Home Health Care Intervention for Patients with Bariatric Surgery regarding their Lifestyle Pattern

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Abstract

Background: Bariatric surgery is currently the most successful weight loss intervention for the treatment of obesity, but its long-term success depends on adopting healthy lifestyle pattern. **Aim of the study:** Was to evaluate home health care intervention for patients with bariatric surgery regarding their lifestyle pattern. **Research design:** A quasi-experimental research design was used in carrying out this study. **Setting:** This study was conducted at Surgical Outpatient Clinic affliated to Benha University Hospital and followed by home visits. **Sample:** Purposive sample of ٧٩ patients was used to conduct this study. **Tools:** Four tools were used to collect the data in this study. **Tool I:** A structured interviewing questionnaire that included; socio-demographic characteristics, past history, anthropometric measurements of the patients with bariatric surgery, and knowledge of the patients regarding obesity and bariatric surgery. **Tool II:** Lifestyle pattern of the patients with bariatric surgery. **Tool III:** Attitude of the patients regarding bariatric surgery. **Tool IV:** Observational checklist of home environment of patients with bariatric surgery. **Results:** ١٥.٢٪ of the studied patients had good total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which increased to ٧٢.٢٪ & ٦٥.٨٪ post-intervention and at follow-up phase respectively. ٣٠.٤٪ of the studied patients had healthy total lifestyle pattern level regarding bariatric surgery pre-home health care intervention which increased to ٨١٪ & ٧٣.٤٪ post-intervention and at follow-up phase respectively. ٢٥.٣٪ of the studied patients had positive total attitude level regarding bariatric surgery pre-home health care intervention which increased to ٧٧.٢٪ & ٦٨.٤٪ post-intervention and at follow-up phase respectively. **Conclusion:** Home health care intervention had a positive effect on improvement of the knowledge, lifestyle pattern, and attitude of patients with bariatric surgery. There were highly statistically positive correlation between the studied patients' total knowledge, total lifestyle pattern, and total attitude pre and post-home health care intervention and at follow-up phase (P<٠.٠٠١). **Recommendations:** Continuous educational program for the patients with bariatric surgery recommended to identify the physiological and psychological conditions of the patients post-bariatric surgery to achieve appropriate outcomes for a long time.

Keywords: Bariatric surgery, Home health care intervention, Lifestyle pattern, Patients.

Introduction

Bariatric Surgery (BS) is considered the cornerstone in the management of severe and complicated obesity particularly for the patients who have not achieved significant or sustainable excessive weight loss despite comprehensive non-surgical approaches that including dietary, behavioral, and pharmacological interventions. Bariatric surgery is an umbrella term for a variety of surgical procedures including sleeve gastrectomy, adjustable gastric banding, vertical banded gastroplasty, roux-en-Y gastric bypass, and biliopancreatic diversion with or without duodenal switch. The benefits of bariatric surgery not only facilitate significant weight loss but also improve or resolve obesity-related comorbidities like type ٢ diabetes, hypertension, and dyslipidemia. Furthermore, BS is associated with improved survival rates and fostered well-being for the patients that

solidifying its role as a transformative treatment option for severe obesity **(Reytor-González et al., ٢٠٢٥).**

Bariatric surgery is the gold standard treatment for morbid obesity and related health problems that reducing the risk of death from obesity-related complications by ٩٢٪ for diabetes, ٦٠٪ for cancer, and ٥٢٪ for coronary heart disease compared to the traditional treatments. The incidence of BS has plateaued at approximately ٨٠٠,٠٠٠ annual surgical procedures worldwide which recommended for the patients with a Body Mass Index (BMI) ≥ ٤٠kg/m^{٢} with or without the co-existing health comorbidities (class III obesity), the patients with a BMI= ٣٥-٣٩.٩kg/m^{٢} with associated comorbidities (class II obesity), or patients with a BMI= ٣٠-٣٤.٩kg/m^{٢} (class I obesity) with the presence of metabolic diseases associated with obesity **(Peterli et al., ٢٠٢٤; Khan, ٢٠٢٥).**

The mechanism or function of the bariatric surgery depends in different ways, whether by reducing the capacity or size of stomach and increasing early satiation, limiting the capability of the body to absorb calories, or having a combination of both mechanisms. Bariatric surgery has advantages as improved glycemic control, reduced morbidity and mortality as well as reduced cancer risk that resulting in an increase in life expectancy of an average ٦.١ years compared with the conventional care for obesity, however, some patients experience serious adverse effects of the bariatric surgery such as nutrient deficiencies, dumping syndrome, strictures or bowel obstructions, gallstones, weight regain, in addition to psychological challenges which leading to a reduced the patient's quality of life, so all patients with bariatric surgery need to be evaluated by a multidisciplinary health team with surgical, medical, psychiatric, physiological, and nutritional expertise to address the post-operative complications after bariatric surgery **(Bjerkan, ٢٠٢٤).**

Lifestyle pattern is a cornerstone to optimize the post-operative outcomes of the bariatric surgery. Lifestyle pattern is distinguished as a dynamic interaction among factors that can help maintain or improve the bariatric surgery patients' health and well-being. Lifestyle modification behavior plays an essential role in the success of bariatric surgery which can positively encourage the post-operative changes in a patient's life. The patients undergoing bariatric surgery are required to adhere and commit to healthy lifestyle practices after the surgery that can include; following healthy eating and drinking behaviors, exercising regularly which is considered an essential component of the lifestyle pattern intervention, taking the prescribed medications/supplements daily, stopping smoking, managing stress, and attending the follow-up medical appointments for regular monitoring the patient's progression after bariatric surgery **(Kuipers et al., ٢٠٢٥).**

Bariatric surgery remains the most effective treatment to maintain weight loss and improve the associated comorbidities and mortality, however most BS patients suffer or experience suboptimal long-term weight changes including weight regain which threatens the benefits initially achieved and gained from BS if the bariatric surgery patients don't comply with the recommended guidelines regarding their lifestyle pattern post-operatively. Consequently, several behavioral interventions targeting standard lifestyle modification skills are recommended as the first step to achieve or maintain weight loss and treat obesity-related comorbidities in patients with severe morbid obesity leading to lower risk of postoperative complications, and higher satisfaction with the bariatric surgical outcomes **(Taha & Ali, ٢٠٢٢).**

Home health care intervention is a structured and multidisciplinary approach which has revolutionized post-operative care in bariatric surgical procedures by the implementation of multimodal strategies to optimize patient outcomes and reduce complications which ensuring optimal recovery and long-term success for patients with bariatric surgery. The benefit of home health care intervention is to ensure personalized care in the patient's own home setting which can aid in a smoother recovery process after bariatric surgery. Home health care approach encompasses rehabilitation, a comprehensive strategy for pain management and the prevention of post-operative adverse events following the bariatric surgical procedures. Also this comprehensive approach encompasses nutritional management plan to quantify the bariatric patients' compliance and adherence to post-surgery dietary and lifestyle pattern, and ongoing monitoring for assessing the bariatric patients' physical and psychological health post-surgery **(Rudiman & Hanafi, ٢٠٢٤; Javed et al., ٢٠٢٥).**

Community Health Nurses (CHNs) are considered essential members of the multidisciplinary team which play a crucial role in supporting patients with bariatric surgery. CHNs provide critical, all-encompassing care for the patients with bariatric surgery which addressing the diverse needs across the continuum of care. CHNs can also provide education and counseling to patients before and after bariatric surgery that helping patients understand the surgical procedure, potential adverse events, and necessary lifestyle changes that essential after the bariatric surgery to prevent post-operative complications. CHNs play a transformative role in helping the patients with bariatric surgical procedures achieve long-term health, sustained recovery, and an improved quality of life by enhancing understanding of post-surgery instructions. CHNs offer vital emotional and psychological support to patients which help foster emotional resilience and navigate body image changes leading to promoting psychological well-being after bariatric surgery **(Barbaro et al., ٢٠٢٣; Dogan & Arslan, ٢٠٢٤).**

Significance of the study:

Bariatric surgery is presently the most efficacious option for morbid obesity when juxtaposed or compared with non-surgical methods, owing to its potential to produce enduring weight loss, attenuate obesity-related comorbidities, and enhance quality of life for the morbidly obese patients. The incidence of bariatric surgery is increasing widely in Egypt now as a method of treating morbid obesity because ٢٨,٣١٩ patients had performed bariatric surgeries with women of reproductive age comprising ٨٠٪ of those patients. Bariatric surgery has markedly escalated with sleeve gastrectomy consistently ranking as the most prevalent surgical interventions which accounting for approximately ٨٠-٨٥٪ of all bariatric surgeries due to its safety, efficacy, and technical simplicity **(Abokhozima et al., ٢٠٢٤).** So that it is very important to design and implement home health care intervention for patients with bariatric surgery regarding their lifestyle pattern.

Aim of the study

The aim of this study was to evaluate home health care intervention for patients with bariatric surgery regarding their lifestyle pattern.

Research hypothesis

Home health care intervention will improve the knowledge, lifestyle pattern, and attitude of patients with bariatric surgery.

Subject and Method

Research design:

A quasi-experimental (pre-post test) research design was used in carrying out this study.

Study setting:

This study was conducted at Surgical Outpatient Clinic affliated to Benha University Hospital that considers the main Governmental Hospital in Qalyubia Governorate, the researcher chose this setting because it has a large number of patients attending for management and follow-up after bariatric surgery, and followed by home visits to conduct the study.

Sampling:

Purposive sample of ٧٩ patients was used to conduct this study in the previously mentioned settings, according to the following criteria:

-Patients aged from ٢٠ to ٥٠ years old.

-Patients free from chronic medical disorders.

-Patients accepted to participate in the study.

Tools of data collection:-

Four tools were used to collect the data in this study

Tool I:- A structured interviewing questionnaire: It was developed by the researcher and revised by supervisor staff, based on reviewing related literatures and it was written in a simple clear Arabic language. It consisted of four parts to assess the following:

Part I: It was concerned with socio-demographic characteristics of the studied patients with bariatric surgery which included ٧ closed ended questions.

Part II: It was concerned with past history of the patients with bariatric surgery:

(A): Past medical history which included ٨ questions.

(B): Past surgical history that included ٧ questions.

Part III: It was concerned with anthropometric measurements of the studied patients with bariatric surgery which were taken by the researcher, and included ٣ items.

Part IV: It was concerned with knowledge of the studied patients:

(A): Knowledge regarding obesity which included ١١ questions.

(B): Knowledge regarding bariatric surgery which included ١٠ questions.

Scoring system:

Scoring system is graded according to the items of questionnaire. The scoring system for the studied patients' knowledge regarding obesity and bariatric surgery was calculated as follows (٢) scores for complete correct answer, (١) score for incomplete correct answer and (٠) for don't know. For each area of knowledge, the score of the questions was summed-up and the total divided by the number of the questions, which converted into a percent score. The total knowledge scores were calculated and ranged from (٠-٤٢) which further categorized:

-**Good**→ if the total score of knowledge was >٧٥٪ (>٣٢ point).

-**Average**→ if the total score equals ٥٠-٧٥٪ (٢١-٣٢ point).

-**Poor**→ if the total score was <٥٠٪ (<٢١ point).

Tool II:- Lifestyle pattern of the studied patients with bariatric surgery adapted from **(Aboulkhair et al., ٢٠٢٢),** and was modified by the researcher. It was divided into ٧ categories; wound care, nutritional practices, physical activity and exercise, sleep and rest, stress management, weight check after bariatric surgery, and follow-up and treatment. These categories consisted of ٦٠ items.

Scoring system:

Scoring system is graded according to the items of questionnaire. The scoring system for the studied patients' lifestyle pattern was calculated as (١) score for done and (٠) for not done. For each area of lifestyle pattern, the score of the questions was summed-up and the total divided by the number of the questions, which converted into a percent score. The total lifestyle pattern scores were calculated and ranged from (٠-٦٠) which further categorized:

-**Healthy**→ if the total score of lifestyle pattern was >٨٠% (>٤٨ point).

-**Unhealthy**→ if the score was ≤٨٠٪ (≤٤٨ point).

Tool III:- Attitude of the studied patients regarding bariatric surgery; using likert scale adapted from **(Albogami et al., ٢٠٢١),** and was modified by the researcher. It included ٢٥ items.

Scoring system:

Scoring system is graded according to the items of questionnaire. The scoring system for the patients' attitude regarding bariatric surgery was calculated as (٢) scores for agree, (١) score for neutral and (٠) for disagree. For each area of attitude, the score of the questions was summed-up and the total divided by the number of the questions, which converted into a percent score. The total attitude scores were calculated and ranged from (٠-٥٠) which further categorized:

-**Positive**→ if the total score of attitude was >٦٠% (>٣٠ point).

-**Negative**→ if the score was ≤٦٠٪ (≤٣٠ point).

Tool IV:- Observational checklist of home environment of the studied patients with bariatric surgery adapted from **(Coyle et al., ٢٠١٨),** and was modified by the researcher. It was divided into ٦ categories; home furniture, home supported equipment, home ventilation, home lighting, kitchen, and bathroom. These categories consisted of ٣٢ items.

Scoring system:

Scoring system is graded according to the items of questionnaire. The scoring system for the patients' home environment was calculated as (١) score for present (٠) for not present. For each area of described home environment, the score of the questions was summed-up and the total divided by the number of the questions, which converted into a percent score. The total home environment scores were calculated and ranged from (٠-٣٢) which further categorized:

-**Sanitary**→ when the total score of home environment was >٦٠٪ (>١٩ point).

-**Unsanitary**→ when the total score of home environment was ≤٦٠٪ (≤١٩ point).

Content validity of the tool:

The tools validity was done by five members Faculty's Staff Nursing-Benha University Experts from the Community Health Nursing Specialties who reviewed the tools for clarity, relevance, comprehensiveness, applicability and easiness for implementation and according to their opinion minor modifications were carried out.

Reliability of the tool:

Reliability of the tool was applied by the researcher for testing the internal consistency of the tool, by administration of the same tools to the same subjects under similar condition on one or more occasion. Answers from repeated testing were compared (test-re-test reliability). The reliability was done by Cronbach's Alpha coefficient test that developed by Lee Cronbach in ١٩٥١which revealed that each of the three tools consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool. The internal consistency of the knowledge was ٠.٩١, while lifestyle pattern were ٠.٩٤, and attitude was ٠.٨٩.

Ethical considerations:

Written approval consent from the Scientific Research Ethical Committee, Faculty of Nursing, Benha University was obtained. Also approval and informed written consent has been obtained from all studied patients before conducting the interview and given them a brief orientation to the purpose of the study. Patients were also reassured that all information gathered would be confidentially and used only for the purpose of the study. No names were required on the forms to ensure anonymity and confidentiality. The patients had right to withdraw from the study at any time without giving any reasons. Ethics, values, beliefs and

culture were respected. The data collected were stored in confidential manner.

Pilot study:

A pilot study was carried out to ascertain the clarity and applicability of the study tools representing ١٠٪ of total study subjects. The pilot study was conducted on (٨) patients. The pilot study was aimed to test the content, clarity, applicability and simplicity of the tool using the interviewing questionnaire and the observational checklist as a pre-test sheet. The estimation of the time needed to fill the questionnaire consumed about ٣٠-٤٥ minutes. No modifications were done, so the pilot study sample was included in the study main subjects.

Home health care intervention

Home health care intervention development included four phases:

Based on the results which obtained from the interviewing questionnaire and observational checklist as well literature review, home health care intervention developed by the researcher. It was implemented immediately after pre-test. The researcher implemented the home health care intervention through four phases as the following:

Phase (I) Preparatory and assessment phase: Preparation of the study design and data collection tools was based on extensive review of the current and past available national and international references related to the research title, using a journal, textbooks and internet search to contrast the tools and the home health care intervention. This was necessary for the researcher to be acquainted with and oriented about aspects of the research problem as well as to assist in the development of data collection tools. Also prepared handout for studied patients that included all items about bariatric surgery, this took about two months for preparing the tools. In this phase of home health care intervention, assessed knowledge, lifestyle pattern and attitude of the studied patients through collection and analysis of baseline data from the filled tools. In this phase the researcher did the pre-test.

Phase (II) Planning phase: The researcher identified the important needs for target group, set priorities of needs, goals and objectives were developed.

Phase (III) Implementation phase: The actual implemented work took about ٩ months from the beginning of April ٢٠٢٤ to the end of December ٢٠٢٤. The study was conducted by the researcher for the studied sample in the selected setting of Surgical Outpatient Clinic affliated to Benha University Hospital and their home through home visits. The researcher visited Surgical Outpatient Clinic two days/ week (Saturday and Tuesday) from ٩:٠٠ am to ١٢:٠٠ mid-day. The researcher chose these days because increase the frequency of patients in these days and these days appropriate for researcher. The average time needed for the sheet was around ٣٠-٤٥ minutes, and the average number of responses was ranged between ١-٢ patients/day depending on the responses of the patients. During the initial visit at Surgical Outpatient Clinic, the researcher introduced herself and explained the purpose of the study research briefly to patients who fulfilled the inclusion criteria. Each patient was individually interviewed in the waiting area of the Outpatient Clinic and their addresses and telephone numbers were taken, then the researcher went to the patient's home two days/week (Wednesday and Thursday) to complete home visit and accomplish home health care intervention to the previously selected cases. The implementation of home health care intervention took about six months from the beginning of April ٢٠٢٤ to the end of September ٢٠٢٤.

After the implementation of home health care intervention, the researcher was done follow-up phase through a home visit after three months of the intervention to monitor the

effect of home health care intervention on lifestyle pattern for the patients with bariatric surgery. The researcher assured patients to feel free for contacts through the telephone call or via WhatsApp chatting through the period of post-home health care intervention and follow-up for answering patients' questions, responding to the studied patients' inquiries in the event of a problem, or promoting adherence to the delivered education and counseling.

The researcher implemented home health care intervention through six sessions of ٤ hours (٣ theoretical sessions and ٣ practical sessions; ٢ hours theoretical and ٢ hours practical), each session lasted ٣٠-٤٠ minutes including periods of discussion. Illustrated booklet guideline was distributed to the patients with bariatric surgery to gain information and facilitate discussion. The duration of each session was variable; according to its contents as well as the studied patients were response which included general and specific objectives:

General objectives: Apply the home health care intervention for patients with bariatric surgery to:-

-Improve the knowledge of patients with bariatric surgery.
-Improve the lifestyle pattern of patients with bariatric surgery.
-Improve the attitude of patients with bariatric surgery.

Specific objectives:-

-Recognize meaning and causes of obesity.
-List the physical symptoms, psychological symptoms, and social symptoms of obesity.
-Mention types and patterns of obesity.
-Identify complications and diagnosis of obesity.
-Discuss treatment and prevention of obesity.
-Recognize meaning and causes of performing bariatric surgery.
-Enumerate benefits, indications, and contraindications of bariatric surgery.
-Explain types of bariatric surgery.
-Mention complications and tips to avoid side effects of bariatric surgery.
-Outline the successful factors of bariatric surgery and reasons of bariatric surgery failure.
-Demonstrate wound care after bariatric surgery.
-Implement nutritional practices.
-Construct physical activity and exercise.
-Schedule sleep and rest.
-Apply stress management.
-Illustrate weight check after bariatric surgery.
-Perform follow-up and treatment.

First session (theoretical): At the beginning of the first session at patients' home, the researcher welcomed and introduced herself to the patients, an orientation to the intervention and its process were presented included; meaning and causes of obesity, physical symptoms, psychological symptoms, and social symptoms of obesity, types and patterns of obesity, and complications and diagnosis of obesity, taking into consideration the use of simple language according to the educational level.

Second session (theoretical): Covered treatment and prevention of obesity, meaning and causes of performing bariatric surgery, and benefits, indications, and contraindications of bariatric surgery.

Third session (theoretical): Covered types of bariatric surgery, complications and tips to avoid side effects of bariatric surgery, and the successful factors of bariatric surgery and reasons of bariatric surgery failure.

Fourth session (practical): Covered wound care after bariatric surgery, and nutritional practices.

Fifth session (practical): Covered physical activity and exercise, sleep and rest, and stress management.

Six sessions (practical): Covered weight check after bariatric surgery, and follow-up and treatment.

Discussion, motivation and reinforcement during session were used to enhance learning. Each session started by a brief summary about the previous session and the objectives of the new topics. Direct reinforcement in the form, a copy of the intervention was given as a gift for each patient to use it as future reference.

Teaching methods:

All patients received the same intervention content using the same teaching methods, there were:

- Discussion.
- PowerPoint presentation.
- Demonstration and re-demonstration.

Teaching aids: Suitable teaching aids were specially prepared for intervention as: illustrated booklet, brochure and colored posters.

Phase (IV): Evaluation of the home health care intervention:

Evaluation of the implementation of the home health care intervention was done immediately and then after three months of intervention. Evaluation of the intervention was done by using the post-test questionnaire which was the same formats of pre-test in order to compare the change in the studied patients' knowledge, lifestyle pattern, and attitude immediately after the implementation of home health care intervention and after three months.

Statistical design:

All data collected were organized, tabulated and analyzed using appropriate statistical test. Data were analyzed by using Statistical Package for Social Science (SPSS) version ٢١ which was applied to calculate frequencies and percentage for qualitative descriptive data, mean and standard deviation was used for quantitative data, t-test was used to test the significance of the paired qualitative variables, as well as test statistical significance and associations by using Chi-square test (x^2) and correlation matrix to detect the relation between the variables (P-value).

Significance levels were considered as follows:

Highly statistically significant	P<٠.٠٠١**
Statistically significant	P<٠.٠٥*
Not significant	P>٠.٠٥

Results:

Table (١): Illustrates that; ٤٨.١٪ of the studied patients were aged from ٣٠ to less than ٤٠ years old with mean and standard deviation was ٣٤.٨٨٦±٧.٩٨٤. Regarding to sex, ٧٨.٥٪ of the studied patients were females, ٤١.٨٪ of them were married, ٥٤.٤٪ of them had university education or more, ٦٢٪ of them were working, ٦٩.٦٪ of them were living in urban area, and ٥٩.٥٪ of them had enough monthly income.

Table (٢): Shows that; ٨٢.٣٪ of the studied patients were not smoking, ٧٣.٤٪ of them suffered from obesity since childhood, ٥٨.٢٪ & ٥٤.٣٪ of them had family history of obesity that was first degree of kinship respectively, ١٠٠٪ & ٤٦.٨٪ of them had followed a previous weight loss program before bariatric surgery which was medicinal herbs respectively, and ٧٤.٧٪ of them reported that the previous weight loss program was ineffective.

Table (٣): Illustrates that; ٥١.٩٪, ٣٩٪ & ٤٨.٨٪ of the studied patients had performed previous surgery that was umbilical or inguinal hernia since less than ٥ years respectively. Regarding previous bariatric surgeries; ٧٧.٢٪ of the studied patients had not performed previous bariatric surgeries, while ٢٢.٨٪, ٣٣.٣٪ & ٧٧.٨٪ of them had performed previous bariatric surgery which was sleeve gastrectomy from ٢-٣ years respectively. Concerning follow-up appointments at the Outpatient Clinic for patients that had performed previous bariatric surgeries; ٥٠٪ of the studied patients had follow-up appointments every week.

Table (٤): Clears that; there were highly statistically significant difference of the studied patients' anthropometric measurement items pre and post-home health care intervention and at follow-up phase (P<٠.٠٠١). The mean of the

studied patients' weight was ١٢٧.٧٨±٦.٧٩ pre-home health care intervention compared to ١٢٢.٧٨±٥.٤٣ & ١٠٩.٤٤±٢.٨٦ post-intervention and at follow-up phase respectively, while the mean of the studied patients' height was ١٧٣.٣٥±٧.٢٠. The mean of the studied patients' BMI was ٤٢.٥٧±١.٥٣ pre-home health care intervention compared to ٣٧.٧٨±.٧٦ & ٣٢.٦٧±١.٠٩ post-intervention and at follow-up phase respectively.

Figure (١): Shows that; ١٥.٢٪ of the studied patients had good total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which increased to ٧٢.٢٪ & ٦٥.٨٪ post-intervention and at follow-up phase respectively. ٣٠.٤٪ of the studied patients had average total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which decreased to ١٧.٧٪ & ٢١.٥٪ post-intervention and at follow-up phase respectively. ٥٤.٤٪ of the studied patients had poor total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which decreased to ١٠.١٪ & ١٢.٧٪ post-intervention and at follow-up phase respectively.

Figure (٢): Shows that; ٣٠.٤٪ of the studied patients had healthy total lifestyle pattern level regarding bariatric surgery pre-home health care intervention which increased to ٨١٪ & ٧٣.٤٪ post-intervention and at follow-up phase respectively. ٦٩.٦٪ of the studied patients had unhealthy total lifestyle pattern level regarding bariatric surgery pre-home health care intervention which decreased to ١٩٪ & ٢٦.٦٪ post-intervention and at follow-up phase respectively.

Figure (٣): Illustrates that; ٢٥.٣٪ of the studied patients had positive total attitude level regarding bariatric surgery pre-home health care intervention which increased to ٧٧.٢٪ & ٦٨.٤٪ post-intervention and at follow-up phase respectively. ٧٤.٧٪ of the studied patients had negative total attitude level regarding bariatric surgery pre-home health care intervention which decreased to ٢٢.٨٪ & ٣١.٦٪ post-intervention and at follow-up phase respectively.

Figure (٤): Shows that; ٥٨.٢٪ of the studied patients with bariatric surgery had unsanitary home environment, while ٤١.٨٪ of them had sanitary home environment.

Table (٥): Clears that; there were highly statistically positive correlation between the studied patients' total knowledge, total lifestyle pattern, and total attitude pre and post-home health care intervention and at follow-up phase (P<٠.٠٠١).

Table (١): Distribution of the studied patients regarding their socio-demographic characteristics (n=٧٩).

Socio-demographic characteristics	No.	%
Age/years		
٢٠ < ٣٠ years	٢٥	٣١.٦
٣٠ < ٤٠ years	٣٨	**٤٨.١**
٤٠-٥٠ years	١٦	٢٠.٣
Mean±SD	**٣٤.٨٨٦±٧.٩٨٤**	
Sex		
Male	١٧	٢١.٥
Female	٦٢	**٧٨.٥**
Marital status		
Single	٢١	٢٦.٦
Married	٣٣	**٤١.٨**
Divorced	١٧	٢١.٥
Widowed	٨	١٠.١
Educational level		
Can't read and write	١١	١٣.٩
Basic education	١٩	٢٤.١
Intermediate education	٦	٧.٦
University education or more	٤٣	**٥٤.٤**
Occupational status		
Working	٤٩	**٦٢.٠**
Not working	٣٠	٣٨.٠
Place of residence		
Urban	٥٥	**٦٩.٦**
Rural	٢٤	٣٠.٤
Monthly income		
Enough and save	٢٢	٢٧.٨
Enough	٤٧	**٥٩.٥**
Not enough	١٠	١٢.٧

Table (٢): Distribution of the studied patients regarding their past medical history (n=٧٩).

Past medical history	No.	%
Smoking		
Yes	١٤	١٧.٧
No	٦٥	**٨٢.٣**
Number of packets smoked/day (n=١٤)		
١ packet/day	٩	**٦٤.٣**
٢-٣ packets/day	٣	٢١.٤
More than ٣ packets/day	٢	١٤.٣
Suffering from obesity		
Since childhood	٥٨	**٧٣.٤**
Recently	٢١	٢٦.٦
Having family history of obesity		
Yes	٤٦	**٥٨.٢**
No	٣٣	٤١.٨
***If answer is yes, what is the degree of kinship? (n=٤٦)**		
First degree	٢٥	**٥٤.٣**
Second degree	١٧	٣٧.٠
Third degree	١٠	٢١.٧
Fourth degree	٨	١٧.٤
Following a previous weight loss program before bariatric surgery.		
Yes	٧٩	**١٠٠.٠**
***If answer is yes, what is the type of a previous weight loss program used/followed to lose excess weight? (n=٧٩)**		
Diet for weight loss	٣١	٣٩.٢
Exercise	٢٤	٣٠.٤
Medicinal herbs	٣٧	**٤٦.٨**
Outcomes of the previous weight loss program followed to lose excess weight (n=٧٩)		
Somewhat effective	٢٠	٢٥.٣
Ineffective	٥٩	**٧٤.٧**

Table (٣): Distribution of the studied patients regarding their past surgical history (n=٧٩).

Past surgical history	No.	%
Performing previous surgeries		
Yes	٤١	**٥١.٩**
No	٣٨	٤٨.١
If answer is yes, what is the type of previous surgeries that had been performed? (n=٤١)		
Appendectomy	١٠	٢٤.٤
Cholecystectomy	١١	٢٦.٨
Umbilical or inguinal hernia	١٦	**٣٩.٠**
Thyroidectomy	٤	٩.٨
If answer is yes, what is the duration of previous surgeries that had been performed? (n=٤١)		
Less than ٥ years	٢٠	**٤٨.٨**
From ٥ to less than ١٠ years	١٤	٣٤.١
More than or equal ١٠ years	٧	١٧.١
Performing previous bariatric surgeries		
Yes	١٨	٢٢.٨
No	٦١	**٧٧.٢**
If answer is yes, what is the type of previous bariatric surgeries that had been performed to treat obesity? (n=١٨)		
Sleeve gastrectomy	٦	**٣٣.٣**
Adjustable gastric banding	٥	٢٧.٨
Vertical banded gastroplasty	٣	١٦.٧
Roux-en Y gastric bypass	٢	١١.١
Biliopancreatic diversion with duodenal switch	٢	١١.١
If answer is yes, what is the time of previous bariatric surgeries that had been performed to treat obesity? (n=١٨)		
٢-٣ years	١٤	**٧٧.٨**
More than ٣ years	٤	٢٢.٢
Follow-up appointments at the Outpatient Clinic to monitor the effects of the previous bariatric surgeries (n=١٨)		
Every week	٩	**٥٠.٠**
Every two weeks	٦	٣٣.٣
Every month	٣	١٦.٧

Table (٤): Mean and standard deviation of the studied patients regarding their anthropometric measurements pre and post-home health care intervention and at follow-up phase (n=٧٩).

Anthropometric measurements	Pre-home health care intervention			Post-home health care intervention			Follow-up after ٣ months			t_1 P-value	t_2 P-value	t_3 P-value
	Min	Max	Mean±SD	Min	Max	Mean±SD	Min	Max	Mean±SD			
Weight (kg)	١١٨.٠٠	١٣٧.٠٠	١٢٧.٧٨±٦.٧٩	١١٢.٠٠	١٢٩.٠٠	١٢٢.٧٨±٥.٤٣	١٠٥.٠٠	١١٤.٠٠	١٠٩.٤٤±٢.٨٦	٥.١١ .٠٠٠**	٢٢.١٢ .٠٠٠**	١٩.٣١ .٠٠٠**
Height (cm)	١٦٢.٠٠	١٨٥.٠٠	١٧٣.٣٥±٧.٢٠	١٦٢.٠٠	١٨٥.٠٠	١٧٣.٣٥±٧.٢٠	١٦٢.٠٠	١٨٥.٠٠	١٧٣.٣٥±٧.٢٠	-	-	-
BMI (kg/m^2)	٤٠.٠٣	٤٤.٩٦	٤٢.٥٧±١.٥٣	٣٦.٥٢	٣٩.٢٥	٣٧.٧٨±.٧٦	٣٠.٦٣	٣٤.٣٨	٣٢.٦٧±١.٠٩	٢٤.٩٤ .٠٠٠**	٤٦.٨٣ .٠٠٠**	٣٤.١٩ .٠٠٠**

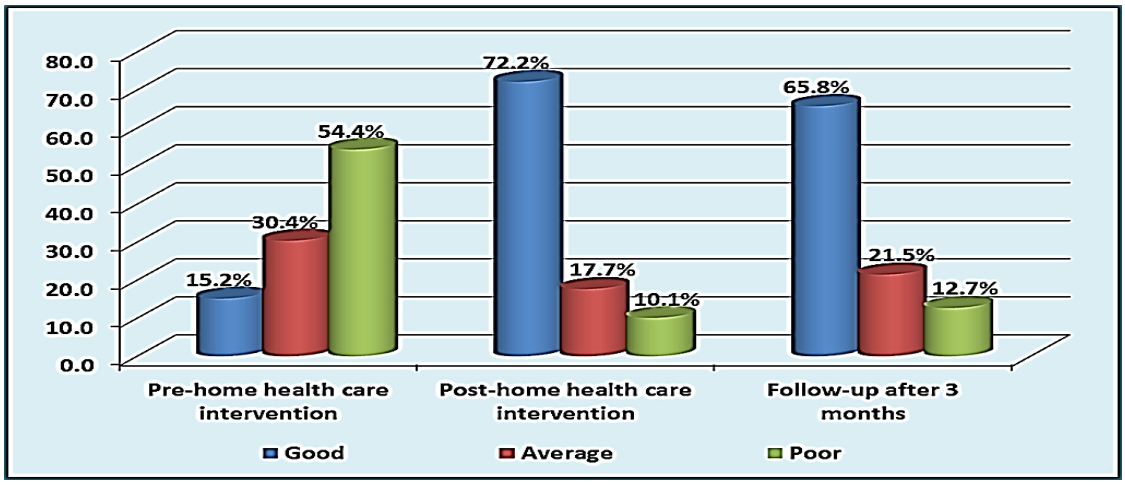

Figure (١): Percentage distribution of the studied patients regarding their total knowledge level about obesity

and bariatric surgery throughout the intervention phases (n=٧٩).

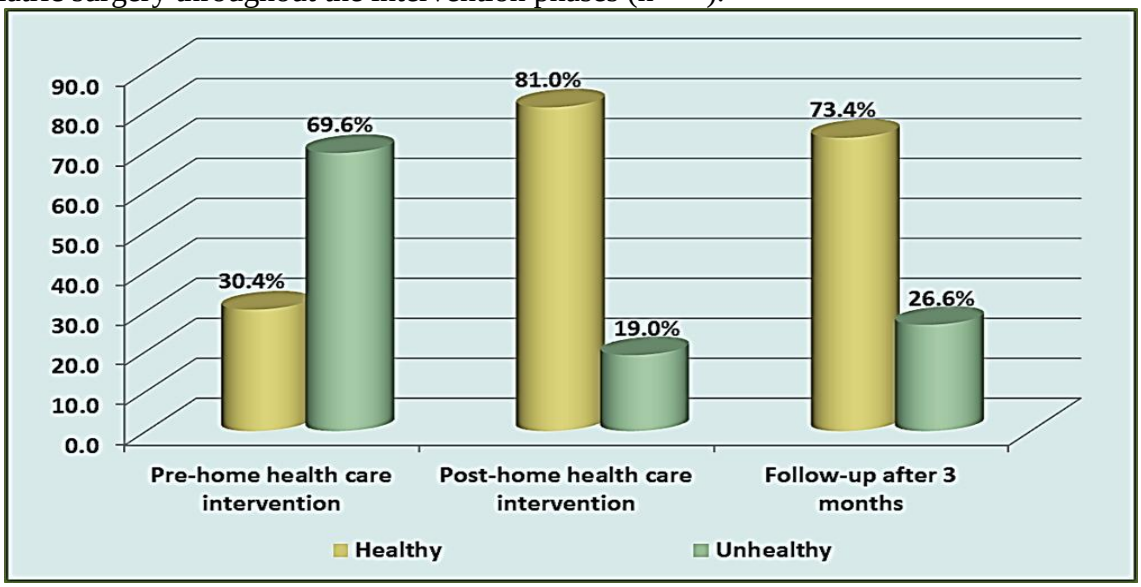

Figure (٢): Percentage distribution of the studied patients about their total lifestyle pattern level regarding bariatric surgery throughout the intervention phases (n=٧٩).

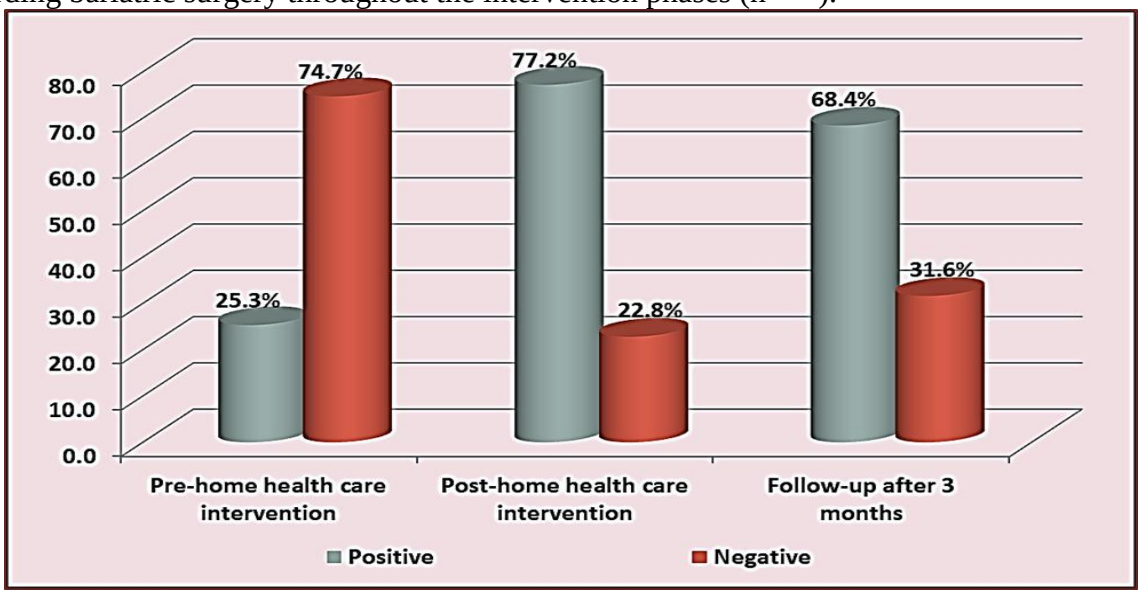

Figure (٣): Percentage distribution of the studied patients about their total attitude level regarding bariatric surgery throughout the intervention phases (n=٧٩).

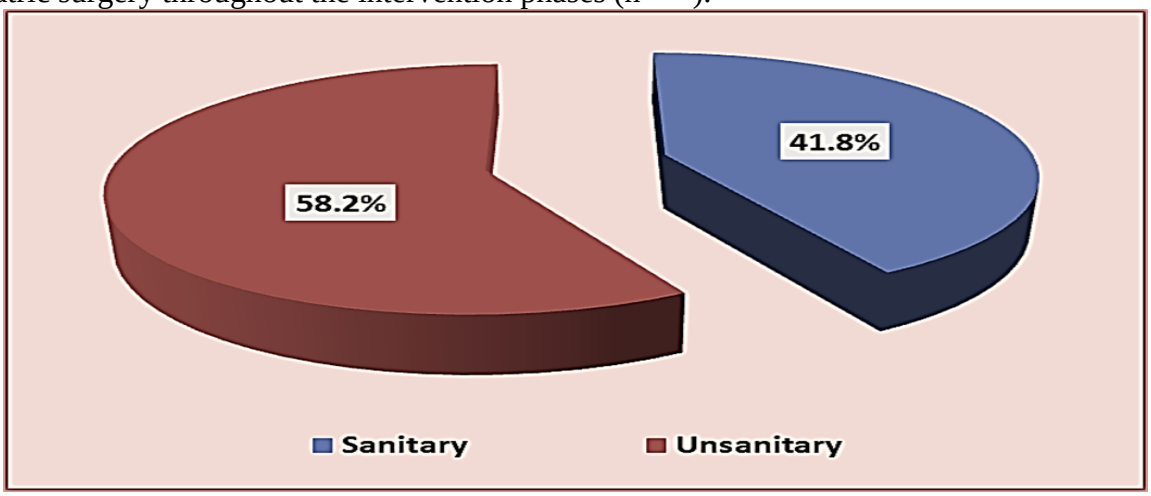

Figure (٤): Percentage distribution of the studied patients with bariatric surgery regarding their home environment (n=٧٩).

Table (٥): Correlation matrix between total knowledge, total lifestyle pattern, and total attitude of the studied patients pre and post-home health care intervention and at follow-up phase (n=٧٩).

Items			Total knowledge	Total lifestyle pattern	Total attitude
Pre-home health care intervention	Total knowledge	r	١	.٨٠١	.٧٨٥
		P-value	-	.٠٠٠**	.٠٠٠**
	Total lifestyle pattern	r	.٨٠١	١	.٨٨١
		P-value	.٠٠٠**	-	.٠٠٠**
	Total attitude	r	.٧٨٥	.٨٨١	١
		P-value	.٠٠٠**	.٠٠٠**	-
Post-home health care intervention	Total knowledge	r	١	.٨٤٤	.٨٧٤
		P-value	-	.٠٠٠**	.٠٠٠**
	Total lifestyle pattern	r	.٨٤٤	١	.٨٩١
		P-value	.٠٠٠**	-	.٠٠٠**
	Total attitude	r	.٨٧٤	.٨٩١	١
		P-value	.٠٠٠**	.٠٠٠**	-
Follow-up after ٣ months	Total knowledge	r	١	.٨٥٦	.٨٩٥
		P-value	-	.٠٠٠**	.٠٠٠**
	Total lifestyle pattern	r	.٨٥٦	١	.٨٨٤
		P-value	.٠٠٠**	-	.٠٠٠**
	Total attitude	r	.٨٩٥	.٨٨٤	١
		P-value	.٠٠٠**	.٠٠٠**	-

Discussion:

Bariatric surgery is a term used for the surgical treatment of severe overweight or morbid obesity that includes several surgical procedures commonly divided into three main types; restrictive, malabsorptive, or combined surgical procedures. Bariatric surgery aims to induce long-term weight loss and improve quality of life with a reduction in the risk of obesity-associated mortality rate. Additionally the psychological benefits of bariatric surgery include remission of depression and anxiety symptoms. The bariatric surgery is frequently used for the patients where the traditional weight loss approaches have proven insufficient, or when morbid obesity already significantly affects well-being and general health of the patients **(Khalil et al., ٢٠٢٣).**

Regarding socio-demographic characteristics of the studied patients, the present study findings illustrated that; less than half of the studied patients were aged from ٣٠ to less than ٤٠ years old with mean and standard deviation was ٣٤.٨٨٦±٧.٩٨٤. This finding came inconsistent with the study performed by **Shubayr et al., (٢٠٢٢),** who studied "Incidence of gallbladder stone formation after bariatric surgery using ultrasound imaging in the Southern Region of Saudi Arabia", (n=٥٧), and found that; ٥٠.٩٪ of the studied patients were aged from ١٨ to ٣٠ years old.

Concerning sex of the studied patients, the present study findings illustrated that; more than three quarters of the studied patients were

females. This finding was in the same harmony with the study performed by **Pokorski & Głuch, (٢٠٢٢),** who studied "Perception of well-being and quality of life in obese patients after bariatric surgery, in Poland", (n=٥٢), and found that; ٨٨.٥٪ of the studied patients were females.

Regarding marital status of the studied patients, the present study findings illustrated that; two fifth of the studied patients were married. This finding was congruent with the study performed by **Neel et al., (٢٠٢٣),** who studied "Factors and barriers influencing the decision to undergo body contouring surgery after bariatric surgery, in Saudi Arabia", (n=٤٤٥), and found that; ٦٨.١٪ of the studied patients were married.

Concerning educational level of the studied patients, the present study findings illustrated that; more than half of the studied patients had university education or more. This finding was in the same line with the study performed by **Ahmed & Rafaat, (٢٠٢٣),** who studied "Life experiences of Egyptian women after bariatric surgery, in Egypt", (n=٣٠), and found that; ٤٣.٣٪ of the studied patients had university education.

Regarding occupational status of the studied patients, the present study findings illustrated that; more than three fifth of the studied patients were working. This finding was congruent with the study performed by **Khalil et al., (٢٠٢٣),** who studied "Common physiological and psychological problems among post-bariatric surgery patients, in Egypt", (n=١٥٠), and found that; ٥٦٪ of the studied patients were working.

Concerning residence place of the studied patients, the present study findings illustrated that; more than two thirds of the studied patients were living in urban area. This finding was in the same line with the study performed by **Mohammed et al., (٢٠٢٤),** who studied "Nutritional assessment among patients undergoing bariatric surgeries, in Egypt", (n=٦٠), and found that; ٨٨.٣٪ of the studied patients lived in urban areas.

Regarding monthly income of the studied patients, the present study findings illustrated that; slightly less than three fifth of the studied patients had enough monthly income. This finding was congruent with the study performed by **Alsulami et al., (٢٠٢٢),** who studied "Prevalence of dumping syndrome and its determinants among post-bariatric surgery adult patients at King Fahad General Hospital, in Saudi Arabia", (n=٢٤٠), and found that; ٤٠.٨٪ of the studied patients had enough monthly income.

Regarding past medical history, the present study findings showed that; majority of the studied patients were not smoking. This finding was in the same line with the study performed by **Sjöholm et al., (٢٠٢٢),** who studied "Association of bariatric surgery with cancer incidence in patients with obesity and diabetes, in Sweden", (n=٧٠١), and found that; ٧٦.٢٪ of the studied patients were not smoking. This might be due to the patients who are aware of their obesity and its associated health risks may avoid smoking to prevent further health complications.

Furthermore the present study findings showed that; less than three quarters of the studied patients suffered from obesity since childhood. This finding was congruent with the study performed by **Mohammed et al., (٢٠٢١),** who studied "Physical activity program for bariatric surgery patients at Assuit university hospital: Post-operative intervention, in Egypt", (n=٧٠), and found that; ٧٤.٣٪ of the studied patients suffered from obesity since childhood. This might be due to the genetic predisposition factor that plays a more significant role in obesity can increase a child's risk of becoming obese.

Moreover the present study findings showed that; less than three fifth & more than half of

the studied patients had family history of obesity that was first degree of kinship respectively. These findings were in the same line with the study performed by **Mustafa et al., (٢٠٢٤),** who studied "Dietary history and lifestyle habits of patients undergoing bariatric surgery in Misurata, in Libya", (n=١٠٠), and found that; ٧٢٪ of the studied patients had family history of obesity with their first relative. This might be due to the genetic factors can be passed down if obesity-related genes are present in the family which can increase the likelihood of obesity in family members.

Also the present study findings showed that; all & less than half of the studied patients had followed a previous weight loss program before bariatric surgery which was medicinal herbs respectively. These findings came inconsistent with the study performed by **El-Attar & El-Emary, (٢٠٢٢),** who studied "Effectiveness of nursing intervention program on body image, marital satisfaction and quality of life among women post bariatric surgery, in Egypt", (n=٥٠), and found that, ٩٠٪ & ٤٠٪ of the patients had performed previous behavioral approaches for weight management which was diet and exercise respectively. This might be due to the medicinal herbs that are considered as a part of the weight loss program can complement other lifestyle changes as a balanced diet and regular exercise which may result in more sustainable weight loss and improved overall health.

Additionally the present study findings showed that; three quarters of the studied patients reported that the previous weight loss program was ineffective. This finding came inconsistent with the study performed by **Taha & Ali, (٢٠٢٢),** who studied "Effectiveness of combined exercise and nutritional-behavioral intervention on health outcomes among patients with bariatric surgery, in Egypt", (n=٦٠), and found that; ٩٣.٣٪ of the studied patients reported that the outcome of the previous weight loss program was ineffective. This might be due to the pre-operative weight loss interventions may not be tailored to the individual patients' needs which result in reducing their effectiveness.

Concerning past surgical history, the present study findings illustrated that; more than half, slightly less than two fifth & less than half of the studied patients had performed previous surgery that was umbilical or inguinal hernia since less than ٥ years respectively. These findings were incongruent with the study performed by **Elgohary et al., (٢٠٢١),** who studied "The incidence of gall stones after bariatric surgery and its association with weight loss, in Egypt", (n=١٤٨), and found that; ٤٠.٦٪ of the studied patients had past surgical history of previous laparoscopic cholecystectomy. This might be due to severe morbid obesity can lead to higher intra-abdominal pressure that may weaken the abdominal wall and increase the likelihood of hernias such as umbilical or inguinal hernias.

Moreover the present study findings illustrated that; more than three quarters of the studied patients had not performed previous bariatric surgeries. This finding was in the same line with the study performed by **Salem et al., (٢٠٢٤),** who studied "Effect of structured teaching program on physiological and psychological problems among post-bariatric surgery patients, in Egypt", (n=١٠٠), and found that; ٦٣٪ of the studied patients had not performed previous bariatric surgeries. This might be due to some patients may have more previous underlying serious health conditions that prevent them from undergoing bariatric surgery or the patients might not be fully informed about the bariatric surgery as a treatment option for obesity.

Additionally the present study findings illustrated that; less than one quarter, one third & more than three quarters of the studied

patients had performed previous bariatric surgery which was sleeve gastrectomy from ٢-٣ years respectively. These findings were incongruent with the study performed by **Mohammed et al., (٢٠٢٢),** who studied "Quality of life before and after bariatric surgery among obese patients in Minia City, in Egypt", (n=١٨٢), and found that; ١٠٠٪ of the patients had performed previous bariatric surgery; ٥٥٪ of them underwent biliopancreatic diversion with duodenal switch, ٢٩٪ of them underwent sleeve gastrectomy, and ١٦٪ of them underwent gastric bypass. This might be due to the bariatric surgery is often recommended for the patients who unable to maintain significant weight loss to improve their quality of life.

Concerning follow-up appointments at the Outpatient Clinic for patients that had performed previous bariatric surgeries; the present study findings illustrated that; half of the studied patients had follow-up appointments every week. This finding was in the same line with the study performed by **Hany et al., (٢٠٢٢),** who studied "A cross-sectional survey of patients attending follow-up visits after sleeve gastrectomy, in Egypt", (n=١٨٢), and found that; ٦٠.٧٪ of the studied patients had follow-up appointments after the previous bariatric surgery every week. This might be due to regular follow-up appointments help track weight loss progress and ensure that the bariatric patients are on the right path to achieving their health goals.

Regarding anthropometric measurements of the studied patients with bariatric surgery, the present study findings cleared that; there were highly statistically significant difference of the studied patients' anthropometric measurement items pre and post-home health care intervention and at follow-up phase (P<٠.٠٠١). This finding agreed with the study performed by **El-Maghawry et al., (٢٠٢١),** who studied "Effect of an educational program on lifestyle modification for patients undergoing laparoscopic sleeve gastrectomy surgery, in Egypt", (n=٣٨), and found that; there were highly statistically significant difference of the studied patients' anthropometric measurement items pre and post educational program. This might be due to the home health care intervention is more likely included tailored dietary and exercise plans which effectively addressed the patients' specific needs and led to more significant improvements in their anthropometric measurements.

Moreover the present study findings cleared that; the mean of the studied patients' weight was ١٢٧.٧٨±٦.٧٩ pre-home health care intervention compared to ١٢٢.٧٨±٥.٤٣ & ١٠٩.٤٤±٢.٨٦ post-intervention and at follow-up phase respectively. This finding was in the same harmony with the study performed by **Hablass et al., (٢٠٢٣),** who studied "Effect of an educational program on minimizing complications for patients post bariatric surgeries, in Egypt", (n=٤٥), and found that; the mean of studied patients' weight was ١٢٦.٣٨±٢٤.٩٧ pre-program compared to ١١٩.٤٩±٢٢.٥٧ & ١٠٣.٥١±٢٣.١٤ during first month and after ٣ months post program implementation respectively. This might be due to home health care intervention include behavioral counseling and support which helping bariatric patients adopt healthier lifestyle habits that contributed to the observed changes in their weight.

Furthermore the present study findings cleared that; the mean of the studied patients' height was ١٧٣.٣٥±٧.٢٠. This finding was in the same line with the study performed by **Baheeg et al., (٢٠٢١),** who studied "Long-term durability of weight loss after bariatric surgery, in Egypt", (n=١٠٠), and found that; the mean of the studied patients' height was ١٧٦.١٠±٥.١٤٤. Also this finding was congruent with the study performed by **Atta et al., (٢٠٢٥),** who studied "Implementing of

novel nursing care bundle on chronic low back pain and functional ability of obese patients undergoing bariatric surgery, in Egypt", (n=٦٠), and found that; the mean of the studied patients' height was ١٧٣±٠.١٣. This might be due to the mean height of ١٧٣.٣٥±٧.٢٠ among the studied patients with bariatric surgery likely reflects the characteristics of specific study population.

Additionally the present study findings cleared that; the mean of the studied patients' BMI was ٤٢.٥٧±١.٥٣ pre-home health care intervention compared to ٣٧.٧٨±.٧٦ & ٣٢.٦٧±١.٠٩ post-intervention and at follow-up phase respectively. This finding was congruent with the study performed by **Hamad et al., (٢٠٢٢),** who studied "Health promotion program regarding lifestyle behaviors among bariatric surgery patients at Assuit University Hospital, in Egypt", (n=٧٠), and found that; the mean of the studied patients' BMI was ٤٥.٧٩±٦.١٣ pre-program compared to ٣٦.٩١±٥.٤٧ post-program. This might be due to home health care intervention can provide personalized care and continuous ongoing monitoring which contribute to better adherence to the prescribed regimen and more significant changes in BMI.

Regarding the studied patients' total knowledge level about obesity and bariatric surgery throughout the intervention phases, the present study findings showed that; less than one fifth of the studied patients had good total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which increased to less than three quarters & two thirds post-intervention and at follow-up phase respectively. Less than one third of the studied patients had average total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which decreased to less than one fifth & slightly more than one fifth post-intervention and at follow-up phase respectively. More than half of the studied patients had poor total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which decreased to tenth & less than one fifth post-intervention and at follow-up phase respectively.

These findings were congruent with the study performed by **Hablass et al., (٢٠٢٣),** and found that; ٢٢.٣٪ of the studied patients had good total knowledge level regarding obesity and bariatric surgery pre-program implementation which increased to ٤٦.٧٪ & ٦٦.٦٪ during the first month and after ٣ months post-program implementation respectively, ٣١.٢٪ of the patients had average total knowledge level regarding obesity and bariatric surgery pre-program implementation which decreased to ٢٢.٣٪ & ١٥.٦٪ during the first month and after ٣ months post-program implementation respectively, while ٤٦.٧٪ of the patients had poor total knowledge level regarding obesity and bariatric surgery pre-program implementation which decreased to ٣١.٢٪ & ١٧.٧٪ during the first month and after ٣ months post-program implementation respectively. This might be due to more significant improvements in the patients' total knowledge level about obesity and bariatric surgery throughout the intervention phases could be attributed to the effectiveness of the home health care intervention.

Concerning the total lifestyle pattern level of the studied patients regarding bariatric surgery throughout the intervention phases, the present study findings showed that; less than one third of the studied patients had healthy total lifestyle pattern level regarding bariatric surgery pre-home health care intervention which increased to majority & less than three quarters post-intervention and at follow-up phase respectively. More than two thirds of the studied patients had unhealthy total lifestyle pattern level regarding bariatric surgery pre-home health care intervention which decreased

to slightly less than one fifth & more than one quarter post-intervention and at follow-up phase respectively.

These findings were in the same line with the study performed by **Hamed et al., (٢٠٢٤),** who studied "Effect of implementing nursing care standards on compliance and lifestyle behavior for patients undergoing laparoscopic sleeve gastrectomy, in Egypt", (n=٧٢), and found that; ٩.٧٢٪ of the studied patients had healthy total lifestyle pattern regarding surgery pre-implementing the nursing care standards which increased to ٨٣.٣٣٪ post-implementing the nursing care standards, while ٩٠.٧٪ of the studied patients had unhealthy total lifestyle pattern regarding surgery pre-implementing the nursing care standards which decreased to ١٦.٦٦٪ post-implementing the nursing care standards. This might be due to the role of home health care intervention in improving lifestyle patterns for the bariatric surgery patients is well-effective which often include a combination of nutritional guidance, behavioral therapy, and physical activity programs that aim to address not only the immediate recovery process but also the long-term lifestyle adjustments necessary for sustained health benefits.

Concerning total attitude level of the studied patients regarding bariatric surgery throughout the intervention phases, the present study findings illustrated that; one quarter of the studied patients had positive total attitude level regarding bariatric surgery pre-home health care intervention which increased to more than three quarters & more than two thirds post-intervention and at follow-up phase respectively. This finding was in the same harmony with the study performed by **Elmoula et al., (٢٠٢٣),** and found that; ٨٪ of the studied patients had satisfied attitude regarding surgery pre implementation of the hybrid nursing guidance compared to ٥٨٪ post one month of implementation of the hybrid nursing guidance. This might be due to the home health care intervention often provided clear accessible information, addressed individual concerns, and offered emotional support which helped patients feel more confident and optimistic about the bariatric surgical procedures.

Regarding total home environment of the studied patients, the present study findings showed that; less than three fifth of the studied patients with bariatric surgery had unsanitary home environment, while two fifth of them had sanitary home environment. This might be due to some bariatric patients may not fully understand the significant importance of a sanitary environment in fostering and promoting recovery after surgery or may be due to the bariatric patients' thought mainly focus on significant adjustment and lifestyle modification that required after the bariatric surgery (including dietary, physical, and emotional changes) which can make home maintenance at a lower priority.

Concerning correlation matrix between total knowledge, total lifestyle pattern, and total attitude of the studied patients pre and post-home health care intervention and at follow-up phase, the present study findings cleared that; there were highly statistically positive correlation between the studied patients' total knowledge, total lifestyle pattern, and total attitude pre and post-home health care intervention and at follow-up phase ($P<٠.٠٠١$). This might be due to the home health care intervention provide personalized support and guidance for the patients with bariatric surgery which reinforce the connections between knowledge, lifestyle, and attitude that can create a structured environment for the patients to learn, practice, and internalize positive changes.

Conclusion

Home health care intervention had a positive effect on improvement of the knowledge, lifestyle pattern, and attitude of patients with bariatric surgery. Less than one

fifth of the studied patients had good total knowledge level regarding obesity and bariatric surgery pre-home health care intervention which increased to less than three quarters & two thirds post-intervention and at follow-up phase respectively. Less than one third of the studied patients had healthy total lifestyle pattern level regarding bariatric surgery pre-home health care intervention which increased to majority & less than three quarters post-intervention and at follow-up phase respectively. One quarter of the studied patients had positive total attitude level regarding bariatric surgery pre-home health care intervention which increased to more than three quarters & more than two thirds post-intervention and at follow-up phase respectively. There were highly statistically positive correlation between the studied patients' total knowledge, total lifestyle pattern, and total attitude pre and post-home health care intervention and at follow-up phase (P<٠.٠٠١).

Recommendations

-Continuous educational program for the patients with bariatric surgery recommended to identify the physiological and psychological conditions of the patients post-bariatric surgery to achieve appropriate outcomes for a long time.

-Appropriate counseling and educational guidelines should be provided for post-bariatric surgery patients to improve their awareness regarding any health problems that possibly might occur and ways of prevention.

-Conducting a structured nursing intervention program for increasing the obese patients' awareness regarding the essential lifestyle modifications following bariatric surgery.

Further Research:

-Integrating mobile application-based lifestyle interventions in the future pathway of care for bariatric surgery to optimize patients' outcomes.

-Replicating the current study with a larger probability sample is advised to ensure generalizability and wider use of the designed method.

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