

Latent Profile Analysis of Emotional Expression Conflicts and Associated Influencing Factors in Breast Cancer Patients Receiving Postoperative Chemotherapy

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Purpose: Emotional expression conflicts, characterized by approach-avoidance dilemmas in self-disclosure, are prevalent among breast cancer patients undergoing postoperative chemotherapy. This study identifies emotional expression conflict subtypes and their predictors to inform targeted interventions.

Methods: This cross-sectional study employed convenience sampling to recruit 238 postoperative breast cancer patients. The assessment protocol comprised three validated instruments: the Ambivalence over Emotional Expressiveness Questionnaire-G28 for emotional conflict evaluation, the Cognitive Fusion Questionnaire for cognitive assessment, and the Family Resilience Assessment Scale for family dynamics measurement. Latent profile analysis was conducted to characterize distinct emotional expression conflict subtypes, with subsequent multivariate logistic regression modeling to identify significant predictors.

Results: Three distinct emotional expression conflict profiles emerged: (a) Low conflict-emotion expression (33.6%): Proactive emotional sharing with minimal ambivalence. (b) Medium conflict-emotion expression (42.4%): Context-dependent disclosure with moderate ambivalence. (c) High conflict-expression blocked (23.9%): Suppression-dominated behavior with severe ambivalence. Younger age, lower education, reduced income, poor sleep quality, and higher cognitive fusion significantly increased the likelihood of high emotional conflict. Conversely, stronger family resilience was associated with reduced conflict risk.

Conclusion: This study highlights the clinical significance of heterogeneity in emotional expression conflicts among breast cancer patients. By targeting modifiable factors (such as sleep quality, cognitive fusion), oncology nursing may advance personalized psychosocial support to address these conflicts. Such strategies demonstrate global applicability for effectively alleviating patient distress and enhancing patient-centered care outcomes.

Keywords: breast cancer, emotional expression conflict, cognitive fusion, family resilience, nursing intervention

Introduction

Breast cancer, a common malignant tumor among women, poses a significant threat in China due to its high incidence and mortality rates.¹ Medical advancements have improved early detection and treatment, with surgery combined with adjuvant chemotherapy as the standard treatment.^{2,3} While this regimen has increased five-year survival rates and reduced recurrence risks,⁴⁻⁷ adjuvant chemotherapy still causes considerable biological toxicity, including side effects such as nausea, vomiting, and hair loss. These side effects severely impact patients' daily lives and psychological well-being, reducing their overall quality of life.⁸ Additionally, chemotherapy often leads to physical and psychological stress, contributing to emotional disorders. Addressing these psychological challenges and improving patients' care experiences have become critical focuses of breast cancer nursing research.⁹

Traditional Chinese culture often conceals bad news, especially regarding serious illnesses like cancer, imposing taboos that restrict emotional expression.^{10,11} Breast cancer patients endure not only physical pain and discomfort during treatment

but also enormous psychological stress.¹² Patients may feel the urge to express emotions but often struggle with whether others will understand or accept their feelings, leading to emotional expression conflicts.^{13,14} Emotional expression conflict refers to the internal struggle individuals experience when they want to express emotions—whether positive or negative—while fearing negative social consequences or judgment from others.^{15,16} This internal-external conflict exacerbates patients' anxiety and depression, further impeding their treatment progress and negatively affecting their quality of life.¹⁷

Emotional expression conflict significantly contributes to psychological distress, physical discomfort, and social maladjustment among breast cancer patients.^{18–20} Suppressing emotions and failing to express negative feelings can intensify anxiety, depression, impair immune function, and reduce treatment efficacy, thereby diminishing quality of life. Understanding the sources, characteristics, and influencing factors of emotional expression conflict is crucial for developing personalized interventions to improve patients' mental health.²¹

This study is conceptually guided by the ABC-X model,^{19,22} a widely used framework in family and psychological stress research. Within this model, A (stressor) refers to the diagnosis and chemotherapy of breast cancer; B (resources) includes individual and environmental protective factors such as family resilience; C (cognitive appraisal) is represented by cognitive fusion, reflecting how patients mentally process and internalize their cancer experience; and X (outcome) denotes the emotional expression conflict, viewed as a psychological adaptation response.

Based on this framework, we hypothesized that emotional expression conflict in breast cancer patients is shaped not only by objective stressors, but also by subjective interpretations and available resources. Therefore, the inclusion of family resilience and cognitive fusion as key variables in this study is theoretically grounded. Prior studies have supported the association between these factors and emotional regulation in cancer populations.

Currently, most studies on emotional expression conflict among cancer patients rely on scale scores to assess the overall level of emotional expression, but this approach does not account for the heterogeneity within patient populations.²³ Emotional expression conflict levels can vary significantly between individuals due to differences in psychological characteristics, living environments, cultural backgrounds, and disease cognition. To address this issue, this study employs Latent Profile Analysis (LPA) to explore the characteristics of emotional expression conflict and its potential influencing factors in breast cancer patients undergoing postoperative chemotherapy. By conducting a more nuanced group division and analysis, this study aims to provide more targeted psychological intervention strategies to reduce emotional expression conflict, enhance patients' psychological adaptation, and improve long-term health outcomes.

In conclusion, this study not only focuses on the physiological treatment outcomes of breast cancer patients but also emphasizes their psychological and emotional responses during treatment. Through more refined emotional management, the goal is to help patients better cope with the physical and psychological challenges posed by cancer, thereby promoting comprehensive improvements in their treatment outcomes and quality of life.

Methods

Subjects

From March 2023 to March 2024, a convenience sampling method was employed to select breast cancer patients from the Breast and Oncology Wards of Fenyang Hospital in Shanxi Province as study participants. Inclusion criteria: ① Patients diagnosed with primary breast cancer based on histopathological examinations; ② Patients who have undergone surgery and completed at least one cycle of chemotherapy; ③ Female patients aged ≥ 18 years; ④ Patients who are aware of their medical condition and have a certain level of comprehension and expressive ability; ⑤ Patients who provided informed consent and voluntarily participated in the study. Exclusion criteria: ① Patients with recurrent breast cancer or distant metastasis; ② Patients with severe diseases of the heart, lungs, kidneys, liver, or other organs; ③ Patients with a history of mental illness or severe trauma. Based on research on sample size calculations, the required sample size was 5 to 10 times the number of observed variables.²⁴ With 21 independent variables in this study and considering a 20% invalid questionnaire rate, the required sample size ranged from 126 to 252 cases. Ultimately, 238 breast cancer patients were surveyed in this study.

Research Tools

Self-Designed Questionnaire: This questionnaire consists of two parts: demographic information and disease-related information. Demographic information includes age, marital status, education level, etc.; disease-related information includes pathological staging, chemotherapy cycles, and other relevant data. Personal information was provided by the patients themselves, while disease-related information was collected by the researchers through a review of the patients' medical records.

Ambivalence over Emotional Expressiveness Questionnaire-G28 (AEQ-G28): Developed by King and Emmons,¹⁵ and translated and revised into Chinese by Ji Lili et al²⁵ this questionnaire measures emotional expression conflict in breast cancer patients. The Chinese version retains 24 items, which are based on the cognitive patterns of Chinese breast cancer patients, and is a unidimensional scale. It uses a 5-point Likert scale, ranging from “Never” to “Often”, scored from 0 to 4 points. Higher scores indicate a greater degree of emotional expression conflict. The scale demonstrated good reliability and validity, with a Cronbach's alpha coefficient of 0.897 in this study.

Cognitive Fusion Questionnaire (CFQ): Developed by Gillanders et al²⁶ and adapted into Chinese by Zhang Weichen et al²⁷ only the CFQ-F version, consisting of 9 unidimensional items, was retained for use across different age groups. It employs a 7-point Likert scale, ranging from “Never” to “Always”, scored from 1 to 7 points, with total scores ranging from 9 to 63 points. Higher scores indicate a higher degree of cognitive fusion, reflecting more severe negative emotions and a tendency toward psychological rigidity. In this study, the scale's Cronbach's alpha coefficient was 0.866.

Family Resilience Assessment (FRA): This is the first family resilience assessment tool specifically developed for women with a history of breast cancer. Developed by Lane et al²⁸ and translated and revised into Chinese by Zhang Shanshan et al²⁹ in 2021, it assesses the family resilience levels of Chinese breast cancer patients. The scale includes five dimensions: positive attitude, family connectedness, social and economic resources, clear communication, and collaborative problem-solving, with a total of 28 items. The scale demonstrated good reliability and validity, with a Cronbach's alpha coefficient of 0.834 in this study.

Data Collection

Before the survey, three investigators underwent standardized training. They used standardized instructions to explain the significance, objectives, and methods of the study to the patients and obtained their informed consent before instructing them to complete the questionnaires independently. Data collection was conducted with paper-based questionnaires. For patients who had difficulties reading or writing, the investigators assisted them in completing the questionnaires using neutral language. During the survey, patients were informed of the methods and precautions for completing the questionnaires. After the survey, the completeness of the questionnaires was checked, and any incomplete questionnaires were returned to the patients for correction. Once verified, the questionnaires were collected. In total, 280 questionnaires were distributed, of which 42 were invalid, leaving 238 valid responses and resulting in an effective recovery rate of 85%.

Statistical Processing

Latent profile analysis was performed using Mplus 8.3 software. Latent Profile Analysis (LPA) was employed to identify unobserved subgroups of emotional expression conflict based on 24 continuous item responses. Unlike traditional clustering methods such as K-means—which rely on distance metrics and assume equal variance—LPA models the probability of latent class membership and allows for statistical model selection using fit indices (AIC, BIC, entropy). This approach is especially suitable for uncovering psychological heterogeneity and identifying subtypes with clinical relevance. The model fit indices were the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Adjusted Bayesian Information Criterion (aBIC), Lo-Mendell-Rubin Likelihood Ratio Test (LMRT), Bootstrap Likelihood Ratio Test (BLRT), and Entropy. Lower values of AIC, BIC, and aBIC indicate a better model fit. The LMRT compares the differences between models with different latent classes. A P-value of <0.05 indicates that the k-class model fits significantly better than the (k-1)-class model. Based on the fit results, the optimal model was selected, categorizing breast cancer patients undergoing postoperative chemotherapy, and profile plots were generated.³⁰

Data analysis was performed using SPSS 27.0. Normally distributed quantitative data were expressed as means and standard deviations, and categorical data as frequencies and percentages. Chi-square tests and analysis of variance (ANOVA) were used to compare the general characteristics and questionnaire scores across different patient groups. Ordered logistic regression analysis was used to identify the influencing factors of emotional expression conflict among different categories of breast cancer patients. A P-value of <0.05 was considered statistically significant. To assess potential multicollinearity among predictors, we conducted correlation analysis and calculated Variance Inflation Factors (VIFs). All pairwise correlations were below 0.6, and VIF values were less than 3.0, indicating that multicollinearity did not significantly affect the model.

Results

General Characteristics of Breast Cancer Patients Undergoing Postoperative Chemotherapy

A total of 238 breast cancer patients were successfully surveyed, with ages ranging from 25 to 80 (mean age = 54.11 ± 14.52). Of these, 140 patients were from urban areas, and 98 from rural areas. The duration of illness was ≤ 0.5 years in 20 patients, between 0.5 and 1.5 years in 118 patients, and ≥ 1.5 years in 100 patients. Of the patients, 173 were married. The number of chemotherapy cycles was ≤ 3 in 79 patients, between 3 and 6 in 118 patients, and ≥ 6 in 41 patients. Health insurance covered 230 patients. Additionally, 66 patients had ≥ 2 comorbidities, and 76 had religious beliefs. A total of 122 patients underwent breast-conserving surgery. Other details are presented in Table 1.

Scores of Emotional Expression Conflict, Cognitive Fusion, and Family Resilience in Breast Cancer Patients

The emotional expression conflict score for breast cancer patients was 52.43 ± 16.56 ; the cognitive fusion score was 38.88 ± 7.37 ; and the family resilience score was 83.37 ± 14.39 . The scores for the five dimensions—positive attitude,

Table 1 Univariate Analysis of Latent Categories of Emotional Expression Conflict in Breast Cancer Patients

| variable | | Low Conflict Emotional Expression Group (n=80) | Medium Conflict Emotional Expression Group (n=101) | High Conflict-Expression Inhibited Group (n=57) | Test Statistics | P |
|---|--|--|--|---|-----------------|----------|
| Education | Junior high school and below | 21 (26.3) | 40 (39.6) | 26 (45.6) | $\chi^2=11.991$ | 0.017 |
| | High school | 24 (30.0) | 35 (34.7) | 20 (35.1) | | |
| | College higher vocational level or above | 35 (43.8) | 26 (25.7) | 11 (19.3) | | |
| Age (years) | ≤ 35 | 10 (12.5) | 23 (22.8) | 20 (35.1) | $\chi^2=18.256$ | 0.001 |
| | 35~60 | 30 (37.5) | 37 (36.6) | 27 (47.4) | | |
| | ≥ 60 | 40 (50.0) | 41 (40.6) | 10 (17.5) | | |
| Per capita monthly household income (RMB) | ≤ 3000 | 17 (21.3) | 34 (33.7) | 34 (59.6) | $\chi^2=22.521$ | <0.001 |
| | 3000~5000 | 37 (46.3) | 44 (43.6) | 15 (26.3) | | |
| | ≥ 5000 | 26 (32.5) | 23 (22.8) | 8 (14.0) | | |
| Pathologic stage | I | 14 (17.5) | 7 (6.9) | 5 (8.8) | $\chi^2=16.573$ | 0.011 |
| | II | 46 (57.5) | 44 (43.6) | 26 (45.6) | | |
| | III | 18 (22.5) | 37 (36.6) | 22 (38.6) | | |
| | IV | 2 (2.5) | 13 (12.9) | 4 (7.0) | | |
| Sleep quality | Poor | 22 (27.5) | 45 (44.6) | 33 (57.9) | $\chi^2=13.888$ | 0.008 |
| | Average | 36 (45.0) | 33 (32.7) | 17 (29.8) | | |
| | Good | 22 (27.5) | 23 (22.8) | 7 (12.3) | | |
| Occupation situation | Farmer | 14 (17.5) | 20 (19.8) | 21 (36.8) | $\chi^2=13.533$ | 0.035 |
| | Worker | 26 (32.5) | 24 (23.8) | 7 (12.3) | | |
| | Other | 25 (31.3) | 30 (29.7) | 18 (31.6) | | |
| | Retired | 15 (18.8) | 27 (26.7) | 11 (19.3) | | |
| Family resilience | | 87.60 ± 15.45 | 82.57 ± 12.13 | 78.84 ± 15.17 | F values=6.740 | 0.001 |
| Cognitive fusion | | 37.05 ± 7.65 | 38.69 ± 6.33 | 41.79 ± 7.89 | F values=7.315 | <0.001 |

family connectedness, social and economic resources, clear communication, and collaborative problem-solving—were 12.53 ± 3.15 , 30.58 ± 6.89 , 14.98 ± 3.31 , 13.50 ± 3.65 , and 11.77 ± 3.17 , respectively.

Latent Category Model Analysis and Naming of Emotional Expression Conflict in Breast Cancer Patients

Based on the 24 items measuring emotional expression conflict, latent category models ranging from 1 to 5 were constructed. Model fit indices, including Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Adjusted Bayesian Information Criterion (aBIC), Entropy, Lo-Mendell-Rubin Likelihood Ratio Test (LMRT), and Bootstrap Likelihood Ratio Test (BLRT), were used to identify the heterogeneity of emotional expression conflict among breast cancer patients undergoing postoperative chemotherapy. The results of the latent profile analysis and the model fit indices are shown in Figure 1. As the number of models increased, the values of the AIC, BIC, and aBIC model fit indices gradually decreased. The VLMR values for models 4 and 5 were 0.294 and 0.117, respectively, which did not reach significant levels. This indicated that the fit of models 4 and 5 was not as good as that of model 3 (VLMR = 0.019). Moreover, the average probability of category membership in model 3 was 97.7%, 96.1%, and 98.8% for each category — all exceeding 90%, indicating high accuracy of category assignment and credible model results (see Table 2).

The comprehensive analysis indicated that model 3 had the best fit, ultimately classifying emotional expression conflict in breast cancer patients into three latent categories. Based on their characteristics, the categories were named as follows:

Category 1 had low scores on all items, reflecting a low level of emotional expression conflict among breast cancer patients undergoing postoperative chemotherapy. This group was named the “Low Conflict Emotional Expression Group” (33.6%).

Category 2 had intermediate scores between Categories 1 and 3, with medium-level scores on all items. This group was named the “Medium Conflict Emotional Expression Group” (42.4%).

Category 3 had the highest emotional expression conflict scores among the three categories, particularly scoring high on the following items: Item 4: “When I am proud of an achievement, I want to tell others, but worry that they will think I am arrogant”. Item 5: “I try not to worry others, even when they should know the truth”. Item 6: “When I want to express my feelings, I feel as if something is preventing me from doing so”. This group was named the High Conflict-Expression Inhibited Group” (23.9%).

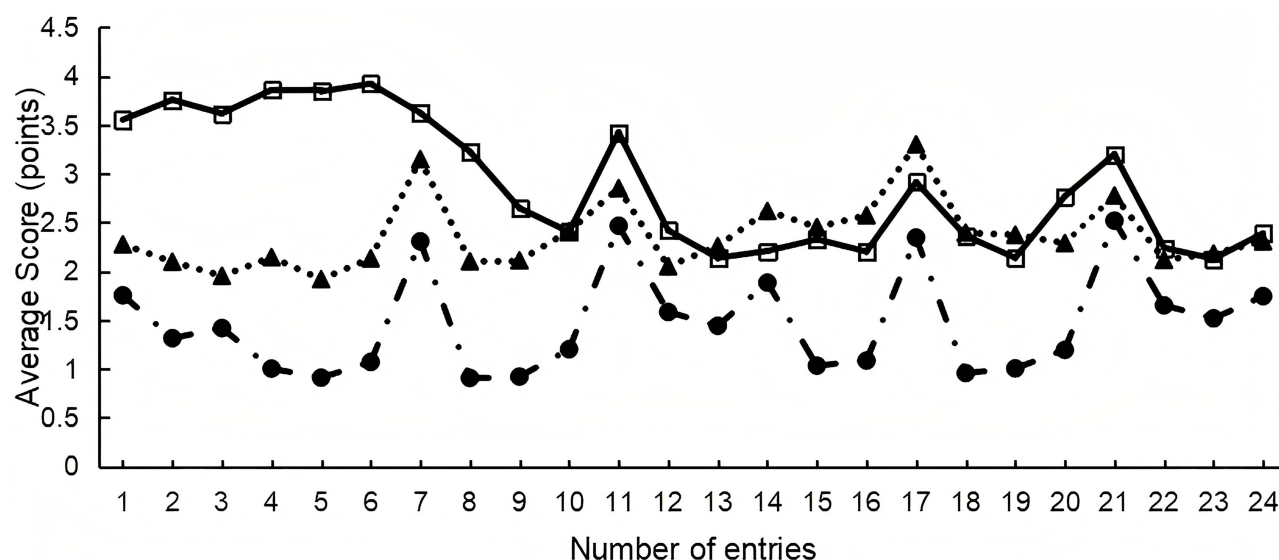


Figure 1 Latent profile distribution of emotional expression conflict among breast cancer patients receiving postoperative chemotherapy. The figure shows three distinct groups identified through latent profile analysis: ● Low Conflict Emotional Expression Group, ▲ Medium Conflict Emotional Expression Group, □ High Conflict-Expression Inhibited Group.

Table 2 Model Fit Indices for Latent Profile Analysis of Emotional Expression Conflict in Breast Cancer Patients (n = 238)

| variable | AIC | BIC | aBIC | Entropy | VLMR | BLRT | Categorical probability |
|----------|------------|------------|------------|---------|-------|--------|--------------------------|
| 1 | 18,916.078 | 19,082.747 | 18,930.602 | – | – | – | 1 |
| 2 | 17,796.956 | 18,050.432 | 17,819.045 | 0.930 | 0.003 | <0.001 | 0.59/0.41 |
| 3 | 17,364.031 | 17,704.313 | 17,393.684 | 0.938 | 0.019 | <0.001 | 0.34/0.42/0.24 |
| 4 | 17,158.081 | 17,585.170 | 17,195.299 | 0.957 | 0.294 | <0.001 | 0.30/0.32/0.14/0.24 |
| 5 | 16,893.970 | 17,407.066 | 16,938.752 | 0.969 | 0.117 | <0.001 | 0.30/0.32/0.10/0.13/0.15 |

Univariate Analysis of Latent Profile Analysis of Emotional Expression Conflict in Breast Cancer Patients

The univariate analysis revealed no statistically significant differences among the three patient groups in terms of marital status, residence, comorbidities, duration of illness, medical payment status, surgical method, number of chemotherapy cycles, or presence of religious beliefs (all $P > 0.05$), as shown in [Table 1](#).

Multivariate Analysis of Factors Influencing Emotional Expression Conflict in Breast Cancer Patients

Using the latent categories of emotional expression conflict in breast cancer patients undergoing postoperative chemotherapy as the dependent variable (Low Conflict Emotional Expression Group = 1, Medium Conflict Emotional Expression Group = 2, High Conflict-Expression Inhibited Group = 3; with the High Conflict-Expression Inhibited Group as the reference), variables found to be statistically significant in the univariate analysis were included as independent variables in the logistic regression model. The parallelism test yielded $\chi^2 = 20.532$, $P = 0.197$, confirming the suitability of an ordered logistic regression analysis. The results indicated that age (≤ 35 years = 1, 35–60 years = 2, ≥ 60 years = 3; with ≥ 60 years as the reference), sleep quality (Poor = 1, Fair = 2, Good = 3; with Good sleep quality as the reference), education level (Junior high school and below = 1, High school = 2, College/Vocational and above = 3; with College/Vocational and above as the reference), per capita monthly household income (≤ 3000 RMB = 1, 3000–5000 RMB = 2, ≥ 5000 RMB = 3; with ≥ 5000 RMB as the reference), cognitive fusion (original score input), and family resilience (original score input) were significant factors influencing the latent categories of emotional expression conflict among breast cancer patients undergoing postoperative chemotherapy. The detailed results are presented in [Table 3](#).

Table 3 Multivariate Analysis of Latent Profiles of Emotional Expression Conflict in Breast Cancer Patients Undergoing Postoperative Chemotherapy (n=238)

| Variables | | Regression Coefficient | Standard Error | Wald χ^2 Value | P | OR | 95% CI |
|-------------------------|--|------------------------|----------------|---------------------|--------|-------|-------------|
| Cognitive Fusion Score | | 0.056 | 0.020 | 8.072 | 0.004 | 1.058 | 1.017–1.099 |
| Family Resilience Score | | –0.029 | 0.010 | 9.034 | 0.003 | 0.971 | 0.953–0.99 |
| Age (years) | ≤ 35 | 1.427 | 0.388 | 13.496 | <0.001 | 4.166 | 1.944–8.917 |
| | 35–60 | 0.867 | 0.322 | 7.246 | 0.007 | 2.380 | 1.266–4.473 |
| | ≥ 60 | | | | | | |
| Sleep Quality | Poor | 0.735 | 0.371 | 3.930 | 0.047 | 2.085 | 1.008–4.315 |
| | Average | 0.105 | 0.365 | 0.082 | 0.774 | 1.111 | 0.543–2.27 |
| | Good | | | | | | |
| Educational Level | Junior High School or Below | 1.005 | 0.388 | 6.694 | 0.010 | 2.732 | 1.276–5.847 |
| | High School | 1.069 | 0.380 | 7.901 | 0.005 | 2.912 | 1.383–6.141 |
| | College higher vocational level or above | | | | | | |

(Continued)

**Table 3** (Continued).

| Variables | | Regression Coefficient | Standard Error | Wald χ^2 Value | P | OR | 95% CI |
|---|-----------|------------------------|----------------|---------------------|-------|-------|-------------|
| Per Capita Monthly Household Income (RMB) | ≤3000 | 0.960 | 0.393 | 5.951 | 0.015 | 2.612 | 1.208~5.646 |
| | 3000~5000 | -0.276 | 0.392 | 0.497 | 0.481 | 0.759 | 0.352~1.636 |
| | ≥5000 | | | | | | |
| Occupation | Farmer | 0.421 | 0.401 | 1.103 | 0.294 | 1.523 | 0.694~3.347 |
| | Worker | -0.388 | 0.404 | 0.923 | 0.337 | 0.678 | 0.307~1.496 |
| | Other | 0.197 | 0.371 | 0.282 | 0.595 | 1.218 | 0.589~2.519 |
| | Retired | | | | | | |
| Pathological Stage | I | -0.987 | 0.649 | 2.312 | 0.128 | 0.373 | 0.104~1.331 |
| | II | -0.664 | 0.517 | 1.648 | 0.199 | 0.515 | 0.187~1.419 |
| | III | 0.177 | 0.534 | 0.110 | 0.741 | 1.194 | 0.419~3.401 |
| | IV | | | | | | |

Discussion

Heterogeneity in Emotional Expression Conflict Among Breast Cancer Patients

Breast cancer is one of the most common malignant tumors among women globally, and its rising incidence poses a significant threat to women's health. In recent years, with advancements in early screening and treatment technologies, surgery combined with adjuvant chemotherapy has become the standard treatment regimen, significantly improving the survival rate of patients. However, despite the remarkable progress in treatment, patients still face substantial physiological and psychological stress during the process. Especially during postoperative chemotherapy, patients not only endure severe physical side effects but also experience emotional fluctuations such as anxiety, depression, and fear, which impact their emotional regulation and psychological adaptation. Emotional expression conflict, as a common psychological response, has become an important factor influencing the mental health of breast cancer patients. During treatment, patients often suppress or experience conflict in expressing their emotions due to concerns that others may not understand or accept them. This internal-external emotional conflict not only exacerbates their psychological burden but may also affect their treatment outcomes and quality of life. Therefore, a comprehensive exploration of the sources and influencing factors of emotional expression conflict in breast cancer patients is of great significance for developing more effective psychological interventions to improve patients' mental health.

The results of this study indicate that the emotional expression conflict score for breast cancer patients undergoing postoperative chemotherapy was 52.43 ± 16.56 , which is consistent with the findings of Li Xuekun²⁵ in middle-aged and young patients. Latent profile analysis revealed that emotional expression conflict among patients was categorized into three groups: the "Low Conflict Emotional Expression Group" (33.6%), the "Medium Conflict Emotional Expression Group" (42.4%), and the "High Conflict, Expression Inhibited Group" (23.9%).

Low Conflict Emotional Expression Group: This group exhibited a generally low level of emotional expression conflict. This may be attributed to the fact that patients in this group tend to be older, have higher educational levels, and possess extensive life experience. Consequently, they are better equipped to calmly and rationally handle significant life changes and effectively regulate their emotions. For such patients, healthcare providers should maintain effective communication, continuously monitor changes in their emotional states, and proactively address any barriers to emotional expression.

Medium Conflict Emotional Expression Group: This group comprised the largest number of patients, which may be due to these patients having a preliminary understanding of their illness and basic emotional management skills. However, they may struggle to integrate their cognitive understanding with their actions, resulting in obstacles to emotional expression. Healthcare providers should equip these patients with appropriate emotional expression pathways and techniques, encouraging them to express their emotions. Additionally, it is crucial to actively monitor the emotional distress in this category of patients to prevent their transition into the high conflict group.

High Conflict-Expression Inhibited Group: Patients in this category exhibited the highest levels of emotional expression conflict. This may be because many study participants are middle-aged and young women who, due to treatment, experience

changes in their physical appearance related to breast cancer. As a result, they may be more sensitive to bodily defects and struggle with psychological regulation. Moreover, patients in this group demonstrated lower levels of family resilience and had fewer accessible family and social resources, exacerbating their fear of communicating with family members and making emotional expression more challenging. Therefore, healthcare professionals should proactively identify high-risk patients early on and implement stratified interventions tailored to the different categories of breast cancer patients. Encouraging self-disclosure and reducing emotional expression conflict levels are essential strategies for improving patient outcomes.

Multiple Factors Affecting the Categories of Emotional Expression Conflict in Breast Cancer Patients Undergoing Postoperative Chemotherapy

Education Level and Per Capita Monthly Household Income

Lower-educated patients exhibited significantly higher likelihood of High Conflict-Expression Inhibited Group membership compared to Low/Medium Conflict Groups (all $P < 0.05$). This association may arise through two pathways: (a) Limited health literacy impedes emotional articulation and breast cancer knowledge acquisition, fostering shame-driven expression avoidance;³¹ (b) Reduced per capita income linked to lower education amplifies treatment-related financial strain,³² exacerbating familial guilt and emotional suppression.

Higher-educated counterparts demonstrated superior emotional regulation through enhanced illness comprehension. Clinical interventions should prioritize: (a) Simplified health education materials (such as short videos);³¹ (b) Family communication training using plain language;³³ (c) Mitigation of hierarchical doctor-patient dynamics in China to promote therapeutic dialogue.³³

Age and Sleep Quality

This study found that, compared to the Low Conflict Emotional Expression Group and the Medium Conflict Emotional Expression Group, younger patients and those with poorer sleep quality were more likely to belong to the High Conflict—Expression Inhibited Group ($P < 0.05$). Studies have shown that younger breast cancer patients have more active hormone metabolism, faster cell proliferation, earlier metastasis, higher risks of disease staging, recurrence, and mortality, and poorer prognosis.³⁴ The patients in this study were mostly middle-aged and young, carrying multiple social roles. Cancer not only increases their economic burdens but also hinders career development, leading to a loss of social roles and preventing them from achieving self-worth. Moreover, anticancer treatments inevitably cause destruction or loss of fertility,³⁵ adding psychological pressure and emotional conflicts to younger patients.¹⁴ Additionally, younger women have a higher prevalence and severity of sleep disorders,³⁶ and treatments such as surgery and chemotherapy are common causes of sleep disturbances.³⁷ Patients with poorer sleep quality experience lighter sleep, difficulty falling back asleep after waking, and long-term sleep deprivation, which can easily disrupt physiological rhythms, impair emotional cognition and regulation functions, and lead to emotional expression conflicts.³⁸ Furthermore, these patients are prone to daytime lethargy and drowsiness, leading to difficulties in concentration and handling various tasks. This results in the continuous accumulation of negative emotions, increasing the likelihood of emotional expression conflicts. Therefore, healthcare providers should pay more attention to younger breast cancer patients, disseminate disease knowledge and psychological care, encourage them to face cancer, strengthen health education on disease communication, and encourage them to seek help from their support systems to alleviate physical and mental stress and burdens. Additionally, healthcare providers should help patients improve sleep quality through methods such as mindfulness training to enhance their perception of their physiological states, thereby increasing their sense of self-control and improving their ability to regulate emotions.

Cognitive Fusion

The results of this study showed that, compared to the Low Conflict Emotional Expression Group and the Medium Conflict Emotional Expression Group, patients with higher levels of cognitive fusion were more likely to belong to the High Conflict—Expression Inhibited Group. Psychological rigidity can cause patients to experience negative emotions during the rehabilitation process, leading to distorted cognitions influenced by their subjective awareness. This makes it difficult to process their emotions and increases their psychological burden,³⁹ which can lead to emotional expression conflicts. This suggests that healthcare providers should pay attention to patients with

different psychological states, help them establish accurate disease cognition, address their doubts, build positive beliefs, and adopt a rational attitude toward coping with the disease. Additionally, healthcare providers should guide patients to appropriately express their needs and improve their emotional management abilities.

Family Resilience

Regression analysis showed that patients with lower family resilience were more likely to belong to the High Conflict—Expression Inhibited Group compared to the Low and Medium Conflict Groups. Family resilience refers to a family's capacity to mobilize internal and external resources to adapt to illness challenges.⁴⁰ Higher family resilience correlates with harmonious relationships and optimistic disease attitudes, promoting proactive emotional expression and reducing conflicts. When families actively listen to patients, mutual understanding improves, enabling better coping with disease stress and forming a resilience-conflict resilience cycle.

Therefore, healthcare providers should conduct comprehensive and multi-dimensional assessments for patients, offer sufficient emotional care to patients with low family resilience, establish good communication with patients and their families, encourage family members to participate in the patient's treatment, and provide patients with more family support. Additionally, healthcare providers should monitor the psychological development trends of patients and offer targeted assistance in a timely manner.

This study identified age, education, income, sleep quality, cognitive fusion, and family resilience as key predictors of emotional conflict in breast cancer patients. These findings underscore the urgent need for personalized nursing interventions, including cognitive-behavioral and mindfulness therapies to improve emotional regulation, alongside family-centered strategies to strengthen resilience and communication dynamics. While preliminary, the results emphasize the critical role of integrated psychological support and family engagement in oncology care. Future multi-center studies with larger cohorts are warranted to validate these findings and refine culturally adaptive intervention frameworks.

Limitations and Future Research

Despite the meaningful findings, several limitations of this study should be considered, which also highlight directions for future research. The use of self-report instruments may introduce bias due to measurement error. Although we employed validated tools with strong psychometric properties, the reliance on observed total scores rather than latent constructs may limit precision. Structural Equation Modeling (SEM), which offers advantages for testing causal pathways and explicitly modeling measurement error, was not employed in this exploratory study, which aimed primarily to identify latent subgroups of emotional expression conflict and examine associated influencing factors.

Furthermore, while our analysis identified several significant correlates of subgroup membership, we did not examine potential mediating or moderating effects—such as the roles of cognitive fusion or family resilience—due to the cross-sectional design and modest sample size ($n = 238$). Future research should adopt longitudinal designs and SEM-based frameworks to rigorously explore the psychological mechanisms underlying emotional expression conflict in breast cancer patients.

Although the variable-to-sample ratio in our regression analysis meets recommended thresholds, the possibility of Type I error cannot be excluded. Future studies should consider larger sample sizes and explore alternative modeling techniques, such as penalized regression (eg, LASSO), to ensure the robustness of the findings.

Conclusion

Emotional expression conflicts among breast cancer patients undergoing postoperative chemotherapy exhibit distinct categorical characteristics. Age, education level, per capita monthly income, sleep quality, cognitive fusion, and family resilience are key influencing factors for different categories of emotional expression conflict. It is recommended that nursing staff promptly implement personalized psychological interventions, cognitive-behavioral therapy, mindfulness-based interventions, and other strategies to encourage patients to actively express their emotions and describe their experiences. This can help reduce the sense of guilt following a cancer diagnosis and alleviate emotional expression conflicts. The sample size of this study was relatively small, and future research should involve multi-regional, large-sample surveys to further validate and refine the conclusions drawn in this study. Furthermore, as the global demand for

cancer care continues to rise, the findings of this study offer valuable insights for emotional support and psychological health interventions in oncology nursing practices worldwide.

Ethics Approval

This study was reviewed and approved by the Ethics Committee of Fenyan College of Shanxi Medical University. The ethics approval number is 2023031. Informed consent was obtained from all patients, and the process was reviewed by the Ethics Committee of Fenyan College of Shanxi Medical University. The study was conducted in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its later amendments.

Author Contributions

Zhaoxia Tian and Ruishan Sheng contributed equally to this work and are co-first authors. All authors made substantial contributions to the work reported, including in the conception, study design, execution, data acquisition, analysis and interpretation, or in all these areas; participated in drafting, revising, or critically reviewing the manuscript; approved the final version to be published; agreed on the journal to which the article has been submitted; and are accountable for all aspects of the work.

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Disclosure

The authors declare that there are no financial or non-financial competing interests associated with the conduct or publication of this research.

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