Mirror Therapy: Impact of Mobile Follow-up Enhancement Nursing Program on Health Status and Coping Strategies among Elderly Women with Mastectomy

Naglaa Mohammed Amein Ghanem[1], Shimaa Hassan Abd El-Fatah[2], Laila Awadin Ali Hassan[3], Hassanat Ramadan Abdel-Aziz [4],Zeinab shaban ali kareem[5], Lobna Eid Zaki Hassan[6]

Assistant professor, Community Health Nursing Department faculty of Nursing, Minia University
Assistant Professor, Geriatric Nursing, Faculty of Nursing, Sohag University, Egypt)
Assistant Professor, Community Health Nursing Department, Faculty of Nursing, Beni Suef University, Egypt
Assistant Professor, Gerontological Nursing, Faculty of Nursing, Zagazig University, Egypt
Lecturer of Women Health and Obstetric Nursing, Faculty of Nursing, Minia University, Egypt
Lecturer of Community Health Nursing - Faculty of Nursing- Zagazig University

Abstract

Introduction: Mastectomy negatively on health status, upper limb function, and coping strategies among elderly women, enhancement nursing program based on mirror therapy is an effective way to help elderly women restore their health status. **Aim of the study:** To appraise the impact of mobile follow-up enhancement nursing program on health status and coping strategies among elderly women with mastectomy based on mirror therapy. **Research design**: Quasi-experimental research design. **Research setting:** the study was performed at the oncology outpatient building, Zagazig University Hospital. **Sample**: Judgmental sample of 50 elderly women. **Tools**: collected data by four tools, (I): personal and health profile data interview questionnaire, **(II):** The Short Form 12 health survey (III) scale of disabilities of arm, shoulder, and hand (DASH) and (IV): Adaptive Coping Strategies Questionnaire**. Result:** 60.0 % of the studied elderly women aged between 60 to < 70 years old, less than two-fifths of them had secondary education, there was a statistically significant improvement in health status, DASH, and coping strategy level after mobile follow-up enhancement nursing program at post-program and follow up phases compared to pre-program phase. Moreover, level of education, onset surgery, and mirror therapy were statistically significant negative predictors of DASH level among studied elderly women. **Conclusion**: A mobile follow-up enhancement nursing program based on mirror therapy was an effective method for improving health status, upper limb disabilities & dysfunction, and coping strategies among elderly women with mastectomy. **Recommendation:** health centers-based support groups that include psychologists and consultants for women after mastectomy are needed to improve their health status and coping strategies.

Keywords: Elderly women, Coping strategies, Health status, Mastectomy, Mirror therapy, and Mobile Enhancement program.

Introduction:

Breast cancer (BC) is among the most prevalent cancers worldwide. In rich nations, 5-year survival rates range from 85% to 90%, while in developing nations, they range from 80% to 84%. Despite being the main treatment option for breast cancer at the moment, surgery still has drawbacks. A common and long-lasting side effect of mastectomy is shoulder dysfunction, which has a major negative influence on the health status of breast cancer survivors. It is described by a limited range of motion (ROM), shoulder pain and numbness, and weakened arm strength **(Yuan et al., 2024).**

A mastectomy is a major surgical procedure that frequently causes women to undergo considerable mental and physical changes. Women who have mastectomy may need patient care because of the psychological effects of the procedure, in addition to the troubles of accepting the alterations in their bodies and managing pain following surgery. They might find it difficult to face their scars and suffer from anxiety, despair, and low self-esteem, which could result in a poor coping strategy **(Amin, et al., 2024 & Barkar, et al., 2023).**

Mirror therapy (MT), a novel technique that highlights movements without causing limb pain. By reducing the motor cortex excitability, it eases limb movements and increases ROM. It helps patient visualize their affected limb in well state. Mirror therapy is a patient- centered approach that is also accessible, inexpensive,

and simple to use enabling patients to continue the practice at home. Evidence currently indicates that this strategy improves performance and lessens upper limb pain and false discomfort for upper limb pain (**Jalalmanesh, et al., 2024).**

Muscle strength and movement can be enhanced by mirror therapy. Although range of motion (ROM) exercises are performed to maintain or improve the degree of achievement of the ability to move joints normally and completely in order to increase muscle mass and muscle tone, providing ROM exercises at an early can increase muscle strength because it can stimulate the motor units involved **(Birinci, et al., 2022& Hekim, et al., 2023).**

Technology's integration into health care delivery has decreased hospitalization, decreased costs for health systems, and enabled the managing of health issues in the community. Any health practice that is facilitated by mobile technology, such as cell phones, patient monitoring devices, and other wireless gadgets, is referred to as mHealth. A more customized, preventative, accessible, and cost-effective approach to healthcare delivery is made feasible by the integration of mHealth into the system **(Zou, et al., 2023).**

An enhancement program is basic that includes early mobilization, pain management optimization, patient education and preparedness, and an emphasis on patient autonomy and rehabilitation. Healthcare professionals can provide patients with a greater sense of control over their recuperation by educating them about the surgery, potential results, and pain and discomfort management techniques. Additionally, by enhance early movement of limb and providing care for self-care, patients can recover their strength and self-confidence quicker and need fewer lengthy care time (**Pintault, et al., 2023**).

Enhancement nursing programs based on mirror therapy increase the elderly women help task-oriented training; it is an active technique to boost motor skills by the repetition of specific and functional tasks. It depends on personalized activities that mimic daily actions. Healthcare professionals plan precise training programs for each patient, considering their individual needs, motor deficiencies, and recovery goals. These programs highlight actions like the tasks the patient wants to achieve in their daily life. The efficiency of task-oriented training lies in its highlighting on functionality and applied motor skills in real-life situations. This program wishes not only to return motor function but also to improve the patient's health status and coping strategies (**Fernández-Solana, et al., 2024**).

Nurses should educate elderly women with mastectomy to follow self-care schedule instructions such as daily skin care, wearing gloves in activities to prevent skin breakdowns, avoiding injury in the affected side, stopping muscle strain, and encouraging lymph drainage. Nurses' skillfulness scans also ease patients to improve a diversity of coping strategies, thus bringing more sense of contentment to the women (**Amin, et al., 2024).**

Significance of the study:

Breast cancer is the most prevalent cancer in the globe, accounting for 24.2% of all cancer cases among women. It is the second most common cause of cancer-related deaths, with an anticipated 2.3 million new cases in 2020 according to the most recent World Health Organization statistics. The likelihood of getting BC rises with age; women over 50 are most likely to get it, and those 70 and older have the highest incidence. The American Cancer Society reports that 90% of them will survive for five years. 42% of all cancer cases in Egyptian females were BC, the most prevalent type, and most of these instances manifested at advanced age **(Salem, et al., 2024).**

One of the most obstacles after mastectomy is shoulder pain and disability. A recent report shows that 62.0% and 74.0% of BC fighters had some level of disability, or physical & mental health status after one year from surgery. These obstacles are highly connected, may negatively influence the physical and mental health status of breast cancer women, and may last more than 7 years after surgery. All musculoskeletal difficulties after mastectomy may cause complications in performing activities of daily living which after weakening the health status in those women **(Akbas, et al., 2021& Roustaee, et al., 2023).**

Several studies have shown the problems in health status and problems of

coping strategies after a mastectomy and recommended that "needed to implement and measure the effect of mastectomy education programs in improving physical and mental health conditions among elderly women with mastectomy" **(Amin, et al., 2024).**

Nurses' eyewitness the daily problems of mastectomy women from the time before diagnosis to the end of their management journey and always are concerned in discovery methods to release the difficulties from the extensive range of complications that mastectomy women struggle with. Researchers suggested that postsurgical mirror therapy using mobile follow-up can achieve good results because of its stress-free, applied, and economy nature. MT has benefits in several diseases, but there are few studies regarding the effectiveness of mirror therapy for mastectomy woman to improve health status and coping strategies. The goal of the study was to shed further light on how mobile follow-up enhancement nursing programs affect health status and coping strategies among elderly women with mastectomy based on mirror therapy.

Aim of the study:

This study aims to appraise the impact of mobile follow-up enhancement nursing programs on health status and coping strategies among elderly women with mastectomy based on mirror therapy.

Specific objectives:

- Assess health status and coping strategies among elderly women with mastectomy
- Planning enhancement nursing program according to priorities and needs of the elderly women.
- Evaluation of effect mobile follow-up enhancement nursing programs on health status and coping strategies among elderly women with mastectomy based on mirror therapy.

Research hypotheses: -

(H1): Mobile follow-up enhancement nursing program has a positive effect on health status, and coping strategies among elderly women with mastectomy based on mirror therapy.

(H2) Mobile follow-up enhancement nursing program will be revealed a lessening in disabilities of the arm, shoulder & hand, among elderly women with mastectomy based on mirror therapy.

(H0): Mobile follow-up enhancement nursing program does not have effect on health status, disabilities of the arm, shoulder & hand, and coping strategies among elderly women with mastectomy based on mirror therapy.

Methods:

Research design: A quasi-experimental research design was used to complete the current study.

Research setting: the study was performed at the oncology outpatient building at Zagazig University Hospital.

Study Subjects:

A purposive/ judgmental sample of 50 elderly women was used in the current study.

Based on data literature from **Roustaee, et al., (2023)** considering the level of significance of 5.0% and the power of the study of 80.0% the sample size can be based on the application software "Epi Info" version 7.2.2.6 with our Population size 490 according to Zagazig University Hospital statistical record during 2023 regarding elderly with breast cancer. Two side confidence level 99.99%, power 80.0%, Ratio unexposed: Exposed =.30, Outcome in unexposed group=9%, risk ratio= 7.68889, odds ratio= 22.717, the outcome of exposed group=69.2%, the sample size required for the study is 50.

Inclusion criteria:

- Elderly women aged 60 and more
- Diagnosis unilateral mastectomy.
- Complain from shoulder pain
- Being able to use mobile and its application alone or with other family member.
- Free from communication problems

Exclusion criteria:

- Deformity in another arm
- Breast reconstruction surgery
- History of shoulder surgery to the affected part

Tools of the study:

Four tools were used to collect the data according to the following:

Tool (I): personal and health profile data interview questionnaire. The researchers designed it following a thorough the literature **(Amin, et al., 2024, Atya, et al., 2022&**

Roustaee, et al., 2023) to gather the demographic and clinical data. It was obtained just once at the first interview. It is divided into two parts:

Part (I): personal data of the elderly: Such as (age, residence, marital status, level of education, living condition, occupation, and income).

Part (II): health profile; full history was taken from the woman including menstrual, and medical history).

- **Menstrual history**: it is composed of age of menarche, regularity, parity, contraceptive, and menopause.
- **Medical history:** it includes (previous disease, previous surgery, onset of diagnosis, family history of breast cancer, and type of treatment).

Tool (II): The Short Form 12 health survey (SF-12): it used for assess the mental and physical health status among elderly women. It was adopted by **Ebrahim, et al., (2021)** and composed of 12 questions including the physical component summary physical functioning, role physical, bodily pain, and general health and questions for mental components summary e.g. vitality, social functioning, role emotional, and mental health scoring system: a higher score indicates a better health state.

Tool (III) :Disabilities of the Arm, Shoulder, and Hand Scale (DASH): This tool utilized to evaluate a woman's arm, shoulder, and hand disabilities after mastectomy, adopted by **Mohamed, et al., (2017)**, it composes of 34 items and contains five parameters (physical, social, symptoms, psychological, and work). A **physical parameter** (21 items) scored from 1 to 5 (none difficult to unable) respectively. **Social parameters** (2 items); 22 scored 1 to 5 (not at all to extreme) respectively while 23 scored 1 to 5 (not limited at all to unable) respectively. Moreover, **symptoms parameters**: (6 items) 24 to 28 it's scored 1 to 5 (none to extreme) respectively, while, 29 it's scored 1 to 5 (no difficult to so much difficult) respectively. **The psychological parameter (**one item) scored from 1 to 5 (strongly disagree to strongly agree) respectively. Lastly; **the work parameter** (4 items) scored from 1 to 5 (no difficulty to unable) respectively. A higher total score indicated worse abilities; total score was categorized as follows: -

DASH level	Score
No dysfunction	< 33
Mild dysfunction	33-66
Moderate dysfunction	67-99
Severe	100-132
Unable.	>132

Tool (IV): Adaptive Coping Strategies Questionnaire: It was adopted from **Atya, et al., (2022)** to measure the adaptive coping styles among women with mastectomy. It involves 31 items, such as (a conscious way of living; positive attitudes; reappraisal; trust in medical help; God's help; and search for alternative help). All items were scored on a 3-point scale from (0, 1& 2) (Never, Sometimes & Often) respectively. A higher total score indicated better coping; total score was categorized as follows: -

Level	Score
low	<21
Moderate	21-40
High	>41

Validity of tools:

The tools were verified for content validity through a panel of seven experts from the faculty of Nursing, at Sohag, Minia & Zagazig University (Community health nursing, geriatric, and women health and obstetric nursing). They appraised the tools for face & content validations through ascertaining, relevance, clarity, understandability, and comprehensiveness. The tools were changed according to their notes and recommendations.

Reliability:

The tools were found to have a reliability coefficient was r= 0.893 and r= 0.96 for parts I and II from the second, third while the fourth tool ranged from r=0.70 to 0.900 by using Cronbach's alpha test.

A pilot study:

The pilot study was done on 5 of the elderly women according to inclusion criteria to assess the clarity of questions, feasibility, and time needed to complete the study tools. Elderly women in the pilot study were included in the study due to no modification required**.**

Ethical Considerations: -

• The research proposal was established by the Ethical Committee from the Faculty of Nursing, Zagazig University

• There is no threat to the elderly women further apply of the research.
• The study keeps common ethical codes in clinical research.
• written consent was acquired from elderly women with mastectomy who were ready to contribute to the study, after a clarification of the nature and purpose of the study. Participants were informed that their participation was voluntary, with anonymity and confidentiality assured through data coding.
• Elderly women were guaranteed that the data of this research would not be used again lacking agreement.

Fieldwork:

Written approval letter sent from dean of faculty of Nursing, Zagazig University to manager of oncology clinics of Zagazig university hospital to perform the study. After clarifying the aim of the research and the component of tools for each elderly woman at the beginning of data collection.

Fieldwork of Mobile Follow-up Enhancement Nursing Program based on mirror therapy conducted in four phases: -

1. Assessment phase:

In the beginning, the researcher visited the oncology building at Zagazig University Hospital to select elderly women according to the study's criteria. The researcher met the elderly women and their relatives and introduced herself; explained the study's aim to each woman and to gain their cooperation to contribute to the mobile follow-up enhancement nursing program. The researchers review present and previous, national, & international related literature to improve the study tools and construct the Mobile Follow-up Enhancement Nursing Program. Pre-test phase: the researcher collected data from elderly women by using all tools; the mobile numbers of all elderly women and their caregivers were taken to organize for the program's sessions. The meeting took about 30-45 minutes, depend on a level of thoughtful (this point takes about three months starting from February to April 2024).

2- Planning phase:

Face-to-face preparation stage: The researchers identified the important needs of each elderly woman during the assessment phase, set priorities, suggested exercise guidelines, evolved a behavior-specific action plan for behavioral changes, and defined objectives upon which the content of effect of mobile follow-up designed and made information about the program (educational booklet), a broad overview, and actual success outcomes.

3- Implementation phase:

The mobile follow-up enhancement nursing program was carried out 3 days a week at the oncology day clinic at the outpatient building. Before the applying of the program session, the researcher organized the environment to be quiet and relaxed for each woman, and have adequate lighting in a separate, quiet room. The studied elderly women were classified into 10 groups and each group consisted of 5 women. Implementation of the program lasts for 4 months, beginning from June to the end of September 2024.

The mobile enhancement program was divided into. The educational booklet was distributed to the studied elderly women. It is written in simple language and supported by photos and illustrations to help them and their caregivers understand the content simply and an individualized mobile follow-up is conducted one week after the preparatory phase.

The guide booklet was covered information regarding mastectomy, the methods of early diagnosis, prognosis, and prevention, the importance of breast self-examination, the methods of breast self-examination, and the lifestyle modifications required to prevent the recurrence of breast cancer and the coping strategies for mastectomy and how to improve women's coping and information regarding relaxation techniques and deep breathing exercises, the importance of stress reduction techniques like deep and slow breathing or mental imagery and visualization. In addition to a discussion of the free expression of feelings and the exchange of life experiences, the women who underwent mastectomy were given psychological support to help relieve stress and anxiety and improve their coping strategies.

After gaining consent in the first session and booklet, the last author gave the woman face-to-face instruction to put the provided mirror on a secure table that was crosswise situated along the body level between the two upper limbs. To make the affected hand

invisible, the unaffected hand was positioned in front of the mirror and the affected hand was positioned in the same manner behind it. The mirror measured 50 x 50 in both length and width. For three weeks, the program therapy involved 30 minutes a day, five days a week, at home. Only the hands that were unaffected were used for all exercises. For three weeks, the exercises were done at home for thirty minutes each day, five days a week, using just the unaffected hands. The exercises involved watching an afflicted limb for five minutes, followed by twenty-five minutes of shoulder motions in healthy hands and range-of-motion exercises on the surface using items (such as turning the hands and elbows simultaneously and rubbing a duster back and forth).

Elderly women were told to look in the mirror during exercise and imagine that the affected hand was moving. Lastly, the researcher asked women if they experienced any complications during the intervention to stop exercise immediately. At the conclusion of each day, phone calls were made to confirm that elderly women and their caregivers were carrying out the interventions as planned in a booklet at home

Mirror therapy program includes the following steps (Yuan, et al., 2021& Roustaee, 2023).

Practical	Description
Preparation	• Before the intervention, elderly women were required to take off any accessories (including watches, rings, bracelets, and hair bands) on both upper limbs. • Elderly women decide to stand or sit depending on themselves. In order to observe the full reflection of the unaffected limb in the mirror, elderly women are asked to lean forward slightly. • The reflecting side of the standing mirror faces the unaffected limb, while the affected limb was hidden behind it. The mirror was placed in front of the participants along the midsagittal plane.
Warm-up	• Elderly women are advised to relax, concentrate on their image in the mirror, picture the limb on the side that is impacted, and then, if they choose, move the unaffected limbs for two to three minutes. We will repeat this procedure three times.
Exercise:	Perform a free range of motion upper limb exercise
Hand exercise	▪ Stand relaxed ▪ Place a bouncy ball in her hand's palm. ▪ Position her arm so that her elbows are flexed and her shoulders are slightly stretched. ▪ Squeeze the ball as firmly as you can for two to three seconds, then spread your fingers. ▪ Rotate your wrists clockwise and anticlockwise while maintaining the same arm position as before. ▪ Repeat the exercise ten times.
Shoulder strength	▪ Stand relaxed ▪ Placed an arm by her sides ▪ Using her hand on the afflicted limb, alternately touch the ipsilateral and contralateral shoulders. ▪ Recover rotation and adduction ▪ Repeat the exercise ten times.
Arm exercises	• Place the arms side by side. • Perform backwards in a range of about 60° and raise the arms forward in a range of about 120°. • Maintain a standing posture with your elbows bent and your shoulders slightly outstretched. • Shoulder abduction and adduction • Rotate shoulders forward and backward; abduct and adduct shoulders within a range of around 120°. • Place the palm of the afflicted arm on the wall while standing in front of it. Then, move your finger up until you feel like you can no longer run up. Run down after a minute of continuing. • Repeat ten times.
Cooling down	▪ Relax and place your arms by your sides. ▪ As much as is comfortable, raise your arms forward and backward to an active range of motion. ▪ Maintain a comfortable posture, put your arms at shoulder height in abduction, flex your elbows to 90 degrees (the abducted position), and then spin your forearms up and down. ▪ Maintain a comfortable posture and place your arm by your sides. ▪ Shoulder abduction and adduction to the maximum amount of tolerable active range of motion ▪ Ten times, repeat the workout.

The evaluation phase:

This phase was concerned with determining the effect of applying a mobile follow-up enhancement nursing program on health status coping strategies among elderly women had mastectomy based on mirror therapy, from a comparison between pre-, post-test, and follow-up at one month and three months respectively by using second and third tools.

Statistical Analysis: -

SPSS 27 was used to score, tabulate, and analyze the data that had been gathered. The actual numbers and percentages were then displayed in tables and graphs. The data was analyzed using the independent sample t-test, the Fisher's exact test, and other appropriate statistical tests. A significance threshold of $p < 0.05$ and a high threshold of $p < 0.001$ were established.

Result:

Table (1): reveals that 60.0 % of the studied elderly women aged between 60 to less than 70 years old, less than 36.0 % of them had secondary education. Also, the majority of them 70.0 % were married, and more than half of them (56.0%) came from urban areas. Moreover, most of them (86.0%&84.0%) lived with their family and had insufficient income respectively.

Table (2): portrays that more than half (58.0 %) of the studied elderly women mentioned age of menarche was less than 15 years old, 66.0% of them had regular menses, 83.0% & 62.0 of them had parity, and age of menopause less than 45 years respectively. Also, nearly one-third of them (34.1%) used OCPS as the last contraceptive method.

Table (3): displays that the most frequent diseases among them were hypertension, diabetes, and arthritis (70.0, 66.0%& 54.0%) respectively, 44.0% of them had symptoms from 3 years, with less than two-thirds of them (60.0%) had mastectomy surgery from 11 to 20 months. Moreover, 76.0% of them did not have a family history of breast cancer. At last, all of the studied elderly women received chemotherapy.

Table (4): Exhibits that there was a statistically significant enhancement in both physical and mental health status after applying for a mobile follow-up enhancement nursing program at post-program and follow-up phases (<0.05*). Also, there was a statistically significant enhancement in total health status score after the mobile follow-up enhancement nursing program (<0.05*).

Table (5): Reveals that there was a statistically significant decreasing in DASH level after mirror therapy during post-program and follow-up phases (<0.05*).

Figure (1): Reveals that there was a statistically significant improvement in coping strategy level after the mobile follow-up enhancement nursing program at post-program and follow-up phases (<0.05*).

Table (6): demonstrates that level of education, onset surgery, and mirror therapy were statistically significant negative predictors of DASH level among studied elderly women (B=1.182, p= .05*, B=4.431, p=0.005* & B=0.635, P=0.000**) respectively, while age, arthritis and hypertension (B= -3.913, P= .001**, B= -1.068, P=.002**& B=-1.478, P=0.08) respectively, were statistically significant positive predictors.

Table (7): reveals that there was a highly statistically positive correlation found between a score of total health status and level of coping strategies with r= 0.723, while there was a highly statistically negative correlation found between a score of total health status, DASH level, and DASH and level coping strategies in which -0.463, & -0.512 p value= 0.000.

Results :

Table (1): distribution of personal data for elderly women with mastectomy (n=50).

Personal data	No (50)	%
Age:		
60-	30	60.0
70-	12	24.0
≥80	8	16.0
Level of education:		
Illiterate	14	28.0
Basic	10	20.0
Secondary	18	36.0
High education and more	8	16.0
Marital status:		
Married	35	70.0
Single	3	6.0
Divorce	2	4.0
Widow	10	20.0
Previous occupation:		
Working	17	34.0
Not working	33	66.0
Residence:		
Urban	28	56.0
Rural	22	44.0
Living condition:		
Alone	7	14.0
With family	43	86.0
Income:		
Sufficient	8	16.0
Insufficient	42	84.0

Table (2): distribution of obstetric history for elderly women with mastectomy (n=50).

Obstetric history	No (50)	%
Age of menarche (years):		
<15	29	58.0
>=15	21	42.0
Regularity of menses:		
Regular	33	66.0
Irregular	17	34.0
Parity (47)		
Yes	39	83.0
No	8	17.0
Age of menopause (years):		
<45	26	62.0
≥45	24	48.0
Type of the last contraceptive: (47):		
No	10	21.3
intrauterine device	8	17.0
Injection	13	27.6
Oral contraceptive pills	16	34.1

Table (3): distribution of the studied elderly women according to medical history (n=50).

Clinical data	No (50)	%
Previous chronic diseases&		
No	1	2.0
Hypertension	35	70.0
Diabetes	33	66.0
Chronic kidney diseases	12	24.0
Arthritis	27	54.0
Anemia	11	22.0
Gastrointestinal diseases	17	34.0
Hepatic diseases	10	20.0
Respiratory diseases	12	24.0
Other	4	8.0
Onset symptoms (year):		
Less than one year	5	10.0
1-	12	24.0
3-	22	44.0
5 and more	11	22.0
Onset of surgery (months):		
< 10	15	30.0
11-20	30	60.0
21-30	5	10.0
Family history of breast cancer:		
Yes	12	24.0
No	38	76.0
What is kinship degree (12):		
Grandmother	8	66.7
Mother	3	25.0
Aunt	1	8.3
Type of treatment&:		
Chemotherapy	50	100.0
Radiation therapy	12	24.0
Hormonal therapy	4	8.0

& More than one answer *other (cataract& pruritic)

Table (4): comparison between health status during program phase (no=50)

Item	Pre-program Mean ± SD	Post-program Mean ± SD	Follow up Mean ± SD	T-test	P value
Physical health	9.8±2.1	10.6±3.9	13.3±4.2	7.89	0.042*
Mental health	16.4±2.1	17.9±3.4	19.2± 2.2	6.210	0.03*
Total	26.2±2.1	28.5±3.7	32.5±4.5	8.954	0.02*

* Significant difference

Table (5): comparison between DASH levels during the program phase (no=50)

DASH level	Pre-program		Post-program		Follow up		P value
	N0	%	N0	%	N0	%	T-test
No dysfunction	0	0.0	0	0.0	0	0.0	
Mild dysfunction	12	24.0	15	30.0	19	28.0	
Moderate dysfunction	30	60.0	31	62.0	30	60.0	
Severe	8	16.0	4	8.0	1	2.0	
Unable	0	0.0	0	0.0	0	0.0	T=20.22
Mean +_SD	76.2+12.8		69.5+20.7		66.0+25		0.032*

* Significant difference

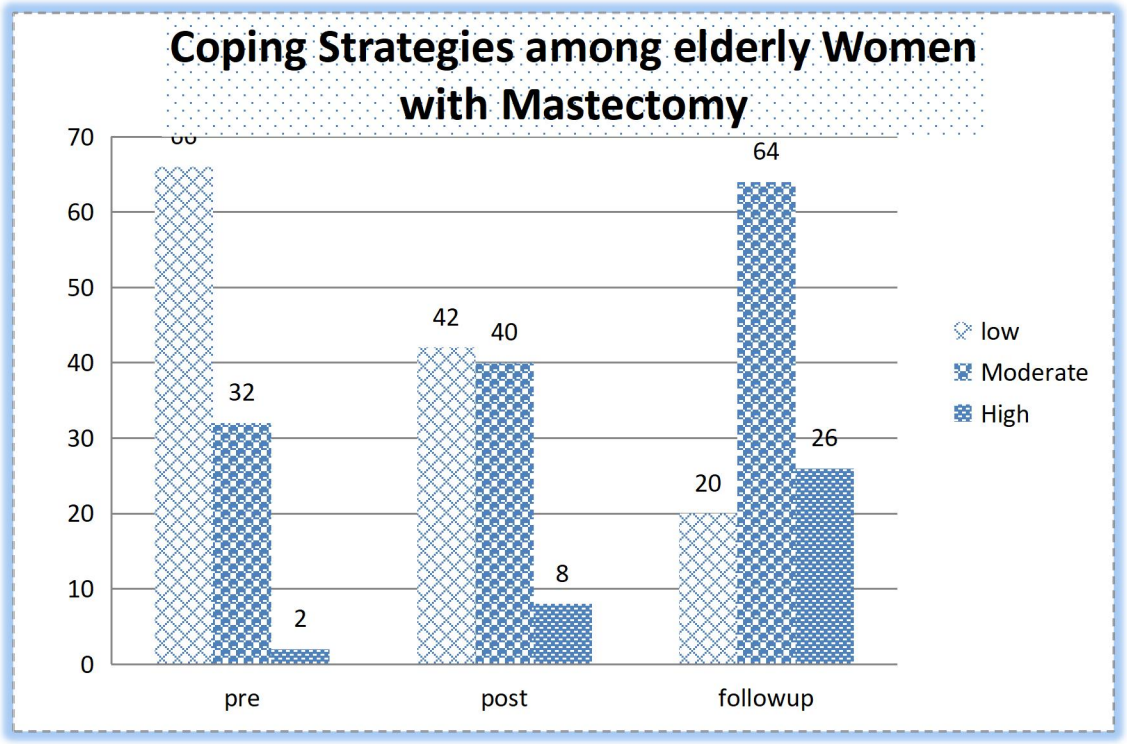

Figure (1): comparison between coping strategies among elderly women with mastectomy during the program phase (no=50):

Table (6): logistic regression for factors that expect DASH level in elderly women (no=50):

Model	Unstandardized Coefficients		Standardized Coefficients	T-test	Significant
	16.176	2.815		5.866	.000**
Age	-3.913	1.086	-.732	-3.601	.001**
Level Education	1.182	.278	.324	4.250	.005*
Marital status	.140	.072	.113	1.947	.055
Living condition	-4.713	.771	-.922	-6.110	.000**
Age of menopause	-.573	.405	-.167	-1.415	.161
Arthritis	-1.068	.329	-.190	3.251	.002**
Diabetes	-.321	.067	-.462	4.802	.000**
Hypertension	-1.478	0.834	-0.245	-1.719	0.08
Kidney disease	1.182	.278	.324	4.250	.000**
Onset of surgery	4.431	1.324	0.433	3.150	0.005*
Mirror therapy	0.635	0.273	0.321	2.254	0.000**

Table (7): correlation between total health status, DASH level, and coping strategies among elderly women with mastectomy during the program phase (n=50).
* Significant difference ** high Significant difference

Parameter		Health status	DASH level	Coping strategies
Health status	R P			
DASH level	R P	-0.463 0.000**		
Coping strategies	R P	0.723 0.002**	-0.512 0.001**	

Discussion:

The loss of a physical part that is essential to femininity and sexuality is something that women who have mastectomy must cope with. The woman's body image and worries about the situation can have a detrimental impact on her physical and mental well-being following a mastectomy and the treatment procedure. Daily life may be dominated by the woman's obsession with her body, her family, the recurrence or metastasis, and the views of her partners (**Abo-Ali, et al., 2024**). Therefore, this study aimed to appraise the impact of mobile follow-up enhancement nursing programs on health status and coping strategies among elderly women with mastectomy by using mirror therapy.

Concerning age, the current study findings revealed that less than two-thirds of the studied elderly women ranged between 60 to less than 70 years old. This result may be due to a lack of routine screening in this age group combined with reduced breast self-examination awareness, but women with breast cancer 70 years and above are associated with a high mortality rate. This finding is confirmed by a study carried out in Sohag by **Atta, et al., (2022)** who revealed that more than three-quarters of the studied elderly women had ages ranging between 60 to 70 years old. On other the hand, this finding is in disagreement with a study by **Mohammed, et al., (2024)** who displayed that less than one-quarter of the studied women had mastectomy aged less than 70 years.

Regarding studying elderly women's level of education, the present study showed that less than two-fifths of them had secondary education. This result is in harmony with previous research carried out by **Usman, (2022)** in Lahore, who stated that about one-third of the studied women with breast cancer had secondary education. On the other hand, this finding is in disagreement with a study by **Atta, et al., (2022)** who showed that the highest percentage of the studied women did not read and write. The difference between studies may be due to different residences in rural areas in which people as, most people didn't care for the educational level of their females, especially in past times.

Concerning residence, the result of the current study demonstrated that more than half of the studied elderly women came from urban areas. This finding is in congruent with a study by **LeBlanc, et al., (2022)** who stated that more than half of the studied sample came from urban areas.

Concerning the last contraceptive, the result of the recent study demonstrated that most of the studied elderly women used contraceptives and more than one-third of them used oral contraceptive pills as a contraceptive method. This finding may be due to oral contraceptive pills can disrupt normal hormonal levels of estrogen in the body resulting in normal cell changes to be abnormal and increasing activation of cancer occurrence among women, especially breast cancer. This result is matched with a study by **Hidayati, et al., (2024)** who found that breast cancer was increased with the use of hormonal contraceptives especially oral contraceptive pills. On the other hand, this finding is in disagreement with a study by **Phillips, et al., (2024)** who found no significant relation between breast cancer and oral contraceptives.

Regarding co-morbidity, the result of the present study exhibited that the majority of the studied elderly women with mastectomy had co-morbidities. This finding may be due to co-morbidity associated with medication intake and side effects of the medications increasing mastectomy rates. This finding is matched with a study done in England published by **Morgan, et al., (2020)** who found that increasing co-morbidity among the studied sample was associated with a high rate of mastectomy.

Regarding the family history of breast cancer, the present study demonstrated that most of the studied elderly women did not have a family history of breast cancer. This finding may be due to in the past most females suffered breast cancer deaths without knowing the accurate causes and poor awareness regarding screening and checkups. This result is in the same line with a study by **Abo-Ali, et al, (2024)** who reported that the majority of the studied sample had a negative family history of breast cancer. On other the hand, this finding is contraindicated with **Hashem, et al., (2020)** who revealed that most of the studied sample had a family history of breast cancer. The difference between studies may be due to different sample criteria.

According to physical health, the result of the present study showed a significant marked improvement in total mean score in physical health at the post and follow-up phase after applying the enhancement program compared with the preprogram phase. This finding may be due to the mobile follow-up enhancement nursing program being scientific and systematic adapting to the needs of each elderly woman according to her needs, continuously adjusting plans, and achieving better results. This finding is consistent with a previous study done in China published by **Wei, et al., (2024)** who confirmed that a nursing intervention program had a significant effect on improving physical function among studied elderly women with mastectomy after applying the program.

Regarding mental health among the studied elderly women during the phase's implementation program, the present study displayed a significant marked improvement in elderly women's mental health in the post-program and follow-up phases compared with the preprogram phase. This result may be due to most elderly women with mastectomy having bad psychological feelings, fearing death and complications from treatment. The enhancement intervention program which was properly prepared in simple Arabic language and followed up frequently by mobile had a great effect on coping with mastectomy and improving mental health among studied elderly women. Also, elderly women's desire to improve their mental health reflected the positive effect of mobile follow-up enhancement nursing programs. This finding is approved with a study in Cairo by **Nabawy, et al., (2024)** who displayed a significant improvement in mental health conditions after applying a nursing intervention program.

The result of the present study indicated that there was a statistically significant decreasing in DASH level after mirror therapy during post-program and follow-up phases. This finding may be due to mirror therapy giving back the comparison between sensory output and motor output in elderly women with unilateral pain on hand, as well as the involvement of multisensory, visuo-proprioceptive integration which help elderly women to follow range of motion and improve shoulder condition. Moreover, the commitment of elderly women and researchers to the exercise plan and enough time given to the elderly women to practice the exercise and continuous remote (home) follow-up during the period of the program was done by telephone. This finding is consistent with previous studies published by **Louw, et al., (2017), Başkaya, et al., (2018), Roustaee S et al., (2023) & Yuan, et al., (2024)** who stated that mirror therapy had a significant effect on the improvement of shoulder disability among women with breast cancer. This finding approved the research hypothesis (2) " Mobile follow-up enhancement nursing program will be revealed a lessening in disabilities of the arm, shoulder & hand among elderly women with mastectomy based on mirror therapy "

Concerning coping strategies, the result of the present study indicated that there was a statistically significant improvement in coping strategy levels after the mobile follow-up enhancement nursing program at the post-

program and follow-up phases. These findings may be because the majority of elderly women with mastectomy, and chemotherapy have various psychological issues, such as fatigue, physical side effects from chemotherapy, and fear of dying as a result of their weakness. They also require psychosocial counseling. Therefore, coping strategy levels improved after the mobile follow-up enhancement nursing program was provided to the study sample. This result is in the same line with **Atye, et al., (2024)** who presented an improvement in total coping strategies level after applying nursing program. This finding supported research hypothesis " Mobile follow-up enhancement nursing program has a positive effect on health status, and coping strategies among elderly women with mastectomy based on mirror therapy".

Conversely, this finding is in disagreement with a study published by **Ośmiałowska, et al., (2021)** who showed that there was an improvement in coping strategy levels after the nursing program post-program but no significant effect. This difference may be due to differences studied sample from age, duration of diagnosis, and stage of breast cancer.

The present study showed that level of education, onset of surgery, and mirror therapy were statistically significant negative predictors of DASH level. This finding may be due to more exercise performance focus on the individualized condition of each studied woman with supervision led to improve the function of the hand, moreover, the educated patients have an awareness of the importance of health and follow instructions. This result is in accordance with a study by **Soliman, et al., (2018)** who displayed that educational program had a significant effect on reducing the level of disability.

The present research results revealed that age, arthritis, and hypertension were statistically significant positive predictors of DASH level. This can be the result of typical aging-related physiological changes that impair bodily function. In addition, older women discourage exercise. Younger patients may have fewer coping mechanisms and experience more psychological shock, cancer-related sadness, anxiety, and stress, which could lead to age-related disparities in social functioning. This result is in line with a study by Al-**Karni, et al., (2024**) which was conducted in Saudi Arabia, and revealed that age was statistically significant positive predictors of DASH level.

The present study displayed that there was a highly statistically positive correlation found between a score of total health status and level of coping strategies. This finding may be due to coping strategies depend on awareness of the women from how deal with health condition through enhancement nursing program who provide variety different coping strategies to cope with health condition. This outcome is confirmed with study by **Stojadinović, et al., (2024)** who founded that there was statistically positive correlation between a health condition and level of coping strategies.

The result of current study illustrated that there was a highly statistically negative correlation found between a score of total health status, DASH level. This result is matched with study by **Che Bakri, et al., (2021)** who revealed that there was a statistically negative correlation found between a score of quality of life and DASH level.

Conclusion:

Mobile follow-up enhancement nursing program based on mirror therapy is an effective method for improving health status, and coping strategies and reducing limb disabilities & dysfunction among elderly women with mastectomy.

Recommendation:

- Health centers-based support groups that include psychologists and consultants for women after mastectomy are needed to improve their health status and coping strategies.
- Training nurses in the oncology department and outpatients to apply mobile follow-up enhancement nursing programs based on mirror therapy for women with mastectomy.

Ethics approval:

Ethical approval was obtained from the Ethics Committee of the Faculty of Nursing, Zagazig University (Approval no. 1, 2024). A legally appointed representative or representatives provided written informed consent for the publication of anonymised data about older women in this article.

Acknowledgment:

The researchers would like to express their thankfulness and admiration to elderly women, and their relatives who shared in the study, moreover, everyone helped with this study.

Funding: -

This research did not obtain any funding.

Conflict of interest:

The researchers affirm no conflict of interest

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