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# The mediating effect of academic engagement between psychological capital and academic burnout among nursing students during the COVID-19 pandemic: A cross-sectional study

Jinfang Wang<sup>a</sup>, Lingrui Bu<sup>b</sup>, Yan Li<sup>a</sup>, Jie Song<sup>c</sup>, Na Li<sup>d,\*</sup>

<sup>a</sup> School of Nursing, Shandong University of Traditional Chinese Medicine, Jinan, China

<sup>b</sup> Department of Information Engineering, Shandong Labor Vocational and Technical College, Jinan, China

<sup>c</sup> School of Nursing, Shandong University of Traditional Chinese Medicine, Jinan, China

<sup>d</sup> School of Nursing, Shandong University of Traditional Chinese Medicine, Jinan, China

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## ABSTRACT

**Background:** Almost all universities have been forced to close and change to online teaching during the COVID-19 pandemic, which has been a big challenge for students. There is little knowledge about the academic burnout among nursing students in these difficult circumstances, especially in traditional Chinese medicine universities, and the relationship between the burnout and their psychological capital and academic engagement.

**Objective:** The aim is to describe academic burnout and clarify the relationships between academic burnout, academic engagement, and psychological capital among nursing students in traditional Chinese medicine universities.

**Design:** This is a cross-sectional, descriptive study.

**Setting:** The study sampled a four-year undergraduate traditional Chinese medicine university in Jian, Shandong Province, China.

**Participants:** A convenience sampling method was used to select 733 nursing students from April to June 2020.

**Methods:** The Academic Burnout Scale, the Positive Psychological Capital Scale, and the Academic Engagement Scale were used for data collection, in addition to social-demographic data. Path analysis was used to clarify the relationships among academic burnout, academic engagement and psychological capital.

**Results:** Of all the study participants, 39.29% had a certain degree of academic burnout. Academic engagement and psychological capital were negatively correlated with academic burnout among nursing students in traditional Chinese medicine university. Psychological capital was positively correlated with academic engagement.

**Conclusion:** Nursing students had a certain degree of academic burnout. Academic engagement played a partial mediated role in the relationship between psychological capital and academic burnout.

## 1. Introduction

Burnout is defined by Leiter and Maslach (2004) as a psychological syndrome, which is usually considered to be a delayed response (such as exhaustion, cynicism and reduced personal accomplishment) to chronic emotional and interpersonal stress at work. It was initially applied to the service industry. However, as time passed, research on burnout gradually extended to university students. Subsequently, the concept of academic burnout was developed. According to Lian et al. (2005), academic burnout refers to a series of negative psychological manifestations in learning (such as anxiety, fatigue, depression, dejection and low self-

esteem) due to a lack of interest or excessive pressure, which can lead to negative attitudes and behaviours that signal that the student is tired of learning. Under the pressure of long-term learning, students begin to retreat or do not want to invest in the process of learning, and this finally leads to physical or emotional exhaustion, academic inefficacy, and cynicism towards studying (Jiang, 2010). Academic burnout has some negative effects, which can lead to unsatisfactory academic performance and poor mental health (Rudman and Gustavsson, 2011).

Previous systematic review showed that because of the different instruments or socio-cultural backgrounds, the observed prevalence of academic burnout among medical students varied from 18% to 82%

\* Corresponding author at: #4655 University Road, Changqing District, Jinan, China.

E-mail address: [lina131468@163.com](mailto:lina131468@163.com) (N. Li).

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(Prins et al., 2007). Many factors influence the levels of medical students' academic burnout, such as social demographic information (gender, grade, major) (Valero-Chillerón et al., 2019; Wang et al., 2019), school environment (Liu et al., 2018) (e.g. learning overload), personality traits (Skodova and Lajciakova, 2013), social support (Kim et al., 2018), self-efficacy and academic engagement (Laurentiu and Coralia, 2019; Liu et al., 2018). Nevertheless, most studies were focused on medical students, and only a small number of studies targeted nursing students. Among the studies of nursing students' academic burnout, all the studies were aimed at Western medicine universities. We have not retrieved any literature on academic burnout among nursing students at traditional Chinese medicine universities (TCMUs). Therefore, it is essential to investigate the academic burnout and explore its antecedent variables among nursing students at TCMUs.

Studies have shown that academic engagement is positively related to academic performance (Schaufeli et al., 2002a) and wellbeing (Boulton et al., 2019), and negatively predicted academic burnout (Laurentiu and Coralia, 2019; Liu et al., 2018). Unlike burnout, engagement focuses on the positive qualities of people and their optimal functioning, such as an active attitude, optimism, and creativity (Schaufeli et al., 2002a; Schaufeli et al., 2002b). Schaufeli et al. (2002a) defined engagement as a positive, fulfilling work-related state of mind that involves dedication (characterised by a sense of enthusiasm, significance, challenge, pride and inspiration), vigor (characterised by good mental resilience and abundant energy while working), and absorption (characterised by being happily engrossed and fully absorbed in work). Engagement was initially adopted in human resources management; however, studies have shown that it also applies to university students (Schaufeli et al., 2002a; Schaufeli et al., 2002b). Li and Huang (2010) defined academic engagement as a persistent, fulfilling, and positive emotional and cognitive state of mind related to learning and/or research.

Previous study found that high psychological capital in college students could promote learning, overcome barriers, and facilitate future goal achievement and was significantly positively related to academic engagement (You, 2016). Psychological capital is an important variable of positive psychology. Luthans et al. (2007) defined it as a positive state of mind manifested in the process of growth and development, characterised by self-efficacy (confident in accepting and trying to accomplish challenging tasks), optimism (being positive about current or future success), resilience (maintaining tenacity and bouncing back to achieve goals when beset by difficulties and setbacks) and hope (persevering in pursuit of the goal and adjusting the way to achieve it when necessary). Research in psychological capital has been gradually moved from the field of human resources to education. Previous studies have demonstrated that nurses' psychological capital is negatively correlated with job burnout (Li et al., 2019) and helps reduce nurses' perceptions of psychological distress, increase their job satisfaction and enhance the patient safety (Brunetto et al., 2016a; Brunetto et al., 2016b). However, the mediating effect of academic engagement between psychological capital and academic burnout among nursing students has not been clarified. As a variable of positive psychology, psychological capital might be beneficial to enhance academic engagement and reduce their burnout among nursing students in TCMUs.

As a result of the COVID-19 pandemic that began in December 2019, all schools in mainland China moved to online learning, which is challenging for students. Nursing students in China are accustomed to face-to-face traditional teaching methods in the classroom or laboratory, and online learning may make them difficult to adapt, feel tired or depressed, and they may find it difficult to adapt to this style of learning. First, students are less likely to participate in online discussions, and the interaction between teachers and students is not deep enough. Second, the teaching platforms of different specialized courses are not unified, so, students have to download various teaching APPs and switch back and forth with the change of courses, which costs a lot of energy (Zis et al., 2021). Furthermore, online teaching does not achieve instant

supervision, and students face great temptations outside of study. In addition, students are confined to stay at home, they are uncertain to know when they can return to school, which may cause anxiety and depression (Wang et al., 2020). All of these challenges may have influences on nursing students' academic burnout, academic engagement, and psychological capital. Thus, it is significant to conduct this investigation.

Based on previous studies, we hypothesised that (1) academic engagement is negatively related to burnout among nursing students in TCMUs, (2) psychological capital is negatively correlated with academic burnout, (3) psychological capital is positively correlated with academic engagement, and (4) academic engagement mediates the relationship between psychological capital and academic burnout (Fig. 1). Our aims were to (1) describe academic burnout among nursing students in TCMUs and (2) clarify the relationships among academic burnout, engagement, and psychological capital.

## 2. Methods

### 2.1. Design

A cross-sectional, descriptive study was conducted from April to June 2020 to clarify the relationships among psychological capital, academic engagement, and burnout among nursing students in a TCMU.

### 2.2. Participants and procedures

This research was conducted in a four-year undergraduate TCMU in Jian, Shandong Province. A convenience sampling method was used to select the participants. Due to the COVID-19 pandemic, none of the students could not come to school; therefore, we issued the instructions and questionnaires through an online platform called 'wenjuanxing' which is very popular in mainland China after obtaining consent. Wenjuanxing is a professional online questionnaire survey platform, focusing on providing users with powerful and user-friendly online questionnaire design and data collection. All the full-time nursing students in the TCMU who agreed to participate were included. Finally, 765 questionnaires were received, of which 733 questionnaires were valid, yielding an effective response rate of 96.8%.

### 2.3. Instruments

#### 2.3.1. Social-demographic information questionnaire

The socio-demographic information questionnaire included five items on nursing students' gender, age, grade, and the choice of nursing profession.

#### 2.3.2. Academic burnout scale (ABS)

The academic burnout scale (ABS) was developed by Maslach and Goldberg (1998) and modified by Lian et al. (2005). The scale included 20 items on three dimensions: reduced personal accomplishment (6 items), inappropriate behaviour (6 items), and dejection (8 items). Responses were assessed on a 5-point Likert scale ranging from 1 (totally

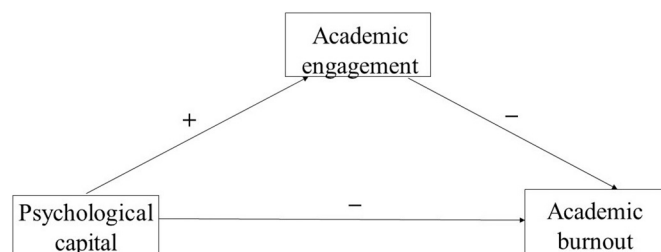


Fig. 1. Hypothesised model.

inconformity) to 5 (totally conformity). The ABS score was the average score of the items, with higher scores reflecting higher academic burnout. A score of less than 3 (the median) implies no academic burnout, 4 or more means a high level of academic burnout, and the scores in between these values indicates a light-to-moderate level of academic burnout (Jiang, 2010). The ABS was initially validated among Chinese university students. Confirmatory factor analysis found that the model had good fit,  $\chi^2 = 1104.68$ ,  $df = 268$ ,  $\chi^2/df = 2.013$ , GFI (goodness-of-fit index) = 0.915, AGFI (adjusted goodness-of-fit index) = 0.891, CFI (comparative fit indexes) = 0.903, NFI (normative fit index) = 0.920. Cronbach's alpha of the total scale and each dimension was 0.87, 0.73, 0.71 and 0.80, respectively (Lian et al., 2005). Currently, it has been proven to be a reliable and valid instrument for assessing academic burnout among Chinese nursing student (Wang et al., 2019). In this study, the reliability (Cronbach's alpha) of the ABS and each dimension were 0.90, 0.72, 0.75, and 0.85, respectively.

2.3.3. Positive psychological capital scale (PPCS)

The positive psychological capital scale (PPCS) was developed by Zhang et al. (2010) based on the scale by Luthans et al. (2007). It contained 26 items on four subscales: self-efficacy (7 items), optimism (6 items), resilience (7 items), and hope (6 items). Responses were rated on a 7-point Likert scale ranging from 1 (totally disagree) to 7 (totally agree). Higher scores indicated higher levels of positive psychological capital. The PPCS had good validity and reliability among Chinese university students (confirmatory factor analysis:  $\chi^2 = 475.39$ ,  $df = 317$ ,  $\chi^2/df = 1.50$ , RMSEA (root mean square error of approximation) = 0.049, CFI = 0.94, IFI (incremental fit index) = 0.94; the Cronbach's alpha of the PPCS and its four subscales were 0.96, 0.86, 0.76, 0.83 and 0.80, respectively) (Zhang et al., 2010) and nursing students (Qin et al., 2018). In this study, the Cronbach's alpha of the PPCS and the four subscales were 0.93, 0.87, 0.79, 0.66, and 0.83, respectively.

2.3.4. Academic engagement scale (AES)

Academic engagement was rated by the 17-item academic engagement scale (AES), which was revised by Li and Huang (2010) on the basis of the Utrecht Work Engagement Scale-Student (UWES-S) (Schaufeli et al., 2002a). The AES contained three subscales: dedication (5 items), vigor (6 items), and absorption (6 items). Each item was measured on a 7-point Likert scale (from 0 = 'never' to 6 = 'every day'). Higher scores indicated higher academic engagement. AES had good structural validity and reliability. Confirmatory factor analysis found that the model had good fit,  $\chi^2 = 321.35$ ,  $df = 116$ ,  $\chi^2/df = 2.77$ , GFI = 0.86, AGFI = 0.81, CFI = 0.93, NFI = 0.90, IFI = 0.93. The Cronbach's alpha of the total scale and the three subscales were 0.92, 0.82, 0.83 and 0.86, respectively (Li and Huang, 2010). In this study, the reliability (Cronbach's alpha) of AES and the three subscales were 0.98, 0.92, 0.95, and 0.93, respectively.

2.4. Ethical considerations

This research was approved by the Institutional Review Board of the TCMU where the research conducted (No.2020048). Informed consent was provided by all the nursing students and submitted online. All students were informed that the questionnaires were filled out anonymously.

2.5. Data analysis

Descriptive statistics and correlation analysis of academic engagement, psychological capital, and burnout were analysed using SPSS 20.0.  $P < 0.05$ (two-tailed test) was considered statistically significant.

A path analysis with Analysis of Moment Structures (AMOS) was adopted for testing our hypothetical model. A bias-corrected percentile bootstrap was used to test the mediating effect of academic engagement, with a 95% CI (confidence interval) not containing 0 representing

statistical significance.

3. Results

3.1. Descriptive statistics of social-demographic information

As presented in Table 1, among all 733 nursing students, 602 (82.13%) were female, and 431 (58.80%) actively chose the nursing profession actively. The average age of the participants was years 20.07 (SD =1.45).

3.2. Descriptive statistics of academic burnout, psychological capital, and academic engagement

Table 2 presents the participants' descriptive statistics of academic burnout, psychological capital, and academic engagement. The mean score of academic burnout was 2.97 (SD = 0.34), with inappropriate behaviour scoring the highest (3.51 ± 0.55). Overall, 280 participants (38.20%) had a light-to-moderate level of academic burnout and 8 (1.09%) had a high level of academic burnout. The mean scores of psychological capital and academic engagement were 4.91(SD = 0.61) and 3.83 (SD = 0.90), respectively.

3.3. Correlations among academic burnout, psychological capital, and academic engagement

The correlations among academic burnout, psychological capital, and academic engagement are shown in Table 3. All the three variables were correlated with each other.

3.4. Test of the hypothesised model

The test of the hypothesised model and the effect estimates are displayed in Fig. 2 and Table 4, respectively. Academic engagement was negatively related to academic burnout ( $\beta = -0.47$ ,  $p < 0.01$ ) among nursing students in TCMUs. Psychological capital was positively correlated with academic engagement ( $\beta = 0.69$ ,  $p < 0.01$ ). Moreover, psychological capital had an indirect negative effect ( $\beta = -0.47 \times 0.69 = -0.32$ ,  $p < 0.01$ ) on academic burnout mediated by academic engagement, with 95% CI of -0.26 to -0.42. Since this CI not containing 0, we concluded that there was a significant mediating effect of academic engagement on the relationship between psychological capital and academic burnout. The direct negative effect of psychological capital on academic burnout was -0.34 ( $p < 0.01$ ), so, the mediating effect of academic engagement was partial. The total effect of psychological capital on academic burnout was -0.66.

4. Discussion

This research aimed to examine academic burnout among nursing students in TCMUs and the relationships among academic burnout, psychological capital, and academic engagement during the COVID-19

Table 1  
Social-demographic information of nursing students (n = 733).

Variable		n	%	Mean	SD	Range
Gender	Female	602	82.13	20.07	1.45	17–24
	Male	131	17.87			
Age Grade	Freshman	203	27.69			
	Sophomore	176	24.01			
	Junior	225	30.70			
	Senior	129	17.60			
Choice of nursing profession	Choose actively	431	58.80			
	Transfer	302	41.20			

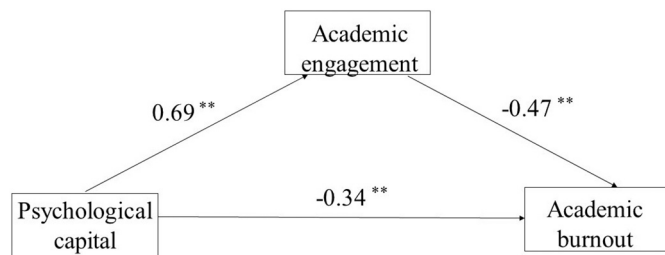
**Table 2**  
Means, standard deviations, minimum, and maximum of academic burnout, psychological capital, and engagement (n = 733).

Variable	Mean	SD	Minimum	Maximum
Academic burnout	2.97	0.34	1.60	4.30
Inappropriate behaviour	3.51	0.55	1.67	5.00
Reduced personal accomplishment	3.02	0.44	1.67	4.50
Dejection	2.54	0.71	1.00	4.88
Psychological capital	4.91	0.61	1.04	7.00
Self-efficacy	4.96	0.86	1.00	7.00
Optimism	4.78	0.62	1.11	7.00
Resilience	4.76	0.67	1.00	7.00
Hope	5.18	0.73	1.00	7.00
Academic engagement	3.83	0.90	1.06	6.00
Dedication	4.06	0.89	1.00	6.00
Vigor	3.71	0.97	0.33	6.00
Absorption	3.70	0.95	0.80	6.00

**Table 3**  
Correlations of academic burnout, psychological capital, and engagement (n = 733).

Variable	1	2	3
1. Academic burnout	1.000		
2. Psychological capital	-0.135**	1.000	
3. Academic engagement	-0.233**	0.695**	1.000

\*\* p < 0.01 (2-tails).



**Fig. 2.** Final model \*\* p < 0.01 (2-tails).

**Table 4**  
Effect estimates of the hypothesised model (Standardized coefficients).

Structural paths	Direct effects	Indirect effects (95%CI)	Total effects
AE → AB	-0.47**	-	-0.47**
PC → AE	0.69**	-	0.69**
PC → AB	-0.34**	-0.32**(-0.26~-0.42)	-0.66**

Note: PC = psychological capital; AE = academic engagement and AB = academic burnout.

\*\* p < 0.01 (2-tails).

pandemic. In general, our findings confirmed the proposed hypotheses.

In this research, 39.29% of all the nursing students in the TCMU had a certain degree of academic burnout, which was not comparable to a previous study due to the different measuring tools and scoring methods. Nursing students in the TCMU had an average score of academic burnout (2.97 ± 0.34) that was higher than that in a previous study measured by the same instrument (Wang et al., 2019) and higher than that in study of nursing students from non-TCMU during the COVID-19 pandemic (You et al., 2021) in China. Inappropriate behaviour scored the highest, which was consistent with the study in non-TCMU (You et al., 2021). The results may be due to the fact that in TCMUs, nursing students are taught not only Western medicine and nursing but also traditional Chinese medicine (TCM), which is obscure, abstract, and tedious to learn because of the profound cultural background and strong theoretical content. The heavy academic load and stress (Smith and Yang, 2017)

might cause them to struggle with learning and lead to burnout. The second reason might be that during the COVID-19 pandemic, nursing students were under the pressure to adapt the online learning, which is hard (Zis et al., 2021). In addition, some online teaching lacked teacher-student interactions; instead, more homework was assigned. Therefore, students were prone to a lack of enthusiasm and concentration on the course, which led to inappropriate behaviours such as playing with mobile phones, dozing off, and absence from learning. Contrary to our findings that inappropriate behaviour scored the highest, Valero-Chill-erón et al. (2019) showed that none of the nursing students in a study in Spain had high levels of inappropriate behaviour. This may be due to the different cultural backgrounds and causes of academic burnout.

In addition, this study confirmed that academic engagement was negatively related to academic burnout among nursing students in the TCMU, which was consistent with a previous study among medical students (Liu et al., 2018). This means that improving nursing students' academic engagement is beneficial for reducing burnout. In our study, the average score of academic engagement was higher than the median, indicating that the level of academic engagement of nursing students in the TCMU was at a medium level, with dedication scoring highest, which was similar to another study involving nursing students in China (Gao et al., 2017). However, Hampton and Pearce (Hampton and Pearce, 2016) demonstrated that nursing students in the USA and Canada had high engagement levels in online courses. Hence, measures focused on creating highly engaged learning environments are essential for further study in the future among nursing students in China.

In this study, we also found that psychological capital was positively related to academic engagement and negatively related to academic burnout, which meant that the higher the psychological capital of nursing students, the higher the academic engagement and the lower the burnout. This was consistent with previous studies of college students (Ding, 2015) and nurses (Li et al., 2019). In terms of the score of psychological capital, hope scored the highest and resilience scored the lowest, which was partially consistent with Liao and Liu (2016) (optimism scored the highest, resilience scored the lowest). This may be due to the different samples. According to Luthans et al. (2007), psychological capital can be developed and effectively managed, so it is essential to conduct interventions on psychological capital for nursing students in TCMUs, especially in terms of negative psychological effects (confusion, post-traumatic stress symptoms, anxiety) caused by the COVID-19 pandemic (Brooks et al., 2020; Cao et al., 2020).

Moreover, we found that academic engagement played a partially mediating role between psychological capital and academic burnout, which supported our hypothesis. The findings demonstrated that the effect of nursing students' positive psychological capital on decreasing academic burnout maybe enhanced by strengthened their academic engagement. During the COVID-19 pandemic, all the nursing students were inevitably affected by negative information about the pandemic, which can cause stress, anxiety, depression, panic, helplessness, and other negative emotions (Wang et al., 2020; Cao et al., 2020). Psychological capital can help students cope with these negative effects, which can increase academic engagement and alleviate academic burnout. Therefore, our study indicated psychological capital was an important antecedent variable for nursing students to cope with negative academic burnout via academic engagement. The mediating effect of academic engagement provided new perspectives on reducing nursing students' academic burnout.

Fortunately, students in China have returned to school after half a year's homebound study. However, the epidemic is still spreading around the world, and some students in other countries are still unable to have school study. In order to reduce academic burnout among nursing students in TCMUs, we suggest that measures should be taken to improve their psychological capital and academic engagement during the COVID-19 pandemic. For example, Luthans et al. (2007) put forward the psychological capital intervention (PCI) model, and verified its effectiveness of it among management students. Later, Luthans et al.

(2008) verified a web-based training intervention based on the PCI model, and the results showed that the psychological capital of the treatment group improved significantly. However, studies focusing on the PCI of nursing students are rare and therefore worthy of further research. In addition, Kuh (2010) pointed out that to improve students' academic engagement, effective educational practises that have the characteristics of co-operative learning methods, creative and challenging work, rich teaching experience, active learning or social relationships, and effective interaction between students should be established. Pilar et al. (2017) showed that the use of co-operative networks was effective in strengthening engagement among nursing students. Mackavey and Cron (2019) indicated that gamification strategies and case-based discussion enabled the creation of a challenging environment to enhance nursing students' academic engagement in online learning. Durrani (2020) created an effective educational content by using a debate format, small group virtual learning environment which included post-debate debriefing, paced repetitions, and discussion to improve medical students' enjoyment and engagement during the COVID-19 pandemic. Lee et al. (2020) established an academic coaching programme based on the conceptual framework of master adaptive learning to improve medical students' academic engagement and empower them with effective adapting and learning skills during the COVID-19 pandemic.

## 5. Limitations

This survey had several limitations. First, nursing students from only one TCMU were investigated by convenience sampling, which may have caused selection bias and limited the generalisability of our results. In future studies, the responses of nursing students from multiple TCMUs should be collected. Second, the data were collected through self-report questionnaires, which might lead to bias in the overestimated responses of the participants. Third, we performed the hypothesised model as a structural equation modeling (SEM), but due to poor fit indexes ( $\chi^2 = 585.769$ ,  $df = 32$ ,  $P = 0.000$ ,  $\chi^2/df = 18.305$ , RMSEA = 0.154, NFI = 0.902, CFI = 0.907, IFI = 0.907), we lately preferred to switch to a path analysis and to transform the latent variables into observed. Therefore, future studies should strive to perform a SEM model.

## 6. Conclusion

Our results indicated that nursing students in a TCMU experienced a certain degree of academic burnout. It also provided confirmatory support on the mediating effect of academic engagement between psychological capital and academic burnout among these students in TCMU. Nursing students' academic engagement can reduce their academic burnout. On the one hand, psychological capital can directly reduce academic burnout; on the other hand, it can reduce academic burnout by improving academic engagement.

Given the above findings, we suggest that educators should pay attention to the academic burnout of nursing students in TCMUs. Measures focused on strengthening nursing students' psychological capital and academic engagement (presented in the Discussion section) are effective for reducing their burnout.

## Ethical statement

This research was approved by the Institutional Review Board of Shandong University of Traditional Chinese Medicine (No.2020048). All participants were informed of the anonymity and purpose of the investigation.

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## CRedit authorship contribution statement

Jinfang Wang: Writing-Original draft preparation, Investigation; Lingrui Bu: Software, Data curation; Yan Li: Investigation, Validation; Jie Song: Supervision, Writing-Reviewing; Na Li: Conceptualization, Methodology, Writing-Reviewing and Editing.

## Declaration of competing interest

There is no conflict of interest.

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