work engagement (i.e., profile group 4) manifested also lowest levels of emotional exhaustion, which aligns nicely with previous literature suggesting that experience of exhaustion is an opposite of vigor (Schaufeli et al., 2002; Schaufeli and Bakker, 2010). However, the highest levels of emotional exhaustion were evidenced among teachers who had

highest levels of stress along with highest levels of work engagement (i.e., profile group 3). In addition, two profile groups with similar levels of occupational stress yet different levels of vigor (i.e., Profile groups 1 and 2), did not differ significantly with respect to their experiences of emotional exhaustion. Therefore, it seems that at least during the first few months of the COVID-19 pandemic, experiences of vigor and exhaustion were not exactly opposite experiences for many teachers (cf. Schaufeli and Bakker, 2010). Some relatively similar findings have been reported before the COVID-19 pandemic as well (Salmela-Aro et al., 2019). This result calls attention to the need to more closely examine the individual experiences of teachers rather than talking about teachers as a homogenous group.

With respect to findings of the present study, it is possible to speculate whether teachers' experiences of emotional exhaustion were more determined by the level of their occupational stress and increase of stress due to the COVID-19 pandemic than by the level of vigor or dedication. This would also be in line with the speculation that perhaps some teachers' work engagement was not severely affected by the COVID-19 pandemic during the Spring of 2020. Nevertheless, the present findings highlight the importance of providing support for those teachers who are experiencing occupational stress or increase of stress due to the COVID-19 situation. Recently, Salmela-Aro et al. (2020) identified that during the first few months of the COVID-19 pandemic, 11% of teachers were "engaged but burned out". In the present study, 26.5% of the teachers were somewhat similarly "engaged but stressed" (i.e., Profile group 3). It would be crucially important to recognize those teachers who are experiencing high occupational stress while functioning well due to their high work engagement so they could be supported before their stress evolves into burnout. It is likely that this concern would be real even when the COVID-19 pandemic has been overcome.

Third, in contrast to what was expected (Hypothesis 2b), subgroups did not clearly differ with respect to teachers' recovery from work. From four major recovery experiences examined, differences were found only in experiences of control (i.e., in ways on how the teachers experienced of being able to decide schedules and activities of their leisure time; Sonnentag and Fritz, 2007). In the previous literature, there are some examples showing that from different recovery experiences related to teachers' life satisfaction, control plays the most significant role (e.g., Virtanen et al., 2020). This could perhaps explain to some extent the results of the present study indicating that it was teachers identified with lowest occupational stress and highest work engagement (i.e., profile groups 4) who experienced higher control over their leisure time than those who were identified with mediocre stress along with mediocre or lowest work engagement (i.e., profile groups 1 and 2). However, it does not provide a solid reason why the identified subgroups did not differ with respect to psychological detachment, relaxation, or mastery. Perhaps the absence of clear differences could be related to changes that the COVID-19 pandemic made into teachers' leisure time as well. Similar to many other countries, Finnish government (2020b)

recommended social distance and many leisure activities were put on hold in the Spring 2020. Therefore, it is possible that during the first few months of the COVID-19 pandemic, teachers were still updating their ways to recover from work as well.

Finally, in line with what was expected (Hypothesis 2c), there were differences between identified subgroups with respect to teachers' interactional styles of teaching. First, the findings indicated that the teachers who experienced highest work engagement along with either highest stress (i.e., profile group 3) or lowest stress (i.e., profile group 4), reported highest affection with their students. This means that regardless of differences in the levels of occupational stress, teachers with very high levels of vigor and dedication, valued the most the relatedness with students, that is, of being warm and caring with students, and being responsive to students' needs (see also, Kuntsche et al., 2006; Pakarinen et al., 2010; Walker, 2008). However, the current study cannot be used to determine the causalities. It is impossible to determine whether teachers valued affective interactional style because of their very high levels of vigor and dedication, whether they experienced very high vigor and dedication due to their interactional style, or whether those were somewhat reciprocally linked to one another. Nevertheless, to some extent the present findings can be seen to support previous literature suggesting that teacher-student relationship is associated with teachers' occupational well-being (e.g., Spilt et al., 2011; Klassen et al., 2012), and importance of caring relationships remained to be present during the time of school closures followed from the COVID-19 pandemic as well (Kim and Asbury, 2020).

Along with differences found with respect to affection, teachers' interactional styles of teaching differed between profile groups also with respect to behavioral control. Teachers with highest stress and work engagement (i.e., profile group 3), reported higher behavioral control than teachers in any other profile groups did. It should be particularly noted that the difference was evidenced also between the two profile groups in where vigor and dedication were at equal levels (i.e., Profile groups 3 and 4). Thus, it was teachers with the highest levels of occupational stress and greatest increase of stress due to the COVID-19 situation, who highlighted the importance of rules and structures defining students' good behavior more than the others (see also, Kuntsche et al., 2006; Pakarinen et al., 2010; Wentzel, 2002). While causalities cannot be determined, it might be reasonable to wonder whether changes that teachers faced during the first few months of the COVID-19 pandemic (see UNESCO, UNICEF, and the World Bank, 2020; Vuorio et al., 2021) could have been particularly straining for the teachers who valued behavioral control in their interactional style. That would be somewhat in line with previous finding suggesting that loss of control over work was the third highest stressor for teachers during the first few months of the COVID-19 pandemic (MacIntyre et al., 2020).

In sum, the findings of the present study contribute to the literature by providing a stance for teachers' occupational well-being during the time of when the COVID-19 pandemic was recently begun. The findings concurred that occupational well-being is a complex phenomenon, and there are individual differences in teachers' occupational well-being. Patterns found

during the COVID-19 pandemic were somewhat similar to those found before. The findings indicated also that during the first few months of the COVID-19 pandemic many teachers experienced occupational stress as well as at least some increase of stress due to the pandemic. The experiences of stress were related to experiences of emotional exhaustion, and the teachers experiencing the highest levels of occupational stress were also the ones who valued behavioral control in their interactional style the most. However, somewhat surprisingly, the findings did not provide a reason to assume that the COVID-19 pandemic or school closures would have clearly affected on teachers' work engagement during the first few months of the pandemic. Moreover, the findings related to teachers' interactional styles of teaching suggested that the teachers with highest vigor and dedication reported the most of being warm and caring when interacting with students.

Limitations and Suggestions for Further Research

The present study has some limitations. First, this study did not focus on possible differences in teachers' occupational well-being based on participants' background factors (e.g., gender, age, and work experience) or include them as covariates. To understand how teachers from different backgrounds have experienced the COVID-19 pandemic, future studies should be undertaken. Second, teachers' occupational stress was measured with two single-item questions. While the usage of first single-item question has been previously validated to identify occupational wellness (Elo et al., 2003; see also; Eddy et al., 2019), the question used to assess the teachers' experiences of change in their occupational stress due to the COVID-19 pandemic, was used for the first time. In addition, it should be noted that the data were cross-sectional and collected during the first few months of the COVID-19 pandemic. That should be kept in mind when trying to generalize the findings into time when the COVID-19 pandemic does not dictate teachers' daily functions in work or during leisure time. Moreover, due to being cross-sectional, no causal inferences can be made. In the future, longitudinal research focusing on relations between occupational well-being during and after the COVID-19 pandemic is necessary. This would provide deeper knowledge of the ways in which teachers' occupational well-being has been evolving during the pandemic and what will happen afterwards. Particularly interesting would be to examine whether there has been changes in teachers' vigor and dedication as the COVID-19 pandemic has continued, and the ways on how that would be associated with teachers' occupational stress. With respect to the Job Demands-Resources model, the present findings raise the question of how long the experiences of stress or even exhaustion should last before imbalance between demands and resources would have decreasing effects on work engagement. This is something that would be important to understand even when sources of demands would not be as substantial as the COVID-19 pandemic or some other crisis. Crucially important would also be to find ways to recognize the teachers who are experiencing occupational stress or emotional exhaustion while being also

highly engaged in work, and find ways to support them during the COVID-19 pandemic, but also later on. In addition, research revealing the causalities between teachers' interactional styles of teaching and different negative and positive aspects of occupational well-being could enhance the understanding of the role that teacher-student interactions have in teachers' occupational well-being.

CONCLUSION

The present study reveals that teachers' occupational well-being is individually constructed. The findings indicate that many teachers experienced occupational stress during the first few months of the COVID-19 pandemic, but somewhat surprisingly teachers' work engagement was perhaps not severely affected by the pandemic at that point. However, the diversity in ways on how these different negative and positive aspects of well-being are drawn into patterns, highlights the importance of acknowledging the individual experiences of teachers rather than talking about teachers as certain group. This is central when examining teachers' occupational well-being during the time of the global pandemic and beyond.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because of the ongoing research. Requests to access the datasets should be directed to sannipoysa@jyu.fi.

REFERENCES

- Addimando, L. (2019). The Effect of Positive Working Conditions on Work Engagement and Teaching Classroom Practices: A Large Cross-Sectional Study in Switzerland. *Front. Psychol.* 10, 2129. doi:10.3389/fpsyg.2019.02129
- Aulén, A.-M., Pakarinen, E., Feldt, T., and Lerkkanen, M.-K. (2021). Teacher Coping Profiles in Relation to Teacher Well-Being: a Mixed Method Approach. *Teach. Teach. Education.* 102, 103323. doi:10.1016/j.tate.2021.103323
- Aunola, K., Lerkkanen, M.-K., Poikkeus, A.-M., and Nurmi, J.-E. (2005). *Teacher Interactional Style Scale*. Jyväskylä, Finland: University of Jyväskylä
- Bakker, A. B., and Bal, M. P. (2010). Weekly Work Engagement and Performance: A Study Among Starting Teachers. *J. Occup. Organ. Psychol.* 83 (1), 189–206. doi:10.1348/096317909X402596
- Bakker, A. B., and Demerouti, E. (2007). The Job Demands-Resources Model: State of the Art. *J. Managerial Psych* 22 (3), 309–328. doi:10.1108/02683940710733115
- Bakker, A. B., and Demerouti, E. (2008). Towards a Model of Work Engagement. *Career Dev. Int.* 13 (3), 209–223. doi:10.1108/13620430810870476
- Bakker, A. B., Hakanen, J. J., Demerouti, E., and Xanthopoulou, D. (2007). Job Resources Boost Work Engagement, Particularly when Job Demands Are High. *J. Educ. Psychol.* 99 (2), 274–284. doi:10.1037/0022-0663.99.2.274
- Bergman, L. R., and Trost, K. (2006). The Person-Oriented versus the Variable-Oriented Approach: Are They Complementary, Opposites, or Exploring Different Worlds? *Merrill-Palmer Q.* 52 (3), 601–632. doi:10.1353/mpq.2006.0023
- Bermejo-Toro, L., Prieto-Ursúa, M., and Hernández, V. (2016). Towards a Model of Teacher Well-Being: Personal and Job Resources Involved in Teacher

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The ethical committee of the University of Jyväskylä. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

SP was responsible for the research questions and statistical analyses of the present manuscript, and she act as a corresponding author. EP was the Responsible Researcher and M-KL was the Principal Investigator of the larger study projects The Effects of Teacher-Student Interactions on Child Outcomes: Behavioral and Psychophysiological Mechanisms (ETSIC), and The effect of coronavirus epidemic on education: Teacher stress and remote teaching practices as mechanisms for student outcomes (CONE), under which the current study has been conducted. They were responsible on study design, data collection, publishing plan, and they supported with analyzing the data and by co-authoring the current manuscript.

FUNDING

This study was funded by grants from the Academy of Finland (No. 335635; 317610), and by the grant from The Trade Union of Education in Finland.

- Burnout and Engagement. *Educ. Psychol.* 36 (3), 481–501. doi:10.1080/01443410.2015.1005006
- Chaplain, R. P. (2008). Stress and Psychological Distress Among Trainee Secondary Teachers in England. *Educ. Psychol.* 28 (2), 195–209. doi:10.1080/01443410701491858
- Collie, R. J. (2021). COVID-19 and Teachers' Somatic Burden, Stress, and Emotional Exhaustion: Examining the Role of Principal Leadership and Workplace Buoyancy. *AERA Open.* 7, 233285842098618. doi:10.3886/E127641V1
- Cumming, T. (2017). Early Childhood Educators' Well-Being: An Updated Review of the Literature. *Early Child. Educ. J.* 45 (5), 583–593. doi:10.1007/s10643-016-0818-6
- Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The Job Demands-Resources Model of Burnout. *J. Appl. Psychol.* 86 (3), 499–512. doi:10.1037/0021-9010.86.3.499
- Eddy, C. L., Herman, K. C., and Reinke, W. M. (2019). Single-Item Teacher Stress and Coping Measures: Concurrent and Predictive Validity and Sensitivity to Change. *J. Sch. Psychol.* 76, 17–32. doi:10.1016/j.jsp.2019.05.001
- Elo, A.-L., Leppänen, A., and Jahkola, A. (2003). Validity of a Single-Item Measure of Stress Symptoms. *Scand. J. Work Environ. Health.* 29 (6), 444–451. doi:10.5271/sjweh.752
- Eye, A. v., Bogat, G. A., and Rhodes, J. E. (2006). Person-oriented and Variable-Oriented Research: Concepts, Results, and Development. *Merrill-Palmer Q.* 52 (3), 390–420. doi:10.1353/mpq.2006.0032
- Ferguson, K., Frost, L., and Hall, D. (2012). Predicting Teacher Anxiety, Depression, and Job Satisfaction. *J. Teach. Learn.* 8 (1), 27–42. doi:10.22329/jtl.v8i1.2896
- Finnish Government (2020a). VALTIONEUVOSTON SUOSITUKSET Yliopistoille, Ammattikorkeakouluille, Lukiokoulutuksen ja Ammatillisen Koulutuksen, vapaan Sivistystyön, Taiteen Perusopetuksen, Perusopetuksen, Esiopetuksen Sekä Varhaiskasvatuksen Järjestäjille Koronaviruspandemian

- aikana [Government Policy for Universities, Universities of Applied Sciences, General Upper Secondary Education, Vocational Education, Liberal Education, Basic Art Education, Primary and Lower Secondary Education and Early Childhood Education and Care during the Coronavirus Pandemic of 16 March]. Available at: <https://minedu.fi/documents/1410845/4449678/Suosituksset+16.3.2020/cc750ec2-9603-c2fd-79a7-ebc56c71a4b7/Suosituksset+16.3.2020.pdf> (Accessed March 21, 2021)
- Finnish Government (2020b). Government, in Cooperation with the President of the Republic, Declares a State of Emergency in Finland over Coronavirus Outbreak. [Press release.]. Available at: <https://valtioneuvosto.fi/en/-/10616/hallitus-totesi-suomen-olevan-poikkeusoloissa-koronavirustilanteen-vuoksi> (Accessed April 3, 2021)
- Foley, C., and Murphy, M. (2015). Burnout in Irish Teachers: Investigating the Role of Individual Differences, Work Environment and Coping Factors. *Teach. Teach. Education*. 50, 46–55. doi:10.1016/j.tate.2015.05.001
- González-Romá, V., Schaufeli, W. B., Bakker, A. B., and Lloret, S. (2006). Burnout and Work Engagement: Independent Factors or Opposite Poles? *J. Vocat. Behavior* 68 (1), 165–174. doi:10.1016/j.jvb.2005.01.003
- Granziera, H., and Perera, H. N. (2019). Relations Among Teachers' Self-Efficacy Beliefs, Engagement, and Work Satisfaction: A Social Cognitive View. *Contemp. Educ. Psychol.* 58, 75–84. doi:10.1016/j.cedpsych.2019.02.003
- Hakanen, J. J., Bakker, A. B., and Schaufeli, W. B. (2006). Burnout and Work Engagement Among Teachers. *J. Sch. Psychol.* 43 (6), 495–513. doi:10.1016/j.jsp.2005.11.001
- Herman, K. C., Hickmon-Rosa, J. e., and Reinke, W. M. (2018). Empirically Derived Profiles of Teacher Stress, Burnout, Self-Efficacy, and Coping and Associated Student Outcomes. *J. Positive Behav. Interventions*. 20 (2), 90–100. doi:10.1177/1098300717732066
- Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P., and Millet, C. (2005). The Experience of Work-related Stress across Occupations. *J. Managerial Psych.* 20 (2), 178–187. doi:10.1108/02683940510579803
- Kim, L. E., and Asbury, K. (2020). 'Like a Rug Had Been Pulled from under You': The Impact of COVID-19 on Teachers in England during the First Six Weeks of the UK Lockdown. *Br. J. Educ. Psychol.* 90 (4), 1062–1083. doi:10.1111/bjep.12381
- Klassen, R. M., and Chiu, M. M. (2010). Effects on Teachers' Self-Efficacy and Job Satisfaction: Teacher Gender, Years of Experience, and Job Stress. *J. Educ. Psychol.* 102 (3), 741–756. doi:10.1037/a0019237
- Klassen, R. M., Perry, N. E., and Frenzel, A. C. (2012). Teachers' Relatedness with Students: An Underemphasized Component of Teachers' Basic Psychological Needs. *J. Educ. Psychol.* 104 (1), 150–165. doi:10.1037/a0026253
- Kuntsche, E., Gmel, G., and Rehm, J. (2006). The Swiss Teaching Style Questionnaire (STSQ) and Adolescent Problem Behaviors. *Swiss J. Psychol.* 65 (3), 147–155. doi:10.1024/1421-0185.65.3.147
- Kyriacou, C. (2001). Teacher Stress: Directions for Future Research. *Educ. Rev.* 53 (1), 27–35. doi:10.1080/00131910120033628
- Laursen, B. P., and Hoff, E. (2006). Person-Centered and Variable-Centered Approaches to Longitudinal Data. *Merrill-Palmer Q.* 52 (3), 377–389. doi:10.1353/mpq.2006.0029
- Lerkanen, M.-K., and Pakarinen, E. (2016–2021). *The Effects of Teacher-Student Interactions on Child Outcomes: Behavioral and Psychophysiological Mechanisms (ETSIC) Study*. Finland: Jyväskylä, University of Jyväskylä. Available at: <http://www.jyu.fi/tessi>
- Li, Q., Miao, Y., Zeng, X., Tarimo, C. S., Wu, C., and Wu, J. (2020). Prevalence and Factors for Anxiety during the Coronavirus Disease 2019 (COVID-19) Epidemic Among the Teachers in China. *J. Affective Disord.* 277, 153–158. doi:10.1016/j.jad.2020.08.017
- Lo, Y., Mendel, N. R., and Rubin, D. B. (2001). Testing the Number of Components in a normal Mixture. *Biometrika*. 88, 767–778. doi:10.1093/biomet/88.3.767
- Lubke, G. H., and Muthén, B. (2005). Investigating Population Heterogeneity with Factor Mixture Models. *Psychol. Methods*. 10 (1), 21–39. doi:10.1037/1082-989X.10.1.21
- MacIntyre, P. D., Gregersen, T., and Mercer, S. (2020). Language Teachers' Coping Strategies during the Covid-19 Conversion to Online Teaching: Correlations with Stress, Wellbeing and Negative Emotions. *System*. 94, 102352. doi:10.1016/j.system.2020.102352
- Madigan, D. J., and Kim, L. E. (2021). Does Teacher Burnout Affect Students? A Systematic Review of its Association with Academic Achievement and Student-Reported Outcomes. *Int. J. Educ. Res.* 105, 101714. doi:10.1016/j.ijer.2020.101714
- Maslach, C., Schaufeli, W. B., and Leiter, M. P. (2001). Job Burnout. *Annu. Rev. Psychol.* 52 (1), 397–422. doi:10.1146/annurev.psych.52.1.397
- McIntyre, T. M., McIntyre, S. E., and Francis, D., J. (2017). *Educator Stress. An Occupational Health Perspective*. Cham: Springer International Publishing. doi:10.1007/978-3-319-53053-6
- Montgomery, C., and Rupp, A. A. (2005). A Meta-Analysis for Exploring the Diverse Causes and Effects of Stress in Teachers. *Can. J. Education / Revue canadienne de l'éducation*. 28, 458–488. doi:10.2307/4126479
- Muthén, L. K., and Muthén, B. O. (1998–2017). *Mplus User's Guide*. Seventh edition. Los Angeles, CA: Muthén & Muthén.
- Nylund, K. L., Asparouhov, T., and Muthén, B. O. (2007). Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study. *Struct. Equation Model. A Multidisciplinary J.* 14 (4), 535–569. doi:10.1080/10705510701575396
- Nylund-Gibson, K., and Masyn, K. E. (2016). Covariates and Mixture Modeling: Results of a Simulation Study Exploring the Impact of Misspecified Effects on Class Enumeration. *Struct. Equation Model. A Multidisciplinary J.* 23, 782–797. doi:10.1080/10705511.2016.1221313
- Pakarinen, E., Lerkanen, M.-K., Poikkeus, A.-M., Kiuru, N., Siekkinen, M., Rasku-Puttonen, H., et al. (2010). A Validation of the Classroom Assessment Scoring System in Finnish Kindergartens. *Early Education Development*. 21 (1), 95–124. doi:10.1080/10409280902858764
- Parker, P. D., Martin, A. J., Colmar, S., and Liem, G. A. (2012). Teachers' Workplace Well-Being: Exploring a Process Model of Goal Orientation, Coping Behavior, Engagement, and Burnout. *Teach. Teach. Education*. 28 (4), 503–513. doi:10.1016/j.tate.2012.01.001
- Parker, P. D., and Martin, A. J. (2009). Coping and Buoyancy in the Workplace: Understanding Their Effects on Teachers' Work-Related Well-Being and Engagement. *Teach. Teach. Education*. 25, 68–75. doi:10.1016/j.tate.2008.06.009
- Perera, H. N., Vosicka, L., Granziera, H., and McIlveen, P. (2018). Towards an Integrative Perspective on the Structure of Teacher Work Engagement. *J. Vocational Behav.* 108, 28–41. doi:10.1016/j.jvb.2018.05.006
- 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
- Salmela-Aro, K., Rantanen, J., Hyvönen, K., Tilleman, K., and Feldt, T. (2011). Bergen Burnout Inventory: Reliability and Validity Among Finnish and Estonian Managers. *Int. Arch. Occup. Environ. Health*. 84 (6), 635–645. doi:10.1007/s00420-010-0594-3
- Salmela-Aro, K., Upadyaya, K., and Hietajärvi, L. (2020). Suomalaisten Rehtorien Ja Opettajien Työhyvinvointiprofiilit Koronakeväänä [Work-Related Well-Being Profiles Among Finnish School Teachers and Principals during the spring of Covid-19]. *Psykologia*. 55 (6), 426–443.
- Schaufeli, W., and Bakker, A. (2004). *Utrecht Work Engagement Scale. Preliminary Manual*. Utrecht: Utrecht University. Available at: https://www.wilmarschaufeli.nl/publications/Schaufeli/Test%20Manual/Test_manual_UWES_English.pdf (Accessed March 30, 2021)
- 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*. Editors A. B. Bakker and M. P. Leiter (England: Psychology Press), 10–24.
- 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
- Schaufeli, W., and Salanova, M. (2014). "Burnout, Boredom and Engagement at the Workplace," in *An Introduction to Contemporary Work Psychology*. Editors M. C. Peeters, J. de Jonge, and T. W. Taris (England: Wiley-Blackwell), 293–320.
- Seppälä, P., Mauno, S., Feldt, T., Hakanen, J., Kinnunen, U., Tolvanen, A., et al. (2009). The Construct Validity of the Utrecht Work Engagement Scale: Multisample and Longitudinal Evidence. *J. Happiness Stud.* 10 (4), 459–481. doi:10.1007/s10902-008-9100-y
- Siltaloppi, M., Kinnunen, U., Feldt, T., and Tolvanen, A. (2011). Identifying Patterns of Recovery Experiences and Their Links to Psychological

- Outcomes across One Year. *Int. Arch. Occup. Environ. Health*. 84 (8), 877–888. doi:10.1007/s00420-011-0672-1
- Skaalvik, E. M., and Skaalvik, S. (2009). Does School Context Matter? Relations with Teacher Burnout and Job Satisfaction. *Teach. Teach. Education*. 25, 518–524. doi:10.1016/j.tate.2008.12.006
- Skaalvik, E. M., and Skaalvik, S. (2014). Teacher Self-Efficacy and Perceived Autonomy: Relations with Teacher Engagement, Job Satisfaction, and Emotional Exhaustion. *Psychol. Rep.* 114 (1), 68–77. doi:10.2466/14.02.PR0.114k14w0
- Skaalvik, E. M., and Skaalvik, S. (2016). Teacher Stress and Teacher Self-Efficacy as Predictors of Engagement, Emotional Exhaustion, and Motivation to Leave the Teaching Profession. *Creative Education*. 07, 1785–1799. doi:10.4236/ce.2016.713182
- Sonnentag, S., and Fritz, C. (2007). The Recovery Experience Questionnaire: Development and Validation of a Measure for Assessing Recuperation and Unwinding from Work. *J. Occup. Health Psychol.* 12 (3), 204–221. doi:10.1037/1076-8998.12.3.204
- Spilt, J. L., Koomen, H. M. Y., and Thijs, J. T. (2011). Teacher Wellbeing: The Importance of Teacher-Student Relationships. *Educ. Psychol. Rev.* 23, 457–477. doi:10.1007/s10648-011-9170-y
- Travers, C. (2017). “Current Knowledge on the Nature, Prevalence, Sources and Potential Impact of Teacher Stress,” in *In Educator Stress: An Occupational Health Perspective*. Editors T. M. McIntyre, S. E. McIntyre, and D. J. Francis (Cham: Springer International Publishing AG), 23–54. doi:10.1007/978-3-319-53053-6_2
- UNESCO (2021). Covid-19: Adverse Consequences of School Closures. Available at: <https://en.unesco.org/covid19/educationresponse/consequences> (Accessed March 20, 2021).
- UNESCO, UNICEF, and the World Bank (2020). *What Have We Learnt?: Overview of Findings from a Survey of Ministries of Education on National Responses to COVID-19*. Paris, New York, Washington D.C: UNESCO, UNICEF, World Bank. © World Bank. Available at: <https://openknowledge.worldbank.org/handle/10986/34700> License: CC BY-SA 3.0 IGO (Accessed March 20, 2021).
- United Nations (2020). Policy Brief: Education during COVID-19 and beyond. August 2020. Available at: https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf (Accessed March 20, 2021)
- Vermunt, J. K., and Magidson, J. (2002). “Latent Class Cluster Analysis,” in *Latent Class Cluster Analysis*, in *Applied Latent Class Analysis*. Editors J. A. Hagenaars and A. L. McCutcheon (Cambridge: Cambridge University Press), 89–106. doi:10.1017/CBO9780511499531.004
- Virtanen, A., De Bloom, J., and Kinnunen, U. (2020). Relationships between Recovery Experiences and Well-Being Among Younger and Older Teachers. *Int. Arch. Occup. Environ. Health*. 93, 213–227. doi:10.1007/s00420-019-01475-8
- Vuorio, J., Ranta, M., Korksinen, K., Nevalainen-Sumkin, T., Helminen, J., and Miettunen, A. (2021). Etäopetuksen Tilannekuva Koronapandemiassa Vuonna 2020. [Report of Remote Teaching during the Covid-19 Pandemic in Year 2020.] Raportit Ja Selvitykset 2021:4. Available at: <https://www.op.fi/fi/tilastot-ja-julkaisut/julkaisut/etaopetuksen-tilannekuva-koronapandemiassa-vuonna-2020> (Accessed April 3, 2021)
- Walker, J. M. (2008). Looking at Teacher Practices Through the Lens Of Parenting Style. *J. Exp. Educ.* 76 (2), 218–240. doi:10.3200/JEXE.76.2.218-240
- Wentzel, K. R. (2002). Are Effective Teachers Like Good Parents? Teaching Styles and Student Adjustment in Early Adolescence. *Child Dev.* 73 (1), 287–301. doi:10.1111/1467-8624.00406
- Whitaker, R. C., Dearth-Wesley, T., and Gooze, R. A. (2015). Workplace Stress and the Quality of Teacher-Children Relationships in Head Start. *Early Child. Res. Q.* 30 (A), 57–69. doi:10.1016/j.ecresq.2014.08.008

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.

Copyright © 2021 Pöysä, Pakarinen and Lerkkanen. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.