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Effectiveness of an interventional program on nurses knowledge about bariatric surgery in Al-Sulaymaniyah teaching hospital

SOZ Othman Aziz

College Nurse /MSc. Sulaymaniyah Cardiac Hospital/Ministry of Health/ Kurdistan

Corresponding author email: sozaziz2020@gmail.com

Suad Jassim Mohammed

Assist Professor/PhD. Adult Nursing Department/College of Nursing/ University of Baghdad, Iraq.

Abstract---This study indicates that there is significant association among post-test nurses' knowledge with their qualification in nursing (p-value =0.02) and years of employment p-value =0.03. This study shows that nurses' general knowledge about bariatric surgery and their knowledge about the nursing management of pre and post bariatric surgery were statistically significantly increased in the intervention group post-test (96.6% and 94.8%, respectively), $p \leq 0.001$. A Quasi-experimental design was performed from February to March 2021 at a referral surgical hospital for bariatric surgery in Al-Sulaymaniyah city, with 50 nurses (25 in the control group and 25 in the study group).

Keywords---Knowledge, Obesity, Bariatric surgery, Nurses, Educational nursing program.

Introduction

The global obesity epidemic continues unabated, wreaking havoc on global health and the economy (Thomas et al., 2013). People with significant obesity have the worst health implications, including a shorter life expectancy (Agha & Agha, 2017). Obesity surgeries have become the best solution for people's unable to stick to a permanent diet, especially since these operations have undergone significant medical and technological advancement (Nguyen & Varela, 2017). Bariatric surgery (BS) is now the most effective treatment for extreme obesity, resulting in significant long-term weight loss, better obesity-related comorbidities, and lower mortality (Pucci & Batterham, 2019). According to a meta-analysis,

bariatric surgery reduces the risk of heart attack by nearly half and the risk of stroke by more than half (Al Khalifa & Al Ansari, 2018).

Weight reduction is achieved by restricting the amount of food, inducing nutrient malabsorption, or by a combination of both gastric restriction and malabsorption (Ionut et al., 2013). Hormonal alterations are also a most common after bariatric surgery (Dimitriadis et al., 2017). The role of nurses in caring for and educating people with pre and post bariatric surgery has dramatically increased in scope and scale with the worldwide increase in the prevalence of obesity. Pre and post bariatric surgery self-management requires dietary management, adherence to diet restriction. Patients' outcomes have been demonstrated to improve when patients receive up-to-date, complete and accurate information about bariatric surgery and its care and management (Magallares & Schomerus, 2015).

Nurses are an indispensable part of this process, guiding patients' self-care practices through education and counselling (Zhang & Pan, 2021). Studies have indicated knowledge deficits regarding care and management among nurses working in the surgical ward especially patients with bariatric surgery (Idzik & Davenport, 2011). Insufficient knowledge about clinical practice guidelines for the identification, evaluation, and treatment of obesity and bariatric surgery has been found among American nurses (Idzik & Davenport, 2011). Studies in the United State of America (Balduf & Farrell, 2008) and France (Thuan & Avignon, 2005) also indicated nurses' needing further educational program in bariatric surgery management. In a Chinese study, nurses have a lack of knowledge in bariatric surgery combined conditions such as carcinoma (49.5%), gastroesophageal reflux disease (40.1%), and psychological disorders (49.1%), which are controversial issues in bariatric surgery (Fan et al., 2020). However, limited or no studies investigated nurses' knowledge of bariatric surgery and its care and management in Kurdistan-Iraq. Thus, these results indicate that the nurses from different countries may experience significant knowledge deficits of bariatric surgery. In Iraq, there remain deficiencies in the healthcare system suffering from a shortage of medical services (Business Monitor International, 2015). Many of the country's most pressing needs are for public health interventions, yet these are not fully addressed as the government is still struggling to restore basic functions. This study will provide a shed light at the level of knowledge regarding bariatric surgery among nurses in Iraq and helps to fill this gap in the literature as well as to evaluate the effectiveness of educational program on nurses' knowledge of care and management of patient with bariatric surgery.

Aims and objectives

The aim of this study was to evaluate the effectiveness of nursing instructional intervention program on nurses' knowledge of bariatric surgery and its care and management in Al- Sulaymaniyah, Iraq. The specific objectives were 1) to assess nurses' knowledge regarding bariatric surgery pre and post nursing instructional intervention; 2) examine relationships between nurses' knowledge of bariatric surgery and their socio-demographic related data

Method

A quasi-experimental design has been used in the present study addressing the effectiveness of an interventional program on nurses' knowledge of bariatric surgery and its care and management, at Surgical Teaching Hospital of Al-Sulaymaniyah City for the period of February 2nd 2021 up to the end of March 2022. The study recruited participants from the surgical ward at Surgical Teaching Hospital in Al-Sulaymaniyah Health Directorate, Iraq. Al-Sulaymaniyah Surgical Teaching Hospital is the largest hospital in Al-Sulaymaniyah, the second largest city in Kurdistan, north of Iraq, offering both primary and secondary health care. It has a primary healthcare centre, and a range of subspecialties including cardiac surgery, medicine, surgery, neurology, nephrology, urology and obstetrics/gynaecology. Because the researcher needs to meet the participants at the same time, environments and place, and to use the same teaching methods to perform the intervention program, the intervention program implemented for the study group of nurses in the Dr. Ali Ehssan classroom inside the hospital after getting an official permission. This hospital was chosen because it's received all adult patients with all surgery, it's the only teaching hospital in AL-Sulaymaniyah, the availability of the sample with a large number of nurses work in this hospital, and the availability of resources such as classrooms, chairs, tables, data show, computers, speakers, and lights during the implementation of the program. A non-probability, purposive sample consists of (50) nurses' working at Surgical ward in AL-Sulaymaniyah Surgical Teaching Hospital divided in two group: (25) nurses as intervention group were exposed to the nursing interventional program, and (25) nurses as a control group who were not exposed to the program. The study population consisted of nurses' who met the study inclusion criteria of being and working in the surgical teaching hospital (bariatric surgical wards) and having minimum of at least one year nursing work experience or more. Nurses who graduated from various nursing educational programs (college of nursing, nursing institute, secondary nursing schools. Nurses of both genders and who work at the morning and night shift were considered. Nurses were excluded if they are nurses who have already participated in the pilot study and unwilling to participate in this study or refused to participate in filling in the research forms. Data are collected through the use of the study questionnaires; the structured interview technique and the observation technique as means of data collection. Each interview takes approximately 15-25 minutes to be completed and the observation takes approximately 25-30 hours. Data collection was done at two times: baseline data (before any interventional program was provided to the study and control group) and data that are collected 21 days after giving the interventional program for study group.

Result

1-Participants' characteristics

Nurses' characteristics are presented in Table 1. Sociodemographic data did not differ significantly in the two study groups (Table 1).

Table (1)
Distribution of the Sample According to their Socio-demographic Characteristics

List	Characteristics	Study Group		Control Group		Comparison significance
		f	%	f	%	
1	Age group					
	20- less than year	25 2	8	3	12	$X^2= 17.954$ p-value= .327 Sig= N.S
	25-less than year	30 0	0	1	4	
	30-less than year	35 1	4	1	4	
	35-less than year	40 3	12	2	8	
	40-less than year	45 7	28	7	28	
	45 and more	12	48	11	44	
	Total	25	100	25	100	
2	Gender					
	Male	12	48	11	44	$X^2= 19.200$ p-value= .258 Sig= N.S
	Female	13	52	14	56	
	Total	25	100	25	100	
3	Years of employment					
	1-less than 6	3	12	2	8	$X^2= 13.959$ p-value= .561 Sig= N.S
	6-less than 11	2	8	2	8	
	11-less than 16	4	16	4	16	
	16-less than 21	5	20	4	16	
	21and more	11	44	13	52	
	Total	25	100	25	100	
4	Nursing qualifications					
	Nursing School	4	16	3	12	$X^2= 5.804$ p-value= .759 Sig= N.S
	Nsg High School	6	24	7	28	
	Nursing Institute	14	56	13	52	
	Nursing College	1	4	2	8	
	Total	25	100	25	100	
5	Participation in training session					
	Yes	4	16	5	20	$X^2= 3.741$ p-value= .053 Sig= N.S
	No	21	84	20	80	
	Total	25	100	25	100	
6	Number of training session					
	None	21	84	20	80	$X^2= 3.741$ p-value= .053 Sig= N.S
	One week	4	16	5	20	
	Total	25	100	25	100	
7	Duration of training session					
	None	21	84	20	80	$X^2= 3.741$ p-value= .053 Sig= N.S
	One week	4	16	5	20	
	Total	25	100	25	100	
8	Location of training session					
	None	21	84	20	80	$X^2= 3.741$
	National	4	16	5	20	

Total 25 100 25 100 p-value= .053
Sig= N.S

f: Frequency, %: Percentage, X²: Chi-square, df: degree of freedom, p: Probability, Sig: Significance, S: Significant, N.S: Not significant, Nsg: Nursing

Nurses general knowledge about bariatric surgery

(Table 2) presents the item related to nurses' general knowledge about bariatric surgery; the total percentage of nurses' correct answers were 13% during the pre-test time among those in the study group, while their correct responses is increased to 98% during the post-test time which indicate an improvement in their knowledge regarding bariatric surgery. Nurses in the control group reveal no significant difference in their percentage during the pre-test and post-test times in which their correct answers were 34% during the pre-test and 32.7% during the post-test time.

List	Items	Study group (N=25)								Control group (N=25)							
		Pre-test				Post-test				Pre-test				Post-test			
		Correct	Incorrect			Correct	Incorrect			Correct	Incorrect			Correct	Incorrect		
		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
1	Bariatric surgery status mean weight-loss surgeries	9	36.0	16	64.0	25	100.0	0	0.0	11	44.0	14	56.0	9	36.0	16	64.0
2	Bariatric Surgery: Change the personality	3	12.0	22	88.0	24	96.0	1	4.0	12	48.0	13	52.0	8	32.0	17	68.0
3	Bariatric surgery is very painful	3	12.0	22	88.0	24	96.0	1	4.0	10	40.0	15	60.0	8	32.0	17	68.0
4	Weight loss surgery has proven to be effective cure for obesity	1	4.0	24	96.0	24	96.0	1	4.0	9	36.0	16	64.0	11	44.0	14	56.0
5	Bariatric surgery make felling full sooner by allowing to eat and drink less at one time	6	24.0	19	76.0	25	100.0	0	0.0	8	32.0	17	68.0	12	48.0	13	52.0
6	The least complications of bariatric surgery is sleeve	2	8.0	23	92.0	25	100.0	0	0.0	10	40.0	15	60.0	8	32.0	17	68.0
7	Benefits for bariatric surgery: Rapid, sustained weight loss	6	24.0	19	76.0	25	100.0	0	0.0	13	52.0	12	48.0	8	32.0	17	68.0
8	Most common bariatric surgeries are Sleeve <u>Gastrectomy</u>	3	12.0	22	88.0	25	100.0	0	0.0	5	20.0	20	80.0	5	20.0	20	80.0
9	One of the three warning signs of a gastric leak Worsening abdominal pain and abdominal distention	3	12.0	22	88.0	25	100.0	0	0.0	5	20.0	20	80.0	7	28.0	18	72.0
10	Possible complication associated with bariatric surgery is hernia	2	8.0	23	92.0	24	96.0	1	4.0	3	12.0	22	88.0	10	40.0	15	60.0
11	The best describes how you feel about bariatric surgery: Bariatric surgery improves the quality of life for all obese patients who are compliant with	2	8.0	23	92.0	23	92.0	2	8.0	5	20.0	20	80.0	12	48.0	13	52.0

	postoperative instructions and diet																
12	BMI indicator for evaluating the level obesity	0	0.0	25	100.0	25	100.0	0	0.0	9	36.0	16	64.0	3	12.0	22	68.0
13	A phenotype of obese individuals (Sick Fat) in the bariatric surgery	0	0.0	25	100.0	24	96.0	1	4.0	8	32.0	17	68.0	5	20.0	20	68.0
14	metabolically unhealthy obese or "at risk" obese	5	20.0	20	80.0	25	100.0	0	0.0	4	16.0	21	84.0	4	16.0	21	84.0
15	Obesity is mainly related to genetic	2	8.0	23	92.0	24	96.0	1	4.0	7	28.0	18	72.0	6	24.0	19	76.0
16	The weigh to be considered for bariatric surgery is BMI of 40 over ideal body weight and having	5	20.0	20	80.0	25	100.0	0	0.0	17	68.0	8	32.0	15	60.0	10	40.0
	There are many contraindication of bariatric surgery is Severe heart failure																
Total percentage		13%		87%		98%		2%		34%		66%		32.7%		67.3%	

N: Sample size, f: Frequency, %: Percentage

Nurses' Knowledge about Pre and post bariatric surgery management

In table 3, item related to nurses' knowledge about pre-bariatric surgery nursing management show that the total percentage of study group nurses' correct answers were 12.5% during the pre-test time and 17.4% during the pre-test time. Their correct answer responses were increased to 96.6% during the post-test time and 94.8% during the post-test time, which indicate an improvement in their knowledge regarding pre-bariatric surgery nursing management. Nurses in the control group reveal no significant difference in their percentage during the pre-test and post-test times in which their correct answers were 34.4% during the pre-test and 33.7% during the post-test time.

List	Items	Study group (N=25)								Control group (N=25)							
		Pre-test				Post-test				Pre-test				Post-test			
		Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
		F	%	f	%	f	%	f	%	F	%	f	%	f	%	f	%
1	Preoperative evaluation should be holistic, integral, and include Dieticians	4	16.0	21	84.0	24	96.0	1	4.0	5	20.0	20	80.0	6	24.0	20	80.0
2	One of the past and present evolution of medical history include Detailed history	4	16.0	21	84.0	25	100.0	0	0.0	5	20.0	20	80.0	4	16.0	20	80.0
3	Evaluation for psychological preparation include Depression	4	16.0	21	84.0	25	100.0	0	0.0	3	12.0	22	88.0	3	12.0	22	88.0
4	Nutritional assessment and patient education will help guide the patient towards dietary modifications that are necessary Before surgery	2	8.0	23	92.0	25	100.0	0	0.0	5	20.0	20	80.0	6	24.0	20	80.0
5	Start complete liquid diet Two days before surgery	2	8.0	23	92.0	23	92.0	2	8.0	3	12.0	22	88.0	4	16.0	22	88.0
6	Preoperative fasting important for Prevented Prolong recovery	3	12.0	22	88.0	23	92.0	2	8.0	3	12.0	22	88.0	3	12.0	22	88.0
7	A guided weight loss plan is Necessary for bariatric surgery	1	4.0	24	96.0	25	100.0	0	0.0	3	12.0	22	88.0	2	8.0	22	88.0
8	The weight loss plan should include Nutritional assessment	6	24.0	19	76.0	23	92.0	2	8.0	5	20.0	20	80.0	5	20.0	20	80.0
9	pre-operative laboratory tests for the patient is Important	3	12.0	22	88.0	25	100.0	0	0.0	5	20.0	20	80.0	4	16.0	20	80.0
10	Pre-operative required Medical and Surgical Screening for Bariatric Surgery Abdominal ultrasound	3	12.0	22	88.0	24	96.0	1	4.0	7	28.0	18	72.0	8	32.0	18	72.0

11	Bowel preparation is important before surgery for Prevent obstruction	3	12.0	22	88.0	25	100.0	0	0.0	4	16.0	21	84.0	5	20.0	21	84.0
12	The bladder preparation (emptying\ catheterization) is important before surgery to Prevent trauma to the bladder	3	12.0	22	88.0	25	100.0	0	0.0	4	16.0	21	84.0	5	20.0	21	84.0
13	The skin preparations in the surgery day include Bathing by antiseptic solution	1	4.0	24	96.0	25	100.0	0	0.0	5	20.0	20	80.0	5	20.0	20	80.0
14	Preoperative of body wash by antimicrobial solution for bariatric surgery To avoid infections	3	12.0	22	88.0	23	92.0	2	8.0	7	28.0	18	72.0	7	28.0	18	72.0
15	Preoperative Exercise include Turning and lifting	5	20.0	20	80.0	23	92.0	2	8.0	4	16.0	21	84.0	4	16.0	21	84.0
16	The importance of preoperative Instructions regarding benefits for bariatric surgery is to Reduce Pain	5	20.0	20	80.0	24	96.0	1	4.0	5	20.0	20	80.0	5	20.0	20	80.0
17	Sleep study important to Pre-operative sleep test (polysomnography) to check for the condition	2	8.0	22	88.0	23	92.0	2	8.0	3	12.0	22	88.0	3	12.0	22	88.0
18	Preoperative H. pylori eradication versus standard care in patients undergoing bariatric surgery Done before surgery	1	4.0	24	96.0	24	96.0	1	4.0	4	16.0	21	84.0	4	16.0	21	84.0
19	The steps in pre-operative preparations for bariatric surgery are Creating awareness of the risks	5	20.0	20	80.0	25	100.0	0	0.0	4	16.0	21	84.0	4	16.0	21	84.0
Total percentage			12.5%	87.5%	96.6%			3.4%		17.7%	82.3%			20.8%		79.2%	

N: Sample size, f: Frequency, %: Percentage

There was a high significant difference in knowledge score for nurses in the study group with regard to post-test time at p-value= 0.001 which indicates that the educational program was highly effective, while there is no significant difference in nurses' knowledge with regard to post-test time table 4.

List	Items	Study group (N=25)								Control group (N=25)							
		Pre-test				Post-test				Pre-test				Post-test			
		Correct f	%	Incorrect f	%	Correct f	%	Incorrect f	%	Correct f	%	Incorrect f	%	Correct f	%	Incorrect f	%
1	A catheter is passed in to the bladder to collect urine When the patient is asleep in the operating room	12	48.0	13	52.0	24	96.0	1	4.0	11	44.0	14	56.0	13	52.0	14	56
2	The benefit of tube through the skin into the operated part of the stomach Check leak in to the abdomen from the surgical site	4	16.0	21	84.0	25	100.0	0	0.0	10	40.0	15	60.0	14	56.0	15	60
3	Bariatric patients can take for Pain relievers that are Acetaminophen-based, such as Tylenol	4	16.0	21	84.0	23	92.0	2	8.0	13	52.0	12	48.0	11	44.0	12	48
4	Tests After Surgery EGD	5	20.0	20	80.0	25	100.0	0	0.0	14	56.0	11	44.0	10	40.0	11	44
5	The eat and drink slowly Avoid dumping syndrome	1	4.0	24	96.0	23	92.0	2	8.0	10	40.0	15	60.0	2	8.0	15	60
6	The foods cannot be eaten after bariatric surgery Food with Empty Calories and High-Fat Food	3	12.0	22	88.0	25	100.0	0	0.0	7	28.0	18	72.0	4	16.0	18	72
7	Patients can return to work Within two to six weeks	3	12.0	22	88.0	24	96.0	1	4.0	7	28.0	18	72.0	7	28.0	18	72
8	Breathing exercises (Incentive Spirometer) after bariatric surgery important to Prevent pneumonia	3	12.0	22	88.0	24	96.0	1	4.0	6	24.0	19	76.0	6	24.0	19	76
9	Patients can start do heavy lifting First six weeks after surgery, do not lift any more than 15 lbs	1	4.0	24	96.0	24	96.0	1	4.0	2	8.0	23	92.0	10	40.0	23	92
10	Patients can Resume Driving After Weight Loss Surgery Week after bariatric surgery	2	8.0	23	92.0	24	96.0	1	4.0	4	16.0	21	84.0	7	28.0	21	84
11	Patients can take a bath or shower 48 hours after surgery	7	28.0	18	72.0	21	84.0	4	16.0	12	48.0	13	52.0	6	24.0	13	52
12	Inform the doctor if the patients develop a fever after bariatric surgery	9	36.0	16	64.0	23	92.0	2	8.0	14	56.0	11	44.0	7	28.0	11	44
13	Expectation after bariatric surgery is to improve type 2 diabetes or sleep apnea	5	20.0	20	80.0	25	100.0	0	0.0	7	28.0	18	72.0	7	28.0	18	72
14	Gastric bypass Cannot increase or decrease life span	8	32.0	17	68.0	23	92.0	2	8.0	7	28.0	18	72.0	7	28.0	18	72
15	Patient's follow-up visits for recognize Iron deficiencies	4	16.0	21	84.0	24	96.0	1	4.0	9	36.0	16	64.0	9	36.0	16	64
16	Schedule of Postoperative Visits 1-2 weeks after bariatric surgery	0	0.0	25	100.0	21	84.0	4	16.0	6	24.0	19	76.0	12	48.0	19	76
17	Support group meetings for bariatric surgery leads to Allow patients to surround themselves with people who understand and support their goals	3	12.0	22	88.0	25	100.0	0	0.0	7	28.0	18	72.0	14	56.0	18	72
Total percentage		17.4%		82.6%		94.8%		5.2%		34.4%		65.6%		33%		67%	

N: Sample size, f: Frequency, %: Percentage

There was a significant association among post-test nurses' knowledge with their qualification in nursing at p-value= 0.025 and with years of employment at p-value= 0.033, while there is no significant association is seen with other sociodemographic characteristics table 5.

Knowledge	Study Group (N=25)					Control Group (N=25)				
	M.	t	df	p-value	Sig.	M.	t	df	p-value	Sig.
Pre-test	59.60	46.666	48	.001	H.S	66.64	16.175	48	0.140	N.S
Post-test	102.20					63.72				

M: Mean, t: t-test, df: Degree of freedom, p: Probability, Sig.: Significance, HS: High Significant, N.S: Not Significant

Discussion

Participants' characteristics

Participants were 50 nurses in both study and control group employed at the Surgical Teaching Hospital of Al- Sulaymaniyah City, most were female of age $45 \leq$ years; most were female (52%) and held a diploma degree (54%), with $21 \leq$ years of nursing work experiences. The majority (84%) of nurses in the study group did not participate in the national training session of bariatric surgery. Self-rated their competency in providing diabetes care as fair; 20.6% rated it as good/excellent. More than 50% of nurses were currently providing diabetes care and had access to diabetes management policies or guidelines but few (15%) had attended any diabetes education programs. The study result shows that most of the nurses works in bariatric surgery have long experience that most of them with 21 years of employment. However, nurses may insufficiently care for patients, with all respect to these range of years of experience in bariatric surgery gives indication that continually many nurses were moved from these wards, which have a negative consequence on the quality of care provided to the patients regarding bariatric surgery. Interpret of this result related to updating knowledge and practice toward bariatric surgery, the nurse work at bariatric surgery should participate in updating knowledge through participate in sessions.

Nurses knowledge of bariatric surgery

The study results reveal that presents the item related to nurses' general knowledge about bariatric surgery; the total percentage of nurses' correct answer refer to 13% during the pre-test time among those in the study group, while their correct responses are increased to 98% during the post-test time which indicate an improvement in their knowledge regarding bariatric surgery. The nurses in the control group reveal no significant difference in their percentage during the pre-test and post-test times in which their correct answer was 34% during the pre-test and 32.7% during the post-test time. The result of study supported by a Swiss study by (Bucher Della Torre et al., 2018) showed that the reason why some doctors and nurses did not have knowledge and skills bariatric surgery is due to a lack of guidelines of bariatric surgery and lifestyle; after that study, Geneva revised a pre graduate and postgraduate curriculum for medical students and doctors, as well as health care providers. Also the result shows the correct responses is increased to 98% during the post-test time which indicate an improvement in their knowledge regarding bariatric surgery clarify of this result refers to effect of education program in enhance nurses knowledge.

The study results indicates that nurses' knowledge about pre-bariatric surgery nursing management were 12.5% during the pre-test time among those in the study group, this percentage increased to 96.6% during the post-test time which indicate an improvement in their knowledge regarding pre-bariatric surgery nursing management. This indicate that most of nurses don't have efficient knowledge about pre-bariatric surgery nursing management at pre-test. Sikorski et al. (2013) stated that knowledge and attitudes towards obesity and bariatric surgery in nurses have been seldom studied and attention to the miss understandings and gaps should take. This information is useful to improve perioperative nursing care, improved postoperative follow-up rates, and thus better patient outcomes. The American Association of Nurse Practitioners (2018) reported that nurses have poor knowledge about bariatric surgery and obesity and there is a critical need to address not just the body, but the biological, sociological, and psychological factors that make obesity a complex disease and not a personal choice. The online intervention program introduced techniques to increase patients' health literacy by providing details on the science and pathophysiology of the disease of obesity in the first module.

The study showed that nurses' general knowledge about post-bariatric surgery nursing management with correct answers refer to 17.4% during the pre-test time, their correct responses were increased to 94.8% during the post-test time which indicate an improvement in their knowledge regarding post-bariatric surgery nursing management. This indicate that nurses' knowledge deficit regarding bariatric surgery might be due to the new technique for the treatment of obesity, nurses may not familiar themselves with the obesity and bariatric surgery in all levels of education for nursing, they do not have any training courses about bariatric surgery, and they do not develop and update their knowledge continuously. The results of this study agreed with (Mansour et al., 2019) showed that more than two-thirds of studied nurses (73.3%) had poor knowledge and practice. The findings of this study agreed with (Fan et al., 2020) concluded that the nurses have poor knowledge of obesity-related metabolic disorders and also have poor acceptance of surgical treatment modalities.

Relationships between nurses' characteristics and diabetes knowledge

Concerning the result related to associations between nurses' knowledge and demographical data, this study reveals that there is significant effect of an educational program on study group. The results of the present study are supported by other studies that indicated significant effects of instructional program in study group (Wadi Al-Azawi & Hameed, 2021) argued that nurses' demographic data did not affect the results in control group while effects in study group. Summery from above result that improving nurses' knowledge of bariatric surgery will ultimately improve quality of care among the nursing staff, enhance their skills of bariatric care offered to the patients. Increased awareness among the nursing staff may lead to improved health outcomes in the long term.

Conclusion and recommendations

There was a low level of knowledge regarding patient management in bariatric surgery among nurses and the intervention program was effective in the

improvement of nurses' knowledge of the bariatric surgery and modifying health management. Thus, more efforts should be done to educate nurses about the bariatric surgery so that encourage nurses to teach patients during the pre and post period about the bariatric surgery. Furthermore, Establishing, and implementing gastric rehabilitation program in all bariatric centres. Therefore, all nurses should be involved in such program as soon as their health condition is stable. Finally, future studies are needed to evaluate and investigate the effectiveness of other health knowledge variables like cues to action and/or self-efficacy and realize if that is effective on improving nurses' knowledge. This will be supported by a theoretical model in the health education and health promotion in order to find the different viewpoint on the issues of bariatric surgery.

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