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Effectiveness of Discharge Education Plan for Patients' Care Practices and Anxiety Levels Post-Mastectomy: A Quasi-Experimental Study

Rasha Ahmed Fouad*[a,b,c], Safaa Mabrouk Abdelaziz Elgarhy[d], Somaya Abdel Moneim El shazly[e], Abeer Abd El Rahman Mohamed[f]

[a]*Faculty of Nursing, King Saud Bin Abdul-Aziz University for Health Sciences Alahsa, Saudi Arabia*

[b]*King Abdullah International Medical Research Center, Alahsa, Saudi Arabia*

[c]*Gerontological Nursing Department, Faculty of Nursing, Alexandria University, Egypt*

[d]*Gerontological Nursing, Faculty of Nursing, Damanhur University, Egypt*

[e]*Professor Gerontological Nursing, Faculty of Nursing, Alexandria University, Egypt*

[f]*Gerontological Nursing, Faculty of Nursing, Alexandria University, Egypt*

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ABSTRACT

Background: Breast cancer poses a major public health concern, particularly among elderly women, due to its high incidence and psychological burden. Effective nursing interventions are crucial for minimizing complications, improving psychological well-being, and enhancing self-care practices post-mastectomy. The aim of this study was to assess the effect of a discharge education plan on self-care practices and anxiety levels among post-mastectomy patients.

Methods: A randomized clinical trial was conducted at the Oncology Center in Damanhur Governorate, Egypt, including 80 elderly female patients undergoing modified radical mastectomy. Participants were randomly assigned to either the study group (n=40, receiving a discharge education plan) or the control group (n=40, receiving routine care). Data collection involved structured assessments of sociodemographic and clinical profiles, self-care practices, and anxiety levels pre- and post-intervention.

Results: Baseline self-care and anxiety levels were comparable between groups. Post-intervention, self-care practice scores significantly improved in the study group (mean = 85.6 ± 7.2) compared to the control group (mean = 62.3 ± 10.1, P<0.001). Anxiety levels significantly decreased in the study group (mean = 2.78 ± 0.77) versus the control group (mean = 6.90 ± 2.00, P<0.001). The study group's mean self-care practice score (353.9 ± 9.2) was significantly higher than that of the control group (265.3 ± 36.9, P<0.001), reinforcing the effectiveness of the intervention.

Conclusion: The discharge education plan significantly enhanced self-care practices and reduced anxiety levels among post-mastectomy geriatric patients. The statistical significance of these improvements (P<0.001) underscores the intervention's efficacy, demonstrating its vital role in post-operative recovery and psychological well-being.

***Address for correspondence:**
Rasha Ahmed Fouad,
Faculty of Nursing, King Saud Bin Abdul-Aziz University for Health Sciences Alahsa, Saudi Arabia; King Abdullah International Medical Research Center, Alahsa, Saudi Arabia; Gerontological Nursing Department, Faculty of Nursing, Alexandria University, Egypt
Email: Kamelr@ksau-hs.edu.sa

INTRODUCTION

Worldwide, breast cancer remains the most prevalent cancer among women, both in developed and developing countries contributing to global morbidity and mortality. Approximately, 25% of breast cancer patients are over the age of 65, and nearly 10.6% of the cases are in women aged 80 years and older.[1]

The average age at diagnosis is 61 years, and the majority of women who die from breast cancer are aged 65 years or older, with geriatric patients experiencing unique challenges following mastectomy, including heightened risks of lymphedema, infection, and psychological distress, such as anxiety and depression.[2] Notably, elderly women face barriers due to social isolation, physical frailty, and inadequate post-operative support, further emphasizing the need for targeted interventions.[3]

These statistics emphasize a growing need to address the specific healthcare and support needs of the geriatric population affected by breast cancer. Notably, the United States reports the highest incidence rates globally, with 128.6 cases per 100,000 in white women and 112.6 per 100,000 in African American women.[4] In Egypt, approximately 46,000 incident cases are forecasted for 2050.[3] Although this incidence rate in Egypt is lower than the global figures, mortality is higher at an age-standardized rate of 20.4/100,000.[5]

Risk factors for breast cancer encompass a complex interplay of biological, environmental, and lifestyle determinants, including advancing age, hormonal influences, diet, obesity, tobacco use[1,6], and urbanization-associated factors and the adoption of Western lifestyles.[7] This population experiences distinct post-mastectomy challenges, including increased psychological distress, such as anxiety and depression, and a heightened risk of complications like lymphedema, infection, and fatigue.[8]

Surgery remains the cornerstone of breast cancer treatment, particularly mastectomy, which is frequently combined with other therapies such as chemotherapy, radiation, and hormonal therapy.[9] Despite improvements in survival rates due to advancements in treatment, women who undergo mastectomy still face substantial psychological distress, with increased rates of depression and anxiety, which can significantly impact recovery.[10] Psychological distress is particularly prominent in older women, who also experience challenges such as social isolation and physical frailty, which can further complicate post-surgical recovery.[11] Research suggests that structured discharge education programs significantly improve self-care practices and reduce psychological distress, including anxiety and depression, in post-mastectomy patients.[12,13] However, much of this research has focused on younger populations, highlighting the need for tailored interventions for older women, who face unique challenges in managing their health. Geriatric oncology nursing emphasizes the importance of education to empower patients in managing their recovery and reducing distress. However, studies evaluating the effectiveness of targeted educational programs for elderly women post-mastectomy remain scarce.[14]

One critical gap in the current healthcare system is the insufficient post-operative care and self-care education provided to older women after mastectomy. Many geriatric patients face difficulties in managing post-surgical complications that can significantly affect their quality of life.[15] Self-care practices, including manual lymphatic drainage, skin care, exercise, and infection prevention, are essential for post-mastectomy recovery, but many older women lack the knowledge and support to effectively manage these aspects of their care.[16] Given the brief hospital stays and the rising demand for home-based care, discharge education, particularly through telecommunication, has emerged as a vital means to support patients during recovery.[17]

Despite these findings, there remains a lack of targeted interventions addressing the specific needs of elderly women undergoing mastectomy. This demographic not only requires comprehensive education on self-care practices, such as lymphatic drainage and infection prevention, but also psychological support to navigate the emotional toll of their diagnosis and treatment.[18] This study aims to bridge this gap by evaluating the impact of a proposed discharge education plan on self-care practices and anxiety levels in elderly post-mastectomy patients, contributing to a growing body of evidence that underscores the value of structured patient education.

Discharge education plans have demonstrated significant benefits across surgical populations, improving self-care practices, reducing re-admissions, and enhancing psychological well-being. For example, studies have shown that discharge education can alleviate anxiety, improve self-efficacy, and decrease the severity of post-operative symptoms in cardiac and general surgery patients.[19] Web-based education programs and structured discharge plans have proven particularly effective, offering patients and caregivers the tools to better manage recovery and address potential complications early.[20]

Given the physical and emotional toll of mastectomy, targeted self-care education is crucial for elderly women. It helps them manage post-surgical recovery, reduces anxiety, and improves overall quality of life.[21] In conclusion, this study will address the significant gap in current healthcare practice by providing targeted self-care education for older women after mastectomy.

The hypothesis posits that discharge education will lead to improved self-care practices and reduced anxiety levels in this population, ultimately enhancing their post-operative recovery and quality of life.

Research hypothesis

Geriatric patients receiving a proposed discharge education plan will exhibit improved self-care practices and reduced anxiety levels post-mastectomy compared to those receiving routine care.

METHODS

This study employed a randomized clinical trial to evaluate the effect of a discharge education plan on self-care practices and anxiety levels among geriatric patients post-mastectomy.

It included 80 geriatric female patients undergoing modified radical mastectomy at the Oncology Center in Damanhur Governorate, Egypt, affiliated with the Ministry of Health and Population (MOHP). Participants were equally assigned to a study group (n = 40) and a control group (n = 40). The sample size was determined using G*Power statistical software, considering an expected large effect size (0.8), a power of 80%, and a significance level of $P < 0.05$. Based on these parameters, the minimum required sample size was 34 participants per group. To accommodate potential dropouts, the final sample size was set at 40 per group, totaling 80 participants.

Inclusion criteria ensured participants were aged 60 years or older, able to communicate effectively, had no prior upper limb injuries or surgeries, and had not received chemotherapy or radiotherapy before surgery. Eligible patients were also required to be available during the data collection period.

Exclusion criteria included a history of upper limb disorders, previous mastectomy, or ongoing cancer treatments (chemotherapy/radiotherapy). These criteria were applied to control for confounding variables that could influence outcomes, such as pre-existing conditions affecting post-surgical recovery or anxiety levels.

Participants were assigned to the study or control groups through a simple randomization process. Each eligible patient was sequentially numbered and allocated alternately to the study group (discharge education plan) and the control group (routine care).

Three tools were used for data collection.

Geriatric cancer patients' sociodemographic and clinical data structured interview schedule

This tool was developed by the researchers based on the relevant literature, consisting of 2 distinct components. The first component captured sociodemographic characteristics of female geriatric patients, including age, marital status, educational level, occupation before retirement, telephone number, family income, and place of residence. The second component focused on clinical parameters, encompassing the date of admission, family history of breast cancer, past and present medical history, medication received, practicing exercise, stage and duration of breast cancer, treatment, and body mass index.

Geriatric cancer patients' self-care practices: structured interview schedule

This tool was specifically developed by the researchers following a comprehensive review of the relevant literature on self-care practices for post-mastectomy patients.[22,23] References to key studies[16-18] were used to inform the content, structure, and focus of the interview schedule. The tool was designed to evaluate the self-care practices of geriatric cancer patients pre- and post-mastectomy, aimed at preventing early post-operative complications. These practices include arm exercise, arm care, dietary habits, wound care, breast self-examination, and anxiety management. The instrument employs a 5-point Likert scale in terms ranging from 1 (never) to 5 (frequently), with a total score categorized as unsatisfied (0–33.3), moderate (33.4–66.6), or satisfied (66.7–100).

This tool provides a holistic measure of self-care practices, tailored specifically to the challenges faced by geriatric cancer patients. It captures a comprehensive spectrum of activities that are critical for post-operative recovery and complication prevention. The development of the tool was grounded in evidence-based practices and expert consultations to ensure it reflected the unique needs of geriatric patients undergoing mastectomy. Content validation was conducted through a panel of experts in gerontological nursing, medical-surgical nursing, and community health nursing, who assessed the relevance and comprehensiveness of the items. Pilot testing was performed on a small sample of the target population to evaluate clarity and cultural appropriateness. Initial reliability testing demonstrated a Cronbach's alpha of 0.93, indicating good internal consistency.

Visual Analog Scale (VAS) for anxiety

This tool was originally developed by Cline *et al.*[24] and adapted into Arabic by El Sakhy.[25] It was used to measure the patient's state of anxiety. The scale is a single-question response used to assess anxiety quickly and adequately. It is especially useful when it is required to measure anxiety more than once. This scale measured anxiety on a 100-mm horizontal line. Participants indicated their anxiety level, scored from below 2 (not anxious) to 8–10 (extremely anxious). Validation tests confirmed reliability (r=0.814) and appropriateness for geriatric populations.

The Visual Analog Scale (VAS) was selected due to its pragmatic utility and sensitivity in longitudinal anxiety level assessments, a critical attribute in clinical settings necessitating repeated measurements. Its simplicity minimizes respondent burden, particularly advantageous for geriatric populations, while yielding precise and actionable data. To ascertain the psychometric properties of the VAS within the specific cultural and linguistic context of the target population, a comprehensive validation process was conducted. Construct validity was established through correlational analyses with established anxiety assessment instruments, namely the Generalized Anxiety Disorder-7 (GAD-7) and the State-Trait Anxiety Inventory (STAI). These analyses revealed a robust correlation between VAS scores and the aforementioned measures, confirming its efficacy in quantifying anxiety levels. Criterion validity was further evaluated by comparing VAS scores with the GAD-7, considered a gold-standard anxiety measurement tool, demonstrating congruence with established clinical assessments. Reliability was assessed via test-retest analysis, yielding a significant correlation coefficient (r=0.814), indicative of strong temporal stability. These findings collectively support the robustness and applicability of the VAS as a reliable instrument for anxiety assessment within geriatric populations.

The abovementioned tools were chosen for their ability to capture critical aspects of the study outcomes (i.e., self-care practices and anxiety levels), while being appropriate for the geriatric population. The structured interview schedules enabled consistent data collection, and the VAS provided a quick yet reliable measure of anxiety. Together, these instruments ensured a comprehensive evaluation of the discharge education plan's impact.

Data Collection Procedure

An official letter was issued by the College of Nursing, Alexandria University, to seek approval from relevant authorities, explaining the study's purpose and timeline.

Tools II (Self-Care Practices Interview Schedule) and III (Visual Analog Scale for Anxiety) were reviewed by 5 experts in gerontological, community, and medical-surgical nursing for content validity, and necessary modifications were implemented.

The Arabic version of Tool III was utilized to assess anxiety, and Tool II's reliability was confirmed with a high Cronbach's alpha of 0.93.

A pilot study was conducted on 8 geriatric patients undergoing mastectomy to evaluate the tools' clarity, feasibility, and applicability. The participants were excluded from the main study, and adjustments were made based on feedback.

A formal discharge education plan was created as a manual after reviewing the relevant literature. It included general and specific objectives, pre-operative instructions (e.g., breathing exercises), and post-operative care guidance (e.g., pain management, wound care, warning signs).

The booklet was written in Arabic, with detailed illustrations to ensure clarity and address literacy challenges among elderly patients.

Researchers reviewed medical records daily in the surgical unit to identify eligible patients. Four cases meeting the criteria were identified daily and were randomly divided into 2 equal groups: the study group, which received the discharge education plan, and the control group, which received routine care.

Implementation phase

The data collection process was structured into distinct phases to ensure systematic and comprehensive coverage:

Each participant was interviewed individually within 24 hours of admission to the surgical department. The interview was conducted in a private setting (the nursing staff room) to ensure confidentiality and avoid cross-contamination of information between study and control groups.

Baseline assessments included socio-demographic data collection, clinical history, and anxiety levels using the Visual Analog Scale for Anxiety (VAS). Contact information was collected to facilitate follow-up post-discharge.

The first session was conducted on the first day of admission, lasting approximately 45 minutes. This session focused on introducing the discharge education plan, including post-operative exercises (e.g., shoulder shrugs, arm lifts) and deep breathing techniques to manage anxiety and enhance recovery. These exercises were demonstrated using visual aids and re-demonstrated by patients for better understanding.

The second session was conducted during the evening shift of the surgery day, lasting about 30 minutes. This session reviewed previous instructions and emphasized immediate post-operative care, including arm positioning and recognizing warning signs.

The third session was held on the morning of the first post-surgery day. This session focused on wound care, infection prevention, and continuation of prescribed exercises.

Thirteen days of outpatient follow-ups were conducted to reinforce the education provided during the inpatient period. The patients attended three interviews per week for two weeks.

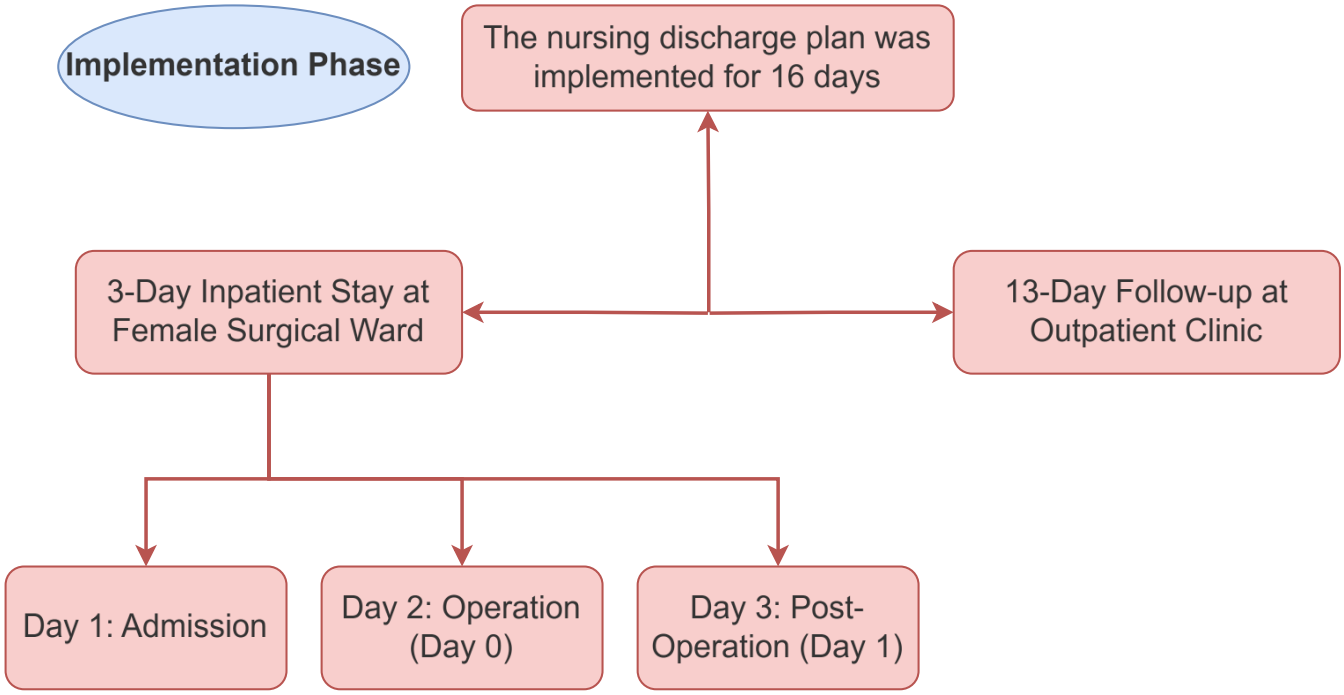

Figure 1. Phases of the nursing discharge plan implementation

These sessions emphasized hygiene, advanced exercises, monthly breast self-examinations, and adherence to follow-up appointments.

Fourteen days post-surgery, researchers re-evaluated the participants' self-care practices and anxiety levels using structured tools. The study group's adherence to self-care practices and anxiety improvement was compared with that of the control group.

The control group received routine hospital care without the additional structured education plan. Both groups were evaluated during the same follow-up periods for consistency.

Given the vulnerability of the geriatric population undergoing major surgery, care was taken to minimize potential risks. The study interventions (discharge education sessions) were non-invasive and designed to enhance participants' well-being. Emotional and psychological support was provided as part of the intervention to address anxiety and ensure patient comfort.

Potential ethical concerns, such as the risk of fatigue from interviews or anxiety related to discussions about post-surgical care, were mitigated by conducting sessions at times convenient for participants and maintaining a supportive, empathetic environment. By adhering to these ethical practices, the study ensured the safety, dignity, and rights of all participants.

Statistical analysis

Data were coded and analyzed using SPSS Statistics version 20.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize sociodemographic characteristics, clinical profiles, self-care practices, and anxiety levels.

Categorical data were compared between the study and control groups using the chi-square test. Independent *t* tests were utilized to compare mean scores of continuous variables between the groups post-intervention.

Statistical significance was set at $P<0.05$, with $P<0.01$ indicating high significance.

RESULTS

The sociodemographic profiles of the participants are assessed and compared between the study and control groups in Table 1.

The majority of the participants in both groups were aged 60 to 65 years (35% in the study group and 37.5% in the control group). Married participants constituted 42.5% of the study group compared to 62.5% of the control group. Illiteracy was observed in 32.5% of the study group and 17.5% of the control group. A higher proportion of the control group (62.5%) lived with family compared to the study group (42.5%). Urban dwellers comprised 55.0% of the control group and 27.5% of the study group. Only 10.0% of the study group were currently working, compared to 52.5 % of the control group. A majority in both groups reported sufficient monthly income (72.5% in the study group and 67.5% in the control group).

Table 1. Distribution of the Study and Control Groups According to Their Sociodemographic Characteristics

	Group types						
	Study (N = 40)		Control (N = 40)		Total		
Sociodemographic characteristics	n	(%)	n	%	n	%	Statistical test*
Age, y							
60 to <65	14	35.0	15	37.5	29	36.3	P = 0.72
65 to <70	10	25.0	8	20.0	18	22.5	
70 to <75	10	25.0	12	30.0	22	27.5	
≥75	6	15.0	5	12.5	11	13.7	
Marital status							
Single	1	2.5	1	2.5	2	2.5	P = 0.04
Married	17	42.5	25	62.5	42	52.5	
Divorced	4	10.0	3	7.5	7	8.8	
Widowed	18	45.0	11	27.5	29	36.2	
Level of education							
Illiterate / read and write	13	32.5	7	17.5	20	25.0	P = 0.04
Basic education							
Secondary/technical	1	2.5	21	52.5	22	27.5	
education	22	55.0	10	25.0	32	40.0	
University education	4	10.0	2	5.0	6	7.5	
Living arrangement							
Alone	2	5.0	10	25.0	12	15.0	P = 0.04
With family	17	42.5	25	62.5	42	52.5	
With children	21	52.5	5	12.5	26	32.5	
Place of residence							
Urban	11	27.5	22	55.0	33	41.2	P = 0.01
Rural	29	72.5	18	45.0	47	58.8	
Current work							
Working	4	10.0	21	52.5	25	31.2	
Not working	36	90.0	19	47.5	55	68.8	
Income sufficiency							
Sufficient	29	72.5	27	67.5	56	70.0	P = 0.67
Insufficient	11	27.5	13	32.5	24	30.0	

* Chi-square test

These sociodemographic factors are pertinent to understanding the baseline characteristics of the participants and the potential influence of individual differences on self-care practices and anxiety levels.

Table 2 presents the health profile and breast cancer history of the patients. Chronic comorbidities were prevalent in both groups, affecting 75.0% of the study group and 62.5% of the control group; however, this difference was not statistically significant (P=0.21). Among the reported comorbidities, diabetes mellitus was the most frequent, exhibiting a significantly higher prevalence in the control group (60.0%) compared to the study group (36.7%) (P=0.037). The prevalence of other chronic conditions, including heart disease, respiratory illness, osteoporosis, gout, and arthritis, did not differ significantly in the 2 groups.

Medication adherence rates were approximately similar in both the study (66.7%) and control (72.0%) groups (P=0.65). A family history of cancer was reported more frequently in the control group (22.5%) than in the study group (10.0%), although the difference was not statistically significant (P=0.12). Among the participants with a family history of cancer, the relationship to the affected relative (first- versus second-degree) did not differ significantly in the 2 groups (P=0.83).

Regarding symptom management behaviors, all the participants in both groups reported consulting a physician upon experiencing symptoms (100.0%; P=1.00). Other coping responses, such as prayer, acceptance, denial, and fear/anxiety, showed slight variations between the groups, but these differences were not statistically significant (P-values ranging from 0.09 to 0.58). Surgical duration was comparable between the study and control groups, with no significant difference observed (P=0.46).

Table 3 indicates significant differences for BMI (P<0.01) and regular exercising (P<0.01), which are important indicators of physical health disparities between the 2 groups. The categories for duration (P=0.33) and type (P=0.48) of Exercises showed no statistically significant difference.

Table 2. Health profile and breast cancer history of the patients

	Group type						
	Study (N = 40)		Control (N = 40)		Total		
Items	n	%	n	%	n	%	Statistical test*
Suffering from another chronic disease							
No	10	25.0	15	37.5	25	31.2	P = 0.21
Yes#	30	75.0	25	62.5	55	68.8	
Heart diseases	15	50.0	7	28.0	22	40.0	P = 0.048
Respiratory diseases	3	10.0	1	4.0	4	7.3	P = 0.30
Osteoporosis	2	6.7	1	4.0	3	5.5	P = 0.55
Gout	0	0.0	1	4.0	1	1.8	P = 0.31
Diabetes Mellitus	11	36.7	15	60.0	26	47.3	P = 0.037
Arthritis	3	10.0	1	4.0	4	7.3	P = 0.30
Compliance with medication							
Yes	20	66.7	18	72.0	38	69.1	P = 0.65
No	10	33.3	7	28.0	17	30.9	
Family History of cancer							
Yes	4	10.0	9	22.5	13	16.3	P = 0.12
No	36	90.0	31	77.5	67	83.7	
Affected family member	4		9		13		
First degree	2	50.0	5	55.6	7	53.8	P = 0.83
Second degree	2	50.0	4	44.4	6	46.2	
Duration of diagnosis (months)	40		40		80		
2 < 4	23	57.5	18	45.0	41	51.3	P = 0.04
4 < 6	13	32.5	10	25.0	23	28.8	
6 < 8	3	7.5	6	15.0	9	11.3	
≥8	1	2.5	6	15.0	7	8.8	
Manifestation#							
Change in breast shape/size	26	65.0	22	55.0	48	60.0	P = 0.09
Abnormal nipple discharge	8	20.0	5	12.5	13	16.3	
Change in breast texture	7	17.5	2	5.0	9	11.3	
Swelling of lymph nodes	7	17.5	5	12.5	12	15.0	
Pain	5	12.5	9	22.5	14	17.5	
Measures taken after manifestation#							
Consult physician	40	100.0	40	100.0	80	100.0	P = 1.00
Doing prayers	9	22.5	7	17.5	16	20.0	P = 0.58
Acceptance	1	2.5	3	7.5	4	5.0	P = 0.31
Denial	1	2.5	5	12.5	6	7.5	P = 0.09
Fear/anxiety	2	5.0	4	10.0	6	7.5	P = 0.39
Duration of surgery							
<2 hours	30	75.0	22	55.0	52	65.0	P = 0.46
≥2 hours	10	25.0	18	45.0	28	35.0	

* Chi-square test

Responses are NOT mutually exclusive.

Table 4 demonstrates the impact of the nursing intervention program on mean self-care practice scores among the studied geriatric patients. The discharge education plan significantly improved self-care practices in the study group compared to the control group. The total self-care practice score in the study group was significantly higher than that of the control group (P<0.001). All self-care practice domains showed significant improvements (P<0.001).

Table 5 presents the distribution of anxiety levels within the intervention and control groups at baseline and post-intervention. The intervention group demonstrated a statistically significant shift in anxiety categories following the intervention. Specifically, a marked reduction in severe and extreme anxiety was observed, with these categories disappearing entirely post-intervention (P<0.001 for both). Concurrently, the proportion of patients experiencing mild anxiety increased significantly from 2.5% to 80.0% (P<0.001). This indicates a substantial positive effect of the structured nursing intervention on reducing psychological distress and promoting emotional regulation among breast cancer patients

Table 3. Anthropometric Measurement and Practicing Exercises of the Patients

	Group type						
	Study (N=40)		Control (N=40)		Total (N=80)		
Items	n	%	n	%	n	%	Statistical test*
Body mass index							
Normal	10	25.0	21	52.5	31	38.7	P<0.001
Overweight	13	32.5	16	40.0	29	36.2	
Obese	16	40.0	2	5.0	18	22.5	
Regular exercising							
Yes	4	10.0	20	50.0	24	30.0	P<0.001
No	36	90.0	20	50.0	56	70.0	
Types of exercises	4		20		24		
Walking	3	75.0	17	85.0	20	83.3	P=0.48
Physical fitness	1	25.0	3	15.0	4	16.7	
Duration of exercises							
Daily	1	25.0	3	15.0	4	16.7	P=0.33
3 times/week	1	25.0	5	25.0	6	25.0	
2 times/week	2	50.0	12	60.0	14	58.3	

* Chi-square test

In contrast, the control group showed no statistically significant changes in most anxiety categories. The pre- and post-intervention differences in mild (P=0.50), moderate (P=1.00), and severe (P=0.22) anxiety levels were not significant. While a trend towards a reduction in extreme anxiety was noted (from 90.0% to 77.5%), this change was not statistically significant (P=0.06).

Table 4. Effect of the Nursing Intervention Program on Mean Self-Care Practice Scores Among the Studied Geriatric Patients

	Group types		
	Study (N=40)	Control (N=40)	
Items	Mean ± SD	Mean ± SD	Test of significance*
Pain management	32.15 ± 1.578	22.45 ± 1.947	t = 24.479*
Wound care	30.55 ± 1.467	23.50 ± 2.708	t = 14.478*
Prevention of wound infection	32.27 ± 1.432	20.90 ± 1.174	t = 38.834*
Managing fatigue	12.87 ± 1.017	9.68 ± 2.235	t = 8.216*
Managing nausea	17.30 ± 0.911	13.32 ± 3.308	t = 7.336*
Prevention of lymphedema	50.75 ± 2.145	34.75 ± 4.068	t = 22.004*
Follow-up	63.95 ± 3.616	51.15 ± 8.411	t = 8.842*
Anxiety management	18.67 ± 0.829	14.97 ± 3.919	t = 5.842*
Prevention of DVT	28.80 ± 1.224	21.98 ± 5.981	t = 7.065*
Proper nutrition	18.65 ± 2.070	13.83 ± 4.431	t = 6.233*
Skincare	19.20 ± 2.066	15.43 ± 4.408	t = 4.898*
Total self-care practices	353.9 ± 9.211	265.3 ± 36.99	t = 14.699*

* P<0.001; Student's *t* test. DVT, deep vein thrombosis.

Table 6 provides a basic comparison between anxiety levels (mild and moderate) and the total self-care practice scores. Participants with mild anxiety had a slightly higher mean self-care practice score (356.75 ± 7.402) compared to those with moderate anxiety (353.28 ± 9.586). The scores suggest that participants with lower anxiety levels demonstrated better adherence to self-care practices. However, the P-value of 0.270 indicates no statistically significant difference was found between the mild and moderate anxiety groups in terms of self-care practices.

DISCUSSION

Breast cancer remains a global health challenge, ranking as one of the most common malignancies affecting women and a leading cause of mortality worldwide. Its impact is especially pronounced among older populations, where age serves as a significant risk factor.[1] Women aged 60 to 69 years have a notably higher probability of developing breast cancer compared to younger demographics, with the risk escalating further among women aged 70 and above. These statistics highlight the importance of targeted interventions for this vulnerable group to address their unique post-treatment needs and improve quality of life.[26,27]

This study evaluated the effectiveness of a discharge education plan in improving self-care practices and reducing anxiety levels among elderly women post-mastectomy.

Table 5. Effect of the Nursing Intervention Program on the Patients' Anxiety Levels

	Group types				
	Study group (n=40)		Control group (n=40)		
Levels of anxiety	Before intervention N (%)	After intervention N (%)	Before intervention N (%)	After intervention N (%)	Test of significance*
Mild anxiety	1 (2.5%)	32 (80.0%)	0 (0.0%)	2 (5.0%)	P<0.001
Statistical test**	P<0.001		P=0.50		
Moderate anxiety	9 (22.5%)	8 (20.0%)	3 (7.5%)	2 (5.0%)	P=0.037
Statistical test**	P=1.00		P=1.00		
Severe anxiety	15 (37.5%)	0 (0.0%)	1 (2.5%)	5 (12.5%)	P=0.02
Statistical test**	P<0.001		P=0.22		
Extreme	15 (37.5%)	0 (0.0%)	36 (90.0%)	31 (77.5%)	P≤0.001
Statistical test**	P<0.001		P=0.06		

* Chi-square test
** McNemar's test

The results revealed significant improvements in the intervention group, suggesting that such structured educational interventions can play a pivotal role in enhancing both physical recovery and psychological well-being.

Table 6. Relationship between self-care practices and anxiety levels post-nursing intervention

	Total self-care practice score	Test of significance
Anxiety level	Mean ± SD	
Mild	356.75 ± 7.402	P=0.270
Moderate	353.28 ± 9.586	

The observed improvements in self-care practices align with findings from previous research, such as the study done by Cui *et al.*[28] that emphasized the importance of tailored educational interventions in enhancing adherence to post-operative care routines. In addition, our findings are in line with the results reported by Speyer *et al.*[29] that demonstrated substantial compliance with self-care regimens, including arm care and follow-ups, among patients who received focused education. Similarly, Gautam *et al.*[30] confirmed that post-mastectomy training programs led to good self-care practices, such as arm care and arm exercises, which were associated with better quality of life scores. These findings underscore the effectiveness of patient-centered approaches in bridging knowledge and encouraging proactive health behaviors.

However, the findings contrast with the results reported by Kilbreath *et al.*[31], who reported limited improvements in physical outcomes, such as upper limb strength, following educational programs. These discrepancies may be attributed to differences in participant demographics, with Kilbreath's study focusing on younger women who might have faced fewer physical recovery barriers compared to the elderly cohort in the current study. Additionally, the inclusion of psychological support in the discharge education plan might have contributed to better outcomes in the present study, as emotional well-being is a critical determinant of adherence and recovery.

The structured nature of the discharge education plan, incorporating visual aids, hands-on demonstrations, and iterative reinforcement, emerged as a key strength. These strategies effectively addressed barriers such as high illiteracy rates among the participants, ensuring the accessibility and practicality of self-care instructions. Moreover, the phased delivery of the intervention allowed for consistent reinforcement, fostering better knowledge retention and skill application. These findings resonate with the principles of Bandura's Social Cognitive Theory, which posits that guided mastery experiences and reinforcement enhance self-efficacy and behavior change. The inclusion of demonstration and re-demonstration of exercises during the education sessions likely enhanced patients' confidence in their ability to perform these tasks. Observing and practicing under guided supervision seem to have reinforced learning and bolstered self-efficacy, contributing to improved adherence to self-care practices.[32] By enabling patients to practice self-

care under professional supervision, the education plan likely boosted their confidence and ability to manage post-operative challenges.

The psychological benefits observed in the intervention group were notable, with significant reductions in anxiety levels post-intervention. These findings align with those reported by Sawant *et al.*[33], who demonstrated the role of pre-operative education in mitigating fear and enhancing coping mechanisms. The supportive patient-provider relationship established during the educational sessions likely contributed to this outcome, alleviating uncertainties and fostering a sense of empowerment. Additionally, the incorporation of relaxation and breathing exercises may have directly influenced anxiety reduction, as highlighted by Caruso *et al.*[34] in their work on psychosocial interventions for cancer patients.

Regarding the relationship between geriatric women's self-care practices and their anxiety levels following the implementation of the discharge plan, the present study found no significant correlation between self-care practices and anxiety levels (Table 5). However, it was observed that higher mean scores for self-care practices were more frequently associated with women experiencing mild anxiety. This finding is consistent with a Turkish study conducted by Erbay *et al.*[35], which demonstrated that relaxation exercises helped reduce anxiety levels and other side effects of chemotherapy in patients undergoing a radical mastectomy, particularly those receiving chemotherapy for the first time. Similarly, a study by Taso *et al.*[36] in Taiwan found no significant relationship between anxiety and yoga exercise programs in relation to fatigue among women with breast cancer.

Despite its notable contributions, the study has several limitations that must be addressed to enhance the robustness and applicability of its findings. One key limitation is the sample's focus on geriatric women, which restricts the generalizability of the results to other demographic groups, including younger women and individuals from diverse socio-economic backgrounds. Furthermore, the study did not fully control for potential confounding variables, such as variations in familial support and socio-economic disparities, which could have influenced both adherence to self-care practices and psychological outcomes. To build on these findings, future research should employ stratified analyses or multivariable models to account for these confounding factors, thereby providing a more nuanced and comprehensive understanding of the intervention's broader impact.

Clinically, the study highlights the critical role that discharge education plays in improving post-operative outcomes. However, to scale this intervention effectively, healthcare systems must prioritize the training of nursing staff in culturally sensitive and contextually appropriate educational delivery. This ensures that education is tailored to meet the specific needs of diverse patient populations. Additionally, the integration of digital tools, such as telehealth platforms and mobile applications, could improve accessibility, particularly for rural or underserved communities. By offering remote support, these digital solutions ensure continuity of care and help address gaps in access to in-person resources. Furthermore, the establishment of peer support programs and community-based initiatives could enhance the intervention's impact, promoting a collaborative environment conducive to recovery and self-management.

The broader implications of this research emphasize the importance of long-term evaluations of discharge education programs. While the study demonstrated short-term benefits in self-care and anxiety reduction, it remains crucial to examine the sustainability of these outcomes over time. Longitudinal studies are needed to explore the intervention's effects on key indicators such as quality of life, healthcare utilization, and overall survival. Expanding the scope of future research to include more diverse populations, such as men with breast cancer, patients undergoing different cancer treatments, or individuals recovering from various types of surgery, would strengthen the external validity of the findings and increase the adaptability of the intervention across different patient groups. Younger patients, in particular, may benefit from customized approaches that address their unique needs and recovery goals.

Looking forward, research should focus on several key areas: first, assessing the long-term sustainability of improved self-care practices and anxiety reduction over six months to a year; second, evaluating the cost-effectiveness of structured education plans, particularly in terms of their impact on reducing complications and hospital readmissions; and finally, exploring the integration of technology, such as telehealth and mobile applications, to deliver education and monitor adherence remotely. By addressing these areas, future studies can further refine and expand upon the findings of this research, leading to more effective and scalable interventions in post-operative care.

CONCLUSION

The results of the study showed that the discharge education plan significantly improved self-care practices and reduced anxiety levels in the intervention group compared to controls,

demonstrating its effectiveness in enhancing post-operative recovery and psychological well-being.

The results reinforce the value of tailored educational strategies in enhancing recovery and improving quality of life for breast cancer patients across various healthcare settings. They also highlight the importance of integrating structured discharge education into routine nursing practice. By equipping patients with the necessary knowledge and skills for effective post-operative care, this intervention not only contributes to better patient outcomes but also has the potential to reduce healthcare costs by preventing complications and readmissions.

To maximize the benefits of this intervention, it is crucial for nursing staff to be trained in delivering individualized education. This should include the use of visual aids and culturally appropriate materials to meet the diverse needs of patients. Furthermore, incorporating digital platforms for follow-up care and educational delivery could improve accessibility, particularly for patients in rural or resource-constrained settings. Ultimately, this approach holds the potential to significantly enhance the overall quality of care and patient satisfaction in post-operative settings.

DATA AVAILABILITY

Data are available from the corresponding author upon reasonable request. Confidentiality and security of data and materials were ensured through all stages of the study.

CONFLICT OF INTERESTS

The authors declare that they have no competing financial interests or personal relationships that could have appeared to influence the work reported in this research.

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ETHICAL CONSIDERATIONS

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the College of Nursing Research Ethics Committee at Damanhur University with approval reference number (50-e), dated [18-11-2021].

All participants were fully informed about the study's purpose, procedures, potential risks, and benefits. Written informed consent was obtained from each participant before inclusion. To accommodate participants with limited literacy, the consent form was explained verbally in simple, comprehensible terms, and participants were encouraged to ask questions before signing. Family members were also allowed to be present during the consent process for additional support.

Participants' data were anonymized and securely stored. Identifiable information was not shared or disclosed outside the research team. Participants were informed of their right to withdraw from the study at any stage without any penalty or impact on their medical care.

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