

# Work Stress, Work-Related Rumination, and Depressive Symptoms in University Teachers: Buffering Effect of Self-Compassion

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**Purpose:** The association between work stress and depressive symptoms has been well documented. More research is still needed to further investigate the underlying explanatory process mechanism and the potential protective function of personal resource in attenuating the negative effect of work stress on mental health. To address this gap and informed by the stress process model and emotion regulation theory, the present study examined the indirect role of work-related rumination and the buffering effect of self-compassion in university teachers, a population with increased vulnerabilities for both work stress and mental health issues.

**Methods:** This study collected data from 727 university teachers ( $M_{\text{age}} = 37.65 \pm 7.77$  years, 61.5% women) through an online survey. Indirect effect analysis and moderation effect analysis were implemented using structural equation modeling via Mplus.

**Results:** Work stress was directly and indirectly associated with depressive symptoms through work-related rumination, and self-compassion moderated the associations between (a) work stress and depressive symptoms and (b) work-related rumination and depressive symptoms. The direct and indirect effects of work stress on depressive symptoms were weaker in university teachers with high levels of self-compassion than in those with low levels of self-compassion.

**Conclusion:** Work stress was associated with depressive symptoms through a cognitive pathway. The findings deepen our understanding of the link between work stress and mental health outcomes by revealing the indirect role of cognitive processes, the protective function of emotion regulation strategies, and their interplay. Reducing work-related rumination and strengthening self-compassion may constitute effective interventions to alleviate the negative effects of work stress on mental health.

**Keywords:** work stress, work-related rumination, self-compassion, depressive symptoms, university teachers

## Introduction

Studies have emphasized work stress in higher educational settings because of its negative effects on university teachers, as evidenced by the increased burnout, the use of cognitive enhancement drugs, and impairment on job satisfaction, organizational commitment, general trust, and mental health.<sup>1-4</sup> One far-reaching consequence of work stress is its detrimental effect on the mental health of university teachers.<sup>5</sup> The stressors of high teaching and research workloads, administrative tasks, and emotional demands contribute to psychological distress in university teachers.<sup>4</sup> Work stress is associated with mental health outcomes (e.g., depressive symptoms) in university teachers.<sup>6,7</sup> To further investigate the underlying mechanism and protective function of personal resource, this study examined the indirect role of work-related rumination in the association between work stress and depressive symptoms and the moderating effect of self-compassion according to the stress process model and emotion regulation theory. The findings may be helpful for the well-being and long-term development of university teachers.

## Potential Indirect Effect Through Work-Related Rumination

Some studies have investigated the mechanism of work stress on mental health in university teachers. Work stress is associated with mental health outcomes (eg, psychological strain, depressive symptoms) through damaged psychological capital, burnout, and job resources.<sup>6–8</sup> University teachers' high job demands predicted subsequent psychological strain through damaged workplace autonomy and procedural fairness.<sup>8</sup> Because cognitive processes are important for maintaining the mental health of university teachers,<sup>9</sup> the present study examined the indirect role of work-related rumination in the association between work stress and depressive symptoms with theoretical support from stress process model.<sup>10,11</sup> The stress process model asserts that initial stressors in daily life can exert adverse consequences by promoting secondary stressors through stress proliferation. Secondary stressors may be negative experiences (eg, caregiving burden or parenting stress) or damaged personal resources (eg, self-compassion or self-esteem),<sup>12–14</sup> which are generally treated as mediators and indirect roles in the association between the initial stressors and the subsequent consequences. For example, one study observed that caregivers' appraisals (eg, caregiving burden and positive caregiver feelings) served as mediators of the relationship between caregiving stress and caregiver depression.<sup>12</sup> The stress process model has also been applied to examine the underlying mechanism of the association between stress and mental health in educational settings. The stress of perceived discrimination is associated with depressive symptoms and anxiety through damaged self-concept (eg, self-esteem) in adolescents.<sup>15</sup> An adverse family environment is associated with depressive symptoms through impaired mastery and self-efficacy in college students and doctoral students.<sup>16,17</sup> According to the stress process model, work-related rumination may be a secondary stressor caused by the initial stressor of work stress, which exacerbates mental health problems in university teachers.

Rumination, a form of perseverative cognition, refers to repetitive and persistent thoughts or cognitive processes that occur after the initial experience of a stressor and prolong an individual's physiological and psychological activation toward the stressor.<sup>18,19</sup> Work-related rumination involves repetitive thoughts about work (eg, work tasks and work performance) during nonworking hours. One common risk factor for work-related rumination is work stress.<sup>20–22</sup> Employees facing more unfinished tasks at the end of the workweek are likely to be less satisfied with their competence, which trigger work-related rumination over the weekend.<sup>20</sup> Work-related rumination has been found to mediate the longitudinal association between job stress and flow experience at work.<sup>22</sup> One study also described a positive association between work stress and work-related rumination in the university environment.<sup>21</sup> Teachers are more likely to engage in rumination with increased job stress.

The adverse effect of work-related rumination is emphasized because increased cognitive load during nonworking hours may eventually result in deficient recovery from work and other negative consequences (e.g., negative work events and reduced well-being).<sup>23</sup> Studies have reported a longitudinal association between work-related rumination, job exhaustion, and off-job recovery in employees.<sup>24,25</sup> Individuals with high levels of work-related rumination are more likely to experience deficits in executive functioning, such as cognitive failure, lapse of attention, and absentmindedness.<sup>26</sup> One far-reaching negative consequence of work-related rumination is impaired mental health.<sup>27,28</sup> One study observed that the stress of working in intensive care units is associated with burnout, depression, and the risk of psychiatric morbidity among healthcare professionals through work-related rumination.<sup>29</sup> Employees who perceive their leaders as having a transformational leadership (eg, supportive and encouraging) are less inclined to experience psychological strain at work and engage in work-related rumination during leisure time, which reduces the likelihood of depressive symptoms.<sup>27</sup>

For teachers in educational settings, multiple daily demands (eg, teaching performance and guiding students) often spill over into nonwork time, resulting in overtime work and a blended boundary between work and nonwork time. Teachers in this situation are vulnerable to work-related rumination and may struggle to achieve work-related recovery and psychological detachment.<sup>30</sup> Teachers with higher levels of work-related rumination are more likely to experience negative moods and are less likely to have good sleep quality and ease of awakening.<sup>31,32</sup> Studies have investigated the effect of work stress on work-related rumination and the consequences of work-related rumination in teachers; however, studies have not investigated the indirect effect of work stress on mental health through work-related rumination in university teachers, such findings are important for their well-being and long-term development. The present study

investigated the cognitive pathway of work stress on depressive symptoms by examining the indirect role of work-related rumination with the theoretical support from stress process model and emotion regulation theory and empirical evidences that indirect role of work-related rumination in the link between stress-induced outcomes in different populations (eg, employees, dental students, and health-care professionals).<sup>22,28</sup>

## Protective Function of Self-Compassion

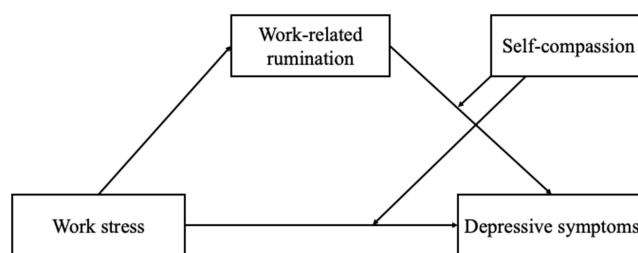
Emotion regulation theory emphasizes the strategies of modulating emotional experiences or responses (eg, cognitive change and response modulation) and their beneficial role in health and illness.<sup>33,34</sup> How to regulate emotions, particularly negative emotions, is an essential topic in the educational settings.<sup>35</sup> Appropriate emotion regulation strategies (eg, deep acting and reappraisal) can effectively alleviate the negative affect and improve positive affect, job satisfaction, and life satisfaction;<sup>36–39</sup> furthermore, studies have found that such strategies moderate the association between stress and its consequences (eg, systemic inflammation and poor sleep quality).<sup>40,41</sup> Self-compassion, which is considered as an adaptive emotion self-regulation strategy and personal resource,<sup>14,42</sup> may provide a protective function by buffering the negative effect of work stress on mental health in university teachers.

Self-compassion refers to positive responses toward oneself when experiencing inadequacy, failure, hardship, adversity, or suffering.<sup>42</sup> Individuals with higher levels of self-compassion are more likely to be able to face adversity by treating themselves in a compassionate manner, which includes practicing self-kindness rather than self-judgment, viewing suffering as a part of the shared human experience rather than as an isolated experience, and balancing rather than over-identifying with negative emotions and thoughts.<sup>43,44</sup> Studies have investigated the positive function of self-compassion in educational settings.<sup>45,46</sup> Associations between self-compassion and resources (eg, emotional support and stress resilience) and reduced negative consequences (eg, perceived stress and poor sleep quality) have been found in childhood teachers and educators.<sup>45,47</sup> Self-compassion is associated with teachers' motivating styles (ie, autonomy-supportive style and structuring style) through need-satisfaction and personal accomplishment.<sup>48</sup>

Studies have contended that self-compassion buffers the negative effect of stress (eg, body shame and perceived discrimination) on mental health.<sup>49–52</sup> The association between external shame and depression and anxiety symptoms is weaker in individuals with high levels of self-compassion than in those with low levels of self-compassion.<sup>50</sup> The protective function of self-compassion in moderating the association between stress and mental health has also been found in educational settings. Self-compassion and social connectedness jointly buffer the negative effects of racial discrimination and depression in Asian American university students.<sup>53</sup> Self-compassion has been found to moderate the relationship between the lack of forgiveness and depressive symptoms in Korean teachers.<sup>54</sup> The association between the lack of forgiveness and depressive symptoms is weaker in teachers with high levels of self-compassion than in those with low levels of self-compassion. Thus, self-compassion may moderate the association between stress (eg, work stress and work-related rumination) and depressive symptoms.

## The Present Study

Although studies have revealed the association between work stress and mental health outcomes in university teachers, the underlying mechanism between them and protective factors that buffer the negative effect of work stress on mental health remain unexplored. The present study examined the indirect role of work-related rumination and the moderating role of self-compassion in the association between work stress and depressive symptoms according to the stress process model and emotion regulation theory. The nature of university teachers' work and the characteristics of their work environment may cause work stress to spill over into nonwork time, resulting in overtime work and blended boundaries between work and nonwork hours. Primary stressors related to work may lead to depressive symptoms by triggering the secondary stressor—the cognitive process of work-related rumination during nonworking hours. In addition, according to emotion regulation theory, this study examined the moderating role of self-compassion in the direct and indirect effects of work stress on depressive symptoms. Specifically, self-compassion may moderate the associations between (a) the primary stressor of work stress and depressive symptoms and (b) the secondary stressor of work-related rumination and depressive symptoms in university teachers. [Figure 1](#) displays the hypothesized model for the present study. This study proposes the following hypotheses:



**Figure 1** The hypothesized model.

- (1) Work stress is associated with more depressive symptoms through work-related rumination. The indirect effect of work stress is significant.
- (2) Self-compassion moderates the association between work stress and depressive symptoms. The association between work stress and depressive symptoms is weaker or absent in university teachers with high levels of self-compassion compared with in those with low levels of self-compassion.
- (3) Self-compassion moderates the association between work-related rumination and depressive symptoms. The association between work-related rumination and depressive symptoms is weaker or absent in university teachers with high levels of self-compassion compared with in those with low levels of self-compassion.

## Methods

### Participants and Procedure

This study obtained data from a project on the effect of work-related stress on psychosocial adjustment (eg, depressive symptoms and well-being) in Chinese university teachers. Study participants were recruited through the social networks of the authors and university teachers. Participants were informed about the research purpose, confidentiality, and their right to voluntary participation. Participants signed the informed consent forms before starting the survey. Participants who completed valid surveys received a small monetary reward (RMB 80, approximately US\$11). Before data collection commencement, the project was approved by the research ethics committee of the School of Social Development and Public Policy at Beijing Normal University.

A total of 800 participants registered for and completed the online survey. After respondents who failed the attention check questions ( $n = 72$ ) and those whose affiliation was outside China ( $n = 1$ ) were excluded, the finalized sample comprised 727 (280 men) participants. The sample included 269 (37%) teachers from national key institutions (The 211/985 National Key Universities), 396 teachers (54.5%) from provincial key institutions, and 53 teachers (7.3%) from vocational and technical institutions. Regarding the regions of the universities, 196 (27%) teachers were from universities in southern China, 131 (18%) were from universities in eastern China, 65 (8.9%) were from universities in north and northeastern China, and 329 (45.3%) were from universities in western and central China. The average age of participants was 37.65 years ( $SD = 7.77$ ). Nearly all the participants (99.7%) had a bachelor's degree or higher. Moreover, 461 (63.4%) participants had a PhD degree. Regarding teaching experience, 41% of the participants had less than 5 years of teaching experience, 23.5% had 5 to 10 years of teaching experience, 24.2% had 11 to 20 years of teaching experience, and 11.3% had more than 20 years of teaching experience. Regarding professional rank, 13.3% were categorized as senior research assistants, 46.6% were lecturers or assistant professors, 29.3% were associate professors, and 10.7% were professors.

### Measures

Work stress was measured using the Chinese version of the revised sources of Faculty Stress Scale (R-SFS),<sup>55</sup> which assesses the stressors relevant to higher education, including recognition inadequacy (3 items, e.g., "Inadequate opportunities for career advancement"), perceived organizational inadequacy (3 items, eg, "Lack of consultation and communication with university authority"), factors intrinsic to teaching (5 items, eg, "Teaching schedules are too tight"), financial inadequacy (2 items, eg, "Inadequate training or financial assistance for further study"), teaching–research

conflict (3 items, eg, “Too much research work after teaching hours”), unfavorable student quality (3 items, eg, “The quality of students is declining”), and new challenges (3 items, eg, “Applying modern education technology”). The 22 items were rated on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). Confirmatory factor analysis (CFA) results showed that the measurement model fit the data well ( $\chi^2 = 14.619$ ,  $df = 8$ , comparative fit index [CFI] = 0.995, standardized root mean square residual [SRMR] = 0.017, root mean square error of approximation [RMSEA] = 0.34; 90% CI: 0.000 to 0.061). Higher mean scores indicated higher levels of work stress. Cronbach’s  $\alpha$  for the R-SFS in the present study was 0.92; Cronbach’s  $\alpha$  for the subscales ranged from 0.73 to 0.90.

The affective rumination subscale of the Chinese version of the Work-Related Rumination Scale<sup>56,57</sup> was employed to measure university teachers’ work-related thoughts outside work. Example items include “Are you annoyed by thinking about work-related issues when not at work?” and “Do you become tense when you think about work-related issues during your free time?” The 5 items were rated on a 5-point Likert scale ranging from 1 (never) to 5 (always). A higher mean value represented a higher level of work-related rumination. The CFA results indicated that the measurement model fit the data well ( $\chi^2 = 3.466$ ,  $df = 4$ , CFI = 1, SRMR = 0.006, RMSEA = 0; 90% CI: 0.000 to 0.053). Cronbach’s  $\alpha$  for this scale was 0.92.

Self-compassion was measured using the Chinese version of Self-Compassion Scale-Short Form (SCS-SF).<sup>58,59</sup> All 12 items were rated on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). Example items include “I try to see my failings as part of the human condition” and “When something painful happens, I try to take a balanced view of the situation”. The CFA results indicated that the measurement model fit the data well ( $\chi^2 = 74.171$ ,  $df = 37$ , CFI = 0.981, SRMR = 0.026, RMSEA = 0.037; 90% CI: 0.025 to 0.049). Higher mean scores indicated higher levels of self-compassion. Cronbach’s  $\alpha$  of the SCS-SF in the present study was 0.81.

The depression subscale of the Chinese version of the Depression-Anxiety-Stress Scale<sup>60,61</sup> was used to measure depressive symptoms. Participants rated 7 items on a 4-point scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much). Example items include “I felt that life was meaningless” and “I was unable to become enthusiastic about anything”. The CFA results indicated that the measurement model fit the data well ( $\chi^2 = 14.477$ ,  $df = 10$ , CFI = 0.997, SRMR = 0.013, RMSEA = 0.025; 90% CI: 0 to 0.051). Higher mean scores indicated higher levels of depressive symptoms. Cronbach’s  $\alpha$  for this scale in the present study was 0.89.

Sociodemographical covariates were controlled for in the model, including age, sex, educational level, years of teaching, profession title, concurrent administrative position, university region (ie, north and northeastern China, eastern China, southern China, and western and central China), and university level (ie, national key institutions, provincial key institutions, and junior vocational and technical institutions).

## Data Analysis

Structural equation modeling was implemented to examine the hypothesized model with Mplus 7.4.<sup>62</sup> Missing data were addressed using the full information maximum likelihood method, and robust maximum likelihood estimator that allows for non-normal distribution data was employed for structural equation modeling.<sup>63</sup> The model fit indices employed to evaluate the model fit were  $\chi^2$ , RMSEA (<0.08), CFI (>0.90), and SRMR (<0.08).<sup>64</sup> First, this study tested the direct and indirect effects of faculty stress on depressive symptoms in university teachers through work-related rumination by using bootstrapping with 5000 resamples. Second, we further examined the moderating role of self-compassion in the direct and indirect effects of faculty stress on depressive symptoms. The components of faculty stress, work-related rumination, and self-compassion were mean-centered. The main effects of faculty stress, work-related rumination, and their interactions terms with self-compassion were examined on depressive symptoms. Third, simple slope analyses were performed to test the conditional slopes of the associations between (a) faculty stress and depressive symptoms and (b) work-related rumination and depressive symptoms at high and low levels of self-compassion (low:  $M - \geq 1 \times SD$ ; high:  $M + \geq 1 \times SD$ ).

## Results

Table 1 displays the descriptive statistics (ie, mean scores and SDs of the key variables) and correlations between variables. Components of faculty stress were positively associated with work-related rumination and depressive symptoms and negatively associated with self-compassion. Self-compassion was negatively associated with work-related

**Table 1** Descriptive Statistics and Correlations Among the Key Variables

|                            | Mean | SD   | Range     | 1        | 2        | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10 |
|----------------------------|------|------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----|
| 1. Faculty stress-PV       | 3.81 | 1.24 | 1–6       | —        |          |          |          |          |          |          |          |          |    |
| 2. Faculty stress-OP       | 3.97 | 1.20 | 1–6       | 0.68***  | —        |          |          |          |          |          |          |          |    |
| 3. Faculty stress-IA       | 3.81 | 1.06 | 1–6       | 0.50***  | 0.55***  | —        |          |          |          |          |          |          |    |
| 4. Faculty stress-RS       | 4.25 | 1.25 | 1–6       | 0.48***  | 0.48***  | 0.51***  | —        |          |          |          |          |          |    |
| 5. Faculty stress-TRB      | 4.29 | 1.13 | 1–6       | 0.33***  | 0.44***  | 0.57***  | 0.40***  | —        |          |          |          |          |    |
| 6. Faculty stress-SQ       | 3.79 | 1.21 | 1–6       | 0.27***  | 0.32***  | 0.43***  | 0.32***  | 0.26***  | —        |          |          |          |    |
| 7. Faculty stress-IC       | 3.69 | 1.15 | 1–6       | 0.19***  | 0.26***  | 0.39***  | 0.35***  | 0.37***  | 0.45***  | —        |          |          |    |
| 8. Work-related rumination | 3.20 | 0.98 | 1–5       | 0.35***  | 0.40***  | 0.39***  | 0.27***  | 0.38***  | 0.28***  | 0.34***  | —        |          |    |
| 9. Self-compassion         | 3.30 | 0.50 | 1.58–4.67 | –0.24*** | –0.25*** | –0.23*** | –0.18*** | –0.23*** | –0.20*** | –0.25*** | –0.46*** | —        |    |
| 10. Depressive symptoms    | 1.53 | 0.57 | 1–4       | 0.35***  | 0.37***  | 0.33***  | 0.19***  | 0.26***  | 0.22***  | 0.24***  | 0.56***  | –0.53*** | —  |

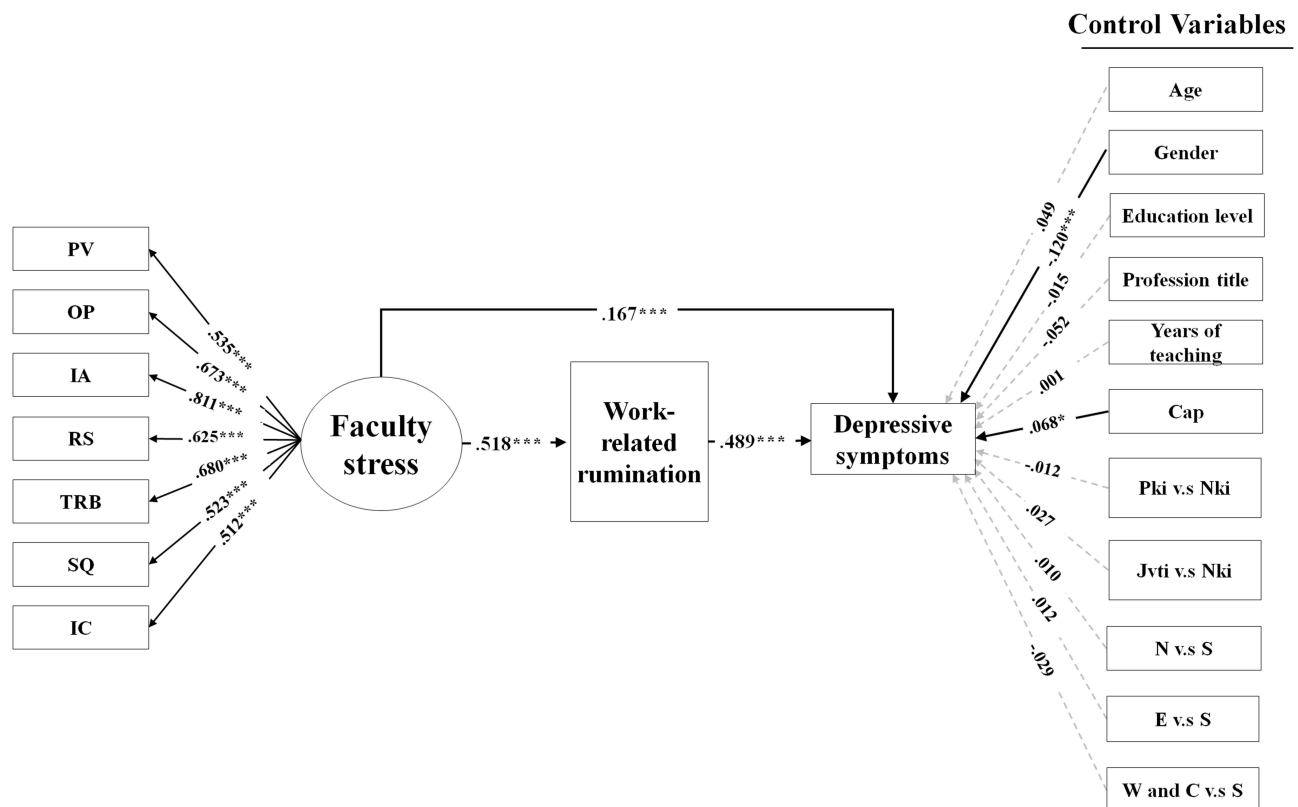
**Note:** \*\*\* $p < 0.001$ .  
**Abbreviations:** PV, inadequate recognition of personal values; OP, organizational practices; IA, instructional activities; RS, research support; TRB, teaching-research balance; SQ, student quality; IC, instructional changes; CAP, concurrent administrative position.

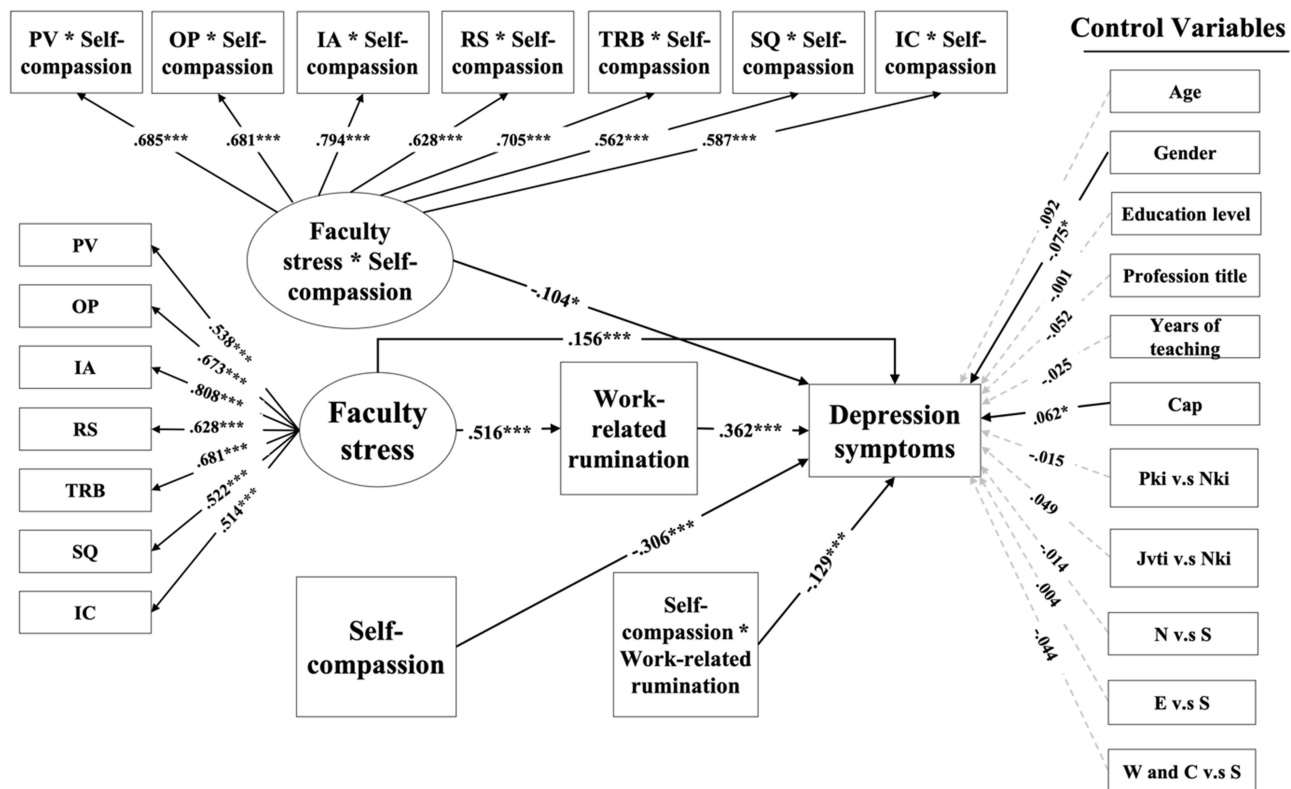


rumination and depressive symptoms. Work-related rumination was positively associated with depressive symptoms. The details of the interitem correlation matrices (inter-component correlation matrices for faculty stress that served as latent variables in SEM analysis) and related information (M, SD) for each scale are presented in [Tables S1-S4](#).

First, we examined the indirect role of work-related rumination in the association between faculty stress and depressive symptoms in university teachers. The results demonstrated that the model fit the data well ([Figure 2](#);  $\chi^2 = 295.719$ ,  $df = 87$ , CFI = 0.913, SRMR = 0.037, RMSEA = 0.057; 90% CI: 0.050 to 0.065). Faculty stress was positively and directly associated with depressive symptoms ( $\beta = 0.167$ , SE = 0.039,  $p < 0.001$ ). In addition, faculty stress was positively associated with work-related rumination ( $\beta = 0.518$ , SE = 0.033,  $p < 0.001$ ), which, in turn, was positively associated with depressive symptoms ( $\beta = 0.489$ , SE = 0.030,  $p < 0.001$ ). Faculty stress exerted indirect effects on depressive symptoms through work-related rumination ( $\beta = 0.253$ , SE = 0.023,  $p < 0.001$ ; 95% CI: 0.210 to 0.299).

We then examined the moderating role of self-compassion in the associations between (a) faculty stress and depressive symptoms and (b) work-related rumination and depressive symptoms. The model fit the data well ([Figure 3](#);  $\chi^2 = 543.002$ ,  $df = 252$ , CFI = 0.923, SRMR = 0.036, RMSEA = 0.040; 90% CI: 0.035 to 0.044). For the control variables, gender was negatively associated with depressive symptoms ( $\beta = -0.075$ , SE = 0.030,  $p = 0.014$ ) and concurrent administrative position was positively associated with depressive symptoms ( $\beta = 0.062$ , SE = 0.030,  $p = 0.036$ ). The interaction between faculty stress and self-compassion was negatively associated with depressive symptoms ( $\beta = -0.104$ , SE = 0.041,  $p = 0.011$ ); the interaction between work-related rumination and self-compassion was also negatively associated with depressive symptoms ( $\beta = -0.129$ , SE = 0.037,  $p < 0.001$ ). Simple

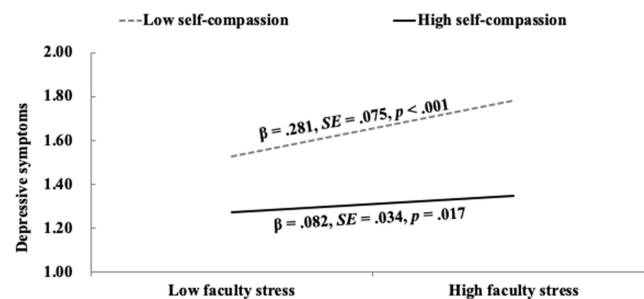




**Figure 3** Plots of the moderating effects of self-compassion of faculty stress's direct and indirect effects on depressive symptoms.

**Notes:** \* $p < 0.05$ , \*\*\* $p < 0.001$ .

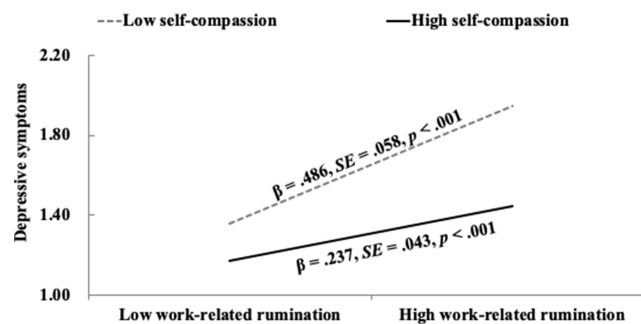
**Abbreviations:** PV, inadequate recognition of personal values; OP, organizational practices; IA, instructional activities; RS, research support; TRB, teaching-research balance; SQ, student quality; IC, instructional changes; CAP, concurrent administrative position; PKI vs NKL, provincial key institution vs national key institution; JVTI vs NKL, junior vocational and technical institution vs national key institution; N vs S, northeastern vs southern; E vs S, eastern vs southern; W and C vs S, western and central vs southern.



**Figure 4** Plots of the interaction of faculty stress and self-compassion on depressive symptoms.

slope analyses revealed that the association between faculty stress and depressive symptoms was stronger when self-compassion was low ( $\beta = 0.281, SE = 0.075, p < 0.001$ ) than when self-compassion was high ( $\beta = 0.082, SE = 0.034, p = 0.017$ ; Figure 4). Furthermore, the association between work-related rumination and depressive symptoms was stronger when self-compassion was low ( $\beta = 0.486, SE = 0.058, p < 0.001$ ) than when self-compassion was high ( $\beta = 0.237, SE = 0.043, p < 0.001$ ; Figure 5). Overall, self-compassion served as a buffering factor, weakening the association between faculty stress and depressive symptoms and between work-related rumination and depressive symptoms. Moreover, faculty stress in university teachers exerted indirect effects on depressive symptoms through work-related rumination ( $\beta = 0.130, SE = 0.025, p < 0.001$ ; 95% CI: 0.084 to 0.184 with high self-compassion;  $\beta = 0.268, SE = 0.035, p < 0.001$ ; 95% CI: 0.202 to 0.338 with low self-compassion).





**Figure 5** Plots of the interaction of work-related rumination and self-compassion on depressive symptoms.

## Discussion

The present study investigated the indirect role of work-related rumination in the association between work stress and depressive symptoms and the protective role of self-compassion in university teachers according to the stress process model and emotion regulation theory. The findings support the hypothesized model. Consistent with the findings of relevant studies, the results revealed a positive association between work stress and depressive symptoms in university teachers.<sup>4,6,7</sup> University teachers encounter multiple occupational stressors, such as high teaching and research workloads, teaching–research conflicts, the demands of administrative tasks, and challenges in techniques, teacher–student relationships, professional development, and interpersonal relationships. These stressors reduce teachers’ job satisfaction and organizational commitment and contribute to their emotional exhaustion and psychological distress.<sup>3,4,65</sup> Thus, university teachers faced with multiple stressors are reasonably more likely to become depressed.

The results indicate the indirect role of work-related rumination in the association between work stress and depressive symptoms in university teachers. This finding supports the stress process model, which describes that an initial stressor may lead to negative consequences by promoting secondary stressors of negative experiences (stress proliferation).<sup>10,13</sup> The initial stressor of work stress is associated with the negative consequence of depressive symptoms through the secondary stressor of work-related rumination, which transmits the negative effect of work stress into the mental health outcomes of university teachers. University teachers who experience more work stress are more likely to engage in work-related rumination.<sup>21,30</sup> A high workload and stressful job demands may cause teachers to work overtime or to ruminate about work during nonwork hours, which results in a negative mood and inhibits work-related recovery and good sleep quality.<sup>31,32</sup> Thus, university teachers in this situation are vulnerable to depressive symptoms.

Moreover, the results demonstrated that self-compassion moderates the associations between (a) work stress and depressive symptoms and (b) work-related rumination and depressive symptoms. These results agree with previous findings that self-compassion may work as an effective emotion regulation strategy with protective effects on mental health against the adverse effects of various stressors.<sup>49,52,53</sup> In this study, the adverse effects of work stress and work-related rumination on depressive symptoms are weaker in university teachers with high levels of self-compassion compared with those with low levels of self-compassion. Self-compassionate university teachers are more likely to treat themselves with kindness and to tolerate personal flaws or inadequacies when facing high work stress. They may believe that stressful work conditions and related negative consequences (eg, work-related rumination) are common experiences shared by university teachers in educational settings. In addition, these teachers can regulate their emotions and maintain a balanced view of the situation when facing work stress. Such university teachers cope with daily stressors in a resilient manner, and the negative effects of work stress and work-related rumination on mental health are therefore reduced.

In addition, the results suggest that self-compassion weakens both the direct and indirect effects of work stress on depressive symptoms. Existing studies have found that emotion regulation strategies moderate the direct and indirect effects of stress on the subsequent negative consequences.<sup>40,41</sup> Our findings extend previous findings by identifying an adaptive emotion self-regulation strategy in the stress process framework, its protective role, and the interplay between cognitive processes and emotion regulation strategies. Self-compassion could attenuate the direct effect of the initial stressor and its

indirect effect or stress proliferation on depressive symptoms. Self-compassion can effectively suppress stress and inhibit work-related rumination, which transmits the negative effect of work stress into mental health outcomes.

The present study has several implications. The present study examined the cognitive mechanism in the association between work stress and impaired mental health and the protective function of emotional resources in alleviating this negative effect in university teachers. Work stress was associated with depressive symptoms through a maladaptive cognitive process (ie, work-related rumination), and the direct and indirect effects of work stress on depressive symptoms were buffered by the effective emotion regulation strategy of self-compassion. Moreover, the findings extend the implications of the stress process model by demonstrating that the adverse effect of stress proliferation on mental health can be weakened by using an adaptive emotion regulation strategy. The association between the secondary stressor of work-related rumination and depressive symptoms was alleviated by self-compassion. In addition, these findings describe the interplay of cognitive processes and emotion regulation strategies, their influence on mental health, and the importance of considering multiple psychological factors when investigating the relationship between work stress and mental health in university teachers. In practice, our findings provide insights that can be used to design interventions for enhancing the mental health and well-being of professionals in universities. Because self-compassion buffers the negative effect of work stress on depressive symptoms through work-related rumination, interventions to reduce work-related rumination (eg, cognitive behavioral therapy) and to promote self-compassion (eg, mindful self-compassion program) can be applied to protect the mental health of university teachers.<sup>66,67</sup>

## Limitations and Future Research

This study has several limitations. First, because the present study has a cross-sectional design, causal relationships among key variables could not be examined. Additional longitudinal studies are required to investigate the mediating role of work-related rumination in the association between work stress and depressive symptoms and the moderating role of self-compassion. Second, this study employed self-reported data, which may lead to response and recall biases. To decrease the potential risk of bias, future studies can measure key variables with physiological indicators or related biomarkers (eg, cortisol).<sup>68</sup> Third, the present study did not control for some work characteristics (eg, work environment, work time/amount ratio, work continuity, departments of teachers) that are potential covariates.<sup>21</sup> Future studies need to assess and control for these covariates in data analysis. Fourth, mental health was only measured based on depressive symptoms. The direct and indirect effects of work stress on mental health may vary when other indicators are employed. Future models should incorporate multiple indicators of mental health (eg, anxiety) to comprehensively examine the effect of work stress on mental health.

## Ethical Statement

This study complies with the Declaration of Helsinki. Ethical approval was obtained from the research ethics committee of the School of Social Development and Public Policy at Beijing Normal University before data collection. Informed consent was obtained from all participants included in the study.

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## Disclosure

The authors report no conflicts of interest in this work.

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