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ORIGINAL RESEARCH

The Mediating Effect of Emotional Regulation Between Psychological Resilience and Psychological Distress in Young and Middle-Aged Lymphoma Patients

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Background: Psychological distress is common among young and middle-aged lymphoma patients. Psychological resilience and emotion regulation are key factors in coping with cancer, but their interrelationships remain unclear. Clinical psychologists play a crucial role in addressing psychological resilience and distress by providing therapeutic interventions that enhance coping mechanisms and emotion regulation. This study examines the mediating role of difficulties in emotion regulation between psychological resilience and psychological distress.

Methods: A cross-sectional study was conducted among lymphoma patients at Northern Jiangsu People's Hospital from January to December 2023. Psychological resilience, distress, and emotion regulation were assessed using standardized scales. SPSS 26.0 was used for descriptive statistics and spearman correlation analysis. PROCESS 4.0 was used to calculate the significance of the mediating effects of the variables.

Results: Patients had a psychological resilience score of 5.72 ± 2.31, a difficulties in emotion regulation score of 95.22 ± 8.86, and a psychological distress score of 5.72 ± 2.31. Psychological resilience was negatively correlated with both difficulties in emotion regulation ($r = -0.28$, $P < 0.01$) and psychological distress ($r = -0.31$, $P < 0.01$), while difficulties in emotion regulation were positively correlated with distress ($r = 0.29$, $P < 0.01$). Mediation analysis confirmed that difficulties in emotion regulation fully mediated the link between resilience and distress (effect size = −0.310, 95% CI: −1.195, −0.136).

Conclusion: Difficulties in emotion regulation partially mediate the relationship between psychological resilience and distress. Enhancing resilience and improving emotion regulation may help alleviate distress, emphasizing the need for targeted psychological interventions in young and middle-aged lymphoma patients.

Keywords: lymphoma, psychological resilience, psychological distress, emotion regulation, young and middle-aged

Introduction

Lymphoma is a common hematological malignancy worldwide, primarily including Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL). According to data from the Global Cancer Observatory (GLOBOCAN), there were approximately 250,000 new cases of Hodgkin lymphoma and over 540,000 new cases of non-Hodgkin lymphoma globally in 2018.[1] Research indicates that the incidence of non-Hodgkin lymphoma has significantly increased over the past few decades, particularly in developed countries.[2] In China, the incidence of lymphoma is also on the rise. According to data from the National Cancer Center of China, the incidence of lymphoma in 2015 was approximately 6.7 cases per 100,000 people, with non-Hodgkin lymphoma accounting for the majority of cases.[3] Furthermore, studies related to lymphoma indicate that, with changes in lifestyle and environment, the incidence of lymphoma has significantly increased over the past few decades.[4] The incidence of lymphoma in the young and middle-aged population is particularly concerning. Research indicates that the

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incidence of non-Hodgkin lymphoma in this age group is continually rising, with some studies showing that the incidence in this age range represents a significant proportion of total lymphoma cases.[5]

Lymphoma patients often face various psychological issues during the diagnosis and treatment process, which not only affect their mental health but may also have a significant impact on their overall quality of life and disease prognosis. Multiple studies indicate that the incidence of depression and anxiety is significantly higher among lymphoma patients.[6,7] Approximately 25% of patients experience persistent feelings of depression and anxiety, a condition referred to as psychological distress.[8] This psychological burden is often related to the severity of the disease itself, the uncertainty during the treatment process, and concerns about the future.[9] For young and middle-aged patients, they bear more social roles and responsibilities compared to other age groups, resulting in more significant impairment of social functioning. This heightened burden contributes to a higher incidence of psychological distress among these patients. Severe psychological distress not only impacts an individual's mental health but also has widespread and profound effects on physical health, quality of life,[10] and social functioning.[11] Additionally, it can reduce patients' adherence to treatment plans,[12] increase the utilization of medical resources,[13] and elevate the risk of suicide.[14]

Psychological resilience refers to an individual's ability to effectively adapt and quickly recover when facing adversity, stress, and challenges.[15] This concept emphasizes how people utilize both internal and external resources to maintain their mental health and normal functioning during difficult and painful times. Psychological resilience is not a fixed trait; rather, it is a dynamic process that involves an individual's thought patterns, emotional responses, and effective use of social support. Psychological resilience serves as an essential psychological defense system for individuals, effectively shielding cancer patients from negative emotions such as depression, anxiety, and fear.[16] This resilience contributes to maintaining patients' mental health and promotes recovery from the disease. Previous studies have demonstrated a significant negative correlation between psychological resilience and psychological distress in cancer patients.[17,18] This indicates that higher levels of psychological resilience are associated with lower levels of psychological distress. Psychological resilience is one of the crucial factors in mitigating the psychological suffering experienced by cancer patients.[19] It enables individuals to cope more effectively with the challenges and uncertainties associated with their diagnosis and treatment, ultimately fostering a sense of hope and well-being. However, the pathways through which psychological resilience alleviates psychological distress and the underlying psychological mechanisms remain unclear.

Emotional regulation ability is crucial for individual mental health, influencing various aspects of a person's well-being. In recent years, emotional regulation has become a focal point of research in the field of psychology. While there is no universally accepted definition of emotion regulation, scholars generally agree that difficulties in emotional regulation are multidimensional, encompassing a lack of suppression of intense negative and positive emotions, as well as failures in self-regulatory actions.[20] For cancer patients, emotional regulation is closely related to their adaptation, health, and quality of life.[21] The relationship between emotional regulation ability, psychological distress, and psychological resilience is complex and closely intertwined. Effective emotional regulation can significantly reduce psychological distress, such as anxiety and depression.[22] The level of psychological distress is closely related to an individual's emotional regulation ability; patients who can effectively regulate their emotions tend to experience less psychological distress.[23] Currently, there is limited research on the relationship between emotional regulation and emotional distress. A study on psychological distress and its relationship with emotion regulation in patients with substance-related disorders showed a significant positive correlation between psychological distress and the emotion regulation strategy of expressive suppression.[24] Furthermore, emotional regulation is considered a key factor in enhancing psychological resilience, helping individuals maintain adaptability and a positive psychological state when facing negative emotions.[25]

This study hypothesizes that there is a close relationship between emotional resilience and psychological distress in young and middle-aged lymphoma patients, and that emotional regulation may play a mediating role between the two.

Materials and Methods

Research Participants

Young and middle-aged lymphoma patients who visited the Hematology Department of Northern Jiangsu People's Hospital from January to December 2023 were selected as subjects for this study.

Inclusion criteria: (1) pathologically diagnosed with lymphoma; (2) aged between 18 and 60; (3) clear consciousness, able to cooperate in completing the survey; (4) provided informed consent and voluntarily participated.

Exclusion criteria: (1) cognitive impairment or mental illness; (2) severe complications preventing survey cooperation.

This study was approved by the Ethics Review Committee of Life Sciences at Northern Jiangsu People's Hospital. A total of 230 questionnaires were distributed, with 205 valid questionnaires included in the final analysis, yielding an effective rate of 89.13%.

Potential Biases and Control Methods

In this study, we identified several potential sources of bias and implemented measures to control them:

1. Selection Bias: Since participants were recruited from a single hospital, there may be a risk of selection bias. To minimize this, we applied strict inclusion and exclusion criteria to ensure the homogeneity of the study population.
2. Information Bias: Self-reported data may introduce recall or reporting bias. To address this, we used validated scales (eg, CD-RISC-10 and DERS) and provided standardized training to investigators to ensure consistency in data collection.
3. Confounding Bias: Variables such as age, gender, and disease stage may confound the results. We controlled for these potential confounders by including them in multivariate analyses.
4. Measurement Bias: The translation and cultural adaptation of scales may affect measurement accuracy. To mitigate this, we used Chinese versions of the scales that have been validated in previous studies and reported their reliability.

Measurements

Sociodemographic and Clinical Characteristics

Gender, age, education level, marital status, monthly income, types of medical insurance, disease staging, recurrence status, and whether there are other comorbid chronic diseases.

Psychological Resilience

The simplified version of the Connor-Davidson Resilience Scale (CD-RISC-10) was originally developed by Connor et al[26] and later condensed to 10 items by Campbell et al, resulting in the CD-RISC-10. This study utilized the simplified Chinese version translated by Zhang Danmei and others.[27] Each item is scored on a 5-point Likert scale, ranging from 1 ("Never") to 5 ("Always"), with higher scores indicating stronger psychological resilience. In this study, the Cronbach's α coefficient for this scale was 0.92.

Psychological Distress

The Psychological Distress Thermometer[28] assesses participants' level of psychological distress over the past week, scored on a scale from 0 to 10, where 0 indicates no psychological distress and 10 indicates extreme psychological distress. The Cronbach's α coefficient for this scale was 0.8.

Emotion Regulation

The Difficulties in Emotion Regulation Scale (DERS)[29] is a self-report questionnaire created by Gratz and Roemer in 2004 to evaluate the challenges individuals encounter in regulating their emotions. It is widely utilized in clinical and research contexts to measure various aspects of emotional regulation difficulties. The scale consists of six subscales: the use of regulation strategies, goal-directed behavior, emotional clarity, emotional awareness, impulse control in response to emotions, and acceptance of emotional responses. Comprising 36 items, it employs a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always), with some items requiring reverse scoring. Higher scores reflect greater difficulties in emotional regulation. The Cronbach's α coefficient for this scale was 0.95.

Statistical Analysis

Data analysis was conducted using SPSS 26.0 statistical software and its Process plugin. Pearson correlation analysis was utilized to assess the relationships between variables. Psychological distress among lymphoma patients was presented in terms of the mean ± standard deviation (SD). *T*-tests were used for comparisons between two groups, while one-way ANOVA was employed for comparisons among multiple groups. Mediation effect analysis was performed using Model 4 in the Process plugin to examine the role of difficulties in emotional regulation between psychological resilience and psychological distress. Finally, the significance level of the mediation effect was tested using the Bootstrap method with 5000 resamples. A p-value of < 0.05 was considered statistically significant.

Results

Psychological Distress with Respect to Demographic and Clinical Characteristics

Comparison of psychological distress scores among lymphoma patients with different demographic and clinical characteristics showed statistically significant differences in scores based on marital status, monthly family income, and recurrence. No statistically significant differences were found in scores based on gender, age, education level, insurance type, disease stage, or presence of chronic comorbidities, as shown in Table 1.

Correlation Analysis of Study Variables

Pearson correlation analysis indicated that all variables showed significant correlations ($P < 0.01$). Psychological resilience was significantly negatively correlated with both difficulties in emotional regulation and psychological distress, while difficulties in emotional regulation were significantly positively correlated with psychological distress, as shown in Table 2.

Table 1 Psychological Distress With Respect to Demographic and Clinical Characteristics

Variables	Classification	N (%)	DT ($\bar{x} \pm s$)	*t/F*	*P*
Gender	Male	128 (62.5)	5.3±2.4	−0.98	0.326
	Female	77 (37.5)	5.8±2.4		
Age (years)	18~44	93 (45.3)	6.5±2.2	0.85	0.394
	44~59	112 (54.7)	6.1±1.9		
Educational level[a]	Low	97 (47.5)	5.8±2.1	1.02	0.386
	Middle	51 (24.9)	5.4±2.3		
	High	57 (27.6)	5.6±2.2		
Marital status[b]	Married	147 (71.6)	4.5±1.9	−8.56	*P* <0.001
	Others	58 (28.4)	7.5±2.6		
Monthly income[c]	Low	82 (40.2)	6.8±2.0	10.9	*P* <0.001
	Middle	48 (23.5)	5.3±1.8		
	High	75 (36.3)	4.3±1.6		
Medical insurance[d]	Employee medical insurance	113 (54.9)	5.2±1.8	−1.75	0.063
	Others	92 (45.1)	5.6±2.3		
Disease Stage	I	56 (27.5)	5.4±1.8	2.28	0.120
	II	21 (10.2)	5.6±2.0		
	III	54 (26.5)	6.0±1.9		
	IV	74 (35.8)	6.1±2.2		
Recurrence Status	Yes	79 (38.6)	7.2±2.8	7.23	0.001
	No	126 (61.4)	5.5±2.1		
Comorbid chronic diseases	Yes	94 (45.7)	5.7±2.3	0.97	0.386
	No	111 (54.3)	5.4±2.2		

Notes: [a]Low: junior school and below; middle: senior school or secondary specialized school; high: college degree or above. [b]Others: single, divorce, separation and widowerhood. [c]Low:<3000 yuan; middle:3000–6000 yuan; high:>6000 yuan. [d]Others: Rural medical insurance, Out-of-Pocket.

Table 2 Correlation Among the Study Variables (N=205)

	M	SD	Psychological Resilience	Emotion Regulation	Psychological Distress
Psychological resilience	19.85	7.54	1		
Emotion regulation	95.22	8.86	−0.28**	1	
Psychological distress	5.72	2.31	−0.31**	0.29**	1

Note: **P<0.01.

Analysis of the Mediating Effect of Emotion Regulation Between Psychological Resilience and Psychological Distress

Multiple linear regression analysis showed that after controlling for marital status, family monthly income, and recurrence, psychological resilience had a significant negative predictive effect on psychological distress (β = −0.421, P = 0.002), explaining 74.2% of the variance in psychological distress. Psychological resilience also significantly negatively predicted difficulties in emotion regulation (β = −0.532, P =0.001). When both psychological resilience and difficulties in emotion regulation were included in the equation, the predictive effect of psychological resilience remains significant (β = −0.111, P=0.041), while difficulties in emotion regulation significantly positively predicted psychological distress (β = 0.13, P = 0.036). Together, they explained 76.2% of the variance in psychological distress (see Table 3).

Using psychological resilience as the independent variable, psychological distress as the dependent variable, and difficulties in emotional regulation as the mediator, we employed Model 4 of the PROCESS macro to test for mediation effects. The Bootstrap method was used to perform 5000 repetitions, setting a 95% confidence interval to examine whether difficulties in emotional regulation serve as a mediator between psychological resilience and psychological distress. If the 95% confidence interval does not include 0, the mediation effect is considered significant.

The total effect of psychological resilience on psychological distress was significant (95% CI[−1.345, −0.012], P <0.01), and the direct effect was also significant (95% CI[−0.128, −0.021], P <0.05). The mediation effect of difficulties in emotion regulation between psychological resilience and psychological distress was significant (95% CI [−1.195, −0.136], P <0.01), with a mediation effect value of −0.310. These results indicate that emotion regulation partially mediates the relationship between psychological resilience and psychological distress, as the mediation effect was observed for 73.6% of the variance in psychological distress (see Table 4).

Table 3 Regression for Prediction of Psychological Distress (N=205)

Outcome Variable	Predictor Variable	R	R2	F (df)	β	t
Psychological distress	Psychological resilience	0.861	0.742	49.85(10)	−0.421	−3.21**
Emotion regulation	Psychological resilience	0.716	0.512	18.89(10)	−0.532	−6.84**
Psychological distress		0.873	0.762	47.12 (11)		
	Psychological resilience				−0.111	−1.84*
	Emotion regulation				0.13	2.35*

Notes: **P<0.01,*P<0.05.

Table 4 Mediation Analysis of Emotion Regulation in the Relationship Between Psychological Resilience and Psychological Distress

Effect	Path	Effect Size	Boot SE	95% CI	
				Lower	Upper
Total effect		−0.421	0.045	−1.345	−0.012
Direct effect	Psychological resilience →psychological distress	−0.111	0.018	−0.128	−0.021
Indirect effect	Psychological resilience →Emotion regulation →psychological resilience	−0.310	0.039	−1.195	−0.136

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Discussion

The study results indicate that the Distress Thermometer (DT) score for young and middle-aged lymphoma patients averaged 5.72 ± 2.31, suggesting a moderate overall level of psychological distress. This score is notably higher than those reported in some international studies on cancer patients' distress levels.[30,31]. Young and middle adulthood represents a pivotal phase in life, characterized by significant family and career responsibilities, while simultaneously facing the dual physical and psychological challenges posed by cancer. In this context, the patients' social functioning and quality of life are severely impacted, contributing to both a higher prevalence and intensity of psychological distress. This finding highlights the profound impact of lymphoma on patients' lives, particularly among younger individuals, who often must balance multiple societal roles while also coping with cancer, making them more vulnerable to emotional distress and psychological suffering.

This study indicates that the level of psychological distress in lymphoma patients is closely associated with factors such as marital status, monthly household income, and whether they have experienced disease recurrence. Married lymphoma patients exhibit lower levels of psychological distress, indicating that a stable marital relationship plays a positive role in mitigating psychological distress. This suggests that supportive relationships can significantly enhance mental well-being during challenging times. Numerous studies indicate that marital status significantly affects psychological distress levels in lymphoma patients.[32,33] Married individuals often report lower distress compared to their single, divorced, or widowed counterparts.[10] This difference is likely attributed to the emotional and practical support provided by a spouse, which can alleviate the burdens associated with illness and diminish feelings of isolation. Conversely, unmarried patients, who navigate treatment without such immediate support, may be more vulnerable to distress and anxiety. To effectively manage the psychological health of single patients, it may be essential to integrate broader social support resources. This approach could help mitigate the psychological challenges they face during treatment. Patients with lower monthly family income experience higher levels of psychological distress. This finding aligns with research conducted internationally.[34]. The long treatment duration and substantial medical costs associated with lymphoma can be particularly burdensome for low-income patients, who may struggle to cover these expenses. This financial strain can exacerbate feelings of anxiety and helplessness. Additionally, low-income patients may have limited access to healthcare resources or may be unable to choose optimal treatment options, potentially worsening their condition or delaying treatment. Such circumstances can intensify their worries and anxiety regarding their illness. This study also indicates that lymphoma patients who experience recurrence have higher levels of psychological distress. This aligns with findings from several studies on cancer patients' fear of recurrence.[35,36]. The elevated distress may stem from concerns about prognosis, the complexity of treatment, declines in quality of life, uncertainty about the future, depletion of psychological resources, and potentially reduced social support.

The study results show a significant negative correlation between psychological resilience and both emotion regulation and psychological distress in young and middle-aged lymphoma patients, while emotion regulation have a significant positive correlation with psychological distress. A study on gynecologic cancer patients indicates a negative correlation between psychological distress and family resilience. Higher levels of family resilience and lower perceived stress are associated with reduced psychological distress in these patients.[37] A cross-sectional study on breast cancer patients shows that psychological resilience can mitigate the relationship between perceived stress, loneliness, and sleep disturbances. When psychological resilience is high, the impact of perceived stress and loneliness on sleep disturbances is reduced.[38] Additionally, enhanced levels of psychological resilience help alleviate negative emotions and improve quality of life in breast cancer patients.[39] These studies indicate a negative correlation between psychological resilience and psychological distress, suggesting that enhancing patients' resilience can help alleviate their distress. On the other hand, Psychological distress negatively predicts psychological resilience, with emotional distress reducing patients' levels of resilience. Psychological distress (such as anxiety, depression, and stress) often weakens an individual's ability to cope with challenges and adapt to stress, thereby reducing resilience. Increased psychological distress adds to the emotional burden, making it harder to maintain positive coping strategies and psychological adaptability. Therefore, the higher the psychological distress, the lower the level of resilience is likely to be.[25] It can be inferred that there may be a bidirectional relationship between psychological resilience and psychological distress. Psychological resilience plays

a significant protective role among lymphoma patients, as it may substantially reduce their psychological distress by enhancing their coping abilities, promoting positive emotional regulation, and aiding in the reconstruction of meaning in their lives.

The research findings indicate that, after controlling for factors such as marital status, monthly family income, and recurrence, difficulties in emotional regulation serve as a mediating effect between psychological resilience and psychological distress in young and middle-aged lymphoma patients. This suggests that emotion regulation are an important pathway affecting patients' mental health. Studies have shown that post-traumatic stress resulting from breast cancer can increase patients' negative emotions, while cognitive reappraisal, as an emotional regulation strategy, can mitigate the impact of post-traumatic stress on negative emotions in breast cancer patients.[40] This study reaches similar conclusions. Psychological resilience can help patients cope with the stress and pain associated with cancer; however, if patients are unable to effectively regulate their emotions, the protective effects of psychological resilience may be diminished. This indicates that emotional regulation is a critical bridge for transforming psychological resilience into lower levels of psychological distress. Additionally, this emphasizes that intervening in emotional regulation difficulties, such as through cognitive behavioral therapy, may be an effective approach to reducing psychological distress. By improving emotional regulation abilities, patients may better leverage their psychological resilience, thereby reducing their psychological distress.

Limitations

This study has several limitations: Firstly, the sample size is drawn from only one tertiary hospital, which may introduce selection bias. Secondly, the relatively small sample size may affect the stability of the mediation analysis results, indicating the need for further validation with a larger sample in future research. Finally, this study is cross-sectional and cannot directly establish causal relationships. Future research should be conducted as longitudinal studies to better establish causal relationships and observe the temporal sequence among variables.

Conclusion

This study examined the relationship between psychological resilience and psychological distress in young and middle-aged lymphoma patients, focusing on the mediating role of emotional regulation difficulties. The results show that psychological resilience has a significant protective effect in reducing psychological distress among lymphoma patients; however, this protective effect is influenced by emotional regulation difficulties. When patients have insufficient emotion regulation, the effect of psychological resilience in alleviating psychological distress decreases significantly. Thus, emotion regulation is seen as a critical bridge for transforming psychological resilience into lower psychological distress. This study provides important insights for clinical interventions, suggesting that improving patients' emotion regulation abilities may help to better leverage the protective effects of psychological resilience, thereby effectively reducing psychological distress. Thus, We can infer the significant role of clinical psychologists in emotional regulation. Clinical psychologists can help patients improve emotional regulation through evidence-based interventions like cognitive behavioral therapy (CBT) and mindfulness. They can teach skills such as emotion identification and stress management, help patients reframe negative thoughts and manage triggers. By monitoring progress and collaborating with healthcare teams, they can integrate these strategies into care plans, enable patients to use psychological resilience effectively, reduce distress, and improve well-being. It also points out that future studies could adopt a longitudinal design to better establish causal relationships among variables and observe their trends over time.

Ethics Approval and Consent to Participate

The study adhered to the guidelines of the Declaration of Helsinki and received approval from the Medical Ethics Committee of Northern Jiangsu People's Hospital. Informed consent was obtained from all participants.

Disclosure

The authors declare no conflicts of interest in this work.

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