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Unravelling the link between alexithymia and psychological distress in nurses: a multi-hospital cross-sectional study exploring the mediating roles of workplace conflict and emotional exhaustion

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Abstract

Background Nurses are particularly susceptible to the adverse psychological effects of alexithymia, a personality trait characterized by difficulties in identifying and describing emotions. However, the mechanisms linking alexithymia to psychological distress among nurses remain unclear. The present study aimed to unravel the link between alexithymia and psychological distress in nurses, and to explore the potential mediating roles of workplace conflict and emotional exhaustion.

Methods A cross-sectional survey was conducted among 4088 nurses from 43 public hospitals in China. The participants completed a web-based questionnaire that comprised the Toronto Alexithymia Scale (TAS-20), the Interpersonal Conflict at Work Scale (ICAWS), the Emotional Exhaustion Scale (EES), and the Kessler Psychological Distress Scale (K6). The chain mediation model was evaluated using Mplus, with the bias-corrected bootstrap method. Moreover, a sensitivity analysis utilizing a structural equation modeling approach was performed to corroborate the findings.

Results Among the 3977 nurses who returned valid questionnaires, participants reported mean scores of 53.95 ± 10.78 for alexithymia and 7.26 ± 5.75 for psychological distress, with 22.0% meeting the threshold for alexithymia and 16.9% exhibiting clinically significant psychological distress. The study revealed that alexithymia had a direct positive effect on psychological distress ($\beta = 0.164$, 95% CI [0.148–0.181]). Furthermore, workplace conflict ($\beta = 0.036$, 95% CI [0.031–0.042]) and emotional exhaustion ($\beta = 0.118$, 95% CI [0.108–0.128]) independently mediated the pathway linking alexithymia to psychological distress, and also operated sequentially in a chain mediation pathway ($\beta = 0.010$, 95% CI [0.008–0.012]). Sensitivity analyses confirmed the robustness of these findings.

Conclusions This study suggests that alexithymia not only directly affects psychological distress but also exerts chain mediation effects through workplace conflict and emotional exhaustion. The findings unravel the complex

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mechanisms underlying the alexithymia-psychological distress link, providing valuable insights to guide efforts in safeguarding nurses' mental health. By addressing alexithymia and cultivating a supportive organizational environment, managers can facilitate the build-up of emotional resources, ultimately enhancing the psychological well-being of nurses.

Keywords Alexithymia, Psychological distress, Workplace conflict, Emotional exhaustion, Mental health, Nurses

Background

The nursing profession, constituting nearly half of the global healthcare workforce, serves an integral role in delivering high-quality patient care and underpinning the efficacy of healthcare systems worldwide [1]. The high work demands inherent in daily nursing care often expose nurses to psychological distress, defined as a mental state of perceived inability to manage stress [2]. Empirical evidence suggests a wide-ranging prevalence of psychological distress among nurses, estimated from 12% to as high as 83.3% [3–5]. This condition not only undermines the psychosomatic functionality and quality of life of nurses but also leads to suboptimal job performance, heightened susceptibility to burnout, and escalated turnover rates, all of which pose a serious threat to nursing professionalism and the overall standard of care [6–8].

While psychological distress among healthcare professionals can emanate from myriad sources, a growing body of research has pinpointed alexithymia as a significant vulnerability factor [9–13]. Alexithymia is conceptualized as a personality trait characterized by difficulties in recognizing and expressing emotions [14, 15], which occurs in approximately 10% of the general population [16] and is substantially more prevalent among nurses [2, 17, 18]. Individuals with alexithymia often exhibit an impaired capacity to identify and articulate emotions, coupled with a propensity toward externally oriented thinking [15]. This personality trait predisposes them to adopt maladaptive response patterns, such as withdrawal, self-blame, and resorting to fantasy when faced with adversity or pressure, consequently elevating their susceptibility to psychological distress, manifested in conditions like stress, anxiety, and depressive disorders [9–13, 19]. Given the distinct cultural and organizational context unique to China, including an implicit cultural orientation, hierarchical workplace dynamics, and high patient loads, the relationship between alexithymia and psychological distress might be particularly pertinent among Chinese nurses [20, 21]. Although previous studies have examined alexithymia and psychological distress in various populations, comprehensive evidence across diverse clinical settings, specifically focusing on Chinese nurses, remains limited [9–13]. Furthermore, the underlying mechanisms through which alexithymia may contribute to psychological distress are not well understood. Therefore, the first aim of this study is to determine the association between alexithymia and psychological distress in a large, multicenter sample of Chinese nurses.

The compromised capacity for emotional attunement among alexithymic individuals could undermine their ability to navigate the highly interpersonal dynamics inherent in nursing work. Previous studies have shown that alexithymia correlates with inferior emotion recognition, reduced empathy, and impaired interpersonal functioning, thereby hindering effective communication, collaboration, and rapport-building with supervisors, coworkers, and patients [22, 23]. As a result, nurses with higher levels of alexithymia are at an increased risk of experiencing workplace conflicts, characterized by frequent tensions, disagreements, and negative interactions with colleagues and supervisors in the workplace [22, 24]. According to Job Demands–Resources (JD-R) model [25], these workplace conflict represent a social aspect of job demands that requires sustained psychological effort to manage difficult interactions, consequently leading to a variety of adverse psychological outcomes, including negative affect, anxiety, depression, burnout, prolonged fatigue, and job dissatisfaction among employees [24, 26, 27]. In the emotionally charged nursing context, unresolved interpersonal tensions could substantially exacerbate psychological distress [28, 29]. Drawing from the empirical and theoretical underpinnings, workplace conflict may represent an underlying mechanism through which alexithymia heightens susceptibility to psychological distress among nurses.

Typical deficiencies of individuals with alexithymia include problems identifying, processing, describing, and dealing with one's own feelings, leading to an impoverished emotional repertoire and emotionally detached interpersonal style [14, 15, 30]. This affective disconnect not only impairs interpersonal bonds but also impedes effective emotion regulation strategies [14]. Thus, alexithymic individuals may grapple with emotionally taxing situations, rendering them susceptible to emotional exhaustion - a state of diminished emotional reserves and feeling drained from one's work [12, 13]. The phenomenon of emotional exhaustion is pervasive in the Chinese healthcare sector, with prevalence rates reaching up to 86.2% [31, 32]. The sustained depletion of emotional resources could impair nurses' capacity to respond adaptively to stressors, increasing vulnerability to psychological distress [33]. Accordingly, emotional exhaustion may constitute another underlying pathway through which

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alexithymia heightens susceptibility to psychological distress among nurses.

In addition, emotional exhaustion, as the core dimension of burnout, is also influenced by workplace conflict [34–36]. The relationship between workplace conflict and emotional exhaustion can be illuminated through the Conservation of Resources (COR) theory, which posits that workplace conflict represents an initial resource-threatening condition that triggers a resource loss spiral, where persistent interpersonal conflicts deplete individuals' resources, resulting in emotional exhaustion [37]. Hence, workplace conflict and emotional exhaustion may operate in a sequential manner to mediate the relationship between alexithymia and psychological distress. In the context of nurses in China, where both workplace conflict and emotional exhaustion are prevalent concerns [20], the second aim of this study is to elucidate the underlying mechanisms through which alexithymia contributes to psychological distress, with workplace conflict and emotional exhaustion serving as sequential mediators. This examination is theoretically and practically significant, as it reveals how a stable personal characteristic (alexithymia) manifests through interpersonal difficulties (workplace conflict) and emotional states (emotional exhaustion) in the workplace, thereby offering actionable insights for safeguarding nurses' psychological health. Based on theories and the existing literature, we proposed the following hypotheses:

Hypothesis 1 Alexithymia directly and positively impacts psychological distress.

Hypothesis 2 Workplace conflict mediates the impact of alexithymia on psychological distress.

Hypothesis 3 Emotional exhaustion mediates the impact of alexithymia on psychological distress.

Hypothesis 4 Workplace conflict and emotional exhaustion sequentially mediate the pathway from alexithymia to psychological distress.

Methods
Study design
This study employed a multicenter cross-sectional design and followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement for cross-sectional studies [38].

Participants and settings
Participants for this study were recruited from 43 public hospitals, predominantly located in the western and middle regions of China. The development level in these areas is relatively lower compared to the eastern and southern parts of the country. To be eligible for participation, individuals had to fulfil the following criteria: (i) be an active registered nurse, (ii) possess at least one year of clinical nursing experience, and (iii) provide voluntary informed consent to participate. Exclusion criteria were applied to nurses who were on rotational or internship duties, or those who had been on continuous leave for more than 6 months in the past year.

Measurements
Demographic questionnaire
A brief, researcher-designed questionnaire was used to gather sociodemographic and occupational information from the nurse participants. This included data on gender, age, marital status, years of working experience, professional title, and highest educational attainment. Furthermore, to assess perceived socioeconomic status, a single question was posed: 'Considering your income, educational background, and occupation, where do you think your family ranks in the overall social hierarchy?' Responses to this question were provided on a scale ranging from 1, signifying the lowest, to 10, representing the highest status in the social hierarchy.

Alexithymia
The 20-item Toronto Alexithymia Scale (TAS-20) was employed to assess alexithymia [39, 40]. The Chinese version of TAS-20 has demonstrated strong reliability and validity within the Chinese population [41]. The instrument comprises three subscales: Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally Oriented Thinking. Each item, such as "It is difficult for me to reveal my innermost feelings, even to close friends," is rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The total score is derived by summing the item ratings, yielding a range from 20 to 100. Higher scores reflect greater difficulties in identifying and articulating feelings. A TAS-20 score of ≥61 indicates the presence of alexithymia [39, 40]. In the present study, the TAS-20 exhibited acceptable internal consistency, with a Cronbach's α of 0.831.

Workplace conflict
The Interpersonal Conflict at Work Scale (ICAWS), which measures the frequency of disputes, conflicts, and rude behaviours in the workplace, was used to assess workplace conflict [24]. This instrument has been validated for the Chinese population and has demonstrated strong reliability [20]. The ICAWS consists of two 4-item subscales: one for conflict with supervisors and another for conflict with coworkers, featuring items like "How often do you get into arguments with your supervisor/coworker?" [24]. Responses are provided on a 5-point Likert scale, ranging from 1 (less than once a month or

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never) to 5 (several times a day). The total score ranges between 8 and 40, with higher scores indicating greater degree of conflict experienced at work [24]. In our study, the reliability coefficients for the two subscales and the overall scale were 0.933, 0.946, and 0.9648, respectively.

Emotional exhaustion

The 6-item Emotional Exhaustion Scale (EES) [42] derived from the Maslach Burnout Inventory was used to gauge the level of emotional exhaustion [43]. This scale has been widely used and validated in the Chinese context [44]. A sample item is as follows: "I feel emotionally drained from my work." Responses are captured on a 5-point Likert scale, with options ranging from 1 (strongly disagree) to 5 (strongly agree). The total score varies from 6 to 30, with higher scores indicating more severe emotional exhaustion [42]. In this study, the EES demonstrated excellent reliability with a Cronbach's α of 0.957.

Psychological distress

The 6-item Kessler Psychological Distress Scale (K6) was utilized to detect and evaluate non-specific psychological distress [45]. The Chinese version of K6 has been used and validated in the World Mental Health Survey [46]. It comprises 6 questions that gauge the frequency of feelings such as being 'nervous', 'hopeless', 'restless or fidgety', 'so depressed that nothing could cheer you up', 'that everything was an effort', and 'worthless' experienced in the last 30 days [45]. Responses are scored from 0 (none of the time) to 4 (all of the time), leading to a total score ranging between 0 and 24; higher scores represent more severe psychological distress. A K6 score of ≥ 13 is indicative of serious psychological distress [45]. In the present study, the scale showed high reliability with a Cronbach's α of 0.953.

Data collection

Data collection was carried out from January to April 2023, employing a convenience sampling approach. The process began with the principal investigator contacting the heads of the nursing departments in selected hospitals to obtain their consent. Subsequently, a QR code for the questionnaire, created using www.wjx.cn—a widely-used, user-friendly data collection platform in China—was provided to these department heads. They were then tasked with distributing this QR code to potential participants at their respective hospitals. The introductory interface of the questionnaire clearly outlined the research objectives, instructions for completing the questionnaire, the voluntary nature of participation, and the measures implemented to safeguard the privacy and confidentiality of the respondents. Participation in the study was entirely voluntary, and each nurse had the discretion

to decide whether to participate. To ensure the uniqueness of each response, the questionnaire was configured to accept only one submission per IP address. Additionally, the questionnaire was formatted to display questions in a paginated manner, requiring participants to answer all items on each page before proceeding. Brief explanatory notes were included where necessary to ensure accurate interpretation of scale items. All collected data were encrypted and securely stored, with access restricted solely to the principal investigator.

Statistical analysis

Statistical analyses in this study were performed using SPSS Statistics for Windows, version 26 (IBM Corp., Chicago, IL) and Mplus, version 8.3 (Muthen & Muthen, Los Angeles, CA). We employed the Harman's single-factor test and variance inflation factor test were to assess common method bias and the multicollinearity of variables [47, 48]. We calculated Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) to evaluate the internal consistency and convergent validity of the scales used in the study [49]. For descriptive statistics, categorical variables were depicted using frequency and percentage, while continuous variables were represented as mean ± standard deviation (SD). We used *t*-tests or one-way analysis of variance (ANOVA) to examine the differences in psychological distress based on participants' general characteristics. Pearson's correlation analysis was applied to investigate the bivariate correlations among study variables. Moreover, we performed a mediation effect analysis, controlling for potential confounding demographic factors, to explore the sequential mediating roles of workplace conflict and emotional exhaustion in the relationship between alexithymia and psychological distress. This analysis involved the bias-corrected bootstrap method with 5000 iterations to compute 95% confidence intervals (CIs). Additionally, we carried out a sensitivity analysis using structural equation modelling (SEM) with latent variables to validate our findings. For all analyses, a significance level of 0.05 (2-tailed) was used.

Results

A total of 4088 participants submitted the online questionnaires. After deleting those completed in less than 3 min (as indicated by a pilot test which demonstrated that careful completion of the questionnaire required a minimum of 3 min) or had consistently identical answers, 3977 valid questionnaires remained, representing an effective response rate of 97.3%. The Harman's single-factor test extracted nine factors with eigenvalues greater than 1. The primary factors explained 33.58% of the total variance, which was below the 40% threshold. Therefore, common method bias did not appear to pose a serious

threat to the study [47]. Furthermore, variance inflation factor tests verified that there was no multicollinearity between the dependent variable of psychological distress and the independent variables—alexithymia, workplace conflict, and emotional exhaustion—with all variance inflation factor values remaining below 5 [48].

Demographic characteristics of participants

Table 1 outlines the demographic characteristics of the study participants. The mean age of the nurses was 33.3 ± 7.0 years. A predominant majority (95.2%) of the participants were women, and 71.8% were married. Only a marginal 0.4% held a postgraduate degree or higher. On average, the nurses had 11.3 ± 7.6 years of working experience, and the majority (72.0%) were junior nurses in terms of professional title. Approximately two-thirds (62.9%) self-rated their socioeconomic status as middle in the overall social hierarchy.

Differences in psychological distress based on demographic characteristics

Table 1 also outlines the group differences in K6 scores of the participants based on their demographic characteristics. Significant differences were observed across various groups, differentiated by age, gender, marital status, educational attainment, working experience, and socioeconomic status (all $P < 0.05$). Specifically, higher levels of psychological distress were found among nurses aged between 29 and 36 and 37 to 44 years, female nurses, those who were married, possessed an undergraduate degree, had over 6 years of working experience, and belonged to the lower socioeconomic tier. Given these significant group differences, these demographic characteristics were controlled for as potential confounders in subsequent mediation analyses.

Table 1 Participants' demographic characteristics and group differences in K6 scores ($N = 3977$)

Characteristics	Mean ± SD / *n* (%)	Mean ± SD	t/F	P
Age (years)	33.3 ± 7.0		13.748	< 0.001
≤ 28	1037 (26.1%)	6.44 ± 5.63		
29–36	1951 (49.1%)	7.55 ± 5.87		
37–44	642 (16.1%)	8.02 ± 5.65		
≥ 45	347 (8.7%)	6.65 ± 5.30		
Gender			-2.394	0.017
Male	191 (4.8%)	6.29 ± 5.34		
Female	3786 (95.2%)	7.31 ± 5.77		
Marital status[†]			-3.080	0.002
Single	1121 (28.2%)	6.81 ± 5.77		
Married	2856 (71.8%)	7.44 ± 5.74		
Educational level			4.755	0.009
Junior college and below	1761 (44.3%)	6.96 ± 5.85		
Undergraduate	2200 (55.3%)	7.51 ± 5.66		
Postgraduate or above	16 (0.4%)	6.25 ± 5.52		
Working experience (years)	11.3 ± 7.6		11.048	< 0.001
1–5	980 (24.6%)	6.38 ± 5.63		
6–10	1033 (26.0%)	7.35 ± 5.79		
11–15	1128 (28.4%)	7.73 ± 5.86		
≥ 16	836 (21.0%)	7.55 ± 5.59		
Professional title			2.766	0.063
Junior	2865 (72.0%)	7.14 ± 5.87		
Intermediate	908 (22.8%)	7.65 ± 5.53		
Senior	204 (5.1%)	7.21 ± 5.01		
Socioeconomic status[‡]			39.667	< 0.001
Lower	933 (23.5%)	8.53 ± 6.31		
Middle	2503 (62.9%)	7.08 ± 5.45		
Upper	541 (13.6%)	5.91 ± 5.67		

Note. SD, standard deviation

[†] Single indicated separated, divorced, widowed, or never married, and married indicated married or partnered

[‡] Socioeconomic status was classified as lower level for options of 1 ~ 3, middle level for 4 ~ 7, and higher level for 8 ~ 10

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Table 2 Psychometric indicators of the measurements and bivariate correlation analyses (*N* = 3977)

	CR	AVE	Mean ± SD	AL	WC	EE	PD
Alexithymia (AL)	0.966	0.586	53.95 ± 10.78	1			
Workplace conflict (WC)	0.957	0.735	10.38 ± 4.59	0.320**	1		
Emotional exhaustion (EE)	0.966	0.825	17.39 ± 6.60	0.574**	0.283**	1	
Psychological distress (PD)	0.962	0.811	7.26 ± 5.75	0.617**	0.418**	0.661**	1

Note. CR, composite reliability; AVE, average variance extracted; SD, standard deviation

** All correlations in this matrix were found to be statistically significant at the 0.01 level (two tails)

Table 3 The chain mediation effect analysis (*N* = 3977)

Outcome variables	Predictive variables	β	BootSE	BootLLCI	BootULCI
Psychological distress (PD)	Alexithymia (AL)	0.164	0.009	0.148	0.181
	WC	0.249	0.016	0.217	0.281
	EE	0.365	0.014	0.338	0.391
Emotional exhaustion (EE)	AL	0.323	0.009	0.305	0.341
	WC	0.187	0.019	0.145	0.218
Workplace conflict (WC)	AL	0.143	0.007	0.129	0.158
Direct effect	AL → PD				
Total indirect effects	IE = IE1 + IE2 + IE3	0.164	0.006	0.153	0.176
IE1	AL → WC → PD	0.036	0.003	0.031	0.042
IE2	AL → EE → PD	0.118	0.005	0.108	0.128
IE3	AL → WC → EE → PD	0.010	0.001	0.008	0.012

Note. BootSE, bootstrapping standard error; BootLLCI, bootstrapping lower limit confidence interval; BootULCL, bootstrapping upper limit confidence interval; IE, indirect effect. Age, gender, marital status, educational level, working experience, and socioeconomic status were controlled as confounding factors

Psychometric properties, descriptive statistics, and intercorrelations among alexithymia, workplace conflict, emotional exhaustion, and psychological distress

Table 2 displays the CR, AVE, descriptive statistics, and bivariate correlations for the study variables. The CR and AVE values for the variables exceeded the respective thresholds of 0.7 and 0.5, affirming the reliability and validity of the measurement scales used [49]. The descriptive statistics showed that the mean scores were 53.95 ± 10.78 for alexithymia, 10.38 ± 4.59 for workplace conflict, 17.39 ± 6.60 for emotional exhaustion, and 7.26 ± 5.75 for psychological distress. Notably, 22.0% of participants met the criteria for clinical alexithymia and 16.9% exhibited serious psychological distress based on established cutoffs. These prevalence rates were slightly higher than those reported in previous studies [3, 16]. Additionally, the findings unveiled a positive correlation between alexithymia and workplace conflict ($r = 0.320$, $P < 0.01$), emotional exhaustion ($r = 0.574$, $P < 0.01$), and psychological distress ($r = 0.617$, $P < 0.01$). Similarly, a positive correlation was observed between workplace conflict and both emotional exhaustion ($r = 0.283$, $P < 0.01$) and psychological distress ($r = 0.418$, $P < 0.01$). Furthermore, a strong positive correlation was noted between emotional exhaustion and psychological distress ($r = 0.661$, $P < 0.01$). These intercorrelations laid a preliminary foundation for the subsequent mediation analysis.

The chain mediation effects of workplace conflict and emotional exhaustion between alexithymia and psychological distress

Table 3 illustrates the chain mediation effect analysis of workplace conflict and emotional exhaustion on the relationship between alexithymia and psychological distress. Initial univariate regression analysis, controlling for potential confounders, established that alexithymia exerted a direct and positive effect on psychological distress ($\beta = 0.328$, 95% CI [0.315–0.341]). When workplace conflict and emotional exhaustion were introduced into the model, multivariate regression analysis revealed a reduced, yet statistically significant, regression coefficient for alexithymia ($\beta = 0.164$, 95% CI [0.148–0.181]). Subsequent analysis demonstrated the significant indirect effect of alexithymia on psychological distress, with workplace conflict as a mediator ($\beta = 0.036$, 95% CI [0.031–0.042]). Similarly, when emotional exhaustion acted as the mediating variable, alexithymia had an indirect influence on psychological distress ($\beta = 0.118$, 95% CI [0.108–0.128]). Furthermore, when both workplace conflict and emotional exhaustion were used as sequential mediators, this indirect effect remained significant ($\beta = 0.010$, 95% CI [0.008–0.012]). Taken together, alexithymia had a significant overall effect, direct effect, and indirect effect on psychological distress, with the results also indicating that workplace conflict and emotional exhaustion played significant partial mediating roles in a chain mediation pathway.
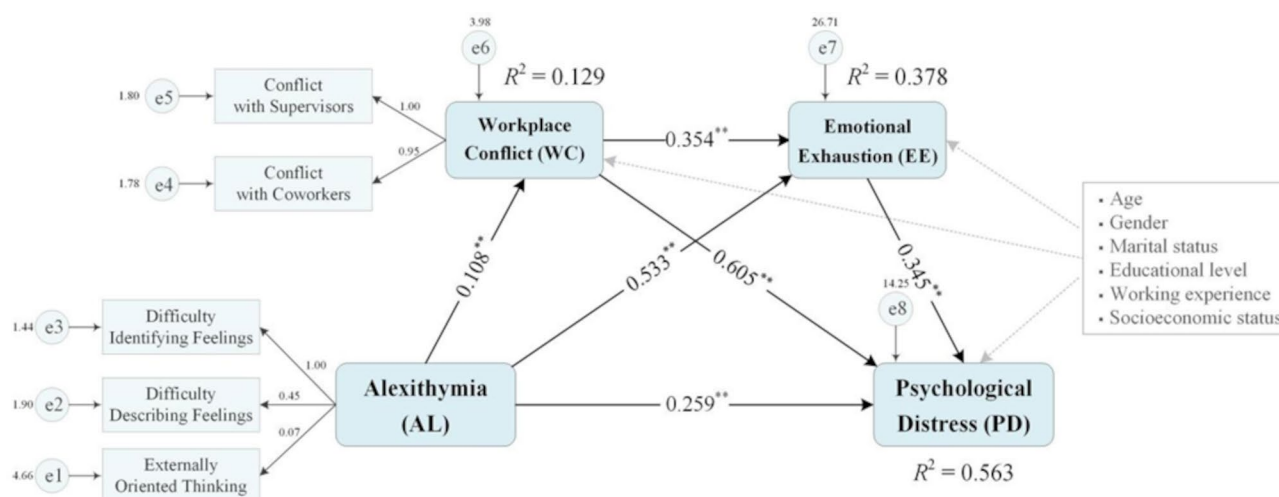
Fig. 1 Structural equation model of the chain mediation effect analysis. Age, gender, marital status, educational level, working experience, and socio-economic status were controlled as confounding factors. R^2 representing the proportion of variation in each dependent variable that can be explained in the model

The findings were further confirmed by structural equation modelling (SEM) incorporating latent variables. As illustrated in Fig. 1, the hypothesized chain mediation model tested using SEM was supported by our data with acceptable goodness-of-fit indices (χ^2/df = 2.838, CFI = 0.990, TLI = 0.981, SRMR = 0.031, RMSEA = 0.034), and all path coefficients in the model achieved statistical significance. More detailed information regarding preliminary bivariate correlations between all variables involved and results of the SEM is available in the Supplementary Figure S1 and Table S1.

Discussion

The present study investigated the association between alexithymia and psychological distress among a large multicenter sample of Chinese nurses and explored the chain mediation effects of workplace conflict and emotional exhaustion. The findings confirmed our first hypothesis by showing that alexithymia had a direct positive effect on psychological distress. Additionally, the results supported our second to fourth hypotheses, demonstrating that workplace conflict and emotional exhaustion independently mediated the pathway linking alexithymia to psychological distress, as well as sequentially in a chain mediation pathway. Furthermore, sensitivity analyses corroborated the robustness of these findings. This study represents one of the initial efforts to unravel the potential mechanisms underlying the association between alexithymia and psychological distress within the Chinese nursing profession. By elucidating the linking pathways, our findings offer valuable insights for nursing management to develop evidence-based strategies aimed at promoting nurses' psychological well-being, ultimately enhancing patient care quality and organizational effectiveness.

Our first main finding revealed that alexithymia had a direct positive effect on psychological distress among Chinese nurses. This result aligns with previous studies conducted in various populations, including healthcare professionals [9, 11, 17, 50], and our research extends the existing literature by specifically examining the nursing profession in China, a population that has received limited attention in this regard. The direct effect of alexithymia on psychological distress can be explained by the inherent deficits associated with this personality trait. Nurses with alexithymia struggle with identifying and articulating emotions [14, 15], which directly conflicts with the profession's demands for emotional intelligence and therapeutic communication. This emotional processing deficit can lead to feelings of confusion, alienation, and overwhelming distress [51]. Further characterized by a limited capacity for introspection and a tendency towards externally-oriented thinking, alexithymia impedes efficient emotion regulation and coping mechanisms [14]. Consequently, unresolved emotional conflicts and stress may accumulate over time, compromising both nurses' psychological well-being and their capacity for empathetic patient care. The finding highlights alexithymia as a risk factor for psychological distress among nurses, calling for more attention to this personality dimension within the nursing community.

In addition to the direct effect, our study also indicated significant indirect effects of alexithymia on psychological distress, with workplace conflict and emotional exhaustion acting as independent mediators. The mediating role of workplace conflict can be attributed to the interpersonal problems experienced by individuals with

alexithymia [22, 23]. Specifically, alexithymic individuals often display a cold and socially avoidant interpersonal style, predominantly exhibiting an insecure attachment pattern, which can result in difficulties connecting with and feeling close to others, as well as problems in taking initiative in social and organizational interactions [22]. In the nursing context, which demands constant inter-professional communication, these characteristics can significantly impair team dynamics. Furthermore, their inherent limitation in identifying and communicating emotions can trigger misunderstandings and strained relationships with colleagues [15]. Such interpersonal challenges not only compromise team-based care but also intensify psychological distress, as consistently demonstrated by studies linking workplace conflict to poor mental health outcomes [52]. The mediating effect of emotional exhaustion may be explained by the emotional processing and regulation deficits associated with alexithymia [14]. Nursing is an emotionally charged profession, and alexithymic nurses have to struggle to align their inner feelings with the emotional demands of their work. The misalignment between felt and expressed emotions can lead to the depletion of emotional resources, as the effort to suppress or fabricate emotions is emotionally burdening [53, 54]. Moreover, the limited emotional regulation capacity associated with alexithymia may hinder effective emotion modulation strategies [14, 30]. Thus, nurses with alexithymia are more susceptible to emotional exhaustion, a condition with established correlations to a spectrum of negative psychological impacts [55].

Moreover, the sequential mediation effect observed in our study highlights the interplay between workplace conflict and emotional exhaustion in amplifying the impact of alexithymia on psychological distress among Chinese nurses. The sequential mediation effect may be explained by the cumulative impact of interpersonal and emotional challenges faced by nurses with alexithymia. As previously discussed, individuals with alexithymia are more prone to workplace conflict, which can drain their emotional resources and lead to emotional exhaustion [17, 22]. In turn, emotionally exhausted nurses may be more vulnerable to psychological distress due to a lack of coping resources [33]. This sequential mediation pathway is consistent with the JD-R model and COR theory [25, 37], which posit that job demands, such as workplace conflict, can lead to exhaustion and subsequent mental health problems. Our findings underscore the importance of addressing both interpersonal and emotional factors when developing interventions to alleviate the negative consequences of alexithymia among Chinese nurses. While several studies have attempted to examine the relationships between alexithymia and psychological distress in nurses [9, 11, 13, 17], our study extends this literature by elucidating the underlying mechanisms involving workplace conflict and emotional exhaustion in a large multicenter sample of Chinese nurses, thereby providing novel insights into the unique challenges faced by this population.

Limitations

Several limitations of this study merit consideration. First, the cross-sectional design limits the ability to establish causal relationships between variables. Future research could employ longitudinal designs to better delineate potential causal pathways. Second, the convenience sampling approach and exclusive focus on Chinese nurses may limit the generalizability of our findings. Cross-cultural validation studies spanning different healthcare systems and cultural contexts are needed to ensure broader applicability of these results. Third, we did not assess participants' engagement in psychotherapy and counselling interventions, which could have served as protective factors. Additionally, this study's exploration of alexithymia's link to psychological distress through workplace conflict and emotional exhaustion may not fully capture all possible mediating variables. Further research should investigate additional mediators, such as cultural norms and individual coping strategies. Finally, the reliance on self-reported data collected via electronic surveys may introduce recall and social desirability biases. Future studies would benefit from incorporating both objective indicators (e.g., physiological stress measures) and multi-source data (e.g., peer ratings) to complement self-report measures and enhance measurement validity.

Conclusions

The study unravels the link between alexithymia and psychological distress among nurses, revealing that alexithymia not only directly affected psychological distress but also exerted indirect effects through workplace conflict and emotional exhaustion, both independently and sequentially in a chain mediation pathway. Our findings not only extend research on nurse alexithymia and psychological distress but also shed light on the mechanisms underlying the alexithymia-psychological distress link, providing valuable insights to guide efforts in safeguarding nurses' mental health and well-being. The findings underscore the necessity for nursing managers to implement a multi-level intervention framework. At the individual level, systematic screening for alexithymia should be coupled with targeted psychological interventions, including emotional literacy training and mindfulness-based stress reduction programs. At the organizational level, evidence-based conflict resolution protocols and workload management strategies should be established to minimize workplace tensions and emotional depletion. At the systemic level, healthcare institutions should

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develop comprehensive support structures that integrate psychological resources, peer support networks, and professional development opportunities. Furthermore, all levels of nursing management should acknowledge the independent and sequential effects of workplace conflict and emotional exhaustion on the relationship between alexithymia and psychological distress, devising and implementing multi-faceted interventions that concurrently target these factors.

Abbreviations

TAS-20	20-item Toronto Alexithymia Scale
ICAWS	Interpersonal Conflict at Work Scale
EES	Emotional Exhaustion Scale
K6	Kessler Psychological Distress Scale
JDR	Job Demands–Resources
COR	Conservation of Resources
SEM	Structural Equation Modelling

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12888-025-06742-2.

Supplementary Material 1

Data availability
The data can be requested from the corresponding author.

Declarations

Ethics approval and consent to participate
This study was performed according to the appropriate Chinese laws and regulations, the principles outlined in the Declaration of Helsinki, and Good Clinical Practice guidelines. Ethics approval was obtained from the Biomedical Ethics Committee of West China Hospital, Sichuan University [Approval number: 2023 (2207)]. Consent was also secured from each participating hospital. All participants in the study were fully informed of the voluntary nature of their participation in the anonymous survey, and consent was implied upon the completion and submission of the questionnaires.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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