



Self-compassion, Mindfulness, Stress, and Self-esteem Among Vietnamese University Students: Psychological Well-being and Positive Emotion as Mediators

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Abstract

Objectives Theory and prior research suggest that improving self-esteem is a promising way to improve students' academic performance and mental health. This study empirically examines the mediating effect of psychological well-being and positive emotion in the relationships between self-compassion, mindfulness, stress, and self-esteem.

Methods An explanatory sequential mixed-method design was employed. Quantitative data collected through a two-wave survey from 654 Vietnamese students were analyzed to test the hypotheses using SPSS 22.0 and AMOS 24.0. Data from 19 in-depth interviews were used to explain the quantitative findings and explore students' experiences in practicing mindfulness and self-compassion.

Results Findings revealed that psychological well-being and positive emotion fully mediated the relationships between self-compassion, mindfulness, stress, and self-esteem.

Conclusions Results of this study highlight the importance of psychological well-being and positive emotion in the self-compassion, mindfulness, stress, and self-esteem relationship, as well as explain a possible process by which factors help university students achieve and sustain a sense of high self-esteem. Ultimately, this study has identified several potential targets for intervention strategies in mental health, such as mindfulness and self-compassion among university students.

Keywords Self-compassion · Mindfulness · Stress · Positive emotion · Psychological well-being · Self-esteem

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Many universities have implemented self-esteem bolstering programs in an attempt to enhance school performance and mental health (Forsyth et al., 2007). Students with high self-esteem may endeavor to improve their academic performance to sustain their sense of self-worth (Rosenberg, 1979). Positive self-esteem enables students to set high goals and have confidence in coping with failure, which contributes to better school performance (Di Paula & Campbell, 2002). Correlational studies implicate low self-esteem in a host of academic and social problems, including a variety of self-handicapping behaviors (i.e., procrastination) (Brown & Dutton, 1995), poor school achievement (Forsyth et al., 2007), and social difficulties (i.e., substance abuse, aggression, and friendship problems) (Crocker & Luhtanen, 2003). More importantly, William James, one of the founding fathers of Western psychology, considered self-esteem an important aspect of mental health (Neff, 2011). A study argues that self-esteem programs are a primary way of encouraging positive self-attitudes (Neff et al., 2005) and

acting as a buffer against anxiety and death-related thoughts (Pyszczynski et al., 2004).

Global self-esteem is defined as an individual's positive or negative evaluation/attitude of the self as a totality (Rosenberg, 2015). It describes an individual's self-competence and self-liking (Tafarodi & Milne, 2002). The former is defined as "the valuative experience of oneself as a causal agent, and intentional being with efficacy and power" while the latter is conceptualized as "the valuative experience of oneself as a social object, a good or bad person according to internalized criteria for worth" (Tafarodi & Milne, 2002, p. 444). Recent research suggests that a high level of self-compassion and mindfulness could correlate with students' psychological well-being and positive emotion (Alirezaee et al., 2021; Arslan & Asıcı, 2021; MacDonald & Baxter, 2017; Moussa et al., 2022; Smit & Stavroulaki, 2021; Tran et al., 2021; Zhu et al., 2019) which help students in having a good global self-esteem (Gomez-Baya et al., 2018; Sarkova et al., 2014). In contrast, students' perceived stress is associated with students' low levels of psychological well-being and positive emotion (Cho et al., 2021; Labrague, 2021). Furthermore, trait anxiety exerts a negative effect on self-esteem (Benetti & Kambouropoulos, 2006).

Despite an abundance of studies on the abovementioned variables (i.e., self-compassion, mindfulness, stress, psychological well-being, positive emotion, and self-esteem), surprisingly, in the student setting, empirical research on the mediating mechanisms of psychological well-being and positive emotion in the relationships between self-compassion, mindfulness, and stress and self-esteem remains under-investigated. Previous research has provided initial evidence on the vital role of self-esteem in encouraging individuals' positive self-attitudes, maintaining individuals' mental health, and enhancing students' academic performance. Earlier studies have also shed light on the direct influences of (1) self-compassion, mindfulness, or stress on students' psychological well-being or positive emotion (Arslan & Asıcı, 2021; Choi et al., 2014; Hall et al., 2013; Labrague, 2021; Liao & Wei, 2014; Wang et al., 2016); (2) stress and anxiety on self-esteem (Hubbs et al., 2012; Zuckerman, 1989); and (3) psychological well-being and positive emotion on self-esteem (Gomez-Baya et al., 2018; Sarkova et al., 2014). However, the mechanisms underlying the influence of self-compassion, mindfulness, and stress on individuals' self-esteem is still unclear and underdetermined in the existing literature. Therefore, scholars have called for more research to clarify factors that may intervene in the relationships between self-compassion, mindfulness, stress, and self-esteem (see Claudat et al., 2016; Randal et al., 2015). One meaningful research direction is to develop and validate mediation and moderation models that explain the underlying mechanisms through which various factors affect self-esteem (see Crocker & Park, 2003).

In western context, self-compassion is conceptualized as comprising three main behaviors: forgiving oneself for failures and mistakes, acknowledging that suffering is a common part of the human condition, and believing that oneself and others are deserving of compassion and understanding (Neff, 2003a). Accordingly, self-compassion can, among others, increase psychological well-being, life satisfaction, behavioral motivation, and self-regulation in terms of coping with stress during difficult times (Neff, 2003a). Particularly, several studies have drawn attention to the positive relationship between self-compassion and psychological well-being (Hall et al., 2013; Saricaoglu & Arslan, 2013; Sun et al., 2016; Tran et al., 2021). Concretely, according to Hall et al. (2013), three main components of self-compassion, including self-kindness, common humanity, and mindfulness, positively correlate with psychological well-being. Sun et al. (2016) conducted different analyses on male and female adolescents and indicated that mindfulness as a dimension of self-compassion maximally facilitates the psychological well-being of male adolescents while common humanity positively affects the psychological well-being of female adolescents. More importantly, self-compassion is a significant predictor of autonomy, environmental mastery, purpose in life, and self-acceptance as sub-scales of psychological well-being (Saricaoglu & Arslan, 2013).

On the other hand, self-compassion enhances positive emotions (e.g., Alirezaee et al., 2021; Ellsworth, 2018; Karakasidou et al., 2021; Krieger et al., 2015). Indeed, Alirezaee et al. (2021) implied that self-compassion training can be regarded as a high capability method to increase positive emotions and decrease negative ones among students. In this sense, self-compassion is employed as a unique resilience factor in enhancing positive emotions in patients with chronic pain (Ellsworth, 2018). Similarly, in the sample of non-clinical participants, higher levels of self-compassion were correlated with less negative emotions, higher positive emotions, and less stress reactivity in daily life (Krieger et al., 2015).

Mindfulness is often defined as the state of awareness and attention to the present moment (Brown & Ryan, 2003; Kabat-Zinn, 1982; Phan et al., 2020). The positive impacts of mindfulness have been empirically shown in many studies: for example, sleep enhancement (Ding et al., 2020), improvements in mental health (Klainin-Yobas et al., 2016), better life quality (Bazzano, 2018), and psychological well-being (Zimmaro et al., 2016). Additionally, mindfulness was shown to reduce depression, anxiety, trauma (Tubbs, 2018), and symptoms of stress (Zimmaro et al., 2016). In the medical field, mindfulness is promoted to facilitate healthy behaviors and reduce the impacts of physical illness (Greeson & Gabrielle, 2018). Previous research has shown that mindfulness disposition is associated with better psychological

well-being (Arslan & Asıcı, 2021; Huang et al., 2021; MacDonald & Baxter, 2017; Zimmaro et al., 2016). For example, students who pay close attention to and awareness of the present moment show high psychological well-being (Zimmaro et al., 2016). In this sense, college students with higher levels of mindfulness show higher psychological well-being, which is explained by lower thought suppression, fewer difficulties with emotion regulation (MacDonald & Baxter, 2017), and better solution-focused thinking (Arslan & Asıcı, 2021). Equally, mindfulness disposition has been shown to help college students attenuate the effects of negative life experiences on psychological well-being (Huang et al., 2021).

At the same time, both mindfulness disposition and mindfulness training facilitate the experience of positive emotions (Wang et al., 2016; Zhu et al., 2019). Indeed, among a sample of college students, Wang et al. (2016) found that mindfulness disposition may play a role in enhancing positive emotions through the ability to generate positive emotions, which is one aspect of emotional resilience. Similarly, in comparison with medical students who participated in a 10-week mindfulness-based stress reduction seminar, control groups witness elevated levels of negative emotions (Rosenzweig et al., 2003). In a similar vein, after a mindfulness-based intervention, positive emotions were at considerably higher levels among 43 university students (Chang et al., 2004). Zhu et al. (2019) also showed that mindfulness practice may protect against increased fatigue by assisting participants in cultivating open and inquiring attitudes towards present-moment experience, lowering emotional resistance (Zhu et al., 2019), responsiveness to present feelings (Campbell et al., 2012), and disengagement from a cognitive process linked to increased work-related fatigue (Deyo et al., 2009), which can significantly improve students' positive emotion.

Stress that university students undoubtedly experience includes academic challenges, financial concerns, and social strains (Skowron et al., 2004). Indeed, COVID-19 has brought a high level of stress to students, and increased levels of stress are shown to be correlated with poorer psychological well-being (Labrague, 2021). This finding is also in accordance with Tan et al. (2021), who suggested that environmental stress due to COVID-19 led to a decrease in the psychological well-being of students, especially a decrease in autonomy and self-acceptance. Besides, stress is negatively associated with positive emotion (Cho et al., 2021; Liao & Wei, 2014; Zhang et al., 2021). For instance, Chinese international students with high academic stress report a lower level of positive affect, which is strengthened by higher levels of the contingency of self-worth on academic competence (Liao & Wei, 2014). In a similar vein, the empirical evidence in the study of Cho et al. (2021) found that highly stressed university students endorse lower

levels of positive emotion, which in turn affects their life satisfaction.

Psychological well-being encompasses six different dimensions, namely, self-acceptance, personal growth, purpose in life, positive relations with others, environmental mastery, and autonomy (Ryff, 1989). At the same time, psychological well-being is defined as “the fulfillment of human potential and a meaningful life” (Chen et al., 2013, p. 1034). Another research has indicated that psychological well-being is positively associated with individual functioning (e.g., hedonic well-being and biological health) and negatively related to maladaptive functioning (Ryff & Singer, 1996). In other words, the correlation between self-esteem and psychological well-being is significant (Dogan et al., 2013; Isiklar, 2012; Sarkova et al., 2014). Specifically, Isiklar (2012) revealed a positive association between the self-acceptance component of psychological well-being and self-esteem in a sample of 382 university students in Turkey. Equally, Dogan et al. (2013) found that there are positive and significant relationships between psychological well-being and self-esteem among 340 Turkish students. Another study on a sample of 3694 students indicated that psychological well-being and self-esteem are significantly related statistically (Sarkova et al., 2014). Together, when individuals are exposed to these relationships, there could be a reduction in problematic behaviors (e.g., aggressive behavior, and excessive alcohol consumption) (Goldstein et al., 2005; Isiklar, 2012; Patterson et al., 2000; Sarkova et al., 2014).

Positive emotion refers to “one’s level of pleasurable engagement with the environment” and includes feelings such as “good,” “positive,” “pleasant,” “joy,” “happy,” and “contented” (Clark et al., 1989; Diener et al., 2010). A large body of literature has shown the beneficial impacts of positive emotion on physical and mental health (Seligman et al., 2005) and accomplishment (Lyubomirsky et al., 2005). Evidence also suggests the benefits of positive emotion on well-being via the decrease of the stress response, including less severe, shorter responses to stress (Ong et al., 2006) and quicker emotional recovery from stressful experiences (Ong et al., 2006; Tugade & Fredrickson, 2004). Along the same lines, research shows that the increased presence of positive emotion tends to benefit global self-esteem (Benetti & Kambouropoulos, 2006; Gomez-Baya et al., 2018). In a longitudinal study, Gomez-Baya et al. (2018) particularly examined the correlations between responses to positive affect (i.e., emotion-focused positive savoring, self-focused positive savoring, dampening) and self-esteem in a sample of 997 adolescents. The results indicate that both types of positive savoring show a positive correlation with self-esteem while dampening is negatively associated with self-esteem (Gomez-Baya et al., 2018). Benetti and Kambouropoulos (2006) also revealed that positive emotion predicts self-esteem, which is significantly influenced by

trait anxiety and trait resilience among young adults from the university campus and the general population.

More importantly, Monitor and Acceptance Theory (MAT) posits two components: (1) continuous awareness of perceptual and sensory experiences in the present moment (i.e., attention monitoring) and (2) a nonjudgmental, open, and receptive attitude towards external and internal occurrences (i.e., acceptance) (Lindsay & Creswell, 2017). MAT views both attention monitoring and acceptance as a stimulus for reducing clinical symptoms and psychological stress and improving affective outcomes (Lindsay & Creswell, 2017). These two components are the core mechanisms across many mindfulness measures and definitions (see Bishop et al., 2004; Quaglia et al., 2015), and their effects are necessary for psychological well-being (Brown & Ryan, 2003) and positive emotion (Lindsay et al., 2018). Additionally, self-compassion that comprises mindfulness (Neff, 2003a) facilitates psychological well-being (Neff et al., 2007) and stimulates positive emotions by embracing negative ones (Barlow et al., 2017; Neff, 2003b). Empirical evidence on the mediating roles of positive emotion and psychological well-being in the student context, however, is still lacking. In the present study, we hypothesized that psychological well-being will play a positive mediating role in the relationship between self-compassion and global self-esteem (hypothesis 1), positive emotion will play a positive mediating role in the association between self-compassion and global self-esteem (hypothesis 2), psychological well-being will play a positive mediating role in the relationship between mindfulness and global self-esteem (hypothesis 3), positive emotion will play a positive mediating role in the association between mindfulness and global self-esteem (hypothesis 4), psychological well-being will play a negative mediating role in the relationship between stress and global self-esteem (hypothesis 5), and positive emotion will play a negative mediating role in the association between stress and global self-esteem (hypothesis 6). In other terms, the mediation effects of the two mediators (i.e., psychological well-being and positive emotion) from self-compassion as well as mindfulness to self-esteem will be significantly positive. However, the mediation effects of the two mediators (i.e., psychological well-being and positive emotion) from stress to self-esteem will be negative and significant. Our proposed research model is presented in Fig. 1.

Method

Participants

A total of 654 Vietnamese students from ten universities in the South of Vietnam participated in the quantitative study from April to July 2021. The mean age of the participants

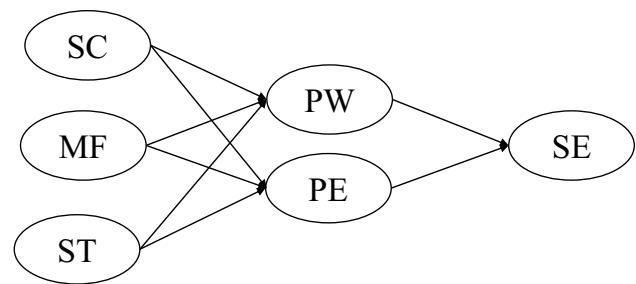


Fig. 1 Proposed research model. Note: SC, self-compassion; MF, mindfulness; ST, stress; PW, psychological well-being; PE, positive emotion; SE, self-esteem

was 19.38 years ($SD=2.13$), with a range from 18 to 32. There were 178 males (27.2%) and 476 females (72.8%). Regarding the university year, there were 290 freshmen (44.3%), 158 sophomores (24.2%), 103 third-year students (15.7%), 77 fourth-year students (11.8%), 10 fifth-year students (1.5%), and 16 sixth-year students (2.4%). In terms of religion, 439 participants reported no religious affiliation (67.1%), 150 identified as Buddhist (22.9%), 44 as Christian (6.7%), and 21 participants had other religious affiliations (3.2%).

Procedures

We employed a sequential mixed-method design combining an initial quantitative phase and a follow-up qualitative phase (Creswell & Creswell, 2017). To test the hypotheses, the quantitative data were collected online. The Research Ethics Committee of the first author's university reviewed and approved this study. Before filling in the questionnaire, participants provided informed consent. The questionnaires included demographic information, mindfulness, self-compassion, stress, psychological well-being, positive emotion, and self-esteem. Students took on average 40 min to complete all the questions.

In order to mitigate common method bias in behavioral research, a two-wave survey was implemented (Podsakoff et al., 2003). The two-wave data were matched using a code given to each participant. The multiple-wave data collection method via a longitudinal study during the pandemic has also been utilized in previous studies (e.g., Tran et al., 2022; Vo-Thanh et al., 2021, 2022; Vu et al., 2022; Wu et al., 2022). In wave 1, participants were asked to indicate their demographic information, emails, and university year, as well as independent and dependent variables (i.e., self-compassion, mindfulness, stress, and self-esteem) scores. After wave 1, we got 715 complete responses. After 4 weeks, the participants from wave 1 were invited to participate in wave 2. In wave 2,

the mediators (i.e., psychological well-being and positive emotion) were evaluated. After wave 2, sample data of 654 valid responses were used for further analysis.

For the qualitative phase, semi-structured in-depth interviews were carried out with 19 students. To select the most qualified interviewees for the qualitative phase, based on Teddlie and Tashakkori (2009) and Vo-Thanh et al. (2022), respondents were asked to indicate whether they have already practiced mindfulness or self-compassion and are willing to participate in the qualitative phase when filling out the questionnaire. Those who have practiced mindfulness or self-compassion and accepted to participate in the qualitative study were invited to do so. According to Teddlie and Tashakkori (2009) and Vo-Thanh et al. (2022), quota sampling was also used to select interviewees from the quantitative sample using three criteria: age, gender, and university year. Furthermore, following Braun and Clarke (2021), we determined the qualitative sample size using the semantic saturation criterion (Table 3). Each interview lasted between 45 and 60 min.

Measures

Self-esteem

The Rosenberg Self-Esteem Scale (Rosenberg, 1979) is a 10-item measure of an individual's self-esteem. In the questionnaire, items 1, 3, 4, 7, and 10 are positive, such as "On the whole, I am satisfied with myself." Items 2, 5, 6, 8, and 9 are negative, such as "At times I think I am no good at all." The items are rated on a 4-point Likert scale from 1 (strongly disagree) to 4 (strongly agree), so a higher score shows greater self-esteem. The current study reported a Cronbach's alpha of 0.80 for this scale, and a McDonald's omega of 0.81.

Psychological Well-being

The World Health Organization Well-Being Index (WHO-5) (Topp et al., 2015) provides a generic look into an individual's subjective psychological well-being over the past 14 days. The WHO-5 consists of 5 items, such as "I have felt cheerful and in good spirits." The response options are from "All of the time" (5) to "At no time" (0), ranging from absence of well-being (0) to maximal well-being (25). The WHO-5 is appropriate for Vietnamese students, and its reliability is good (Tran et al., 2021). In the present study, Cronbach's alpha score is 0.92 and McDonald's omega score is 0.92.

Positive Emotion

The Scale of Positive Experience (PE) (Diener et al., 2010) is a 6-item measure of an individual's positive emotions over the past 4 weeks. The scale assesses its full range of positive feelings, including "good," "positive," "pleasant," "joy," "happy," and "contented." Each item is scored on a 5-point rating scale from 1 (very rarely or never) to 5 (very often or always). The current study reported a Cronbach's alpha of 0.91, and a McDonald's omega of .91.

Self-compassion

The Self-Compassion Scale (SCS) (Neff, 2003a, 2003b) is a 26-item measure of an individual's self-compassion and includes six subscales including self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. The Vietnamese version of SCS has shown good psychometric properties in the Vietnamese population (Nguyen et al., 2020; Tran et al., 2021, 2022). The Cronbach's alpha of the scale was 0.85, and McDonald's omega was 0.77.

Mindfulness

The Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003) provides a detailed look into an individual's attention and awareness of present experiences and events. The MAAS consists of 15 items, such as "I could be experiencing some emotion and not be conscious of it until sometime later." The items are rated on a 6-point Likert scale from 1 (almost always) to 6 (almost never), so a higher score indicates greater mindfulness. In the present study, Cronbach's alpha was 0.87 for the scale and McDonald's omega was 0.86. The MAAS was applied to the Vietnamese population by previous research, and its reliability and validity were very good (e.g., Vu et al., 2022).

Stress

The Perceived Stress Scale (PSS) (Cohen et al., 1994) is a 10-item measure of an individual's perceived stress towards situations and events that occurred a month ago. Each item is scored on a 4-point rating scale from 0 (never) to 4 (very often). A higher score, therefore, shows greater stress. The Vietnamese version of PSS has shown good psychometric properties in the Vietnamese population (Dao et al., 2017). The Cronbach's alpha was 0.82, and McDonald's omega was .70.

Data Analyses

For the quantitative data analyses, we used SPSS 22.0 and AMOS 24.0. AMOS 24.0 was used to evaluate structural equation models (SEM). First, descriptive statistics were conducted. Second, correlation analysis, distribution test, common method bias test, multicollinearity test, and measurement model evaluation were performed. Following Hair et al. (2010), we used indexes to assess the goodness of fit of the measurement model, including $\chi^2/df < 3$, RMSEA < 0.08 , CFI > 0.90 , TLI > 0.90 , GFI > 0.90 , and SRMR < 0.08 . Finally, SEM was evaluated.

For the qualitative data analyses, two of the researchers conducted a thematic content analysis using the QSR NVivo software. To ensure reliability and validity, they coded the first two interviews jointly to ensure method consistency and then worked independently on the remaining corpus, rigorously adhering to the multiple encoding procedure (Miles et al., 2018; Tran et al., 2022; Vo-Thanh & Kirova, 2018). The results were then compared using the query function for coding comparison (Vo-Thanh & Kirova, 2018). Afterwards, the two researchers discussed the contradictions in order to establish a consensus. The findings of the qualitative investigation were used to enrich the discussion section. Some key questions included “How can mindfulness or self-compassion help enhance mental health?”; “How do you feel about mindfulness or self-compassion practices?”; “How do you feel before practicing mindfulness and after practicing mindfulness?”; “How do practices of mindfulness or self-compassion assist you in balancing your emotions?”.

Results

Common Method Bias and Multicollinearity

Although we used some procedural solutions (i.e., a two-wave survey, the use of closed-ended questions, and a consent form), common method bias may not fully be

eliminated. As a result, statistical solutions were conducted as recommended by Podsakoff et al. (2003). In this regard, Harman’s single-factor test was used to determine any common method bias. The results indicate that the first factor accounted for 15% of the total explained variance only, which is inferior to 40%, indicating the absence of concern about common method bias (Aguirre-Urreta & Hu, 2019). Moreover, following Kock (2015), a full collinearity test on the common method variance was performed. The results show that all variance inflation factor values ranged from 1.45 to 2.54, which is inferior to 3.33, suggesting that multicollinearity was not a problem in this study.

Correlation Analysis

Table 1 summarizes the correlations between variables in the research model. Self-esteem positively correlated with self-compassion ($r = 0.71, p < 0.01$), psychological well-being ($r = 0.40, p < 0.01$), and mindfulness ($r = 0.12, p < 0.01$), and negatively correlated with stress ($r = -0.58, p < 0.01$). Self-compassion was positively related to psychological well-being ($r = 0.39, p < 0.01$), mindfulness ($r = 0.13, p < 0.01$), and positive emotion ($r = 0.48, p < 0.01$), and negatively related to stress ($r = -0.66, p < 0.01$). Psychological well-being positively correlated with mindfulness ($r = 0.22, p < 0.01$) and positive emotion ($r = 0.24, p < 0.01$), and negatively correlated with stress ($r = -0.33, p < 0.01$). Mindfulness positively correlated with position emotion ($r = 0.24, p < 0.01$) and negatively correlated with stress ($r = -0.08, p < 0.01$). Finally, positive emotion was negatively related to stress ($r = -0.44, p < 0.01$).

Measurement Model

Confirmatory factor analysis was used to test the data fit of the measurement model. This model included six latent variables (self-compassion, mindfulness, stress, psychological well-being, positive emotion, and self-esteem), and it showed a good data fit: $\chi^2(29) = 74.58 (p < 0.001)$, $\chi^2/df = 2.57$, CFI = 0.97, TLI = 0.96, GFI = 0.92, RMSEA = 0.05, 90%

Table 1 Means, standardize deviations, and correlations

Variables	Mean	SD	1	2	3	4	5	6
1. SE	27.42	5.72	1					
2. SC	81.06	13.26	.71**	1				
3. PW	13.69	5.72	.40**	.39**	1			
4. MF	50.36	12.93	.12**	.13**	.22**	1		
5. PE	20.23	5.00	.48**	.48**	.65**	.24**	1	
6. ST	21.03	6.33	-.58**	-.66**	-.33**	-.08**	-.44**	1

SC self-compassion, MF mindfulness, ST stress, PW psychological well-being, PE positive emotion, SE self-esteem

** $p < .01$

CI=[0.04, 0.07]), SRMR=0.04. All factor loadings for the indicators of the latent variables were significant ($p < 0.001$), indicating that all latent factors were well represented by their respective indicators.

Structural Equation Model Evaluation

We examined the model fit. To that end, we tested 4 models. Model 1 considered both self-compassion (SC), mindfulness (MF), and stress (ST) to be mediators; psychological well-being (PW) and positive emotion (PE) to be independent variables; and self-esteem (SE) to be the outcome. The results showed the following indexes: $\chi^2(6) = 49.972$, $p < 0.001$, $\chi^2/df = 7.50$, CFI=0.97, GFI=0.98, TLI=0.93, RMSEA = 0.10, 90% CI = [0.074, 0.12], SRMR = 0.03. Model 2 (SE: independent variable; PW and PE: mediators; and SC, MF, and ST: dependents). The results indicated the following indexes: $\chi^2(4) = 273.85$, $p < 0.001$, $\chi^2/df = 6.89$, CFI = 0.82, GFI = 0.81, TLI = 0.32, RMSEA = 0.32, 90% CI = [0.29, 0.35]), SRMR = 0.12. Model 3 (SE: independent variable and other five variables: outcomes). The results revealed the following indexes: $\chi^2(8) = 84.229$, $p < 0.001$, $\chi^2/df = 10.52$, GFI = 0.96, CFI = 0.95, TLI = 0.90, RMSEA = 0.12, 90% CI = [0.10, 0.14]), SRMR = 0.08. Model 4 (SC, MF, and ST: independent variables; PW and PE: mediators; and SE: outcome). The results showed a good data fit: $\chi^2(38) = 113.79$, $p < 0.001$, $\chi^2/df = 2.99$, GFI = 0.96, CFI = 0.95, TLI = 0.93, RMSEA = 0.06, 90% CI = [0.05, 0.07]), SRMR = 0.04. Compared to the first three models, model 4 is the best in terms of data fit. Thus, the proposed research model (model 4) was selected. It was, therefore, employed to test the hypotheses using the SEM approach.

Results of Hypotheses Testing

The results of SEM are shown in Table 2. SC was positively associated with PW ($\beta = 0.27$, $p < 0.05$, 95% CI = [0.169, 0.363]), which in turn was positively related to SE ($\beta = 0.07$, $p = 0.05$, 95% CI = [0.012, 0.123]). In addition, SC was positively associated with PE ($\beta = 0.31$, $p < 0.05$, 95% CI = [0.238, 0.410]), which in turn was positively related to SE ($\beta = 0.12$, $p < 0.05$, 95% CI = [0.061, 0.181]). Similarly, MF was positively associated with PE ($\beta = 0.18$, $p < 0.05$, 95% CI = [0.098, 0.244]) and PW ($\beta = 0.17$, $p < 0.05$, 95% CI = [0.097, 0.232]). However, ST negatively influenced PE ($\beta = -0.22$, $p < 0.05$, 95% CI = [-0.301, -0.138]) and PW ($\beta = -0.14$, $p < 0.05$, 95% CI = [-0.220, -0.051]).

The indirect effect of the path SC → PW → SE was significant positively ($\beta = 0.02$, $p < 0.05$, 95% CI = [0.005, 0.047]), supporting hypothesis 1. The indirect effect of the path SC → PE → SE was significant positively ($\beta = 0.04$, $p < 0.01$, 95% CI = [0.020, 0.064]), supporting hypothesis 2.

Table 2 Direct and indirect effects

Variables	Standardized estimates	95% CI		p
		Lower	Upper	
Direct effects				
SC → PW	.27	.169	.363	.013
MF → PW	.17	.097	.232	.013
ST → PW	-.14	-.220	-.051	.014
SC → PE	.31	.238	.410	.005
MF → PE	.18	.098	.244	.016
ST → PE	-.22	-.301	-.138	.016
PW → SE	.07	.012	.123	.050
PE → SE	.12	.061	.181	.015
Indirect effects				
SC → PW → SE	.02	.005	.047	.027
SC → PE → SE	.04	.020	.064	.008
MF → PW → SE	.01	.002	.025	.033
MF → PE → SE	.02	.010	.036	.012
ST → PW → SE	-.01	-.020	-.001	.048
ST → PE → SE	-.03	-.046	-.012	.012

SC self-compassion, MF mindfulness, ST stress, PW psychological well-being, PE positive emotion, SE self-esteem

The indirect effect of the path MF → PW → SE was significant positively ($\beta = 0.01$, $p < 0.05$, 95% CI = [0.002, 0.025]), confirming hypothesis 3. The indirect effect of the path MF → PE → SE was significant positively ($\beta = 0.02$, $p < 0.05$, 95% CI = [0.010, 0.036]), confirming hypothesis 4. ST had a negative influence on SE through PW ($\beta = -0.01$, $p < 0.05$, 95% CI = [-0.020, -0.001]), validating hypothesis 5. Finally, ST exerted a negative effect on SE via PE ($\beta = -0.03$, $p < 0.05$, 95% CI = [-0.046, -0.012]), validating hypothesis 6.

Qualitative Results

Qualitative findings indicated that psychological well-being and positive emotion play a mediator role in the connections between self-compassion, mindfulness, stress, and self-esteem (Table 3). The qualitative results showed that when a third-year student practiced mindfulness, she felt pleasant and had an interesting daily life. She stated that:

“By practicing mindfulness, I can change my breathing rhythm, which makes falling asleep simpler and results in better sleep. Psychologically, I experience less stress, more developed emotional thinking, increased attention, and decreased pressure in my studies and personal life. In summary, my performance at work has improved, and I feel my life has been more meaningful.” [H3].

Table 3 Interviewees' characteristics

No	ID	Gender	Age	University year
1	H1	Female	18	First year
2	H2	Female	18	First year
3	H3	Female	20	Third year
4	H4	Female	20	Third year
5	H5	Female	19	Second year
6	H6	Female	19	Second year
7	H7	Female	19	Second year
8	H8	Female	23	Fifth year
9	H9	Male	20	Third year
10	H10	Female	18	First year
11	H11	Male	18	First year
12	H12	Female	18	First year
13	H13	Female	19	Second year
14	H14	Female	21	Fourth year
15	H15	Male	18	First year
16	H16	Female	18	First year
17	H17	Female	24	Sixth year
18	H18	Male	22	Fourth year
19	H19	Male	19	Second year

For H2, for a first-year student, even though she felt stressed, mindfulness practices have helped her improve her stress and mental health. She stated that:

More at ease, particularly after the stress period. Every day I practice mindfulness, I feel at ease, and my mental health has been enhanced. [H2].

For instance, to help students concentrate on essential tasks and adapt to stressful events (i.e., the impact of COVID-19 on students' academic performance and mental health), they can organize webinars on mindfulness-based stress reduction or mindful self-compassion programs.

“By practicing mindfulness and self-compassion, I can increase my awareness of the present moment, my actions and words, assisting me in returning to reality rather than a judgment about it.” [H19].

“Thanks to the instructions of monks and nuns, I have recently begun to practice mindfulness and self-compassion. I notice a shift in myself due to mindfulness and self-compassion practices, enabling me to be more present in everything. I experience the present moment without regretting what has passed. Additionally, it assists me in accepting bad mental states. Before, I was terrified of sadness, but now I understand that both happiness and sadness will come and go. By cultivating mindfulness and self-compassion,

I can observe the emotional process and increase my capacity to care about others. There are lots of benefits to practicing mindfulness and self-compassion. I will need more practice to fully comprehend them.” [H17]

Discussion

Depending upon the MAT (Lindsay & Creswell, 2017) as well as the Contextual Behavioral Science (CBS) model of behavioral health (see Hayes et al., 2012; Jo et al., 2022), the current study sought to develop and empirically examine an integrated structural model involving crucial variables (i.e., self-compassion, mindfulness, stress, psychological well-being, positive emotion, and self-esteem) within the higher education institutions setting. More specifically, the present study aimed to (1) assess the impact of three independent constructs, namely self-compassion, mindfulness, and stress on both psychological well-being and positive emotions; (2) test the structural associations between students' psychological well-being and positive emotions, and their self-esteem; (3) evaluate the mediating impact of psychological well-being in the connections between self-compassion, mindfulness, and stress (predictors) and self-esteem (and outcome variable); and (4) investigate the mediating role of positive emotions in the paths between self-compassion, mindfulness, and stress (independent variables) and self-esteem of Vietnamese students from 10 universities in the South of Vietnam. Overall, all the research hypotheses were accepted.

The empirical findings of the current paper indicated that self-compassion has a significant and positive connection with psychological well-being. This means that higher levels of a student's self-compassion could reinforce his/her psychological well-being. This finding is in line with the results of prior studies (e.g., Hall et al., 2013; Saricaoglu & Arslan, 2013; Sun et al., 2016; Tran et al., 2021) indicating that psychological well-being is positively linked to self-compassion. In addition, the results revealed that students' positive emotion is positively affected by their self-compassion. That is, the more students' self-compassion, the greater their positive emotions. This supports the findings of previous studies (e.g., Alirezaee et al., 2021; Ellsworth, 2018; Karakasidou et al., 2021; Krieger et al., 2015) demonstrating that self-compassion could play a substantial role in improving human positive emotions.

Moreover, it is indicated that mindfulness has a positive association with psychological well-being, supporting the results presented by past studies such as the work of Zimmaro et al. (2016) pointing out that individuals' psychological well-being could be enhanced through mindfulness. It also is consistent with the findings of prior studies (e.g., Arslan & Asıcı, 2021; Huang et al., 2021; MacDonald & Baxter, 2017), revealing that mindfulness positively impacts

the psychological well-being of people. Additionally, the SEM results found that there is a positive link between mindfulness and positive emotions. This reflects the crucial role played by mindfulness in boosting the positive emotions of humans. This finding is in agreement with the work by Wang et al. (2016) and Zhu et al. (2019) who illustrated that positive emotions could be positively enhanced and facilitated by mindfulness.

In accordance with the quantitative data, the qualitative findings also suggest that mindfulness practices were positively associated with positive emotions and psychological well-being. Furthermore, the results of the present article showed that students' stress could negatively affect their psychological well-being. This finding agrees with the results of Labrague (2021) and Tan et al. (2021) illustrating that students' psychological well-being is substantially and negatively influenced by stress related to the COVID-19 pandemic. Similarly, it is also indicated, based on our findings, that students' positive emotions are negatively impacted by their stress, proving the findings revealed by prior studies, such as Cho et al. (2021), Liao and Wei (2014), and Zhang et al. (2021).

Further, our results depicted that students' self-esteem is positively impacted by their psychological well-being. Having higher psychological well-being could notably help in enhancing the self-esteem of students. This result is in accordance with the findings of past studies (e.g., Dogan et al., 2013; Isiklar, 2012; Sarkova et al., 2014) clarifying the crucial effect of psychological well-being on self-esteem. In a similar way, it is revealed that students' positive emotions have a positive relationship with their self-esteem. When students feel positive emotions, they will have healthy and desirable self-esteem, leading to feeling good about themselves and seeing themselves as deserving of others' respect. This finding supports the results of Benetti and Kambouro-poulos (2006) and Gomez-Baya et al. (2018) indicating that positive emotions lead to increasing global self-esteem.

With regard to the mediation analysis, the results of the present article articulated that psychological well-being positively and significantly mediates the link between self-compassion and mindfulness (predictor constructs) and self-esteem as a dependent variable. On the other hand, psychological well-being has a negative mediation role in the connection between students' stress and their self-esteem. On a wider conceptual level, the empirical results of this study propose that psychological well-being could represent a crucial intervening role in the relationship between self-compassion, mindfulness, and stress of university students and their self-esteem. Indeed, these findings do add substantial contributions to academia and practitioners. In other words, the current work is considered one of the limited attempts investigating the intervening

effect of psychological well-being in the associations between such variables.

Similarly, the findings revealed that students' positive emotions have a positive and significant mediating role in the relationship between self-compassion and mindfulness and self-esteem. However, the impact of students' stress on their self-esteem could be negatively mediated by their positive emotions. In sum, the findings of this study contribute to the existing body of knowledge in various areas, including developmental and educational psychology, mindfulness, human resource management, and education-related research through developing and investigating a comprehensive framework incorporating the studied constructs, namely self-compassion, mindfulness, stress, psychological well-being, positive emotion, and self-esteem of university students. In addition, the research results could add to the theory of MAT (Lindsay & Creswell, 2017) and the CBS model of behavioral health (e.g., Hayes et al., 2012; Jo et al., 2022) by providing empirical evidence on the structural paths between the investigated latent variables. Moreover, the present work is considered, to the best of our knowledge, one of the rare attempts that have examined such connections within the higher education institutions context, particularly in Southeast Asian countries, such as Vietnam.

Limitations and Future Research

The present study has some limitations that need to be considered in future research. First, this study examined the mediation roles of two individual-related constructs (i.e., psychological well-being and positive emotions) in the links between three independent constructs (i.e., self-compassion, mindfulness, and stress) and an outcome latent construct (i.e., self-esteem). Future research could therefore evaluate the moderating or interaction role of psychological well-being and/or positive emotions on such associations. A mediation-moderation model is also suggested to be carried out by scholars among different domains. Additionally, it is recommended to incorporate one variable or more (e.g., anxiety, self-efficacy, confidence, social support) into the current research model. This could help in providing a broader understanding of these variables and their linked effect on students' psychological well-being and their positive emotions.

Second, the sample design of our paper focuses on students from ten universities in Vietnam, leading to limiting the results' generalizability of the current study. Therefore, it is proposed for future studies to examine the present model by conducting a cross-country study, including university students from different countries with different cultures (e.g., a western country and/or another non-western country). Another key point is that despite our paper providing a

fundamental stage in understanding the structural connections between the variables in the research model from the perspective of university students, there is a need to investigate such links among different populations (e.g., primary students, secondary students, high school students, lecturers, community samples).

Finally, a multi-group analysis, based on some socio-demographic features of respondents such as gender, country, and/or specialization, could be a notable direction and good opportunity for further work. This will provide crucial and beneficial findings added value to theory and practice.

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Author Contribution Anh Minh Quang Tran, designed the study, analyzed the data, wrote the introduction, methodology and results, and revised the manuscript. Nguyen Ngoc Thao Chau wrote parts of the introduction. Tan Vo-Thanh and Mohammad Soliman wrote the discussions, limitations, and future research sections. Bassam Khoury edited the manuscript and prepared it for submission. All authors have approved the final version of the manuscript for submission.

Declarations

Ethical Approval All procedures have been approved by the University of Economics and Law, Ho Chi Minh City, Vietnam, with approval ID: QIII-2022-1 and have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Informed Consent Written informed consent was obtained from all participants.

Conflict of Interest The authors declare no competing interests.

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