Journal of Clinical and Nursing Research, 2024, Volume 8, Issue 12
http://ojs.bbwpublisher.com/index.php/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

Characteristics and Influencing Factors of Self-Advocacy in Young and Middle-Aged Patients with Breast Cancer: A Latent Profile Analysis

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Abstract: *Objective:* To explore the potential categories and influencing factors of self-advocacy in young and middle-aged patients with breast cancer and to provide a theoretical basis for personalized intervention. *Methods:* From September 2023 to March 2024, 314 young and middle-aged breast cancer patients were studied. Female cancer patients were surveyed using the self-advocacy scale, social support rating scale, and chronic health literacy scale. Latent profile analysis was used to investigate the heterogeneity and influencing factors of self-advocacy. *Results:* Self-advocacy among young and middle-aged breast cancer patients were classified into two potential categories: low advocacy-lack of support (51.7%) and high advocacy-effective communication (48.3%). Binary logistic regression analysis indicated that educational level, per capita monthly income, social support, and health literacy were significant influencing factors of these categories ($P < 0.05$). *Conclusion:* Self-advocacy in young and middle-aged breast cancer patients demonstrates categorical heterogeneity. Identifying self-advocacy characteristics and implementing targeted intervention strategies—focused on self-efficacy and improving health literacy—can enhance self-advocacy in these patients.

Keywords: Young and middle-aged; Breast cancer; Self-advocacy; Latent profile analysis

1. Introduction

Breast cancer (BC) is the second most common cancer worldwide after lung cancer and the leading cause of cancer death among women globally [1]. In China, middle-aged and young women form the primary morbidity group, with the peak age of onset being 45–54 years [2]. BC survivors face numerous challenges, including adverse effects of chemotherapy and postoperative complications [3]. Modified radical mastectomy is considered the optimal treatment for early breast cancer due to its minimal invasiveness and efficacy, significantly extending patient survival; the 5-year survival rate exceeds 90% [4,5].

Given the rising survival rates, patients are increasingly autonomous, actively participating in disease management decisions to enhance their quality of life and promote positive health outcomes. However, postoperative patients often experience severe symptom burdens, adversely impacting their quality of life [6]. Considering the central role of young and middle-aged women in society and their families, providing timely and effective health information during this critical period is essential. Promoting improved quality of life and addressing their personal interests and needs have become priorities in medical and research fields.

Self-advocacy (SA) emphasizes autonomous decision-making, effective communication with healthcare professionals, and the pursuit of social support. Brashers initially proposed the concept, categorizing it into three dimensions: deepening disease-related knowledge, strengthening self-confidence for rehabilitation, and fostering independent thinking and decision-making abilities [7]. Subsequently, researchers refined the definition, describing SA as a patient's confidence and willingness to advocate for their own interests in the face of life-threatening illness [8,9]. This definition underscores the importance of patient expression and advocacy in overcoming significant health challenges.

Hagan's widely used definition describes SA as the ability to prioritize personal needs and desires when confronting cancer-related challenges [10]. It serves as a benchmark for evaluating how patients assertively express their needs during treatment. Patients with lower SA ability often exhibit reduced social support and health literacy [11-14], which may impede their capacity to protect their health effectively.

Studies indicate that patients with higher SA levels optimize skills and resources, actively engage in medical decision-making, effectively communicate with medical staff, and seek social support to meet their treatment needs and aspirations, thereby improving prognosis and quality of life [15-18]. However, current research often evaluates SA levels based solely on total scores, overlooking group heterogeneity. Latent Profile Analysis (LPA), a person-centered approach, categorizes individuals with similar response patterns, distinguishing characteristics and revealing subgroup differences [19].

This study employs LPA to analyze the potential categories and influencing factors of SA in young and middle-aged breast cancer patients post-surgery, aiming to provide a foundation for personalized SA management.

Previous studies suggest that SA may be influenced by demographic factors, psychological states, personal characteristics, and social support [10,20-24]. Notably, a robust social support network fosters information and emotional support, enabling patients to comprehend disease-related knowledge and engage in treatment decisions [25,26]. Patients who actively seek social support clarify priorities, exhibit greater independence, acquire health information, integrate disease knowledge, and face challenges proactively.

Social support derives from emotional care, respect, and practical assistance from family, friends, and groups, positively influencing SA development [27,28]. Conversely, inadequate support can hinder its growth. High levels of social support correlate with disease empowerment, providing patients with the necessary material and emotional resources to actively engage in health management and decision-making, thereby enhancing SA [29-31].

Health literacy, a multidimensional and dynamic concept, refers to the ability to acquire, comprehend, and apply health information effectively, enabling individuals to make informed health decisions [32,33]. Patients with higher health literacy actively manage their conditions, reducing the risk of complications and improving outcomes and quality of life [34-36]. In contrast, low health literacy increases the risk of complications, adversely affecting disease outcomes and patient quality of life [37,38].

This study hypothesizes that SA among breast cancer patients exhibits categorical differences. The primary objective is to explore the status and classification of SA in Chinese breast cancer patients, analyzing subtype characteristics by integrating demographic, clinical, social support, and health literacy data.

2. Methods

2.1. Participants

A cross-sectional descriptive survey of 314 BC patients was conducted using a convenience sampling method. Participants met the following inclusion criteria: (1) pathological diagnosis of breast cancer; (2) female; (3) aged 18–60; (4) underwent modified radical mastectomy; (5) provided informed consent and participated voluntarily. Exclusion criteria included: (1) the presence of other severe physical diseases; (2) concurrent mental illness.

2.2. Data collection

Between September 2023 and March 2024, participants were carefully recruited from a tertiary A hospital in Xi’an City. The study’s purpose, importance, and content were explained to potential participants, after which they were screened according to strict inclusion criteria. Data collection involved a non-identifiable paper questionnaire survey. The questionnaire design adhered to standardized operational guidelines to ensure the reliability of data processing and strict confidentiality of participants’ information. During the data recovery phase, the research team meticulously reviewed questionnaires, excluding those that did not meet predefined criteria. Specific exclusion criteria included: (1) incomplete questionnaires; and (2) questionnaires displaying uniform response patterns or high consistency across all responses. A total of 330 questionnaires were collected, of which 314 were valid, yielding an effective response rate of 95.15%.

2.3. Instruments

2.3.1. Demographic and clinical questionnaire

Two comprehensive questionnaires were designed to capture demographic and clinical characteristics. The sociodemographic section included age, education level, occupational status, marital status, average monthly family income, and place of residence. The clinical information section encompassed details of the chemotherapy cycle and the presence of lymphatic metastasis.

2.3.2. Self-advocacy scale for female cancer patients

The self-advocacy scale, developed by Hagan [10] and adopted by Feng [39], contains 18 items across three dimensions: self-decision-making, effective communication, and effective social support. It uses a six-point Likert scale, with scores ranging from 1 (“strongly disagree”) to 6 (“strongly agree”). The total score ranges from 18 to 108, with higher scores indicating stronger self-advocacy ability. The scale’s Cronbach’s α coefficient was 0.836.

2.3.3. Social Support Rating Scale

Developed by Xiao [40], this scale evaluates an individual’s social support status. It consists of three dimensions: subjective support (items 1, 3, 4, 5), objective support (items 2, 6, 7), and support utilization (items 8, 9, 10). The total score ranges from 12 to 66, with higher scores reflecting higher levels of social support. In this study, the scale's Cronbach's α coefficient was 0.755.

2.3.4. Health Literacy Management Scale

The Health Literacy Management Scale, developed by Professor Jordan and adapted by Sun [41], includes 24 items across four dimensions: information acquisition ability, communication and interaction ability, willingness to improve health, and willingness to provide economic support. It uses a five-point Likert scale, with total scores ranging from 24 to 120. Scores ≥ 96 indicate good health literacy, 72–96 indicate limited health literacy and 24–72 indicate severe lack of health literacy. A dimension score ≥ 4 is considered indicative of sufficient health literacy. The scale's Cronbach's α coefficient was 0.905.

2.4. Data analysis

Data were analyzed using SPSS 26.0 and Mplus 8.3 software. Latent profile analysis (LPA) was conducted in Mplus 8.3, using item scores from the self-advocacy scale as explicit indicators. Model evaluation criteria included:

(1) Information indices: Akaike information criterion (AIC), Bayesian information criterion (BIC), and sample-adjusted Bayesian information criterion (aBIC), with smaller values indicating better model fit.

(2) Classification index: Entropy, where values closer to 1 indicate a more accurate classification.

(3) Likelihood ratio tests: Bootstrap Likelihood Ratio Test (BLRT) and Lo-Mendell-Rubin test (LMR); $P < 0.05$ indicated that the k-class model fit better than the k-1 model [42].

Based on the results of these indices, the optimal model was selected, and patients were categorized accordingly. SPSS 26.0 was used for additional statistical analyses. Measurement data were presented as means ± standard deviations, while categorical data were described using frequencies and percentages. Single-factor analyses were performed using *t*-tests or ANOVA. Binary logistic regression was employed to identify factors influencing latent categories of self-advocacy in young and middle-aged patients post-mastectomy, with statistical significance set at $P < 0.05$.

2.5. Ethics

This study was approved by the Hospital Ethics Committee (KY20232286-F-2).

3. Results

3.1. Participants' sociodemographic characteristics

A total of 314 young and middle-aged patients who underwent radical mastectomy were included in the study. Among them, 71 patients were aged <40 years, and 243 were aged between 40 and 60 years. Regarding education level, 145 patients had completed junior high school or below, 95 had completed senior high school or junior college, and 74 had a bachelor's degree or higher. In terms of occupational status, 109 patients were employed, 55 were resigned or retired, 62 were farmers, and 88 were unemployed. Marital status included 256 married, 30 unmarried, 23 divorced, and 5 widowed individuals.

The distribution of per capita monthly income was as follows: 103 patients earned 0–5,000 yuan, 146 earned 5,000–10,000 yuan, and 65 earned over 10,000 yuan. Among the participants, 159 were urban residents, and 155 resided in rural areas. Regarding chemotherapy cycles, 103 patients underwent fewer than three cycles, 136 underwent three to six cycles, and 75 underwent more than six cycles. Lymphatic metastasis was observed in 170 patients, while 144 patients showed no signs of lymphatic metastasis.

3.2. Analysis of latent profiles and characteristics of self-advocacy in breast cancer patients

LPA was performed based on the scores of 18 items on the Female Self-Advocacy in Cancer Scale (FSACS), resulting in three models. The fit indices for each model are shown in **Table 1**. When the number of categories was set to two, the entropy value was 0.812, and the *P*-values for the LMR and BLRT were statistically significant ($P < 0.05$). With three categories, while the AIC, BIC, and aBIC values decreased and the entropy increased, the *P*-value for LMR was not statistically significant ($P > 0.05$).

Based on these findings, the two-category model was selected as the optimal solution for classifying self-advocacy characteristics in young and middle-aged patients post-radical mastectomy. The average scores of each category on the 18 FSACS items are shown in **Figure 1**, and the categories were named accordingly.

Category 1: High Advocacy – Effective Communication Group (48.3%, 145 patients). In the dimension of effective communication, item 7, "I will take the initiative to ask questions when I cannot understand the explanation of doctors or nurses," received a higher score compared to other items.

Category 2: Low Advocacy – Lack of Support Group (51.7%, 169 patients). In the social support dimension, items 17, "Telling other people my story makes me feel good," and 18, "I am happy to share my cancer experience with others," received significantly lower scores compared to other items.

Table 1. Latent profile analysis models and fit indices

Model	AIC	BIC	aBIC	Entropy	LMR	BLRT	Class probability
1	14,578.554	14,713.532	14,599.351	-	-	-	-
2	14,024.090	14,230.307	14,055.863	0.812	0.002	< 0.001**	0.483 / 0.517
3	13,735.534	14,012.990	13,778.283	0.895	0.217	< 0.001**	0.041 / 0.547 / 0.412

Note: **$P < 0.001$. Abbreviations: aBIC, Sample size-adjusted Bayesian Information Criterion; AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; BLRT, Bootstrap Likelihood Ratio Test; LMR, LoMendell-Rubin Adjusted Likelihood Ratio Test.

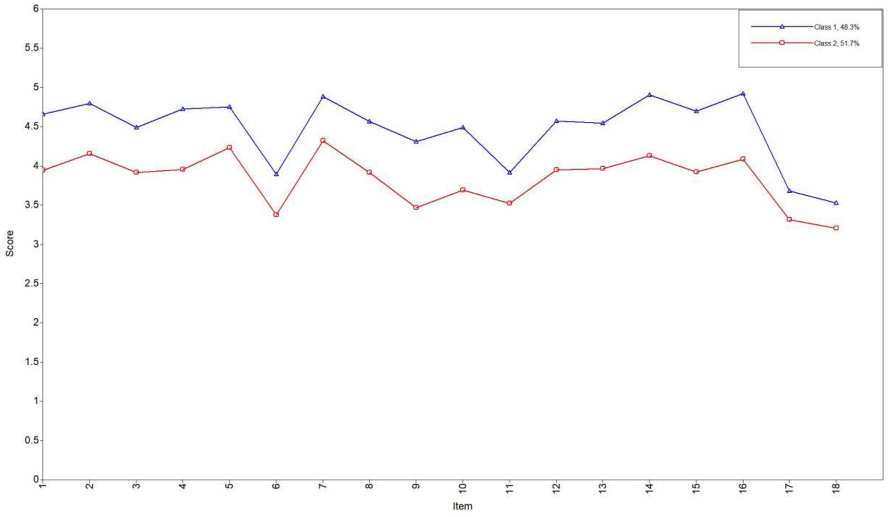

Figure 1. Latent profiles of FSACS items

3.3. Characteristics of the different classes

Statistically significant differences were observed in age, education level, occupational status, marital status, per capita monthly income, residence, and chemotherapy cycles among the two latent profile groups (all $P < 0.05$). Detailed comparisons of the sociodemographic characteristics and self-advocacy classifications are presented in **Table 2**.

Table 2. Comparison of self-advocacy classifications by sociodemographic variables ($n = 314$)

Variables	Classification	Class 1 ($n = 169$)	Class 2 ($n = 145$)	$\chi^2 / F / t$	P
Age (years)	18–39	29 (17.2)	42 (29.0)	6.216	0.013
	40–60	140 (82.8)	103 (71.0)		
Education level	Junior high school or below	109 (64.5)	36 (24.8)	49.912	< 0.001
	High school or college	36 (21.3)	59 (40.7)		
	Bachelor's degree or above	24 (14.2)	50 (34.5)		
Occupational status	Enterprises/institutions	52 (30.8)	57 (39.3)	24.002	< 0.001
	Retired	17 (10.1)	38 (26.2)		
	Laborer	44 (26.0)	18 (12.4)		
	Unemployed	56 (33.1)	32 (22.1)		
Marital status	Married	128 (75.7)	128 (88.3)	8.476	0.037
	Unmarried	21 (12.4)	9 (6.2)		
	Divorced	17 (10.1)	6 (4.1)		
	Widowed	3 (1.8)	2 (1.4)		
Per capita monthly household income (RMB)	0–5,000	71 (42.0)	32 (22.1)	34.721	< 0.001
	5,000–10,000	83 (49.1)	63 (43.4)		
	> 10,000	15 (8.9)	50 (34.5)		
Place of residence	Urban area	72 (42.6)	87 (60.0)	9.449	0.002
	Rural area	97 (57.4)	58 (40.0)		
Chemotherapy cycles (times)	< 3	52 (30.8)	51 (35.2)	6.825	0.033
	3–6	84 (49.7)	52 (35.9)		
	> 6	33 (19.5)	42 (29.0)		
Lymphatic metastasis	Yes	90 (53.3)	80 (55.2)	0.116	0.734
	No	79 (46.7)	65 (44.8)		
SSRS (mean ± SD)		39.50 ± 5.28	38.06 ± 5.317	2.403	0.017
HLMS (mean ± SD)		94.40 ± 12.43	101.23 ± 9.565	-5.388	< 0.001

3.4. Influencing factors of self-advocacy in different groups of patients

Binary logistic regression analysis was conducted to identify factors influencing SA. The second latent class identified through LPA was used as the dependent variable, while the independent variables were those with statistically significant differences in the univariate analysis. The variables were assigned the following values:

(1) Self-advocacy: Class 1 = 1, Class 2 = 2

(2) Age: 18–39 years = 1, 40–60 years = 2

(3) Education level: Junior high school or below = 1, Senior high school or college = 2, Bachelor's degree or above = 3

(4) Occupational status: Employed = 1, Resigned/retired = 2, Farming = 3, Unemployed = 4

(5) Marital status: Married = 1, Unmarried = 2, Divorced = 3, Widowed = 4

(6) Per capita monthly household income (RMB): 0–5,000 = 1, 5,000–10,000 = 2, > 10,000 = 3

(7) Residence: Urban = 1, Rural = 2

(8) Chemotherapy cycles (times): < 3 = 1, 3–6 = 2, > 6 = 3

The results revealed that education level, per capita monthly household income, social support score, and health literacy score significantly influenced the potential types of self-advocacy in young and middle-aged patients following radical mastectomy ($P < 0.05$). The specific influencing factors of SA across different groups are presented in **Table 3**.

Table 3. Influencing factors of self-advocacy in different groups of patients ($n = 314$)

Variable	Regression coefficient	Standard error	Wald χ^2	*P*	*OR*	95% CI
Constant	0.456	2.192	0.043	< 0.001	-	-
Education level	-1.562	0.438	12.718	< 0.001	0.210	[0.089, 0.495]
Per capita monthly household income	-1.264	0.473	7.155	0.007	0.282	[0.112, 0.713]
SSRS	-0.081	0.029	7.580	0.006	0.923	[0.871, 0.977]
HLMS	0.041	0.015	7.775	0.005	1.041	[1.012, 1.071]

4. Discussion

4.1. Potential categories and characteristics of self-advocacy

This study identified two distinct groups of SA among young and middle-aged patients following radical breast cancer surgery: the "low advocacy - lack of support group" and the "high advocacy - effective communication group." These findings emphasize the variability in SA abilities among patients, as detailed below.

The "low advocacy - lack of support group," accounting for 51.7% of the sample, exhibited generally low levels of SA, particularly in the dimension of social support. This suggests that these patients face challenges related to insufficient peer support. This phenomenon may be attributed to the emotional state of "deprivation grief," which patients often experience when confronting the significant stress of breast cancer [43]. This emotion, often misunderstood and unacknowledged in broader society, may lead patients to avoid communication with other cancer patients.

In contrast, the "high advocacy - effective communication group," comprising 48.3% of the sample, demonstrated significantly higher levels of SA, especially in effective communication. This indicates that these patients are adept at transforming their experiences into resources for personal growth and establishing efficient communication channels with their medical teams. Effective communication, a crucial aspect of SA, enables these patients to actively share and learn from experiences, fostering smoother interactions with healthcare professionals.

4.2. Analysis of influencing factors for potential categories of self-advocacy

This study found that the level of self-advocacy (SA) in young and middle-aged patients following radical mastectomy was positively correlated with their education level. Specifically, patients with a bachelor's degree or higher demonstrated significantly higher SA levels, with education identified as a significant predictor (OR = 0.210, $P < 0.05$), consistent with previous studies [44]. A possible explanation for this finding is that patients with lower educational attainment are more prone to negative emotions such as anxiety and depression due to limited access to information and a reduced capacity to process and apply knowledge. This may lead to a passive attitude towards disease-related decision-making [28], thereby hindering the development of SA. Conversely, patients with higher education levels exhibited stronger abilities in processing and integrating information [45], actively participated in disease management decisions, and established effective communication channels with medical teams.

These results highlight the need for tailored strategies for patients with lower education levels, such as integrating online and offline approaches and designing diverse, personalized health education programs. These programs should aim to enhance disease awareness, meet information needs, and strengthen patients' understanding of their roles and responsibilities in disease management to improve their SA levels effectively.

The study also revealed a positive correlation between SA and per capita monthly income, with patients earning over 10,000 yuan per month exhibiting higher SA levels. This finding was confirmed through statistical analysis (OR = 0.282, $P < 0.05$) and aligns with previous research [46]. Economic stability appears to enhance SA by providing access to diverse resources and strong social support networks, facilitating confident decision-making in complex treatment scenarios. Furthermore, financial security can alleviate cancer-related anxiety and depression [47], reduce psychological burdens, bolster treatment confidence, and encourage active disease-coping strategies.

Healthcare professionals should prioritize building trust with breast cancer patients, identifying individuals with weaker SA, and implementing customized education and psychological interventions. These measures aim to address patients' specific needs, strengthen their internal motivation, and enhance their confidence and determination to overcome the disease.

Social support was identified as another significant predictor of SA. Patients with lower levels of social support demonstrated reduced SA abilities, particularly in the "low advocacy – lack of support group," consistent with prior research [48,49]. High-quality social support systems are essential for meeting patients' physical, emotional, and material needs and are critical for enhancing self-decision-making capabilities [50]. Greater social support improves mental health, encourages proactive attitudes towards disease treatment, strengthens doctor-patient communication, and fosters harmonious relationships [51]. Conversely, insufficient social support limits access to information and emotional resources, adversely impacting the disease-coping process.

Medical staff should promptly identify patients with low social support, enhance their awareness of available resources, and mobilize support from family, friends, and organizations. Establishing comprehensive social support networks can significantly improve SA levels among patients.

Lastly, the study highlighted the importance of health literacy in SA, with low health literacy levels closely linked to reduced SA. Patients in the "low advocacy – lack of support group" exhibited lower health literacy levels. Limited health literacy increases uncertainty about the disease and fear of recurrence, heightening the risk of psychological disorders such as anxiety and depression [52,53]. Furthermore, low health literacy results in significant deficiencies in health management knowledge, prevention strategies, and medical decision-making [54], hindering effective participation in disease management.

In contrast, patients with higher health literacy demonstrated a greater willingness to seek health information and engage in self-improvement. These patients effectively communicated with medical teams, actively participated in disease-related decision-making, and implemented positive self-management strategies to meet their health needs. Clinical staff should focus on patients with low health literacy by implementing targeted interventions, providing practical health knowledge, and strengthening mental health education. These efforts aim to alleviate adverse psychological states, enhance health literacy and SA, and support the rehabilitation process.

4.3. Limitations

This study has several limitations. First, the scope of the research was restricted to third-class A hospitals in Xi'an. Considering China's vast geographical size and diverse healthcare environments, the generalizability of the findings may be limited and may not be directly applicable to other regions of the country. To improve the universality and reliability of future studies, clinical data collection should encompass multiple regions and centers, enhancing the diversity and representativeness of the sample population. Additionally, the current study did not sufficiently explore disease-related factors among patients. To achieve a more comprehensive evaluation and prediction of self-advocacy (SA), future research should incorporate a broader range of disease-related variables and implement in-depth analytical strategies for more accurate and holistic predictions of SA.

5. Conclusion

In conclusion, self-advocacy among young and middle-aged patients following radical mastectomy can be categorized into two potential groups: "low advocacy – lack of support group" and "high advocacy – effective communication group." Factors influencing these categories include education level, family per capita monthly income, social support, and health literacy. Clinical practitioners should recognize the unique characteristics of these self-advocacy categories and develop personalized intervention measures to enhance self-advocacy among patients.

Disclosure statement

The authors declare no conflict of interest.

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