ORIGINAL RESEARCH

Current status and influencing factors of emotional suppression in Chinese female breast cancer patients

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Received: December 4, 2024 **Accepted:** January 24, 2025 **Online Published:** February 10, 2025
DOI: 10.5430/jnep.v15n4p32 **URL:** https://doi.org/10.5430/jnep.v15n4p32

ABSTRACT

Objective: To analyze the level of emotional suppression and the factors influencing it in female breast cancer patients in Henan Province, China, and to provide theoretical support for nursing managers to prevent and improve emotional suppression in breast cancer patients, and to improve the quality of life of breast cancer patients.

Methods: A convenience sampling method was used to select 143 breast cancer patients admitted and hospitalized in the oncology departments of three tertiary hospitals in Luoyang City, Henan Province, China, from November 2023 to January 2024 as the study subjects. A general information questionnaire, an emotional suppression scale, and a family support care index questionnaire were used to conduct the survey.

Results: The total score of emotional suppression in breast cancer patients was (32.73 ± 6.59). The results of multiple regression showed that education, disease stage, pain level, and family support were the main influencing factors of emotional inhibition in breast cancer patients (all $p < .05$).

Discussion: Emotional suppression of breast cancer patients in Henan Province is at a medium level; Health care workers and family members should pay more attention to the psychological changes of patients, implement effective nursing interventions, provide positive psychological support, and reduce the psychological burden of patients, to significantly reduce the degree of emotional suppression of patients.

Key Words: Breast cancer, Cancer, Emotional inhibition, Influencing factors, Psychological change

1. INTRODUCTION

Malignant tumors, as a major public health problem, can result in a danger to the physical and mental health of patients. Among these malignant tumor, female breast cancer incidence and mortality have presented an increasing trend since the 21st century, which has triggered a widespread concern.[1] The latest data show that about 416,000 new cases of breast cancer are found every year in China, and 117,000 patients die.[2] Breast cancer has become the highest malignant tumor in females, and caused tremendous hazards in women's daily lives and health. Fortunately, the 5-year survival rate of breast cancer patients following surgery has been gradually improved with the progress of medical technology and treatment concepts. Few negative emotions that appear in patients should go throughout the whole treatment and recovery, such as anxiety, guilt, and depression, which will accompany the patients throughout the treatment and recovery process.[3] Concerning greater emotional pressure and heavy psychological burden, it is urgent to address negative emotions in medical nursing and family care.

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Emotional suppression can be described as an individual with inhibitory defenses deliberately avoiding dealing with something complex and vexing, consisting of three parts: expressive behaviors, physiological reactions, and emotional experiences.[4] Patients with a tendency toward emotion suppression tend to hide distressing feelings behind an optimistic facade,[5] making them less likely to be detected clinically. Although emotion suppression can superficially control an individual's expression of external emotions, in essence, it does not reduce the deeper emotional experience. On the contrary, as negative emotions are not effectively released, patients may adopt more pronounced inhibitory strategies to cope with them, in which case, if not properly managed, allowing these negative emotions to develop may lead to serious psychological problems, such as anxiety and depression.[6]

Current research on emotional suppression has focused on areas such as cancer,[7] management of dermatological conditions,[8] and coping with chronic somatic diseases. Baziliansky,[9] through a study on colorectal cancer patients, found a close association between education level and monthly family income and emotional suppression. Nakatani et al.[10] surveyed 31 breast cancer patients who had undergone surgery at a teaching hospital in Japan and found that patients with emotional suppression had more severe long-term anxiety and depressive symptoms. Lu et al.[11] surveyed 103 Chinese-American breast cancer patients and found that emotional expression suppression led to a decrease in quality of life for patients with low levels of cognitive reappraisal. Chapman et al.,[12] after a 12-year follow-up study on the relationship between emotional suppression and cancer mortality, found a significant association between higher levels of emotional suppression and cancer-related mortality. Cancer patients who use emotional suppression as a maladaptive emotion regulation strategy are more likely to become immersed in negative emotions, and unable to cope effectively, which can further lead to adverse psychological outcomes, affect disease prognosis, and even threaten life.

Emotional suppression among cancer patients varies across different countries and regions due to cultural background differences. Research on emotional suppression among regional cancer patients has gradually increased, but studies on specific cancer types, such as breast cancer, remain relatively limited. Therefore, this study analyzes the level of emotional suppression and its influencing factors among breast cancer patients in Henan Province, providing a theoretical basis for nursing managers to prevent and improve emotional suppression in breast cancer patients, thereby enhancing the quality of life for these patients.

2. METHODS

2.1 Ethics statement

The Institutional Ethics Committee of Pingdingshan University reviewed and approved studies involving human participants. The patients/participants provided written informed consent to participate in this study.

2.2 Sample

A convenience sampling method was used to select 143 breast cancer patients who were admitted to the oncology departments of three tertiary hospitals in Luoyang City, Henan Province, China, from November 2023 to January 2024 as the study subjects. Inclusion criteria: 1) Pathologically diagnosed breast cancer; 2) Female aged 18 years and above; 3) Patients with stable condition and good social ability; 4) Understand their condition and be willing to participate in this study. Exclusion criteria: 1) Combined with other major diseases; 2) Suffering from mental diseases; 3) Taking sedative-hypnotic drugs.

2.3 Research instruments

2.3.1 *General information*

Self-designed general information questionnaire, including age, education, place of residence, marital status, stage of disease, recurrence, radiotherapy, chemotherapy, family support, sleep quality, and pain level. Family support: the Family APGAR Rindex (APGAR) questionnaire developed by scholar Smilkstein[13] was used. The purpose of this questionnaire is to assess patients' satisfaction with their family functioning. The questionnaire consists of five questions on a 3-point scale, ranging from 'often' to 'almost rarely' on a scale of '2' to '0'. The total score is 10 points. Higher scores indicate healthy and positive family support. Pain level: Pain level was assessed using Visual Analog Scales (VAS) for pain,[14] using a pain scale of approximately 10 cm in length with evenly distributed scales ranging from '0' for no pain to '10' for extreme pain, as an indicator of healthy and positive family support. The VAS is a pain scale that uses a 10cm long scale evenly distributed from no pain to '10' for extreme pain and is used as a pain rating tool. The higher the score, the more pronounced the corresponding pain.

2.3.2 *Emotional inhibition scale*

The emotional Inhibition Scale (EIS) was used to evaluate the emotional inhibition status of breast cancer patients,[15] and is a valid scale for interpreting emotionally inhibited behaviors and their intrinsic characteristics. The Cronbach's α coefficient of the scale is 0.78. The scale consists of 4 dimensions and 14 entries, including timidness, verbal inhibition, self-control, and emotional camouflage. The scale was rated on a 5-point scale from 'not' to 'always' as '0' to

'4', with a total score of 56 points. The higher the score, the higher the degree of emotional inhibition of the patient.

2.4 Method of data collection

Before the commencement of the study, the researcher coordinated and communicated with the relevant departments and obtained explicit authorization from the ward matron and key healthcare staff to analyze the cases and obtain information on cases that met the inclusion and exclusion criteria, which were recorded in the questionnaire. After communicating with the breast cancer patients on the ward and explaining to them the purpose, significance, and requirements of the questionnaire, the researcher conducted the study survey in person, using on-site questionnaire distribution to ensure that they completed the questionnaire with full understanding and consent. For breast cancer patients who are visually impaired or have difficulty completing the questionnaire independently, detailed verbal instructions on the content of the questionnaire will be given according to the individual needs of the patients, and the questionnaire will be filled out on their behalf according to the actual situation. All questionnaires will be collected on-site and the missing parts will be completed to ensure that the data is complete and accurate. The completion time was 15 minutes, and the questionnaires were collected on-site and checked for completeness and validity. A total of 150 questionnaires were issued and 143 were effectively recovered, with an effective rate of 95.3%.

2.5 Statistical methods

The data were analyzed using SPSS 27.0, and the comparison of the measurement data was performed using the independent samples *t*-test and one-way ANOVA, and the influence factors were analyzed using multiple linear regression, in which $p < .05$ was taken as the difference was statistically significant.

3. Results

3.1 Emotional inhibition score for breast cancer patients

The breast cancer patients had a total score of (32.73 ± 6.59) for emotional suppression and the mean score of the items was (2.33 ± 0.47) (see Table 1).

Table 1. Emotional suppression scores in breast cancer patients (n = 143, $\bar{x} \pm s$)

	Number of Entries	Score range	Total score ($\bar{x} \pm s$)	Average score of entries ($\bar{x} \pm s$)
Total score	14	0-56	32.73 ± 6.59	2.33 ± 0.47
Dimension of emotional camouflage	3	0-12	9.43 ± 2.28	3.14 ± 0.76
Self-Control Dimension	4	0-16	8.57 ± 3.40	2.14 ± 0.85
Verbal Inhibition Dimension	3	0-12	8.29 ± 2.47	2.76 ± 0.82
Dimension of timidity	4	0-16	6.44 ± 2.30	1.61 ± 0.57

3.2 Differences in emotional suppression scores in breast cancer patients with different characteristics

Differences in emotional suppression scores were statistically significant ($p < .05$) according to marital status, place of residence, age, education, disease stage, pain level, sleep quality, family support, and whether or not they had relapsed and received chemotherapy (see Table 2).

3.3 Multiple linear regression analysis of emotional inhibition in breast cancer patients

Multiple linear regression analyses were performed with the total score on the EIS scale as the dependent variable and the variables that were statistically significant in the univariate analysis as the independent variables. The values assigned to the independent variables are shown in Table 3. The results showed that education, disease stage, pain level, and family support were considered to be the main factors influencing emotional suppression in breast cancer patients (all $p < .05$) (see Table 4).

4. Discussion

4.1 Current status of emotion suppression in breast cancer patients

The results of this study showed that the total emotional inhibition score of breast cancer patients in Henan Province, China, was (32.73 ± 6.59), which was slightly higher than the middle of the score range of 28, and was at an intermediate level, which was similar to the results of the previous study,[16] but higher than the emotional suppression scores of the healthy population in the GRANDIS[17] study. The reasons for this may be as follows: 1) Traditional Chinese culture emphasizes introversion and subtlety and discourages excessive emotional expression. Patients often feel that it is unfortunate to have cancer, and over-expression of emotions may be seen as a weakness or a burden to their families, so they choose to suppress their emotions. Treatment of the disease requires long-term chemotherapy and radiotherapy, which further aggravates the financial burden and affects life, study, and work to varying degrees. Young and middle-aged

patients are more likely to adopt self-control and mask their emotions to solve problems.[18] 2) Breast cancer patients have a long treatment cycle, chemotherapy is the most common treatment for breast cancer, and although it can inhibit the development of the disease, its side effects are more obvious, such as frequent nausea and vomiting, hair loss distress, and other complications are often accompanied. The occurrence of these complications can greatly disrupt the normal social life of patients, aggravate adverse emotional reactions, make patients lose confidence in life, and lead to a greater degree of emotional depression. (iii) Cancer patients are highly isolated.[19] As cancer itself and its treatment cause changes in the patient's body and appearance, patients will be overly concerned about changes in their self-image, which triggers a strong sense of shame and damage to self-esteem, reducing the patient's ability to self-regulate psychological stress and often prone to triggering the growth of negative emotions, such as low self-esteem, and, as the burden of cancer worsens, the patient may experience social restriction due to a lack of the ability or willingness to communicate with the outside world. Long-term social restrictions make it easier for patients to hide their symptoms, suppress their inner feelings, and feel lonely.[20]

Table 2. Differences in emotional suppression scores in breast cancer patients with different characteristics (n = 143)

Items		Number of persons	Total score ($\bar{x} \pm s$)	*t/F*	*p*
Recurrence	Yes	56	35.71 ± 7.08	4.647	< .001
	No	87	30.80 ± 5.50		
Chemotherapy	Yes	97	34.18 ± 6.42	4.007	< .001
	No	46	29.67 ± 5.94		
Marital status	With spouse	109	33.70 ± 6.65	3.610	.001
	No spouse	34	29.62 ± 5.44		
Residence	Urban	79	31.52 ± 6.44	-2.476	.014
	Rural	64	34.22 ± 6.54		
Radiotherapy	Yes	65	33.69 ± 7.08	1.605	.111
	No	78	31.92 ± 6.10		
Age	18-	21	27.71 ± 5.02	7.810	.001
	45-	80	33.69 ± 6.55		
	60-	42	33.40 ± 6.39		
Academic qualifications	Primary and below	55	33.78 ± 6.40	4.408	.005
	Junior High School	61	33.52 ± 6.72		
	High School	21	29.19 ± 5.07		
	College and above	6	27.33 ± 6.56		
Stage of disease	Phase I	31	29.19 ± 5.16	10.091	< .001
	Phase II	41	31.05 ± 6.36		
	Stage III	53	34.38 ± 5.80		
	Stage IV	18	37.78 ± 7.31		
Level of pain	No pain	37	28.00 ± 4.47	17.636	< .001
	Slight	70	32.96 ± 5.99		
	Moderate	28	35.96 ± 6.74		
	Severe	8	41.25 ± 2.87		
Quality of sleep	Good	64	31.30 ± 7.05	9.483	< .001
	Fair	69	32.93 ± 5.66		
	Poor	10	40.50 ± 3.92		
Family support	Severe Disorder	19	39.11 ± 5.37	20.480	< .001
	Moderately impaired	70	33.53 ± 6.53		
	Good	54	29.44 ± 5.00		

Table 3. Assignment of independent variables

Factor	Number	Variable Assignment
Age	X1	1 = 18-，2 = 45-，3 = 60-
Residence	X2	1 = Urban，2 = Rural
Educational level	X3	1 = Primary and below，2 = Junior High School，3 = High School，4 = College and above
Marital status	X4	1 = With spouse，2 = No spouse
Chemotherapy	X6	1 = No，2 = Yes
Relapse	X7	1 = No，2 = Yes
Quality of sleep	X8	1 = Good，2 = Fair，3 = Poor
Level of pain	X9	0 = No pain，1 = Slight，2 = Moderate，3 = Severe
Stage of disease	X10	1 = Phase I，2 = Phase II，3 = Stage III，4 = Stage IV
Family support	X11	1 = Severe Disorder，2 = Moderately impaired，3 = Good

Table 4. Multiple linear regression analysis of factors influencing emotional suppression in breast cancer patients (n = 143)

	B	SD	Beta	*t*	*p*
(Constant)	34.173	3.429		9.965	< .001
Marital status	0.022	1.516	0.001	0.014	.988
Chemotherapy	2.274	1.387	0.162	1.640	.103
Relapse	1.627	0.825	0.121	1.973	.051
Residence	0.728	0.771	0.055	0.945	.347
Age	0.767	0.622	0.076	1.234	.219
Education level	-1.124	0.481	-0.143	-2.336	.021
Stage of disease	1.552	0.408	0.227	3.801	.001
Level of pain	2.028	0.511	0.254	3.969	.001
Quality of sleep	0.702	0.657	0.065	1.069	.287
Family support	-2.652	0.605	-0.271	-4.385	.001

Note. $R^2 = 0.427$, adjusted $R^2 = 0.411$，$F = 25.753$，$p < .001$

In contrast, some Western countries pay more attention to the emotional expression and mental health of individuals. Patients are encouraged to face their emotions bravely and release their stress through confidence and psychotherapy. At the same time, the social support system is relatively complete, with professional psychological counseling agencies and volunteer organizations to assist patients, so that patients feel understood and accepted, reducing the possibility of emotional inhibition. In addition, western cultures have a more rational perception of the disease, believing that cancer is a challenge that can be faced and overcome rather than a stigma, which also helps patients express their emotions more openly.

Among the measures of the dimensions of emotional inhibition, the dimension of emotional camouflage measured the highest total score. Emotional camouflage refers to the fact that people deliberately suppress or hide their true emotions and superficially display outward expressions that do not match their inner experience. This phenomenon may be rooted in the Chinese Confucian tradition, which emphasizes the importance of 'peace is precious', a concept that often leads to many concerns among breast cancer patients. To reduce the mental pressure on their families, they often suppress their negative emotions and try their best to maintain inner peace. They try their best to maintain family harmony and cover their true feelings with a positive and sunny posture. Prolonged suppression of negative emotions, on the other hand, leads to persistent psychological stress, which makes patients suffer and endure greater pain, and makes them prone to negative emotions such as anxiety and depression, leading to further deterioration of the condition. The total score for the timidity dimension is the lowest. Timidity refers to the patient's reluctance to talk too much about their condition and their inner feelings. Compared with other malignant tumors, breast cancer has a relatively high five-year survival rate, a good prognosis, and a low concurrent morbidity rate that makes it easier for patients to accept the disease. Therefore, during the treatment of breast cancer patients, healthcare professionals need to pay special atten-

tion to the patient's emotional changes, especially signs of negative emotions such as anger, sadness, and anxiety. Individualized treatment plans are tailored and implemented to assist patients in effectively expressing and alleviating negative emotions, thereby enhancing overall psychological well-being.

4.2 Analysis of factors influencing emotional suppression in breast cancer patients

4.2.1 *Academic qualifications*

This study shows that education is one of the main influencing factors of emotion suppression in breast cancer patients, with 81.1% of the study participants having an education level of junior high school or below. The scores of emotion suppression of breast cancer patients in high school and college and above were lower than those of breast cancer patients in junior high school and primary schools and below. The reasons for this were analyzed as follows: different educational levels of breast cancer patients have different effects on emotions, and cancer patients with higher educational levels usually have richer cultural literacy and can understand the disease in depth from multiple sources, and the cancer knowledge they acquire is both deep and broad. This gives them a significant intellectual advantage, enabling them to have a deep understanding of cancer, to recognize the disease appropriately, and to cooperate more deeply in treatment. Unnecessary worries as well as fear and anxiety about the disease can be reduced. Breast cancer patients with low education may have a misunderstanding of the disease and an excessive fear of cancer is common. Once diagnosed, patients often lack belief in treatment, are depressed, and are skeptical of therapies. This may lead some to give up treatment. In addition, patients with lower education may be more psychologically stressed because of the lack of social support and psychological adjustment.

Therefore, it is suggested that healthcare professionals consider academic qualifications when treating patients, provide personalized psychological support and educational guidance, pay more attention to patients with lower academic qualifications, explain the patient's illness and therapy simply and directly, and predict the possibility of recovery, which can effectively alleviate their uneasiness and fear due to lack of information by enhancing communication between healthcare professionals and patients.

4.2.2 *Disease stage*

The disease stage is one of the main factors of patients' emotional inhibition, and the study shows that the degree of emotional inhibition of patients with stage IV breast cancer is the heaviest, and the degree of emotional inhibition of patients with stage I breast cancer is the lightest. This is mainly because the stage of the disease not only has an important significance on the choice of treatment plan and prognosis assessment but also can directly affect the psychological state and emotions of the patients. In the early stages of breast cancer, stages I and II, the tumor diameter is small and the risk of local lymph node metastasis is low. Patients recover better after surgery, the incidence of complications is low, and the prognosis of early-stage patients is better compared with the late stage. The expected recovery outcome undoubtedly improves patients' positive state of mind and inspires them to be more proactive in coping with subsequent treatment, thus reducing their psychological stress during the disease journey. A good prognosis makes patients more willing to communicate with family and friends and share their inner feelings and disease experiences. The surgical options available to patients with stage III breast cancer are more limited,[21] with many patients preferring mastectomy, the removal of which affects the patient's outward appearance and makes them prone to negative emotions such as irritability and anger. As malignant tumors continue to spread, the impact of surgery on the body becomes increasingly severe, the risk of postoperative complications rises, and the recovery cycle is subsequently prolonged. Patients feel uncertain about their prognosis, which leads to an imbalance in stress and negative emotion management. Compared to breast cancer patients in stages I, II, and III, stage IV patients, with significant disease progression and increased risk of distant metastasis, have a substantially higher uncertainty of treatment prognosis. Patients in this stage often find it difficult to tolerate the discomfort caused by repeated surgeries, cancerous severe pain, and corresponding symptoms at the site of cancer metastasis,[22] leading to a decline in physical function and deterioration of health. In stage IV of the disease, the lesions gradually extend outward, causing intense physical discomfort, which is mainly reflected in difficulty in sleeping and poor sleep quality. This life pattern of day and night reversal seriously aggravates their pain and heavily depletes their physical strength. It is often accompanied by deep anxiety and depression, sometimes even on the verge of life despair and questioning self-worth. Therefore, healthcare professionals need to communicate frequently and efficiently with patients and their families to help them establish correct concepts provide them with in-depth psychological support, and implement individualized psychotherapy, to alleviate their worry and depression. Special attention is paid to the subtle emotional changes of patients with advanced breast cancer and timely judgment of their emotional status. Customized individualized psychological intervention programs are designed to address the unique characteristics of each clinical stage of breast cancer.

4.2.3 *Pain level*

This study shows that patients with no pain and mild pain scored lower than patients with severe pain. This is mainly because pain causes emotional ups and downs and psychological instability in patients. The International Society of Pain states that 60% to 80% of patients with intermediate and advanced cancer experience varying degrees of cancer pain, and 38.0% of cancer patients have moderate to severe pain in their complaints.[23] Pain is mainly related to the invasion of tumor cells into the central nervous system, resulting in sensory abnormalities that cause subjective physical discomfort and unpleasant emotional experiences.[24] Long-term persistent pain not only exacerbates the pain sensation but also seriously affects patients' comfort and work efficiency in daily life, which significantly reduces the quality of life. Pain may weaken patients' confidence in overcoming the disease and their will to recover, and may even lead to suicidal thoughts. In addition, many patients see pain as a sign of breast cancer exacerbation, recurrence, proliferation, or ineffective treatment, which weakens patients' confidence in the treatment and leads to negative attitudes toward pain treatment,[25] resulting in lower treatment compliance, which further leads to the exacerbation of the disease. Patients with severe pain are more prone to negative emotions such as anxiety and depression, which in turn can aggravate the perception of pain.

Therefore, medical staff should pay high attention to the inhibitory emotional behaviors of patients with moderate and severe pain; at the same time, during the treatment process, nurses should pay close attention to the patient's pain manifestations and carefully assess the patient's pain level, to improve the patient's treatment adherence and avoid the transformation of cancerous pain into cancerous eruptive pain,[26] which will lead to prolongation of the treatment time.

4.2.4 *Family support*

Family support is one of the influencing factors of emotional inhibition in breast cancer patients. Good family support can effectively reduce negative emotions such as anxiety, depression, etc., and the unfailing caring concern and support of family members can bring positive effects to breast cancer patients and help them better regulate their bad emotions.[27] Emotional suppression scores of breast cancer patients with severe impairment of family court support were significantly higher than those with good family support. The reasons for this were analyzed as: Young and middle-aged women with breast cancer carry multiple roles in the family and society. Chinese culture tends to endow women with a deep sense of family responsibility and selfless sacrifice, and even in the face of a disease as serious as cancer, they often choose to bear the psychological weight and difficulties associated with cancer in silence to minimize the negative impact on the family, and thus are prone to anticipatory sadness.[28] Family support is a positive resource for relieving stress and reducing loneliness,[29] and the emotional support and understanding of family members can help patients better cope with the difficulties and challenges of the disease, which is conducive to the establishment of a positive state of mind, enhancement of the ability to cope with the disease, and reduction of the incidence of emotional suppression. Patients with good family support can reduce the level of emotional suppression. The warm and harmonious atmosphere of the family can effectively alleviate the negative emotions of the patients, and the love and care of their loved ones become their strong spiritual support. This support can effectively help patients alleviate physical discomfort and psychological stress during the treatment process, thus significantly improving the quality of life and promoting a sense of well-being. Patients with family support disorders have a poorer ability to regulate psychological stress and the probability of adverse emotions increases. Moreover, breast cancer treatment is a big expense for ordinary families, which may cause a burden on the family's finances, and patients are prone to guilt, which may lead to serious psychological problems over time. In summary, family support has a positive role in promoting the emotions of breast cancer patients, and it is recommended that healthcare professionals explain the main factors of patients' low mood to their families through missionary work in their daily work, emphasizing the positive impact of family support on patients.

4.3 Interventions to improve emotional suppression

Interventions to improve emotional suppression in patients mainly include supportive therapy and mindfulness meditation. Supportive therapy consists of expressive writing therapy and Rosenthal effect intervention. Expressive writing therapy uses writing as an alternative to verbal expression, promoting the expression of emotions and thoughts, and helping identify negative emotions, thereby improving the emotional suppression state in cancer patients.[30] The Rosenthal effect intervention, on the other hand, improves patients' negative emotions through affirmation and positive guidance, focusing on their psychological feelings and encouraging expression. Research by Yao Juan et al.[31] found that psychological interventions based on the Rosenthal effect can help patients build confidence to fight the disease and reduce emotional suppression levels.

Mindfulness meditation, centered on mindfulness techniques, guides individuals to focus on their current thoughts and emotions through meditation, triggering emotional regula-

tion mechanisms. Studies by Villani et al.[32] showed that mindfulness meditation has a long-term impact on reducing emotional suppression in patients. Research by Szaszkó et al.[33] indicated that after eight weeks of Hatha yoga practice, participants reported significantly reduced stress and stress responses, along with enhanced mindfulness. Currently, most mindfulness interventions for cancer patients focus on psychological indicators such as anxiety and depression,[34] with relatively few studies addressing emotional suppression. Therefore, it is necessary to further verify the effects of mindfulness meditation or other mindfulness interventions on emotional suppression in cancer patients.

Providing ways for cancer patients to vent and express their emotions is essential. However, in China, there are few intervention studies on emotional suppression in cancer patients, and the intervention methods are relatively limited, often drawing on international experiences. In the future, it is recommended to develop intervention strategies suitable for Chinese patients by integrating traditional Chinese medicine emotional therapy, mandala painting therapy, and other approaches.

4.4 Practical significance

Investigating the current state of emotional suppression and its influencing factors among Chinese women with breast cancer holds significant practical importance. This research not only helps optimize psychological intervention strategies and alleviate the psychological burden of patients but also enhances the quality of nursing care by improving patients' mental health and quality of life through personalized nursing measures. Additionally, the study can identify high-risk groups, such as patients with lower education levels and those with advanced disease stages, thereby providing more targeted support for them. The findings can also guide families and society in better understanding and supporting patients' psychological states. Through interdisciplinary collaboration, the research can promote the development of comprehensive intervention plans to provide more holistic care for patients. Ultimately, these measures will help improve patients' mental health, enhance treatment outcomes, and elevate their quality of life.

4.5 Research limitations

This study focused solely on breast cancer patients from selected hospitals in Henan Province, China, with a limited sample size that may affect the generalizability of the findings. Moreover, the cross-sectional design of this study, despite the unique psychological characteristics of breast cancer patients, suggests that future research should pay more attention to emotional suppression among male patients and those with other types of cancer. It is recommended that future studies incorporate longitudinal and qualitative research designs, using multi-time-point observations and interviews to deeply explore the tendencies and patterns of emotional suppression among cancer patients, as well as to uncover their true inner feelings. This approach will allow for a more comprehensive summary of the factors influencing emotional suppression. Given that emotional suppression in cancer patients is the result of the interplay of physiological, psychological, and social factors, clinical practice should adopt a multidimensional approach to provide comprehensive care for cancer patients experiencing emotional suppression.

5. Conclusion

The level of emotional suppression is generally moderate in the breast cancer patient population, and this phenomenon is influenced by multiple factors, including educational qualifications, the stage of the cancer disease, the experience of pain levels, and the degree of family emotional support given. Healthcare professionals and family members should pay more attention to the psychological changes of patients, take effective nursing interventions, give positive psychological support, reduce the psychological burden of patients, and thus effectively reduce the degree of emotional inhibition of patients.

Acknowledgements

I would like to extend my sincere gratitude to Dr. Xia Xichao, whose profound knowledge and patient guidance have been instrumental in shaping this research. His continuous support and constructive feedback throughout the entire process have been invaluable to me. I am also very grateful to my collaborators for their collaborative efforts, stimulating discussions, and sharing of valuable insights. Their contributions have significantly enhanced the quality of this work. Last but not least, I would like to thank the National Natural Science Foundation of Henan (No. 242102310556) and the Educational Foundation of Henan (No. 2024YB0221) for their financial support. Without their generous backing, this research would not have been possible.

Authors contributions

The authors' contributions Wang Jihong, Xia Xichao, Liu Shuxin, and Wei Kaixuan contributed to the concept and design, data collection, conducting consultation sessions, and drafting of the manuscript. Ma Suli and Yue Mengyu contributed to the conception and design, data collection, data interpretation, and writing of this manuscript. All authors gave their final approval for publication of this manuscript.

FUNDING
This research was funded by the National Natural Science Foundation of Henan (No. 242102310556) and the Educational Foundation of Henan (2024YB0221).

CONFLICTS OF INTEREST DISCLOSURE
The authors declare no competing interests.

INFORMED CONSENT
Obtained.

ETHICS APPROVAL
The studies involving human participants were reviewed and approved by the Institutional Ethics Committee of Pingdingshan University, and it was registered with the Chinese Clinical Trial Registry (ChiCTR). The patients/participants provided written informed consent to participate in this study. The Publication Ethics Committee of the Sciedu Press. The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

PROVENANCE AND PEER REVIEW
Not commissioned; externally double-blind peer reviewed.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

DATA SHARING STATEMENT
No additional data are available.

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