

# An integrated positive psychology approach into counseling in different settings

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# An integrated positive psychology approach into counseling in different settings

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# Table of contents

05	<b>Editorial: An integrated positive psychology approach into counseling in different settings</b> Christos Pezirkianidis, Anastassios Stalikas and Panagiotis Parpottas
08	<b>A positive psychology group intervention in Greek university students by the counseling center: Effectiveness of implementation</b> Kalliope Kounenou, Antonios Kalamatianos, Aikaterini Garipi and Ntina Kourmousi
17	<b>Intervention effect of group counseling on social support and post-stress growth of orphans and vulnerable children in China</b> Lyuci Zhang, Sumei Wu, Samsilah Roslan, Zeinab Zaremohzzabieh, Ye Chen and Yuqin Jiang
26	<b>Psychological capital has a positive correlation with humanistic care ability among nurses</b> Xiaohong Liu, Cuiping Li, Xiaoting Yan and Bingqing Shi
37	<b>The influence of self-compassion on mental health of postgraduates: Mediating role of help-seeking behavior</b> Lin Min, Ni Jianchao and Lin Mengyuan
53	<b>Positive psychology in the working environment. Job demands-resources theory, work engagement and burnout: A systematic literature review</b> Michael D. Galanakis and Elli Tsitouri
65	<b>Evaluation of a cyberbullying prevention program in elementary schools: The role of self-esteem enhancement</b> Thanos Touloupis and Christina Athanasiades
73	<b>ReStress mindset: An internet-delivered intervention that changes university students' mindset about stress in the shadow of the COVID-19 pandemic</b> Konstantinos Karampas, Christos Pezirkianidis and Anastassios Stalikas
85	<b>Intuitive eating in Greek-Cypriot adults: Influence of gender and body mass</b> Marios Argyrides and Elly Anastasiades
95	<b>Emotion regulation, academic buoyancy, and academic adjustment of university students within a self-determination theory framework: A systematic review</b> Marina Kritikou and Theodoros Giovazolias

- 108 **The relationship between positive psychological qualities and prenatal negative emotion in pregnant women: A path analysis**  
Xiabidan Tuxunjiang, Gulijianati Wumaier, Wei Zhang, Bahedana Sailike, Xiaoting Wang and Ting Jiang
- 119 **Adult friendship and wellbeing: A systematic review with practical implications**  
Christos Pezirkianidis, Evangelia Galanaki, Georgia Raftopoulou, Despina Moraitou and Anastassios Stalikas



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# Editorial: An integrated positive psychology approach into counseling in different settings

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## KEYWORDS

positive psychology, counseling, integration, wellbeing, counseling psychology

## Editorial on the Research Topic

An integrated positive psychology approach into counseling in different settings

## Introduction

Positive psychology (PP) is the scientific field that focuses on revealing, understanding, and reinforcing the factors that make individuals and systems flourish. At first, PP research gave emphasis on individual's positive experiences and characteristics (Pezirkianidis and Stalikas, 2020). Later on, the second research wave focused on the dialectic relationship between the positive and negative aspects of one's life, proposing that wellbeing can only be achieved through overcoming suffering (Wong, 2019). Recently, the third wave of research suggested PP to become more interdisciplinary and multicultural and incorporate systems' principles (Lomas et al., 2021).

Counseling psychology (CP) and PP share their roots in humanistic psychology. Also, CP focuses on a positive orientation toward individual development, mental health promotion and prevention rather than pathology (Malikiosi-Loizos and Ivey, 2012). However, while US counseling psychologists have incorporated PP principles, European ones hesitate to engage with strength-based approaches and use PP theories and techniques (Steffen et al., 2015).

At the same time, more and more approaches in CP have emerged focusing on building positive qualities and making use of the empirically tested positive psychology interventions (PPIs; Carr et al., 2021). These models focus on the promotion of clients' wellbeing and, simultaneously, on symptom alleviation (Jankowski et al., 2020). Counseling practitioners can offer their skills and knowledge as a fertile ground for the application of such models, while at the same time they can benefit by integrating new techniques in their counseling practice (D'raven and Pasha-Zaidi, 2014).

## Overview of studies

Eleven articles in this Research Topic capture different aspects of integrating the PP approach into counseling for children, youth, university students and adults. These articles

provide a systematic review of the current literature (Galanakis and Tsitouri; Kritikou and Giovazolias; Pezirkianidis et al.), study the relationships between PP variables and flourishing factors that connect to counseling needs (Argyrides and Anastasiades; Liu et al.; Min et al.; Tuxunjiang et al.), and evaluate interventions (Karampas et al.; Kounenou et al.; Touloupis and Athanasiades; Zhang et al.) to highlight the added value of PP into counseling practice.

## A positive psychology approach into counseling for children and youth

PP has been extensively studied in the context of early intervention, positive prevention and mental health promotion in children and adolescents, proving to have an added value on counseling with typically developing children and young clients facing psychological problems or being at-risk (Owens and Waters, 2020).

Two contributions in this Research Topic focus on the integration of PP principles into counseling with children and youth. Touloupis and Athanasiades' paper which examined the effectiveness of a cyberbullying prevention program focusing on enhancing self-esteem among elementary school students, found that students' cyberbullying engagement decreased after the intervention mainly because of changes in self-esteem levels. Zhang et al. applied a group counseling intervention to orphans and vulnerable children focusing on enhancing positive interpersonal relationship skills and found increased social support and posttraumatic growth after the intervention. Both studies highlight the importance of PP principles on increasing the effectiveness of counseling interventions to children and youth.

## The integration of PP into university student counseling

In the previous two decades, many studies have focused on the effects of PP variables on wellbeing indices of university students (Carr et al., 2021). Four articles in the present Research Topic address this issue. Kritikou and Giovazolias systematically reviewed the literature and found that several PP variables (i.e., self-efficacy, positive learning climate, and positive interpersonal relationships) affect emotion regulation, academic buoyancy, and academic adjustment of university students. Min et al. found that post-graduate students' self-compassion predicts positive and negative wellbeing indices, while non-professional help-seeking behavior partially mediates this relationship. Kounenou et al. implemented a multicomponent PPI and demonstrated its effects on increased experience of positive emotions among undergraduate students. Finally, Karampas et al. examined the effectiveness of an innovative counseling intervention aiming at changing university students' stress mindset. Their findings indicate an increase in "stress-is-enhancing" mindset, life satisfaction, and self-efficacy against stress, as well as a decrease in "stress-is-debilitating" mindset. Taking everything into account, PP variables explain several positive outcomes concerning university students' academic and psychological

wellbeing and seem promising in enriching counseling practice with this population.

## Counseling services for adults through the lens of PP

Research has also emphasized on the effects of PP variables on many aspects of adult life cycle. Five articles in this Research Topic address adult counseling issues. Galanakis and Tsitouri's systematic literature review offered evidence that the job demands-resources model predicts employee wellbeing. Similarly, Liu et al. provided evidence on the effects of PP variables, namely psychological capital, on work outcomes (humanistic care ability of nurses). Moreover, a literature review by Pezirkianidis et al., found that adult friendship predicts wellbeing components based on the PERMA model and recommended the implementation of positive friendship interventions. Tuxunjiang et al. investigated protective psychological factors of pregnant women and found that self-efficacy, perceived social support and resilience act protectively against anxiety and stress. Finally, Argyrides and Anastasiades focused on positive eating habits and found influences of gender and body mass on intuitive eating behaviors among adults.

## Conclusions

PP can contribute to CP in many ways and in different contexts, e.g., school, work, university, and everyday life. The gradual integration of its principles and interventions could enhance the effectiveness of the counseling process and, in this way, CP could recommit toward human flourishing and actualization. However, the need to continue building PP scholarship and educating counseling psychologists on how to integrate PP principles and techniques still stands.

## Author contributions

CP wrote the article. AS and PP supervised all stages of writing and provided feedback. All authors contributed to the article and approved the submitted version.

## 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.

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# A positive psychology group intervention in Greek university students by the counseling center: Effectiveness of implementation

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Most institutions in higher education have emphasized success in knowledge while overlooking Students' wellbeing. The present study aimed to examine the effectiveness of the implementation of a 5-week positive psychology group intervention to a sample of 69 students that were assigned to the intervention ( $N = 34$ ) and the control group ( $N = 35$ ). Pre and post measures were taken assessing positive and negative emotions, resilience, happiness, optimism, and self-esteem. In particular, Modified Differential Emotions Scale (mDES), Connor-Davidson Resilience Scale (CD-RISC), Subjective Happiness Scale (SHS), Life Orientation Test-Revised (LOT-R), and Rosenberg Self-Esteem Scale (RSES) were administered to the participants. A mixed measures design was employed with the condition experimental vs. control group as the between-participants factor and time, namely, baseline vs. post-intervention as the within-participants factor. Except for optimism, compared with students in the control group, students in the experimental group showed no significant differences at baseline and experienced a significant increase in positive emotions and resilience in the post-test. On the contrary, the control group demonstrated no significant difference at post-test. Additionally, the students of the intervention group reported significantly higher levels in all measures in comparison with the students of the control group, except resilience, at post-test. However, when the interaction of design and time was considered, the increase in positive emotions solely emerged as a significant result of the intervention. The implementation of a positive psychology group intervention program can be effective in helping students experiencing positive emotions. More research is needed in order to refine and improve the application of such a program in a university setting, in regard to long term intervention.

## KEYWORDS

positive psychological intervention, positive emotions, resilience, subjective happiness, optimism, self-esteem

## Introduction

Over the last two decades, positive psychology interventions have been developed and employed in various settings in order to increase people's sense of wellbeing. According to the Broaden-and-Build Theory of Positive Emotions (Fredrickson, 1998), experiencing positive emotions broadens and enriches one's possible alternative ways of thinking and acting. This enlargement results in the acquisition of enduring mental, physical, and social resources, which the individual can use in various situations. In that way, personal growth advances and other positive emotions are fueled, hence leading to a new expansion, thus forming a constantly evolving kind of upward spiral, that fortifies one's mental health against any disorder, making people more psychologically resilient (Fredrickson et al., 2003), resulting in the experience of new positive emotions, and promoting their wellbeing.

A result of the aforementioned process is the gradual increase in the psychological resilience and emotional wellbeing of individuals (Fredrickson and Joiner, 2002). Resilience refers to the positive adjustment of the individuals despite the difficulties they encounter in being effective and in recovering from stressful experiences (Luthar et al., 2000). People high in psychological resilience have been found to endorse an optimistic view of life and to be open to new experiences and characterized by high positive emotional expression (Grant and Kinman, 2014; Bolton et al., 2017). The relation between positive emotions and psychological resilience has been documented by several researchers (Tugade and Fredrickson, 2002, 2007; Fredrickson et al., 2003).

Moreover, positive emotions have been considered as an ingredient of happiness (Cohn et al., 2009) that is viewed as a state. Experiencing positive emotions, people can gradually build resources and use them in order to meet new challenges. Developing this build effect is a key factor that enhances happiness (Cohn et al., 2009).

Furthermore, self-esteem has been defined as "the disposition to experience oneself as competent to cope with the basic challenges of life and as worthy of happiness" by Branden (1994, p. 44). According to Baumeister et al. (2003), high self-esteem leads to greater happiness and is associated with pleasant feelings. Balgiu (2017) and Wang and Kong (2020) have also indicated the relationship between resilience and self-esteem.

Optimism has also been linked with positive affectivity (Scheier and Carver, 1992). Optimism is a trait that has been defined as "...the generalized expectations of the occurrence of good outcomes in one's life." (Scheier and Carver, 1985, p. 239) and as "...an individual difference variable that reflects the extent to which people hold generalized favorable expectancies for their future" (Carver et al., 2010, p. 879).

Brisette et al. (2002) have noticed relations between optimism and distress in students starting college.

Positive Psychological Interventions (PPIs) are theoretically grounded and empirically validated instructions, activities, and recommendations designed to enhance wellbeing (Lomas et al., 2014). PPIs are low cost interventions, easy to deliver, while being non-stigmatizing and lacking side-effects (Layous et al., 2011). PPI strategies that have manifested an improvement in wellbeing contain writing gratitude letters, practicing optimistic thinking, replaying positive experiences, and socializing (Bolier et al., 2013). Pioneers in this field (Fordyce, 1977, 1988) found that happiness levels could be increased by "shotgun" interventions involving multiple exercises. As reported by Lyubomirsky (2007), PPIs, that include consistent gratitude practice, have a positive correlation with greater happiness, more energy, more hope toward the future, and more positive emotions. It has also been demonstrated that people who tend to perform acts of kindness are more likely to describe themselves as happy (Lyubomirsky et al., 2004).

Undergraduate students often experience challenges, as the University life is a period of transition from being a teenager to young adulthood, in which they need to learn to adjust and cope with changes in their everyday life (Arnett, 2000; Trigueros et al., 2020). Hence, positive emotions, e.g., feelings of happiness, could help improve a Student's resilience (Tugade and Fredrickson, 2007) and serve as a determinant of his/her psychological need satisfaction (Howell et al., 2011) and psychological wellbeing (Hasnain et al., 2014).

Despite relevant evidence about the benefits of positive education, higher education is frequently left out of discussions involving the implementation of wellbeing skills (Oades et al., 2011; Norrish et al., 2013). Academic institutions have always put emphasis on acquisition and excellence regarding knowledge and exam performance. Nevertheless, there is an elevated interest in people's wellness within the academic environment (Lambert et al., 2019), especially after the covid-19 quarantine implementation and during the post-covid-19 era. In Greece, PPIs that focus on a single component or a combination of them have proven to be effective (Pezirkianidis and Stalikas, 2020). However, there are only a few studies about PPIs that have been applied in educational settings, such as a 4-week study aiming at promoting wellbeing in a multicultural school setting by Dimitropoulou and Leontopoulou (2017) and a 4-week on-line program enhancing self-compassion, positive emotion, and mental resilience, while reducing isolation, over-identification, self-judgment, trait anxiety, and state anxiety (Karakasidou et al., 2021).

In the current study, the Counseling Centre of Pedagogical and Technological Education (ASPETE) tried to address this gap by offering evidence of a PPI program delivered to a group of university students in Greece. Overall, in keeping with the benefits of this approach to higher education and with the shift of the perspective away from student weaknesses and

toward the recognition of their strengths (Williams et al., 2018), the Counseling Centre investigated core concepts of positive psychology among the students, such as experiencing positive emotions and psychological resilience, together with subjective happiness, optimism, and self-esteem. Implementing a widely used group PPI, rather than viewing students as flawed, targeted these major positive psychology concepts and attempted to help students recognize their existing resources and build their strengths (Hefferon and Boniwell, 2011).

## Aim and hypotheses

The aim of this study was to investigate whether a group PPI program among university students can increase positive emotions, resilience, subjective happiness, optimism, and self-esteem, and decrease negative emotions. To our knowledge the relationship of the aforementioned factors in terms of a positive psychology, psycho-educational group program has not been examined in Greek university students. In particular, we expected the following:

Students in the experimental group will report significantly increased levels of positive emotions, resilience, optimism, subjective happiness, and self-esteem, and significantly decreased levels of negative emotions between baseline and post-test.

Students in the control group will report no significantly increased levels of positive emotions, resilience, optimism, subjective happiness, and self-esteem, and no significantly decreased levels of negative emotions between baseline and post-test.

Students in the experimental group will report significantly increased levels of positive emotions, resilience, optimism, subjective happiness, and self-esteem, and significantly decreased levels of negative emotions compared to students in the control group at post-test.

## Materials and methods

### Participants

Sixty-nine individuals, 52 men and 17 women were recruited from the three Engineering departments of ASPETE. Participants were informed about the purpose of the study and gave their informed consent. The individuals received no reward for their participation. The average age was 22.09 years ( $SD = 6.52$ ) for the experimental group and 20.97 years ( $SD = 0.99$ ) for the control group. With regard to sex, the experimental group included 22 males (64.7%) and 12 females (35.3%) and the control group consisted of 30 males (85.7%) and 5 females (14.3%). The Chi-square test revealed significant difference in the two groups ( $\chi^2 = 4.10$ ,  $p < 0.05$ ), though of weak effect size (Cramer's  $V = 0.24$ ).

## Design and procedure

We employed a mixed measures design. The between-participants factor was the condition experimental vs. control group and the within-participants factor was time, namely, baseline vs. post-intervention/follow up. Hence, we recruited a convenience sample of 75 students from civil and mechanical engineering educators' classes of ASPETE, for the experimental group and 89 students from electrical engineering educators' courses for the control group. The study was conducted in accordance with the Declaration of Helsinki ethical principles. In order to assure confidentiality and anonymity we used personal codes for every participant.

Initially, both groups completed *in vivo* the following questionnaires: The Differential Emotions Scale-modified (mDES), the Connor-Davidson Resilience Scale (CD-RISC), the Subjective Happiness Scale (SHS), the Revised Life Orientation Test (LOT-R), and the Rosenberg Self-Esteem Scale (RSES).

The positive psychology group-counseling intervention consisted of five 1.5–2 h psychoeducational seminars offered across 5 weeks to the students. The techniques used were derived from different positive psychology intervention programs offered to young adults, like, mostly, the 8-week positive psychotherapy group by Parks and Seligman (2007), the how of happiness (Lyubomirsky, 2007), and the Acts of Kindness interventions (Aok) (Lyubomirsky et al., 2005).

More specifically, in the experimental group, in each session two psychologists provided a brief lecture to introduce new material and, later on, the students completed forms related to their everyday experience in each session. In the end of each session they were handed worksheets with the week's exercise that concerned the recording of various aspects of their experience. The participants were urged to discuss their answers. The group program entailed various exercises, such as the three good things, the letter of gratitude, using one's strengths, savoring, kindness, and life summary, tailored to the Students' needs (Table 1). No intervention was provided to the participants of the control group. At the end of the program students of both groups were re-administered *in vivo* the measures. In the experimental group, 41 individuals were excluded because they did not fully attend the program, whereas in the control team 54 individuals were lost to post-test.

## Measures

Basic demographic information included gender, age, and faculty.

Emotions were measured by the Modified Differential Emotions Scale-mDES constructed by Izard (1977) and modified by Fredrickson (2009). It is used to assess specific distinct, positive and negative emotions the respondents experience within the last 2 weeks. The test includes 21 questions and evaluates 11 positive and 9 negative emotions.

TABLE 1 Description of the PPI program in every session.

Session	Topic	Content	Tasks/exercises	Homework
1	Introduction and initial measurement	Information about the aim of the intervention, administration of questionnaires	Savoring and mindfulness Exercises regarding automatism	No
2	Positive psychology and positive feelings	Information about positive psychology and main topics, how it can help students, aim of the Three Good Things exercise	Three good things	Three good things every day in a weekly span
3	Gratitude	Theory about gratitude and its benefits (Emmons and McCullough, 2003)	Questionnaire about gratitude, three things I am grateful for, letter of gratitude	Journal of gratitude for a week
4	Character strengths	Presentation of virtues and character strengths (Peterson and Seligman, 2004)	Questionnaire about gratitude	List of accomplishments and achievements
	Act of kindness	Act of kindness, meaning and aim (Lyubomirsky et al., 2004)	Life summary	5 Act of kindness in 1 day Act of kindness toward self
5	Ending and final measurement	Summary of the program, reflection on students' experience, re-administration of questionnaires	Personal motto	No

The last question refers to the emotion experienced most intensely by each participant. The answers are given on a five-point Likert scale (1 “Not at all,” 5 “Extremely”). Its Greek standardization revealed satisfactory reliability (Galanakis et al., 2016). Cronbach's alphas of the Positive Emotions subscale and the Negative Emotions subscales in the present study were 0.817 and 0.840, respectively.

Resilience was measured by the Connor-Davidson Resilience Scale (CD-RISC; Connor and Davidson, 2003). It assesses one's ability to surpass the adversities and specifically, tenacity and competence, trusting in one's instincts and tolerating of negative affect, accepting of change and security within relationships, control, and spirituality. It consists of five factors, namely, personal competence, tolerance, acceptance of change, control, and spiritual influences, and contains 25 items (“I am able to adapt when changes occur”). Responses range from: 0—*Not true at all* to 4—*True nearly all the time* and higher scores is an indicator of high resilience. It exhibits good psychometric properties. Cronbach's alpha of CD-RSIC in this study was 0.863.

Happiness was assessed by the Subjective Happiness Scale-SHS (SHS; Lyubomirsky and Lepper, 1999). Ratings are made on a 7-point Likert scale (1 “Not a very happy person” to 7 “A very happy person”) and higher scores reflect greater happiness (e.g., “Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?”). Its Greek standardization (Karakasidou et al., 2016) has shown that Cronbach's alpha index was 0.76 and the split half reliability index was 0.72. As for criterion validity, the SHS was significantly negatively correlated to negative emotions, stress, and depression and positively correlated to life satisfaction, resilience, and positive emotions. Cronbach's alpha of 0.842 was obtained in this study.

Optimism was assessed by the Life Orientation Test-LOT-R that identifies one's dispositional level of optimism. It was created by Scheier and Carver (1985) and modified by Scheier et al. (1994). It consists of ten statements (“Overall, I expect more good things to happen to me than bad”) rated on

a 5-grade Likert scale ranging from 0 “*Strongly disagree*” to 4 “*Strongly agree*.” The respondents express their general expectations regarding future outcomes. LOT-R has shown good psychometric properties. Coefficient alpha reliability for the LOT-R was 0.78 and convergent and discriminant validity were demonstrated when the LOT-R correlated positively with measures of self-mastery and the self-esteem and negatively with a measure of anxiety. It has been adapted to Greek by Lyrakos et al. (2010). Cronbach's alpha of 0.717 was obtained in this study.

Self-esteem was measured by the RSES (Rosenberg et al., 1995). It contains 10 items (“On the whole, I am satisfied with myself”) and is used to assess global self-esteem. Respondents are asked to rate on a 4-point Likert scale ranging from 1 “*Strongly agree*” to 4 “*Strongly disagree*” and higher scores indicate more positive self-regard. As for reliability, test-retest correlations values are 0.82 and 0.88. In its Greek validation the internal consistency reliability index was found 0.80 (Galanou et al., 2014). RSES has also exhibited good concurrent, predictive, and construct validity (Rosenberg, 1979). Cronbach's alpha of RSES in the present study was 0.823.

## Statistical analysis

Initially we tested for linearity with the scatter plots and found no deviation. We also checked for normality with histograms, Q-Q plots, goodness of fit tests, e.g., the Kolmogorov-Smirnov and the Shapiro-Wilk test, and skewness and kurtosis values and no statistically significant violations were found (Sposito et al., 1983; Orcan, 2020). Correlations between the measured variables and means, standard deviations, and *t*-tests at baseline and post-intervention were calculated. A MANOVA was conducted to compare positive and negative emotions, resilience, subjective happiness, optimism, and self-esteem in positive intervention and no positive intervention condition prior to the program. Moreover, a paired-samples *t*-test was conducted to compare positive and negative emotions, resilience, subjective happiness, optimism, and self-esteem



in each group, at two time points, baseline and post-test. Finally, mixed ANOVAs were performed with the experimental condition as the between-subjects variable and time (baseline-post-test) as the within-participants factor so as to examine the effect of the intervention. SPSS, version 21, was used.

## Results

The majority of the correlations were positive and statistically significant except the non-significant relations of post-test negative emotions with pre-test positive emotions and self-esteem. Pre and post-test negative emotions demonstrated negative correlations with all the measures. The strongest correlation was found between post-test positive emotions and resilience (Table 2).

Equivalence at baseline was checked with MANOVA. The independent variable was the two level (experiment vs. control) condition and the dependent variables were all the measures. The participants who received the positive psychology intervention ( $M = 3.55$ ,  $SD = 0.671$ ,  $M = 1.79$ ,  $SD = 0.561$ ,  $M = 2.77$ ,  $SD = 0.509$ ,  $M = 5.07$ ,  $SD = 0.930$ ,  $M = 3.01$ ,  $SD = 0.620$ ) compared to the participants in the control group ( $M = 3.41$ ,  $SD = 0.650$ ,  $M = 2.04$ ,  $SD = 0.809$ ,  $M = 2.70$ ,  $SD = 0.427$ ,  $M = 4.57$ ,  $SD = 1.232$ ,  $M = 2.96$ ,  $SD = 0.487$ ) did not demonstrate significantly better positive emotions scores,  $F(1, 67) = 0.770$ ,  $p = 0.383$ ,  $\eta_p^2 = 0.011$ , negative emotions scores,  $F(1, 67) = 2.256$ ,  $p = 0.138$ ,  $\eta_p^2 = 0.033$ , resilience,  $F(1, 67) = 0.450$ ,  $p = 0.505$ ,  $\eta_p^2 = 0.007$ , subjective happiness,  $F(1, 67) = 3.531$ ,  $p = 0.065$ ,  $\eta_p^2 = 0.050$ , and self-esteem,  $F(1, 67) = 0.149$ ,  $p = 0.700$ ,  $\eta_p^2 = 0.002$ , correspondingly. A statistically significant difference was revealed only for optimism,  $F(1, 67) = 6.555$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.089$ , where individuals who attended the positive psychology program ( $M = 2.33$ ,  $SD = 0.699$ ) scored higher than the students in the control group ( $M = 1.91$ ,  $SD = 0.660$ ).

With regard to within-subjects differences, we used dependent  $t$ -test. In the experimental group, the results from the pre-design and post-design measures indicate that the PPI resulted in a statistically significant improvement in positive emotions,  $t(33) = -3.479$ ,  $p < 0.01$ , resilience,  $t(33) = -2.752$ ,  $p < 0.05$ , and marginally in self-esteem,  $t(33) = -1.962$ ,  $p = 0.058$ , and not significant differences in negative emotions,  $t(33) = 1.479$ ,  $p = 0.149$ , subjective happiness,  $t(33) = -0.850$ ,  $p = 0.401$ , and optimism,  $t(33) = -1.489$ ,  $p = 0.146$  (Table 3).

As for the dependent  $t$ -test in the control group, the results from the pre-design and post-design measures resulted in no statistically significant difference in positive emotions,  $t(34) = 0.376$ ,  $p = 0.709$ , negative emotions,  $t(34) = -0.125$ ,  $p = 0.901$ , resilience,  $t(34) = -0.560$ ,  $p = 0.579$ , subjective happiness,  $t(34) = 0.167$ ,  $p = 0.868$ , optimism,  $t(34) = 1.823$ ,  $p = 0.077$ , and self-esteem,  $t(34) = 0.453$ ,  $p = 0.653$  (Table 3).

Finally, a series of mixed ANOVAs revealed several statistically significant differences. In particular, we found significant interaction between condition and time for positive emotions,  $F(1, 67) = 6.463$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.088$ . However, negative emotions,  $F(1, 67) = 0.924$ ,  $p = 0.340$ ,  $\eta_p^2 = 0.014$ , resilience,  $F(1, 67) = 2.827$ ,  $p = 0.097$ ,  $\eta_p^2 = 0.040$ , subjective happiness,  $F(1, 67) = 0.556$ ,  $p = 0.459$ ,  $\eta_p^2 = 0.008$ , optimism,  $F(1, 67) = 0.012$ ,  $p = 0.915$ ,  $\eta_p^2 = 0.000$ , and self-esteem,  $F(1, 67) = 3.207$ ,  $p = 0.078$ ,  $\eta_p^2 = 0.046$  were not significantly affected by the intervention. Thus, students in the experimental group reported less significant negative emotions ( $M = 1.67$ ,  $SD = 0.631$ ), not significantly higher resilience ( $M = 2.96$ ,  $SD = 0.509$ ), significantly higher subjective happiness ( $M = 5.23$ ,  $SD = 1.089$ ), optimism ( $M = 2.48$ ,  $SD = 0.685$ ), and self-esteem ( $M = 3.23$ ,  $SD = 0.482$ ) as compared with participants in the control group ( $M = 2.05$ ,  $SD = 0.609$ ,  $M = 2.73$ ,  $SD = 0.496$ ,  $M = 4.54$ ,  $SD = 1.026$ ,  $M = 2.08$ ,  $SD = 0.663$ ,  $M = 2.92$ ,  $SD = 0.482$ ), respectively (Table 3), but not due to the intervention. On the contrary, the significant increase of positive emotions in the experimental group ( $M = 3.88$ ,  $SD = 0.631$ ) with

TABLE 2 Correlations between measured variables.

	PosEmP	NegEmP	PosEmPo	NegEmPo	CD-RISCP	CD-RISCPo	SHSP	SHSPo	LOT-RP	LOT-RPo	RSESP	RSESPo
PosEmotionP	1											
NegEmP	-0.422**	1										
PosEmotionPo	0.570**	-0.347**	1									
NegEmPo	-0.178 <sup>ns</sup>	0.599**	-0.520**	1								
CD-RISCP	0.663**	-0.501**	0.529**	-0.461**	1							
CD-RISCPo	0.485**	-0.368**	0.735**	-0.556**	0.712**	1						
SHSP	0.613**	-0.590**	0.521**	-0.444**	0.627**	0.492**	1					
SHSPo	0.417**	-0.390**	0.697**	-0.526**	0.422**	0.674**	0.546**	1				
LOT-RP	0.399**	-0.440**	0.444**	-0.416**	0.517**	0.492**	0.655**	0.524**	1			
LOT-RPo	0.386**	-0.530**	0.484**	-0.536**	0.498**	0.624**	0.581**	0.592**	0.678**	1		
RSESP	0.504**	-0.287*	0.279*	-0.154 <sup>ns</sup>	0.424**	0.379**	0.330**	0.505**	0.502**	0.436**	1	
RSESPo	0.292*	-0.468**	0.574**	-0.669**	0.479**	0.576**	0.418**	0.536**	0.398**	0.611**	0.328**	1

P, Pre-intervention; Po, Post-intervention; PosEm, Modified Differential Emotions Scale Positive Emotions; NegEm, Modified Differential Emotions Scale Negative Emotions; CD-RISC, Connor-Davidson Resilience Scale; SHS, Subjective Happiness Scale; LOT-R, Life Orientation Test-Revised; RSES, Rosenberg Self-Esteem Scale. \* $p < 0.05$ , \*\* $p < 0.01$ , <sup>ns</sup>, non-significant.

TABLE 3 Means, standard deviations, and pre and post-intervention between-groups and within-groups differences.

Pre-test	Experimental group		Control group		Independent <i>t</i> -test					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Sig					
Positive emotions	3.55	0.671	3.41	0.650	0.877	0.383 ns				
Negative emotions	1.79	0.561	2.04	0.809	−1.502	0.138 ns				
CD-RISC	2.77	0.509	2.70	0.427	0.671	0.505 ns				
SHS	5.07	0.930	4.57	1.232	1.879	0.065 ns				
LOT-R	2.33	0.699	1.91	0.660	2.560	<0.05				
RSES	3.01	0.620	2.96	0.487	0.386	0.700 ns				
Post-test	Experimental group		Control group		Independent <i>t</i> -test					
	Paired <i>t</i> -test		Paired <i>t</i> -test		Independent <i>t</i> -test					
	<i>M</i>	<i>SD</i>	sig		<i>M</i>	<i>SD</i>	sig		sig	
Positive emotions	3.88	0.631	−3.479	<0.01	3.37	0.655	0.376	0.709 ns	3.276	<0.01
Negative emotions	1.67	0.480	1.479	0.149 ns	2.05	0.609	−0.125	0.901 ns	−2.934	<0.01
CD-RISC	2.96	0.509	−2.752	<0.05	2.73	0.496	−0.560	0.579 ns	1.859	0.067 ns
SHS	5.23	1.089	−0.850	0.401 ns	4.54	1.026	0.167	0.868 ns	2.689	<0.01
LOT-R	2.48	0.685	−1.489	0.146 ns	2.08	0.663	1.823	0.077 ns	2.490	<0.05
RSES	3.23	0.482	−1.962	0.058 ns	2.92	0.482	0.453	0.653	2.691	<0.01

Sig, significance; ns, non-significant; Pre-test, Pre-intervention; Post-test, Post-intervention; Positive Emotions, Modified Differential Emotions Scale Positive Emotions; Negative Emotions, Modified Differential Emotions Scale Negative Emotions; CD-RISC, Connor-Davidson Resilience Scale; SHS, Subjective Happiness Scale; LOT-R, Life Orientation Test-Revised; RSES, Rosenberg Self-Esteem Scale.

comparison to the control group ( $M = 3.37$ ,  $SD = 0.655$ ) seems to be due to the intervention.

## Discussion

The aim of this study was to investigate whether a PPI program among university students can be effective as well as to provide evidence concerning the dynamics of positive psychology in higher education and evaluate the interplay between positive and negative emotions, resilience, subjective happiness, optimism, and self-esteem.

Initially, it was confirmed that students in both groups showed no significant difference in their scores regarding all the measures before the intervention. This is in line with previous studies (Luthans et al., 2008). However, participants in the experimental group demonstrated higher scores in optimism at pre-test.

Results also indicated that the intervention led the students of the PPI program to a significant improvement in positive emotions, resilience and slightly in self-esteem. This result is in agreement with previous studies that have suggested that being emotionally positive could increase the level of resilience (Kay, 2016). Positive emotions are one of the key mechanisms which can influence psychological and physical help (Moskowitz et al., 2014). Moskowitz et al. (2021), in their review on the effects of PPIs, have found that PPIs have significant influence on positive emotion, especially when we examine the change within the intervention group or when we evaluate the intervention vs. a minimum control condition such as a waitlist. In another study by Lambert et al. (2021) college students in the United

Arab Emirates, who participated in a PPI program, reported more positive emotions and an overall balance of feelings that favored positivity over time in comparison to the control group. Nevertheless, after the intervention, the experimental group showed no statistically significant difference in negative emotions, subjective happiness, and optimism, contrary to other studies, such as the research by Huang et al. (2016), that demonstrated improvements in participants' optimism, compared to a control group. However, similar results were found by Joutsenniemi et al. (2014) with a large community sample of Finnish adults, who discovered that an intervention constituting of gratitude, optimism, and rumination reduction showed no significant improvement in levels of happiness.

A growing body of evidence has noted that happiness-increasing strategies do stimulate elevation in wellbeing and happiness. A meta-analysis of 51 positive interventions overwhelmingly revealed that positive interventions significantly increase wellbeing and alleviate depressive symptoms (Sin and Lyubomirsky, 2009). This was not confirmed in our study and it can be attributed to different factors. In particular, when it comes to psychological research, there is a big number of examples in the psychological, educational, and health literature of interventions that have been successful in one place or at one time, but failed to produce similar effects in another place or another time, despite having implemented the original successful protocol (Bohrnstedt and Stecher, 2002; Cartwright and Hardie, 2012). We should bear in mind that the results of an intervention may occur in the beginning of the study, but they may also take more time to become obvious, as individuals may assign new meaning to the intervention, due to changes in their lives (Peuker et al., 2009.)

Finally, people, who participate in a PPI program and seek ways to improve their wellness, do not form a single, homogeneous group and, thus, individuals may differ in their responses to PPIs depending on their symptoms (Parks et al., 2012). As PPIs have shown small to moderate effect sizes in a methodologically sound meta-analysis (Bolier et al., 2013), more effort should be put into the study of theoretically based moderating variables. However, other researchers have shown that psychological interventions are more efficient for individuals with higher levels of positive affect or more effective emotion regulation strategies, as positive emotions facilitate openness to experience and engage toward meaningful goals (Taylor et al., 2017). Besides, according to a meta-analysis by Carr et al. (2020), PPIs were more effective when they included multiple components, more sessions, and lasted longer.

While our results may be interesting, there are some limitations that should be mentioned. Our sample size was rather small. Moreover, a non-randomized quasi experimental design was used and we did not match the two groups. Our results might not be generalizable to other groups with different ethnic characteristics or academic backgrounds. However, our study has several advantages and implications as well. The existence of an experimental and a control group is a notable strength in the internal validity of the study. We statistically controlled for and assured equivalence at baseline for all variables in the study, except optimism. Further, since one intervention may not fit for all, the current study embedded different positive psychology components in order to increase the chance of a productive outcome (Salois, 2021). What's more, the counseling centre's study adds to the growing literature pertaining to PPIs in academic environment. Even so, future research could use randomized trials and a greater sample size, more representative of the Greek university population, from various faculties, e.g., social sciences. We also encourage future studies to use longer time frame with multiple follow-up sessions, since this could help in discovering if the positive outcomes are long lasting, and to associate the positive psychology components with Students' mental health improvement, achieved grade, and academic self-efficacy.

On the whole, the counseling centre's research realized for the PPI group important amelioration in optimism, subjective happiness, and self-esteem, reduction in negative emotions and slight increase in resilience. These changes were not observed in the control group and can, thus, be attributed to the intervention, with caution, since, the results suggest that university students significantly increased only positive emotions due to the PPI program they attended. The use of PPI programs in higher education is a relatively new development that could help the field of education. Consequently, higher educational institutions, not only in Greece but globally, could benefit from applying interventions as the one described in our study and see positive changes in 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

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

## Author contributions

KK, AK, and AG conceptualized the intervention, wrote the manuscript, and reviewed the manuscript. NK provided the final revision. All authors approved the submission of the manuscript.

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## 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.

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# Intervention effect of group counseling on social support and post-stress growth of orphans and vulnerable children in China

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Orphans and vulnerable children fall under the category of children who are at risk of exposure to more stressful circumstances and receive less social assistance compared to other children. This study aims to investigate the impact of group counseling based on social intervention and psychological therapy (SSGPC) on social support and the perceived stress growth of orphans and vulnerable children. In one special educational needs school in Nanning, China, the SSGPC was developed and implemented. Using the social support and post-stress growth scales, the researchers investigated the effects of SSGPC on orphans and vulnerable children. Twenty-seven orphans and vulnerable children between the ages of nine and 12 were arbitrarily assigned to the experimental and control groups. A pre-test post-test method of quasi-experimental design was applied, with 13 participants in the experimental group and 14 in the control group. The results revealed that the intervention group had significantly higher scores for social support and post-stress growth than the control group. The SSGPC had significantly improved the levels of social support for orphans. The findings indicated that the SSGPC provided an effective way to improve social support and post-stress growth of orphans and vulnerable children.

## KEYWORDS

social support group, psychological counseling intervention, post-stress growth, social support, orphans

## Introduction

China is now witnessing fast economic expansion. According to [Liu et al. \(2020\)](#), this expansion aided the Chinese society in improving its living standards in many areas, including a reduction in the number of impoverished people, a lower rate of unemployment, and a reduction in the number of children without a family. According to [Shang and Cheng \(2006\)](#), the total number of orphans in China was 573,000. In 2020, China's orphan

population was expected to be at 193,300, down from over 233,000 the previous year (National Bureau of Statistics of China, 2020). Accordingly, orphans and vulnerable children (OVC) are more likely to suffer from hunger, drop out of school, suffer from low psychological wellbeing, and have an earlier sexual debut (Yendork, 2020). Specifically, among OVC, poor mental health functioning has been extensively proven to be connected with various detrimental health and social repercussions, even into adulthood (Scott et al., 2016). According to Chi et al. (2014), OVC may not communicate their anxieties and worries, resulting in sentiments of wrath, resentment, as well as a sense of estrangement, and despair. Such emotions can result in risk-taking behaviors and withdrawal. Furthermore, severe negative emotions can lead to aggression or various problematic behaviors (Loney et al., 2006).

Scholars have previously demonstrated that OVC are vulnerable to deprivation as a result of mistreatment and isolation from siblings, putting them at risk for mental health issues (e.g., Morantz et al., 2013). It is concerning that OVC's psychological wellbeing receives little attention, since previous academics have recognized that few evidence-based initiatives have addressed these children's mental health and behavioral health preventative requirements (Mellins and Malee, 2013; Skeen et al., 2017). Caspe and Lopez (2006) showed that interventions that promote family involvement in children's development build parental knowledge and skills, and improve family stability through, for example, efforts toward economic security and social inclusion that fall under the rubric of "family strengthening." Nevertheless, it is critical to stress that social support (SSU) should be offered to OVC as early as possible when a lack of parent and family instability begin to have some of the most detrimental consequences on their life (Doku et al., 2019). SSU appears to have acquired some momentum, according to existing studies on the wellbeing of children placed in orphanages (Zhou, 2012).

In addition, post-stress growth (PSG) is an important variable for OVC. After undergoing stressful or traumatic circumstances, PSG is described as recovering psychological equilibrium and further growing psychological maturity (Hu et al., 2021). Losing a parent and being placed in an orphanage can be traumatic because it changes one's status in life (Zhang et al., 2022). There are many ongoing stressful and traumatic life events for OVC such as abuse, neglect, and parental loss among others (Nyathi, 2022). Additionally, vulnerable children and their families commonly live in a state of poverty (Marais et al., 2014). As a result, vulnerable children experience more stressful events than the average children do. However, from the perspective of positive psychology, positive changes within individuals are explored to produce more positive results. Therefore, this study examines the pressure on OVC from a positive perspective. When OVC experiences pressure or negative events, positive changes are explored to achieve growth after pressure.

Fan and He (2016) discovered that group counseling can work as an intervention to prevent the development of severe mental illness. Group counseling has consistently been shown to increase SSU and PSG of OVC (Fawzi et al., 2012; Sitienei

and Pillay, 2019; Penner et al., 2020). Group counseling is a tool in which several OVC participate in social intervention and psychological therapy (SSGPC) to help them change or deal with a long-term problem they are experiencing, guided by a therapist or counselor (Gidron, 2020). The SSGPC has many benefits and is thus appropriate for a variety of difficulties, particularly those OVC with interpersonal concerns. Stress management, for example, is one of them. The SSGPC, which is based on Bronfenbrenner's (1979) ecological systems theory (EST), is designed to help OVC in a culturally appropriate and effective manner. According to EST, human development is mostly influenced by how people interact with their environment as it changes (Senefeld and Perrin, 2014). All ecological systems have a significant impact on OVC's growth, favorably either if support systems are present or adversely if they are not. If the microsystem, particularly the family, fails, the OVC may be unable to explore other ecological systems unless they acquire group counseling. The SSGPC may be viewed as an alternative ecological system that can support the OVC in the shortest amount of time. The SSGPC is likely to provide the OVC with psychological and SSU services that their families, schools, or even communities are unable to provide. This indicates that the SSGPC must take into account a comprehensive strategy that can raise OVC's SSU and PSG. By situating the study's proposed work inside the ecological systems theory, the OVC's PSG and SSU may benefit to some extent from the known SSGPC.

Nevertheless, it should be highlighted that many OVC programs prioritize meeting children's basic needs over their non-material needs, such as providing mental support and stress relief (Onuoha and Munakata, 2010). Community development may be used to treat OVCs' mental health, but in many circumstances (Cheney, 2010), OVCs in South Africa may not have enough access to this type of mental health care. (Marais et al., 2014). In light of this, the current study seeks to determine if the SSGPC is effective in improving the SSU and PSG of OVC in the context of China.

## Materials and methods

### Participants and procedure

In this study, participants were recruited by voluntary enrollment in a school for OVC, and selected according to scale tests and interviews. The criteria for selecting the intervention group were individuals who: (1) could attend each group counseling activity on time; (2) were in good health and had no difficulties in language expression and communication; (3) had low scores on the SSU scale; and (4) had the motivation to change and willingness to participate in group counseling. After the interview, 27 eligible subjects were randomly assigned to the intervention group and the rest were set as members of the control group, namely 13 in the intervention group and 14 in the control

group. All the children went to boarding school together, and the two groups of subjects possessed the same family situation and study life. The age range was 9–12 years old, and the grades were from Grade 3 to Grade 6. Before beginning the interventions, caregivers and parents provided written consent for their own participants.

The intervention was held from October 12, 2021 to December 28, 2021. A group counseling session was held every Saturday from 3.30 pm to 5.30 pm for a total of six times. The venue was the psychological counseling room of the OVC's school. The participants in the experimental group underwent the SSGPC program, while the participants in the control group engaged in activities, including games, coloring activities, and singing songs. During the intervention period, 13 members of the intervention group participated in six of the SSGPC activities completely and filled in the summary of each intervention activity, experience, and group counseling effect evaluation form. After the group counseling session, each participant completed the SSU and PSG scales for the post-test.

## Instruments

### Social support scale

The youth SSU scale prepared by Ye and Dai (2006) was adopted. The scale contains 17 items and three dimensions: subjective support, objective support, and support utilization. The five-point Likert scale was used. It has been shown to be reliable (Cronbach's  $\alpha = 0.82$ ; Zhang et al., 2022) and valid for measuring the social support of the Chinese population (Liu et al., 2011).

### Post-stress growth scale

Qin and Wu's (2016) scale was employed to develop the children's PSG scale. The scale is self-rated and measures positive changes in the past year. There are 15 items on the scale, with five items in each dimension, including coping style, interpersonal relationship, and life philosophy. The Likert self-rating scale was scored with 5 points, ranging from 1 for "very inconsistent" to 5 for "very consistent." The item average score was used as an indicator of individual growth level after stress. The higher the score, the higher the individual growth level after stress. The reliability and validity of PSG were 0.737 and 0.727, respectively (Qin and Wu, 2016).

### Social support group psychological counseling intervention program

Based on a questionnaire survey, current situation analysis, and literature search, and following the principle of group dynamics with regard to the formulation of a group counseling program (Fan and He, 2016), six units of group counseling activities were designed in this study as outlined in Table 1. In this study, group dynamics could sometimes interfere with the OVC group's ability or willingness to share their true thoughts, which they did more of in individual

therapy. Each child brought to the group a particular personality, life experiences, fears, perceptions, gender influences, ethnicity, prejudices, and cultural individualities. Therefore, standard errors might have been underestimated (Paddock et al., 2011). It would be impossible to discuss all of the differences or influences that defined the children in the group sessions, but there were a few key group differences that seemed to underscore how a person interacted with others in a group (Deci and Ryan, 2000; Luyckx et al., 2009). In this study, strategies to reduce all of the differences included explaining the purpose and role of group therapy to the children before the group session started, adjusting and conducting thorough screening of the OVC group, asking the children to create group rules that would make the group safe and productive for the OVC group, and offering individual therapy in conjunction with the group for those who required it. Clinical services offering group interventions could consider providing training on managing group dynamics to staff facilitating groups in order to manage this important component of group interventions.

## Data analysis

Before the first group counseling, SSU and PSG scales measured all members of the intervention group and control group. All data were analyzed with IBM SPSS Statistics 22. The normal distribution test showed that the data in this study conformed to normal distribution, while the parametric test was applicable. Therefore, independent samples t-test and paired samples t-test were run to assess between-groups differences and within-groups differences in the SSU and PSG scales before and after SSGPC, respectively. Additionally, effect sizes  $d$  were calculated (small  $\geq 0.20$ , medium  $\geq 0.50$ , and large  $\geq 0.80$ ; Cohen, 1988).

## Results

### Between-subjects analyses

The independent samples t-test revealed no differences for SSU before SSGPC (see Figure 1); however, a large effect of between-groups difference in SSU [ $t = -10.181, p = 0.000, d = 3.98$ ] and PSG scores [ $t = -2.791, p = 0.000, d = 3.59$ ] was found. Therefore, pre-test and post-test differed in improving SSU and PSG after SSGPC with higher SSU and PSG scores in the experimental group than in the control group (see Table 2).

### Within-subjects-analyses

No differences in SSU and PSG were found. Nevertheless, the paired samples t-test (see Table 2) revealed a large effect increase

TABLE 1 Intervention activities.

Goal	Activities	Goal	Activities
<b>Unit 1 1.</b> 1. Set up a team and make a team pact collectively 2. Team members get to know each other, get familiar with each other, establish interactive relations, and feel the warmth of the team	1. Warm-up activity: smile and shake hands. Mentor: “Today you are different from the previous you. You are happy and optimistic today, so that everyone in our group can feel the different you today. A. All members sit in a circle B. Give everyone a minute to introduce himself or herself. C. Sharing: teachers guide members to think and discuss. 2. Circle sit, choose a hand holding newspaper roll into the “stick,” the director shouted a member of the nickname, called the left and right sides of the members to immediately stand up, otherwise by called to give a blow, “stick thin lover,” repeatedly do, until everyone familiar with each other’s name. 3. Who can remember the most names of other people.	<b>Unit 2.</b> 1. Promote self-cognition and strengthen self-understanding 2. Increase the understanding of others, better understand others, affirm others, and promote interpersonal interaction	1. Take out the mirror and take a closer look at yourself, as students may not have this opportunity to take a closer look at themselves. Then the teacher asked the students to think for a few minutes and say what kind of person they are. 2. Each person writes 20 sentences “I am a XXXXXX person.” Ask to reflect the characteristics of the individual, after writing fixed group communication, everyone holds the mood of understanding others, to get to know each unique person in the group. Finally, the group representative spoke and the group shared their feelings. 3. The teacher first presented the activity’s rules: divide the students into groups of 3–5, give them each a small piece of paper, and have them write down their thoughts on the other students in the group. Students are not permitted to speak during the activity. Instead, they can only jot down on paper what they wish to say to the interviewee. They can share their thoughts and provide ideas.
<b>Unit 3.</b> 1. Let members learn the mode of effective communication between classmates 2. To encourage students to learn empathy	1. The rules of the game are as follows: Each team member must jump off a 1.6-meter platform straight back while his teammates hold out their hands to shield him. To avoid a lack of security, everyone wants to be able to trust one another. Be trustworthy if you want people to trust you. Getting people to trust you might be challenging when they have suspicions about you. Through the course of the game, teammates can enhance their sense of responsibility and trust for one another. 2. Teachers lead the team members on a tour of the school and provide them instructions to get there without any problems. The team can test their communication, cooperation, tacit understanding, empathy, and teamwork while walking. They can also test their listening and communication abilities when they run into obstacles or move too quickly.	<b>Unit 4.</b> 1. Learn to understand and respect teachers 2. let members through personal experience to perspective-taking Improve members’ understanding and comprehension of teacher support	1. let all the members to hand circle at the beginning, then, leaders said that “, a group of four “, members must, in accordance with the requirements of the gang of four again, to form a new “home,” at the moment, please find home to talk to the person who do not have the feeling of the free outside groups, mostly talks to “lonely, lonely, abandoned, do not rely on, lost, worried about...” You can also ask members of the group to share their feelings of being with you. Most of them will say “warm, powerful, safe, dependable...” The number of members can be changed many times, so that members have the opportunity to change their behavior, actively integrate into the group, so that members can experience the feeling of home, experience the support of the group, so that they are more willing to stay with the group. 2. Prelude: Play the song “Get You” or “It’s Morning” Prepare 3 small scenes, pen and paper and 2–3 students discuss the topic situation, make and act out a corresponding situation, other students think in others’ shoes, understand others, For example, the situation: always gentle mother came back from work today, sad face, temper is very angry, because of a little thing on xiaoming angry. Xiaoming is very distressed very aggrieved, hence... Four steps of perspective-taking: Step 1: If I were him, WHAT I’d need is... Step 2: If I were him, I would not want to... Step 3: If I were the other person, what I would do is... Step 4: Am I treating him the way he expects me to? 3. Sharing Summarize and fill in the group experience form.

(Continued)



TABLE 1 Continued

Goal	Activities	Goal	Activities
<b>Unit 5.</b> 1. Experience and understand their loved ones pay and care for themselves 2. Strengthen the ability of empathy 3. improve the ability to understand teacher support	1. Each group circle, invite one member to the middle, other members hand in hand circle. At the beginning of the exercise, the circle members close their eyes, consciously and comfortably lead to any side, other members must join hands to form a protective circle for protection, cannot let the circle members fall down. Where he falls, the group goes to catch him, protect him, and push him to the center. Therefore, fall, catch, the middle member from nervous to very relaxed. Can switch to the circle to experience. The activity fully embodies the cooperation of the group. 2. Sharing: What went through your mind when you fell down? People outside the circle How do you feel when you pick someone up? (Thank you for your trust and help.) 3. Write the stories of teachers who have influenced me greatly and share them with each other. Be as specific as possible. 4. share 5. Read the material aloud and let the members close their eyes, hold hands with each other and form a circle. The leader will read the words of gratitude (materials), and let the members engage in meditation and memory as much as possible. 6. Express gratitude to a teacher or classmate by text message or email, or by phone	<b>Unit 6.</b> 1. Consolidate learning experience 2. End group counseling, return to reality, look into the future, and encourage members to apply what they have learned to real life.	1. To bring warmth and strength through physical contact, so that members can confirm the unity of the group more realistically before the end, experience the feeling of being together, and gain support and confidence. 2. How to do it: at the end of the last group activity, the instructor asks everyone to stand in a circle, put your hands on the shoulders of each group member, and gather together in silence for 30 s. Then gently hum the familiar song, and sway freely with the melody of the song. From children's songs to country songs, try to find people who know them, all of them, one after another. Let all members bid farewell to the group in a warm, sweet and cohesive scene, and walk towards life, leaving a forever, beautiful, very symbolic, unforgettable memory. 3. Parting 4. Give gifts 5. Fill in the questionnaire 6. Take a group photo

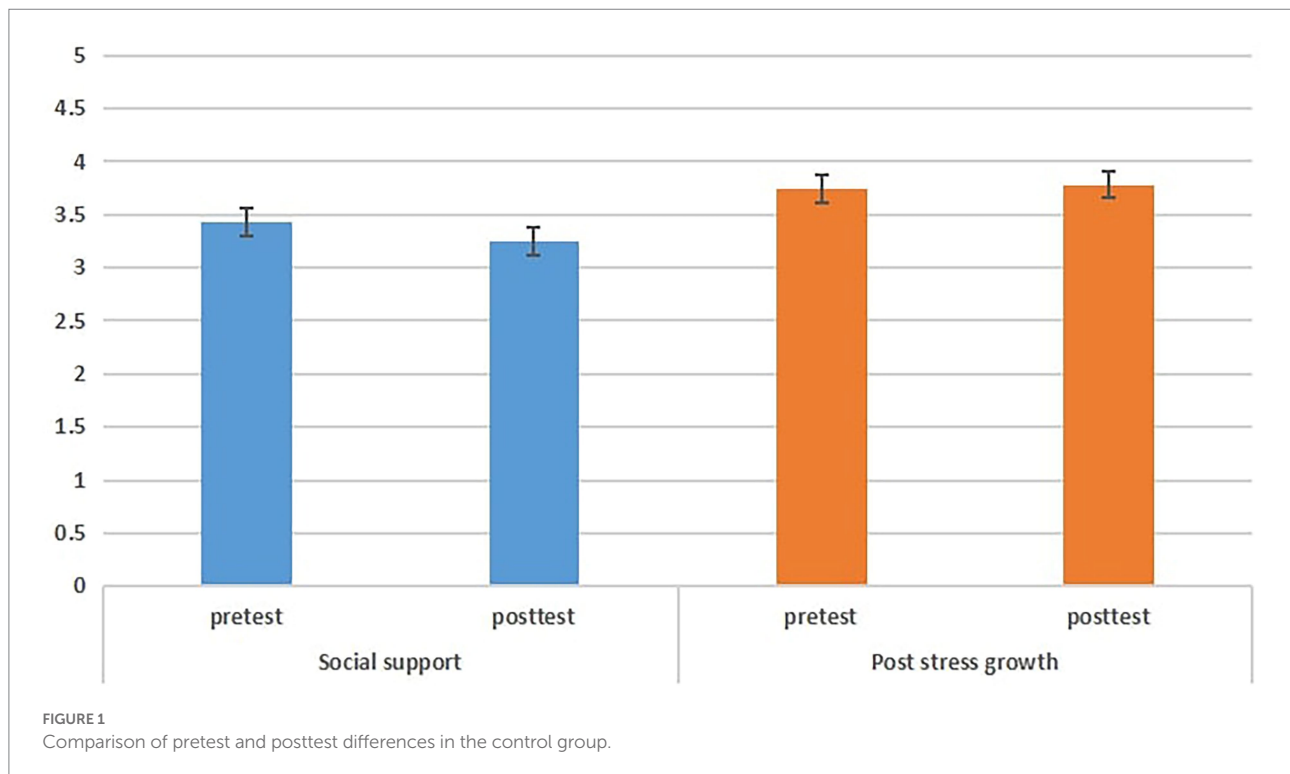
of SSU [ $t = -11.599, p = 0.00, d = 3.221$ ] and PSG [ $t = -11.921, p = 0.001, d = 3.259$ ] scores in the experimental group but not in the control group. Therefore, the results indicated that the SSGPC should take into account a group counseling program that could increase OVCs' SSU and PSG.

Evaluation of group intervention effect

The feedback sheet of the group activity effect was used in this study to design five topics. The results indicated that the contents of the items in the table matched the theme and content of group psychological counseling activities. The scoring scale was 0 to 10, with 0 representing extremely dissatisfied, and 10 representing extremely satisfied. The higher the score, the more satisfied. It was employed to examine group members' overall experience and evaluation of counseling activities. The subjective evaluation of intervention group members on group activities is shown in Table 3.

Discussion

The current study examined the intervention effects of SSGPC on SSU and PSG with a focus on OVC in the context of China. The results of this study provided proof that the SSGPC offered psychoeducational and social interventions to OVC. According to the study, group counseling was used to support the SSU and PSG of OVC to help them cope with the psychological difficulties they were experiencing. One of the key strengths of the SSGPC is that it is based on Bronfenbrenner's (1979) ecological model. Each child is viewed by the SSGPC as a dynamic individual who is both impacted by and able to influence many systems. Masten (2001) argued that one must concentrate on both the child and the system in which the child lives if one wants to minimize stress or increase resilience through intervention. The SSGPC considers these processes and seeks to improve them, intervening in a more comprehensive and efficient manner. To the authors' knowledge, this is the first study to look at SSGPC's efficacy with the OVC population in China.



The first finding of this study showed that there was a significant increase in SSU in the intervention group as compared to the control group. The findings of this study regarding social and peer support concurred largely with those documented by earlier researchers (Kumakech et al., 2009; Hong et al., 2010; Doku et al., 2015; Li et al., 2019). Within the SSGPC, the OVC discovered that they did not live in isolation, but belonged to a social system. These outcomes concurred with those from a study in Rwanda by Lavin et al. (2010), who found that intervention involving group counseling improved children's social support. Based on the ecological systems theory, Mc Guckin and Minton (2014) maintained that the environment in which a child grows up plays a critical role in shaping the relationship between the child and their development. As such, the SSGPC is helpful for OVC in enhancing mental health and social interaction, and establishing new relationships with their community, family, and peers.

Additionally, the results revealed that there were significant differences in the levels of PSG between the pre-test and post-test in the intervention group, indicating that the PSG in the intervention group was significantly higher than those before the intervention. Therefore, the SSGPC is effective in improving the level of PSG of OVC. The results of this study were in line with those of an earlier study, which showed that trauma-focused cognitive behavior therapy and cognitive behavioral interventions for trauma in schools could enhance PSG in children who had experienced trauma (Little et al., 2011). Regarding findings, teachers gave their positive feedback, which illustrated that the SSGPC might be effective in post-traumatic stress disorder (PTSD) symptom reduction. Meanwhile, the SSGPC's supportive

mechanisms and effective teamwork were thought to be crucial for raising the level of PSG of OVC. Through the six SSGPC activities, it can be seen that the group psychological counseling to each member of the help was very significant. This study can provide some reference value for OVC's mental health and intervention.

Regardless of the context, the SSGPC reawakens awareness of OVC, highlighting their needs and mobilizing assistance for them. An important factor of the SSGPC is that it was run in a community-based school, thus promoting awareness of OVC to the teachers and principal in the school and offering the staff support and contact with other professionals who are interested in and trained to assist OVC. The findings of this study regarding training of teachers in schools to acquire the basic skills required to support OVC concurred with earlier studies on the same issue (Wood and Goba, 2011). Therefore, training all teachers in terms of SSGPC would enable them to cope with the large numbers of OVC that are found in schools.

## Limitations and future research directions

This study has a few limitations that should be addressed. First, because this was an interventional study, it was unable to draw firm conclusions from the connection between variables. As a result, follow-up and longitudinal studies may be conducted in the future to address this issue. Second, because all of the primary factors were self-reported, self-presentation biases may have altered the connections between the variables. Future research

TABLE 2 Mean and standard deviation of social support and post-stress growth before and after intervention.

	Experimental group (N = 13)		Control group (N = 14)		Paired samples <i>t</i> -test		Independent samples <i>t</i> -test		Experimental group (N = 13)		Control group (N = 14)		Paired samples <i>t</i> -test		Experimental group (N = 13)		Control group (N = 14)	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
	<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>M</i> ( <i>SD</i> )	<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>M</i> ( <i>SD</i> )	<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>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )
SS	2.99(0.24)	4.05(0.35)	2.95(0.20)	4.05(0.35)	2.89(0.23)	2.89(0.23)	2.95(0.20)	4.05(0.35)	2.99(0.24)	2.99(0.24)	2.95(0.20)	4.05(0.35)	2.89(0.23)	2.89(0.23)	2.99(0.24)	2.99(0.24)	4.05(0.35)	4.05(0.35)
PSG	3.19(0.20)	4.30(0.36)	3.08(0.23)	4.30(0.36)	3.18(0.19)	3.18(0.19)	3.08(0.23)	4.30(0.36)	3.19(0.20)	3.19(0.20)	3.08(0.23)	4.30(0.36)	3.18(0.19)	3.18(0.19)	3.19(0.20)	3.19(0.20)	4.30(0.36)	4.30(0.36)

SS, Social support; PSG, Post-stress growth

TABLE 3 Group psychological counseling effect feedback sheet.

No.	Item	1st (M)	2nd (M)	3rd (M)	4th (M)	5th (M)	6th (M)
1	I appreciate the corporate atmosphere of this group	8.92	9	9.25	9.92	9.61	9.53
2	I like the content of this group activity	8.46	8.92	9.61	9.84	8.92	9.84
3	I agree with the leadership of this group activity	8.53	9.84	9.53	9.3	9.23	9.76
4	I agree with the leadership of this group activity	8.92	9.46	8.92	9.53	9.84	9.61
5	I took an active part in this group coaching activity	8.00	9.38	9.61	9.15	9.61	9.84

might benefit from obtaining data from numerous respondents to overcome these possible biases (e.g., teachers, orphanage staff). Third, the focus of this study was primarily on the effect of SSU group psychological therapy intervention on SSU and PSG. More research is needed to investigate other parameters that influence the SSU and PSG of Chinese OVC.

Conclusion

In this study, the SSGPC was adopted to improve the level of SSU and PSG of OVC. For OVC, increased levels of SSU are necessary to improve their mental health. The results showed that this group counseling intervention effectively improved the level of SSU for OVC. In addition, this study further explored the potential positive effects of the effect of SSGPC on stress after growth. It was found that the intervention improved the PSG level by improving the level of SSU. The results of this study provided some insight into the prevention and intervention of OVC’s mental health. Specifically, the content of the intervention and the form of intervention can be designed to prevent OVC from the negative effects of low SSU. It can also be that OVC are more likely to grow up after experiencing stressful events. Therefore, this intervention provides a certain direction for improving the SSU and PSG of OVC.



## 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

LZ and SR: conceptualization and writing—original draft preparation. LZ and YJ: methodology. LZ and YC: software. SR: validation and supervision. LZ: formal analysis and visualization. YJ: investigation. SW and SR: resources. LZ and ZZ: data curation. ZZ: writing—review and editing. All authors contributed to the article and approved the submitted version.

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## Conflict of interest

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# Psychological capital has a positive correlation with humanistic care ability among nurses

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**Objective:** With the improvement in health awareness, humanistic care ability of nurses has become a focus of public attention. The aim of the study was to confirm the relationship between psychological capital and humanistic care ability of nurses, and to provide suggestions on improving the humanistic care ability of nurses.

**Methods:** A cross-section survey was conducted. Three hundred thirty-nine nurses were recruited from a tertiary general hospital in Taizhou, China. Psychological capital and humanistic care ability were measured using a self-reported questionnaire. Correlation analysis and stepwise multiple regression analysis were performed to analyze the correlation between psychological capital and humanistic care ability.

**Results:** The psychological capital and humanistic care ability scores were  $91.57 \pm 13.96$  and  $189.08 \pm 20.37$ , respectively. Differences in psychological capital scores across professional titles ( $F=4.88$ ,  $p=0.01$ ), departments ( $F=3.69$ ,  $p<0.001$ ), years of work ( $F=4.68$ ,  $p<0.001$ ), and marital status ( $t=3.25$ ,  $p<0.001$ ) were statistically significant. There were statistical differences for the humanistic care ability scores among nurses based on marital status ( $p=0.01$ ). The total psychological capital scores and the four sub-dimensions scores were positively correlated with the humanistic care ability scores among nurses. Self-efficacy was the main predictor of nurses' humanistic care ability.

**Conclusion:** Psychological capital positively affected the humanistic care ability of nurses. Self-efficacy was the main predictor of humanistic care ability. Nursing managers can formulate strategies from the perspective of positive psychology to improve humanistic care ability of nurses.

## KEYWORDS

nurse, psychological capital, humanistic care ability, self-efficacy, positive psychology, training

## Introduction

Nursing is an art that emphasizes the nature of caring (Yeh and Lee, 2011). Care that is based exclusively on objective knowledge might be unsafe and low quality (Rafi et al., 2021). Humanistic care, one of the core competencies of nurses, is a type of value and attitude that cares about people's willingness, consciousness, or responsibility, and reflects particular actions (McCance et al., 1999). Nurses should have humanistic qualities to identify what the patients need with effective care plans, and meet these needs (Yanmis et al., 2022). Nevertheless, the humanistic care ability of nurses in China is currently at a level (Sheng et al., 2018) that cannot meet the requirements of high-quality nursing services (Gao et al., 2021). Technology continues to be valued over humanistic values, especially in resource-constrained work environments (Bu et al., 2021).

Humanistic caring is integrated into nursing care (Letourneau et al., 2021). Humanistic caring is not simply to meet the clinical needs of the patients, it requires medical professionals to pursue excellence in many aspects of caring, especially with the spiritual, philosophical, ethical and moral dimensions (Calle et al., 2017). The nurse and patient, organizational environment (Mohamadi Asl et al., 2022), psychological characteristics (Kovner et al., 2006) and society give rise to a set of intertwined characteristics which influence the realization of humanistic caring. Nurses with higher humanistic care ability are able to provide effective clinical practice and offer high quality of care in hospitals, which contributes to improvement in metrics such as higher patients' satisfaction, less work pressure and more harmonious doctor-patient relationship (Raja et al., 2015). Nursing managers have adopted a variety of strategies to improve humanistic care ability, such as improving nurses' working conditions (Letourneau et al., 2021), conducting standardized training (Yan et al., 2022) and providing continuous learning (Wang et al., 2020). Nevertheless, due to the increasing workload of clinical nurses and the lack of nursing human resources, the implementation of humanistic care has been hindered to some extent (Lai et al., 2022).

Research has shown that a lack of psychological resources and solidified personality traits are the leading reasons for the low level of humanistic care ability (Li et al., 2017). Therefore, it is necessary to explore strategies to increase psychological resources in order to improve humanistic care ability.

Psychological capital is defined as an individual's positive mental state during his/her growth and development (Luthans et al., 2007b). As a positive psychological characteristic, psychological capital strengthens an individual's abilities and increases the resources to overcome difficult situations and achieve success (Guo et al., 2021). Individuals may better cope with stress if they have more psychological capital (Elliott and Fry, 2021). Positive psychological capital is an important manifestation of individual physical and mental health, which can effectively strengthen job involvement and subjective well-being, and inhibit silent behavior (Kaya and Eskin Bacaksiz, 2021). Positive psychological capital increases organizational commitment and

decreases job burnout, and also reduces symptoms of anxiety among female nurses (Zhou et al., 2018). Positive psychological capital influences work-related performance of nurses (Dwyer et al., 2019; An et al., 2020).

To advance our knowledge of the relationship between psychological capital and humanistic care ability, we draw on Watson's theory of human caring (Smith and Parker, 2015) and psychological capital theory (Luthans et al., 2004). Watson puts forward ten carative factors as a framework for providing a format and focus for nursing phenomena. Instillation of faith-hope and promotion and acceptance of the expression of positive and negative feelings are the two factors. Studies (Antonini et al., 2021; Goral Turkcu and Ozkan, 2021) have shown that applying Watson's theory of human caring to the practice of humanistic care can improve nurse's self-confidence, time management, work engagement, and benevolent behaviors. Positive psychological capital is the concept of positive organizational behavior based on psychology, which emphasizes the importance of positive psychological values. Positive psychological capital is composed of four independent components: self-efficacy; optimism; hope; and resilience (Luthans et al., 2004). Psychological capital can affect the attitudes and behaviors of individuals (Kaya and Eskin Bacaksiz, 2021). Positive psychological capital is predicted to affect person-centered care competence, which refers to a humanistic care approach by reducing negative aspects and amplifying positive aspects (Kim, 2022). The relationship between psychological capital and humanistic care ability is becoming the focus of research.

Studies involving the relationship between psychological capital and humanistic care are mostly focused on nursing students. Studies have shown that humanistic care ability was positively correlated with psychological capital among nursing students (Jiang et al., 2017). Positive psychological capital and adaptive emotion expression had multiple mediating roles between individual social capital and humanistic care ability in nursing students (Shen et al., 2020). Lai et al. (2022) studied the association between positive mental character and humanistic care ability in nursing students. However, there is little information about the relationship between psychological capital and humanistic care ability among nurses. It is important to explore the relationship between psychological capital and humanistic care ability of nurses.

## Materials and methods

### Participants and procedure

This is a cross-section study. In order to ensure that the samples were representative and comparable, the work department and years of employment were set as the stratified sampling basis. Research subjects were selected from internal medicine (including gastroenterology, endocrinology, respiratory medicine, cardiology, hematology, nephrology, neurology, radiation therapy, geriatrics,

and a combination of traditional Chinese and Western medicine), surgery (including breast surgery, gastrointestinal surgery, urology, thoracic surgery, orthopedics, neurosurgery, and liver and gallbladder surgery), obstetrics and gynecology, pediatrics, emergency medicine and the intensive care units (ICUs). Sample size was selected in proportion to the number of nurses in the department. From January to March 2020, with the support of nursing personnel department of a tertiary Grade A general hospital in Taizhou (a city on the east coast of China), 370 questionnaires were distributed to all departments and 339 valid questionnaires were returned (effective rate = 91.62%); the samples with missing and incomplete answers were excluded. Before filling out the questionnaire, the researchers explained the purpose, content, and significance of the research to the subjects using standardized guidelines. Informed consent was obtained from all subjects. All personal information was deidentified.

All of the nurses in this study have worked in the hospital for >6 months. The descriptive statistical results of the sample were as follows: average age =  $30.50 \pm 6.32$  years; 326 (96.17%) females; and 13 (3.83%) males. Two hundred twelve (62.54%) were primary nurses, 113 (33.33%) were intermediate nurses, and 14 (4.13%) were senior nurses. Two (0.59%) nurses graduated from technical secondary school, 93 (27.43%) graduated from junior college, 243 (71.68%) graduated from undergraduate programs, and one (0.3%) graduated from a graduate program. One hundred thirty-six (40.12%) were unmarried and 203 (59.88%) were married.

## Measures

### Psychological capital questionnaire

Psychological capital in nurse participants was evaluated by the psychological capital questionnaire [PCQ] (Luthans et al., 2007a). The Chinese version of the PCQ, which was developed by Luo and He (2010), contains 20 items in four dimensions: self-efficacy (six items); hope (six items); resilience (five items); and optimism (three items). Self-efficacy is the knowledge and confidence to carry out specific tasks. Hope is an ability to persevere with goals successfully. Resilience is characterized by the ability to succeed, learn, and become stronger in the face of challenges. Optimism is consciously cultivating a positive attribution to succeed (Luthans and Youssef-Morgan, 2017). Each item was measured using a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The total score ranged from 20 to 120. The higher the score, the higher the psychological capital. The validation study showed that the questionnaire demonstrated adequate validity and reliability. The Cronbach alpha ranged from 0.718 to 0.923.

### Caring ability inventory

Humanistic care ability is the core of nursing (Woods, 2011). The Caring Ability Inventory (CAI) designed by Nkongho (1990) is one of the most well-recognized and widely-used

instruments to evaluate the humanistic care ability (Ma et al., 2022). The CAI has three dimensions that included a knowing dimension (14 items), a courage dimension (13 items), and a patience dimension (10 items). Knowing refers to how well you know yourself, others, and your surroundings. Courage refers to the ability to handle unknown situations. Patience refers to endurance and toughness (Ma et al., 2022). Each item was measured using a 7-point Likert scale, ranging from 1 (completely opposed) to 7 (fully agree). The CAI total score was 37–259 (knowing, 14–98; courage, 13–91; and patience, 10–70). The higher the total score, the stronger the caring ability. A total score < 203.1 was considered low humanistic care ability, a score from 203.1–220.3 was considered medium humanistic care ability, and a score > 220.3 was considered high humanistic care ability. The scale has good reliability with a Cronbach alpha of 0.832. Cronbach alpha coefficients of knowing, courage, and patience were 0.785, 0.720, and 0.748, respectively.

## Data analysis

SPSS20.0 was used for data processing and statistical analysis, which was performed using a *t*-test, analysis of variance, correlation analysis, and multiple stepwise regression analysis. Measurement data were described by the mean  $\pm$  the standard deviation.

## Results

### Current status of psychological capital and humanistic care ability of nurses

The psychological capital scores of 339 nurses were  $91.57 \pm 13.96$ . The self-efficacy, hope, resilience, and optimism scores were  $27.3 \pm 4.66$ ,  $27.27 \pm 4.36$ ,  $22.68 \pm 4.03$ , and  $14.31 \pm 2.72$ , respectively. The humanistic care ability score of nurses was  $189.08 \pm 20.37$  (<203.1), and the knowing, patience, and courage scores were  $77.01 \pm 10.80$ ,  $59.28 \pm 6.93$ , and  $52.79 \pm 12.17$ , respectively, which were all lower than the foreign norm (Watson, 2002; Table 1;  $p < 0.01$ ), indicating that the humanistic care ability of nurses in China was generally low.

TABLE 1 Comparison of clinical nurse CAI scale scores between nurses included in this study and the foreign norm.

Item	<i>n</i>	Knowing	Courage	Patience
Score of this survey	339	$77.01 \pm 10.80$	$52.79 \pm 12.17$	$59.28 \pm 6.93$
Foreign norm	1,388	$80.22 \pm 7.56$	$68.25 \pm 11.57$	$63.11 \pm 5.36$
<i>t</i>		6.39	21.83	11.09
<i>P</i>		<0.01	<0.01	<0.01



TABLE 2 Comparison of the psychological capital score and humanistic care ability among nurses with different characteristics.

Item	<i>n</i> (%)	Psychological capital score	<i>t/F</i>	<i>p</i>	Humanistic care ability score	<i>t/F</i>	<i>p</i>
<b>Gender</b>			1.03	0.31		1.01	0.31
Male	13(3.83)	95.46 ± 16.44			194.69 ± 19.19		
Female	326(96.17)	91.41 ± 13.86			188.86 ± 20.41		
<b>Professional title</b>			4.88	0.01*		2.88	0.06
Primary	212(62.54)	90.01 ± 14.40			187.04 ± 20.87		
Intermediate	113(33.33)	93.49 ± 12.43			192.56 ± 19.17		
Senior	14(4.13)	99.71 ± 15.17			191.93 ± 19.37		
<b>Department</b>			3.69	0.00**		2.58	0.03
Internal medicine	102(30.09)	94.98 ± 15.04			193.93 ± 21.36		
Surgery	85(25.07)	91.73 ± 11.90			188.39 ± 20.07		
Obstetrics and Gynecology	47(13.86)	88.26 ± 16.01			186.15 ± 17.90		
Pediatric	14(4.13)	92.00 ± 7.26			189.64 ± 21.11		
Emergency	44(12.98)	93.09 ± 12.08			189.73 ± 20.99		
ICU	47(13.86)	85.64 ± 13.96			181.98 ± 18.42		
<b>Education</b>			0.86	0.46		0.46	0.71
Technical secondary school	2(0.59)	94 ± 7.07			203 ± 26.87		
Junior college	93(27.43)	89.60 ± 12.95			187.91 ± 19.94		
Undergraduate	243(71.68)	92.30 ± 14.36			189.44 ± 20.57		
Graduate	1(0.3)	93 ± 0			184		
<b>Years of employment</b>			4.68	0.00**		1.25	0.29
<2 years	93(27.43)	87.92 ± 12.34			187.8 ± 20.78		
2–5 years	48(14.16)	91.35 ± 12.28			186.52 ± 19.63		
6–10 years	86(25.37)	90.29 ± 16.26			187.4 ± 21.16		
11–20 years	98(28.91)	95.12 ± 12.47			192.47 ± 19.45		
>20 years	14(4.13)	95.50 ± 16.99			193.07 ± 20.76		
<b>Growth environment</b>			0.59	0.56		1.12	0.33
City	49(14.45)	91.06 ± 14.77			185.06 ± 22.70		
Villages and towns	82(24.19)	93.02 ± 10.95			189.68 ± 20.79		
Country	208(61.36)	91.12 ± 14.83			189.79 ± 19.61		
<b>Only child</b>			−0.03	0.98		−0.33	0.74
Yes	45(13.27)	91.51 ± 13.04			188.16 ± 15.96		
No	294(86.73)	91.58 ± 14.12			189.22 ± 20.98		
<b>Marital status</b>			−3.25	0.00**		−2.74	0.01*
Single	136(40.12)	88.60 ± 13.67			185.42 ± 20.934		
Married	203(59.88)	93.56 ± 13.84			191.54 ± 19.655		
<b>Religious belief</b>			0.35	0.73		1.05	0.30
Have	43(12.68)	92.26 ± 13.28			192.12 ± 20.97		
No	296(87.32)	91.47 ± 14.08			188.64 ± 20.28		

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

## Comparison of psychological capital and humanistic care ability among nurses with different characteristics

Differences in psychological capital scores across professional titles ( $F=4.88$ ,  $p=0.01$ ), departments ( $F=3.69$ ,  $p<0.001$ ), years of employment ( $F=4.68$ ,  $p<0.001$ ), and marital status ( $t=3.25$ ,  $p<0.001$ ) were all statistically significant. There were statistical

differences for the humanistic care ability scores among nurses based on marital status ( $p=0.01$ ; Table 2). There were no significant differences in gender, education, growth environment, the only child and religious beliefs in psychological capital or humanistic care ability.

The results of multiple comparisons are shown in Tables 3–6. Nurses from obstetrics, pediatric and ICU had lower psychological capital scores. The psychological capital and humanistic care ability scores of married nurses were higher than unmarried nurses.

TABLE 3 Multiple comparisons of psychological capital scores of nurses with different professional title.

(I) Professional title	(J) Professional title	Mean difference (I-J)	Std. error	<i>p</i>	95% Confidence interval	
					Lower bound	Upper bound
Primary	Intermediate	-3.48*	1.61	0.03	-6.64	-0.31
	Senior	-9.70*	3.81	0.01	-17.20	-2.21
Intermediate	Primary	3.48*	1.61	0.03	0.31	6.64
	Senior	-6.23	3.91	0.11	-13.92	1.47
Senior	Primary	9.70*	3.81	0.01	2.21	17.20
	Intermediate	6.23	3.91	0.11	-1.47	13.92

\*The mean difference is significant at the 0.05 level.

TABLE 4 Multiple comparisons of psychological capital scores among nurses from different departments.

(I) Department	(J) Department	Mean difference (I-J)	Std. error	<i>p</i>	95% Confidence interval	
					Lower bound	Upper bound
Internal medicine	Surgery	3.25	2.01	0.11	-0.71	7.21
	Obstetrics and gynecology	6.73*	2.41	0.01	1.98	11.47
	Pediatric	2.98	3.90	0.45	-4.70	10.66
	Emergency	1.89	2.47	0.45	-2.97	6.75
	ICU	9.34*	2.41	0.00	4.59	14.09
Surgery	Internal medicine	-3.25	2.01	0.11	-7.21	0.71
	Obstetrics and gynecology	3.47	2.49	0.16	-1.42	8.37
	Pediatric	-0.27	3.95	0.95	-8.04	7.50
	Emergency	-1.36	2.54	0.59	-6.36	3.64
	ICU	6.09*	2.49	0.02	1.19	10.99
Obstetrics and gynecology	Internal medicine	-6.73*	2.41	0.01	-11.47	-1.98
	Surgery	-3.47	2.49	0.16	-8.37	1.42
	Pediatric	-3.74	4.17	0.37	-11.95	4.46
	Emergency	-4.84	2.87	0.09	-10.49	0.82
	ICU	2.62	2.82	0.36	-2.94	8.17
Pediatric	Internal medicine	-2.98	3.90	0.45	-10.66	4.70
	Surgery	0.27	3.95	0.95	-7.50	8.04
	Obstetrics and gynecology	3.74	4.17	0.37	-4.46	11.95
	Emergency	-1.09	4.20	0.80	-9.36	7.18
	ICU	6.36	4.17	0.13	-1.84	14.56
Emergency	Internal medicine	-1.89	2.47	0.45	-6.75	2.97
	Surgery	1.36	2.54	0.59	-3.64	6.36
	Obstetrics and gynecology	4.84	2.87	0.09	-0.82	10.49
	Pediatric	1.09	4.20	0.80	-7.18	9.36
	ICU	7.45*	2.87	0.01	1.80	13.10
ICU	Internal medicine	-9.34*	2.41	0.00	-14.09	-4.59
	Surgery	-6.09*	2.49	0.02	-10.99	-1.19
	Obstetrics and gynecology	-2.62	2.82	0.36	-8.17	2.94
	Pediatric	-6.36	4.17	0.13	-14.56	1.84
	Emergency	-7.45*	2.87	0.01	-13.10	-1.80

\*The mean difference is significant at the 0.05 level.

## Correlation between psychological capital and humanistic care ability of nurses

It can be seen from Table 7 that each sub-dimension and total psychological capital scores were positively correlated with

humanistic care ability.

We performed a stepwise multiple regression analysis using sex, age, professional title, departments, education, years of employment, growth environment, marital status, efficacy, hope, resilience, and optimism as independent variables and the

TABLE 5 Multiple comparisons of psychological capital scores of nurses with different years of employment.

(I) Years of employment	(J) Years of employment	Mean difference (I–J)	Std. error	<i>p</i>	95% Confidence interval	
					Lower bound	Upper bound
<2 years	2–5 years	–3.43	2.43	0.16	–8.21	1.35
	6–10 years	–2.37	2.05	0.25	–6.39	1.66
	11–20 years	–7.20*	1.98	0.00	–11.09	–3.30
	>20 years	–11.58*	3.92	0.00	–19.28	–3.87
2–5 years	<2 years	3.43	2.43	0.16	–1.35	8.21
	6–10 years	1.06	2.46	0.67	–3.78	5.91
	11–20 years	–3.77	2.41	0.12	–8.51	0.97
	>20 years	–8.15	4.15	0.05	–16.31	0.02
6–10 years	<2 years	2.37	2.05	0.25	–1.66	6.39
	2–5 years	–1.06	2.46	0.67	–5.91	3.78
	11–20 years	–4.83*	2.02	0.02	–8.81	–0.86
	>20 years	–9.21*	3.94	0.02	–16.96	–1.46
11–20 years	<2 years	7.20*	1.98	0.00	3.30	11.09
	2–5 years	3.77	2.41	0.12	–0.97	8.51
	6–10 years	4.83*	2.02	0.02	0.86	8.81
	>20 years	–4.38	3.91	0.26	–12.06	3.31
>20 years	<2 years	11.58*	3.92	0.00	3.87	19.28
	2–5 years	8.15	4.15	0.05	–0.02	16.31
	6–10 years	9.21*	3.94	0.02	1.46	16.96
	11–20 years	4.38	3.91	0.26	–3.31	12.06

\*The mean difference is significant at the 0.05 level.

humanistic care ability total score as dependent variables. The analysis showed that efficiency and optimism had statistically significant effects on humanistic care ability scores. Both of them explained 21.1% of the total variation in humanistic care ability. The standardized regression coefficient of efficiency was the largest, which was the major predictive variable affecting the humanistic care ability of nurses (Table 8).

## Discussion

### Factors influencing psychological capital of nurses

Psychological capital refers to a positive psychological state that can be developed by individuals (Avey et al., 2010) and is characterized by development and change. Professional titles, departments, years of employment, and marital status had an impact on the psychological capital of nurses.

### Professional title

Nurses with senior professional titles had the highest psychological capital scores. Senior nurses are more inclined to

have a positive coping style (Shan et al., 2021). Moreover, senior nurses were generally well-qualified with extensive work experience and enthusiasm for their job, and showed strong resilience in dealing with frustration and pressure (Zhu et al., 2021). Additionally, senior nurses had mastered more professional skills and were able to manage clinical events more easily.

### Department

Nurses from obstetrics and gynecology, pediatric, and ICU had lower psychological capital scores. Obstetrics and gynecology is a high-risk technical environment in which nurses are responsible for the safety and health of women and newborns (Ribeliene et al., 2019). Studies have shown that nurses in obstetrics and gynecology, especially midwives and neonatology nurses, have high levels of anxiety, burnout and secondary traumatic stress disorder compared with nurses in other departments (De la Fuente-Solana et al., 2019). High workload and ethically challenging duties are major problems for obstetric nurses (Holmlund et al., 2022). Feelings of powerlessness, work pressure, and work frustration among obstetrics and gynecology nurses are common in the work environment (Jin et al., 2022). Investigations have shown that obstetric nurses have psychological problems such as fear and



TABLE 6 Multiple comparisons of humanistic care ability scores among nurses from different departments.

(I) Department	(J) Departments	Mean difference (I-J)	Std. error	<i>p</i>	95% Confidence interval	
					Lower bound	Upper bound
Internal medicine	Surgery	5.54	2.96	0.06	−0.27	11.36
	Obstetrics and gynecology	7.78*	3.55	0.03	0.80	14.77
	Pediatric	4.29	5.74	0.46	−7.00	15.58
	Emergency	4.20	3.63	0.25	−2.94	11.35
	ICU	11.95*	3.55	0.00	4.97	18.94
Surgery	Internal medicine	−5.54	2.96	0.06	−11.36	0.27
	Obstetrics and gynecology	2.24	3.66	0.54	−4.96	9.44
	Pediatric	−1.25	5.81	0.83	−12.68	10.17
	Emergency	−1.34	3.74	0.72	−8.70	6.02
	ICU	6.41	3.66	0.08	−0.79	13.61
Obstetrics and gynecology	Internal medicine	−7.78*	3.55	0.03	−14.77	−0.80
	Surgery	−2.24	3.66	0.54	−9.44	4.96
	Pediatric	−3.49	6.13	0.57	−15.55	8.57
	Emergency	−3.58	4.22	0.40	−11.89	4.73
	ICU	4.17	4.15	0.32	−4.00	12.34
Pediatric	Internal medicine	−4.29	5.74	0.46	−15.58	7.00
	Surgery	1.25	5.81	0.83	−10.17	12.68
	Obstetrics and gynecology	3.49	6.13	0.57	−8.57	15.55
	Emergency	−0.08	6.18	0.99	−12.24	12.07
	ICU	7.66	6.13	0.21	−4.40	19.72
Emergency	Internal medicine	−4.20	3.63	0.25	−11.35	2.94
	Surgery	1.34	3.74	0.72	−6.02	8.70
	Obstetrics and gynecology	3.58	4.22	0.40	−4.73	11.89
	Pediatric	0.08	6.18	0.99	−12.07	12.24
	ICU	7.75	4.22	0.07	−0.56	16.06
ICU	Internal medicine	−11.95*	3.55	0.00	−18.94	−4.97
	Surgery	−6.41	3.66	0.08	−13.61	0.79
	Obstetrics and gynecology	−4.17	4.15	0.32	−12.34	4.00
	Pediatric	−7.66	6.13	0.21	−19.72	4.40
	Emergency	−7.75	4.22	0.07	−16.06	0.56

\*The mean difference is significant at the 0.05 level.

TABLE 7 Correlation analysis of psychological capital and humanistic care ability of nurses.

Item	Humanistic care ability	
	<i>r</i>	<i>p</i>
Self-efficacy	0.45	0.00
Hope	0.37	0.00
Resilience	0.37	0.00
Optimism	0.39	0.00
Psychological capital total score	0.45	0.00

hypochondria under the COVID-19 epidemic (Wu et al., 2021). Pediatric nurses are in a similar situation to obstetric nurses. Work-related stressors cause emotional burden, psychological distress, and burnout (Macintyre et al., 2022).

All these factors may affect the psychological capital of nurses.

The ICU is a complex and stressful work environment due to the critical nature of hospitalized patients, the highly technical devices and equipment used in the ICU, and the need for speedy action of nurses in inpatient care (Mehri et al., 2022). Thus, ICU nurses need to withstand a heightened risk of infection and often need to render emergency treatment within a few seconds, which is likely to cause tension (Li et al., 2021). ICUs can be stressful due to high mortality rates, critical medical conditions, and ethical dilemmas (Oliveira et al., 2019). ICU nurses are more prone to burnout syndrome because of the heavy workload and long shifts (Choudhary et al., 2022). During the COVID-19 pandemic, ICU nurses had been under great pressure (Wang et al., 2020). ICU nurses work under great physical and mental pressure, thus tend to have negative self-evaluations and the psychological capital scores are decreased.

TABLE 8 Humanistic care ability stepwise multiple regression analysis.

Model		Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>
		<i>B</i>	Std. error	Beta		
1	(Constant)	136.02	5.90		23.05	0.00
	Self-efficacy	1.94	0.21	0.45	9.12	0.00
2	(Constant)	130.60	6.17		21.18	0.00
	Self-efficacy	1.47	0.27	0.34	5.37	0.00
	Optimism	1.29	0.47	0.17	2.76	0.01

$R^2 = 0.216$ , adjust  $R^2 = 0.211$ ,  $F = 46.21$ ,  $p < 0.00$ .

## Years of employment

Nurses with more professional experience had higher psychological capital levels, which is consistent with the results of other studies in the literature (Jeong and Jung, 2018; Kaya and Eskin Bacaksiz, 2021). The nurses with low seniority had relatively low psychological capital scores. Transition into the workplace causes a range of stress for new graduate nurses who experience both psychological well- and ill-being (Jarden et al., 2021). Newly qualified nurses encounter multiple work-related stress over the first 12 months post-qualification (Halpin et al., 2017). Some newly qualified nurses feel overwhelmed and vulnerable. The post-registration period can be a challenging time for nurses (Collard et al., 2020). With the increase in years of employment, skills and experience would be richer than before, and psychological capital was also significantly improved.

## Marital status

The psychological capital of married nurses was higher than unmarried nurses. Functional social support could protect individuals from psychological problems by buffering the negative effect of life stressors on mental health and promoting wellbeing (Azanedo et al., 2021). The spiritual orientation of nurses has a positive effect on psychological capital. Married nurses are more spiritual than single nurses to shape empathetic behaviors (Allahyari Bouzanjani et al., 2021). Married nurses are better able to cope with stress and frustration from life and work.

## Factor influencing humanistic care ability of nurses

Humanistic caring ability is not innate, but is progressively formed and developed through one's own learning and social practice under the interaction of environment and education (Huang et al., 2008). Studies have shown that nurses' educational background can affect humanistic care (Mohamadi Asl et al., 2022).

However, in our study, the educational background does not play a prominent role. This result is consistent with another study (Deng et al., 2019). In the past decade, nursing education in China has developed rapidly (You et al., 2015). Because of the effect of working experience, there was no difference in humanistic care ability between senior college nurses and junior undergraduate nurses.

In our study, results showed that gender was not the influencing factor of humanistic care ability, which is consistent with the study by Lai et al. (2022). But other studies showed that female nurses have higher humanistic care ability scores than males (Fei et al., 2017). This result may be due to the uneven sample size of males and females.

Results showed that the humanistic care ability of married nurses was stronger than that of single nurses. This has also been shown in other studies (Zhou et al., 2014). Empathy is the essence of communication, and effective communication promotes the development of humanistic care among nurses (Babaii et al., 2021). Life satisfaction and optimal communication within the family have a positive effect on relationship satisfaction (Sztanyi-Szeke et al., 2022), which helps nurses effectively carry out humanistic care.

## Relationship between nurses' psychological capital and humanistic care ability

Psychological capital was positively correlated with humanistic care ability. A high level of psychological capital enhances an individuals' active engagement in work (Setar et al., 2015). Members with greater psychological capital try harder with the conviction that they can achieve better performance (self-efficacy), derive multiple ways to solve problems with strong willpower (hope), expect positive results based on internal attribution (optimism), and make efforts to respond positively to difficult situations [resilience] (Jang, 2022). Psychological capital has a significant impact on lower rates of burnout and turnover (Lee et al., 2019). Nurses with high psychological capital have more enthusiasm to care for patients.

Self-efficacy and optimism directly affect humanistic care ability. Self-efficacy is significantly associated with work-related stress and mental health problems (Azemi et al., 2022). Self-efficacy plays a significant role in understanding consequences of occupational stress (Dianat et al., 2021). The level of self-efficacy determines the success rate of the event (Herts et al., 2017). Nurses with low self-efficacy have stress and anxiety during difficult situations, which in turn hamper work (Xiong et al., 2020). High self-efficacy which ensures proactive work and better goal achievement (Lim et al., 2022) could improve the quality of care and nurse-patient relationships (Bu et al., 2021).

Optimism is a positive emotion. A growing body of evidence highlights the unique, independent role of positive emotion in promoting adaptive coping in the face of stress (Cheung et al., 2020). From an optimist's point of view, negative events are transient, of an external cause, and specific to a given fact, and the positive events are

linked to internal issues that are more permanent and recurrent (Almeida and Miclos, 2022). Optimists are more likely to provide humanistic care to patients to cope with a disease positively.

## Practical implications

By identifying the relationship between psychological capital and humanistic caring capacity, our study offers some practical implications.

We suggest that nursing managers can improve the humanistic care ability of nurses by reinforcing their self-efficacy. High self-efficacy can help nurses show greater confidence in their work and develop positive relationships with patients.

Nursing managers can also implement psychological interventions to keep nurses optimistic so that nurses are more willing to practice humanistic care.

Nowadays, positive psychology has been widely used. Positive psychology is regarded as an academic field encompassing character strengths, positive relationships, experience, and institutions (Seligman, 2019). Short-term positive psychological coaching is a valuable method for developing personal psychological capital (Corbu et al., 2021). Positive psychological group intervention effectively enhanced positive emotions (Kounenou et al., 2022). Positive psychological intervention will play a greater role in improving humanistic care ability.

## Limitations

Several limitations need to be considered. First, the nurse participants were conveniently recruited from one hospital, resulting in findings that may not represent all Chinese nurses. Second, self-report measures were employed, which may affect the objectivity and authenticity of the collected data. Third, only psychological capital and some socio-demographic characteristics were tested as influences on humanistic caring ability; other possible determinants need to be explored for comprehensively understanding humanistic caring ability. Longitudinal research designs and randomized sampling are recommended in future studies.

## Conclusion

Psychological capital positively affected the humanistic care ability of nurses. Self-efficacy was the main predictor of humanistic

care ability. Nursing managers can formulate strategies from the perspective of positive psychology to improve humanistic care ability of nurses.

## 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

Ethical review and approval were not required for the study on human participants in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

XL conceived and designed the study and reviewed the manuscript. XL and XY collected the data. XL and CL interpreted the data. XL wrote the first draft of the manuscript. CL and BS modified the manuscript. All authors contributed to the article and approved the submitted version.

## 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.

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# The influence of self-compassion on mental health of postgraduates: Mediating role of help-seeking behavior

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This study explores the relationship between self-compassion and mental health of postgraduates based on the perspective of the dual-factor model (DFM) of mental health and the mediating role of help-seeking behavior. A total of 605 postgraduates were investigated with a questionnaire. The results showed that the DFM of mental health was better than the one-factor model for the mental health status of postgraduates. Among them, those with complete mental health accounted for the highest proportion (63.3%), followed by vulnerable (25.1%), troubled (9.1%), and symptomatic but content (2.5%). Self-compassion and non-professional help-seeking behavior had a positive predictive effect on positive mental health factors of the postgraduates, while self-compassion had a negative predictive effect on their psychological symptoms. Non-professional help-seeking behavior played a partial mediating role between self-compassion and positive mental health factors.

## KEYWORDS

postgraduates, self-compassion, help-seeking behavior, DFM, flourishing

## Introduction

With the continuous expansion of postgraduate enrollment in China, the competition for academics and employment has become increasingly fierce. The group of postgraduates not only carries high expectations from family, society, and country but also faces multiple pressures such as uncertainty of scientific research, economic distress, marriage, employment, and interpersonal relationships. Some postgraduates even have to take on multiple responsibilities of parenthood. As a result, this group generally feels stressed and physically and mentally exhausted (Song et al., 2019). The existing school mental healthcare system pays more attention to symptom relief and crisis intervention of psychological problems. This working mode may ignore some people who need help (Wang and Zhang, 2011). Positive psychology holds that “mental health is not simply the elimination of negative factors such as mental illness but also the stimulation of happiness experience and positive skills” (Seligman, 2008). It is acknowledged that the absence of psychopathology (PTH) is not equal to positive mental health (PMH), i.e., high levels

of emotional, cognitive, and psychological wellbeing (Keyes et al., 2002). Elements of PMH and PTH are not opposite poles of a single dimension but two negatively correlated factors of mental health (Keyes, 2005).

## The DFM of mental health

“The Dual-Factor Model of Mental Health (DFM)” integrates psychopathology (PTH) and subjective wellbeing (SWB) into a mental health continuum and provides an adjustment and supplement to traditional mental health research paradigms (Greenspoon and Saklofske, 2001; Suldo and Shaffer, 2008; Provencher and Keyes, 2011). Based on the DFM, mental health status may be divided into four categories by measuring subjective wellbeing (SWB) and psychopathology (PTH): complete mental health (high wellbeing, low symptoms of mental illness), symptomatic but content (high wellbeing, high mental illness symptoms), vulnerable (low wellbeing, low mental illness symptoms), and troubled (low wellbeing, high mental illness symptoms) (Doll, 2008; Suldo and Shaffer, 2008). The complete mental health group has the best health condition and develops emotional vitality and good psychological and social functions. Although symptomatic but content people have mental symptoms (such as depression), they also have positive characteristics (such as moderate or high subjective wellbeing). Because of the expansion and formation of positive emotions and positive cognition of life, they are easy to recover from mental illness. Vulnerable people are often overestimated by traditional mental health models and excluded from research and services, because their symptoms of mental diseases do not meet the diagnostic criterion (Suldo and Shaffer, 2008). Troubled ones not only suffer from depression and anxiety but also feel dissatisfied with current life and have poor psychological and social functions. Previous studies have confirmed that the model has a good predictive effect on the physical and mental functions and social function of different groups (Keyes, 2007). Compared with the other three groups, people with complete mental health have better physical condition, psychological function, academic performance, and social function, while troubled people have the worst performance (Renshaw and Cohen, 2014; Antaramian et al., 2015; Wang et al., 2016; Cheng, 2018). It is shown that mental health is not only related to the level of symptoms of mental illness but also to the conscious maintenance of positive psychological quality. Applicability of the DFM with Chinese populations has also been shown to be usable and reliable (Dong et al., 2014; Wang et al., 2016; Xiong et al., 2016; Xiao et al., 2021).

## Self-compassion and mental health

Self-compassion (SC) is a positive self-attitude or emotion regulation strategy and emotional arousal state in which

individuals do not dodge their own pain and failure, feel it with an open and tolerant attitude, and give an unbiased understanding (Neff, 2009). Self-compassion plays an active role in mental health, and there is a positive correlation between self-compassion and individual well-being (Neff et al., 2005; Wei et al., 2011; Albertson et al., 2015; Bluth and Blanton, 2015; Greene and Britton, 2015). Self-compassion includes three main components: self-kindness, common humanity, and mindfulness. Self-kindness means that individuals can objectively estimate their own abilities and face their own shortcomings, not being too harsh and critical of themselves, and being more tolerant and understanding themselves. Common humanity means that individuals can realize that pain and disaster are not unique to one person but are experienced by all human beings, and that they are connected and affected by each other rather than isolated individuals. Mindfulness is when an individual can clearly understand their environment, accept it, and try to adjust rather than ignore or magnify their pain. The three elements are closely related to each other. Self-kindness is the emotional component of self-compassion, unconditional acceptance of oneself; common humanity is the cognitive component of self-compassion; it mobilizes the individual's thinking through processes such as social connection and comparison; mindfulness is the advanced adjustment control of self-compassion components, and it optimizes self-kindness and common humanity (Zhang et al., 2010). By activating the individual's self-comfort and self-protection functions, self-compassion reduces the feeling of being threatened, promotes feeling of similar attachment and security, and enhances the sense of well-being (Cheung et al., 2004; Chen et al., 2011; Hu, 2013); the dimensions of self-compassion, self-kindness, and mindfulness have a significant positive correlation with subjective well-being, and there is a significant negative correlation between isolation and subjective wellbeing. There is a significant correlation between self-compassion and total scores on life satisfaction scale and positive and negative emotional scale. People with high self-compassion experience more positive experiences such as optimism and curiosity, and various positive emotions such as excitement, passion, and inspiration. Self-compassion is negatively correlated with depression, anxiety, body shame, and fear of failure (Neff et al., 2005; Odou and Brinker, 2014; Webb et al., 2016). Even after controlling variables such as self-criticism and self-esteem, self-compassion is negatively correlated with anxiety and depression, indicating that people with low levels of self-compassion might be more prone to self-criticism and self-aggression (Gilbert et al., 2010).

## The indirect effect of help-seeking behavior

Help-seeking behavior is an individual coping behavior in the interpersonal field when people suffer from psychological

distress (Rickwood et al., 2005). Help-seeking behavior refers to the behavior of actively seeking help from others. They get inner support from other, usually by intimate conversation, is often applied to deal with unpleasant experiences. Generally, the sources of help are divided into two categories: one is from professionals such as professional psychological counselors, and doctors in hospitals, and the other is from non-professionals such as family members, friends or classmates, student tutors, teachers or net friends (Jiang and Wang, 2003). Help-seeking behavior negatively predicts the level of symptoms of mental illness (Qu, 2010; Huang et al., 2020), and professional help-seeking attitude also negatively predicts symptoms of mental illness (Hu, 2011; Bai and Xiao, 2018), indicating that the more the help-seeking behavior, the lower the symptoms of mental illness and that the higher the awareness, willingness, and possibility of help-seeking, the less the symptoms of mental illness. There is a significant positive correlation between self-compassion and professional help-seeking attitude (Allen et al., 2012; Heath et al., 2017; Keum et al., 2018; Zhang and Hao, 2019). Students with high levels of self-compassion feel connected, accept each other's opinions easily, and actively help each other when interacting with others, and in general, those with high levels of self-compassion have more social support and positive coping styles and experience less isolation and helplessness (Neff and Beretvas, 2012). Therefore, self-compassion promotes help-seeking behaviors, and those with high levels of self-compassion take more active behaviors to improve their emotions. There is less shame when they fail, less worry about others' judgment when seeking help, less resistance and defense against receiving help and help-seeking behavior, and increase in the probability of seeking help (Allen et al., 2012). Self-compassion also increases self-disclosure by reducing self-stigma when seeking help and increasing help-seeking behavior from professionals (Jiang and Wang, 2003).

## This study

Although the DFM has been widely verified in middle school students and undergraduates (Eklund et al., 2010; Wang et al., 2016; Lai, 2017; Zhang et al., 2018), there are few relevant studies on postgraduates. Despite the postgraduates have relatively high cultural and human capital of the graduate population, with the increase of enrollment and employment pressure, there are also more and more problems such as anxiety, depression and stress. It is necessary to examine the level of mental health and its factors influencing postgraduates. Focusing on positive psychological qualities can help to understand the improvement and solution of the problem.

The aim of this study is to focus on the applicability of the DFM to the mental health status of postgraduates. Based on the research results of undergraduates and the general population, this study assumes that the DFM of mental health

is better than the one-factor model. The mental health status of postgraduates will be classified with the DFM quartering method, and the results will be similar to those of the population (Renshaw and Cohen, 2014; Antaramian et al., 2015; Wang et al., 2016; Xiao et al., 2021). In addition, this study also focuses on the construction of positive factors of mental health and intends to find out the relationship between self-compassion and help-seeking behavior and positive factors of mental health. Assumptions are put forward in this study that self-compassion could effectively improve mental health, and that high self-compassion would improve the level of help-seeking, which in turn affects the positive factors of mental health. The state of mental health is often the result of the long-term interaction between individual psychological traits and behavioral responses. Influenced by self-compassion, whether individuals can effectively seek help during stress is an important factor affecting their actual state of mental health. Therefore, it is assumed that help-seeking behavior is an intermediary variable in the relationship between self-compassion and mental health. Because of the positive correlation between self-compassion and positive mental health and the negative correlation between psychological symptoms, this study hypothesizes that the level of self-compassion of postgraduates will affect the two factors of their mental health.

Based on the above research studies, this research hypothesizes:

**Hypothesis 1:** The DFM model could be applied to measure the mental health status of postgraduates, and the model fits better than the one-factor model.

**Hypothesis 2:** Self-compassion is positively correlated with flourishing (positive dimension of mental health) and negatively correlated with symptoms (negative dimension of mental health).

**Hypothesis 3:** Self-compassion positively affects help-seeking behavior.

**Hypothesis 4:** Help-seeking behavior positively affects flourishing (positive dimension of mental health) and negatively affects symptoms (negative dimension of mental health).

**Hypothesis 5:** Help-seeking behavior mediates between self-compassion and mental health.

## Research methods

### Procedures

The random sampling and snowball methods were used to send questionnaire links to postgraduate groups in various departments of certain universities *via* email. All participants gave informed consent to allow their data to be analyzed. The questionnaires were collected from November to December



TABLE 1 Basic characteristics of samples ( $N = 605$ ).

Variable name		Sample size	Proportion (%)
Gender	Male	179	29.6
	Female	426	70.4
Grade of postgraduates	First-year	279	46.1
	Second-year	162	26.8
	Third-year or above	164	27.1
Place of origin	Town	360	59.5
	Rural	245	40.5
Major category	Humanities and Arts	170	28.1
	Social Sciences	294	48.6
	Natural Sciences	141	23.3

2020, and a total of 781 questionnaires were collected, including 605 valid questionnaires, with an effective rate of 77.46%.

## Participants

The basic characteristics of the samples are shown in Table 1. The distribution of samples in demographic variables such as gender, major category, and place of origin was relatively balanced, which could reduce the impact of the sample on the research results to a certain extent, meaning that the sample had certain representativeness.

## Measures

### Dual-factors of mental health

The Chinese College Students Mental Health Screening Scale (Fang et al., 2018) was used to measure the negative factors of mental health. Internalization symptoms were measured by second-level screening of psychological internalization problems in the College Student Mental Health Screening Scale, with a total of 30 items, including 7 indicators of anxiety, depression, sensitivity, inferiority, social anxiety, somatization, and paranoia. The 7 indicators were scored on a 4-level Likert scale; 1 means “don’t think about me at all” and 4 means “very much like me”; the higher the score, the more severe the symptoms or distress. In this study, the Cronbach’s  $\alpha$  coefficient of the total scale was 0.953, and the subscales were between 0.757 and 0.835, indicating good reliability and validity.

Referring to the research of Xiao et al. (2021), Flourishing Scale (FS) was used to measure the positive factors of mental health more robustly than life satisfaction (Diener et al., 2010). There are 8 items on the flourishing scale, which is scored on a 7-point Likert scale, with “1” representing strongly disagree and “7” representing strongly agree, all of which are scored

positively, with a scoring range of 0–56. The scale was based on the self-realization theory and the Flourishing Scale (FS) to re-evaluate the individual’s sense of wellbeing; the higher the score, the higher the individual’s positive psychological level with more positive psychological resources and social functions. In this study, the internal consistency coefficient of the scale was 0.953, indicating good reliability and validity.

### Self-compassion

The Chinese version of the Self-Compassion Scale (SCS) was adopted (Chen et al., 2011); the Self-Compassion Scale has a total of 26 items, including the three core components: self-kindness, common humanity, and mindfulness, of which 13 questions were scored positively and 13 questions were scored negatively. The Likert’s 5-level scoring method was adopted for all the questions. “1” means never, and “5” means always. This scale was used to measure the level of self-compassion. From the positive and negative aspects, the three core components were further divided into six subdimensions: self-kindness, self-judgment, common humanity, sense of isolation, mindfulness, and over-identification to evaluate the attitude and cognition toward oneself, so as to make the measurement results of self-compassion more comprehensive; the higher the total score, the higher the self-compassion. Numerous research results show that the scale has good reliability and validity, and can stably and effectively measure the level of self-compassion of Chinese college students (Cronbach’s  $\alpha = 0.84$ ). In this study, the Cronbach’s  $\alpha$  coefficient of the total scale was 0.901, and the subscales were between 0.697 and 0.834, indicating good reliability and validity.

### Help-seeking behavior

The help-seeking behavior scale mainly refers to the Actual Help-Seeking Questionnaire (AHSQ) (Rickwood and Braithwaite, 1994). This scale is used to measure students’ help-seeking behavior, including people whom they seek for help or advice, the frequency of seeking help, and the effectiveness of help they feel when they encounter psychological problems and unpleasant experiences. It includes 2 parts: professional help-seeking and non-professional help-seeking. A total of 10 items are listed. Professional help-seeking includes three items: school therapists, off-campus psychologists, and psychiatrists. Non-professional help includes parents, family members (other than parents), boyfriend/girlfriend, classmates or friends, religious personnel such as priests and monks, teachers or student tutors, net friends, etc. Those who have sought help from the above-mentioned are marked as “1”; otherwise, they are assigned 0 points. The frequency of help-seeking (“1” is rarely, “5” is always) and the level of help (“0” is not helpful, “4” is very helpful) are assessed on a Likert scale of 5 scoring

method; First is to find out whether the subject has carried out help-seeking behavior from a certain recourse and second, to measure the frequency of help-seeking behaviors; the higher the frequency, the higher the score, and the more the help-seeking behaviors. Finally, the effectiveness of help the seeker felt was measured, and this item was used as a weighted item to assess the quality of the behavior. Therefore, the score of help-seeking behavior is the product of the three scores under each item, that of professional help is the sum of the scores of the professional help recourses, and that of non-professional help-seeking is the sum of the scores of the non-professional help recourses. Higher scores indicate more help-seeking behavior. In this study, the Cronbach's  $\alpha$  coefficient of the total scale was 0.835, and the subscales were between 0.794 and 0.815, indicating good reliability and validity.

## Data analysis

Descriptive statistics and inferential statistics were used to summarize the mental health status of the postgraduates. First of all, the average and standard deviations are used to describe the general situation of postgraduates' mental health, self-compassion, and help-seeking behavior. Second, according to the internalization symptoms and the level of flourishing, four categories of mental health groups are divided into four categories, namely, "complete mental health," "symptomatic but content," "vulnerable," and "troubled mental ill," and the proportion is described. A structural equation model (SEM) was applied to test which model fits better, the traditional mental health model (one factor model) or the DFM. Then, an ANOVA was carried out to analyze the situations of self-compassion and help-seeking behaviors among the postgraduates. Finally, a linear regression analysis and SEM were used to explore the mediation effect of help-seeking behavior between self-compassion and mental health.

## Results

### Descriptive statistics of the DFM of postgraduate mental health

The results show that the overall mental health status of the postgraduates is good (Table 2). Specifically, in terms of positive psychology, the level of flourishing is relatively high ( $M = 5.22$ ,  $SD = 0.99$ ). Referring to previous studies (Lai, 2017), a score of 5 or more indicates a higher level of wellbeing. In terms of negative psychology, the average score of internalization problems is 1.84. In previous studies, a score of more than 2 indicates that there are related psychological problems. It was shown that the level of internalization problems of the postgraduates is generally at a moderate level. Among them, the sensitivity symptom had the highest score ( $M = 2.23$ ,  $SD = 0.58$ ), followed by the symptoms of social anxiety, depression, and inferiority, paranoia, anxiety, and somatization. The average score of each dimension was between 1.48 and 2.23.

### Test of the DFM of postgraduate mental health

#### Comparison of classification results between one-factor model and DFM

According to the DFM, the score of the flourishing scale represents positive psychology. Referring to previous studies (Lai, 2017), a score of flourishing above 5 points represents high flourishing, while a score below 5 points represents low flourishing. The internalization problem scale is symptom situation. The average score of any symptom of internalization problem  $\geq 2$  SD is used as the screening standard to classify the level of psychological problems (Liu, 2019). Those with low psychological problems and high flourishing are complete mental health, and those with both high indicators are symptomatic but content. Those with

TABLE 2 Overall mental health of the postgraduates.

Variable	Dimension	Factor	M	SD	Md
Mental health	Flourishing		5.22	0.99	5.25
	Total score of internalization problems		1.84	0.48	1.83
		Anxiety	1.67	0.6	1.50
		Depression	1.89	0.56	2.00
		Sensitive	2.23	0.58	2.25
		Inferiority	1.89	0.56	2.00
		Social anxiety	2.01	0.64	2.00
		Somatization	1.48	0.54	1.25
		Paranoid	1.69	0.55	1.75

M, mean, SD, standard deviation, and Md, mean deviation.

TABLE 3 Comparison of DFM quartering method and one-factor model classification method.

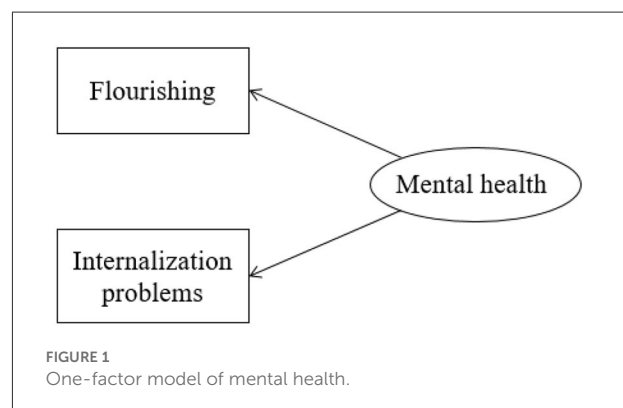
	Type	Quantity	Proportion	Flourishing		F/t value	Internalization problems		F/t value
				M	SD		M	SD	
Division method	Quartering method								
	Completely mental health	383	63.3	5.80	0	338.36***	1.66	0	129.82***
	Symptomatic but content	15	2.5	5.40	0.43		2.24	0.34	
	Vulnerable	152	25.1	4.23	0.65		1.97	0.39	
	Troubled	55	9.1	3.90	0.66		2.65	0.27	
Traditional method	Mental health	535	88.4	5.35	0.9	9.64***	1.75	0.4	−18.74***
	Mental illness	70	11.6	4.22	0.88		2.56	0.33	
	Total	605	100%	5.22	0.99		1.84	0.48	

\* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .

both low indicators represent vulnerable, and those with high psychological problems and low flourishing represent troubled. Under the traditional model, the average score of any symptom of internalization problem  $\geq 2$  SD represents a person with mental illness; otherwise, it is a person with mental health. The results of the two classification methods on the subject classification are compared, as shown in Table 3.

The DFM was used, and the results showed that in terms of number and proportion, the number of completely mentally healthy people was 383, which was the largest group and accounted for 63.3%; followed by vulnerable people, and the number was 152, accounting for 25.1%. There were 55 people with mental illness (troubled), accounting for 9.1%. The number of symptomatic but content group was 15, which was the smallest group and accounted for 2.5%. From the perspective of flourishing score, completely mentally healthy people ( $M = 5.8$ ,  $SD = 0.58$ ) scored the highest, followed by those who were symptomatic but content ( $M = 5.4$ ,  $SD = 0.43$ ) and vulnerable ( $M = 4.23$ ,  $SD = 0.77$ ), and those who were troubled ( $M = 3.9$ ,  $SD = 0.66$ ) scored the lowest ( $p < 0.05$ ). From the point of view of score of internalization, those who were troubled ( $M = 2.65$ ,  $SD = 0.27$ ) scored the highest, followed by those who were symptomatic but content ( $M = 2.24$ ,  $SD = 0.34$ ) and those who were vulnerable ( $M = 1.97$ ,  $SD = 0.39$ ), and those with complete mental health ( $M = 1.66$ ,  $SD = 0.38$ ) scored the lowest. An ANOVA was performed on the four groups of people for the problems of agitation and internalization, and it was found that there were significant differences (flourishing dimension  $F = 338.36$ ,  $p < 0.001$ ; internalization problem dimension  $F = 129.82$ ,  $p < 0.001$ ), and further *post-hoc* tests found that there were significant differences among the four groups.

According to the traditional one-dimensional model, mental health indicators are mainly psychological symptoms. In this study, there were 535 people with mental health, accounting for 88.4%, and 70 people had mental illness, accounting for 11.6%. An independent sample *t*-test was conducted for the two groups of people on flourishing and internalization problems. It was



found that there were significant differences. The flourishing of mentally healthy people was higher than that of those with mental illness ( $t = 9.64$ ,  $p < 0.001$ ), and the score of internalization problems was lower than that of mental illness ( $t = -18.74$ ,  $p < 0.001$ ).

### Comparison of fitting test of one-factor model and DFM

Referring to the model construction ideas of previous studies (Wang et al., 2016), two test models were constructed, model 1 of mental health one-factor model (as shown in Figure 1) and model 2 of mental health DFM (as shown in Figure 2). Model 1 takes mental health as the only latent variable; items related to flourishing are positive factor loads, and items related to internalization problems are negative factor loads. Model 2 contains two latent variables, positive factor and negative factor. Positive factor corresponds to flourishing projects, while negative factor internalizes problem projects. The model diagram is as follows.

The Amos 22.0 software was used to test the fit degree of the model, and the maximum likelihood method was used

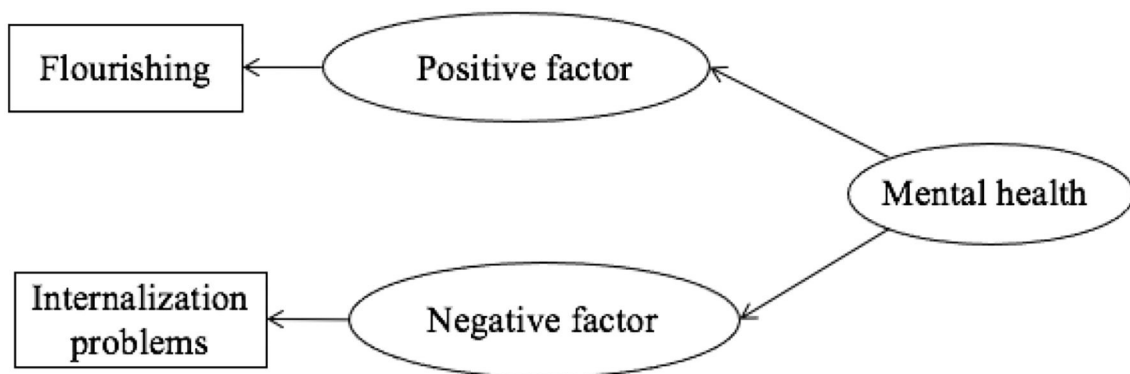


FIGURE 2  
Dual-factor model of mental health.

to estimate the model. The model fitting path diagram was obtained as follows.

As shown in Figure 3, the normalized path coefficients of positive factor loads in model 1 ranged from 0.46 to 0.83, and the normalized path coefficients of negative factor loads ranged from 0.6 to 0.9, all of which were significant results ( $p < 0.001$ ). The explanation rate of each factor was between 27 and 81%. As shown in Figure 4, The normalized path coefficients of positive factor in model 2 ranged from 0.62 to 0.91 and were all significant results ( $p < 0.001$ ). The normalized path coefficients of negative factor ranged from 0.64 to 1 and were significant results ( $p < 0.001$ ). The explanation rate of each factor was between 39 and 92%.

As shown in Table 4, the comparison between model 1 (absolute fit index results:  $\chi^2/df = 18.479$ , RMSEA = 0.17, GFI = 0.784; relative fit index results: NFI = 0.775, CFI = 0.784) and model 2 (absolute fit index results:  $\chi^2/df = 2.405$ , RMSEA = 0.048, GFI = 0.965; relative fit index results: NFI = 0.976, CFI = 0.986) showed that the DFM fits better than the one-factor model.

## Self-compassion and help-seeking behavior of postgraduates

### Self-compassion level of postgraduates

According to the results of this study, the overall self-compassion status of the postgraduates was good (refer to Table 5). Specifically, the mean ranking of the six subdimensions of self-compassion was mindfulness, self-kindness, common humanity, self-judgment, isolation, and over-identification, with scores ranging from 3.02 to 3.51 and all higher than 3 (higher than the median score of 2.5). It was shown that the level of self-compassion of the postgraduates was generally above the middle.

## Help-seeking behavior of postgraduates

In terms of help-seeking behavior, most of the people (75.54%) had sought help from others because of unpleasant experiences in the past 6 months, and only a few (24.46%) had never asked anyone for help. Among the non-professional help-seeking, the top three resources people chose the most were friends or classmates (61.32%), parents (42.64%), family members (except parents) (32.56%). Among the professional help-seeking, the most choice was school psychological counselors (5.79%).

The results are shown in Table 6. The postgraduates had more non-professional help-seeking behavior ( $M = 18.84$ ,  $SD = 18.7$ , but less professional help-seeking behavior ( $M = 0.31$ ,  $SD = 1.61$ ). It was shown that the postgraduates were more inclined to seek help from non-professionals and less from professionals when encountering psychological problems.

## Hypothesis testing

### The relationship between self-compassion and mental health

It is shown in Table 7 that there is a significant correlation between self-compassion and mental health. There was a significant positive correlation between self-compassion and its dimensions and flourishing ( $p < 0.01$ ), and it was significantly negatively correlated with the total score of internalization problems and the seven factors of anxiety, depression, sensitive, inferiority, social anxiety, somatization, and paranoia ( $p < 0.01$ ).

### The relationship between self-compassion and help-seeking behavior

It is shown in Table 8 that self-compassion and all the dimensions except for over-identification are positively correlated with the total score of help-seeking ( $p < 0.05$ ), among

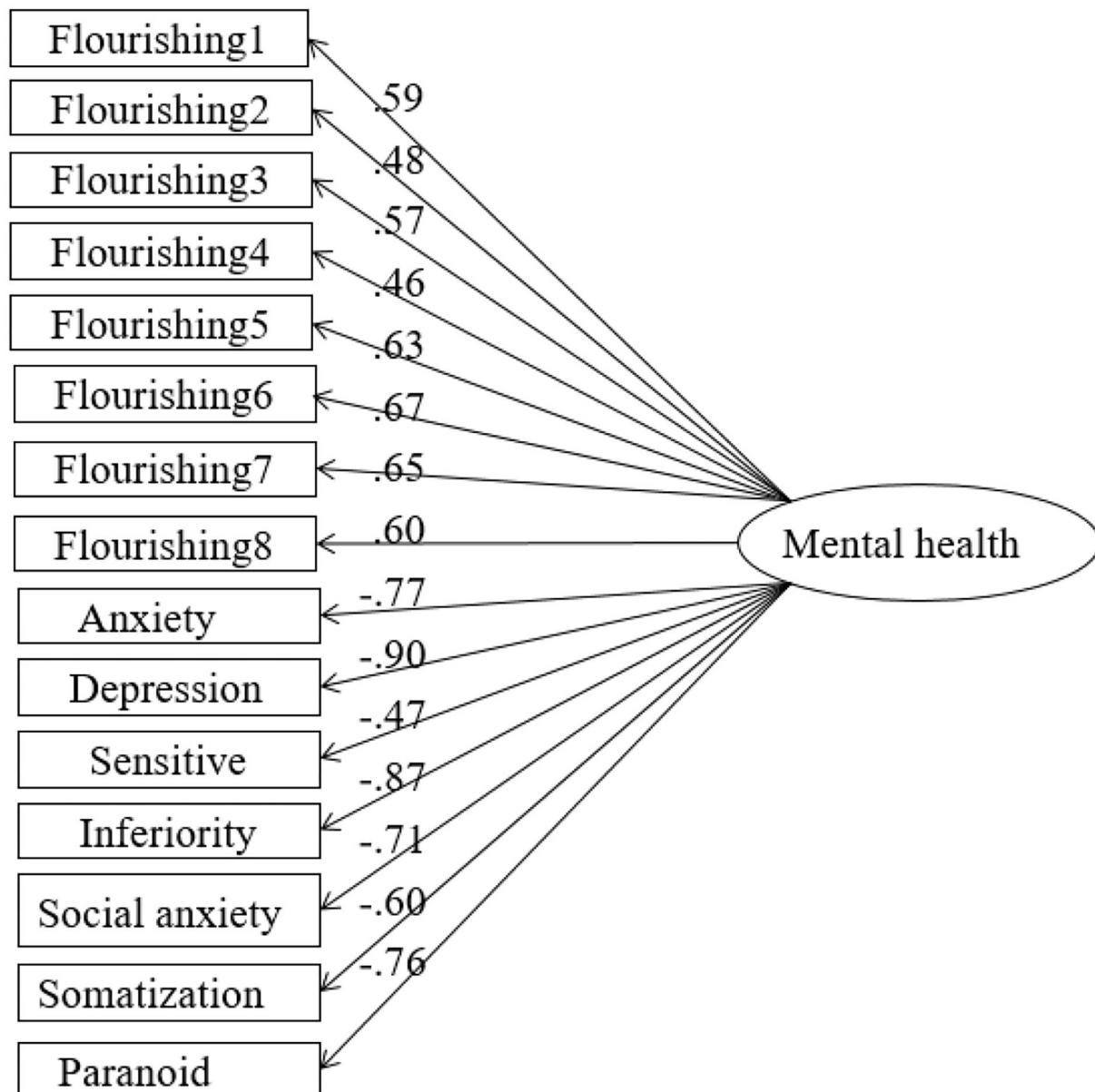


FIGURE 3  
Fitting path data of the one-factor mental health model.

which professional help-seeking behavior was not significantly related to self-compassion and each dimension. Self-compassion and all the dimensions except over-identification were positively correlated with non-professional help-seeking behavior ( $p < 0.05$ ).

### The relationship between help-seeking behavior and mental health

It is shown in Table 9 that there is a significant positive correlation between the total score of help-seeking behavior

and non-professional help-seeking behavior and flourishing ( $p < 0.01$ ). There was a significant negative correlation between the total score of help-seeking behavior and the total score of internalization problems, social anxiety, and paranoia ( $p < 0.05$ ). There was a significant positive correlation between professional help-seeking behavior and the total score of internalization problems, anxiety, and paranoia ( $p < 0.05$ ). There was a significant negative correlation between non-professional help-seeking behavior and the total score of internalization problems, depression, inferiority, social anxiety, and paranoia ( $p < 0.05$ ).



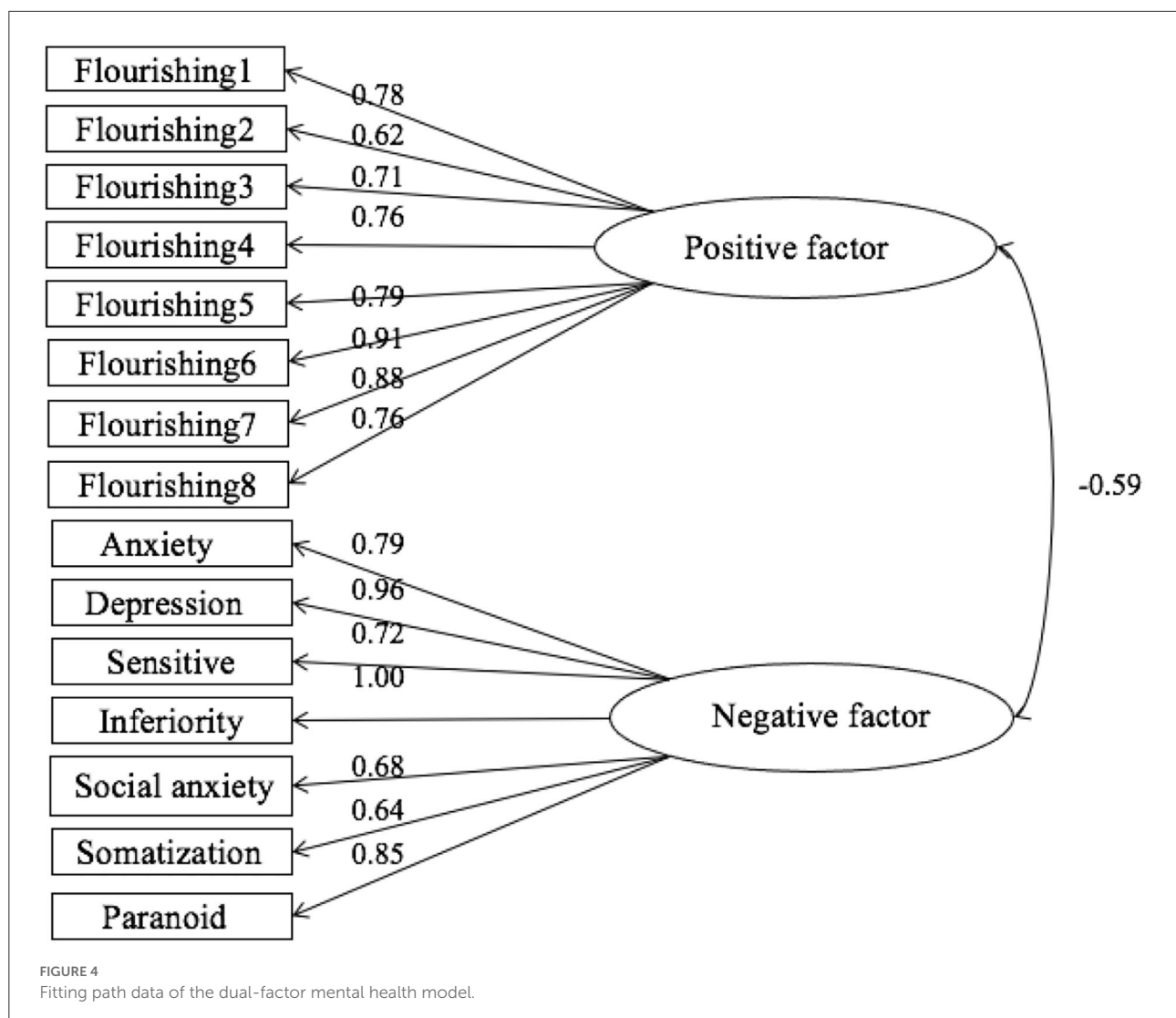


TABLE 4 Model fitting index.

Model	$\chi^2/df$	GFI	CFI	NFI	RMSEA
Model 1	18.479	0.666	0.784	0.775	0.17
Model 2	2.405	0.965	0.986	0.976	0.048

$3 < \chi^2/df \leq 5$  means acceptable range of model fitting;  $1 < \chi^2/df \leq 3$  means excellent model fitting;  $0.05 < RMSEA \leq 0.08$  means basic fitting;  $RMSEA \leq 0.05$  means high fitting degree;  $0.8 \leq GFI/NFI/CFI < 0.9$  means acceptable range;  $GFI/NFI/CFI \geq 0.9$  means excellent fitting.

### Regression analysis of self-compassion, help-seeking behavior, and mental health of postgraduates

A linear regression analysis was carried out to set up the model by taking flourishing as the dependent variable and self-compassion and help-seeking behavior as independent variables. The results showed that the multivariate correlation coefficient  $R$  was 0.534, the coefficient of determination  $R^2$  was 0.295, and the adjusted coefficient of determination

$\Delta R^2$  was 0.285 (Table 10). The analysis of variance showed that the results are significant (Table 11). The influence of the three variables of non-professional help-seeking behavior as predictors on the dependent variable reached a significant level, and the dimension of mindfulness and self-judgment ( $p = 0.056$ ;  $p = 0.062$ ) reached a marginally significant level.

The total score of internalization problems was taken as the dependent variable. Self-compassion (self-kindness,

TABLE 5 Overall situation of postgraduates' self-compassion.

Variable	Dimension	Factor	M	SD
Self-compassion	Overall average score (M = 3.33, SD = 0.53, Md = 3.31)	Self-kindness	3.50	0.70
		Self-judgment	3.29	0.76
		Common humanity	3.43	0.69
		Sense of isolation	3.19	0.84
		Mindfulness	3.51	0.69
		Over identification	3.02	0.80

In order to facilitate the calculation of total scores, self-judgment, isolation, and over-identification were scored in reverse.

common humanity, mindfulness, self-judgment, isolation, and over-identification), help-seeking behavior (non-professional help-seeking behavior and professional help-seeking behavior) were used as independent variables; the input regression analysis was carried out using the method, and the results showed that the multivariate correlation coefficient  $R$  was 0.736, the coefficient of determination  $R^2$  was 0.641, and the adjusted coefficient of determination  $\Delta R^2$  was 0.535 (Table 12). The variance analysis showed that the results are significant (Table 13); isolation and over-identification, as predictors, had a significant impact on the dependent variable.

### Mediating analysis of self-compassion, help-seeking behavior, and mental health of postgraduates

Referring to the results of the above multiple regression analysis, insignificant paths were deleted, and a structural equation model was constructed to test the mediating effect of self-compassion, help-seeking behavior, and mental health. The settings were as follows: self-judgment, isolation, mindfulness, and over-identification constituted self-compassion. Non-professional help-seeking behavior was used as a mediating variable and flourishing as a dependent variable were all significant. The final model includes 6 explicit variables and 1 latent variable.

Using AMOS22.0 for model fitting analysis, the results are as follows:

The research results (Table 14) show that the fitting degree of the mediation model reaches the standard. Specifically, the results of the mediation model (absolute fit index:  $\chi^2/df = 1.6$ , RMSEA = 0.032, GFI = 0.995; relative fit index: NFI = 0.993, CFI = 0.997) was excellent, and all the indicators were well-fitted, indicating that the mediation model is acceptable. The output of the model is as follows.

The mediating effect of the model was tested with the Bias-Corrected Bootstrap procedure. Using the repeated random sampling technique to draw 2,000 bootstrap samples

from the original data, an approximate sampling distribution was generated, and a 95% confidence interval model for the mediation effect was estimated using the 2.5th and 97.5th percentiles. The results of the data verified that non-help-seeking behavior played a mediating role in the prediction of self-compassion and flourishing, as shown in Figure 5. In this model, the size of the direct effect of self-compassion on flourishing was 0.49,  $p < 0.001$ , and the size of the mediating effect was  $0.11 \times 0.15 = 0.0165$  ( $p < 0.001$ ).

## Discussion

This study found that the DFM is applicable for measurement of the mental health of the postgraduates. Combined with the model path coefficient and interpretation rate results, it was shown that the DFM fit better than the traditional one-dimensional mental health model, and that the DFM could be applied to the tested sample group and was more suitable for explaining the mental health status of the postgraduates, which supports hypothesis 1. The DFM of mental health was better than the one-factor model, which confirmed the rationality of evaluating mental health from two dimensions of positive factor and negative factor. It shows that the traditional way of defining mental health as the absence of mental illness has the potential to ignore the positive factors of mental health and underestimate people's resilience. According to the DFM, the postgraduates can be divided into complete mental health (63.3%), symptomatic but content (2.5%), vulnerable (25.1%), and troubled (9.1%). In general, the postgraduates had a good level of mental health and less internalized psychological problems. The internalized psychological problems were mainly sensitivity, social anxiety, depression, and inferiority. The proportion of the four groups in this study was basically consistent with previous research results (Eklund et al., 2010; Wang et al., 2016; Lai, 2017; Zhang et al., 2018). It was found that the proportion of people with complete mental health was the highest, and that the proportion of people with symptomatic but content was the lowest. However, compared with other studies, the proportion of people with complete mental health and those who were vulnerable in this study was relatively high, and the proportion of people who were symptomatic but content and those who were troubled was relatively low. The reason might be that the postgraduates enjoyed more social resources and school environmental protection, and that they had better human and social resources and supports. Therefore, the proportion of completely mental health was higher than other groups, and there was fewer troubled (Zhang et al., 2018). Due to the competitive pressure and high expectation brought by their own identity advantages, they also faced high academic challenges, which could easily lead to their feeling of pressure and reduced

TABLE 6 Scores of help-seeking behavior of the postgraduates in the past 6 months.

Variable	Dimension	Factor	M	SD	Md
Help-seeking behavior	Help-seeking behavior (M = 19.15, SD = 18.9, Md = 15)	Non-professional help-seeking behavior	18.84	18.7	15
		Professional help-seeking behavior	0.31	1.61	0

According to the three indexes related to help-seeking behavior, namely, whether to ask for help from the others, the frequency of asking for help, and the effectiveness of the help, the table adds up the product of the three scores under each item to obtain 2 factors of non-professional help-seeking behavior and professional help-seeking behavior.

TABLE 7 Correlation between self-compassion and mental health.

	Flourishing	Total score of internalization problems	Anxiety	Depression	Sensitive	Inferiority	Social anxiety	Somatization	Paranoid
Self-compassion	0.505**	−0.68**	−0.549**	−0.648**	−0.589**	−0.634**	−0.535**	−0.415**	−0.533**
Self-kindness	0.296**	−0.326**	−0.243**	−0.326**	−0.255**	−0.315**	−0.281**	−0.185**	−0.258**
Common humanity	0.233**	−0.234**	−0.209**	−0.226**	−0.178**	−0.214**	−0.174**	−0.157**	−0.189**
Mindfulness	0.287**	−0.333**	−0.276**	−0.317**	−0.263**	−0.294**	−0.287**	−0.219**	−0.259**
Self-judgment	0.414**	−0.594**	−0.474**	−0.57**	−0.517**	−0.562**	−0.464**	−0.363**	−0.461**
Sense of isolation	0.441**	−0.67**	−0.533**	−0.628**	−0.576**	−0.641**	−0.522**	−0.419**	−0.53**
Over identification	0.425**	−0.645**	−0.535**	−0.606**	−0.636**	−0.583**	−0.478**	−0.373**	−0.499**

\*p < 0.05, \*\*p < 0.01, and \*\*\*p < 0.001.

happiness (Lu et al., 2008). Therefore, although they had mild psychological symptoms, they lacked a positive psychological experience. At present, mental health management in colleges and universities is still mainly focused on students with serious psychological problems (Jiang and Wang, 2003). There is a lack of effective support and intervention measures for individuals with mild psychological disorders and susceptible groups. In addition, students rarely seek professional help to solve their psychological problems (Fang et al., 2018). Therefore, they also lack mental health care resources. The symptomatic but content group that could coexist with mental disorders and has a better psychological experience accounts for the least proportion.

The symptomatic but content and vulnerable groups could not be identified by traditional models, but they have different characteristics and need more attention. The symptomatic but content group has high levels of mental health, so despite the symptoms of mental illness, they can actively participate in learning and social life, and are more likely to repair themselves and develop in a positive way of living (Gokcen et al., 2012). Therefore, they should be encouraged to develop their own inner strength and understand their self-relationship with symptoms. On the contrary, for the vulnerable group, although they show PTH, because of their low flourishing, they are more likely to be converted into troubled when they encounter troubles or pressures. Vulnerable groups are often ignored by the psychological appraisal system based on the traditional model (Fang et al., 2018) and do not get guidance and help on time (Jiang and Wang, 2003). With the increasing competition and psychological symptoms among postgraduates,

TABLE 8 Correlation between self-compassion and help-seeking behavior.

	Total score of help-seeking behavior	Professional help-seeking behavior	Non-professional help-seeking behavior
Total score of self-compassion	0.134**	−0.070	0.141**
Self-kindness	0.149**	−0.039	0.154**
Common humanity	0.161**	−0.049	0.167**
Mindfulness	0.113**	−0.038	0.118**
Self-judgment	0.076*	−0.058	0.082*
Sense of isolation	0.098*	−0.037	0.102*
Over identification	−0.025	−0.073	−0.019

\*p < 0.05, \*\*p < 0.01, and \*\*\*p < 0.001.

it is very important to cultivate the abilities of self-compassion and help-seeking behavior.

In this study, the highest levels of internalization problems of the postgraduate students are sensitivity and social anxiety, which is somewhat different from previous studies focusing on depression or anxiety (Hu, 2013; Yang et al., 2015; Xiao et al., 2021). The reason is that for most of the postgraduates, the emotional distress in their daily life is not severe enough to be depressive or anxious, and the main distress comes from interpersonal sensitivity and social distress, especially if the

TABLE 9 Correlation between help-seeking behavior and mental health.

	Flourishing	Total score of internalization problems	Anxiety	Depression	Sensitive	Inferiority	Social anxiety	Somatization	Paranoid
Total score of help-seeking behavior	0.209**	−0.095*	−0.049	−0.102*	−0.020	−0.078	−0.118**	−0.069	−0.110**
Non-professional help-seeking behavior	−0.073	0.088*	0.118**	0.076	0.075	0.073	0.017	0.063	0.090*
Professional help-seeking behavior	0.217**	−0.104*	−0.060	−0.110**	−0.026	−0.085*	−0.120**	−0.075	−0.119*

\* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .

TABLE 10 Summary of the flourishing model.

Model	R	R <sup>2</sup>	$\Delta R^2$	F
1	0.543	0.295	0.285	31.153***

\* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .

relationship with the tutor may be an important indicator of the mental health level of the postgraduates (Zhang et al., 2018). At the same time, there may also be individuals who lack awareness and introspection about psychological problems and tend to attribute problems to external causes such as interpersonal tension (Wang et al., 2015).

Consistent with existing results (Yang et al., 2015), this study found that the overall level of the postgraduates' self-compassion was relatively good, that the overall difference was small, and that most of them were at the upper-middle level. Self-compassion is significantly positively correlated with the positive dimension of mental health and significantly negatively correlated with the negative dimension of mental health, which supports hypothesis 2. In general, the postgraduates have better self-awareness ability and could have a certain understanding and control of their own cognitive and emotional processes (Zhang et al., 2018). When encountering setbacks or difficulties, they could give themselves more understanding and tolerance, view their own shortcomings correctly, evaluate and understand themselves reasonably, reduce self-attacks and negative judgments on themselves, and believe that they are connected with others. They are not isolated individuals and could make efforts to get themselves out of difficulties rather than get blindly immersed in negative cognitions or emotions (Lu et al., 2008). Self-compassion could positively predict the positive mental health of postgraduates and negatively predict internalized psychological problems (Chen et al., 2011).

This study also found that the postgraduates had a high incidence of help-seeking behavior, and that more than 70% of them chose to ask others for help when they encountered

psychological distress. Consistent with the results of previous studies (Gu, 2013; Hu, 2013; Li, 2013), it was found that there was a positive correlation between self-compassion and help-seeking behavior, and that the correlation was mainly focused on non-professional help-seeking, which partially supports hypothesis 3 and indicates that the students' self-compassion-oriented help-seeking behavior was mainly targeted at non-professional social networks around them such as friends, parents, and family rather than choosing professionals. This is consistent with the results of previous studies on college students (Jiang and Wang, 2003; Wang et al., 2015). The reasons for this result might be as follows: first, it might be related to Chinese cultural atmosphere that talking about personal emotions will be regarded as revealing personal vulnerability and that family troubles should not be talked about in public, leading to negative attitudes toward seeking professional help (Guo, 2015). When people feel that the society has higher tolerance for professional help-seeking behavior, they are more inclined to seek help (Xia, 2005). Second, it is related to the accessibility and trust of professionals. People of non-professional help are usually from one's social network. They are more connected with students' daily life, more familiar, more trustworthy, more accessible, and more convenient. On the contrary, school counselors might be hindered by the multiple identities of college student tutors (Qin and Gao, 2012). Postgraduates may not recognize the effect of professional, lack of trust and are unwilling to seek professional help.

Help-seeking behavior is significantly positively correlated with positive factors of mental health and significantly negatively correlated with negative factors of mental health (total score of internalization problems and depression, social anxiety, and paranoia). Professional help-seeking is significantly correlated with positive factors of mental health, and it was significantly negatively correlated with negative mental health factors (total score of internalization problems and depression, inferiority, social anxiety, and paranoia). Non-professional help-seeking is significantly positively correlated with negative factors of mental health (total score of internalization problems and social anxiety

TABLE 11 Coefficient of the flourishing regression model.

	Non-standard partial regression coefficient		Standard partial regression coefficient	t
	B	Standard error	Beta	
Self-kindness	0.064	0.083	0.045	0.765
Common humanity	0.084	0.071	0.059	1.189
Mindfulness	0.154	0.081	0.108	1.913
Self-judgment	0.142	0.076	0.109	1.872
Sense of isolation	0.194	0.068	0.165	2.874**
Over identification	0.229	0.075	0.185	3.063**
Professional help-seeking behavior	−0.032	0.021	−0.052	−1.508
Non-professional help-seeking behavior	0.009	0.002	0.170	4.760***

\* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .

and paranoia), which basically supports hypothesis 4. This is consistent with the results of previous studies on college students (Bai and Xiao, 2018; Keum et al., 2018). Help-seeking as a positive coping style was negatively correlated with all factors of SCL-90 (Lu et al., 2008) among postgraduates. Subjective wellbeing is positively correlated with help-seeking behavior in a positive coping style (Shi et al., 2011; Wang, 2017). College students with positive help-seeking qualities have a healthier mental state, and college students who are more willingly to ask for help are more likely to maintain a positive mood, enhance their subjective feelings of happiness and joyfulness, and improve their mental health (Nam et al., 2013).

The mediating effect of this study showed that non-professional help-seeking behavior played a partial mediating role in self-compassion and positive mental health, which partially supported for hypothesis 5. It can be seen that self-compassion has made a major contribution to positive mental health (Allen et al., 2012), indicating that self-compassion is an important influence for postgraduates to maintain mental health. On the one hand, self-compassion could directly affect positive mental health. People with self-compassion are more tolerant to themselves and have a stronger sense of connection with others (Bluth and Blanton, 2015). They could use some strategies to help themselves out of a predicament, which could improve their positive experience (Albertson et al., 2015). This also explains the influence of self-compassion on help-seeking behavior. People who actively engage in self-compassion improve their emotional awareness and cognitively and emotionally accept the fact that they need help and make the behavior of seeking help from others (Gu, 2013). Help-seeking behavior requires individuals to rely on the strength of others, and it requires certain social relations and communication skills (Rickwood et al., 2005). Self-compassion has a positive effect on improving personal relationships and trusting others (Crocker et al., 2010). On the other hand, self-compassion could affect positive mental health by influencing the behavior

TABLE 12 Summary of the internalization problem model.

Model	R	R <sup>2</sup>	$\Delta R^2$	F
1	0.736	0.641	0.535	87.82***

\* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .

of obtaining help from social networks such as friends and family, which shows that caring for oneself is a positive self-attitude (Guo, 2015). Help seeking behavior requires individuals to rely on the strength of others, it requires certain social relations and communication skills (Rickwood et al., 2005). Self-compassion could promote individuals to seek help by communicating with others. It was shown that the improvement of self-compassion and the behavior of being good at asking for help could effectively improve the positive psychological quality of individuals (Shi et al., 2011).

## Limitations and future prospects

There are still limitations on the current study. First, the sampling source has certain limitations, and the sample size is relatively small; contemplation of geographic area and courses is relatively insufficient, so it is difficult to generalize the results. Second, with convenience sampling, there may be selection bias and potential threats. Finally, this study only involves the results of one survey and lacks long-term and longitudinal tracking of the development trend of individual mental health and changes with the development of academic study as well as the dynamic understanding of the two factors of mental health and the intervention of negative factors.

Therefore, as part of future research, follow-up research should be designed and implemented using multiple data collection methods. Longitudinal research should be carried out after conducting a questionnaire survey. Future research should



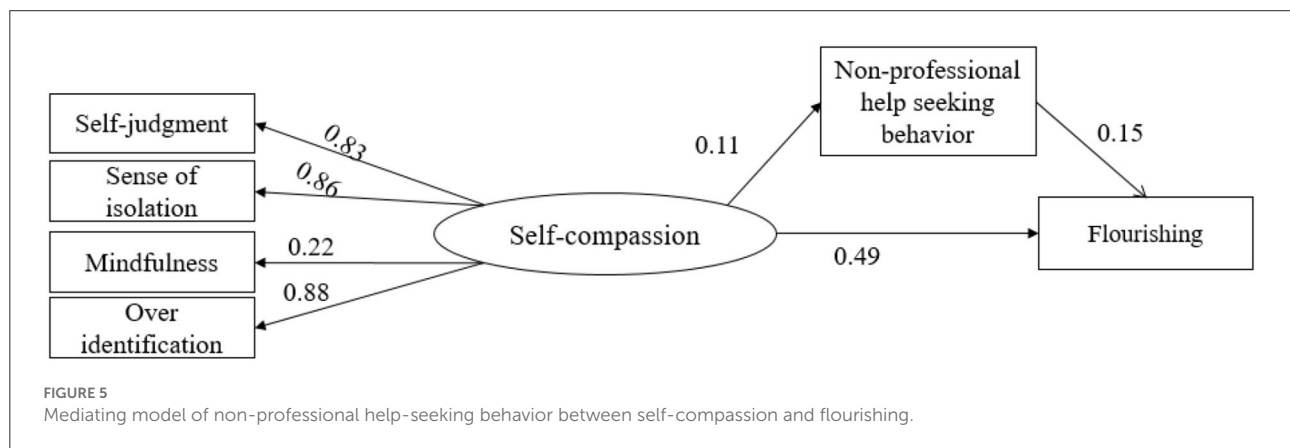
TABLE 13 Model coefficients of internalization problems.

	Nonstandard partial regression coefficient		Standard partial regression coefficient	t
	B	Standard error	Bate	
Self-kindness	−0.01	0.032	−0.015	−0.320
Common humanity	−0.035	0.027	−0.050	−1.265
Mindfulness	−0.1	0.031	−0.146	−3.204***
Self-judgment	−0.079	0.029	−0.126	−2.685**
Sense of isolation	−0.194	0.026	−0.344	−7.415***
Over identification	−0.151	0.029	−0.253	−5.203***
Professional help-seeking behavior	0.013	0.008	0.044	1.570
Non-professional help-seeking behavior	−0.001	0.001	−0.039	−1.342

\* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .

TABLE 14 Fitting index of the mediation model.

Model	$\chi^2/df$	GFI	CFI	NFI	RMSEA
Mediation model	1.600	0.995	0.997	0.993	0.032



include longitudinal data or experimental methods to verify their relationships, extend to other types of master's degrees and other geographical realities, and analyze in a factorial way to better cover the universe studied.

## Conclusion and value

By DFM measurement of postgraduates' mental health, it was found that the overall mental health of the postgraduates was good, and that the main internalized problems include sensitivity, social anxiety, depression, and inferiority. Self-compassion significantly positively predicted positive factors of mental health, and significantly negatively predicted

negative factors of mental health. The postgraduates mainly used non-professional help-seeking methods to seek outside help, which positively predicted the positive factors of mental health. Non-professional help-seeking played a partial mediating role between self-compassion and positive factors of mental health.

This study verifies the applicability of the DFM in the mental health assessment of postgraduates, which not only enriches the applicable groups of DFM but also provides a more comprehensive and accurate method for evaluating the mental health of postgraduates. It was also found that the postgraduates had a high level of self-compassion and help-seeking behavior, which had a strong correlation with the overall mental health and social adaptation of the postgraduate

group. Moreover, it was found that non-professional help-seeking played a partial mediating role between self-compassion and positive factor of mental health, suggesting that further mental health education needs to prompt the individual's ability of self-care and the awareness of active help seeking, which can effectively improve the positive factor of mental health, thereby improving the individual's mental health and social adaptability. It may be necessary to build a more appropriate general education for students on how to maintain mental health and conduct self-compassion to help individuals acquire knowledge and learn skills, develop grit and optimistic attitude, and learn to keep their mind and body balanced.

## Data availability statement

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

## Author contributions

LMi designed the study. LMi and LMe analyzed the data. LMi and NJ wrote and modified the manuscript. All authors have read and agreed to the published version of the manuscript.

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# Positive psychology in the working environment. Job demands-resources theory, work engagement and burnout: A systematic literature review

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The purpose of the present systematic review is to examine the Job Demands-Resources (JD-R) model in order to pinpoint how applicable and relevant is the present theoretical framework in the 21st Century workplace environment. Initially, there will be an examination of the key concepts of the theory, followed by a brief investigation of the empirical validity and importance of the theory in the workplace environment. Then, there will be an empirical investigation of various studies of both cross-sectional and longitudinal nature in the form of a methodology, offering substantial empirical evidence that attests to the validity and effectiveness of the JD-R model in predicting work engagement and burnout—two independent and contrasting states of employee wellbeing, covering the entire spectrum from employee wellness to employee ill-health. We hope this review contributes to the advancement of the JD-R model, aiding researchers and practitioners to obtain a better understanding of the current state of the JD-R model, whilst also offering avenues for future development of the theory, ultimately resulting in a better prediction of employee wellbeing.

## KEYWORDS

work engagement, burnout, employee wellbeing, systematic review, job demands-resources theory

## Introduction

The most widely used paradigm in occupational health and in positive psychology at the moment for examining the relationships between job characteristics and employee wellbeing is the Job Demands-Resources (JD-R) model. The model has gained traction from both scholars and practitioners since it was initially published in 2001. According to *Google Scholar*, the three most important papers on the JD-R model (Demerouti et al., 2001; Schaufeli and Bakker, 2004; Bakker and Demerouti, 2007) have received almost 7,000 citations as of January 2015, with the original paper proposed by Demerouti et al. (2001)

possessing more than 13,000 citations today. Additionally, since the model's creation about 20 years ago, thousands of organizations have utilized it and the model has sparked hundreds of empirical studies. The JD-R model's hypotheses have also been widely used and generally supported in fields like organizational behavior, occupational psychology, human resource management and a variety of other fields (Bakker and Demerouti, 2016).

Demerouti et al. (2001) developed the JD-R model to better understand burnout, a “*persistent state of work-related stress*” marked by *exhaustion* (feeling emotionally expended and low on energy), *mental distancing* (lack of excitement and cynicism) and *decreased professional efficacy* (doubts about one's skill and ability to contribute at work; Schaufeli et al., 2002, p. 74). After some time, Bakker and Demerouti (2007) proposed a revised version of the JD-R model that included work engagement, a “*positive, fulfilling affective - motivational state of work-related wellbeing*,” defined by *vigor* (high levels of energy and perseverance when faced with difficulties), *dedication* (experiencing a strong sense of fulfillment, inspiration, pride and challenge) and *absorption* (being completely focused and totally immersed in one's work; Bakker et al., 2008, p. 187). As a result, the updated JD-R model sought to examine both a negative and positive psychological state of employee wellbeing-burnout and work engagement-as two opposite poles of a continuum. It is interesting to note, that the JD-R model took 10 years from Demerouti et al. (2001) pioneering work and hundreds of research studies conducted in order to reach its current status as the acclaimed and universally accepted JD-R theory.

Overall, the purpose of the present paper is to offer a synthesis and review of the present literature pertaining to the JD-R model, focusing on current and emerging findings. Furthermore, despite the JD-R model having been explored in relation to a variety of outcomes, the current systematic review only focuses on burnout and work engagement as the original outcome variables of the JD-R model. Additionally, to address the several modifications of the JD-R model, the role of personal resources will also be examined. The function of personal resources in the JD-R model has been the subject of different propositions, according to existing research. We ultimately decided to focus on two theoretical propositions, that we believe provide important avenues for future research; the fact that personal resources mediate the relationship between job resources and wellbeing but also that personal resources can have a direct impact on the wellbeing of individuals. Overall, the hypotheses of the present study were the following:

- Job demands are positively associated to burnout.
- Job resources are positively associated to work engagement.
- Lack of job resources predicts burnout.
- Personal resources mediate the relationship between job resources and wellbeing (work engagement/ burnout).
- Personal resources directly impact wellbeing.

In order to respond to the research objectives outlined above, the remainder of this paper is organized as follows. The next section will extend the presentation of the JD-R model and illustrate its major components and propositions as well as the applicability and importance of the JD-R model in the workplace environment. Afterwards, we will explain comprehensively the systematic review approach that was employed in order to systematically assess the use of the JD-R model in empirical research. The major findings of our rather streamlined systematic review will then be presented, followed by a discussion. The paper concludes with an overview of the key findings, limitations, recommendations for future research and practical implications.

## JD-R model and key propositions

The JD-R model is a theoretical framework that seeks to combine the stress research approach with the motivation research approach, two relatively independent research paradigms. It is based on well-known stress models like Karasek's *Job Demand Control Model* (1979) and Siegrist's *Effort-Reward Imbalance Model*. The JD-R model's basic premise is that every profession has unique risk factors connected to work-related stress. These factors fall into two broad categories: job demands and job resources, yielding a comprehensive, holistic model that can be applied to a variety of occupational settings, regardless of the specific demands and resources implicated (see Figure 1). According to Demerouti et al. (2001), job demands are defined as “*those physical, social or organizational components of the job that require persistent physical or mental effort and are consequently connected with particular physiological and psychological costs*” (p. 501). Role conflict, time and workload pressure as well as quantitative workload, are the most prevalent examples of job demands. While job resources are considered to be “*those physical, social or organizational aspects of the job that are: functional in achieving work goals; decrease job demands and the associated physiological and psychological costs and enhance personal growth, learning and development*” (Demerouti et al., 2001, p. 501). Examples of the most prominent job resources are support from others, performance feedback, job control and autonomy among others.

The second pillar of the JD-R model is that the emergence of work-related strain and motivation is influenced by two distinct physiological processes. The first is a process of *health impairment*, which contends that demanding jobs or jobs with ongoing demands (such as work overload, emotional demands etc.) drain workers' mental and physical resources and may consequently result in the loss of energy and health issues. Basically, when job demands are consistently high and are not counterbalanced by job resources, employees' energy is gradually depleted resulting in a state of exhaustion (burnout),



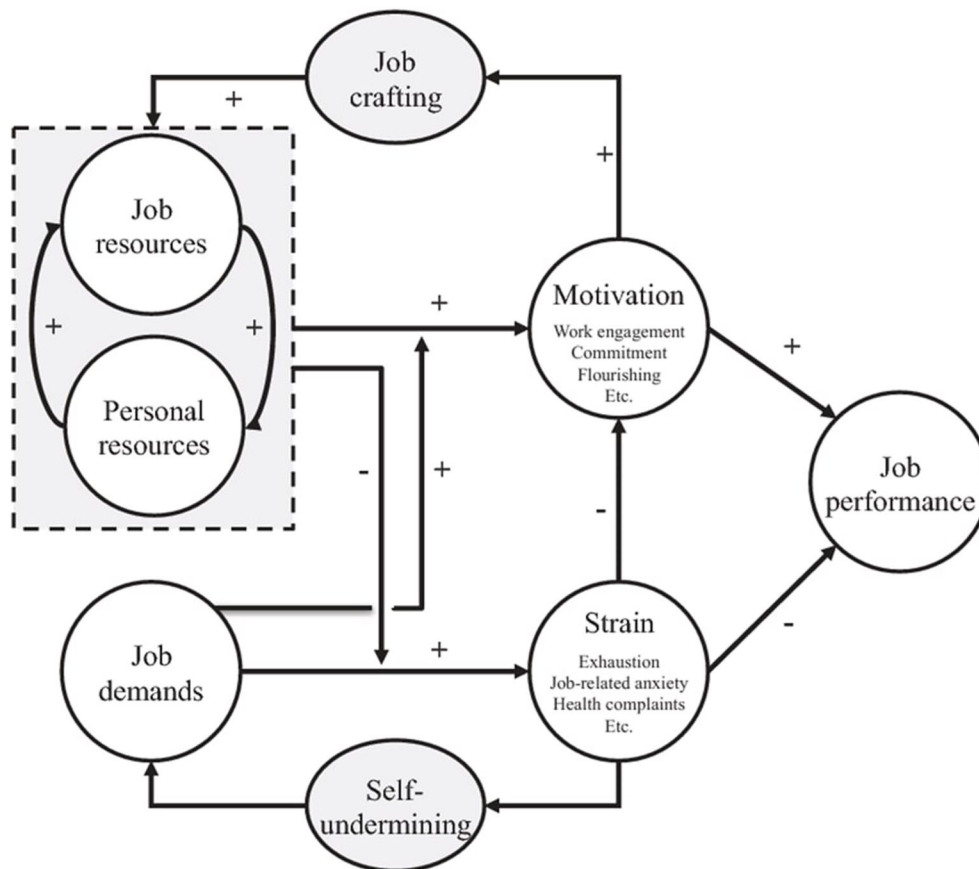


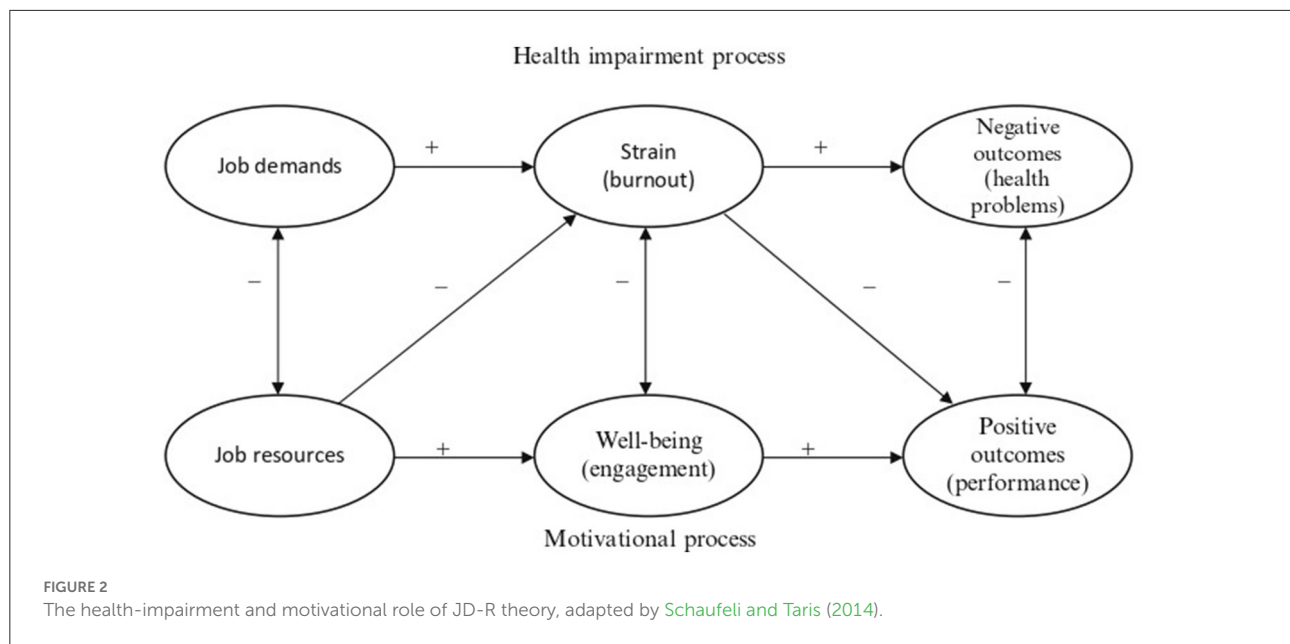
FIGURE 1  
The job demands-resources (JD-R) model, adapted from Bakker and Demerouti (2016).

which may have adverse effects for both the individual (e.g., ill-health) and the organization (e.g., poor performance; Demerouti and Bakker, 2011). The second process put forth by the JD-R model is *motivational* in nature and assumes that job resources have the capacity to motivate and can result in high levels of work engagement, low levels of cynicism and excellent job performance (Hakanen and Roodt, 2010). Accordingly, job resources may play an extrinsic motivational function because they are crucial to attaining work goals or they may play an intrinsic motivational role because they stimulate employees' learning, growth and development (see Figure 2).

The JD-R model also suggests that the interaction between job demands and job resources plays a crucial role in the emergence of job strain and motivation. As such, job resources may reduce the negative effects of job demands on one's health; when faced with high workload expectations, employees may experience less burnout if they have a variety of job resources at their disposal. The JD-R model's final and most recent proposition states that job resources have the greatest impact on motivation or work engagement when job demands are high. In other words, during challenging circumstances, job

resources become especially important and salient. Specifically, when a worker is faced with high work demands, job resources become increasingly more valuable and prompt commitment and dedication to current responsibilities (Bakker et al., 2007).

It is also worth noting that an important extension of the JD-R model has been the integration of personal resources. Personal resources are the psychological traits or qualities of the self that are typically linked to resiliency and that allude to the capacity to successfully influence and control one's surroundings (Xanthopoulou et al., 2007). Such favorable self-evaluations can predict motivation, job and life satisfaction, performance at work, among various other desirable outcomes. This is because the more personal resources an individual possesses, the higher their self-esteem and likelihood of experiencing goal self-concordance is Bakker et al. (2014). Self-efficacy, organizational based self-esteem and optimism are considered to be the most prominent examples of personal resources (Xanthopoulou et al., 2007). Specifically, they are regarded as antecedents of job demands and job resources since they facilitate the experience of job resources while also preventing the occurrence of job



demands. Furthermore, they moderate the relationship between job characteristics and work outcomes. As a result, high levels of personal resources can reduce the negative impact of high job demands on strain but can also boost the already beneficial effects of high job resources on motivation. Finally, personal resources can also act as mediators between job characteristics and work outcomes; the premise is that job characteristics, particularly job resources, will create personal resources, which in turn will have a direct positive effect on work engagement ([Taris and Schaufeli, 2015](#)).

## Empirical validity and importance of the JD-R model in the workplace environment

The empirical support for the JD-R model is robust. The JD-R model has been proven effective across a wide range of occupations, including those requiring high levels of skill (such as those held by teachers, police officers, dentists, managers, nurses) and low levels of skill (such as those held by call center agents, employees of fast-food restaurants, hotel staff as well as students and volunteers). Studies comparing blue- and white-collar workers as well as studies utilizing heterogeneous samples further confirm the model's generalizability ([Brough et al., 2013](#)). The model has also been replicated in both qualitative and quantitative designs and it has been found to be quite stable across gender and age. It is also important to note that the JD-R model has been validated in several European countries, such as Finland, the Netherlands, Belgium, Spain,

China, Australia and Nigeria. All of these studies certainly provide sufficient evidence of the cross-cultural stability of the model ([Van den Broeck et al., 2013](#); [Bakker and Demerouti, 2014, 2018](#)).

One of the most important strengths of the JD-R model is its current flexibility. As previously mentioned, the theory contends that all working environments or job characteristics can be modeled and thus explained by using two different categories, namely job demands and job resources. Accordingly, the JD-R model is not limited to any particular job demands or job resources; it operates under the premise that any demand or resource may have an impact on employee health and wellbeing. Thus, the theory can be adjusted to the particular occupation under consideration and can be applied to all work contexts. For instance, a certain job demand may be important in occupation A but not in occupation B. In the framework of the JD-R model, such diverging conclusions are not inherently problematic since they just represent the fact that not all demands are equally relevant across all job settings. The broad scope of the model appeals to researchers, just as its flexibility is attractive to practitioners ([Taris and Schaufeli, 2015](#)). Additionally, the JD-R model differs from earlier models in that rather than connecting clearly defined and specific concepts to one another, the model is heuristic in its form, offering a method of thinking about how work attributes may affect health, wellbeing and motivation. This implies that two studies may be based on and assess the same assumptions of the JD-R model even if there is not any overlap in terms of the concepts being examined. The JD-R model's widespread use in both research and practice is apparently due to its heuristic application as well

as due to its broad scope and flexibility (Schaufeli and Taris, 2014).

## Method

A first observation when engaging with JD-R research is that the model has been utilized increasingly by researchers, since its inception in 2001. However, very few studies, including both meta-analyses and systematic reviews, have attempted to examine and evaluate the literature in a standardized manner, examining both burnout and engagement as outcome variables (e.g., Crawford et al., 2010; Bakker et al., 2014; Rattrie and Kittler, 2014; Lesener et al., 2019; Mäkinen et al., 2021). In order to provide a systematic and critical evaluation of the current state of the JD-R model in accordance with empirical literature, the present paper will employ a systematic review. Such a selection is justifiable since a well-conducted systematic review will provide us with a thorough, balanced overview of the available research that takes into account various conceptual frameworks while preserving rigor for evaluating the evidence (Thorpe et al., 2005). Therefore, we contend that a systematic methodology is a crucial tool for promoting evidence-based research, giving us a more thorough understanding of the current state of JD-R-related research as well as of potential gaps and avenues for further research. Additionally, there are several fundamental criteria for conducting effective systematic reviews, that the present review attempted to adhere to (e.g., transparency, focus, clarity, synthesis). Given the descriptive nature of the studies under review, the present study adhered to PRISMA standards when feasible. Institutional review board permission was not requested because this was a systematic study that did not include any human subjects.

## Search strategy

An extensive literature search was conducted during June–July 2022. Specifically, a systematic literature search was performed for the period: 2001–2022, given that the primary article of the JD-R model was published in 2001 (Demerouti et al., 2001). Databases utilized included in the search were: Google Scholar, PsycInfo, PsycArticles and Academic Search Complete (EBSCO). Additional articles were found by scanning the reference lists of such articles, as well as by conducting manual searches of pertinent books. All articles were examined based on title and abstract and labeled as “eligible” or “ineligible.” The search included the terms: *burnout*, *work (or employee) engagement*, *job demands*, *job resources*, *personal resources* and *JD-R model*. Specifically, keywords relevant for engagement were: *vigor*, *dedication*, *absorption* while for burnout relevant keywords were: *exhaustion*, *cynicism*, *inefficacy* and *depersonalization*. Furthermore, two additional search terms

were added: *cross-sectional*, *longitudinal*, in order to further filter results with a specific research design, given that we wanted to obtain a general overview of both cross-sectional and longitudinal research on the JD-R model.

The final search phrase used in queries was: (“work engagement” or “employee engagement” or “vigor” or “dedication” or “absorption”) AND (“burnout” or “cynicism” or “exhaustion” or “inefficacy” or “depersonalization”) AND (“job demand”) OR (“job resource”) OR (“personal resource”) AND (“job demands-resources model” or “JD-R model”) AND (“cross-sectional” or “longitudinal”).

## Inclusion criteria

The inclusion criteria for studies were the following:

- *Type of Study*: Studies should focus on connecting work engagement or burnout to the JD-R model. Additionally, studies ought to measure at least one job characteristic (demand or resource).
- *Participants*: Studies should utilize employees as subjects of their research, in accordance with the work-oriented nature of the JD-R model. In addition, for the results to be statistically significant, the sample size for such investigations should consist of at least 100 individuals.
- *Study Design*: Studies should be of empirical nature. Specifically, studies should be of cross-sectional or longitudinal design.
- *Publication Status*: Included studies should be published in English, peer-reviewed scientific journals.
- *Year of Publication*: Studies should have been published from 2001 and after, given that in 2001 the foundational article of the JD-R model was published.

## Results

Twenty articles were included in the present review and assessed in accordance with our research objectives. The study sample sizes ranged from 146 to 11,468, nearly all utilizing a mixed gender sample. There were a range of occupations, with no industry or job type receiving more emphasis than others. The participants in the studies of our sample were drawn from a range of 12 different countries. In total, 5 studies used participants from Finland (23%), 3 studies used participants from China (14%), 2 studies used participants from Netherlands (9%), 2 studies used participants from South Africa (9%) and 2 studies utilized participants from Australia (9%). The rest of the studies utilized participants from different countries of origin, i.e., Austria, Belgium, Africa, Italy, Spain, Sweden and Switzerland. Evidently, there is a European bias in regard to the nationality of participants and country of origin of the

institutions where researchers were employed, with the majority of JD-R related research being carried out in European countries. Furthermore, the majority of the studies utilized a cross-sectional design, specifically 11 studies utilized a cross-sectional design (23%), 7 studies utilized a longitudinal design (15%) and 2 studies utilized a mixed methods design (4%), otherwise known as a cross-sequential design (e.g., utilizing both a cross-sectional and longitudinal data set; see Table 1). For longitudinal studies, duration ranged from 8 months to 7 years, with majority of studies (82%) utilizing a two-wave approach, with only 2 studies (9%) employing a three-wave approach. In regard to the method of analysis, 11 studies utilized structural equation modeling (50%), 5 studies utilized regression analysis (23%), two studies utilized discriminant analysis (9%) and another 2 studies utilized principal component analysis (9%).

Furthermore, out of 20 studies, 11 studies (50%) examined both burnout and work engagement, 5 studies (23%) examined only work engagement and 4 studies (18%) examined only burnout. Out of these studies, 16 studies (73%) measured burnout through the *Maslach Burnout Inventory* (Maslach and Jackson, 1986), followed to a lesser extent by three studies (14%) utilizing the *Oldenburg Burnout Inventory* (Halbesleben and Demerouti, 2005; Demerouti and Bakker, 2008) and one study (4.5%) utilized the *Burgen Burnout Inventory* (Salmela-Aro et al., 2011). As for work engagement, all studies utilized the *Utrecht Work Engagement Scale* (Schaufeli et al., 2002). Additionally, 14 studies (67%) examined both job demands and resources, five studies (23%) examined only job resources and 1 study (4.5%) examined only job demands; in that extent, four of these studies (18%) examined the role of personal resources. Out of the four studies that investigated personal resources, three of these studies (14%) found evidence that personal resources mediate the relationship between job resources and engagement/burnout, with two of the studies also suggesting that they directly impact wellbeing.

The most prevalent job demands were: work overload (quantitative/qualitative), emotional demands and role conflict/ambiguity, followed closely by the physical work environment and home-family conflict. The most prominent job resources were: support (either from supervisors or co-workers), autonomy, job control, opportunities for learning and development, performance feedback and role clarity. While, for personal resources, the studies that examined personal resources are too limited in order to investigate potential patterns; nevertheless, in the present studies, the personal resources examined were: psychological capital (PsyCap), self-efficacy, optimism, mental and emotional competencies and self-esteem.

Moreover, the majority of studies (82%) found conclusive support both for the motivational and health-impairment processes of the JD-R model (18 out of 20 studies), with only two studies (9%) finding support only for the motivational pathway. Specifically, the reviewed studies found robust evidence that increased job demands and lack of resources contribute to

burnout, while also having found that job resources positively predict work engagement. In regard to the coping hypothesis of the JD-R model, three studies assessed whether job resources become particularly salient in the presence of high job demands, with all studies having found concrete evidence. As for the proposition of the JD-R model regarding reciprocal causation, the number of studies (two) assessing the reversed pathways of the JD-R model are too limited in order to allow for any patterns or further explanations to be identified. Four studies (18%) also found support for the presence of loss/ gain spirals, in accordance with Hobfoll's *Conservation of Resources (COR) Theory*. Finally, only two studies (9%) investigated the differentiation between *challenge* and *hindrance demands*, with both studies finding evidence that challenge demands can have a beneficial role in promoting the engagement and motivation of employees.

## Discussion

The present systematic literature review consisted of 20 studies which met the eligibility criteria and could thus be included. This study aimed to address four hypotheses, in accordance with the JD-R model: (a) job demands are positively associated to burnout; (b) job resources are positively associated to work engagement; (c) lack of job resources predicts burnout, (d) personal resources mediate the relationship between job resources and wellbeing (work engagement/ burnout) and (e) personal resources directly impact wellbeing. As can be seen, nearly all of the effects received support (albeit at different levels), suggesting that the JD-R model can act as a valuable tool for predicting burnout and work engagement. Almost all of the studies examined, confirmed the dual pathway to employee-wellbeing, namely that job demands and resources are the catalysts of two relatively distinct processes, namely a health impairment process and a motivational process. Consequently, job demands are typically the most significant predictors of outcomes like burnout, psychological strain and exhaustion, while job resources are typically the most important determinants of motivation and work engagement. These findings corroborate JD-R theory's assertion that job demands and job resources elicit two unique psychological processes that ultimately have an impact on significant organizational outcomes (Schaufeli and Taris, 2014).

Additionally, our hypothesis that a lack of job resources predicts burnout was further validated, confirming Maslach et al. (2001) proposition that a lack of job resources will instill a self-protective process, resulting in diminished motivation and disengagement from work (e.g., the motivational component of burnout). In that respect, our systematic review also confirmed the fourth proposition of the JD-R model, namely that job resources are particularly motivating when job demands are high. Consistent with previous research, job resources are most

TABLE 1 Overview of the identified studies of the JD-R model.

Primary study	Country	Participants (N)	Study design	Method of analysis
Bakker et al. (2004)	Netherlands	146	Cross-sectional	Structural equation modeling
Bakker et al. (2007)	Finland	805	Cross-sectional	Hierarchical regression analysis
Brauchli et al. (2013)	Switzerland	3.045	Longitudinal	Structural equation modeling
Brough et al. (2013)	Australia and China	9.404	Cross-sequential	Hierarchical multiple regression analysis
Consiglio et al. (2013)	Italy	5.407	Cross-sectional	Multilevel structural equation modeling
De Beer et al. (2013)	South Africa	593	Longitudinal	Structural equation modeling
Hakanen et al. (2005)	Finland	3.255	Cross-sectional	Hierarchical regression analysis
Hakanen et al. (2008)	Finland	3.035	Longitudinal	Structural equation modeling
Hakanen et al. (2021)	Finland	11.468 (cross-sectional data set), 2.334 (longitudinal two-wave data set)	Cross-sequential	Discriminant analysis
Hu et al. (2017)	China	445	Longitudinal	Principal component analysis
Korunka et al. (2009)	Austria	956	Cross-sectional	Structural equation modeling
Kotze (2018)	Africa	407	Cross-sectional	Structural equation modeling
Lorente Prieto et al. (2008)	Spain	274	Longitudinal	Hierarchical multiple regression analysis
Patience et al. (2020)	South Africa	420	Cross-sectional	Regression analysis
Peterson et al. (2008)	Sweden	3.719	Cross-sectional	Linear discriminant analysis
Salmela-Aro and Upadaya (2018)	Finland	1.415	Cross-sectional	Structural equation modeling
Schaufeli et al. (2009)	Netherlands	201	Longitudinal	Structural equation modeling
Van den Broeck et al. (2017)	Belgium	2.585	Cross-sectional	Structural equation modeling
Vinod Nair et al. (2020)	Australia	171	Cross-sectional	Structural equation modeling
Wang et al. (2016)	China	263	Longitudinal	Principal component analysis

conducive to sustaining work engagement under conditions of high job demands; in other words, job resources become more salient and acquire their motivational potential when employees are faced with high job demands (Bakker and Demerouti, 2007). Additionally, although limited, from the studies included, it was found that the differentiation of *challenge* and *hindrance demands* is crucial, with evidence pointing out to the fact that while challenge demands may be linked to strain variables, they can also be advantageous because they can enhance employees' motivation and work engagement. Consistent with LePine et al. (2005) claim, challenge demands can be potentially gratifying work experiences that can lead to opportunities for personal development, stimulation and success.

As for personal resources, the studies are too limited to draw any concrete conclusions; nevertheless, the findings of the reviewed studies demonstrated that personal resources can influence employees' wellbeing, particularly they can buffer the unfavorable effect of job demands, thereby reducing burnout as well as enhance employees' work engagement, given that they increase employees' belief about being able to adequately fulfill their tasks and achieve desired outcomes at work.

This is consistent with Xanthopoulou et al. (2007) claim that personal resources can enhance employees' resiliency and perceived ability and that by enabling successful control of their environment, personal resources can help employees to achieve positive health outcomes in the future. As for our hypothesis that personal resources mediate the relationship between job resources and wellbeing (work engagement/burnout), results were mixed with some studies (both cross-sectional and longitudinal) confirming their mediating role, while others failing to confirm their mediating effect. Clearly, more research is needed in order to fully comprehend the function of personal resources within the JD-R model.

Moreover, evidence of reversed causation and of gain and loss cycles was found by some studies. Based on JD-R theory, within positive gain cycles, job resources stimulate work engagement which, in turn, increases job resources, prompting further engagement. While, loss cycles refer to processes in which burnout induces resource loss and an accumulation of job demands, which contribute to further burnout. These findings indicate that work engagement may enable the deployment of job resources. As such, engaged employees, who are intrinsically



driven to complete their objectives at work, will activate or create job resources to utilize as a means of fulfilling these objectives. While, employees experiencing strain or disengagement often behave in a way that places additional demands upon them, making it harder for them to cope with job demands in an effective manner and thus initiating the subsequent loss of job resources and an increase in job demands (Xanthopoulou et al., 2009).

## Limitations

Despite our best attempts to provide a thoroughly conducted systematic review that adheres to acceptable standards, our study possesses certain limitations. The key limitation of the present review is that not all existing studies were taken into account. This is a frequent shortcoming in systematic reviews. The searches were limited to titles, abstracts and keywords, so it is plausible that some pertinent studies were missed. In this regard, we also concentrated on databases that are dedicated to psychology, such as *PsycInfo* and *PsycArticles*. However, in order to address this limitation and to cover a wider spectrum of studies, we also included multidisciplinary databases, such as *Academic Search Complete* and *Google Scholar*. Certainly, it is possible that we did not discover every study that employed the JD-R model as its conceptual framework. Other databases that were not taken into consideration may reveal additional studies that were not included in the present review. For instance, it is likely that possible that relevant studies may have been published in business and management oriented journals, which were excluded from our database search. Furthermore, papers published in languages other than English were not included; this should certainly be taken into account when interpreting the findings. The low sample size of the studies included in the present systematic review should also be taken into consideration, given that it undoubtedly limited the extent to which inferences can be formed. However, it is important to note that, in organizational psychology research, small numbers are pervasive (Knight et al., 2017).

Furthermore, we concentrated on peer-reviewed, published literature due to the vast amount of relevant studies which was sufficient in order to examine our research objectives as well as due to the higher caliber and rigor of such research. This might have contributed to publication bias (file-drawer effect). However, research indicates that such a bias is unlikely and does not seriously jeopardize the validity of the study (Dalton et al., 2012; Van Aert et al., 2019). To minimize the occurrence of such bias, we did not concentrate on effect sizes or significance levels in the studies reviewed, but rather on general approaches and conceptualizations of studies, relating work engagement and burnout to the JD-R model. Finally, all of the studies relied solely on the UWES, in order to measure work engagement. This does not accurately depict the rather fragmented nature

of the field in regard to the measurement of work engagement, but it does reflect the prevalence of the measure. Its dominance, however, does not make it the “best” measure and its validity and reliability have most recently come into question, given that the UWES overlaps with a number of job attitudes including stress, organizational commitment, job performance and burnout (Byrne et al., 2016). At the same time, however, it could also be considered as an advantage given that results obtained from utilization of the same scale are standardized, making comparisons easier and more meaningful. As such, we were able to more effectively synthesize and understand the present findings, which would have been considerably more challenging if numerous different work engagement measures and definitions had been examined simultaneously.

## Future research directions

Although the JD-R model possesses substantial empirical validity as proven by the systematic literature review conducted, there are several unanswered questions which ought to be further investigated in future research. The synthesis of JD-R related research allows us to make judgements and reach certain conclusions “about what we currently know and do not know” in regard to the current state of the JD-R model (Rattrie and Kittler, 2014, p. 271). The most important ones will be emphasized in the present study. The JD-R model makes the fundamental assumption that most (if not all) job characteristics can be seamlessly separated into two broad categories: demands and resources, respectively. As such, one avenue for future research would be to look into the nature of demands and resources. The conceptual gap between job demands and job resources is not as clear-cut as it might initially seem. On the one hand, a shortage of a certain job resource may be seen as a demand; for instance, a lack of resources at work indicates that employees must put in more effort to meet their objectives at work. This implies that a scarcity in job resources is equivalent to an excess of job demands.

On the other hand, not all job demands in the JD-R model seem to be equal. Based on the conceptual distinction between *challenge demands* and *hindrance demands*, Van den Broeck et al. (2010) demonstrated that high levels of hindrance demands—threatening demands that hinder employees’ control and cannot easily be conquered—were associated with lower vigor and higher exhaustion at work, whereas challenging demands—demands that not only require effort in order to effectively address them but are also stimulating in their own right and aid in the achievement of work objectives—were related to positive outcomes, such as higher vigor. The meta-analysis by Crawford et al. (2010) substantiated these results. It appears that the distinction between job demands and resources in the early versions of the JD-R model is not as straightforward as first believed. Thus, future studies should investigate this subject,

preferably across a variety of job types and different types of demands (and possibly resources; Demerouti and Bakker, 2011). They should also attempt to identify the circumstances in which job demands serve as hindrances vs. challenges (Podsakoff et al., 2007; Schaufeli and Taris, 2014).

Moreover, the JD-R model proposes clear-cut, one-directional causal relations between demands, resources and outcomes. Numerous empirical studies have validated the model's central propositions, which contend that job demands predict job strain and job resources predict motivation. However, it is also feasible that job demands and resources are influenced by employee wellbeing. Although research has frequently established that longitudinal reciprocal effects exist between job demands and burnout as well as with job resources and work engagement, it is not clearly understood how a gain (or loss) spiral would manifest itself or even if such a spiral truly exists. As such, given that assuming linear causality is unnecessarily simplistic, future research should examine more methodically the complicated relations among the concepts in the model, in order to obtain to better comprehend the reciprocal relationships among key variables in the model (Taris and Schaufeli, 2015; Lesener et al., 2019). Evidently, more well-designed and thoroughly investigated research on this intriguing subject is required.

The role of personal resources should also be further investigated; the JD-R model can incorporate personal resources in a variety of ways. Currently, there is no single optimum approach for broadening the JD-R model in order to allow for the inclusion of personal resources into the model. For instance, they can be integrated as mediators, moderators, antecedents of job demands and job resources or as any combination of these. Future research should systematically examine the various roles of personal resources, “*comparing different conceptualizations of the relations between personal and job resources, job demands and outcomes*” (Schaufeli and Taris, 2014, p. 51). Future studies should examine the possibility of a three-way interaction between job demands, job resources and personal resources, that is a by-product of the complicated relationship between personal resources and the workplace environment (Taris and Schaufeli, 2015). This would imply a two-way interaction of personal resources with job demands and job resources, respectively.

Finally, future studies should utilize objective indicators at a greater extent. Most JD-R related research has relied on self-report measures. The issue with such measures is that since one individual provides all the data, common method bias may cause statistical relations amongst constructs to be overestimated. Thus, it is vital for the advancement of the field of organizational psychology to include in research studies, objective metrics that have a direct impact in business. Therefore, future studies should build on earlier work by utilizing longitudinal designs, which provide more credible conclusions to be reached in regard to the causal pathways of the JD-R model. Future research should further clarify the extent to which the JD-R model predicts

objective business metrics (i.e., sales, customer satisfaction, work performance, sickness absenteeism etc.). In that respect, the ability to predict objective health outcomes, whilst using both job demands and resources as key predictors would also be worthwhile to investigate (Bakker and Demerouti, 2007, 2016).

## Practical implications

Organizations can utilize the JD-R model as a framework in order to enhance employee wellbeing and motivation while also optimizing various organizational outcomes. First of all, the JD-R model does not restrict the study concepts that can be potentially investigated. It is therefore theoretically applicable to a very broad range of job and personal characteristics and outcomes, as opposed to concentrating on a narrow range of factors that are supposed to account for a rather limited set of outcomes (Bakker and Demerouti, 2016). Practically speaking, this suggests that the model may be modified to accommodate the specific requirements of a company in any situation. This greatly enhances the model's applicability in a multitude of settings. The JD-R model accordingly presupposes that while each occupation may have distinct characteristics, these characteristics can be grouped into two general categories (i.e., job demands and job resources), constituting an all-encompassing model that may be applied to numerous occupational settings, regardless of the specific demands and resources implicated. Given the complexity of today's work, identifying the demands and resources that may be harmful to health or deplete motivation is a crucial first step toward enhancing wellbeing in the workplace (Bakker and Demerouti, 2007). In that regard, the JD-R model also appeals to various occupational groups responsible for the management of an organization's human resources. As such, human resources experts are drawn to the “*positive*” motivational perspective whereas occupational health professionals are drawn to the “*negative*” stress perspective. The JD-R approach might therefore can potentially bridge the divide between occupational health management and human resources management. From the standpoint of the JD-R model, these two viewpoints are not only equally acceptable, but they are also intertwined with one another (Schaufeli and Taris, 2014).

The JD-R model has also been found to be of essence in organizational practice since it assists practitioners and organizations in identifying the elements necessary for optimal wellbeing (such as motivation and health) as well as for effective performance in the workplace. In that respect, organizational assessment is an especially important practical application. Most organizations interested in employee wellbeing want to determine the extent of potential job demands and job resources. Essential job demands and resources are measured at the individual level in an organizational assessment and overall organizational scores are compared to industry/national benchmarks. Additionally, the organizational report contains

crucial data about job demands, resources, wellbeing as well as the performance of various teams, departments etc. (Bakker and Demerouti, 2018). This intervention is typically created through discussion between managers and employees, who brainstorm in workshops about potential solutions for suboptimal work environments.

Finally, job redesign and job crafting interventions are also two additional significant practical implications of the JD-R model. Job redesign is a structural organizational intervention that seeks to modify the determinants of employee wellbeing—namely their job demands and resources. Specifically, it refers to the process through which an organization or supervisor modifies a job, its tasks or an employee's working environment. As such, the organization or the employees themselves can redesign the structure and content of the work, with the ultimate goal of improving outcomes like employee wellbeing, work engagement and job performance (Schaufeli, 2017). Finally, job crafting interventions are also of essence; job crafting is an individual-level intervention that is usually carried out by the individual worker. By choosing specific tasks, negotiating different job content and giving their tasks or jobs meaning and significance, employees can actively change the design of their jobs (Bakker and Demerouti, 2014, 2016). From a JD-R standpoint, employees can dynamically modify their own job demands and job resources, ultimately resulting in increased engagement, motivation, job satisfaction and thriving at work. Furthermore, by demonstrating to employees how to craft their jobs, organizations can encourage behavior that is advantageous both to their employees and the organization itself (Van Wingerden and Van der Vaart, 2019).

## Conclusion

Overall, the present study provided a comprehensive and systematic review of research on the JD-R model, offering substantial evidence of its applicability and implementation in the workplace environment. It also proved its effectiveness in predicting work engagement and burnout, two especially important forms of employee wellbeing or lack thereof. Since its inception, JD-R theory has inspired hundreds of studies, with its empirical validity attested and supported in numerous studies and organizational settings. However, it is important to bear in mind that the present theoretical framework also possesses certain limitations and unresolved issues, which

ought to be further examined by future research in order to develop an even more nuanced understanding of the theory. Nevertheless, despite existing research limitations, the JD-R model offers a truly effective conceptual framework for describing employee wellbeing in a wide range of organizations and occupational domains. This is further proven by the fact that our review corroborated the fundamental propositions of the JD-R model. Various practical applications and interventions in the organizational context have also been developed on the basis of the theory, with the most important ones being discussed. We hope this review contributes to the advancement of the JD-R model, aiding researchers and practitioners to obtain a better understanding of the current state of the JD-R model, whilst also offering avenues for future development of the theory, ultimately resulting in a better prediction of employee wellbeing.

## 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.

## Author contributions

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

## 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.

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# Evaluation of a cyberbullying prevention program in elementary schools: The role of self-esteem enhancement

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Although elementary schools are considered a fertile ground for promoting positive behaviors among students (such as safe online practices), to date, almost no study has examined the effectiveness of a cyberbullying prevention program among elementary school students of typical and non-typical development. The present study evaluated the effectiveness of such a school-based European funded preventive program (TABBY, Threat Assessment of Bullying Behavior in Youth) among sixth graders with and without special educational needs (SEN). The study also examined the predictive role of self-esteem in students' cyberbullying involvement. Overall, 240 students from randomly selected Greek schools completed a self-report questionnaire, which included a scale on cyberbullying and self-esteem. Following an experimental longitudinal research design, the intervention was applied to the experimental ( $N=120$ ) but not to the control group of students ( $N=120$ ). Each group consisted of both students with ( $N=60$ ) and without SEN ( $N=60$ ). The evaluation was based on the completion of the self-report questionnaire before (1<sup>st</sup> phase), immediately after (2<sup>nd</sup> phase), and 6 months after the intervention was completed (3<sup>rd</sup> phase) by trained general and special education teachers. According to the findings, students' cyberbullying engagement (as bullies/victims) decreased significantly in the second and third phase, and especially for those with SEN. Additionally, self-esteem negatively predicted students' involvement in cyberbullying (as bullies/victims) in all three phases. The findings partially support the appropriateness of interventions within the elementary school context in order to enhance self-esteem and promote a safe online culture among students of typical as well as atypical development.

## KEYWORDS

cyberbullying, prevention, elementary school students, special educational needs, self-esteem

## Introduction

Today the easy and instant access of youths to new technologies has highlighted the phenomenon of cyberbullying as a common online risk behavior among them who intentionally use electronic devices to harm others (Smith et al., 2008), with a negative impact at both the socio-emotional and the educational level (Rudnicki et al., 2022).

International findings show that cyberbullying concerns not only adolescents (Ng et al., 2022) but also elementary school students (DePaolis and Williford, 2015; Aizenkot and Kashy-Rosenbaum, 2018). This has been more obvious during the last 2 years of the COVID-19 pandemic since social isolation has led to the dominance of the internet in youths' daily lives (Chen et al., 2022). More specifically, according to relevant data, elementary school students are involved in cyberbullying either as bullies or as victims in percentages up to 8 and 12%, respectively (DePaolis and Williford, 2015; Zhang et al., 2021).

Furthermore, students with special educational needs (SEN) are also involved in cyberbullying, sometimes even more than students of typical development. Specifically, students with learning disabilities (LD), autistic spectrum disorder (ASD), and attention deficit hyperactivity disorder (ADHD), due to their learning and behavioral difficulties, usually experience labelling issues and stigmatization at school. Therefore, they are considered a vulnerable group for engaging in bullying incidents, not only in the physical context but also in cyberspace, reaching percentages of 13.5% for bullies and 23.5% for victims (Aslan, 2016; Jenaro et al., 2018; Wright and Wachs, 2020; Touloupis and Athanasiades, 2022).

Apart from SEN, individual emotional characteristics have also been highlighted as significant predictive factors for cyberbullying involvement (either as victims or as bullies). Self-esteem, namely someone's evaluative self-perspective (Leontari, 1996), has consistently proved to be one of these factors. Related findings show that both students with and without SEN when experiencing low self-esteem (e.g., due to their learning/behavioral difficulties or other reasons) are more likely to seek peer support and acceptance, even in cyberspace (Kokkinos and Panayiotou, 2004; Lei et al., 2020).

The above data confirm the necessity to implement cyberbullying prevention programs at schools (particularly during the elementary school years) that enhance students' emotional skills. The implementation of these programs is based on Bronfenbrenner's (1989) ecological systems theory, which proposes that at micro-environmental levels, such as the school environment, effective practices can be applied to influence students' behaviors and attitudes. Consequently, following a holistic context-based approach, prevention programs encompass the involvement of all stakeholders in the school community (e.g., students, teachers; Jabulani and Edward, 2021).

In general, teachers' willingness to get involved and apply an intervention depends on the organizational characteristics and working circumstances of the school context, which are usually different in secondary and elementary school contexts (at least in Greece). For example, in elementary schools participatory decision-making processes, peer mentorship, and collaborative practices are widely used at both the school and classroom level, contributing to a more positive and creative school climate as well as to closer interpersonal relationships within the school community (Wong et al., 2008; Zapata-Caceres et al., 2021). In this context, teachers feel more comfortable in having students express

their thoughts, perceptions, and enthusiasm about technological devices, enhancing in this way teachers' vigilance towards students' unsafe patterns of online behavior (Wong et al., 2008; Touloupis and Athanasiades, 2020a; Zapata-Caceres et al., 2021). Additionally, the emphasis placed on students' technological literacy from the beginning of elementary education (Vélez and Zuazua, 2017; Touloupis and Athanasiades, 2018, 2020b) offers more opportunities for teachers to raise issues of ethical and safe online behavior. Finally, elementary school teachers, due to their familiarity with critical issues related to educational/school psychology during their undergraduate studies (Katman and Tutkun, 2015), are more likely to motivate students to engage in positive behaviors, even in cyberspace, and to act as role models for children.

Therefore, it is deduced that teachers, especially in the elementary school context, can play a vital role in the implementation of cyberbullying prevention programs. The international literature highlights a limited number of studies evaluating such programs (e.g., "I-SAFE Program," "Missing Program," "HAHASO study," "Let us Fight It Together"), which are aimed almost exclusively at the school community of secondary education (Mishna et al., 2009; Gaffney et al., 2019). The results of these studies seem to be contradictory since most of the programs, although promoting adolescents' knowledge of safe internet use, do not reduce adolescents' involvement in cyberbullying, implying a limited effectiveness of the programs (Mishna et al., 2009; Thompson et al., 2013). On the other hand, other programs, such as the "ConRed Cyberbullying Prevention Program" and the "Media Heroes," have proved effective in increasing adolescents' safe online behavior and reducing their involvement in cyberbullying (Ortega Ruiz et al., 2012; Schultze-Krumbholz et al., 2018). Furthermore, it worth noting that in some of the above programs, the implementation was carried out by psychologists or other mental health specialists (Mishna et al., 2009), even though teachers have been proposed as key figures in schools for the effective implementation of prevention programs (Yoon and Bauman, 2014). This could explain, to some extent, the contradictory findings regarding the effectiveness of cyberbullying prevention programs.

In Greece, the TABBY program (threat assessment of bullying behavior in youth) for the prevention of cyberbullying among adolescents reflects a scientifically integrated effort to develop and implement such an action of European standards. This program has been successfully implemented in Greek high schools, thereby reducing the percentages of adolescents who have been victims of cyberbullying (Athanasiades et al., 2015). However, considering that the program, compared to cyber-victims, did not reduce the rates of Greek adolescents who acted as cyberbullies, it is implied that there may be a need to enrich the content of the TABBY program. For example, based on the reported negative association between low self-esteem and cyberbullying behavior among students with and without SEN (Kokkinos and Panayiotou, 2004; Touloupis and Athanasiades, 2022), it is likely that within the program emphasis should be given not only to students'

cyberbullying awareness and sensitization but also to the enhancement of their emotional skills, such as self-esteem, as a protective filter against the phenomenon. Additionally, although elementary school students, and mainly those with SEN, are considered equally vulnerable to involvement (either as victims or as bullies) in cyberbullying as adolescents (Wright and Wachs, 2020; Zhang et al., 2021), there is no scientific documentation for the appropriateness of the TABBY program in this student population.

The above literature highlights the necessity to implement and evaluate the effectiveness of a cyberbullying prevention program, such as TABBY, in the elementary school context, which can be beneficial for both students with and without SEN. Also, the study intends to investigate the role of students' self-esteem in their cyberbullying involvement. Specifically, the research goals were to investigate (a) the effect of the intervention on students with and without SEN in relation to their cyberbullying involvement before, immediately after the intervention, and 6 months later, and (b) the predictive role of self-esteem in cyberbullying involvement in the three phases of the study (before, immediately after, and 6 months after the intervention) for students with and without SEN.

The corresponding research hypotheses were the following:

Hypothesis 1 (H1)

It was speculated that the intervention will be effective immediately after and 6 months after the intervention was completed for both students without (H1a) and with SEN (H1b).

Hypothesis 2 (H2)

It was speculated that self-esteem of both students with and without SEN will negatively predict their cyberbullying involvement in all three phases of the study (Kokkinos and Panayiotou, 2004; Lei et al., 2020; Hypothesis 2).

## Materials and methods

### Sample

The participants were 240 sixth grade<sup>1</sup> students ( $N=120$  with SEN and  $N=120$  without SEN), who had internet access and made use of social media (e.g., Facebook, Instagram). Almost half of the students with SEN ( $N=59$  [49.2%]) and without SEN ( $N=65$  [54.2%]) were boys, while their age ranged between 11 and 12 years ( $Mean=11.8$ ,  $SD=0.45$ ). The students came from 29 randomly selected general education elementary schools from the city area of Thessaloniki (the second largest Greek city after Athens). All schools had integration classrooms in which students with SEN were taught by special education teachers daily. The students with SEN had been formally diagnosed in the past with LD (e.g., dyslexia;  $N=45$  [37.5%]), ASD of high-functioning (previously known as Asperger syndrome according to DSM-IV;

$N=39$  [32.5%]) and ADHD ( $N=36$  [30%]), and attended for a few hours every day the general education classrooms, as they had (at least) a normal Intelligent Quotient (IQ) and could meet their classroom curriculum (MINEDU, 2018). In the pilot study participated 54 sixth grade students ( $N=27$  with SEN and  $N=27$  without SEN). However, the pilot administration of the questionnaires did not indicate the need to be modified. Consequently, the pilot sample was consolidated with the main sample ( $N=186$ ), resulting in the total sample of the study ( $N=240$ ).

### Questionnaires

Apart from answering to demographic questions (e.g., gender, age), participants completed the following two self-reported questionnaires:

**Cyberbullying questionnaire:** Cyberbullying experiences were investigated through a short version of the "Cyberbullying Questionnaire" (Smith et al., 2006), which examines the four frequently reported cyberbullying behaviors among elementary school students (sending text messages, spreading rumors, circulating audiovisual material, and making online calls; Touloupis and Athanasiades, 2014) with questions such as the following: "Have you spread, in the last year, negative rumors or comments about someone on social media (e.g., Facebook, Instagram, Twitter) to make him/her feel bad/sad/upset?" Questions were answered on a five-point scale (from 1 = *I have not done anything similar/Nothing similar has ever happened to me* to 5 = *I do it/It happens to me several times a week*).

According to previous studies (Touloupis and Athanasiades, 2014) the questionnaire reflects two factors, online victimization and online bullying. A confirmatory factor analysis, using the Maximum Likelihood method, was applied and confirmed the above two-dimensional model, which had a very good fit,  $\chi^2(93, N=240)=139.098$ ,  $p<0.05$ , CFI=0.942, TLI=0.951, RMSEA=0.039, SRMS=0.034. Two factors emerged with eigenvalue  $>1.0$  and significant interpretive values: Factor 1 = Online victimization, explaining 39.11% of the total variance, and Factor 2 = Online bullying, explaining 28.03% of the total variance. The internal consistency indexes were satisfactory: Factor 1 ( $\alpha=0.811$ ) and Factor 2 ( $\alpha=0.799$ ).

**Self-esteem scale:** Students' self-esteem was investigated with the Greek version (Kokkiades and Kourkoutas, 2016) of Rosenberg's "Self-esteem Scale" (Rosenberg, 1989), which includes 10 proposals (e.g., "I take a positive attitude toward myself") examining the way people feel about themselves and forming a single factor ("Self-esteem"). Proposals were answered on a five-point Likert scale (from 1 = *Strongly disagree* to 5 = *Strongly agree*).

A confirmatory factor analysis, using the Maximum Likelihood method, was applied and confirmed the unidimensional model, which had a very good fit,  $\chi^2(88, N=240)=231.128$ ,  $p<0.05$ , CFI=0.949, TLI=0.941, RMSEA=0.037, SRMS=0.038. The single-factor model had

<sup>1</sup> Greek students' attendance in elementary school lasts 6 years.

eigenvalue  $>1.0$  and significant interpretive value: Factor 1 = Self-esteem, explaining 52.11%. The internal consistency index was satisfactory ( $\alpha = 0.889$ ).

## Procedure

Once the Greek Ministry of Education approved the study, the researchers informed the selected schools and the students' parents/legal guardians regarding the purpose and the procedure of the study. Following an experimental longitudinal research design, the students from all schools were divided into an experimental and a control group. Each group included students with SEN ( $N = 60$ ) and without SEN ( $N = 60$ ). In the pretest phase of the study both groups completed the questionnaires in the classrooms. Subsequently, an intervention based on the TABBY program (Athanasiades et al., 2015), which was enriched with experiential activities and material for the enhancement of students' self-esteem, was applied only to the experimental group by the specially trained general and special education teachers from the selected schools. Their nine-hour seminar training addressed the importance of holistic/systemic school interventions that focus on critical contextual factors (e.g., classroom climate, interpersonal relationships, collaborative practices) to bring about positive changes in students' behavior and emotions. The intervention in the classrooms lasted 4 hours and included audiovisual material regarding different forms of cyberbullying, a discussion on related legal issues and the role of schools in countering cyberbullying, as well as experiential activities to enhance self-esteem. For the comparative evaluation of the short- and long-term effectiveness of the intervention, students completed again the questionnaires 2 weeks (1<sup>st</sup> post-test) and 6 months after the intervention was completed (2<sup>nd</sup> post-test). Students and teachers participated in the study voluntarily, and the anonymity of the data was preserved.

## Results

### Evaluation of the effectiveness of the intervention on experimental and control group

To examine the effectiveness of the intervention immediately after (2<sup>nd</sup> phase) and 6 months after its completion (3<sup>rd</sup> phase) repeated measures ANOVA was used. The intervention seemed to affect statistically significantly students' online victimization, Pillai's Trace = 0.129,  $F(3, 237) = 5.887$ ,  $p < 0.001$ , partial  $\eta^2 = 0.431$ , and online bullying, Pillai's Trace = 0.208,  $F(3, 237) = 11.231$ ,  $p < 0.001$ , partial  $\eta^2 = 0.401$ . Violation of the Sphericity assumption of Mauchly's  $W$  ( $p < 0.05$ ) led to Huynh-Feldt's correction of degrees of freedom in cases of online victimization,  $F(2.8, 301.44) = 8.423$ ,  $p < 0.001$ , partial  $\eta^2 = 0.401$ , and online bullying,  $F(2.9, 411.91) = 10.989$ ,  $p < 0.001$ , partial  $\eta^2 = 0.398$ .

Pairwise comparisons among the phases of the study, applying the Bonferroni criterion ( $p < 0.017$ ), showed statistically significant differences concerning students' online victimization and online bullying before, immediately after and 6 months after the intervention. Based on Table 1, compared to control group, experimental groups' involvement in cyberbullying either as victims (online victimization) or as bullies (online bullying) significantly decreased immediately after and 6 months after the intervention.

### Differences between students with SEN and without SEN of the experimental group regarding cyberbullying involvement

Focusing on the experimental group,  $T$ -test for independent groups was applied to examine differences in the effectiveness of the intervention between students with ( $N = 60$ ) and without SEN ( $N = 60$ ). There were statistically significant differences between the above two subgroups regarding online victimization and online bullying immediately after/2<sup>nd</sup> phase (online victimization:  $t(117) = 2.546$ ,  $p = 0.008$ , online bullying:  $t(137) = 3.119$ ,  $p = 0.010$ ) and 6 months after the intervention/3<sup>rd</sup> phase (online victimization:  $t(117) = 8.304$ ,  $p = 0.011$ , online bullying:  $t(137) = 11.201$ ,  $p = 0.031$ ). Specifically, students with SEN were statistically less involved in cyberbullying either as victims or as bullies, compared to students without SEN in the 2<sup>nd</sup> (victims: students with SEN [ $Mean = 2.49$ ,  $SD = 2.01$ ] vs. students without SEN [ $Mean = 2.89$ ,  $SD = 2.12$ ], bullies: students with SEN [ $Mean = 2.23$ ,  $SD = 1.93$ ] vs. students without SEN [ $Mean = 2.62$ ,  $SD = 2.09$ ]) and 3<sup>rd</sup> phase of the study (victims: students with SEN [ $Mean = 2.44$ ,  $SD = 2.05$ ] vs. students without SEN [ $Mean = 2.91$ ,  $SD = 1.89$ ], bullies: students with SEN [ $Mean = 2.21$ ,  $SD = 2.10$ ] vs. students without SEN [ $Mean = 2.65$ ,  $SD = 2.11$ ]).

### Effect of the type of SEN on online victimization/bullying for students of the experimental group

Furthermore, to investigate differences on students' online victimization/bullying based on their type of SEN (learning disabilities, ASD, ADHD), in the three phases of the study, MANOVAs analyses were applied. In all phases the required assumptions were met: 1<sup>st</sup> phase [Box's Test of Equality of Covariance Matrices: Box's  $M = 192.11$ ,  $F = 3.31$ ,  $p = 0.08$ , and Levene's Test of Equality of Error Variances for online bullying ( $F = 2.48$ ,  $df1 = 3$ ,  $df2 = 236$ ,  $p = 0.31$ ) and online victimization ( $F = 2.83$ ,  $df1 = 3$ ,  $df2 = 236$ ,  $p = 0.41$ )], 2<sup>nd</sup> phase [Box's Test of Equality of Covariance Matrices: Box's  $M = 181.21$ ,  $F = 4.05$ ,  $p = 0.10$ , and Levene's Test of Equality of Error Variances for online bullying ( $F = 3.89$ ,  $df1 = 3$ ,  $df2 = 236$ ,  $p = 0.23$ ) and online victimization ( $F = 2.44$ ,  $df1 = 3$ ,  $df2 = 236$ ,  $p = 0.11$ )], and 3<sup>rd</sup> phase



TABLE 1 Evaluation of the effectiveness of the intervention regarding online victimization/bullying.

	Experimental group (N=120)						Control group (N=120)					
	Before the intervention		Immediately after the intervention		Six months after the intervention		Before the intervention		Immediately after the intervention		Six months after the intervention	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Online victimization	3.09	1.23	2.43	1.12	2.45	1.97	3.11	1.82	3.02	0.93	3.08	1.03
Online bullying	3.06	1.09	2.49	1.08	2.39	1.09	3.01	1.22	2.98	1.04	3.02	1.29

S.D.: standard deviation.

TABLE 2 Effect of the type of SEN on online victimization/bullying for students of the experimental group in the three phases of the study.

Phases of the study		Type of SEN	Mean	S.D.
Before the intervention	Online victimization	Learning disabilities	3.11	0.79
		Asperger syndrome	3.07	0.52
		ADHD	3.08	0.49
	Online bullying	Learning disabilities	3.07	0.88
		Asperger syndrome	3.05	0.89
		ADHD	3.06	0.43
	Online victimization	Learning disabilities	2.67	0.72
		Asperger syndrome	<b>2.30</b>	0.59
		ADHD	<b>2.31</b>	0.89
Immediately after the intervention	Online bullying	Learning disabilities	2.74	0.87
		Asperger syndrome	<b>2.39</b>	0.94
		ADHD	<b>2.36</b>	0.82
	Online victimization	Learning disabilities	2.69	0.72
		Asperger syndrome	<b>2.32</b>	0.59
		ADHD	<b>2.34</b>	0.89
	Online bullying	Learning disabilities	2.57	0.47
		Asperger syndrome	<b>2.29</b>	0.84
		ADHD	<b>2.30</b>	0.92

S.D.: standard deviation.

[Box's Test of Equality of Covariance Matrices: Box's  $M=201.44$ ,  $F=3.15$ ,  $p=0.29$ , and Levene's Test of Equality of Error Variances for online bullying ( $F=2.09$ ,  $df1=3$ ,  $df2=236$ ,  $p=0.39$ ) and online victimization ( $F=2.32$ ,  $df1=3$ ,  $df2=236$ ,  $p=0.14$ )].

The MANOVAs results showed that immediately after (2<sup>nd</sup> phase) and 6 months after the intervention (3<sup>rd</sup> phase), there was a significant interaction effect of the type of SEN on students' involvement in cyberbullying: 2<sup>nd</sup> phase (Pillai's Trace = 0.052,  $F(3, 236)=3.209$ ,  $p<0.001$ , partial  $\eta^2=0.39$ ), and 3<sup>rd</sup> phase (Pillai's Trace = 0.083,  $F(3, 236)=9.943$ ,  $p<0.001$ , partial  $\eta^2=0.41$ ). Also, in these two phases, the above effect proved significant for both cyberbullying roles: 2<sup>nd</sup> phase (online victimization,  $F(1, 238)=9.332$ ,  $p<0.001$ , partial  $\eta^2=0.49$ , online bullying,  $F(1, 238)=8.320$ ,  $p<0.001$ , partial  $\eta^2=0.44$ ), and 3<sup>rd</sup> phase (online victimization,  $F(1, 238)=8.459$ ,  $p<0.001$ , partial  $\eta^2=0.38$ , online bullying,  $F(1, 238)=11.298$ ,  $p<0.001$ , partial  $\eta^2=0.34$ ).

The direction of this effect on the above cases is presented in Table 2, showing that in immediately after (2<sup>nd</sup> phase) and 6 months after the intervention (3<sup>rd</sup> phase) students with ASD and ADHD of the experimental group were involved in cyberbullying as victims and bullies to a relatively lesser extent (their lower Means are in bold), compared to students with learning disabilities of the experimental group.

## Correlations between cyberbullying and self-esteem

To examine the pattern of correlations among the variables involved for the total sample in the three phases of the study, Pearson (Pearson  $r$ ) correlations were applied. It was found that before the intervention (1<sup>st</sup> phase), self-esteem negatively predicted students' online victimization ( $r=-0.329$ ,  $p<0.01$ ) and online bullying ( $r=-0.311$ ,  $p<0.01$ ). Stronger negative predictive correlations were found between self-esteem and the two roles of cyberbullying immediately after (2<sup>nd</sup> phase [victims:  $r=-0.455$ ,  $p<0.01$ , bullies:  $r=-0.409$ ,  $p<0.01$ ]), and 6 months after the intervention (3<sup>rd</sup> phase [victims:  $r=-0.441$ ,  $p<0.01$ , bullies:  $r=-0.432$ ,  $p<0.01$ ]).

## The predictive role of self-esteem in cyberbullying

The predictive relationship between students' self-esteem and their online victimization/bullying was checked through linear



regressions. Although, the regression indexes of  $R^2$  were generally low, comparing the standardized regression coefficients (Table 3) for the three phases of the study, there were found stronger negative predictive relationships between the above variables for the experimental group immediately after (2<sup>nd</sup> phase; see the corresponding bold indexes in Table 3) and 6 months after the intervention (3<sup>rd</sup> phase; see the corresponding bold indexes in Table 3), compared to the 1<sup>st</sup> phase (before intervention).

## Discussion

The study evaluated the effectiveness of a cyberbullying intervention based on the TABBY program in the elementary school environment where students with SEN and without SEN co-exist, examining at the same time the role of self-esteem in their cyberbullying involvement. According to the results, the intervention generally proved effective as the experimental group (students with and without SEN) reported lower rates of cyberbullying involvement (either as victims or as bullies) not only immediately after but also 6 months after the intervention was completed. This is in line with H1a and H1b, highlighting the short-term and the long-term effectiveness, respectively, of the intervention not only for victims, as was found before (Athanasiades et al., 2015), but also for bullies of typical development. Given the different contextual characteristics of elementary schools compared to high schools (i.e., closer interpersonal relationships, sense of belonging, less competitive school climate; Zapata-Caceres et al., 2021), it could be inferred that a cyberbullying intervention implemented in such a context could benefit all students, even the perpetrators of such aggressive behaviors. After all, it has been reported that in this setting teachers are also more likely to become involved and committed to the effective implementation of the intervention (Wong et al., 2008).

Furthermore, when adopting an intragroup comparative perspective within the experimental group, it seemed that

students with SEN benefitted more from the intervention, compared to their peers without SEN. This could be attributed to the fact that the intervention was implemented not only by general education teachers but also by special education colleagues. The latter collaborate closely with the general education teachers and spend many hours daily with students with SEN in the integration classrooms of elementary schools; they are usually well trained in the implementation of interventions for the SEN (MINEDU, 2018), and consequently, special education teachers may contribute significantly to the effective implementation of the intervention. The above parameters are likely to have made students, and especially those with SEN, report lower involvement in cyberbullying (either as victims or as bullies) immediately after and 6 months after the intervention. Also, focusing only on students with SEN, it was found that those with ASD and ADHD experienced a relatively higher benefit from the intervention compared to their peers with learning disabilities (e.g., dyslexia). Considering that learning audiovisual material (e.g., videos, pictures) has proved very helpful mainly for students with social and behavioral difficulties, such as those with ASD and ADHD (Rogers, 2013), we could justify that cyberbullying awareness through corresponding material was slightly greater for these students in the second and the third phase of the study.

The above parameters, along with the fact that in secondary education students with SEN are not supported by the same teacher (as a stable key figure) but by different specialties of teachers for fewer hours daily (MINEDU, 2018), could partially support the fact that the elementary school context may act as a fertile ground/organization for applying appropriate strategies in order for students of typical and non-typical development to benefit from preventive actions. Nevertheless, as the TABBY program has not been implemented to date in secondary school students with SEN, it would be worth conducting similar study to elicit “comparative” findings regarding the appropriateness of a

TABLE 3 The predictive role of self-esteem in cyberbullying for experimental and control group in the three phases of the study.

Three phases of the study	Predictive factor	Cyberbullying involvement	Groups	$R^2$	$\beta$	$t$	$p$
Before the intervention	Self-esteem	Online victimization	Experimental	0.033	−0.210	−4.330	0.032
			Control	0.031	−0.221	−4.442	0.039
		Online bullying	Experimental	0.052	−0.280	−3.989	0.015
			Control	0.045	−0.229	−4.032	0.023
Immediately after the intervention	Self-esteem	Online victimization	Experimental	<b>0.065</b>	<b>−0.521</b>	<b>−8.732</b>	<b>0.009</b>
			Control	0.024	−0.242	−5.301	0.032
		Online bullying	Experimental	<b>0.081</b>	<b>−0.449</b>	<b>−7.887</b>	<b>0.005</b>
			Control	0.048	−0.201	−4.911	0.029
Six months after the intervention	Self-esteem	Online victimization	Experimental	<b>0.061</b>	<b>−0.489</b>	<b>−7.439</b>	<b>0.004</b>
			Control	0.029	−0.188	−3.773	0.022
		Online bullying	Experimental	<b>0.077</b>	<b>−0.501</b>	<b>−7.014</b>	<b>0.015</b>
			Control	0.033	−0.302	−4.209	0.042

$\beta$ : standardized regression coefficient.

secondary school environment to promote related prevention actions for this student population.

Furthermore, in line with hypothesis 2 and other related findings (Kokkinos and Panayiotou, 2004; Lei et al., 2020), the results revealed a negative predictive role of self-esteem in cyberbullying involvement (either as victims or as bullies) in all three phases of the study, although with low predictive values. Considering the experiential activities during the intervention for the enhancement of students' self-esteem, we could explain the fact that this predictive relationship seemed to be stronger immediately after and 6 months after the intervention was completed for the experimental group. Based on the fact that young children's socio-emotional skills are gradually shaped from the early years of their school attendance (Dowling, 2014), we could view the elementary school context as a fertile ground for strengthening longitudinally children's self-esteem as a protective factor against cyberbullying. Finally, considering the reported correlation between low self-esteem and online perpetrators' behavior (Patchin and Hinduja, 2010), we could argue that the intervention's emphasis on enhancing students' self-esteem may have contributed to the decreased rates not only of cyber-victims but of cyberbullies as well in the present study. This is a finding that was not the case when the intervention was implemented in secondary education without self-esteem activities included (Athanasiades et al., 2015). Nevertheless, future related studies based on the TABBY program should examine the extent of the predictive role of self-esteem in elementary school students' involvement in cyberbullying.

In conclusion, it seems that a cyberbullying intervention based on the TABBY program could be effectively implemented in the elementary school context, which is identified with the sensitive years of students' socio-emotional development as well as with specific organizational characteristics (e.g., close collaboration between teachers of general and special education). In this context, it seems that key figures, such as teachers of general and special education, may effectively enhance emotional skills and subsequently bring about positive changes in the cyber behavior of students of typical and non-typical development. Undoubtedly, future related studies in elementary schools could confirm and extend the above findings.

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## Data availability statement

The datasets presented in this article are not readily available because due to the specificity of the sample and the sensitive nature of the research topic, the participating students and parents/guardians were assured raw data and material would remain confidential and would not be shared. Requests to access the datasets should be directed to [touloupis@psy.auth.gr](mailto:touloupis@psy.auth.gr).

## Ethics statement

The studies involving human participants were reviewed and approved by Greek Ministry of Education, Institute of Educational Policy. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

## Author contributions

TT conducted the study, performed the statistical analyses, and wrote the research article. CA supervised the whole procedure. All authors contributed to the article and approved the submitted version.

## 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.

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# ReStress mindset: An internet-delivered intervention that changes university students' mindset about stress in the shadow of the COVID-19 pandemic

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The aim of this study is to evaluate "ReStress Mindset," an internet-delivered intervention that combines the Stress Mindset Training Program (SMTP) with Acceptance and Commitment Therapy (ACT). To that end, the current study determined whether the pilot study's findings on the intervention's effectiveness on stress mindset and stress response among university students in the midst of the COVID-19 pandemic, remained for 3 months following the completion of "ReStress Mindset" intervention. Twenty-six participants were randomly assigned to an intervention ( $N = 12$ ) and a control ( $N = 14$ ) group. Participants in the intervention group attended 5 weekly sessions online, between the second and third waves of the COVID-19 pandemic. All participants completed self-report questionnaires (Stress Mindset Measure, Satisfaction With Life Scale, Depression Anxiety and Stress Scale-9, Perceived Stress Scale, Scale of Positive, and Negative Experience) before, at the end of the intervention and 3 months after the completion of the program. The "ReStress Mindset" intervention resulted in a statistically significant increase in "stress-is-enhancing" mindset (SIEM), life satisfaction, and self-efficacy against stress, as well as a statistically significant decrease in "stress-is-debilitating" mindset (SIDM), with these effects lasting 3 months after the program's completion. The findings of this study suggest that university students could benefit from the "ReStress Mindset" intervention in order to cultivate and maintain a positive stress mindset and increase their life satisfaction and self-efficacy against stress, even during the COVID-19 pandemic or any other highly stressful period or crisis.

## KEYWORDS

stress, stress mindset, Acceptance and Commitment Therapy, internet-delivered interventions, university students stress, university students

## Introduction

### Mental health in the shadow of the COVID-19 pandemic

On March 2020, [World Health Organization \[WHO\] \(2020\)](#) has declared the COVID-19 as a pandemic. Coronavirus disease (COVID-19), which is thought to have originated in Wuhan, China, in December 2019, has had a significant global impact on people's mental health ([Holmes et al., 2020](#)). A systematic review and meta-analysis, during the early period of the COVID-19 crisis in China, found that stress was the most prevalent (48.1%) mental health consequence of the COVID-19 pandemic, followed by depression (26.9%) and anxiety (21.8%; [Bareeqa et al., 2021](#)). According to a review study, stress can have a direct and indirect impact on health through changes in health behaviors, which can result in a variety of negative mental and physical health effects, including an increased risk of infectious diseases like COVID-19 ([O'Connor et al., 2021](#)). Moreover, a systematic review and meta-analysis showed that 28.6% of people worldwide reported low levels of wellbeing during the COVID-19 outbreak ([Nochaiwong et al., 2021](#)).

University students' mental health is a growing public health concern ([Bewick et al., 2010](#); [Gallagher, 2012](#)). Many studies show that students experience higher levels of distress, depression, and anxiety than the general population at their age ([Eisenberg et al., 2007](#); [Bayram and Bilgel, 2008](#); [Lipson et al., 2018](#)). A systematic review and meta-analysis found that during the COVID-19 pandemic anxiety symptoms were more prevalent among university students compare to similar populations prior to the pandemic ([Deng et al., 2021](#)). Moreover, the detrimental effects of the COVID-19 outbreak have been associated to higher stress levels and lower self-rated health among university students ([Zurlo et al., 2020](#); [Ryerson, 2022](#)). Also, it is well documented that during the COVID-19 pandemic, university students and young adults worldwide experienced severe lifestyle and mental health disruptions, with serious consequences for their wellbeing ([Cao et al., 2020](#); [Li et al., 2020](#); [Liu et al., 2020](#); [McGinty et al., 2020](#); [Tang et al., 2020](#); [Giuntella et al., 2021](#)).

A study in China found that during the coronavirus disease outbreak, the prevalence rates of stress among 746,217 university students was 34.9%, while anxiety symptoms were 11.0% ([Ma et al., 2020](#)). In a survey study conducted in the United Kingdom during the COVID-19 pandemic, university students reported significant levels of anxiety and depression, with more than half reporting levels above clinical cutoffs, as well as low levels of resilience ([Chen and Lucock, 2022](#)). Also, a study conducted among Polish university students found that self-reported physical health and life satisfaction decreased significantly during three waves of the COVID-19 pandemic ([Rogowska et al., 2021b](#)). Moreover, university students who reported high levels of perceived stress were seven times more

likely to indicate high anxiety disorder risk. Low life satisfaction was also found to be a predictor of higher anxiety levels ([Rogowska et al., 2021b](#)). In Greece, a survey study among 1,018 undergraduates during the COVID-19 quarantine, found significantly increased levels of depression, anxiety, stress, and negative affect, while life disruption and perceived threat of the disease were risk factors in all psychological distress measures ([Kornilaki, 2022](#)).

Furthermore, the COVID-19 pandemic has exacerbated known mental health risk factors and other health concerns among university students, while also compromising students' academic outcomes and future prospects ([Lederer et al., 2021](#)). As a result of campus closures and strict social isolation and physical distancing measures enacted in response to the COVID-19 pandemic, tertiary education institutions have shifted to online learning platforms. This transition is likely to exacerbate academic and other stressors for university students, such as mounting financial problems, a lack of social relationships, housing and food insecurity, uncertainty about the future, insufficient computer skills, poor quality of online classes, online exams, academic performance, and future studies ([Byrnes et al., 2020](#); [Kapasias et al., 2020](#); [Aristovnik et al., 2021](#); [Lederer et al., 2021](#); [Chen and Lucock, 2022](#)).

Previous research has clearly demonstrated that university students are experiencing unprecedented disruption and uncertainty, demanding immediate action to mitigate the pandemic's negative academic and psychosocial impact ([Grubic et al., 2020](#); [Kornilaki, 2022](#)). To that end, developing and implementing adequate prevention and intervention programs at universities should be a top priority in the fight against the COVID-19 pandemic, both during and after this global crisis ([Grubic et al., 2020](#); [Cénat et al., 2021](#); [Rogowska et al., 2021b](#); [Kornilaki, 2022](#)).

### The ReStress mindset intervention

There is mounting evidence that mindset influences not only intelligence ([Dweck, 2008](#)) and aging ([Levy and Myers, 2004](#)), but also the stress response ([Crum et al., 2013](#)). According to a growing body of research on mindset, changing individual's mindset toward stress can have a significant impact on stress response ([Crum et al., 2017](#)). Stress mindset is conceptualized as one's belief that stress itself has either enhancing or debilitating consequences for outcomes such as performance and productivity, health and wellbeing, learning and growth ([Crum et al., 2013](#)). Moreover, "stress-is-enhancing" (SIEM) and "stress-is-debilitating" (SIDM) mindsets can have a different impact on physiological and behavioral responses to stress ([Crum et al., 2013](#)). Furthermore, research suggests that stress mindset is related to perceived health and life satisfaction over and above the effects of amounts of stress, stress appraisals, and coping strategies ([Crum et al., 2013](#)).



Acceptance and Commitment Therapy (ACT; Hayes et al., 2011) is a transdiagnostic psychological intervention that aims to increase psychological flexibility through six core processes (cognitive defusion, acceptance, committed action, values, contact with the present moment, and self-as-context), all of which are important for improving mental health (Hayes et al., 2011). Psychological flexibility is defined as the ability to be mindful of experiences in the present moment, in an accepting and non-judgmental manner, as well as to take action guided by values in order to move toward who or what is important, even in the face of adversity (Hayes et al., 2006; Polk and Schoendorff, 2014; Levin et al., 2017). According to ACT, human suffering derives from psychological inflexibility, a core process in which behavior is rigidly guided by immediate psychological experiences rather than by the individual's values or goals (Levin et al., 2017). Experiential avoidance is a major component of psychological inflexibility, in which individuals avoid negative internal experiences such as thoughts, emotions, bodily sensations, and memories (Kocovski et al., 2013). Previous research found that university students who received ACT intervention reported less stress, reduced anxiety and depressive symptoms, increased psychological flexibility and general mental health, as well as improved mindful acceptance (Levin et al., 2017; Grégoire et al., 2018).

A meta-analysis of internet-delivered interventions for mental health and wellbeing in university students found that these types of interventions can be effective and improve the functioning of university students (Harrer et al., 2019). The “ReStress Mindset” is an internet-delivered intervention program designed to change the stress mindset and stress response of Greek university students in the midst of the COVID-19 pandemic (Karampas et al., 2022). The modules of this program were formed by combining the Stress Mindset Training Program (SMTP; Crum, 2011; Crum et al., 2013) and the ACT matrix protocol (Polk and Schoendorff, 2014) into a unified psycho-educational intervention. The pilot study of the “ReStress Mindset” intervention demonstrated that combining both models in a single intervention benefited university students by providing them with a broader repertoire of strategies and tools to deal with their challenges (Karampas et al., 2022). Research also suggests that providing university students with a variety of coping strategies during this period of extreme uncertainty can help them deal with stress and improve their overall wellbeing (Rogowska et al., 2021a). Moreover, Hayes et al. (2019) argue that we must tailor interventions to specific people in specific contexts. In this regard, the “ReStress Mindset” intervention is a context-oriented program that acknowledges that psychological flexibility contains the ability to shift mindsets (Kashdan and Rottenberg, 2010). Furthermore, the “ReStress Mindset” intervention is built within the framework of evidence-based processes of change and intervention elements that move them forward (Hayes and Hofmann, 2018; Hofmann et al., 2021). Processes of change

are defined as theory-based, dynamic, progressive, contextually bound, modifiable, and multilevel change mechanisms that occur in predictable, empirically established sequences oriented toward desirable outcomes (Hofmann and Hayes, 2019). The modules of the intervention are presented in Table 1.

## The purpose of the present study

The aim of the present study is to evaluate “ReStress Mindset” intervention (Karampas et al., 2022). To that end, this study will determine whether the findings of the pilot study regarding the intervention's effectiveness on stress mindset and stress response among university students in the midst of the COVID-19 pandemic (Karampas et al., 2022), will remain for 3 months following the completion of the intervention.

The pilot study implemented the “ReStress Mindset” intervention led university students to cultivate a positive stress mindset even during COVID-19 pandemic, although further studies are required to establish the stability of the results over longer periods of time (Karampas et al., 2022). The results of the pilot study also indicated an increase in the levels of life satisfaction and psychological resilience of the intervention group, while the levels of life satisfaction and psychological resilience of the control group decreased after the intervention (Karampas et al., 2022). Additionally, no statistically significant changes in positive and negative emotions and psychological symptoms, were observed following the intervention, possibly due to the severe psychological impact of the COVID-19 pandemic (Karampas et al., 2022).

Thus, the present study will focus on answering the following research questions: (1) Does the “ReStress Mindset” intervention result in higher levels of SIEM, 3 months following the completion of the intervention? (2) Does the “ReStress Mindset” intervention result in lower levels of SIDM, 3 months following the completion of the intervention? (3) Does the “ReStress Mindset” intervention lead to an increase in levels of positive emotions, self-efficacy against stress, and life satisfaction, 3 months following the completion of the intervention? (4) Does the “ReStress Mindset” intervention result in lower levels of depression, anxiety, perceived helplessness against stress, and negative emotions, 3 months following the completion of the intervention?

## Materials and methods

### Participants

The sample consisted of 26 undergraduate Psychology students (96.2% women), aging from 19 to 39 years old ( $M_{age} = 24.46$ ). Participants were recruited from Panteion University of Social and Political Sciences in Greece by

TABLE 1 Modules of the “ReStress Mindset” intervention.

	Module 1 stress mindset	Module 2 rethinking stress toolkit	Module 3 ACT overview	Module 4 ACT matrix	Module 5 final
In module	The paradox of stress and the power of mindset	Three steps to a SIEM exercise	ACT overview and ranking your values exercise	ACT matrix and values form exercises	Review material
Homework	Mindfulness exercises	Mindfulness exercises	Mindfulness exercises	Mindfulness exercises	N/A

responding to an online invitation sent *via* newsletter email. The majority of the participants was unemployed (50%), while some participants were working part-time (30.8%) and others full-time (19.2%). Regarding the marital status of the participants, 43.2% of them were single, 46.2% were in a relationship, 7.7% were married, and 3.8% were divorced.

## Measures

### Demographics

Participants were asked to report demographic information regarding their gender, age, marital and employment status.

(1) Stress Mindset Measure (SMM; Crum et al., 2013; Greek version: Karampas et al., 2020). In the SMM the participants are rating how strongly they agree or disagree with eight statements (e.g., the effects of stress are positive and should be utilized, the effects of stress are negative and should be avoided) on a 0 (strongly disagree) to 4 (strongly agree) scale. In the Greek study, two factors were identified instead of a single stress mindset factor representing two different mindsets on the effects of stress: either it is enhancing or debilitating.

(2) Satisfaction With Life Scale (SWLS; Diener et al., 1985; Greek version: Galanakis et al., 2017). The scale measures individual's cognitive assessment of his/her life indicating satisfaction with life levels. The SWLS consists of five items rated on a 7-point Likert-type scale (1-Strongly disagree to 7-Strongly agree).

(3) Depression Anxiety Stress Scales-9 (DASS-9; Yusoff, 2013; Greek version: Kyriazos et al., 2018a). DASS-9 is an empirically derived version based on DASS-21 (Lovibond and Lovibond, 1995; Pezirkianidis et al., 2018). The DASS-9 measures three negative emotional states (a) depression, (b) anxiety, and (c) tension/stress. Respondents report the presence of 9 symptoms over the previous week using a Likert-type scale (0-Did not apply to me at all to 3-Applied to me very much or most of the time). The three subscales of the DASS-9 were each cumulatively scored between 0 and 9, with higher scores demonstrating poorer mental health.

(4) Perceived Stress Scale (PSS; Cohen et al., 1983; Greek version: Andreou et al., 2011). The PSS has been developed to measure general stress based on the conceptualization of stress as an appraisal of something threatening and that people cope with stress more or less effectively (Lazarus and Folkman, 1984). PSS items ask participants to reflect on the past month and includes questions such as “Have you been upset by something

that happened unexpectedly?” and “Have you felt that you could not cope with all the things you had to do?” (Scale: 0 = never to 4 = very often).

(5) Scale of Positive and Negative Experience (SPANE; Diener et al., 2010; Greek version SPANE-8: Kyriazos et al., 2018b). SPANE-8 is a revised structure containing one general feeling per dimension instead of three in the original SPANE (Diener et al., 2010). This resulted in a briefer structure with four positive (Pleasant, Happy, Joyful, Contented) and four negative (Bad, Sad, Afraid, Angry) items. Items are scored on a Likert scale from 1 (very rarely or never) to 5 (very often or always).

### Procedure

All participants ( $N = 26$ ) were informed on the purpose of the study and gave their informed consent online. Also, participants were randomly allocated in the intervention ( $N = 12$ ) and control ( $N = 14$ ) groups and completed an online battery of questionnaires, as described above, at the beginning (T1), at the end of the intervention (T2) and 3 months after the completion of the program (T3). The members of the control group were offered the opportunity to attend the intervention after the completion of the study. The intervention lasted 5 weeks and consisted of 2-h modules. The intervention took place in February and March 2021, between the second and third waves of the COVID-19 pandemic, with a follow-up in June 2021. The content for each module, as well as the assigned homework, are listed in Table 1.

### Statistical analysis

The data was analyzed using the Statistical Package for Social Sciences (SPSS), version 28. Firstly, we conducted preliminary analyses to test if the data is appropriate and, then, a two-way ( $2 \times 3$ ) repeated measures mixed design ANOVA was performed to answer the research questions.

## Results

### Preliminary analyses

For each of the study variables we computed the mean, standard deviation, and Cronbach's alpha coefficient (see

**Table 2).** The means show differences in the levels of specific variables between the three time-points. Also, the results based on the internal consistency coefficient indicate adequate reliability of all subscales except for the subscale of DASS-9 measuring stress and the subscale of SPANE-8 measuring negative emotions, whose internal consistency range from 0.60 to 0.76. Moreover, the Kolmogorov-Smirnov tests indicate that all variables follow a normal distribution in almost every time-point.

## Two-way repeated measures mixed design ANOVA

A two-way ( $2 \times 3$ ) repeated measures mixed design ANOVA was conducted to test the main effect of time (before, after the end, and 3 months after the intervention) and the two-way interaction amongst time and condition (intervention and control) on the levels of SIEM, SIDM, depression, anxiety, stress, positive and negative emotions, life satisfaction, perceived helplessness, and self-efficacy against stress. The required assumptions were met.

The results indicated a statistically significant main effect of Time on SIEM [ $F_{(2,48)} = 21.627$ ,  $MSE = 6.505$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.47$ ], SIDM [ $F_{(2,48)} = 23.196$ ,  $MSE = 5.970$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.49$ ], experiencing of positive emotions [ $F_{(2,48)} = 3.205$ ,  $MSE = 0.483$ ,  $p = 0.049$ ,  $\eta_p^2 = 0.12$ ], self-efficacy against stress [ $F_{(2,48)} = 6.429$ ,  $MSE = 0.539$ ,  $p = 0.003$ ,  $\eta_p^2 = 0.21$ ], satisfaction with life [ $F_{(2,48)} = 5.922$ ,  $MSE = 0.947$ ,  $p = 0.005$ ,  $\eta_p^2 = 0.20$ ], depression [ $F_{(2,48)} = 3.345$ ,  $MSE = 0.570$ ,  $p = 0.044$ ,  $\eta_p^2 = 0.12$ ], and stress [ $F_{(2,48)} = 4.708$ ,  $MSE = 0.616$ ,  $p = 0.014$ ,  $\eta_p^2 = 0.16$ ]. More specifically, the findings indicate that the participants in the study report higher mean SIEM, positive emotions, self-efficacy against stress, and satisfaction with life levels and lower mean SIDM, depression, and stress levels after the intervention.

To shed more light in the aforementioned results, we tested for possible interactions. A statistically significant interaction between Time and Condition was demonstrated for SIEM [ $F_{(2,48)} = 13.118$ ,  $MSE = 3.946$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.35$ ], SIDM [ $F_{(2,48)} = 18.040$ ,  $MSE = 4.643$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.43$ ], positive emotions [ $F_{(2,48)} = 3.940$ ,  $MSE = 0.593$ ,  $p = 0.026$ ,  $\eta_p^2 = 0.14$ ], negative emotions [ $F_{(2,48)} = 3.362$ ,  $MSE = 0.727$ ,  $p = 0.043$ ,  $\eta_p^2 = 0.12$ ], perceived helplessness against stress [ $F_{(2,48)} = 3.629$ ,  $MSE = 0.367$ ,  $p = 0.034$ ,  $\eta_p^2 = 0.13$ ], self-efficacy against stress [ $F_{(2,48)} = 4.531$ ,  $MSE = 0.380$ ,  $p = 0.016$ ,  $\eta_p^2 = 0.16$ ], life satisfaction [ $F_{(2,48)} = 7.096$ ,  $MSE = 1.135$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.23$ ], and depression [ $F_{(2,48)} = 4.282$ ,  $MSE = 0.730$ ,  $p = 0.019$ ,  $\eta_p^2 = 0.15$ ].

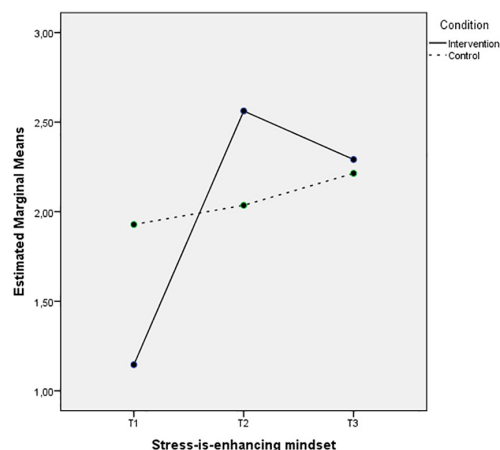
**Figures 1, 2** depict the interaction between Time and Condition for SIEM and SIDM, respectively. The first figure depicts an increase on the intervention group levels of SIEM after the intervention that remains 3 months after and slight changes on the levels of the control group. The second figure

**TABLE 2** Descriptive statistics, alpha levels, and normality coefficients of study variables for the three time-points ( $N = 26$ ).

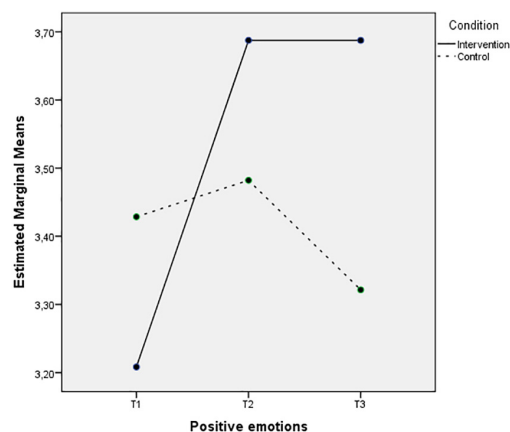
Variable	Time	<i>M</i>	<i>SD</i>	$\alpha$	<i>K-S D</i>	<i>df</i>	<i>p</i>
SIEM	T1	1.57	0.95	0.91	0.182	26	0.026
	T2	2.28	0.88	0.85	0.102	26	0.200
	T3	2.25	0.96	0.89	0.154	26	0.116
SIDM	T1	2.58	0.84	0.78	0.154	26	0.112
	T2	1.77	0.89	0.82	0.195	26	0.012
	T3	1.84	0.95	0.86	0.154	26	0.113
Satisfaction with life	T1	4.85	1.14	0.86	0.105	26	0.200
	T2	5.21	0.87	0.78	0.104	26	0.200
	T3	5.04	1.01	0.84	0.137	26	0.200
Depression	T1	0.92	0.68	0.70	0.153	26	0.122
	T2	0.69	0.67	0.78	0.243	26	0.000
	T3	0.96	0.82	0.89	0.200	26	0.009
Anxiety	T1	0.88	0.72	0.70	0.168	26	0.057
	T2	0.76	0.55	0.70	0.131	26	0.200
	T3	0.78	0.69	0.80	0.182	26	0.027
Stress	T1	1.44	0.66	0.60	0.168	26	0.057
	T2	1.17	0.51	0.65	0.203	26	0.007
	T3	1.24	0.63	0.64	0.136	26	0.200
Perceived helplessness against stress	T1	2.18	0.56	0.70	0.142	26	0.187
	T2	2.10	0.57	0.78	0.123	26	0.200
	T3	2.09	0.63	0.80	0.148	26	0.146
Self-efficacy against stress	T1	2.32	0.67	0.86	0.130	26	0.200
	T2	2.59	0.57	0.81	0.085	26	0.200
	T3	2.50	0.65	0.86	0.129	26	0.200
Positive emotions	T1	3.32	0.76	0.90	0.168	26	0.057
	T2	3.58	0.63	0.73	0.105	26	0.200
	T3	3.49	0.72	0.87	0.144	26	0.174
Negative emotions	T1	2.69	0.80	0.62	0.133	26	0.200
	T2	2.41	0.69	0.65	0.142	26	0.188
	T3	2.60	0.89	0.76	0.115	26	0.200

shows a decrease of SIDM on the intervention group at the second time-point that remains in the follow up measurement, while the SIDM levels of the control group remain unchanged.

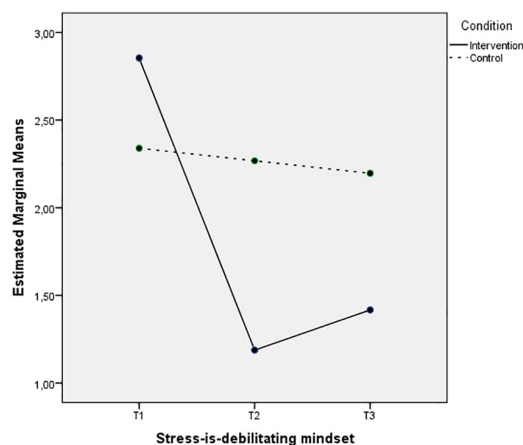
**Figures 3, 4** depict almost the same pattern in the interaction between Time and Condition for the experiencing of positive and negative emotions. The intervention group levels of positive emotions increase, and the negative emotions decrease after the intervention and these levels remain 3 months after the intervention. However, the control group levels on both variables do not change in the second time-point, but the



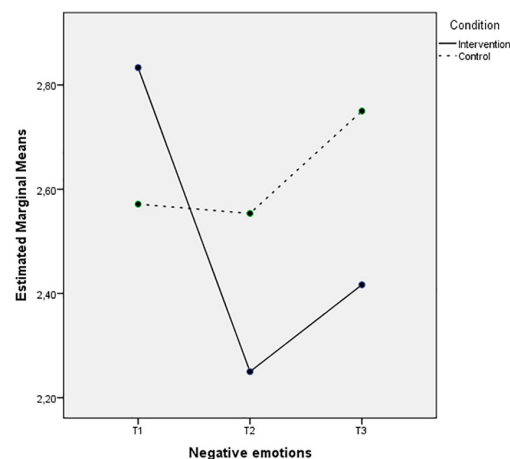
**FIGURE 1**  
Mean of SIEM showing time effects for control and intervention groups.



**FIGURE 3**  
Mean of positive emotions showing time effects on the two conditions.



**FIGURE 2**  
Mean of SIDM mindset showing time effects for control and intervention groups.



**FIGURE 4**  
Mean of negative emotions showing time effects on the two conditions.

levels of positive emotions seem to decrease, and the negative emotions increase during Time 3.

On the other hand, **Figure 5** depict a decrease on the levels of perceived helplessness against stress in Time 2 for the intervention group, half of which remains 3 months after the intervention, while the levels of the control group seem to increase in the second time-point and bounce back to the previous levels in Time 3. The pattern of the interaction between Time and Condition for the self-efficacy against stress is different (see **Figure 6**). The intervention group levels clearly increase in Time 2 and the same levels remain in Time 3. However, the self-efficacy levels of the control group have slight changes between the three time-points.

The last two **Figures 7, 8** also depict an increase of the life satisfaction levels and a decrease of the depression levels in Time 2 that remain 3 months after the intervention, while the control group levels of these wellbeing indices remain the same or even decrease during the three measurements.

## Post-hocs for interactions

To interpret the interactions between Time and Condition more precisely, we ran paired *t*-tests for each group between pairs of the three time-points and independent samples *t*-test between the groups for the three time-points. A Bonferroni correction was applied to the significance level ( $0.05/6 = 0.008$ ).

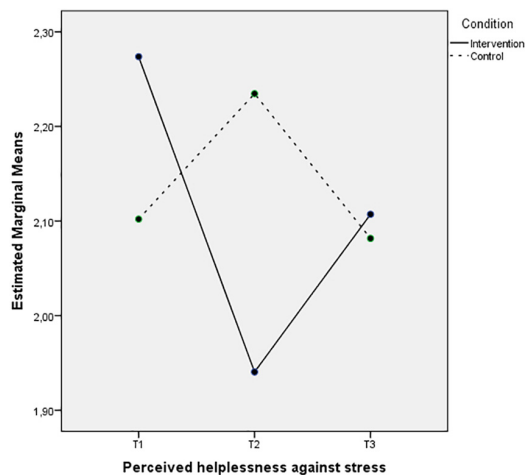


FIGURE 5  
Mean of perceived helplessness against stress showing time effects for control and intervention groups.

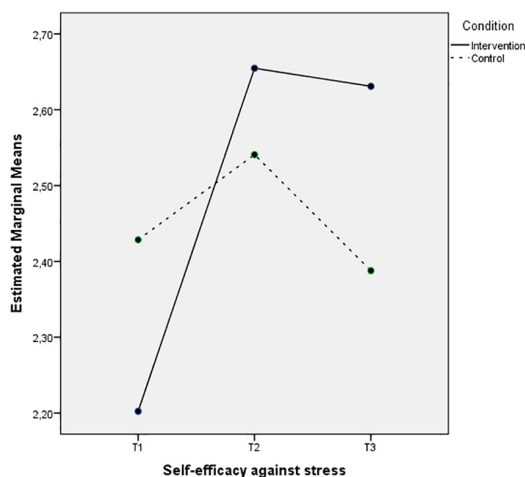


FIGURE 6  
Mean of self-efficacy against stress showing time effects for control and intervention groups.

The results indicate statistically significant differences only for the intervention group (see [Table 3](#)) regarding (a) SIEM between T1–T2 [ $t(11) = -7.745, p < 0.001$ , Cohen's  $D = -4.67$ ] and T1–T3 [ $t(11) = -3.915, p = 0.002$ , Cohen's  $D = -2.36$ ], (b) SIDM between T1–T2 [ $t(11) = 7.487, p < 0.001$ , Cohen's  $D = 4.51$ ] and T1–T3 [ $t(11) = 5.500, p < 0.001$ , Cohen's  $D = 3.32$ ], (c) self-efficacy against stress between T1–T2 [ $t(11) = -3.681, p = 0.004$ , Cohen's  $D = -2.21$ ], and (d) life satisfaction between T1–T2 [ $t(11) = -3.300, p = 0.008$ , Cohen's  $D = -1.99$ ] and T1–T3 [ $t(11) = -3.341, p = 0.007$ , Cohen's  $D = -2.01$ ]. More specifically (see [Table 4](#)), the participants in the intervention group reported significantly higher levels of SIEM (T1:  $M = 1.15, SD = 0.71$ ; T2:  $M = 2.56, SD = 0.72$ ;

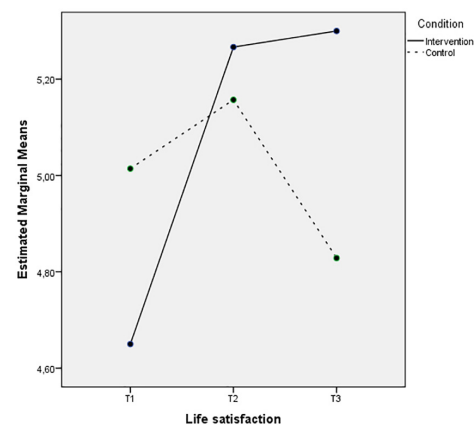


FIGURE 7  
Mean of life satisfaction showing time effects for control and intervention groups.

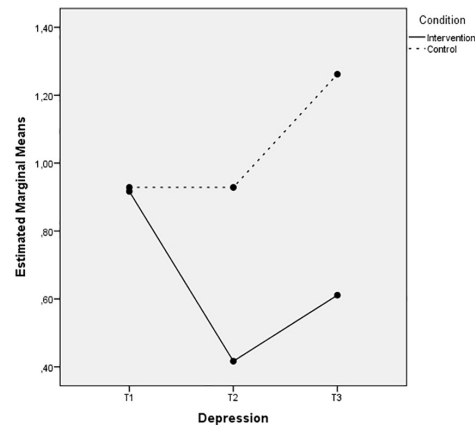


FIGURE 8  
Mean of depression showing time effects for control and intervention groups.

T3:  $M = 2.29, SD = 1.09$ ) and life satisfaction (T1:  $M = 2.20, SD = 0.57$ ; T2:  $M = 2.65, SD = 0.44$ ; T3:  $M = 2.63, SD = 0.42$ ), and lower levels of SIDM that remain significant 3 months after the intervention (T1:  $M = 2.85, SD = 0.76$ ; T2:  $M = 1.19, SD = 0.53$ ; T3:  $M = 1.42, SD = 0.73$ ). Moreover, the participants in the intervention group reported higher levels of self-efficacy against stress after the intervention (T1:  $M = 2.20, SD = 0.57$ ; T2:  $M = 2.65, SD = 0.44$ ). The small sample size in each group and the Bonferroni correction didn't result to other significant results, even though the levels of several variables tend to change in different time-points. No statistically significant differences were found in the control group.

Additionally, statistical significant differences were found between the two conditions in the second time-point regarding the SIDM levels [ $t(22.157) = -3.929, p = 0.001$  Cohen's  $D = 1.52$ ; see [Table 5](#)]. Based on [Table 4](#), the participants of



**TABLE 3** Paired-samples *t*-test coefficients for the mean comparison of pairs between the three time-points as a function of condition.

Pairs		<i>t</i>	<i>df</i>	<i>p</i>
<b>Condition: Intervention</b>				
SIEM	T1–T2	−7.745	11	0.000
	T1–T3	−3.915	11	0.002
	T2–T3	1.458	11	0.173
SIDM	T1–T2	7.487	11	0.000
	T1–T3	5.500	11	0.000
	T2–T3	−1.217	11	0.249
Positive emotions	T1–T2	−2.479	11	0.031
	T1–T3	−2.309	11	0.041
	T2–T3	0.000	11	1.00
Negative emotions	T1–T2	2.420	11	0.034
	T1–T3	1.581	11	0.142
	T2–T3	−1.773	11	0.104
Perceived helplessness against stress	T1–T2	2.244	11	0.046
	T1–T3	0.921	11	0.377
	T2–T3	−1.797	11	0.100
Self-efficacy against stress	T1–T2	−3.681	11	0.004
	T1–T3	−2.913	11	0.014
	T2–T3	0.297	11	0.772
Life satisfaction	T1–T2	−3.300	11	0.008
	T1–T3	−3.341	11	0.007
	T2–T3	−0.248	11	0.809
Depression	T1–T2	2.514	11	0.029
	T1–T3	1.328	11	0.211
	T2–T3	−1.103	11	0.294
<b>Condition: Control</b>				
SIEM	T1–T2	−1.883	13	0.082
	T1–T3	−1.749	13	0.104
	T2–T3	−1.011	13	0.330
SIDM	T1–T2	0.540	13	0.598
	T1–T3	0.667	13	0.516
	T2–T3	0.418	13	0.682
Positive emotions	T1–T2	−0.641	13	0.533
	T1–T3	0.704	13	0.494
	T2–T3	0.987	13	0.342
Negative emotions	T1–T2	0.147	13	0.885
	T1–T3	−1.179	13	0.260
	T2–T3	−1.058	13	0.309
Perceived helplessness against stress	T1–T2	−2.253	13	0.042
	T1–T3	0.175	13	0.864
	T2–T3	1.177	13	0.260
Self-efficacy against stress	T1–T2	−1.282	13	0.222
	T1–T3	0.446	13	0.663
	T2–T3	1.112	13	0.286
Life satisfaction	T1–T2	−1.278	13	0.224
	T1–T3	1.139	13	0.275
	T2–T3	2.880	13	0.013
Depression	T1–T2	0.000	13	1.00
	T1–T3	−3.017	13	0.010
	T2–T3	−2.248	13	0.043

**TABLE 4** Mean (standard deviation) of each variable as a function of time and condition (*N* = 26).

Variable	Time	Intervention group	Control group
SIEM	T1	1.15 (0.71)	1.93 (0.99)
	T2	2.56 (0.72)	2.03 (0.95)
	T3	2.29 (1.09)	2.21 (0.87)
SIDM	T1	2.85 (0.76)	2.34 (0.86)
	T2	1.19 (0.53)	2.27 (0.85)
	T3	1.42 (0.73)	2.20 (0.99)
Positive emotions	T1	3.21 (0.72)	3.43 (0.81)
	T2	3.69 (0.49)	3.48 (0.73)
	T3	3.69 (0.47)	3.32 (0.87)
Negative emotions	T1	2.83 (0.76)	2.57 (0.83)
	T2	2.25 (0.51)	2.55 (0.80)
	T3	2.42 (0.65)	2.75 (1.05)
Perceived helplessness against stress	T1	2.27 (0.59)	2.10 (0.55)
	T2	1.94 (0.54)	2.23 (0.57)
	T3	2.11 (0.65)	2.08 (0.65)
Self-efficacy against stress	T1	2.20 (0.57)	2.42 (0.75)
	T2	2.65 (0.44)	2.54 (0.67)
	T3	2.63 (0.42)	2.39 (0.80)
Life satisfaction	T1	4.65 (1.18)	5.01 (1.13)
	T2	5.27 (0.83)	5.15 (0.92)
	T3	5.30 (0.84)	4.82 (1.12)
Depression	T1	0.92 (0.71)	0.93 (0.68)
	T2	0.42 (0.40)	0.93 (0.76)
	T3	0.61 (0.66)	1.26 (0.85)

the intervention group reported significantly lower levels of SIDM comparing to the control group (intervention: *M* = 1.19, *SD* = 0.53; control: *M* = 2.27, *SD* = 0.85). No other significant differences emerged, since the variable levels in the two groups were not equal in the first time-point.

## Discussion

The results of the present study support the notion that stress mindset can be changed to improve stress responses by influencing the way stress is psychologically experienced and behaviorally approached; thus, the findings support that a change in stress mindset affects individual levels of psychological symptoms and wellbeing (Crum et al., 2013, 2017).

More specifically, answering the first and second research question, the “ReStress Mindset” intervention led participants to a statistically significant increase in SIE mindset that remained 3 months after the completion of the program, and a statistically significant decrease in SID mindset that also remained in the

**TABLE 5** Independent samples *t*-test coefficients for the mean comparison of control and intervention groups as a function of time.

Variables based on Time	<i>t</i>	<i>df</i>	<i>p</i>
SIEM T1	−2.267	24	0.033
SIEM T2	1.563	24	0.131
SIEM T3	0.202	24	0.842
SIDM T1	1.596	24	0.124
SIDM T2	−3.929	22.157	0.001
SIDM T3	−2.246	24	0.034
Positive emotions T1	−0.726	24	0.475
Positive emotions T2	0.827	24	0.417
Positive emotions T3	1.364	20.476	0.187
Negative emotions T1	0.829	24	0.415
Negative emotions T2	−1.126	24	0.271
Negative emotions T3	−0.954	24	0.349
Perceived helplessness against stress T1	0.762	24	0.453
Perceived helplessness against stress T2	−1.340	24	0.193
Perceived helplessness against stress T3	0.100	24	0.921
Self-efficacy against stress T1	−0.859	24	0.399
Self-efficacy against stress T2	0.505	24	0.618
Self-efficacy against stress T3	0.950	24	0.351
Life satisfaction T1	−0.803	24	0.430
Life satisfaction T2	0.315	24	0.756
Life satisfaction T3	1.196	24	0.244
Depression T1	−0.043	24	0.966
Depression T2	−2.079	24	0.048
Depression T3	−2.149	24	0.042

follow up measurement. These results are confirming previous research findings regarding the shift of the university students' stress mindset to a more SIE mindset and a less SID mindset following the completion of the "ReStress Mindset" intervention in the midst of COVID-19 pandemic (Karampas et al., 2022).

Furthermore, the results answered the third research question indicating a statistically significant increase in the levels of life satisfaction that remained significant 3 months after the intervention. Moreover, the participants in the intervention group reported statistically significant higher levels of self-efficacy against stress after the intervention. These findings are in line with previous research indicating that SIE mindset is positively correlated with increased life satisfaction, and positive ways of perceiving stress (self-efficacy when confronting stress) (Crum et al., 2013; Karampas et al., 2020).

The findings also answered the fourth research question, since it was found that the levels of positive emotions increased in the intervention group, while the levels of negative emotions, depression, and perceived helplessness against stress decreased after the intervention and remained unchanged 3 months later, while no statistically significant differences were found in the control group. These findings are consistent with previous research indicating that SIE mindset predicted positive affect,

decreased depressive symptoms, and lower negative feelings (perceived helplessness when confronting stress and negative emotions) (Crum et al., 2013; Kilby and Sherman, 2016; Karampas et al., 2020).

The findings of this study have significant implications for university students during the COVID-19 pandemic, since they are facing severe lifestyle and mental health disruptions, which have profound ramifications for their wellbeing (Cao et al., 2020; Li et al., 2020; Liu et al., 2020; McGinty et al., 2020; Tang et al., 2020; Giuntella et al., 2021). To begin with, shifting to a more SIE mindset and away from a more SID mindset is critical since stress mindset affects both the extent to which stress is psychologically experienced and the way stress is behaviorally approached, two variables that are crucial in determining health and performance outcomes under stress (Crum et al., 2013; Jamieson et al., 2013). Moreover, satisfaction with life, defined as the judgmental component of subjective wellbeing, is thought to be a significant predictor of mental and physical health (Diener et al., 1985; Diener, 2012). Furthermore, self-efficacy is regarded as a powerful motivational, cognitive, and affective determinant of university student behavior, with a significant impact on involvement, effort, persistence, self-regulation, and achievement (Schunk and Pajares, 2010; Honicke and Broadbent, 2016; Ritchie, 2016; Zumbunn et al., 2020). Self-efficacy is an important variable in stress management because of these characteristics (Bandura et al., 2003; Şahin and Çetin, 2017; Lannin et al., 2019), and it is considered as a protective factor against the impact of day-to-day stressors at university (Freire et al., 2018; Schönfeld et al., 2019).

To end up with, the findings of the present study support the notion that a vast repertoire of coping strategies, and flexibility in their selection, may be the best methods to effectively cope with stress and protect university students from decreased wellbeing, during the COVID-19 pandemic (Rogowska et al., 2021a).

## Limitations and recommendations for future research

The results of this study should be viewed in light of its methodological limitations, which should be addressed in future research. First, the study's sample was small, with the vast majority of participants being women. Furthermore, the study's sample only consists of Psychology university students, who are often motivated about the process. In addition, participants volunteered to participate in the survey in response to an online invitation, which may mean that they were actively seeking support in relation to stress. To ensure that the findings are generalizable, future studies should aim to recruit a larger and more diverse sample in terms of gender, age, career, and marital

status. Furthermore, participants only completed self-reported scales, which by definition are highly subjective and can be influenced by external factors. In future surveys, interviews could be used to collect qualitative data. Future designs will also benefit from the addition of follow-up measures beyond the 3 months examined in this study to reinforce the findings and investigate the long-term impact of the changes identified following the program's completion.

In the shadow of COVID-19 pandemic, the findings of this study have important research and clinical implications. To begin with, the material of this program is easily adoptable and implementable by campus-based resources such as health centers, counseling centers, health promotion offices, student affairs staff, and other support services to assist university students in effectively coping with stress and protecting themselves from decreased wellbeing during this period of unprecedented disruption and uncertainty. Moreover, since the material of the "ReStress Mindset" intervention is delivered online, it is easily transferable to other populations and or settings; thus, future research could focus on individuals who are at risk of developing stress-related physical or mental health problems. Finally, considering the effectiveness of the "ReStress Mindset" intervention, mental health practitioners and counseling psychologists may find inspiration for internet-delivered stress mindset interventions during COVID-19 pandemic.

## Conclusion

The "ReStress Mindset" intervention resulted in a statistically significant increase in "stress-is-enhancing" mindset (SIEM), life satisfaction, and self-efficacy against stress, as well as a statistically significant decrease in "stress-is-debilitating" mindset (SIDM), with these effects lasting 3 months after the program's completion. The findings of this study suggest that university students could benefit from the "ReStress Mindset" intervention in order to cultivate and maintain a positive stress mindset and increase their life satisfaction and self-efficacy against stress, even during the COVID-19 pandemic or any other highly stressful period or crisis.

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## Data availability statement

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

## Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

## Author contributions

All authors have contributed equally to the development of the study's idea, data acquisition, data analysis, and writing of the manuscript.

## 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.

The reviewer KK declared a shared affiliation with several of the authors to the handling editor at the time of review.

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# Intuitive eating in Greek-Cypriot adults: Influence of gender and body mass

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**Introduction:** To date, research on eating behaviors has largely taken a pathological approach. Researchers are increasingly taking a positive approach to explore adaptive eating styles. One such style that has recently received much research attention is intuitive eating. Recent work examining intuitive eating and its relationships with body mass and gender has yielded mixed findings. The current study explored the differential effects of gender and body mass on intuitive eating scores in a sample of Greek-Cypriot adults.

**Method:** A total of 1,312 adult participants (women  $n=655$ ;  $M_{age}=34.49$ ) completed the Intuitive Eating Scale-2 and provided demographic information.

**Results:** Our analyses revealed that men reported significantly higher intuitive eating scores than women. Body mass was significantly inversely associated with intuitive eating in both men and women. Additionally, a multivariate analysis of variance (MANOVA) indicated significant interaction effects between gender and body mass on intuitive eating. These interaction effects were explored for each of the four subscales of intuitive eating, identifying differential associations for intuitive eating and BMI between men and women.

**Discussion:** Both gender and body mass are important factors which influence intuitive eating levels in Greek-Cypriot adults. Discussions of how these findings can inform future research, theory and practice are presented.

## KEYWORDS

intuitive eating, wellbeing, eating behavior, adaptive eating, body image

## Introduction

Until recently, eating behavior research has largely taken a pathology-driven approach, focusing on the description, explanation and prediction of restrictive and disordered eating behavior. While such research has proven invaluable in guiding the diagnosis, prevention and treatment of disordered eating, this approach is limited as it focuses solely on the reduction of eating-related distress and does not take into consideration health-enhancing eating behaviors. More recently, scholars are increasingly taking a positive psychological approach, focusing on adaptive eating behaviors (i.e., those that are guided by the body's internal physiological cues rather than external situational and socioemotional cues; [Resch and Tylka, 2019](#)). This work has elucidated the importance of adaptive eating behaviors not only in protecting against the development of disordered eating, but also in enhancing health and wellbeing ([Tylka and Wilcox, 2006](#); [Van Dyke and Drinkwater, 2014](#); [Tylka et al., 2015](#)). An adaptive eating style that has recently gained much research attention has been

operationalized as *intuitive eating* (Tribble and Resch, 1995, 2012). Intuitive eating reflects a set of flexible eating behaviors that are guided by internal physiological hunger and satiety signals. Those who eat intuitively trust and depend on their internal cues to drive their eating behavior, avoid labeling foods as prohibited, eat for physical reasons rather than to cope with their emotions, and make food choices that support or enhance their body's functioning and wellbeing (Tribble and Resch, 2012; Tylka and Kroon Van Diest, 2013; Resch and Tylka, 2019).

Intuitive eating has consistently been found to be closely related to psychosocial factors including facets of negative and positive body image. More specifically, researchers have reported associations for intuitive eating with lower levels of psychological distress, body image dissatisfaction, restrictive/disordered eating, and higher levels of quality of life, body appreciation, self-esteem, self-compassion and wellbeing (e.g., Augustus-Horvath and Tylka, 2011; Tylka et al., 2015; Webb and Hardin, 2016; Homan and Tylka, 2018; Linardon et al., 2020; Anastasiades and Argyrides, 2022; Gödde et al., 2022; Jackson et al., 2022; Teas et al., 2022). These findings have been replicated across a variety of ages, body mass categories, genders and cultural and ethnic groups (for a review, see Bruce and Ricciardelli, 2016; Linardon et al., 2021). Crucially, recent studies using experimental and prospective designs are yielding promising results with intuitive eating being found to lower symptoms of disordered eating and enhance body image, self-esteem, self-compassion, quality of life and psychological wellbeing (Bush et al., 2014; Humphrey et al., 2015; Carbonneau et al., 2017; Wilson et al., 2020; Babbott et al., 2022).

Accumulating empirical work provides strong support for intuitive eating being closely linked to body image. This highlights the importance of exploring the links between intuitive eating and other factors that have been found to play an important role in body image. Two such factors are gender and body mass. A higher body mass is often perceived as unhealthy and undesirable (Pearl et al., 2020). As such, individuals with a higher body mass have reported increased levels of body dissatisfaction and disordered eating (e.g., binge eating and emotional eating), and lower levels of body appreciation (Vartanian and Porter, 2016; Pearl et al., 2020). With regard to gender, there is much evidence suggesting that women face increased societal pressures to conform to unrealistic beauty ideals, with women generally reporting higher levels of body dissatisfaction and lower levels of body appreciation. Even though men also face increasing pressure to conform to ideals (i.e., an athletic, muscular physique; Frederick et al., 2022c), evidence suggests that the pressure and scrutiny women face is both more frequent and more severe (Grogan, 2016; Frederick et al., 2022a). Research exploring the links between intuitive eating and gender and body mass has yielded mixed findings (Linardon et al., 2021). However, a recent meta-analysis found intuitive eating to be (a) consistently negatively related to body mass, and (b) significantly higher in men than in women across a variety of age groups and cultures (Linardon et al., 2021). Despite this, the authors noted limited variability with respect to demographic characteristics (including gender, ethnicity, and culture) across studies examining intuitive eating.

One context in which intuitive eating has rarely been examined is in the Greek-Cypriot population. There are several reasons why intuitive eating is worth examining in this population. For instance, traditionally, the Cypriot diet is a Mediterranean diet, characterized by moderate consumption of seafood, meat and dairy, and high consumption of extra-virgin olive oil, whole grains, olives, legumes, nuts, seeds, and fruits and vegetables (Hidalgo-Mora et al., 2020). There is much research to support the health benefits of consuming a Mediterranean diet including improved life expectancy, quality of life, and lower incidence of chronic disease (Sánchez-Sánchez et al., 2020; Sezaki et al., 2022). In addition, some of the traditional food preparation and consumption practices in the Mediterranean region promote eating as an “embodied” process and may therefore affect intuitive eating behaviors. For instance, eating is largely a socially valued event where food is prepared socially, with care, and the sensory properties of food are acknowledged, discussed and savored (Sutton, 2009).

Surprisingly, however, obesity and overweight rates in Cyprus are among the highest in Europe, and continue to rise, with 33.8% of adults having overweight body mass, and 16.6% of adults having obesity (Eurostat, 2022). In addition, Cyprus has been found to have high levels of weight-related anxiety in relation to other European countries (Argyrides et al., 2019). This might be explained by the Westernization of eating habits with increased consumption of fast-foods (i.e., foods that are high in saturated fats and refined carbohydrates), facilitated by increased accessibility and ease of availability (e.g., using food delivery applications; Argyrides and Kkeli, 2015). Further, there remains a significant lack of public health initiatives and interventions aimed at the promotion of healthy eating behaviors (see Ministry of Health, 2008). This signifies the importance of examining intuitive eating in this population.

## The current study

There is strong support for the clinical utility of intuitive eating in the realm of intervention efforts aimed at the prevention and treatment of disordered eating and obesity. The development of a detailed understanding of how intuitive eating is related to physical and psychosocial factors is essential for the design, implementation, and efficacy of such efforts. As such, the current study aimed to explore differences in intuitive eating scores based on gender and body mass in the Greek-Cypriot population. Based on previous findings (Linardon et al., 2021), we expected that men would report significantly higher intuitive eating scores than women, and that body mass would be significantly inversely associated with intuitive eating in both men and women. In addition, we explored whether the differences in intuitive eating scores across body mass categories differed for men and women (i.e., if there is an interaction effect between body mass and gender on intuitive eating scores).

## Materials and methods

### Measures

#### Demographics

A demographics questionnaire was completed by all participants in which they were asked to report their age, gender, ethnicity, height and weight. Body Mass Index (BMI) was calculated from height and weight as ( $\text{kg}/\text{m}^2$ ).

#### Intuitive eating

To measure intuitive eating, participants completed Intuitive Eating Scale-2 (IES-2; Tylka and Kroon Van Diest, 2013; Greek translation: Giannakou et al., 2022). The 23-item IES-2 comprises 4 subscales which assess the four facets of intuitive eating: Unconditional Permission to Eat (i.e., an individual's willingness to eat when hungry and a refusal to label certain foods as forbidden; 6 items), Eating for Physical rather than Emotional Reasons (i.e., eating when one is physically hungry rather than to cope with emotional distress; 8 items), Reliance on Hunger and Satiety Cues (i.e., an individual's trust in their internal hunger and satiety cues and reliance on these cues to guide eating behaviors; 6 items), and Body-Food Choice Congruence (i.e., a tendency to make food choices that honor one's health and body functioning; 3 items). All items were rated on a 5-point scale ranging from 1 = *strongly disagree*, to 5 = *strongly agree*. An overall subscale score was computed as the mean of all items, with higher scores reflecting greater intuitive eating. Adequate internal consistency and construct validity have been reported for scores on the Greek translation of the IES-2 (Giannakou et al., 2022). For the current sample, the scale was found to be internally consistent ( $\alpha=0.87$  for the Total Scale,  $\alpha=0.72$  for Unconditional Permission to Eat,  $\alpha=0.90$  for Eating for Physical Rather than Emotional Reasons,  $\alpha=0.86$  for Reliance on Hunger and Satiety Cues, and  $\alpha=0.81$  for Body-Food Choice Congruence).

### Participants and procedure

The study was carried out in accordance with the principles of the Declaration of Helsinki, and ethical approval was obtained from the Cyprus Bioethics Committee. Data collection took place between May 2022 and July 2022. Participants were recruited *via* advertisements placed on social media websites supplemented using a snowball sampling method. The study was advertised as a study about "eating styles and behaviors." Those interested in participating were directed to an online questionnaire, hosted by Qualtrics<sup>1</sup> and completed a pre-screener to determine eligibility for the study. Participants were eligible if (a) they were over 18 years of age (b) their preferred language was Greek, and (c) they were a citizen of Cyprus. Upon meeting the inclusion criteria,

participants were provided with further information regarding the study requirements, including that participation was anonymous, voluntary and without remuneration. Provided digital informed consent before completing the online questionnaire with the measures listed above in a pre-randomized order. Attention checks were placed at two points in the questionnaire.

### Data analysis

All data analyses were conducted using IBM SPSS Statistics Version 28. Missing data was managed using listwise deletion. Data were screened to ensure data quality as recommended when using online samples (Burnette et al., 2022; Moeck et al., 2022). This included checking (a) Internet Protocol addresses to identify whether any participant answered the questionnaire more than once (b) responses for age height and weight to identify nonsensical/improbable values and (c) failed responses to the attention checks. The screening identified six participants who entered nonsensical age/height values, and 10 participants who failed the attention checks, who were subsequently removed from the initial sample of  $N=1,328$ , reducing the sample to  $N=1,312$ .

Following this, data were assessed for normality, linearity, and homoscedasticity; all assumptions were met. Participant characteristics and intergroup differences based on gender and BMI category were assessed *via* examination of analysis of variance (ANOVA) and Chi-squared testing. The intercorrelations of the study variables were examined using a Pearson's product moment correlation analysis, with  $r$  values of  $\leq 0.10$  being considered to have a small effect,  $\sim 0.30$ , a moderate effect, and  $\sim 0.50$ , a strong effect (based on Cohen, 1992). To examine subgroup differences in intuitive eating scores, a two-way multivariate analysis of variance (MANOVA; Pillai's trace correction) was conducted with gender and BMI category entered as independent variables and intuitive eating as the dependent variable. Effect sizes were examined, with partial eta-squared values of  $\leq 0.01$  being considered to a small effect,  $\sim 0.06$  a moderate effect, and  $\sim 0.14$  a strong effect (based on Cohen, 1988). For all analyses,  $p < 0.05$  was considered significant.

## Results

### Participant characteristics

The participants of the study were 1,312 Greek Cypriot citizens and residents (women  $n=655$ , men  $n=657$ ), ranging in age from 18 to 70 years ( $M=34.49$ ,  $SD=10.90$ ) and in self-reported body mass index (BMI) from 14.53 to 53.22  $\text{kg}/\text{m}^2$  ( $M=25.37$ ,  $SD=5.24$ ). As can be seen in Table 1, on average, the men in this sample had significantly higher self-reported BMI than the women [ $F(1, 1,311)=120.44$ ,  $p<0.001$ ], and were significantly older than the women [ $F(1, 1,311)=21.64$ ,  $p<0.001$ ]. In addition, the distribution of participants across BMI groups differed

<sup>1</sup> [www.qualtrics.com](http://www.qualtrics.com)

TABLE 1 Sample characteristics.

	Total sample (N=1,312)	Women (n=657)	Men (n=655)	p
BMI (kg/m <sup>2</sup> )	25.37 ± 5.24	23.85 ± 5.09	26.89 ± 4.93	<0.001
<b>BMI groups</b>				
Underweight	n = 61 (4.6%)	n = 48 (7.3%)	n = 13 (2.0%)	*<0.001
Normal weight	n = 660 (50.3%)	n = 416 (63.3%)	n = 244 (37.3%)	
Overweight	n = 389 (29.6%)	n = 117 (17.8%)	n = 272 (41.5%)	
Obese	n = 202 (15.4%)	n = 76 (11.6%)	n = 126 (19.2%)	
Age (years)	34.5 ± 10.9	33.1 ± 10.6	35.9 ± 11.0	<0.001
<b>Age in BMI groups (years)</b>				
Underweight	27.5 ± 9.1	26.7 ± 7.5	30.4 ± 13.3	0.187
Normal weight	32.8 ± 10.5	32.2 ± 10.0	33.7 ± 11.3	0.074
Overweight	37.1 ± 10.6	37.1 ± 11.9	37.1 ± 10.1	0.993
Obese	37.3 ± 11.2	36.0 ± 11.2	38.1 ± 11.3	0.193

Data are M ± SD or number of participants and percentage. *p*-values are derived from a one-way ANOVA, or \* $\chi^2$ -test. *p*-values in bold denote significance (based on alpha = 0.05).

significantly between men and women,  $\chi^2(3, 1,312) = 139.04$ ,  $p < 0.001$ , with women having more participants in the lower BMI groups (i.e., underweight and normal weight), and men having more participants in the higher BMI groups (i.e., overweight and obese). No significant differences were observed for age differences between each of the BMI groups for men and women.

## Inter-correlations

As can be seen in Table 2, for women, the Pearson's product moment correlation analysis indicated significant moderate inverse associations between BMI and intuitive eating ( $r = -0.35$ ,  $p < 0.001$ ), as well as all four of the subscales of intuitive eating. Similar results were observed for men, with moderate inverse associations for BMI and intuitive eating ( $r = -0.32$ ,  $p < 0.001$ ), as well as all the subscales of intuitive eating besides unconditional permission to eat, which did not reach significance.

## Comparison by gender and BMI category

The two-way MANOVA revealed a statistically significant overall interaction effect for gender and BMI category on the dependent variables [ $F(7, 1,304) = 7.19$ ,  $p < 0.001$ ]. The interaction effect was also significant for each of the dependent variables (see Table 3). Concerning the IES total score, men had a trend of higher scores in all BMI categories except in the underweight category (see Figure 1). Concerning the Unconditional Permission to Eat scale, males had similar scores in all weight categories except in the underweight category where scores were higher. Additionally, females were decreasing in scores and plateaued at

TABLE 2 Intercorrelations for study variables.

Variable	1	2	3	4	5	6
1. Body mass index	—	<b>-0.35**</b>	<b>-0.12**</b>	<b>-0.35**</b>	<b>-0.26**</b>	<b>-0.15**</b>
2. Intuitive eating	0.32**	—	<b>0.48**</b>	<b>0.88**</b>	<b>0.82**</b>	<b>0.36**</b>
3. UPE	-0.01	0.40**	—	<b>0.20**</b>	<b>0.28**</b>	<b>-0.26**</b>
4. EPRTE	-0.31**	0.82**	0.03	—	<b>0.58**</b>	<b>0.29**</b>
5. ROHSC	-0.21**	0.72**	0.22**	0.33**	—	<b>0.30**</b>
6. BFCC	-0.17**	0.33**	-0.36**	0.29**	0.19**	—

N = 1,312. UPE, unconditional permission to eat; EPRTE, eating for physical rather than emotional reasons; ROHSC, reliance on hunger and satiety cues; BFCC, body-food choice congruence. Values in bold represent women. \* $p < 0.05$ .

\*\* $p < 0.001$ .

the higher weight categories, implying that males are less affected overall by this variable than females, regardless of weight category (See Figure 2). Concerning the Eating for Physical Rather than Emotional Reasons scale, both genders had the same pattern of decreasing levels as body weight increased. However, this is not the case in the underweight category where females have higher levels than males (see Figure 3). Concerning Hunger Satiety Cues, the same pattern was present with males have a steady drop in levels of hunger satiety cues as their weight increased whereas in females there are similar scores in the underweight and normal weight categories and then decrease in the higher weight categories (see Figure 4). Lastly, concerning the Body-Food Choice Congruence scale, both genders have the same overall pattern of lower levels in the underweight category, increasing in the normal weight category and dropping again in the overweight and obese categories. However, this pattern was evident in men who had lower levels than women in the underweight and obese categories (see Figure 5).

Concerning the main effects of gender, individual ANOVAs indicated a significant difference between males and females on the IES total Score [ $F(1,1,304) = 8.496$ ,  $p = 0.004$ ,  $\eta^2 = 0.006$ ] and the Eating for Physical Rather than Emotional Reasons Subscale [ $F(1,1,304) = 15.008$ ,  $p < 0.001$ ,  $\eta^2 = 0.011$ ]. In both cases, males scored significantly higher than females. No other gender differences were detected.

Concerning the main effects of BMI category, individual ANOVAs indicated a significant difference between the four BMI categories on all five scales (Table 4). Specifically, there was a significant main effect on the IES total Score [ $F(3,1,304) = 41.75$ ,  $p < 0.001$ ,  $\eta^2 = 0.088$ ], the Unconditional Permission to Eat [ $F(3,1,304) = 4.67$ ,  $p = 0.003$ ,  $\eta^2 = 0.011$ ], the Eating for Physical Rather than Emotional Reasons [ $F(3,1,304) = 38.68$ ,  $p < 0.001$ ,  $\eta^2 = 0.082$ ], the Hunger Satiety Cues [ $F(3,1,304) = 20.65$ ,  $p < 0.001$ ,  $\eta^2 = 0.045$ ] and the Body-Food Choice Congruence [ $F(3,1,304) = 17.16$ ,  $p < 0.001$ ,  $\eta^2 = 0.038$ ]. In all four BMI categories, most scale scores significantly differed between them ( $p$ , of 0.03 to 0.000) with mean scores significantly decreasing as each BMI category increased, meaning that levels of total intuitive

TABLE 3 Means and standard deviations for intuitive eating scores among BMI subgroups.

	Underweight		Normal weight		Overweight		Obese	
	Women ( <i>n</i> = 48)	Men ( <i>n</i> = 13)	Women ( <i>n</i> = 416)	Men ( <i>n</i> = 244)	Women ( <i>n</i> = 117)	Men ( <i>n</i> = 272)	Women ( <i>n</i> = 76)	Men ( <i>n</i> = 126)
IE	3.72 (0.50)	3.68 (0.37)	3.45 (0.56)	3.59 (0.47)	3.18 (0.57)	3.46 (0.48)	3.00 (0.57)	3.18 (0.43)
UPE	3.67 (0.85)	3.80 (0.89)	3.39 (0.71)	3.36 (0.74)	3.26 (0.64)	3.37 (0.64)	3.27 (0.65)	3.38 (0.65)
EP RTE	3.91 (0.75)	3.67 (0.55)	3.29 (0.90)	3.75 (0.79)	2.91 (0.96)	3.53 (0.85)	2.60 (1.00)	3.00 (0.84)
ROHSC	3.62 (0.75)	3.80 (0.83)	3.59 (0.74)	3.54 (0.78)	3.29 (0.78)	3.39 (0.67)	3.09 (0.83)	3.18 (0.67)
BFCC	3.52 (0.81)	3.21 (0.96)	3.72 (0.74)	3.74 (0.76)	3.54 (0.74)	3.56 (0.75)	3.36 (0.75)	3.26 (0.71)

*N* = 1,312. IE, intuitive eating; UPE, unconditional permission to eat; EP RTE, eating for physical rather than emotional reasons; ROHSC, reliance on hunger and satiety cues; BFCC, body-food choice congruence.

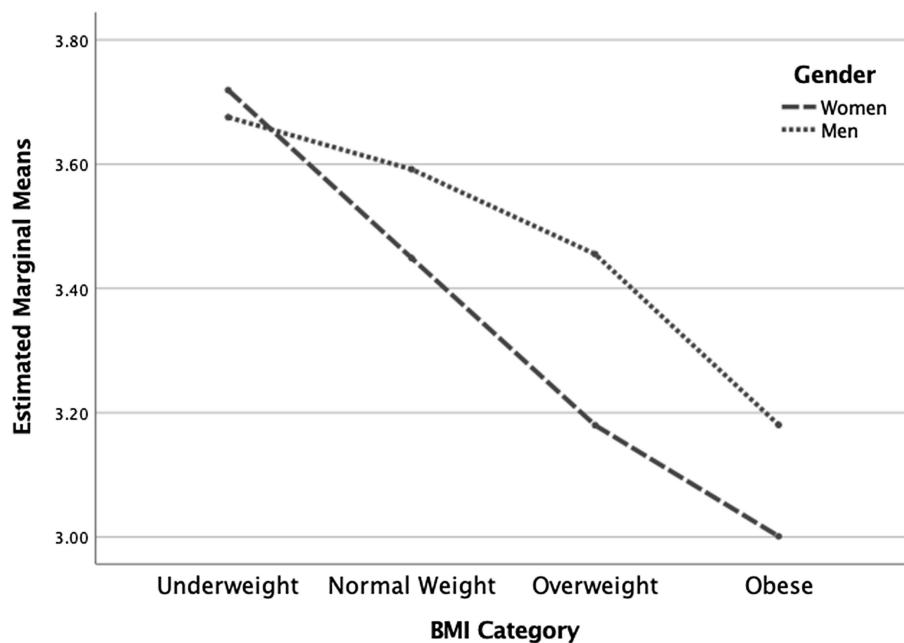


FIGURE 1

Interaction effect for intuitive eating total score. *N* = 1,312 (*n* = 657 for women, and *n* = 655 for men), *p* < 0.001.

eating and its subscales were decreasing as body weight of participants increased. The only exceptions were found in: (a) the subscale of Unconditional Permission to Eat where individuals in the normal weight category did not significantly differ compared to the overweight and obese categories implying similar results between them (b) the Hunger Satiety Cues where individuals in the Underweight and Normal Weight categories had similar results and (c) the Body-Food Choice Congruence where individuals in the underweight category had similar results to the overweight and obese categories.

## Discussion

The current study aimed to explore differences in intuitive eating scores based on gender and BMI in Greek-Cypriot adults. Overall, our findings suggest that both gender and body mass are

important factors which influence intuitive eating levels in Greek-Cypriot adults. More specifically, we found that men generally tend to have higher levels of intuitive eating than women, and that body mass is inversely associated with intuitive eating for both genders. In addition, significant interaction effects between body mass and gender were observed.

The finding that men tend to eat more intuitively than women was expected, and is in line with previous studies with similar findings (Linardon et al., 2021). This finding may be explained in the context of the societal pressures that men and women face. The pressures placed on women to conform to beauty ideals and the degree to which their bodies are objectified and scrutinized tend to be greater than for men, with women experiencing greater body-surveillance, thin-ideal internalization, appearance-related media pressures, and family pressures (Grogan, 2016; Frederick et al., 2022b). In addition, recent work has shown women to be more likely to follow a



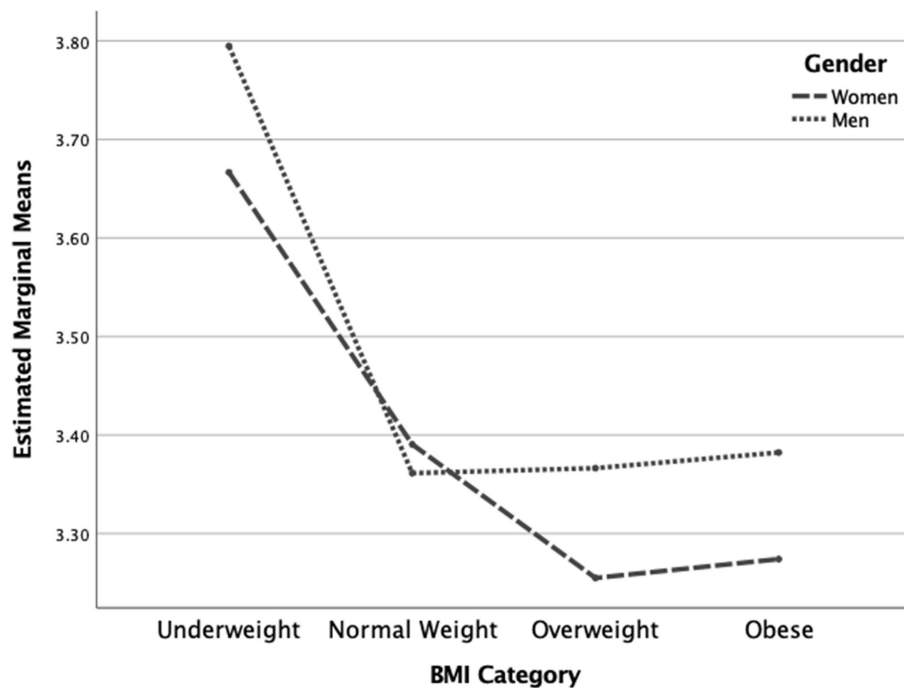


FIGURE 2

Interaction effect for unconditional permission to eat.  $N=1,312$  ( $n=657$  for women, and  $n=655$  for men),  $p=0.01$ .

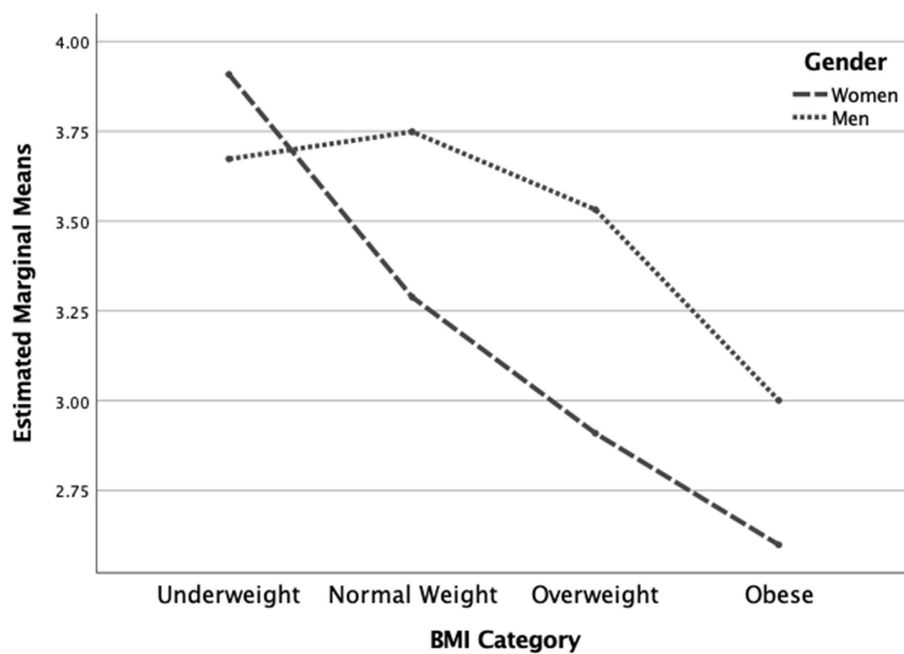


FIGURE 3

Interaction effect for eating for physical rather than emotional reasons.  $N=1,312$  ( $n=657$  for women, and  $n=655$  for men),  $p<0.001$ .

weight loss diet or to attempt to control their appearance through crash diets/fasting (Frederick et al., 2022a). Consequently, women may be more likely to impose restrictions on their food

consumption and be less likely to rely on their internal physiological hunger and satiety cues to guide their eating behavior.

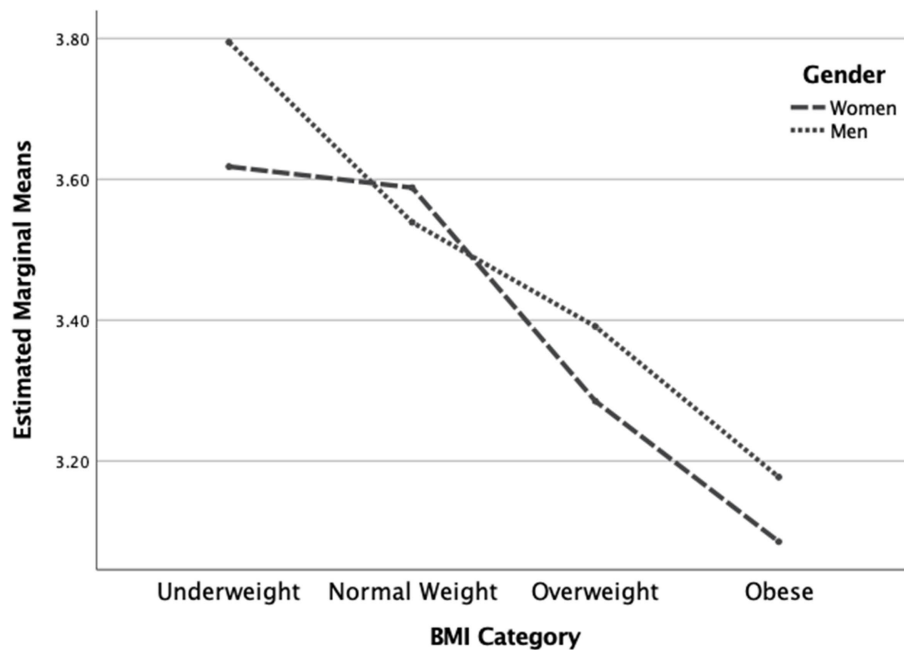


FIGURE 4  
Interaction effect for reliance on hunger and satiety cues.  $N=1,312$  ( $n=657$  for women, and  $n=655$  for men),  $p<0.001$ .

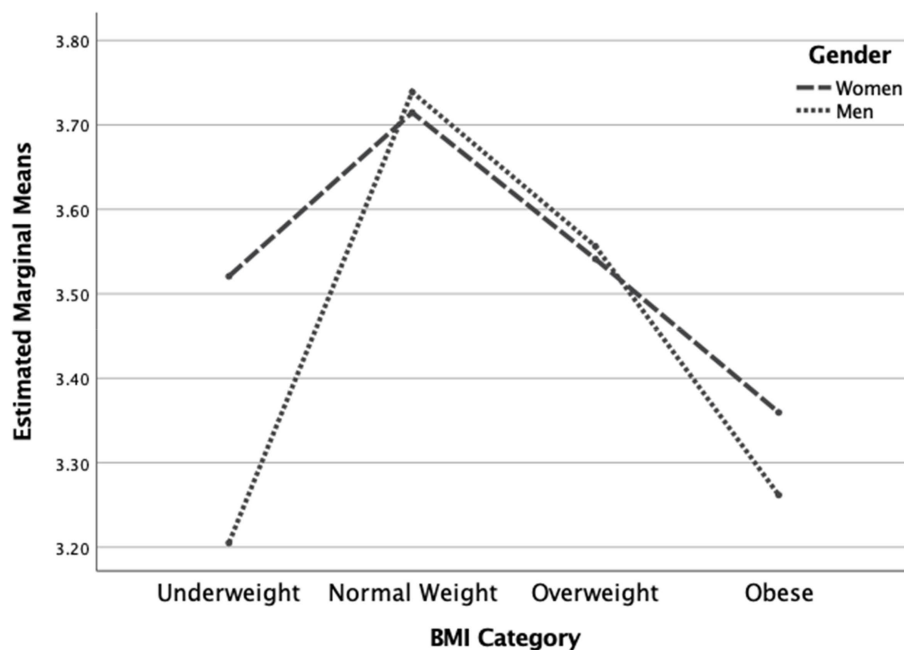


FIGURE 5  
Interaction effect for body food choice congruence.  $N=1,312$  ( $n=657$  for women, and  $n=655$  for men),  $p<0.001$ .

It is worth noting that our results found intuitive eating to be inversely associated with BMI, which was also expected in light of previous work (Linardon et al., 2021). This finding might also be explained from a sociocultural perspective, and common

attitudes held by many societies which equate having a lower BMI to enhanced health and wellbeing, and a higher BMI with unattractiveness and laziness, physically “unfit” or “inactive” (Puhl and Heuer, 2009). Such attitudes, which come to be internalized

**TABLE 4** Gender by BMI category interaction statistics on all variables of interest.

	<i>Mean square</i>	<i>F</i>	<i>P</i>
IE	5.75	21.92	<0.001
UPE	1.29	2.66	0.010
EP RTE	20.97	27.71	<0.001
ROHSC	5.19	9.54	<0.001
BFCC	4.60	8.19	<0.001

*N* = 1,312. IE, intuitive eating; UPE, unconditional permission to eat; EP RTE, eating for physical rather than emotional reasons; ROHSC, reliance on hunger and satiety cues; BFCC, body-food choice congruence.

by individuals with a higher BMI, are related to body functionality and functionality appreciation (i.e., acknowledging and appreciating the functions the body performs; [Alleva et al., 2017](#); [Alleva and Tylka, 2021](#)). Indeed, individuals with higher BMI have been found to have higher levels of functionality appreciation ([Soulliard et al., 2019](#); [Soulliard and Vander Wal, 2019](#); [Todd et al., 2019](#)). Therefore, it may be that individuals with a higher BMI tend to be less inclined to trust their body's physiological hunger and satiety cues, thus prioritizing these in guiding their eating behavior over external emotional and situational cues.

We also found significant interaction effects between gender and body mass on intuitive eating. More specifically, the strongest interaction effects were observed for IES total scores and eating for emotional rather than physical reasons, with men in all BMI categories except in the underweight category scoring higher on both. Based on this finding, it seems that having a higher BMI is more likely to negatively affect intuitive eating in women than in men. Examining these interaction effects for the individual intuitive eating subscales provided further insights. First, the results showed that unconditional permission to eat in men is less likely to be affected by BMI than it is in women. Put differently, as body mass increases, women seem to be much more likely to pose restrictions on their diet than men. In addition, women who are in the underweight category seem to be significantly more likely to eat for physical reasons rather than emotional reasons, than men who are in the underweight category. When it comes to relying on hunger and satiety cues to guide eating behavior, women in the normal weight category tend to score higher than men, who have higher scores for all other categories (i.e., underweight, overweight, and obese). Finally, being underweight or being obese seems to be associated with lower levels of body food choice congruence in men and higher in women. Overall, these findings identify specific facets of intuitive eating which may be important to explore in targeted intervention plans aimed at promoting intuitive eating in Greek-Cypriot adults.

## Strengths and limitations

To the best of our knowledge, the current study was the first to compare levels of intuitive eating based on gender and body mass in the Greek Cypriot population. However, the findings

should be considered in light of several limitations. Firstly, the correlational nature of the study design is somewhat limiting, as it does not allow for causal conclusions to be drawn. Secondly, the assessment of intuitive eating relies solely on self-report recall, which assumes participants' accurate portrayal of their level of functioning and that their perception of their psychological functioning and eating behaviors are an accurate reflection of reality. For example, some studies found no relationship between self-report measures of dietary restraint behaviors and actual caloric intake over several weeks ([Stice et al., 2004, 2010](#)). This suggests that self-report dietary restraint scales often measure intentions or desires rather than actual behaviors. In addition, it cannot be ruled out that participants' responses may have been affected by social and personal desirability, with participants giving responses according to how they want to feel or eat rather than how they actually do. Future studies would therefore do well to control for social desirability when examining intuitive eating using correlational designs.

The present work was also limited by the opportunistic sampling method and use of snowball sampling. For instance, the current study did not assess other variables which may influence eating styles (e.g., health-conditions, psychological distress, and type of diet). These factors may have had a confounding effect on the results, and future studies would do well to assess such additional variables.

## Data availability statement

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

## Author contributions

MA and EA: conceptualization, investigation, data curation, methodology, and writing, reviewing and editing. All authors contributed to the article and approved the submitted version.

## 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.

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# Emotion regulation, academic buoyancy, and academic adjustment of university students within a self-determination theory framework: A systematic review

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**Introduction:** The transition from secondary to tertiary education seems to be a stressful period for many students since they need to adjust to the new academic environment.

**Method:** This article is a systematic review of 4,285 articles. The aim of this review was to investigate the factors in the university environment associated with emotion regulation, academic buoyancy, and academic adjustment of tertiary students within a self-determination theory framework in combination with the nascent third wave of Positive Psychology. Forty-one articles met the inclusion criteria, all of which were rated as either good or moderate quality.

**Results:** The bulk of the studies included in the systematic review reported individual factors, i.e., self-efficacy, intrinsic motivation, academic factors, i.e., intention to drop out, learning climate, and family and social factors i.e., faculty, peer, and parental autonomy support.

**Discussion:** In accordance with the third wave of Positive Psychology that focuses on how interpersonal and ecological factors create nurturing environments and positive institutions, the systematic review highlighted the factors that institutes should consider in order to help students adjust better to the academic environment.

## KEYWORDS

emotion regulation, academic buoyancy, self-determination theory, students, systematic review

## Introduction

### Self-determination theory and positive psychology

#### Self-determination theory

Self-determination theory (SDT); (Ryan and Deci, 2000) is a macrotheory of human motivation, which addresses basic issues such as personality development, self-regulation, universal psychological needs, life goals and aspirations, the relationship of culture to motivation, and the impact of social environments

on motivation, affect, behavior and wellbeing. SDT began by differentiating types of motivation and the initial idea was that the type or quality of a person's motivation would be more important than the total amount of motivation for predicting many important outcomes, such as psychological health and wellbeing (Elliot and Thrash, 2001; Deci and Ryan, 2008). The above hypothesis has been examined also in university students and was found that autonomous motivation positively predicted academic achievement, whereas controlled motivation predicted dropout intentions (Jeno et al., 2018; Corpus et al., 2020).

SDT examines a wide range of phenomena across gender, culture, age, and socioeconomic status and has 6 mini theories: cognitive evaluation theory, organismic integration theory, causality orientations theory, basic psychological needs theory, goal content theory, and relationships motivation theory (Deci and Ryan, 2015). Need satisfaction has been associated with wellbeing and healthy psychological development, whereas the frustration or even thwarting of basic psychological needs has been associated not only with ill-being but also with the pursuit of extrinsic life goals, i.e., materialism and fame (Kanat-Maymon et al., 2015; Vansteenkiste et al., 2020). According to large prospective research, relative intrinsic goals at baseline, i.e., meaningful relationships, community contributions, and personal growth, predicted experiencing greater need satisfaction and improved wellbeing over time (Hope et al., 2019). Moreover, the absence of need satisfaction does not necessarily imply the presence of need frustration, whereas the presence of need frustration denotes the absence of need satisfaction (Vansteenkiste and Ryan, 2013). Self-determination theory is an organismic theory, as it assumes that humans are active, working to integrate new material into their own sense of self; however, it also suggests that the environment can either provide nutrients for this integrative process or can disrupt and impair the process (Deci and Ryan, 2015).

### Positive psychology: Third wave

Given the fact that mainstream psychology has focused primarily on disorder and dysfunction, the first wave of Positive Psychology (emerging around 1998/2000–2010) concentrated on the positive, i.e., positive phenomena including emotions, behaviors, cognitions, and organizations (Seligman and Csikszentmihalyi, 2000). The second wave (emerging around 2010–2015), although focused on flourishing and wellbeing, started focusing also on the dialectical nature of wellbeing and appreciating the ambivalent nature of the good life (Lomas and Ivtzan, 2015). The two waves are not mutually exclusive, but rather inform and complement each other (Lomas et al., 2021).

The third wave is a general movement of shifting from the individual toward greater complexity (Lomas et al., 2021; Wissing, 2022) and focuses on groups, organizations, and broader systems. This wave explores the multiple socio-cultural factors and processes that impact peoples' wellbeing by looking

how various interpersonal and ecological factors can be better understood to create nurturing environments and positive institutions. It also puts greater emphasis on the empirical study of the above (Lomas et al., 2021).

In line with the third wave in Positive Psychology, SDT has already highlighted the learning environment is an important factor for the individual to flourish. An autonomy-supportive environment (i.e., perspective talking, demonstrating relevance, and providing opportunities for choice and self-regulation) has been proposed as a key component to promoting a positive learning environment where students can thrive (Deci and Ryan, 2015). Research on university students has shown that supporting learners' autonomy, providing choices and options, determining and acknowledging student perspectives, and trying to understand their viewpoints significantly predicted wellbeing and basic psychological need satisfaction and frustration (Levesque et al., 2004; Basson and Rothmann, 2018; Neufeld, 2020).

### Emotion regulation

Emotions arise when something occurs and our body responds to this event behaviorally, experientially, or physiologically (Gross, 2002). According to Gross, a definition of emotion regulation defines the process by which we influence which emotions we experience, when we experience them, and how we experience and express them (Gross, 1998). It is more than decreasing negative emotions, as emotion regulation may also occur without conscious awareness and is neither inherently good nor bad (Gross, 2002). Emotion regulation changes across the life span, i.e., in infancy extrinsic emotion regulation is initially dominant, since caregivers play a major role, whereas in early to middle childhood, when developmental changes occur, additional emotion regulation capabilities are enabled. In addition, adolescence represents a developmental period with further changes as due to the maturation of prefrontal regions, new cognitive forms of emotion regulation are enabled (Gross, 2013). Gross (1998) proposed an information-processing model of emotion regulation that treats each step in the emotion-generative process as a potential target for regulation. At a later stage, Gross (2015) changed the information-processing model to an extended process model. This model pictured a process that unfolds over time in three consecutive stages: (i) identification of an emotional goal, (ii) selection of a strategy to regulate emotion (i.e., attentional deployment, cognitive reappraisal, etc.), and (iii) implementation of a particular tactic to regulate emotions (i.e., problem solving, visual distraction, meaning-making).

Within the SDT frame, emotions should be addressed as important sources of information, the awareness of which allows for greater autonomous regulation and enables the individual to unfold its potential and enhance its capacities for choice

and authenticity (Vansteenkiste and Sheldon, 2006). The term *integrative emotion regulation* involves not only a non-critical, receptive attention to one's emotional experience but also an interested and volitional exploration of the above experience (Roth et al., 2019). Three forms of emotion regulation are proposed as follows: (a) integrative regulation that supports autonomy, (b) controlling regulation to direct reinterpret or minimize emotional inputs, and (c) dysregulation which emotions are poorly managed (Roth et al., 2009) and tested in university students. Relevant research has shown that integrative emotion regulation positively predicts wellbeing and mediates psychological needs satisfaction (Benita et al., 2019).

Combining Gross's model with the self-determination frame, a model was developed recently in which the role of autonomy experiences is considered within each stage (Benita et al., 2019). In the proposed model in the identification stage, the concept of autonomous vs. controlled reasons is included in order to pursue emotional goals. In the selection stage, the concept that has been proposed is that of emotion regulation styles, which are broader concepts, compared to emotion regulation strategies. As far as the implementation stage is concerned, apart from the particular tactics, the quality of implementation has been introduced (defensiveness vs. non-defensiveness and flexibility vs. rigidity) (Benita, 2020).

Studies conducted on university students examining the behavioral, emotional, and cognitive consequences of integrative emotion regulation and suppression of emotion, in relation to a fear-eliciting film have concluded that integrative regulation is associated with less defensive written expression (Roth et al., 2014). Furthermore, in relevant research, the relationship between integrative and suppressive emotion regulation and wellbeing was tested in three countries (Israel, Peru, and Brazil) and was found that integrative emotion regulation positively predicted wellbeing and was mediated by psychological need satisfaction in all three countries (Benita et al., 2019).

## Academic buoyancy

In order to differentiate academic buoyancy from academic resilience, Martin and Marsh (2008) reported that resilience has been characterized in terms of "acute" and "chronic" adversities that are seen as "major assaults" on the developmental process, whereas academic buoyancy reflects the ups and downs of everyday life as distinct from acute and chronic diversities. Academic buoyancy is associated with a more typical experience of poor performance, whereas academic resilience may be relevant to chronic underachievement (Martin and Marsh, 2008; Martin, 2013). Also, academic buoyancy is a distinct construct from that of adaptive coping, as it has been suggested that buoyancy is unrelated to coping; for example, an anxiety test explained a significant proportion of variance over and above that explained by coping (Putwain et al., 2012).

A number of motivational factors have been identified as being significantly associated with students' academic buoyancy: confidence (assessed *via* high self-efficacy), coordination (high planning), commitment (high persistence), composure (low anxiety), and control (low uncertain control). The above five motivational factors have been found to be significant predictors of academic buoyancy when subjected to longitudinal examination and also to partially mediate the effects of prior academic buoyancy on subsequent academic buoyancy (Martin et al., 2010).

## Aim and research questions

The aim of this review was to investigate the factors associated with emotion regulation, academic buoyancy, and academic adjustment of university students within a self-determination theory framework. In combination with the third wave of Positive Psychology, another aim was to examine the factors within the university environment that contributes to students' sense of academic buoyancy, emotion regulation, and academic adjustment.

The review questions are as follows:

- What factors are associated with HE students' emotion regulation according to SDT?
- What factors are associated with HE students' academic buoyancy according to SDT?
- What factors are associated with HE students' academic adjustment according to SDT?
- What factors are associated with basic need satisfaction and frustration in HE students according to SDT?

## Methods

### Search strategy

An advanced search was conducted by two independent reviewers. The search strategy was applied to Scopus, Web of Science, and PubMed. Gray literature was identified with Google Scholar. Databases were searched from March to May 2022.

The following term search was used: (a) Review Question 1: [(emotion regulation\* OR emotional control) AND (college students OR university students OR higher education students) AND (self-determination theory OR self determination theory)], (b) Review Question 2: [(college students OR university students OR higher education students) AND (academic buoyancy) AND (self-determination theory OR self determination theory)], (c) Review Question 3: [(college students OR university students OR higher education students) AND (academic adaptation OR academic adjustment) AND (self-determination theory OR self determination theory)], and

(d) Review Question 4: [(college students OR university students OR higher education students) AND (basic psychological needs OR need frustration OR need satisfaction) AND (self-determination theory OR self determination theory)]. The search areas were the title, abstract, topic, and identifiers. In total, 4,285 articles were found and screened.

## Inclusion/exclusion criteria

An overview of our literature search and selection – based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P), (Moher et al., 2010) – is presented in Figures 1–4. The PRISMA-P is a guideline that consists of a 17-item checklist, intended to guide the development of protocols of systematic reviews and meta-analyses in order to answer a specific research question. It helps authors to describe the rationale and intended purpose of the review and the planned methodological and analytical approach. As it is suggested by Shamseer et al. (2015), a systematic review protocol is important as it allows systematic reviewers to plan and foresee possible problems; clearly document their steps before they begin the review process, enabling other researchers to compare and replicate the review methods if needed; prevents arbitrary inclusion and extraction criteria. Authors are generally encouraged to use PRISMA-P because of the lack of existing protocol guidance overall.

Regarding our study, by entering the search terms for the four review questions, we resulted in 1,249, 101,931, and 2,004 hits, respectively. To select appropriate studies, a number of inclusion and exclusion criteria were used. Studies were included if (a) participants were higher education students, (b) they employed quantitative, qualitative, or mixed-methods research methodology, (c) they contained a measure of emotion regulation, academic buoyancy, academic adjustment, or basic psychological needs as a dependent variable, (d) they were situated within a self-determination theoretical framework, and (e) they were published in an English-language peer-reviewed journal. Articles were excluded if: (a) they did not include higher education students or included students conducting a Masters or PhD degree, (b) included students having a mental illness diagnosis, (c) they were reported on a basis of other theoretical paradigms, or (d) they reported conference proceedings or did not present any empirical data.

## Data extraction

For each study/report, details concerning country and region, study aims, design, outcome of interest, sampling and recruitment, data collection methods, population characteristics, predictors and outcomes associated with students' sense of academic buoyancy, emotion regulation,

academic adjustment and basic psychological needs satisfaction and frustration, ecological (institution's environment) risk and protective factors and top-line findings were extracted.

## Risk of bias

Quality assessment was performed following the Mixed-Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018). This tool was developed for evaluating the methodological quality of empirical studies qualitative/quantitative/mixed methods. Two reviewers independently assigned the quality rating (range: 1–10). Studies reporting a score  $\geq 5$  were retrieved. Any discrepancy/disagreement was solved by discussions between the two reviewers.

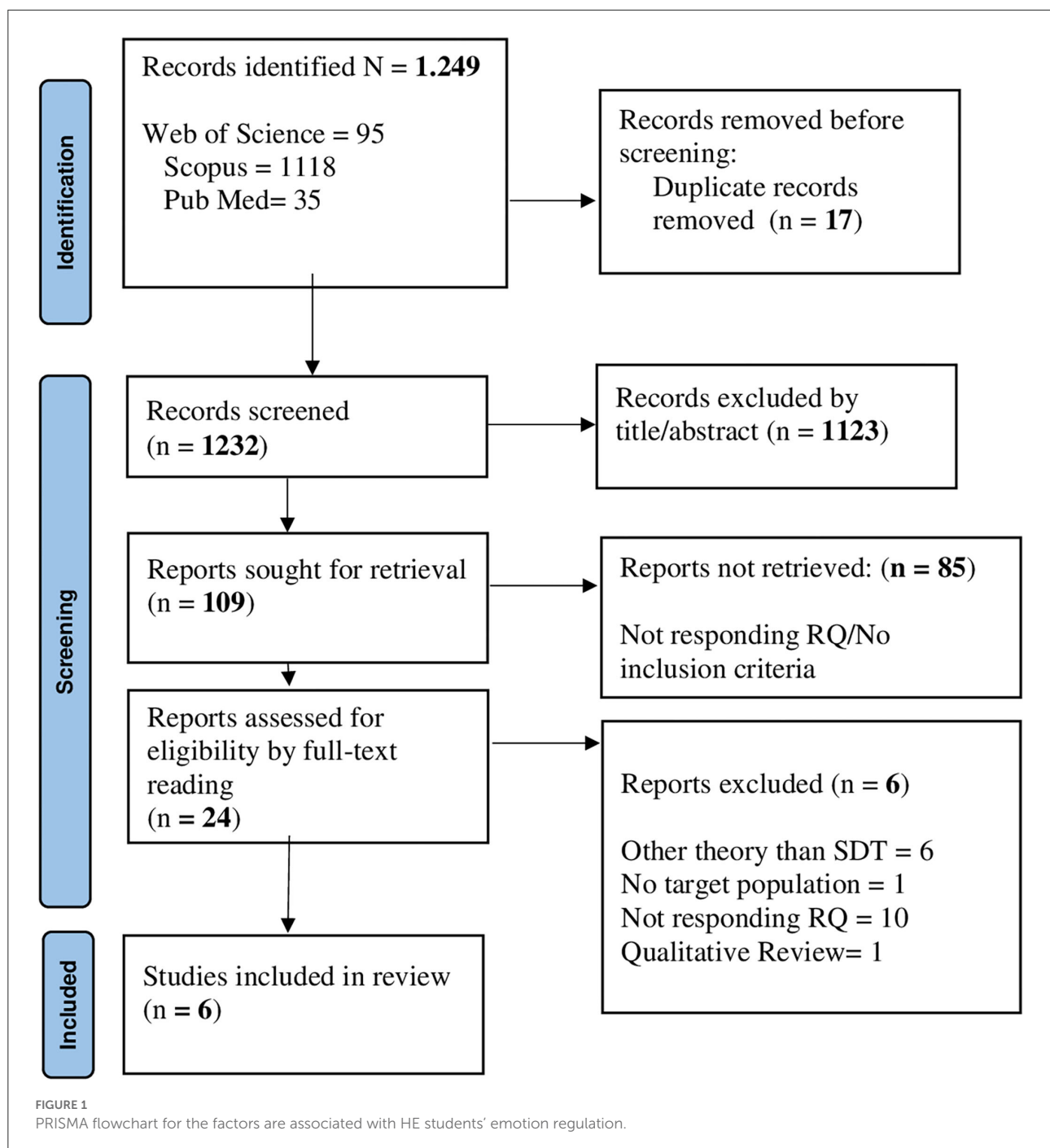
## Procedure

The screening of articles took place in several phases. First, duplicates were removed, and then the two reviewers independently classified the abstracts for each review question as relevant or irrelevant. As a second step, the reviewers screened the articles in each review question by title or abstract. Based on the established exclusion and inclusion criteria, a vast majority of the studies were excluded. Afterward, the two reviewers independently checked for eligibility for the selected pool of articles. The remaining articles were assessed again for eligibility by full-text reading and quality assessment. The reviewers agreed on 90% of the ratings. Any discrepancies were discussed and resolved through discussion. Data appraisal and synthesis were performed narratively.

## Results

### Factors associated with HE students' emotion regulation according to SDT (RQ1)

For research question 1, 1,232 records were identified; of those, 1,123 were removed due to duplications. Next, 109 individual citations were screened by assessing the title/abstracts, and 85 records were removed since they were considered out of topic. After a careful evaluation of the remaining 24 articles, 18 records were eliminated, since they did not meet the inclusion criteria. Overall, 6 articles underwent full-text reading and 6 studies were included in the final analysis (Figure 1). The majority of the studies ( $n = 4$ ) applied quantitative methods, and two ( $n = 2$ ) studies applied a mixed approach. All records included in the final pool reached a quality score  $\geq 5$  in MMAT, indicating a satisfactory data collection,



and coherence between data, analysis, and final interpretation (Supplementary Table 1).

According to SDT, and due to the fact that only a few studies met the criteria for research question 1, the predictors associated with higher education (HE) students' emotion regulation were gratitude and kindness, the three basic psychological needs (competence, relatedness, and autonomy), the difficulty to

perform purposeful behaviors related to emotions, and the emotion creativity.

As for the first factor, gratitude and kindness, in an online pilot intervention (Datu et al., 2021), participants in the kindness and gratitude group, had significantly higher scores for positive emotions, than those assigned in the control condition. Furthermore, the three basic psychological needs



(competence, relatedness, and autonomy) seemed to be the predictors of students' emotion regulation (Holzer et al., 2021). Other factors associated with students' emotion regulation were the autonomous motivation cluster since the more self-determined types of motivation were positively associated with pleasant emotions and achievement (Gonzalez et al., 2012) and the difficulty to perform purposeful behaviors related to emotions (Bytamar et al., 2020). Finally, other factors were emotion creativity, which was associated with the positive emotions of gratitude, hope, and love (Oriol et al., 2016), and emotion regulation style with integrative emotion regulation was associated with less defensive processing of negative experiences and better functioning (Roth et al., 2018).

## Factors associated with HE students' academic buoyancy according to SDT (RQ2)

For research question 2, 101 records were identified; of those, 4 were removed due to duplications. Next, 97 individual citations were screened by assessing the title/abstracts, and 88 records were removed since they were considered out of topic. After a careful evaluation of the remaining 9 articles, 5 records were eliminated, since they did not meet the inclusion criteria. Overall, 4 articles underwent full-text reading and 3 studies were included in the final analysis (Figure 2). All studies ( $n = 3$ ) applied quantitative methods. All records included in the final pool reached a quality score  $\geq 5$  in MMAT, indicating a satisfactory data collection, and coherence between data, analysis, and final interpretation (Supplementary Table 2).

According to SDT, three factors associated with higher education (HE) students' academic buoyancy were identified. Autonomous motivation was the first factor that was found to be positively associated with academic buoyancy (Aydin and Michou, 2019). Also, students' adaptability was another significant predictor of students' university academic achievement, beyond the effects of buoyancy and motivation (Holliman et al., 2019). In addition, personal best goals were found to be positively and significantly associated with academic buoyancy, and thus, adapting personal best goals can be a technique to achieve students' everyday resilience (Jahedizadeh et al., 2021).

## Factors associated with HE students' academic adjustment according to SDT (RQ3)

For research question 3, 931 records were identified; of those, 28 were removed due to duplications. Next, 908 individual citations were screened by assessing the title/abstracts, and 861

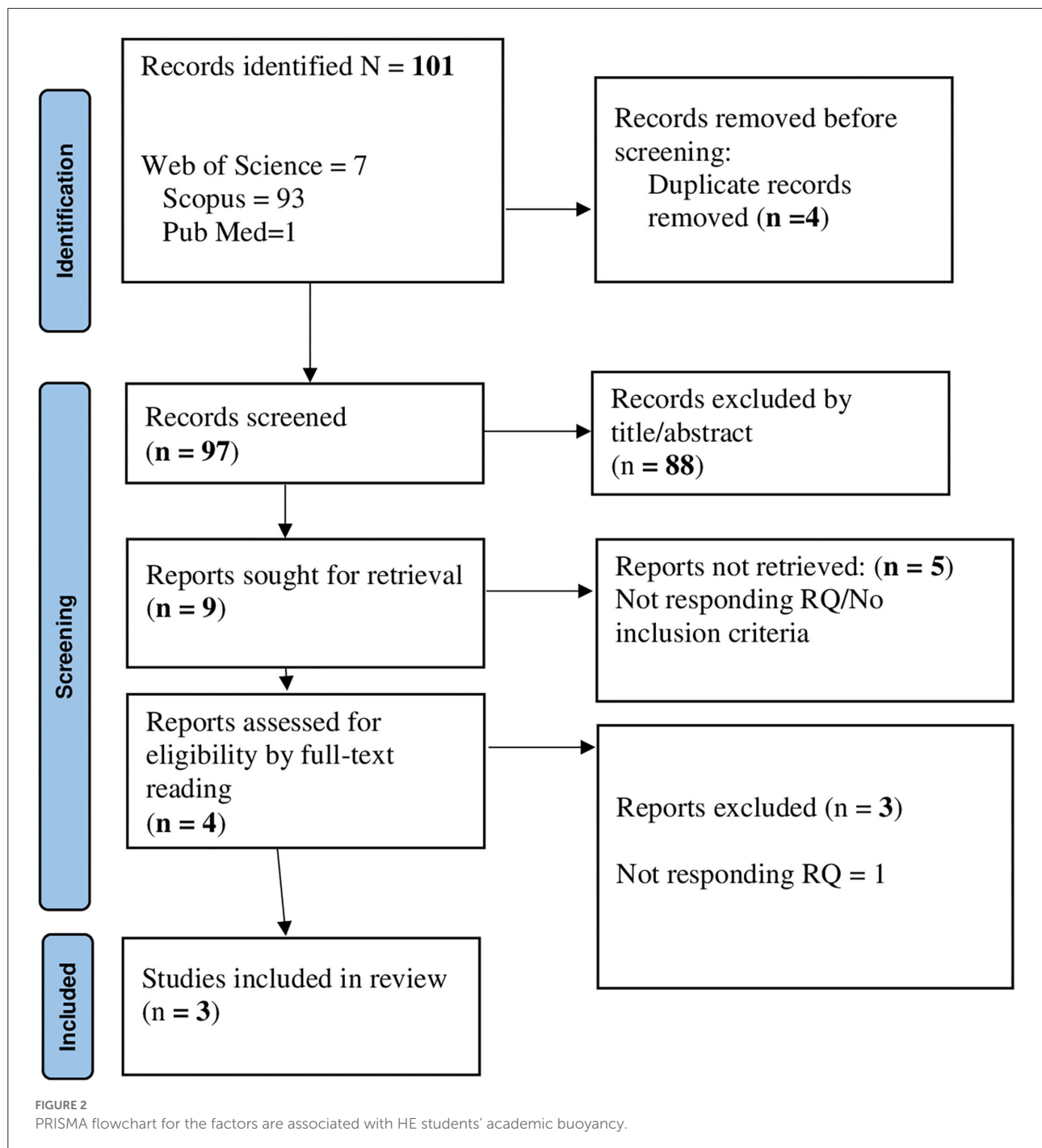
records were removed since they were considered out of topic. After a careful evaluation of the remaining 47 articles, 23 records were eliminated, since they did not meet the inclusion criteria. Overall, 24 articles underwent full-text reading and 12 studies were included in the final analysis (Figure 3). All studies ( $n = 12$ ) applied quantitative methods. All records included in the final pool reached a quality score  $\geq 5$  in MMAT, indicating a satisfactory data collection, and coherence between data, analysis, and final interpretation (Supplementary Table 3).

According to SDT, factors associated with higher education (HE) students' academic adjustment were identified, critically appraised, and summarized as follows: academic, individual, and family factors. What is more, as far as the institutional environment is concerned, the factor that was found to be protective for students' academic adjustment was perceived autonomy from teachers, a factor that significantly predicted autonomous motivation and self-efficacy (Girelli et al., 2018).

As for academic factors, variables that were found to be associated with students' academic adjustment were learning engagement and goal orientations (Wang et al., 2021), intention to drop out and academic self-efficacy (Girelli et al., 2018), and high school GPA and obtained credit points (van der Zanden et al., 2019). Considering individual factors, several other variables were found to be associated with students' academic adjustment. Firstly, academic motivation was found to be an associated variable in a few types of research (e.g., Levpuscek and Podlesek, 2019; Noyens et al., 2019). In addition, motivation variables, i.e., autonomous motivation (Miquelon et al., 2005; Bailey and Phillips, 2015; Willems et al., 2021), self-oriented perfectionism (Miquelon et al., 2005), self-efficacy, and learning strategies (Willems et al., 2021), as well as basic psychological needs satisfaction were also found to be associated with students' academic adjustment (Carr et al., 2013; Vergara-Morales and Del Valle, 2021). In terms of family factors, parental autonomy support (Daniels et al., 2019), parental involvement (Smojver-Ajic et al., 2015), and attachment styles were significantly linked to attachment security (positive relationship with the insecurity dimension) (Carr et al., 2013).

## Factors associated with basic need satisfaction and frustration in HE students according to SDT (RQ4)

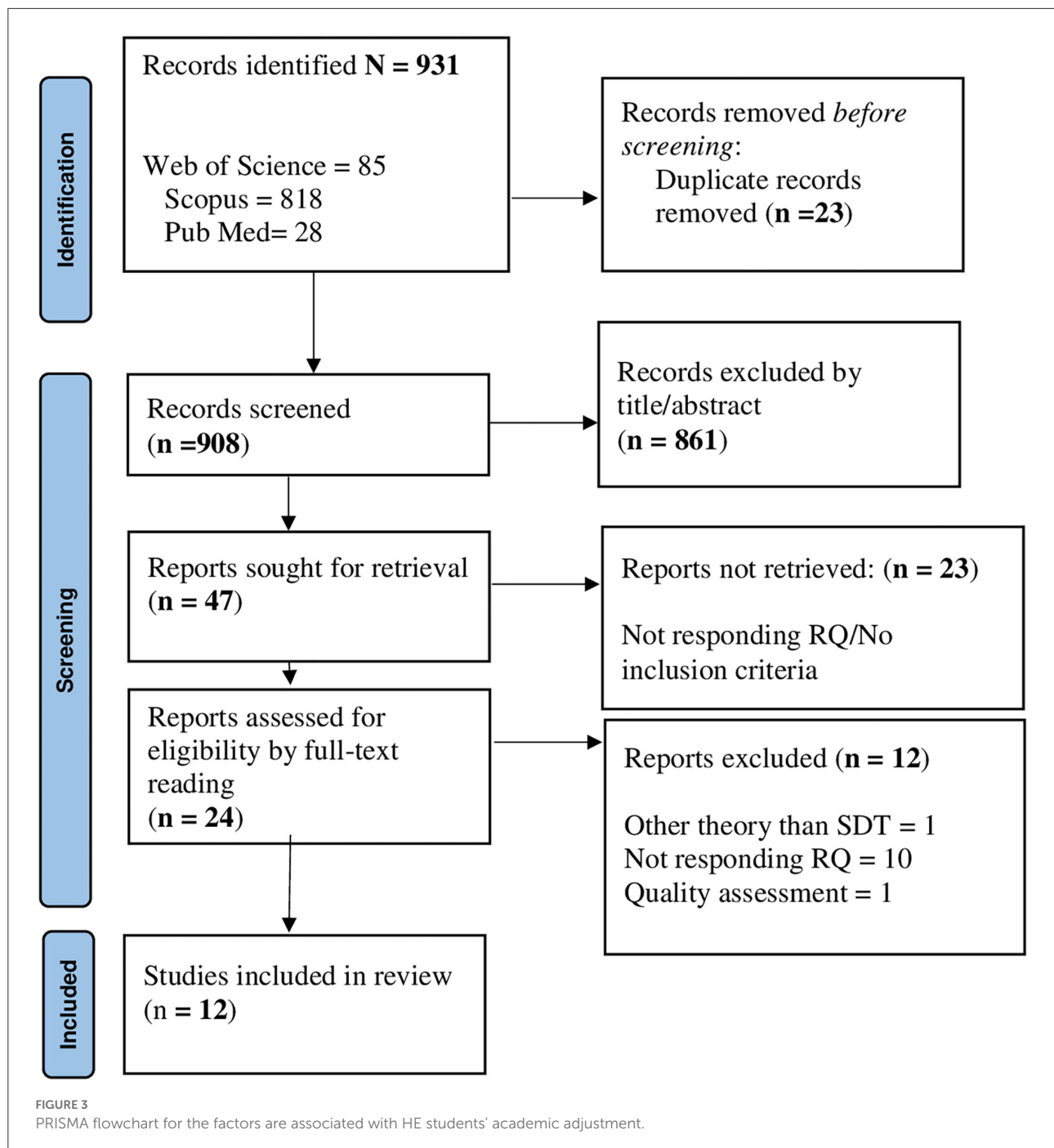
For research question 4, 2,004 records were identified; of those, 272 were removed due to duplications. Next, 1,732 individual citations were screened by assessing the title/abstracts, and 1,656 records were removed since they were considered out of topic. After a careful evaluation of the remaining 76 articles, 51 records were eliminated, since they did not meet the inclusion criteria. Overall, 25 articles underwent full-text reading, and 20 studies were included in the final



analysis (Figure 4). All studies ( $n = 20$ ) applied quantitative methods. All records included in the final pool reached a quality score  $\geq 5$  in MMAT, indicating a satisfactory data collection, and coherence between data, analysis, and final interpretation (Supplementary Table 4).

According to SDT, factors associated with higher education (HE) students' basic need satisfaction and frustration were identified, critically appraised, and summarized as follows:

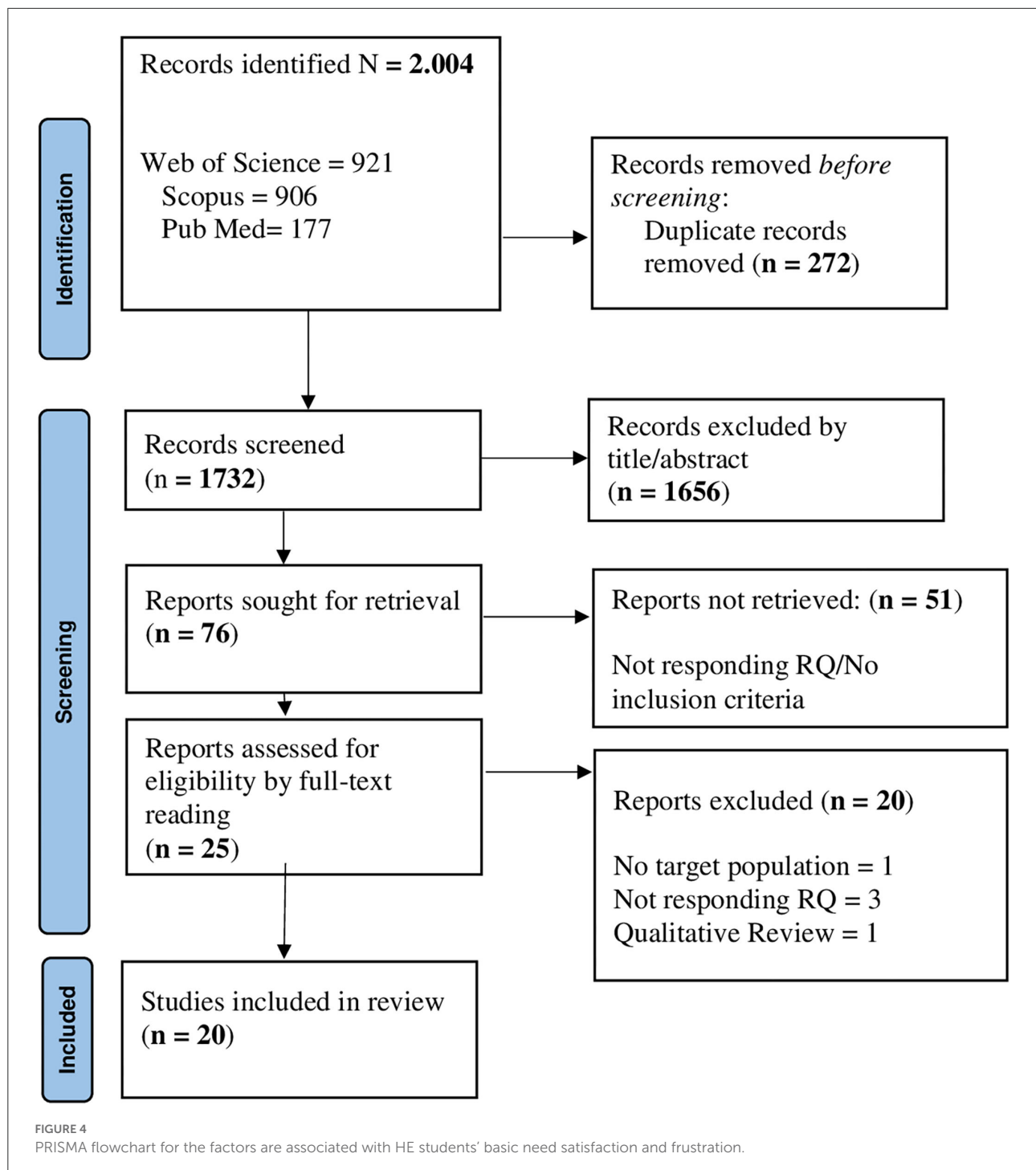
academic, individual, and family-social factors. In terms of academic factors, academic satisfaction and experiences of autonomy support in the learning environment (Jeno et al., 2018; Schenkfelfelder et al., 2020; Yu and Levesque-Bristol, 2020), learning climate (Orsini et al., 2012; Neufeld, 2020), academic adjustment (Levesque et al., 2004; Law and Liu, 2021), and college adjustment, as well as study commitment (Hagenauer et al., 2017; Babenko et al., 2018;



Benlahcene et al., 2020) were variables that predicted students' satisfaction needs. As for individual factors, life satisfaction, resilience, and wellbeing (Levesque et al., 2004; Vansteenkiste et al., 2016; Gunnell et al., 2017; Hagenauer et al., 2017; Neufeld, 2020), study commitment and engagement (Sulea et al., 2015; Hagenauer et al., 2017), self-efficacy and intimacy (Faye and Sharpe, 2008; Wood and Macakova, 2022) seemed to be related to students' needs. Finally, faculty and peer support were recognized as protective factors for students' psychological needs

and frustration (Basson and Rothmann, 2018; Schenkfenfelder et al., 2020).

Furthermore, as far as the institutional environment is concerned, several factors were found to be protective for the students' psychological needs satisfaction. At first, the relationship between student and advisor and the opportunity to connect with faculty members were related to academic satisfaction and volitional autonomy (Schenkfenfelder et al., 2020). In addition, personalized feedback acknowledged feelings



and interpersonal involvement predicted psychological needs satisfaction (Levesque et al., 2004; Basson and Rothmann, 2018). Further, learner's autonomy, i.e., providing choices and options, acknowledging student perspectives, and trying to understand their viewpoints, seemed to be important factors in order for the institution to be supportive to the students' needs (Orsini et al., 2012; Neufeld and Malin, 2019; Neufeld, 2020;

Yu and Levesque-Bristol, 2020). Finally, institutions in which students were included in interdisciplinary first-year projects, were engaged actively in their learning process, generated ideas, and improved general skills such as conflict management, negotiation, and communication skills (Koch et al., 2016).

Hindering students' autonomy was identified as a risk factor for students' psychological needs satisfaction considering the

institutional environment, i.e., giving directives or commands, using controlling language, providing answers, over-praising and spoon-feeding, being dismissive and/or defensive, being unaware of curriculum, unfair judgment, not providing relevance of content or teaching, using incentives (rewards and punishments) to motivate students (Neufeld and Malin, 2019; Neufeld, 2020).

## Discussion

### Summary of the main findings

On the one hand, the results of the narrative synthesis highlighted the fact that only a few studies have examined emotion regulation and academic buoyancy within a self-determination framework. On the other hand, as for the factors associated with university students' academic adjustment and basic need satisfaction and frustration, a greater number of studies were found suitable according to the inclusion and exclusion criteria.

Summarizing the results for review question 1, only a few factors were associated with higher education (HE) students' emotion regulation. These factors seemed to be gratitude and kindness, the three basic psychological needs (competence, relatedness, and autonomy), the difficulty to perform purposeful behaviors related to emotions, and the emotion creativity. These factors are in line with another review that highlighted affective, cognitive, motivational, and individual factors to be associated with emotion regulation (Matthews et al., 2021). A possible explanation for the fact that few articles were found to be eligible could be the fact that based on the literature described in the introduction (Roth et al., 2014, 2019; Benita et al., 2019; Benita, 2020), the field of emotion regulation was only recently developed within the self-determination framework. Another reason could be the fact that the research literature has focused more on emotion regulation among children or adolescents and less on emerging adulthood according to a previous review (Rawana et al., 2014). As for review question 2, only a few studies that examined academic buoyancy in university students were included. The above studies showed autonomous motivation, students' adaptability, and personal best goals to be positively and significantly associated with academic buoyancy. Indeed, empirical studies have suggested that when students are not able to effectively navigate the typical difficulties and challenges in their educational setting (as demonstrated by low buoyancy); this disrupts adaptive patterns of motivation and engagement (e.g., Martin et al., 2013). Other researchers (e.g., Collie et al., 2015) have also stressed that academic buoyancy is associated with an internal locus of control over academic outcomes that are an important element for their motivation and engagement.

However, as the majority of the research conducted in this field concerns elementary or high school educational settings (Martin and Marsh, 2008; Martin et al., 2010; Devi et al., 2019),

there is a need for further research on the role and the associated factors of academic buoyancy in the tertiary education.

As far as questions 3 and 4 are concerned, factors associated with higher education (HE) students' academic adjustment and basic psychological need satisfaction were classified into academic, individual, and family factors. These factors that we found to be relevant also emerged from a recent review study (Zak-Moskal and Garrison, 2020), which highlighted the correlation between student retention and the college's failure to meet students' basic psychological needs. What is more, perceived autonomy from teachers was found to be protective for students' academic adjustment as far as the institutional environment is concerned. Lastly, the relationship between student and advisor and the opportunity to connect with faculty members, personalized feedback, acknowledged feelings, interpersonal involvement, and learner's autonomy have been found to predict the satisfaction of psychological needs (Lyness et al., 2013).

### Limitations and future research directions

From a methodological point of view, access to all databases was inevitable; therefore, some research have not been included in the quality assessment. Moreover, according to the review's inclusion criteria, only undergraduate students were involved, so future research should also consider Master or PhD students and how they adjust to the academic demands. What is more, focus should be given to students that cope with mental illnesses during their studies.

## Conclusion

This review tried to investigate the factors in the university environment that are associated with emotion regulation, academic buoyancy, and academic adjustment of tertiary students within a self-determination theory framework in combination with the nascent third wave of Positive Psychology. In line with the third wave in Positive Psychology, SDT has already highlighted the importance of the learning environment as an important factor for the individual to flourish. An autonomy-supportive environment (i.e., perspective talking, demonstrating relevance, and providing opportunities for choice and self-regulation) was identified as a key component to promoting a positive learning environment where students can thrive. Academic institutions need to prepare for today's students and help them to engage academically throughout their studies; feeling supported and having optimal learning experiences during their academic life is meaningful, life-enhancing, and resonates in students' later lives.

Practitioners working in the field of student counseling could create prevention programs emphasizing in cultivating the skills identified as associating factors for emotion



regulation, academic buoyancy, academic adjustment, and basic psychological needs satisfaction and frustration (Hui and Tsang, 2012). Helping university students see the value in the activities, as well as acknowledging any potential difficulties could increase their motivation and commitment to their studies (Graham and Vaughan, 2022). Lastly, increasing students' academic buoyancy could help them deal with academic pressures and challenges and solve problems effectively facing at their academic settings (Absellatif, 2022).

## 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.

## Author contributions

MK and TG contributed to research design, literature review, and writing up of the manuscript. All authors contributed to the article and approved the submitted version.

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# The relationship between positive psychological qualities and prenatal negative emotion in pregnant women: A path analysis

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**Objective:** The objective of this study was to investigate the relationship between positive psychological qualities and negative emotions of pregnant women.

**Methods:** We surveyed 774 pregnant women in a tertiary hospital in Urumqi using the following measures: a self-report general demographic data questionnaire, Generalized Anxiety Disorder scale (GAD-7), Patients Health Questionnaire depression scale (PHQ-9), Pregnancy Pressure Scale (stocktickerPPS), Perceived Social Support Scale (PSSS), General Self-Efficacy Scale (GSES), and Connor-Davidson Resilience scale (CD-RISC). We used the Amos2.03 system to build a structural equation model.

**Results:** A total of 774 subjects had an average age of 30 years and an average gestational age of 23 weeks. Among the 774 respondents, 122 (15.8%) had moderate or above pregnancy stress (stocktickerPPS > 1), 376 (48.6%) had mild or above anxiety symptoms (GAD-7 ≥ 5), 456 (58.9%) had mild or above depression symptoms (PHQ-9 ≥ 5), 740 (95.6%) had moderate or above social support scores (PSSS ≥ 37), and 124 (16.0%) had good or above psychological resilience scores (CD-RISC ≥ 60). Notably, 372 (48.1%) people had a self-efficacy score above the overall average (GSES ≥ 2.6). Pregnancy stress had positive correlations with anxiety and depression ( $\beta = 0.57, 0.30, P < 0.01$ ) and negative correlations with self-efficacy ( $\beta = -0.19, P < 0.01$ ). Anxiety had positive correlations with depression ( $\beta = 0.54, P < 0.01$ ) and negative correlations with social support ( $\beta = -0.45, P < 0.01$ ). Social support had positive correlations with self-efficacy and resilience ( $\beta = 0.37, 0.47, P < 0.01$ ). Resilience had negative correlations with anxiety ( $\beta = -0.09, P < 0.01$ ), and self-efficacy had positive correlations with resilience ( $\beta = 0.41, P < 0.01$ ).

**Conclusion:** Identification of pregnancy stress should be emphasized in pregnant women with negative emotions. Efforts to strengthen the positive psychological qualities of pregnant women should focus on cultivating psychological resilience to reduce the occurrence of anxiety, and improving

social support should be a priority because it can enhance psychological resilience and self-efficacy. We provide a reason to intervene in the negative emotions of pregnant women from the perspective of the positive psychology of pregnant women.

#### KEYWORDS

pregnant women, prenatal depression, prenatal anxiety, positive psychological quality, path analysis

## Introduction

Women experience psychological and physical changes during pregnancy, and psychological problems occur frequently (Brunton et al., 2022). Hormone fluctuations in the body during pregnancy can lead to emotional instability, such as anxiety, depression, tension, and other negative emotions. In psychology, anxiety, tension, anger, depression, sadness, pain, and other emotions are collectively referred to as negative emotions. A growing number of studies have shown that the prevalence of prenatal anxiety in Chinese pregnant women is high (7.9–68.4%) (Hou et al., 2018; Tang et al., 2019). Furthermore, the prevalence of prenatal anxiety was reported to be 15.2–49.0% in several studies in Turkey, South Africa, Pakistan, Australia, Canada, the United Kingdom, and the United States (Howard et al., 2014; Waqas et al., 2015; Dennis et al., 2017). In recent years, because of the outbreak of COVID-19, many researchers have paid attention to the mental health of pregnant women, especially anxiety and depression (Ramiro-Cortijo et al., 2021). Numerous studies have focused on assessing anxiety, depression, and other psychological disorders, exploring their related risk factors and understanding pregnancy-related diseases and adverse pregnancy outcomes (García-Blanco et al., 2018).

Researchers have proposed various strategies to alleviate prenatal anxiety and depression in pregnant women. The positive psychology approach involves the treatment of mental illness while also striving to stimulate and cultivate positive psychological qualities (An and Zeng, 2020; Abbasi et al., 2022). Methods are needed to assess the psychological problems of pregnant women in a timely manner, identify the factors that influence negative emotions, and help patients develop positive psychological qualities and improve their mental health (Guriganati et al., 2022).

Positive psychological qualities include social support, self-efficacy, resilience, and mindfulness level. Many previous studies have shown that self-efficacy is the closest determinant of a critical structure and behavior. Self-efficacy affects the physical and psychological state of the mother, such as anxiety and

depression (Cramp and Brawley, 2009; Sónia et al., 2018). Self-efficacy can also help individuals cope with stress rationally and positively (Anca et al., 2012). Resilience is another positive psychological resource for preventing mental disorders. It is a dynamic process that enables people at any stage of life to cope with adversity, bounce back after hardship, deal with unpleasant feelings, and adapt to changes (Gagnon and Stewart, 2014; Jin et al., 2021). Pregnant women's depression is affected by many factors. Social support is one of the important factors and has attracted the attention of many scholars. Social support is an individual's perception of external support, which is negatively correlated with depressive symptoms of pregnant women, that is, the higher the level of social support, the milder the depressive symptoms during pregnancy (Behmard et al., 2022).

As a new type of nursing intervention, positive psychological counseling mainly promotes the psychological balance of patients by enhancing the communication between nurses and patients so as to improve the effectiveness of treatment, thereby improving the pregnancy outcome and the quality of life of patients (Li et al., 2020). Positive psychological qualities such as resilience, self-efficacy, and social support can be cultivated to improve the negative emotions of pregnant women, which in turn can improve the individual's physical and mental positive status (Wu et al., 2017; Rastad et al., 2021). In this study, we evaluated 774 pregnant women to study the correlations between positive psychological qualities and prenatal negative emotions and to explore the factors that influence these characteristics.

## Materials and methods

### Study participants

From August 2021 to April 2022, we used a simple sampling method to study pregnant women who were treated at the Obstetrics and Gynecology Department of a tertiary hospital in Urumqi, Xinjiang. Inclusion criteria were a clear diagnosis of pregnancy, informed consent, and willingness to cooperate with researchers to complete the questionnaires. Exclusion



criteria were no informed consent; incomplete data collection; severe mental, cognitive, hearing, or language communication disorders; severe pregnancy complications (Such as gestational diabetes and hypertension); and high-risk pregnancies (previous habitual abortion, fetal malformation, pelvic abnormalities, etc.). A total of 800 questionnaires were distributed, and 774 valid questionnaires were returned. The completion rate was 96.7%.

## Measures

### Demographic questionnaire

The general demographic questionnaire included general demographic data such as maternal age, education level, monthly family income, place of residence, and occupation. Other factors included maternal family environment and living conditions, marital relations, living conditions, exercise, psychological preparation for pregnancy, and pregnancy knowledge.

### Generalized anxiety disorder-7 (GAD-7) scale

A generalized anxiety scale was developed by Spitzer et al. The GAD-7 consists of seven items, each of which is scored on a scale of 0-3, and the total score ranges from 0 to 21. An overall score of 0-4 indicates normal; 5-9 indicates mild anxiety; 10-14 indicates moderate anxiety, and 15-21 indicates severe anxiety. This study uses the Chinese version of this questionnaire, which has been verified by domestic research, indicating that the questionnaire has good reliability and validity in Chinese pregnant women (Jiang et al., 2021). In this study, Cronbach's  $\alpha$  for the scale was 0.885.

### Patient health questionnaire depression scale-9 item (PHQ-9)

The PHQ-9 is a simple and effective self-rating assessment based on nine symptoms of depressive disorder. It has good reliability and validity in the auxiliary diagnosis of depressive disorder and in evaluating the severity of emotional symptoms. The scale used is 0 (absolutely not) to 3 (almost daily), and the total score ranges from 0 to 27. A score of 0-4 indicates no depressive symptoms; 5-9 indicates mild depressive symptoms; 10-14 indicates moderate depressive symptoms; 15-19 indicates moderate to severe depressive symptoms; and 20-27 indicates severe depressive symptoms (Chen et al., 2020; Zhang and Huang, 2022). The research and systematic review of relevant scholars at home and abroad have also confirmed

that the Chinese version of the scale is widely used for screening depression in hospitalized patients, people in primary communities, and specific populations (Hinz et al., 2016; Sun et al., 2017). In this study, Cronbach's  $\alpha$  for the scale was 0.852.

### Pregnancy pressure scale

The PPS contains three dimensions with a total of 30 entries. Dimension 1 (parent role) contains 15 items (items 0-15), dimension 2 (mother and child health and safety) contains 8 items (16-23), and dimension 3 (body shape and physical activity change) contains 4 entries (24-27); three other items were not included in the dimension as other factors, namely, the last three items of the scale (28-30). The Likert 4 grading method is used to score the inventory, and the scale score is the actual total score of the scale divided by the total items of the scale (Chen et al., 2021). A score of 0 indicates no pressure; 0.001-1 indicates mild pressure; 1.001-2 indicates moderate pressure; and 2.001-3 indicates severe pressure (Kim and Chung, 2018). In this study, Cronbach's  $\alpha$  for the scale was 0.953.

### Perceived social support scale

The PSSS translated by Jiang Qianjin into Chinese version has 12 items, consisting of three dimensions, namely, family support, friend support, and other support. Each item is scored from 1 to 7 points ranging from strongly agree to strongly disagree. A total score of 12-36 indicates low-level support; 37-60 indicates medium-level support; and 61-84 indicates high-level support. A higher score indicates a higher level of perceived social support. PSSS has good reliability and validity, and its internal consistency coefficient is 0.93. The internal consistency reliability of family support in the subscale is 0.83, and the internal consistency reliability of friend support and other support is 0.82 and 0.76, respectively, which has reached the standard of psychometrics (Luo et al., 2020; Qi et al., 2020). In this study, Cronbach's  $\alpha$  of the scale was 0.97.

### General self-efficacy scale

We used the Chinese version of the GSES translated by Wang et al. in 2000 (Zhang, 2020). The scale consists of 10 items related to the self-confidence of individuals when they encounter setbacks or difficulties. For each item, the participants answered "completely incorrect," "somewhat correct," "mostly correct," or "completely correct" according to their actual situation, which corresponded to 1 point, 2 points, 3 points, and 4 points, respectively. The total score ranged from 10 to 40 points. A higher total score indicates stronger self-efficacy.

This scale has good reliability and validity when employed in the Chinese population. In this study, Cronbach's  $\alpha$  of the scale was 0.952.

## Connor–Davidson resilience scale

The CD-RISC includes three dimensions of tenacity (13 items), strength (8 items), and optimism (4 items) (Kuiper et al., 2019), and 0–4 points are assigned to answers of “completely different,” “rarely,” “sometimes,” “often,” and “almost always.” The total score on the scale was 0–100 points. A score < 60 indicates poor resilience; 60–70 indicates middle-level resilience; 70–80 indicates good resilience; and  $\geq 80$  indicates excellent resilience (Li, 2020; Li et al., 2020). In this study, Cronbach's  $\alpha$  of the scale was 0.972.

## Statistical methods

We analyzed the data using SPSS version 25.0 (IBM, Armonk, NY, USA), and the count data are expressed as the number of cases and percentages. The measurement data that obeyed the normal distribution were statistically described. The data conformed to normality as detected by the Shapiro–Wilk test ( $P > 0.05$ ). Scores for the six scales were analyzed using Pearson's correlation analysis. We used the IBM SPSS Amos23.0 modeling and analysis system to create the path analysis diagram of the relationship between the factors. The final path analysis model was obtained through continuous correction of the degree of model fitting. The criterion of structural equation model fit evaluation index is goodness of fit index (GFI) > 0.9, adjusted goodness of fit index (AGFI) > 0.9, PGFI > 0.5, IFI > 0.9, Tucker–Lewis coefficient (TLI) > 0.9, comparative fit index (CFI) > 0.9, CMIN/DF < 5, root mean square error of approximation (RMSEA) < 0.05 (Good fit), or RMSEA < 0.08 (reasonable adaptation).  $P < 0.05$  indicated that differences were statistically significant.

## Results

### General demographic data

Among the 774 pregnant women included in this study, 686 (88.6%) were Han and 88 (11.4%) were ethnic minorities. Of the participants, 60 (7.8%) were younger than 25 years old, 638 (82.4%) were between 25 and 35 years old, and 76 (9.8%) were older than 35 years old. Sixty-eight women (8.8%) had an education level below high school, 216 (27.9%) women attended high school and college, 395 (51.0%) women had a bachelor's

TABLE 1 Demographic characteristics ( $N = 774$ ).

Variable	Number (n)	Percent (%)
<b>Nationality</b>		
Ethnic Han	686	88.6
Minority	88	11.4
<b>Age</b>		
$\leq 25$	60	7.8
26–35	638	82.4
> 35	76	9.8
<b>Education</b>		
Lower than high school	68	8.8
High school or technical secondary	216	27.9
Bachelor	395	51.0
Master	95	12.3
<b>Monthly family income</b>		
$\leq 3,000$	34	4.4
3,001–5,000	185	23.9
5,001–8,000	214	27.6
> 8,000	341	44.1
<b>Occupation</b>		
Full-time job	558	72.1
Housewives	216	27.9
<b>Living site</b>		
Village	45	5.8
City	729	94.2

degree, and 95 (12.3%) women had a master's degree or above. Of the participants, 558 (72.1%) were employed and 216 (27.9%) were housewives. Notably, 45 (5.8%) women lived in rural areas and 729 (94.2%) lived in urban areas.

### Positive psychological scores

In this study, among the 774 respondents, 740 (95.6%) had moderate or above social support scores (PSSS  $\geq 37$ ), 124 (16.0%) had good or above psychological resilience scores (CD-RISC  $\geq 60$ ), and 372 (48.1%) had a self-efficacy score above the overall average (GSES  $\geq 2.6$ ). The average PSSS score was  $63.29 \pm 14.19$  (in the middle of the range); the average GSES score was  $26.18 \pm 7.25$  (in the middle of the range); and the CD-RISC score was  $41.10 \pm 22.79$  (poor level of psychological resilience) (Table 1). Pregnant women of different ages and with different levels of education and family income differed significantly in their GSES and CD-RISC scores. The social support level of pregnant women with different education levels, family income levels, and occupations was statistically significant.

TABLE 2 The positive psychological level of the pregnant women assessed in this study.

Variable	GSES (Mean $\pm$ SD)	CD-RISC (Mean $\pm$ SD)	PSSS (Mean $\pm$ SD)
<b>Nationality</b>			
Ethnic Han	26.15 $\pm$ 7.28	41.22 $\pm$ 22.69	63.33 $\pm$ 14.22
Minority	26.44 $\pm$ 6.98	40.16 $\pm$ 23.64	62.93 $\pm$ 14.00
<i>t</i>	−0.359	0.412	0.252
<i>P</i>	0.639	0.332	0.396
<b>Age</b>			
$\leq 25$	22.42 $\pm$ 7.37	31.85 $\pm$ 20.79	59.18 $\pm$ 17.86
26~35	26.37 $\pm$ 7.03	41.34 $\pm$ 22.42	63.52 $\pm$ 13.73
$> 35$	27.57 $\pm$ 8.05	46.37 $\pm$ 25.41	64.58 $\pm$ 14.48
<i>F</i>	9.931	7.123	2.925
<i>P</i>	0.000	0.001	0.054
<b>Education</b>			
Lower than high school	21.63 $\pm$ 7.61	25.57 $\pm$ 19.82	50.93 $\pm$ 16.39
High school or technical secondary	25.89 $\pm$ 7.14	38.76 $\pm$ 21.91	62.06 $\pm$ 13.71
Bachelor	26.82 $\pm$ 7.13	44.06 $\pm$ 22.89	64.92 $\pm$ 13.44
Master	27.47 $\pm$ 6.49	45.23 $\pm$ 21.32	68.15 $\pm$ 11.36
<i>F</i>	11.519	15.363	25.387
<i>P</i>	0.000	0.000	0.000
<b>Monthly family income</b>			
$\leq 3,000$	23.82 $\pm$ 8.49	31.06 $\pm$ 25.87	53.74 $\pm$ 19.63
3,001~5,000	25.33 $\pm$ 7.24	37.09 $\pm$ 21.80	61.15 $\pm$ 14.05
5,001~8,000	25.21 $\pm$ 6.57	38.11 $\pm$ 19.70	62.29 $\pm$ 13.06
$> 8,000$	27.49 $\pm$ 7.35	46.16 $\pm$ 23.77	66.04 $\pm$ 13.68
<i>F</i>	7.240	11.383	11.621
<i>P</i>	0.000	0.000	0.000
<b>Occupation</b>			
Full-time job	26.72 $\pm$ 7.18	42.89 $\pm$ 22.36	64.71 $\pm$ 13.38
Housewives	24.80 $\pm$ 7.24	36.49 $\pm$ 23.29	59.61 $\pm$ 15.54
<i>t</i>	3.332	3.532	4.538
<i>P</i>	0.878	0.310	0.000
<b>Living site</b>			
Village	24.22 $\pm$ 8.93	32.29 $\pm$ 24.30	55.91 $\pm$ 18.00
City	26.30 $\pm$ 7.12	41.65 $\pm$ 22.59	63.74 $\pm$ 13.81
<i>t</i>	−1.873	−2.684	−3.622
<i>P</i>	0.042	0.638	0.017

## Negative emotion scores

Among the 774 respondents, 122 (15.8%) had moderate or above pregnancy stress (PPS  $> 1$ ), 376 (48.6%) had mild or above anxiety symptoms (GAD-7  $\geq 5$ ), and 456 (58.9%) had

mild or above depression symptoms (PHQ-9  $\geq 5$ ). **Table 2** shows that of the 774 pregnant women evaluated in this study, the GAD-7 score was  $4.70 \pm 3.54$ , and 376 (48.6%) participants had anxiety symptoms. The average PHQ-9 score was  $6.11 \pm 4.14$ , and 456 (58.9%) women had depressive

TABLE 3 Negative emotion score of pregnant women.

Variable	GAD-7 (Mean $\pm$ SD)	PHQ-9 (Mean $\pm$ SD)	PPS (Mean $\pm$ SD)
<b>Nationality</b>			
Ethnic Han	4.71 $\pm$ 3.51	6.13 $\pm$ 4.15	0.56 $\pm$ 0.45
Minority	4.59 $\pm$ 3.76	6.01 $\pm$ 4.07	0.59 $\pm$ 0.42
<i>t</i>	0.304	0.249	−0.576
<i>P</i>	0.530	0.993	0.715
<b>Age</b>			
$\leq 25$	5.73 $\pm$ 3.74	6.95 $\pm$ 4.87	0.68 $\pm$ 0.47
26~35	4.60 $\pm$ 3.39	6.05 $\pm$ 3.92	0.56 $\pm$ 0.43
> 35	4.74 $\pm$ 4.42	6.04 $\pm$ 5.18	0.50 $\pm$ 0.53
<i>t</i>	2.848	1.324	2.855
<i>P</i>	0.059	0.267	0.058
<b>Education</b>			
Lower than high school	6.16 $\pm$ 4.18	7.00 $\pm$ 5.14	0.65 $\pm$ 0.56
High school or technical secondary	4.93 $\pm$ 3.45	6.54 $\pm$ 4.21	0.55 $\pm$ 0.46
Bachelor	4.41 $\pm$ 3.39	5.79 $\pm$ 3.97	0.56 $\pm$ 0.43
Master	4.34 $\pm$ 3.58	5.86 $\pm$ 3.78	0.55 $\pm$ 0.38
<i>F</i>	5.478	2.718	0.942
<i>P</i>	0.001	0.044	0.420
<b>Monthly family income</b>			
$\leq 3,000$	5.41 $\pm$ 2.87	6.06 $\pm$ 3.97	0.55 $\pm$ 0.44
3,001~5,000	4.98 $\pm$ 3.53	5.99 $\pm$ 4.15	0.52 $\pm$ 0.41
5,001~8,000	4.81 $\pm$ 3.58	6.36 $\pm$ 3.93	0.62 $\pm$ 0.47
> 8,000	4.41 $\pm$ 3.56	6.03 $\pm$ 4.29	0.55 $\pm$ 0.45
<i>F</i>	1.689	0.361	2.070
<i>P</i>	0.168	0.781	0.103
<b>Occupation</b>			
Full-time job	4.50 $\pm$ 3.41	5.83 $\pm$ 3.88	0.54 $\pm$ 0.42
Housewives	5.21 $\pm$ 3.80	6.84 $\pm$ 4.68	0.62 $\pm$ 0.50
<i>t</i>	−2.547	−3.058	−2.166
<i>P</i>	0.179	0.005	0.009
<b>Living site</b>			
Village	6.18 $\pm$ 3.77	6.71 $\pm$ 4.89	0.54 $\pm$ 0.44
City	4.61 $\pm$ 3.50	6.08 $\pm$ 4.09	0.56 $\pm$ 0.45
<i>t</i>	2.904	0.995	−3.159
<i>P</i>	0.453	0.183	0.002

symptoms. The mean PPS score was  $0.56 \pm 0.45$ , and 122 (15.8%) patients had pregnancy stress. The anxiety score differed significantly among pregnant women with different educational levels, as did the depression status of participants with different educational levels and occupations. Pregnancy pressure differed significantly between women with or without an occupation and between different living sites.

## Correlation between positive psychological qualities and negative emotions of pregnant women

We detected significant positive correlations in pairwise comparison between prenatal anxiety, depression, and pregnancy stress. For the positive psychological qualities,

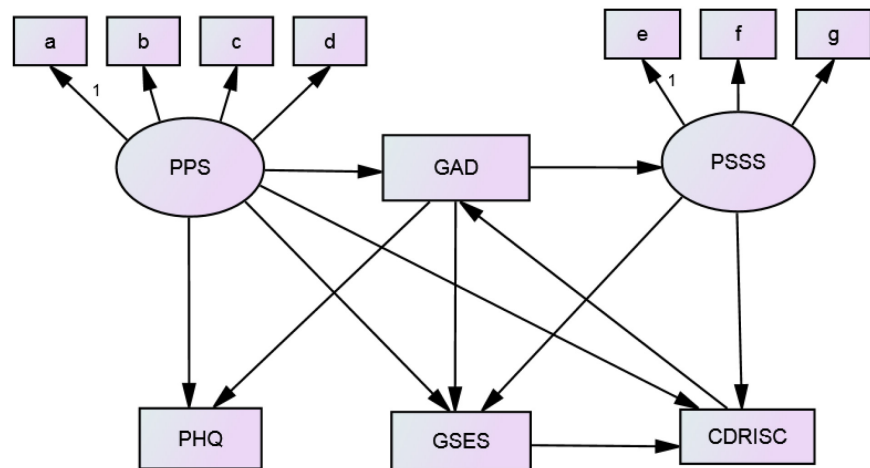


FIGURE 1  
Theoretical model of path analysis of positive psychology and negative emotion of pregnant women.

TABLE 4 Correlation analysis of positive psychology and negative emotion of pregnant women.

Variable	Prenatal anxiety	Depression	Pregnancy stress	Self-efficacy	Resilience	Social support
Prenatal anxiety	1	–	–	–	–	–
Depression	0.698**	1	–	–	–	–
Pregnancy stress	0.509**	0.556**	1	–	–	–
Self-efficacy	–0.236**	–0.256**	–0.312**	1	–	–
Resilience	–0.347**	–0.367**	–0.406**	0.606**	1	–
Social support	–0.384**	–0.387**	–0.371**	0.416**	0.605**	1

\*\* $P < 0.01$  (double tails), the correlation was significant.

comparisons of self-efficacy, resilience, and social support revealed significant positive correlations. We found a significant negative correlation between negative emotions and positive psychological qualities of pregnant women (Table 3).

### Correlation path analysis of positive psychology and negative emotion of pregnant women

According to the previous research results of correlation analysis, path analysis relationship is found between positive psychology and anxiety, depression, and other factors in pregnant women. Combining relevant literature, expertise, and results of single factor analysis and correlation analysis builds the initial theoretical model (refer to Figure 1).

The path analysis results (Table 4) showed the path relationships among anxiety, depression, pregnancy stress, social support, self-efficacy, and psychological resilience in the 774 participants in this study. After using Amos23.0 to construct the initial theoretical model, we obtained the structural

equation model by continuously adjusting and revising the model. The model had an acceptable degree of fit and was statistically significant ( $P < 0.001$ ). The fit indices are as follows: CMIN/DF = 4.803, RMSEA = 0.070, GFI = 0.959, AGFI = 0.930, CFI = 0.959, and TLI = 0.960. Figure 2 shows the path analysis diagram.

The results of the path analysis (Table 5) showed that pregnancy pressure has a positive influence on anxiety and depression ( $\beta = 0.57, 0.30$ ) and a negative influence on self-efficacy ( $\beta = -0.19$ ). Anxiety has a positive influence on depression ( $\beta = 0.54$ ) and a negative influence on social support ( $\beta = -0.45$ ). Meanwhile, social support has a positive influence on self-efficacy and resilience ( $\beta = 0.37, 0.47$ ). Resilience has a negative influence on anxiety ( $\beta = -0.09$ ), and self-efficacy has a positive influence on resilience ( $\beta = 0.41$ ).

### Discussion

In this study, we investigated the mental health of pregnant women from the perspective of positive psychological qualities



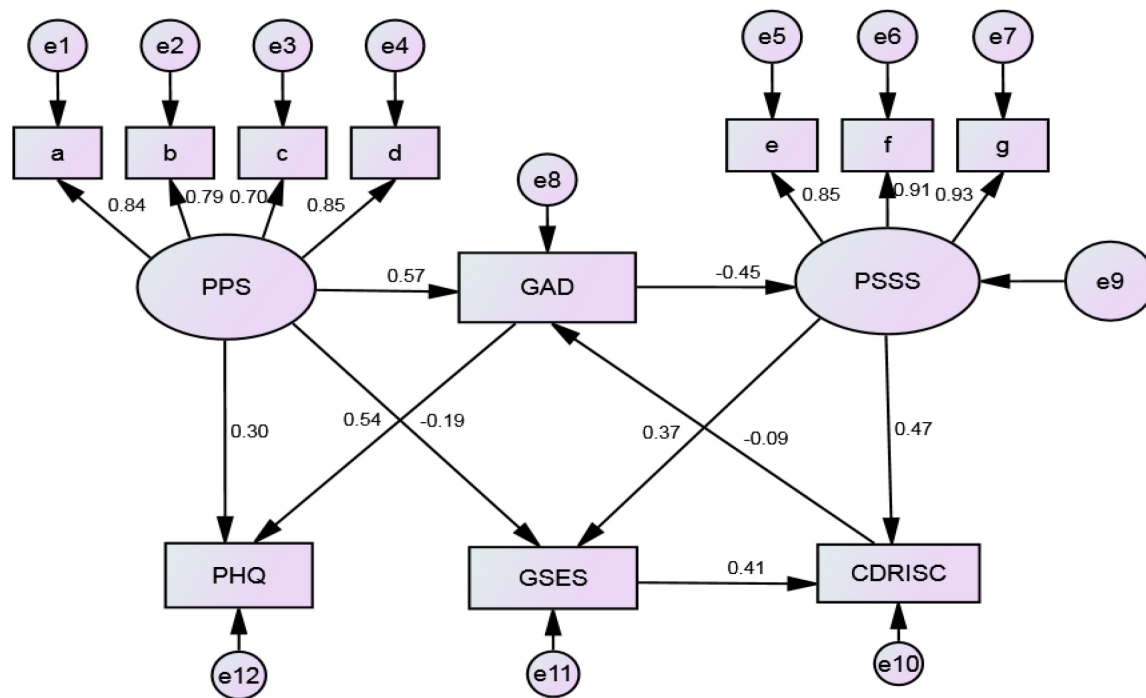


FIGURE 2

Analysis of positive and negative emotional paths of the 774 pregnant women evaluated in this study. PPS, pregnancy pressure scale; GAD, generalized anxiety disorder scale; PSSS, perceived social support scale; PHQ, patient health questionnaire depression scale; GSES, general self-efficacy scale; CD-RISC, Connor–Davidson resilience scale; a, parent role; b, mother and child health; c, body shape; d, others; e, family support; f, friend support; g, others support.

TABLE 5 Path analysis results of positive psychology and negative emotion of pregnant women.

Path	$\beta$	S.E.	C.R.	P
Anxiety $\leftarrow$ Pregnancy stress	0.569	0.028	15.207	< 0.001
Self-efficacy $\leftarrow$ Pregnancy stress	-0.194	0.054	-5.437	< 0.001
Depression $\leftarrow$ Pregnancy stress	0.299	0.028	9.226	< 0.001
Depression $\leftarrow$ Anxiety	0.538	0.035	17.999	< 0.001
Social support $\leftarrow$ Anxiety	-0.448	0.052	-10.646	< 0.001
Self-efficacy $\leftarrow$ Social support	0.374	0.060	10.334	< 0.001
Resilience $\leftarrow$ Social support	0.474	0.167	14.758	< 0.001
Anxiety $\leftarrow$ Resilience	-0.085	0.07	1.998	0.046
Resilience $\leftarrow$ Self-efficacy	0.407	0.088	14.651	< 0.001

and negative emotions. We found that the social support and self-efficacy of pregnant women were at a medium level, but their psychological resilience was poor. The mental resilience value of pregnant women measured in our study is lower than that reported by Shang et al. (2019). We found that psychological resilience is related to the age, education level, and family income of pregnant women. As 36.8% of the pregnant women evaluated in this study had an education level lower than junior college, this factor may affect the overall level of psychological resilience. Other studies showed that resilience as a protective factor can have positive effects on

individual physical and mental health (Wu et al., 2017; Luo et al., 2022). In contrast, poor psychological resilience can increase the risk of anxiety and depression in pregnant women. In this study, the incidence of anxiety and depression was 48.6 and 58.9%, respectively. Meanwhile, in previous studies in Turkey, South Africa, and Pakistan, the prevalence of prenatal anxiety was 15.9, 23, and 49% (Van Heyningen et al., 2017; Kirupamani et al., 2019). Cultural clashes may exacerbate prenatal diseases such as stress and anxiety. This may explain the high rate of prenatal anxiety and depression among Chinese women.

In recent years, research on the mental health of pregnant women has mostly consisted of in-depth studies from the perspective of anxiety and depression, with less research from the perspective of positive psychological qualities (Corno et al., 2018). Therefore, we investigated both the negative emotions of pregnant women and their positive psychological qualities to understand the relationship between them. We found that positive psychological qualities were negatively correlated with the negative emotions of pregnant women. This result is consistent with previous research results (Zhao et al., 2019; Shaghghi et al., 2020), which showed that positive psychological counseling can reduce the increase of negative psychological emotions of pregnant women, increase the cooperation of pregnant women with medical staff, and improve pregnancy outcomes (MacGinty et al., 2020). When women face the stressful event of pregnancy, they inevitably have concerns about themselves and the fetus, and these concerns are the direct influencing factors of pregnancy stress (Nakamura et al., 2018). Our results indicated that pregnancy stress had a direct influence on anxiety and depression, which is consistent with previous research results (Zhao et al., 2020). Therefore, reducing the psychological stress of women during pregnancy was an important factor in preventing prenatal depression.

Path analysis showed that two positive psychological qualities (social support and self-efficacy) had an indirect influence on anxiety and depression of pregnant women; they both affected depression by first regulating anxiety. This result reveals that anxiety is an important influencing factor for depression. Previous studies have reported that anxiety had the highest direct influence among the influencing factors of depression in pregnant women (Yang et al., 2020; Ma et al., 2021). Pregnancy stress, family income, psychological preparation for pregnancy, and social support of pregnant women all have an influence on depression through anxiety. However, psychological resilience has a direct influence on anxiety. Zou et al. (2022) showed that pregnant women with poor psychological resilience were more likely to have anxiety. Social support has a direct positive influence on self-efficacy and resilience, thus improving the social support of pregnant women will enhance these qualities. This study explores the relationship between the positive psychological level and the negative emotions of pregnant women and finds that paying attention to the negative emotions of pregnant women should also focus on the positive psychology of pregnant women. Cultivating the positive psychological level of pregnant women can buffer the occurrence of negative emotions of pregnant women.

Our study had certain limitations. First, we used a cross-sectional survey approach, and interventions need to be tested in future experiments and follow-up studies need to be conducted. Second, the sample size of this study was not large, so further studies with more participants from more hospitals are needed to provide data that are representative of the population of

pregnant women in China. Nevertheless, our results provided a better understanding of the relationship between positive psychological qualities and negative emotions of pregnant women. We found that pregnancy stress had a direct influence on anxiety and depression and an indirect influence on social support and resilience; resilience had a direct influence on anxiety and an indirect effect on other negative emotions; and social support could directly influence self-efficacy and resilience. Therefore, clinicians should focus on pregnancy stress to alleviate the anxiety and depression of pregnant women. Cultivating resilience in pregnant women could greatly reduce the occurrence of anxiety, and improving social support could help cultivate psychological resilience and self-efficacy.

## 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 Ethics Committee of Xinjiang Medical University (approval no.: XJYKDXR20220302029). The patients/participants provided their written informed consent to participate in this study.

## Author contributions

XT and GW contributed to the study's conception and design. WZ contributed to the development of the material and data collection. XT wrote the manuscript. BS and XW assisted in the technical design of the survey. TJ helped with the data analysis and its processing in SPSS. All authors contributed to the article and approved the submitted version.

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## 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.

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# Adult friendship and wellbeing: A systematic review with practical implications

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This study aimed to systematically review research findings regarding the relationship between adult friendship and wellbeing. A multidimensional scope for wellbeing and its components with the use of the PERMA theory was adopted. A total of 38 research articles published between 2000 and 2019 were reviewed. In general, adult friendship was found to predict or at least be positively correlated with wellbeing and its components. In particular, the results showed that friendship quality and socializing with friends predict wellbeing levels. In addition, number of friends, their reactions to their friend's attempts of capitalizing positive events, support of friend's autonomy, and efforts to maintain friendship are positively correlated with wellbeing. Efforts to maintain the friendship, friendship quality, personal sense of uniqueness, perceived mattering, satisfaction of basic psychological needs, and subjective vitality mediated this relationship. However, research findings highlighted several gaps and limitations of the existing literature on the relationship between adult friendship and wellbeing components. For example, for particular wellbeing components, findings were non-existent, sparse, contradictory, fragmentary, or for specific populations only. Implications of this review for planning and implementing positive friendship interventions in several contexts, such as school, work, counseling, and society, are discussed.

## KEYWORDS

friendship, wellbeing, adults, PERMA, systematic review

## 1. Introduction

### 1.1. Adult friendship

Adult friendship is conceptualized as a voluntary, reciprocal, informal, restriction-free, and usually long-lasting close relationship between two unique partners (Wrzus et al., 2017; Fehr and Harasymchuk, 2018).

Mendelson and Aboud (1999) defined six functional components of adult friendship that determine its quality. The first friendship function is *stimulating companionship*, which refers to joint participation in recreational and exciting activities (Fehr and Harasymchuk, 2018). Friends, unlike acquaintances, interact in a more relaxed and carefree way, use more informal language, make jokes, and tease each other (Fehr, 2000).

Existing research literature has mainly focused on the second function of friendship, namely *help or social support* (Wallace et al., 2019). Three forms of social support have been identified: (a) *emotional support*, which is conceptualized as acceptance, sympathy, affection, care, love, encouragement, and trust (Li et al., 2014); (b) *instrumental support*, which is defined as provision



of financial assistance, material goods, services, or other kinds of help (Nguyen et al., 2016); and (c) *informational support*, which refers to provision of advice, guidance, and useful information (Wood et al., 2015).

The third function of adult friendship is *emotional security*, which refers mainly to the sense of safety offered by friends in new, unprecedented and threatening situations (Fehr and Harasymchuk, 2018). Research has shown that friends can significantly reduce their partners' stress caused by negative life events (Donnellan et al., 2017).

The fourth function of adult friendship is *reliable alliance*, which is defined as the constant availability and mutual expression of loyalty (Wrzus et al., 2017). At the core of reliable alliance lie the concepts of trust and loyalty (Miething et al., 2017).

*Self-validation* is the fifth function of adult friendship. It concerns the individuals' sense that their friends provide them with encouragement and confirmation, thus helping them to maintain a positive self-image (Fehr and Harasymchuk, 2018).

Finally, the sixth function of adult friendship is *intimacy*, which refers to self-disclosure procedures (e.g., the free and honest expression of personal thoughts and feelings; Fehr and Harasymchuk, 2018). It is necessary for both friends to reciprocally reveal "sensitive" information and react positively to the information that their partner discloses to them; in this way, feelings of trust can be developed and consolidated (Hall, 2011).

Adults differ significantly not only with regard to friendship quality, but also to the number of friends one has and the hierarchy of friendships (Demir, 2015). Most individuals maintain small networks of long-term and close friends (Wrzus et al., 2017). Empirical research shows that individuals report an average of three close friends (Christakis and Chalatsis, 2010). Also, individuals make fine distinctions between best, first closest friend, second closest friend, other close friendships, and casual friendships (Demir and Özdemir, 2010). These differentiations reflect the ratings of these friendships regarding several quality indicators (Demir et al., 2011b). The present systematic review of the literature will cover multiple aspects of friendship as predictors of wellbeing, namely friendship quality indicators, number of friends, and friendship ratings.

## 1.2. The concept of wellbeing

Wellbeing is a central issue in the field of positive psychology (Heintzelman, 2018). It is a multifaceted construct (Forgeard et al., 2011) and there are several theoretical approaches of its components (Martela and Sheldon, 2019). We define *wellbeing* as a broad construct that involves the presence of indicators of positive psychological functioning, such as life satisfaction and meaning in life, and the absence of indicators of negative psychological functioning, e.g., negative emotions or psychological symptoms (Houben et al., 2015). This conceptualization captures both *hedonic elements* of wellbeing (Diener, 1984), that involve pleasure, enjoyment, satisfaction, comfort, and painlessness (Huta, 2016) and *eudaimonic elements* (Ryff, 1989), that include concepts like meaning, personal growth, excellence, and authenticity (Huta and Waterman, 2014). Our definition on wellbeing also involves the components of *subjective wellbeing* (Diener et al., 1999), *psychological and social wellbeing* (Ryff, 1989) and *general wellbeing* (Disabato et al., 2019). Finally, this definition encompasses the two different

approaches on wellbeing, which are based on the *mental illness model* (Keyes, 2005) and on *positive psychology principles* (Seligman, 2011).

Several attempts have been made to synthesize the aforementioned models. In this systematic review of the literature, we used Seligman's (2011) *PERMA theory* to organize our findings. Seligman (2011) argued that individuals can flourish and thrive if they manage to establish the following five pillars of their lives: positive emotions (P), engaging in daily activities (E), positive relationships (R), a sense of meaning in life (M), and accomplishments (A).

According to the Broaden-and-Build theory (Fredrickson, 2001), when individuals experience *positive emotions*, their repertoire of thoughts and actions broaden (Fredrickson and Branigan, 2005). The broadening effect activates an upward spiral, resulting in the experience of new and deeper positive emotions (Fredrickson and Joiner, 2002). This, in turn, leads to building of resources, which last over time and act as a protective shield against adversity (Tugade and Fredrickson, 2004). Finally, experiencing positive emotions seems to undo the unpleasant effects of experiencing negative emotions (Fredrickson et al., 2000). All the above mechanisms facilitate the physical and psychological wellbeing of individuals (Kok et al., 2013).

*Engagement* describes a positive state of mind in which individuals are fully present psychologically and channel their interest, energy, and time into physical, cognitive, and emotional processes to achieve or create something (Butler and Kern, 2016). Engagement is substantially linked to the experience of *flow*, which is conceptualized as the psychological focus on an activity, accompanied by an experience of high intrinsic motivation and sense of control, and resulting in optimal functioning (Csikszentmihalyi, 2009). High levels of engagement are associated with various indices of wellbeing, such as increased levels of experiencing positive emotions and life satisfaction (Fritz and Avsec, 2007) and decreased levels of anxiety and depression over time (Innstrand et al., 2012).

Positive close *relationships* with family, friends and other significant people are also beneficial. They are found to be associated with emotional and instrumental support, intimacy, trust, increased sense of belonging and other protective indices of physical and psychological wellbeing (Carmichael et al., 2015; Mertika et al., 2020; Mitskidou et al., 2021).

*Meaning* in life reflects the individual's sense that life has coherence, purpose, and significance so that it is worth-living (Martela and Steger, 2016). Research findings show that the presence of meaning in life enhances wellbeing, because it entails high levels of positive emotions and life satisfaction as well as low levels of negative psychological and physical conditions (Pezirkianidis et al., 2016a,b, 2018; Galanakis et al., 2017).

*Accomplishments* in all domains of life are recognized and rewarded by society; this reinforces the individuals' desire to succeed (Nohria et al., 2008). However, accomplishments are not restricted to great achievements in life but also include the fulfillment of daily personal ambitions and the achievement of everyday goals. These minor accomplishments have been found to contribute to the wellbeing of individuals (Butler and Kern, 2016).

## 1.3. Associations between adult relationships and wellbeing components

Positive, supportive relationships predict higher physical and psychological wellbeing levels more than any other variable (Vaillant,

2012). In particular, integrating people into support networks provides them with the necessary resources to successfully deal with depression, anxiety, loneliness, alcohol overdose and many other physical and mental health difficulties (Christakis and Fowler, 2009, 2013). In addition, the chances of individuals' happiness increase when they are associated with a happy person. Therefore, happiness seems to be transmitted through positive relationships (Fowler and Christakis, 2008).

Moreover, research findings show that perceived support from positive relationships is associated with experiencing more positive emotions (Kok et al., 2013), sense of calm and security (Kane et al., 2012), and presence of meaning in life (Hicks and King, 2009).

In particular, adult friendship is a valuable personal relationship (Demir, 2015), which contributes in various ways to individuals' wellbeing (Demir et al., 2007), and significantly fulfills the fundamental human need for social interaction and belonging (Lyubomirsky, 2008). The quality of adult friendship is related to wellbeing and the experiencing of positive emotions (Demir et al., 2007; Secor et al., 2017; Pezirkianidis, 2020). In addition, existing literature shows that a close adult friendship is related to personal achievement and engagement to projects, which promote meaning in life (Green et al., 2001; Koestner et al., 2012).

#### 1.4. Gaps in the literature on the relationship between adult friendship and wellbeing

Even though the relationship between friendship and wellbeing has been extensively studied in children (e.g., Holder and Coleman, 2015), adolescents (e.g., Raboteg-Saric and Sakic, 2014), and the elderly (e.g., Park and Roh, 2013), it is not yet fully understood how the various elements of adult friendship are related to wellbeing. The main reason for this is that adulthood consists of many different life periods, from young to late adulthood, during which there are fluctuations in the network of friends and changes in friendship quality (Bowker, 2004).

In fact, most of the empirical research on the relationship between adult friendship and wellbeing focuses on the effect of adult friendship on one-dimensional indices of wellbeing, such as happiness or life satisfaction (Demir et al., 2007). It is worth-noting that research is mainly conducted with university student samples, which limits generalizability to older age groups (Demir, 2015).

#### 1.5. The present study

This study aims to systematically review the research literature on the relationship between adult friendship and wellbeing as well as its components, in order to shed more light on the nature of this relationship and the mechanisms that underlie it. More specifically, we will review empirical studies which examined the relationship of quantitative and qualitative indices of adult friendship with wellbeing within the framework of PERMA theory (Seligman, 2011). Therefore, the relationship between adult friendship and overall wellbeing as well as each of its PERMA components will be studied.

Five research questions have been formulated: (a) Which adult friendship variables are mostly associated with wellbeing? (b) Which adult friendship variables predict wellbeing levels based on

longitudinal studies? (c) Are there mediating and/or moderating variables in the association between adult friendship and wellbeing? (d) Are there individual differences on the associations between adult friendship and wellbeing? (e) Does adult friendship associate with specific components of wellbeing on the basis of PERMA theory?

## 2. Methods

### 2.1. Criteria of suitability/inclusion of bibliographic sources

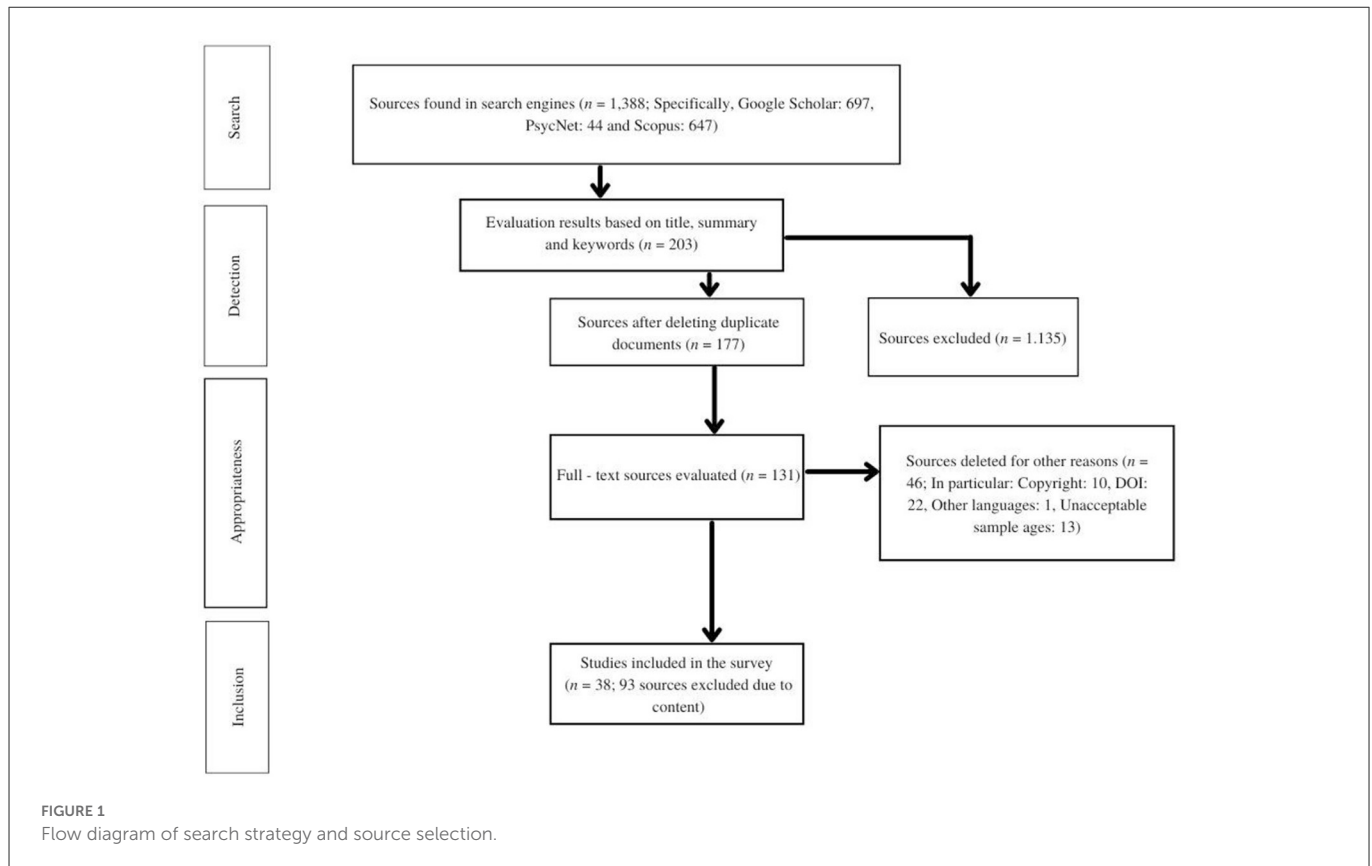
We searched for sources reporting empirical research with quantitative and qualitative design using samples ranging in age from 18 to 65 years. Articles were published in scientific journals between 2000 and 2019, since we decided to exclude studies conducted during the COVID-19 pandemic, when the relationships with significant others were negatively affected. We included articles written in English and accompanied by a digital identifier (DOI). Book chapters, reviews and gray literature were excluded.

### 2.2. Search strategy, source selection and data extraction

We searched for resources in the following search engines: Google Scholar, PsycNET, and Scopus. The following algorithm was used to search for the literature sources: "friends" OR "friend" OR "friendship" OR "friendships" AND "wellbeing" OR "wellbeing" OR "psychological wellbeing" OR "psychological wellbeing" OR "happiness" OR "flourish" OR "flourishing" OR "psychological flourish" OR "psychological flourishing" OR "subjective wellbeing" OR "subjective wellbeing" OR "positive emotions" OR "positive emotion" OR "positive affect" OR "engagement" OR "flow" OR "psychological flow" OR "positive relationship" OR "positive relationships" OR "social support" OR "meaning" OR "meaning of life" OR "meaning in life" OR "life meaning" OR "life purpose" OR "purpose of life" OR "purpose in life" OR "achievement" OR "achievements" OR "accomplishment" OR "accomplishments" OR "performance" OR "success" AND "adult" OR "adults".

The studies were initially selected by two independent evaluators on the basis of their abstract, title and keywords (phase 1). The evaluators were both psychologists and one of them is a researcher, experienced on systematic reviews. The total number of abstracts tested was 1,388. Any paper considered relevant at least by one of the two evaluators was eligible for full-text inspection. The agreement between the evaluators at the first phase was 78%. Thus, 203 articles were included for full-text evaluation (phase 2).

During the second phase of the evaluation process, we first checked the sources for duplication and fulfilling the inclusion criteria. The exclusion criteria were the same for both phases. As a result, we removed 33 duplicate documents, 10 articles that their full-text could not be found due to copyright, 22 articles that did not have a DOI, and one article not written in English. In addition, 13 studies were rejected because the sample's age was not within the set limits. Next, the two evaluators independently inspected the full-text of the remaining articles ( $n = 131$ ). As a result, 93 articles were excluded because their content was not relevant to the aims of the study. The agreement between the evaluators at this phase was 96%;



if the decision was not unanimous after further discussion, it was excluded by the study. Thus, in total, 38 studies were eligible for the review (see Figure 1).

### 3. Results

From the selected 38 studies, two followed a qualitative design, nine were longitudinal, two had a mixed cross-sectional and experimental design and the rest of them were based on a cross-sectional design. Most of them ( $n=28$ ) used a sample of young adults, mainly university students (see Table 1).

The selected studies were divided into six subgroups on the basis of the PERMA theory of wellbeing and with regard to the associations of friendship with (a) wellbeing, (b) experiencing positive emotions; (c) engagement; (d) building positive relationships; (e) meaning in life; and (f) accomplishments. Also, another analysis was conducted focusing on individual differences regarding the association of friendship variables with wellbeing components.

#### 3.1. Associations between adult friendship and wellbeing

Twenty-six studies were found to investigate the association between adult friendship and wellbeing variables. The adult friendship variables studied were friendship quality, best or close friendships, number of friends, support from friends, maintenance of friendship, social interaction with friends and

support of autonomy from friends. The wellbeing variables studied were subjective wellbeing, psychological wellbeing, happiness, and life satisfaction. The measures used to measure wellbeing variables were Subjective Happiness Scale ( $n = 9$  studies, Lyubomirsky and Lepper, 1999), Satisfaction With Life Scale ( $n = 11$ , Diener et al., 1985), Positive and Negative Affect Schedule ( $n = 9$ , Watson et al., 1988), other psychological wellbeing measures ( $n = 5$ ), and single items ( $n = 3$ ; see Table 1).

The results showed that friendship quality significantly associates with wellbeing (Demir and Weitekamp, 2007; Demir et al., 2007, 2011a,b, 2012b, 2013a,b, 2017; Demir and Özdemir, 2010; Akin and Akin, 2015; Carmichael et al., 2015; Miething et al., 2016). In addition, it was found that friendship quality predicts wellbeing levels in the long run. More specifically, friendship quality at the age of 30 predicts wellbeing at the age of 50 (Carmichael et al., 2015). The friendship function, which has been found to mostly correlate with wellbeing levels is stimulating companionship (Demir et al., 2007).

Moreover, perceived emotional or instrumental support offered by friends has been found to significantly associate with wellbeing (Walen and Lachman, 2000; Griffin et al., 2006; Almquist et al., 2014; Morelli et al., 2015; Secor et al., 2017). An interesting finding is that peer support predicts both the provider's and the recipient's wellbeing levels (Morelli et al., 2015).

Regarding socializing with friends, that is, the amount of time individuals spend together, it was found that it also associates with wellbeing levels (Helliwell and Huang, 2013; Huxhold et al., 2013; Li and Kanazawa, 2016), while predicts wellbeing from 6

TABLE 1 Findings of the systematic literature review regarding the associations between adult friendship and wellbeing.

References	Study design	Sample ( <i>n</i> , male %, <i>M<sub>age</sub></i> )	Independent variables	Dependent variables (PERMA variable)	Measures	Key statistical results
1. Akin and Akin (2015)	CS	USA university students (271, 46%, N/A)	FQ, Subjective vitality	H (WB)	FQS, SHS, SVS	FQ positively correlates with H ( $r = 0.29$ ). Subjective vitality partially mediates this relationship ( $\beta = 0.33$ ).
2. Almquist et al. (2014)	Q	Swedish adults born in 1990 (1,289, 50.19%, 19)	FQ, Trust, Self-disclosure	MWB (WB)	Interview <i>via</i> phone	Emotional SS, i.e., FQ ( $B = 3.59$ ), trust ( $B = 2.62$ ), and self-disclosure ( $B = 1.61$ ), positively associate with MWB.
3. Brannan et al. (2013)	CS	College students: Iran (151, 59%, 22), Jordan (161, 57%, 21), USA (234, 35%, 25)	SS-Fr	LS, PE (WB, PE)	PSS-Fr, SWLS, PANAS	In USA sample PSS-Fr associates with LS ( $\beta = 0.13$ ) and PE ( $\beta = 0.26$ ) levels, in the Jordanian sample PSS-Fr associates with PE ( $\beta = 0.21$ ) but no significant relationships found in Iran sample.
4. Cable et al. (2012)	L	Adults born in GB in 1958 (6,681, 47.43%, T1: 42, T2: 45, T3: 50)	SNS	PWB (WB)	SNS-SI, Warwicke-Edinburgh MWBS	Smaller friendship networks at age 45 predict lower levels of PWB 5 years later ( $B = -1.30$ to $-4.72$ for less than five friends).
5. Carmichael et al. (2015)	L	USA adults (133, 44.36%, T1: 20, T2: 30, T3: 50)	FQ	PWB (WB)	Social Network Index, FQ-SI, PWB	FQ at 20s predicts FQ at 30s ( $\beta = 0.29$ to $0.33$ ), while FQ at 30s predict PWB at 50s ( $\beta = 0.38$ ).
6. Carr and Wilder (2016)	CS	USA adults (224, 46%, 21.69)	Risks of seeking SS-Fr	FS, Relational closeness (R)	Risks of seeking social support (5-item scale), Relationship Assessment Scale-FR, Interpersonal Solidarity Scale	Individuals perceiving high risks in seeking social support from friends correlates to lower levels of interpersonal closeness ( $r = -0.38$ ) and friendship satisfaction ( $r = -0.48$ ).
7. Chen et al. (2015)	EXP, CS	University students (study 1: 54 friendship pairs, 24%, 18.56; study 2: 131, 19.85%, 19; study 3: 332, 24.69%, 19)	FQ	SS (R)	Social Support scale, Relationship Quality Scale, Relationship Satisfaction Index	Perceived FQ predicts received support during adversity ( $\beta = 0.26$ ) and emotional-focused support among European Americans ( $\beta = 0.37$ ). Also, FQ more strongly associates with support provision among European Americans ( $\beta = 0.56$ ) than Japanese ( $\beta = 0.24$ ), while FQ associates with higher levels of attentiveness ( $\beta = 0.42$ ) and companionship ( $\beta = 0.38$ ) among Asian Americans than European Americans ( $\beta = 0.20$ and $0.18$ , respectively).
8. Cyranowski et al. (2013)	CS	USA adults (692, 43.4%, 43.97)	Companionship with friends	SS, Loneliness, Social distress (R)	UCLA-R, Interpersonal Support Evaluation List, Negative Interaction Scale	Companionship with friends correlates with higher levels of SS from others ( $r = 0.77$ ) and lower levels of loneliness ( $r = -0.81$ ) and social distress ( $-0.27$ ).
9. Demir and Davidson (2013)	CS	USA university students (4,283, 26.38%, 18.81)	PRCA, PM, NS	PE (PE)	PRCAS, MTOQ, PANAS, NS-FR	PM ( $r = 0.32$ ), NS-FR ( $r = 0.33$ ) and PRCA ( $r = 0.19$ ) positively correlate with PE. NS-FR explains PE levels of men ( $\beta = 0.49$ ), while PM ( $\beta = 0.09$ ), NS-FR ( $\beta = 0.33$ ) and PRCA ( $\beta = 0.08$ ) explain PE levels of women.

(Continued)

TABLE 1 (Continued)

References	Study design	Sample ( <i>n</i> , male %, <i>M<sub>age</sub></i> )	Independent variables	Dependent variables (PERMA variable)	Measures	Key statistical results
10. Demir et al. (2007)	CS	USA university students (280, 31.43%, 22.56)	FQ	LS, PE, H (WB, PE)	Network of Relationships Inventory, SWLS, PANAS	The quality of best ( $r = 0.20$ ) and first close friendships ( $r = 0.19$ ) positively correlates with LS and H ( $r = 0.26$ and $0.19$ , respectively), but not with experiencing of PE. Stimulating companionship in best ( $r = 0.29$ ) and first close friendship ( $r = 0.22$ ) associates with H.
11. Demir et al. (2017)	CS	USA university students (2,997, 30%, 19.15)	FQ, PRCA, PNS	H (WB)	MFQ-FF, PRCAS, NSS, SHS, SWLS, PANAS	PRCA and FQ positively correlate to H ( $r = 0.19$ to $0.27$ and $r = 0.26$ to $0.31$ , respectively). FQ mediates the relationship of PRCA with H in best friendships ( $\beta = 0.29$ for men and $0.53$ for women) and, similarly, PNS in same-sex friendships ( $\beta = 0.65$ among men and $0.52$ amongst women). No differences of gender and same/different-sex friendships were found.
12. Demir et al. (2019)	CS	USA university students (685, 33%, 18.73)	FM, PRCA	SWB, H (WB)	FMS, PRCAS, SWLS, SHS, PANAS	PRCA and FM positively correlates to SWB ( $r = 0.19$ and $0.37$ ) and H ( $r = 0.21$ and $0.31$ ). FM mediates the relationship of PRCA with SWB ( $\beta = 0.11$ for men and $0.16$ for women) and H ( $\beta = 0.08$ for men and $0.14$ for women). No gender differences found.
13. Demir et al. (2013a)	CS	University students: Turkey (287, 46.69%, 22.22), USA (268, 41.42%, 21.37)	FQ, PRCA	H (WB)	MFQ-FF, PRCAS, SHS	Both in Turkish and Americans FQ and PRCA positively associate with H ( $r = 0.35$ and $0.28$ ; $r = 0.18$ and $0.16$ , respectively). FQ mediates the relationship of PRCA and H in both samples ( $\beta = 0.03$ for Turkish and $0.04$ for Americans).
14. Demir et al. (2012a)	CS	University students: Malaysia (154, N/A, 22.10), USA (211, N/A, 21.95)	FQ	H, Social skills (WB, R)	MFQ-FF, Interpersonal Competence Questionnaire, SHS	FQ both among Americans and Malaysians associates with social skills ( $\beta = 0.24$ and $0.20$ ) and H ( $\beta = 0.33$ and $0.38$ , respectively) and mediates the relationship between social skills and H ( $\beta = 0.11$ for Americans and $0.15$ for Malaysians).
15. Demir and Özdemir (2010)	CS	USA university students (400, 29.25%, 22.39)	FQ, PNS	H (WB)	MFQ-FF, NSS, PANAS	FQ positively correlates with to PNS ( $r = 0.69$ ) and H ( $r = 0.25$ ). PNS mediates the relationship of FQ with H in the three closest friendships ( $\beta = 0.26$ ).
16. Demir et al. (2011a)	CS	USA university students (study 1: 256, 32.81%, 20.34; study 2: 498, 21.28%, 19.10; study 3: 299, 20.4%, 19.81, study 4: 175, 30.85%, 20.57)	FAS, FM	H, LS, PE (WB, PE)	FASQ, FMS, SHS, SWLS, PANAS	FAS ( $r = 0.21$ to $0.24$ ) and FM ( $r = 0.41$ to $0.48$ ) positively correlate with H, PE ( $r = 0.18$ and $0.43$ , respectively), and LS ( $r = 0.27$ and $0.35$ , respectively). FM fully mediates the relationship between FAS and H in close and best friendships ( $\beta = 0.51$ ).
17. Demir et al. (2011b)	CS	USA university students (study 1: 212, 32.07%, 23.99)	FQ, PM	H (WB)	MFQ-FF, MTOQ, PANAS	PM ( $r = 0.36$ ) and FQ ( $r = 0.21$ ) positively correlate with H. PM mediates the relationship between FQ and H regarding the three closest friendships ( $\beta = 0.16$ to $0.21$ ).
18. Demir et al. (2012b)	CS	University students: Turkey (296, N/A, 21.14), USA (273, N/A, 21.80)	FQ, PM	H (WB)	MFQ-FF, MTOQ, PANAS	FQ and PM positively correlate to H among Turkish and Americans ( $r = 0.29$ and $0.18$ ; $r = 0.21$ and $0.33$ , respectively). Among Americans, PM mediates the relationship of FQ and H, whilst among Turkish FQ mediates the relationship of PM with H.
19. Demir et al. (2013b)	CS	USA university students (2,429, 27%, 18.8)	FQ, Sense of uniqueness	H (WB)	MFQ-FF, PSU, PANAS, SWLS, SHS	FQ positively correlates with SoU ( $r = 0.34$ to $0.38$ ) and H ( $r = 0.29$ to $0.32$ ). SoU mediates the relationship between FQ and H ( $\beta = 0.38$ to $0.41$ ).

(Continued)



TABLE 1 (Continued)

References	Study design	Sample ( <i>n</i> , male %, <i>M<sub>age</sub></i> )	Independent variables	Dependent variables (PERMA variable)	Measures	Key statistical results
20. Demir and Weitekamp (2007)	CS	USA university students (423, 29.07%, 22.53)	FQ	H, LS, PE (WB, PE)	MFQ-FF, SWLS, PANAS	FQ positively correlates with PE ( $r = 0.25$ ), LS ( $r = 0.18$ ), and H ( $r = 0.26$ ).
21. Derdikman-Eiron et al. (2013)	L	Norwegian adults (1,346, 38.41%, T1: 14.4, T2: 26.9)	Frequency of meeting friends	SS-Fr (R)	Frequency of meeting friends-SI, SS-Fr (2-item scale)	Frequency of meeting friends during adolescence predicts SS-Fr among young adults (OR = 1.33).
22. Griffin et al. (2006)	CS	USA black and white women (290, 0%, 37.8)	SS-Fr satisfaction, Friend network size	LS (WB)	SS questionnaire, LS scale	SS-Fr satisfaction ( $\beta = 0.23$ ) and friendship network ( $\beta = 0.22$ ) positively associate with LS. No racial differences found.
23. Heck and Fowler (2007)	L	USA secondary and high school students, who became adults seven years later (14,332, 50.9%, N/A)	NF	Participation in community activities (E)	Social network measure, Individual interview	NF of secondary and high school students predicts engagement levels in community activities during young adulthood ( $\beta = 0.05$ ).
24. Helliwell and Huang (2013)	CS	Canadian adults (5,025, 49%, 44.93)	NF	LS, H (WB)	NF-SI, Cantril's Self-Anchoring Ladder	NF positively associate with LS and H ( $\beta = 0.29$ and $0.37$ , respectively), especially for single, divorced, separated, or widowed individuals.
25. Huxhold et al. (2013)	L	German adults (2,830, 50.8%, 53.3)	SC-Fr	LS, PE (WB, PE)	SC-Fr scale, SWLS, PANAS	SC-Fr positively predicts LS and PE levels 6 years later ( $\beta = 0.08$ and $0.08$ ).
26. Koestner et al. (2012)	L	105 dyads of friends (210, 0%, 20.19)	FAS	SWB, FQ, Goal progress (WB, R, A)	FQ (5-item scale), SWLS, Goal descriptions and progress ratings	FAS positively correlates with FQ ( $r = 0.60$ ), goal progress ( $r = 0.28$ ), and SWB ( $r = 0.37$ ). FQ positively correlates with SWB ( $r = 0.34$ ). FAS predicts increases in FQ ( $\beta = 0.43$ ), SWB ( $\beta = 0.21$ ), and goal progress ( $\beta = 0.22$ ) 3 months later.
27. Lemay and Clark (2008)	CS	USA (study 1: 96 adults, 15.6%, 34.89; study 2: 86 university students, 38.37%, 21; study 3: 60 pairs of friends, 16.67%, 21; study 4: 96 couples, 50%, 26.5; study 5: 153 adults, 33.33%, 24.63)	Individual's communal responsiveness	SS-Fr, Self-disclosure, Friend's communal responsiveness (R)	Responsiveness (own and friend's), Inventory of Social Supportive Behaviors, SC-Fr-SI, Self-Disclosure Index	Adults' own felt communal responsiveness toward a friend appeared to bias their perceptions of the friend's communal responsiveness ( $r = 0.60$ ), which in turn is associated to own and partner's self-disclosure ( $r = 0.47$ and $0.49$ ), evaluation of the friend ( $r = 0.27$ ), and support provision ( $r = 0.40$ ).
28. Li and Kanazawa (2016)	CS	USA adults (15,197, N/A, 21.96)	SC-Fr	LS (WB)	SC-Fr-SI, LS-SI	Frequency of SC-Fr positively associates with LS ( $\beta = 0.03$ ), when controlling for marital status.
29. Miething et al. (2016)	L	Swedish adults (772, 50.90%, 23)	Friendship network quality (FNQ)	PWB, FNQ (WB, R)	FNQ-SI, PWB (6-item scale)	FNQ correlates with PWB of young adults both for males and females ( $r = 0.15$ and $0.17$ ). FNQ during late adolescence predicts FNQ ( $\beta = 0.37$ for males and $0.30$ for females) and PWB ( $\beta = 0.15$ and $0.17$ , respectively) of young adults.

(Continued)

TABLE 1 (Continued)

References	Study design	Sample ( <i>n</i> , male %, <i>M<sub>age</sub></i> )	Independent variables	Dependent variables (PERMA variable)	Measures	Key statistical results
30. Morelli et al. (2015)	Q	49 dyads of same-sex friends (98, 51%, N/A)	Practical and emotional support	SWB (WB)	Personal diaries	Emotional support is associated to wellbeing levels of the actor during time. Practical support is associated to wellbeing of both friends only when the actor is emotionally engaged.
31. Morry and Kito (2009)	CS	USA university students (253, 42.68%, 19.8)	FQ, FS	Relationship supportive behaviors, Relational self (R)	Relational-Interdependent Self-Construct Scale, MFQ-FF-RA, Self-disclosure (10-item scale), Trust (17-item scale), Relationship Assessment Scale, Liking and loving (26-item scale)	FQ and FS positively correlate with relationship supportive behaviors ( $r = 0.76$ and $0.75$ ) and the tendency to think oneself in terms of relationships with others ( $r = 0.31$ and $0.37$ ).
32. Ratelle et al. (2013)	CS	USA university students (256, 25%, 23)	FAS	SWB (WB)	Learning Climate Questionnaire, SWLS, PANAS	FAS positively correlates with and SWB ( $r = 0.43$ , $\beta = 0.35$ ).
33. Rubin et al. (2016)	L	AU university students (314, 35.67%, 23.4)	SC-Fr, PS	LS (WB)	SC-Fr-SI, DASS, SWLS	SC-Fr predicts LS 6 months later ( $\beta = 0.13$ ).
34. Sanchez et al. (2018)	CS	USA college students (study 1: 273, 30.40%, 19.13; study 2: 368, 32%, 18.90)	FM	H, Compassion (WB, R)	FMS, Compassion Scale, SHS, PANAS	FM correlates with compassion for others and H ( $r = 0.61$ and $0.35$ , respectively) and mediates the relationship of compassion with H ( $\beta = 0.18$ to $0.30$ for men and $0.24$ to $0.29$ for women).
35. Secor et al. (2017)	CS, EXP	USA adults (87, 18.39%, 36.87)	SS-Fr, Negative life events	Positive relationships, Life purpose (R, M)	PSSS-Fr, Impact of Event Scale-R, PWBS	SS-Fr positively associates with positive relationships with others and purpose in life after negative life events ( $r = 0.62$ and $0.39$ , $\beta = 0.52$ and $0.35$ , respectively).
36. Walen and Lachman (2000)	CS	USA adults (3,485, 55%, 49.4)	SS-Fr	LS, PE (WB, PE)	Phone interviews, SS-Fr (4-item scale), LS-SI, PE (6-item scale)	SS-Fr positively associate with LS and PE ( $r = 0.23$ and $0.22$ , $\beta = 0.08$ and $0.14$ , respectively).
37. Weiner and Hannum (2013)	CS	USA university students (142, 28.9%, 19.83)	Distance from friends	SS-Fr (R)	Distance status of friends, Inventory of Socially Supportive Behaviors-Modified	Among geographically closer friends received SS positively correlates with perceived emotional ( $r = 0.32$ ), informational ( $r = 0.33$ ) and instrumental support ( $r = 0.23$ ). Closer best friends provide higher levels of perceived and received SS than long distance friends. Received instrumental SS is affected more by long distance from friends ( $d = 0.78$ ).

(Continued)

TABLE 1 (Continued)

References	Study design	Sample (n, male %, M <sub>age</sub> )	Independent variables	Dependent variables (PERMA variable)	Measures	Key statistical results
38. Weisz and Wood (2005)	L	USA university students (80, 50%, N/A)	Social identity support-Fr; Closeness-Fr	FQ (R)	Social Network, Social Support, Social Identity and Social Identity Support Questionnaires	Closeness with and social identity support by another student during the first year predicts best friendship 4 years later (OR = 1.95 and 3.41, respectively).

CS, cross-sectional; EXP, experimental; L, longitudinal; Q, qualitative; T1, first measurement; T2, second measurement. SI, single item. OR, odds ratio. Friendship variables (measures): FAS, friendship autonomy support; FM, friendship maintenance; FQ, friendship quality (MFQ-FE, McGill Friendship Questionnaire-Friendship Functions); FS, friendship satisfaction; NF, number of friends; PM, perceived mattering (MTOQ, Mattering To Others Questionnaire); PNS, psychological needs satisfaction; PRCA, perceived responses to capitalization attempts; SNS, social network size; SC-Fr, social contact with friends; SS-Fr, social support from friends (PSSS-Fr, Perceived Social Support Scale from Friends). Wellbeing indices (measures): A, accomplishments; E, engagement; H, happiness (SHS, Subjective Happiness Scale); M, meaning in life; LS, life satisfaction (SWLS, Satisfaction With Life Scale); PE, positive emotions (PANAS, Positive and Negative Affect Schedule); PWB, psychological wellbeing; R, positive relationships; SWB, subjective wellbeing; WB, wellbeing.

months to 12 years later (Derdikman-Eiron et al., 2013; Huxhold et al., 2013; Miething et al., 2016; Rubin et al., 2016). Moreover, friends’ support of their partners’ autonomy (Demir et al., 2011a; Koestner et al., 2012; Ratelle et al., 2013), their reactions to partner’s attempts of capitalizing positive experiences (Demir et al., 2013a, 2017), and efforts to maintain the friendship (Demir et al., 2011a) were also found to be positively correlated with wellbeing levels.

Another friendship variable, which was found to be positively associated with wellbeing, is the number of friends (Cable et al., 2012; Helliwell and Huang, 2013). In particular, large and well-integrated friendship networks emerged as a source of wellbeing for adults (Cable et al., 2012). However, no significant associations were found between wellbeing and other friendship variables, such as same gender vs different gender as well as best or close friendships (Demir et al., 2007, 2017).

Finally, six friendship variables were found to mediate the association between adult friendship and wellbeing. These variables are: *maintenance of friendship* (Demir et al., 2011a, 2019; Sanchez et al., 2018), *perceived mattering* (i.e., the psychological tendency to evaluate the self as significant to specific other people, according to Marshall, 2001; see also Demir et al., 2011b, 2012b), *personal sense of uniqueness* (i.e., the tendency to recognize oneself as having distinctive features and to experience worthiness; Demir et al., 2013b), *friendship quality* (Demir et al., 2012b, 2013a, 2017), *satisfaction of basic psychological needs* (Demir and Özdemir, 2010; Demir et al., 2017), and *subjective vitality* (i.e., the conscious experience of possessing energy and aliveness, according to Ryan and Frederick, 1997; see also Akin and Akin, 2015).

3.2. Association between adult friendship and PERMA components

3.2.1. Associations between adult friendship and experiencing positive emotions

Seven studies were identified investigating the relationship between adult friendship and experiencing positive emotions (see Table 1). Almost in all studies PANAS (n = 6, Watson et al., 1988), was used to measure positive emotions. The results are contradictory regarding the relationship between friendship quality and experiencing of positive emotions. Demir et al. (2007) found no significant relationship, while Demir and Weitekamp (2007) found a low positive correlation. On the other hand, support from friends was found to positively associate with positive emotions among Americans and Jordanians but not Iranians (Walen and Lachman, 2000; Brannan et al., 2013) and predict positive emotions six years later among Germans (Huxhold et al., 2013).

Moreover, research showed that friends’ reactions to their partner’s attempts of capitalizing positive events, perceived mattering by the friend, psychological needs’ satisfaction in friendship (Demir and Davidson, 2013), friend’s efforts to maintain the friendship and friendship autonomy support (Demir et al., 2011a) are positively correlated with experiencing of positive emotions. No mediators/moderators of the aforementioned relationships were examined.

### 3.2.2. Associations between adult friendship and engagement

Only one study was identified investigating the relationship between adult friendship variables and engagement in specific activities (see Table 1). In particular, it was found that the number of friends of secondary and high school students predicts engagement levels in community activities during young adulthood (Heck and Fowler, 2007).

### 3.2.3. Associations between adult friendship and building positive relationships

Thirteen studies were identified investigating the associations between adult friendship variables and building positive relationships (see Table 1). The results showed that friendship quality and satisfaction positively correlate to relationship supportive behaviors, the tendency to think oneself in terms of relationships with others (Morry and Kito, 2009) and social skills (Demir et al., 2012a). Also, friendship network quality during late adolescence predicts friendship network quality of young adults (Miething et al., 2016). Moreover, friendship quality predicts received support during adversity and emotional-focused support (Chen et al., 2015).

Similarly, companionship with friends during adolescence predicts support from friends during adulthood (Derdikman-Eiron et al., 2013). Also, time spend with friends significantly correlates to higher levels of social support from others and lower levels of loneliness and social distress (Cyranowski et al., 2013). Furthermore, the existing literature reveals an explicit relationship between social support from friends and positive relationships with others (Secor et al., 2017). Taken together, these findings show that adult friendship is an indicator of a well-developed social life.

In addition, support of friends' autonomy is associated with improved quality of friendship after 3 months (Koestner et al., 2012). Individuals who seek support from their friends develop more solidarity-based relationships in their lives, with which they are more satisfied (Carr and Wilder, 2016). Also, received and perceived social support is stronger among geographically closer friends (Weiner and Hannum, 2013) and these friendship maintenance behaviors associate with higher levels of compassion for others (Sanchez et al., 2018). Young adults, especially, build positive, close, supportive and warm relationships if their friends have supported their social identity when they entered university (Weisz and Wood, 2005). Therefore, it is clear that adult friendship exerts a beneficial influence on the quality of concurrent as well as future relationships.

Finally, there is another interesting finding pointing at the mechanisms which lead to positive friendships. When individuals perceive their friends as generous as themselves in their relationship, they are likely to make efforts to maintain and promote the common bond by increasing support and self-disclosure levels in their friendship (Lemay and Clark, 2008).

### 3.2.4. Associations between adult friendship and meaning in life

Only one study was identified investigating the association between adult friendship variables and sense of meaning in life (see Table 1). In particular, it was found that social support from friends positively associates with purpose in life after negative life events (Secor et al., 2017).

### 3.2.5. Associations between adult friendship and accomplishments

Similarly, only one study found investigating the relationships between friendship variables and accomplishments (see Table 1). This study found that friendship autonomy support predicts increases in goal progress 3 months later (Koestner et al., 2012).

## 3.3. Individual differences on the relationship between adult friendship variables and wellbeing outcomes

Regarding gender differences, contradictory findings emerged for different friendship variables and their relationship with wellbeing indices. More specifically, perceived mattering by a friend was found to associate with experiencing of positive emotions only among women (Demir and Davidson, 2013), while in the relationship of wellbeing with friend's responses to capitalization attempts, friendship quality and friendship maintenance behaviors no gender differences were found (Demir et al., 2017, 2019). Moreover, no differences were found based on friendship ratings, i.e., between the three closest friendships and their associations with wellbeing indices (Demir et al., 2007; Demir and Özdemir, 2010).

Concerning race, the few studies investigating racial differences focused on comparing Americans with samples from Arabic countries, e.g., Jordan, Malaysia, and Turkey. A few interesting findings focus on the role of support from friends and friendship quality on the wellbeing levels of different samples based on race. More specifically, friendship quality associates more strongly with support provision among European Americans than Japanese, and associates with higher levels of attentiveness and companionship among Asian Americans than European Americans (Chen et al., 2015). On the other hand, Demir and colleagues (Demir et al., 2012a,b) found no racial differences on the relationship between friendship quality and wellbeing among Americans with Malaysians and Turkish. Among Americans, however, perceived mattering by a friend mediates the relationship of friendship quality and wellbeing, whilst among Turkish friendship quality mediates the relationship of perceived mattering with wellbeing (Demir et al., 2012b). Also, as regards the relationship of satisfaction by the support from friends and wellbeing, no racial differences were found among black and white women (Griffin et al., 2006). Nevertheless, support from friend was found to associate with wellbeing in an American sample but not in Jordanian and Iranian samples (Brannan et al., 2013).

## 4. Discussion

The purpose of this study was to systematically review the literature regarding the relationship between adult friendship and wellbeing as well as its components. The existing literature was evaluated through the lens of the PERMA theory (Seligman, 2011), which recognizes five pillars of wellbeing: experiencing positive emotions, engagement, positive relationships, sense of meaning in life, and accomplishments.

The literature review showed that, in general, adult friendship is positively correlated with individuals' wellbeing as well as most of its components. It has been documented that friendship is a valuable personal relationship among adults (Demir, 2015), contributes in

various ways to their wellbeing (Pezirkianidis, 2020), enhances their resilience (Mertika et al., 2020; Pezirkianidis, 2020), and fulfills the fundamental human need for social interaction (Lyubomirsky, 2008). However, the instruments used in the previous literature to measure and conceptualize wellbeing significantly vary, i.e., the researchers focus on emotional, psychological, cognitive or subjective aspects of wellbeing making it difficult to draw conclusions and understand the nature of friendships' influences on wellbeing. Also, for particular wellbeing components, the results of the literature review were non-existent, sparse, contradictory or fragmentary, and many were drawn from studies on specific populations.

Concerning the first research question, it was found that the adult friendship variables mostly related to wellbeing are quality of friendship, number of friends, attempts to maintain the friendship, socialization with friends, friends' reactions to partner's attempts to capitalize on positive events, and support from friends (instrumental, emotional or support of autonomy). These findings underlie the importance of studying both qualitative and quantitative dimensions of friendships (Demir and Urberg, 2004; Demir et al., 2007).

As for the second research question, results showed that among the above variables, quality of friendship and socialization with friends predict wellbeing based on longitudinal studies' results. The study of social networks underlines that people's happiness is related to their friends' happiness levels (Fowler and Christakis, 2008; Christakis and Fowler, 2009). Moreover, perceived support from friends, such as companionship, predicts high wellbeing levels more than any other variable (Chau et al., 2010; Forgeard et al., 2011).

In response to the third research question about possible mediators and moderators in the association between adult friendship variables and wellbeing, evidence for moderation was not found. However, six variables were found to mediate this relationship: efforts to maintain the friendship, friendship quality, personal sense of uniqueness, perceived mattering, satisfaction of basic psychological needs, and subjective vitality.

These mediators highlight the possible mechanisms which lead to higher levels of wellbeing. Specifically, when an individual perceives a friend as autonomy supportive, as well as active and constructive responder, *friendship quality* (e.g., intimacy, support, and trust; Demir et al., 2017) and *perceived mattering* increase (Demir et al., 2012b). As a result of these positive friendship experiences, individuals satisfy their *basic psychological needs* (Demir and Özdemir, 2010), realize their *unique* attributes and create a positive self-image (Demir et al., 2013b); therefore, they are likely to engage in *maintenance* behaviors in order to reinforce the resilience and continuity of the friendship (Demir et al., 2011a, 2019). This procedure is enhanced when the individual experiences high levels of energy and *vitality* (Akin and Akin, 2015). Despite the aforementioned findings, further research on mediating and possible moderating effects is clearly needed.

The fourth research question focused on individual differences regarding the associations between adult friendship and wellbeing. The present study found limited differences based on gender and friendship ratings. Previous studies showed significant gender differences concerning friendship functions, but it seems that friendships are equally important for males' and females' wellbeing and prosperity (Christakis and Chalatzis, 2010; Marion et al., 2013). However, significant racial differences were found between samples of completely different cultures, such as Americans and Arabs or

Americans and Japanese. More studies needed to shed light on the racial differences between samples of other cultures as well.

The fifth research question focused on whether adult friendship variables can predict specific components of wellbeing on the basis of the PERMA theory (Seligman, 2011). Regarding adult friendship variables and experiencing positive emotions, it was found that friendship quality, support from friends, perceived mattering by friends and satisfaction of the basic psychological needs by a friend significantly and positively associate with experiencing positive emotions. These findings add to the existing knowledge that positive relationships are emotionally rich and a source of great joy for humans (Ryff, 2014). Studies on social networks have shown that positive emotions are "contagious" and are transmitted among friends (Hill et al., 2010; Coviello et al., 2014). Findings about social support show that when friends interact within a positive emotional atmosphere, their experience broadens and this, in turn, activates an upward spiral which evokes even more positive emotions. In this context, partners enrich their interpersonal resources, such as social support, trust, compassion, perceived positive social connections (Kok et al., 2013), and other friendship qualities that are beneficial for physical and mental health (Garland et al., 2010).

According to the PERMA theory, another nuclear component of wellbeing is building positive relationships. The findings of this literature review showed that adult friendship quality and socialization with friends are associated with higher levels of quality and perceived support on every relationship in individuals' lives. Adult friendship is associated with a developed social life, but also with better and more positive relationships. According to Fowler and Christakis (2008), integrating individuals in support networks provides them with the necessary resources to successfully deal with the adverse effects of loneliness. Support from friends, in particular, has been found to lead to higher levels of engagement and satisfaction from different types of relationships, such as romantic and familial ones (Rodrigues et al., 2017). Finally, Weisz and Wood (2005) pointed out that support and appraisal from friends increase satisfaction with friendship as well as its resilience.

Research findings on the relationship of adult friendship with the other three components of wellbeing are limited. Number of friends was found to be related with engagement to community activities, support from friends was found to associate with meaning in life and accomplishments. Relationships with others and the sense of belonging to a network of relationships are one of the main sources of meaning in people's lives (Sørensen et al., 2019; Zhang et al., 2019) and, thus, create a sense of direction in life and intrinsic motivation to set goals and achieve them (Chalofsky and Krishna, 2009; Weinstein et al., 2013).

## 4.1. Gaps and limitations of the existing literature

The research literature on the associations between adult friendship, wellbeing and its components is currently growing but is also characterized by gaps and limitations which need to be addressed.



First, existing literature focuses on the quality of friendship as a whole rather than on its specific characteristics and functions in relation to wellbeing. In addition, only a few studies used a longitudinal design or were conducted with pairs of friends. Existing longitudinal studies do not focus on the effects of friendship, but rather study it only secondarily and often with a single-item measure. To add more, research has focused on the relationship between adult friendship and one-dimensional wellbeing indices, such as happiness and life satisfaction. No attempt has been made to construct a comprehensive theoretical model in order to account for the effects of adult friendship variables on specific components of wellbeing. Furthermore, most studies have been conducted in university student samples, a fact that limits the generalizability of the results to different age groups. The above gaps regarding the association between adult friendship and wellbeing are in accordance with some previous attempts to map this research field (Demir, 2015). In conclusion, future studies should address all these gaps and limitations, not only in the general population but also in various population subgroups and cultural contexts.

## 4.2. Contribution and practical implications of this study

This literature review has clear clinical and social implications. Counselors, psychologists, coaches, social workers, and educators working in clinical, educational, or work settings could utilize the results of this study in order to design interventions for promoting adult friendships. For example, one of the main goals of positive education in childhood and adolescence is to develop skills for building high-quality friendships. Similar efforts could be made in the university context for promoting students' mental health (Bott et al., 2017). In the workplace, building positive relationships and new friendships between employees could be a priority and lead to higher job satisfaction, engagement and productivity (Donaldson et al., 2019). In addition, during counseling or psychotherapy sessions, mental health professionals could use the information provided by this literature review to enhance their clients' supportive environment, experiencing positive emotions and meaning in life and, consequently, strengthen their resilience (Rashid and Baddar, 2019). At the macro level, efforts to build positive friendships and supportive connections between individuals could lead to better and happier citizens, therefore to happier societies (Oishi, 2012).

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## 4.3. Conclusions

This study presented a systematic review of research on how adult friendships contribute to wellbeing as well as its components. Although individuals could reap the benefits of friendship from other social sources as well, it became evident that friendship is a special type of relationship, with a unique contribution to wellbeing. As a result, friendships have survived through the years and, in our days, are considered as vital to psychological flourishing (Wrzus et al., 2017). As Anderson and Fowers (2020) have argued, the most significant contribution of friendship to peoples' lives is the initiation and acceleration of the processes from which wellbeing emerges.

## Data availability statement

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

## Author contributions

CP designed the study, conducted the review and the analyses, and wrote the research article. EG wrote and revised the writing of the article. GR wrote parts of the research article. DM revised the writing of the article. AS supervised all stages of the research procedure. All authors contributed to the article and approved the submitted version.

## 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.

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