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- **Basic Research**

## **Effect of educational nursing strategies based on health promotion model on health patterns of women with endometriosis**

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### **Abstract**

**Introduction:** Endometriosis is one of the most common gynecological diseases, affecting approximately 6–10% of all women. **Aim:** The study aimed to evaluate the effect of educational nursing strategies based on health promotion model on health patterns of women with endometriosis.

#### **Methods:**

**Design:** A quasi-experimental study design. **Setting:** The study was conducted at endoscopic unit and gynecological outpatient clinic at Zagazig University hospital **Sample:** A purposive sample of 61 women with a medically confirmed laparoscopic diagnosis of endometriosis

**Tools:** Structured interviewing questionnaire, health promotion lifestyle profile-II.

**Results:** There was a statistically significant difference between both the level and the mean scores of women's information about endometriosis before and after nursing strategies based on a health promotion model (t-test =63.964& P<0.000) (t-test = 25.730& P <0.000) respectively. Additionally total mean scores of health-promoting model constructs increased from 114.16±14.89 before implementation to 173.79±7.73 after implementation of nursing strategies. Also, there was no statistically significant relation between women's characteristics and level of women's information about endometriosis before and after nursing strategies implementation.

**Conclusion:** Application of nursing strategies based on health promotion model improved women's knowledge and had a positive effect on health patterns of women with endometriosis. Therefore, the study hypothesis was supported.

**Recommendation:** Use booklets and posters as methods to increase women's awareness regarding endometriosis to encourage them to adapt healthy lifestyle.

**Key words:** Nursing strategies, Health promotion model, health patterns, Endometriosis.

**Introduction:**

Endometriosis is one of the foremost common gynecological illnesses which can be defined as the presence of endometrium in an abnormal or ectopic location. Histologically, it is the presence of endometrial-like tissue or glands outside the uterine cavity <sup>(1)</sup>. Endometriosis has negative impact on confidence, self-esteem and life patterns of women <sup>(2)</sup>.

Endometriosis affected approximately 50% of infertile women and 50–60% of women of childbearing age and adolescent with various forms of pelvic pain <sup>(3)</sup>. Endometriosis symptoms includes difficult, heavy or irregular menstruation, difficult intercourse, difficult urination, chronic pain in pelvis and lower abdomen, infertility and others such as diarrhea or constipation, chronic fatigue, nausea ,vomiting, headaches. <sup>(4)</sup>.

The Health Promotion Model (HPM) is a broadly utilized demonstrate of human behavior and contains builds related to behavior alter, which can offer assistance to investigate the variables affecting wellbeing advancement behavior <sup>(5)</sup>. The HPM shows that people trying to improve the health by interacting with the physical and interpersonal environment <sup>(6)</sup>.

The health promotion model has been recognized as a framework for explaining healthy lifestyle and health-promoting behaviors and it is one of the comprehensive models used for accomplishing health-promoting behaviors. This model serves as a guide in discovering individuals' complex biological-psychological processes in order to promote their health behaviors and explains how individuals make decisions about their health-promoting behaviors. The studies conducted by Pender have revealed the dimensions of health-promoting behaviors as spiritual growth, health responsibility, physical activity, nutrition, interpersonal relations and stress management <sup>(7)</sup>.

Nurses have an important role to promote health by providing women with endometriosis with support and knowledge needed as well as nurses play an important role in providing education in order to facilitate and empower the women to promote/initiate lifestyle-related behavioral changes that promote positive health status outcomes. <sup>(8)</sup> Nurses play a critical part in raising mindfulness of the endometriosis and giving all encompassing, individualized care for women with endometriosis. Nurses play a key part in understanding educating, health promotion to diminish illness progression, moving forward quality of life and diminishing the chance for future infertility. <sup>(9)</sup>

### **Significance of the study**

The prevalence of endometriosis about 176 million worldwide <sup>(10)</sup>. The prevalence of endometriosis was 2%–10% of women in childbearing age, but it can even rise up to 30%–33% in infertile women or women with chronic pelvic pain. <sup>(11)</sup> While, in Egypt the prevalence of endometriosis is difficult to determine because of lack of documentation or filling system for cases of endometriosis while Egyptian prevalence of endometriosis in adolescents with severe dysmenorrhea was 12.3%. <sup>(12)</sup> However, more than 4 million reproductive age women have diagnosed with endometriosis in the United States. <sup>(13)</sup>

### **Aim of the study:**

The study aimed to evaluate the effect of educational nursing strategies based on health promotion model on health patterns of women with endometriosis.

### **Research hypothesis:**

Educational nursing strategies based on health promotion model will have a positive effect on promoting healthy patterns of women with endometriosis.

### **Operational Definitions:**

**Nursing strategies.** Do best to provide quality patient care at the proper time and in the proper place.

**Endometriosis.** It is a condition or disease, when endometrial tissue, that normally lines the inner surface of the body of the uterus, is found elsewhere.

**The health promotion model.** It is a widely used model of human behavior that describes the multi-dimensional nature of persons as they interact within their environment to pursue health.

### **Subjects and Method:**

#### **Research design:**

A quasi-experimental design was used to achieve the aim of the study.

#### **Setting:**

The study was conducted in the endoscopy unit and gynecology outpatient clinic at Zagazig University Hospital.

**Sample type:** Purposive sampling was used for this study.

### **Study sample**

The study sample consisted of 61 women who underwent a laparoscopic diagnosis of endometriosis who received treatment and follow-up in the outpatient clinic of gynecology at Zagazig University Hospital for a period of six months. Further, women do not have any medical or gynecological problems without endometriosis

### **Data collection:**

#### **Tool (I): A structured interviewing Questionnaire:**

It was developed by the investigators. It was written in simple Arabic language.

**Part A. Women's personal characteristics** as (age, level of education, occupation, residence, marital status).

#### **Part B. Women's knowledge regarding endometriosis**

It was adopted from **Abd El-Mouty (2016)** <sup>(14)</sup>. This part included items written in the form of multiple-choice questions. It included (definition of endometrium, risk factors, causes of endometriosis, treatment ....etc)

#### **Scoring system:-**

Each questions was assigned a score of (1) for correct, a score (0) for incorrect. The total score of each section was calculated by summation of the scores of its items. The total score for the knowledge of a participant was calculated by the addition of the total score of all sections. The mean and standard deviation was calculated. As well As women total knowledge score was classified as the following:

- Adequate  $\geq 60$  % of total knowledge score.
- Inadequate  $< 60\%$  of total knowledge score.

#### **Tool II: Health promotion model constructs:**

It was adapted from **Alzahrani (2019)** <sup>(15)</sup>.The Health Promoting model constructs questionnaire is based on Pender's Health Promotion Model, which conceptualizes health patterns of women with endometriosis. It was composed of 50 items and six subdomains:

**Part(1) Health responsibility subdomain:** It consisted of (9) items in relation to (report any unusual signs or symptoms to a physician or other health professional, read or watch

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TV programs about improving health, question health professionals in order to understand their instructions, get a second opinion when I question my health care provider's advice, discuss my health concerns with health professionals, inspect my body at least monthly for physical changes/danger signs, ask for information from health professionals about how to take good care of myself, attend educational programs on personal health care and seek guidance or counseling when necessary).

**Part(2) *Physical activity subdomain:*** It consisted of (6) items in relation to (follow a planned exercise program, exercise vigorously for 20 or more minutes at least three times a week such as brisk walking, cycling and using a stair climber), take part in light to moderate physical activity such as sustained walking from (20minutes) to (30-40 minutes), take part in leisure-time (recreational) physical activities (such as swimming, dancing and cycling), do stretching exercises at least 3 times per week and get exercise during usual daily activities (such as movement during daily activities and using stairs instead of elevators).

**Part(3) *Nutrition subdomain:*** It consisted of (9) items in relation to (eat plenty of fruits full of vitamins, minerals and dietary fiber such as pomegranate and guava, eat vegetables that contain vitamins and high fiber such as cauliflower, cabbage and turnips, eat diet rich in healthy omega-3 fats such as salmon, herring, tuna and mackerel, avoid red meat especially processed meat such as pastrami and luncheon, avoid eggs, milk and dairy products, avoid foods containing sugar, alcohol and caffeine, avoid foods that contain saturated fats such as pans and butter, avoid processed and fast foods containing food dyes and preservatives and eat breakfast.(

**Part (4) *Spiritual growth subdomain:*** It consisted of (9) items in relation to (feel I am growing and changing in positive ways, believe that my life has purpose, look forward to the future, feel content and at peace with myself, work toward long-term goals in my life, find each day interesting and challenging, am aware of what is important to me in life, feel connected with some force greater than myself and expose myself to new experiences and challenges.(

**Part(5) *Interpersonal relationship subdomain:*** It consisted of (9) items in relation to (discuss my problems and concerns with people close to me, praise other people easily for their achievements, maintain meaningful and fulfilling relationships with others, spend time with close friends, find it easy to show concern, love and warmth to others, touch and am touched by people I care about, find ways to meet my needs for intimacy, get support from a network of caring people and settle conflicts with other through discussion and compromise).

**Part(6) *Stress management subdomain:*** It consisted of (8) items in relation to (get enough sleep, take some time for relaxation each day, accept those things in my life which I cannot

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change, concentrate on pleasant thoughts at bedtime, use specific methods to control my stress, balance time between work and play, pace myself to prevent tiredness and practice relaxation or mediation for 15-20 minutes daily).

**Scoring system:**

A 4-point Likert scale with four reactions: 1 (never), 2 (sometimes), 3 (often), and 4 (routinely). The total score was obtained by calculating the mean of reactions to all items. In addition, the total score of each subscale was computed by calculating the mean of responses to that subscale's items. Overall, total scores range from good ( $> 75\%$ ), average ( $50- < 75\%$ ) and poor ( $< 50\%$ )

**Tool Validity:**

The validity of questionnaire was reviewed by 5 jury experts (three experts in the field of obstetrics & woman health nursing and two physicians in the field of obstetrics and gynecology) to ascertain clarity, relevance, comprehensiveness, and applicability of tools.

**Tool reliability**

Reliability was determined by Cronbach's alpha, and the internal consistency of knowledge and health promotion model were 0.89 and 0.75, respectively.

**Ethical Considerations**

Permission was obtained from those responsible for the setting of the study to conduct the study. The researchers then explained the aim of the study to the women before collecting the data.

They took oral consent to participate in the study and to ensure confidentiality.

The women were free to withdraw from study at any time.

**Pilot study**

The pilot study was conducted on 10% of the total sample (6 women) before starting to collect data to estimate the time required and to verify the simplicity, clarity, and applicability of the designed tools. No modifications have been made. Thus, the pilot study was included in the study sample.

**Field of study**

The study was carried out from April 2021 to September 2021, covering six months. The researcher visited the pre mentioned setting from 9 am to 1 pm, three days per week (Sunday, Tuesday and Thursday) until the predetermined size of sample was completed. The study was carried out in three phases.

**Assessment phase:**

Researchers interviewed women with introduce themselves, greet them, explain the aim of the study, and obtain oral consent from the women to collect baseline data for the study. Also, design sessions for educational strategies.

The researchers collected the women's personal characteristics and the information related to endometriosis. As well as the health patterns of women with endometriosis.

The interview process took 3 days a week from 9 to 12 pm, and each woman was interviewed individually. The number of women interviewed was 1-2 women/day. Each woman was assured that the data obtained would be confidential and would only be used for the purpose of the study.

The average time required to complete the questionnaire was about 15-20 minutes.

**Implementation Phase (visits 2-3)**

The researchers attended three times a week (Monday and Wednesday) to the setting of the study. The duration of the educational strategies lasted 4 weeks. It included 4 sessions (each session lasted 25-30 minutes, and these sessions were applied in the waiting area of the Gynecology outpatient clinic of Zagazig University Hospital.

The researchers followed the women and the applied strategies using the health promotion model. At the beginning of each session, the researchers began by presenting a summary of the previous session and an explanation of the purpose of the new session, using simple Arabic language appropriate to the level of understanding of the woman.

The first session (orientation session) included providing women information about endometriosis (meaning, causes, risk factors, signs & symptoms, management).

The second session was related to responsible health and nutrition. Encourage women to report unusual signs or symptoms to a doctor or other health professional and to seek guidance or advice when necessary, and to follow healthy eating habits (foods rich in

omega-3s, fruits, and vegetables). The researchers used visual aids as "images" for convenience.

The third session focused on personal relationships and exercises. Interpersonal relationships included instructions such as discussing any problems and concerns with individuals close to the person, maintaining meaningful and satisfying relationships with others, and spending time with close friends. In addition to describing the different types of exercises for women' such as walking, jogging, cycling, aerobics and gymnastics under supervision of gynecologist.

The fourth session included stress and pain management. The women were taught how to deal with stress with some instruction getting enough sleep, focusing on wonderful ideas, taking time to relax each day, doing breathing exercises, and engaging in a support group. Teaching women ways to relieve pain including heat and massage. In addition to using alternate sexual positions to reduce dyspareunia under supervision of gynecologist. The researchers also gave the woman the educational booklet at the end of the sessions. The researchers also communicated with women via telephone call or E-mail for follow up, instruction and reinforcement.

### **Evaluation Phase:**

The evaluation was performed one month after the implementation of educational nursing strategies. Women's knowledge of endometriosis and health patterns of women with endometriosis were assessed. The researchers evaluated the effect of educational nursing strategies based on the health promotion model on the health patterns of women with endometriosis by comparing pretest and posttest results.

### **Administrative design**

Official written approval was obtained to conduct the study from the Dean of the Faculty of Nursing to the Director of Zagazig University Hospital to obtain their approval to conduct the study.

### **Statistical design:**

Data were verified prior to computerized entry. The Statistical Package for Social Sciences (SPSS version 21.0) was used for that purpose, followed by data tabulation and analysis. Descriptive statistics were applied (e.g., mean, standard deviation, frequency and percentages). Paired t-test, Chi-square test and Pearson correlation coefficients were used.



A significant level value was considered when  $p \leq 0.05$ , a highly significant level value was considered when  $p < 0.001$ .

### Results:

**Table 1** shows that 44.3% of women had age 20-<30 years and 30 - <40 years with mean age of  $29.62 \pm 7.17$  years. A high percentage, (68.9%, 39.3%) of them were from rural and attended Secondary education, respectively. Concerning marital status and occupation, 88.5% & 73.8% of them were married and housewife, respectively.

**Figure 1** shows that 62% of studied women had no information about endometriosis and 18% of them had information from friends.

**Table 2** shows that there was a statistically significant difference between the mean scores of women's information about endometriosis before and after implementation of nursing strategies based on health promotion model (t-test = 25.730 &  $P < 0.000$ ). Additionally, there is a statistically significant difference between the level of women's information about endometriosis before and after nursing strategies based on health promotion model ( $X^2 = 63.964$  &  $P < 0.000$ )

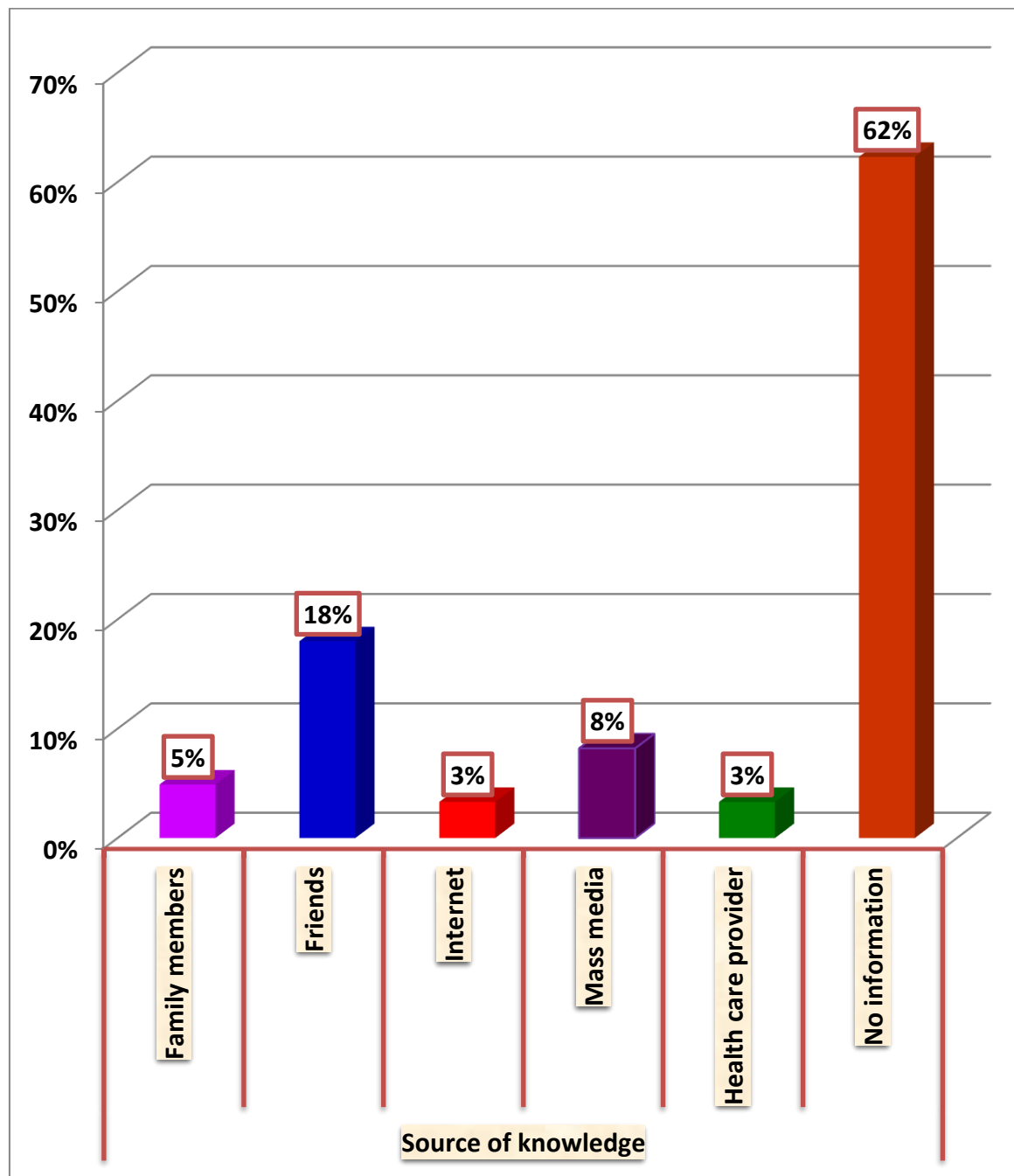
**Table 3** reveals that there was significant difference between the mean scores of health-promoting model constructs before and after implementation ( $P < 0.000$ ). Additionally total mean scores of health-promoting model constructs increased from  $114.16 \pm 14.89$  before implementation to  $173.79 \pm 7.73$  after implementation nursing strategies based on health promotion model.

**Table 4** reveals that there was a statistically significant difference between the levels of health promoting model constructs before and after implementation of nursing strategies based on health promotion model.

**Table 5** reveals that there was no statistically significant relation between women's personal characteristics and level of women's information about endometriosis before and after implementation of nursing strategies based on health promotion model.

**Table (1): Personal characteristics of studied women (n = 61)**

<b>Personal characteristics</b>	<b>No.</b>	<b>%</b>
<b>Age</b>		
>20 years	3	4.9%
20 - > 30 years	27	44.3%
30 - > 40 years	27	44.3%
>40 years	4	6.6%
<b>Mean <math>\pm</math>SD</b>	<b>29.62<math>\pm</math>7.17</b>	
<b>Residence</b>		
Rural	42	68.9%
Urban	19	31.1%
<b>Education</b>		
Read and write	18	29.5%
Primary education	4	6.6%
Secondary education	24	39.3%
University education	15	24.6%
<b>Marital status</b>		
Single	3	4.9%
Married	54	88.5%
Divorced	2	3.3%
Widowed	2	3.3%
<b>Occupation</b>		
House wife	45	73.8%
Employee	16	26.2%



**Figure 1.** Sources of women's information about endometriosis

**Table 2: Women's information about endometriosis before and after nursing strategies based on health promotion model (n = 61)**

Women's information about endometriosis	Nursing Strategies based on health promotion model				test	P-value
	Before		After			
<b>Mean ± SD</b>	2.77±3.05		15.30±2.24		t = -25.730-	.000
<b>Level</b>	No	%	No	%	X <sup>2</sup> = 63.964	.000*
• <b>Poor</b>	51	83.6%	7	11.5%		
• <b>Average</b>	6	9.8%	25	41.0%		
• <b>Good</b>	4	6.6%	29	47.5%		

**Table 3: Mean scores of health-promoting model constructs before and after implementation of nursing strategies based on health promotion model (n = 61)**

Health-promoting model constructs	Mean ± SD		t test	P-value
	Before	After		
<b>Health Responsibility</b>	14.8±2.71	29.72±3.80	24.835	.000
<b>Physical Activity</b>	10.23±2.58	20.36±2.39	23.697	.000
<b>Nutrition</b>	44.26±10.38	30.77±3.20	9.432	.000
<b>Spiritual Growth</b>	15.08±3.95	32.08±3.15	74.200	.000
<b>Interpersonal Relations</b>	15.85±3.53	32.21±1.92	113.045	.000
<b>Stress Management</b>	13.93±3.19	28.64±2.60	25.738	.000
<b>Total score</b>	114.16±14.89	173.79±7.73	26.063	.000

**Table 4: Total level of health promoting model before and after nursing strategies (n = 61)**

Health-promoting model constructs		Nursing Strategies based on health promotion model				Chi-square test	P Value
		Before		After			
		No	%	No	%		
Health Responsibility	Low	18	29.5%	10	16.4%	8.65	.013*
	Moderate	33	54.1%	27	44.3%		
	High	10	16.4%	24	39.3%		
Physical Activity	Low	22	36.1%	5	8.2%	46.638	.000*
	Moderate	32	52.5%	12	19.7%		
	High	7	11.5%	44	72.1%		
Nutrition	Low	25	41.0%	10	16.4%	18.665	.000*
	Moderate	29	47.5%	24	39.3%		
	High	7	11.5%	27	44.3%		
Spiritual Growth	Low	38	62.3%	5	8.2%	55.037	.000*
	Moderate	19	31.1%	16	26.2%		
	High	4	6.6%	40	65.6%		
Interpersonal Relations	Low	30	49.2%	1	1.6%	85.344	.000*
	Moderate	29	47.5%	8	13.1%		
	High	2	3.3%	52	85.2%		
Stress Management	Low	21	34.4%	2	3.3%	34.859	.000*
	Moderate	30	49.2%	20	32.8%		
	High	10	16.4%	39	63.9%		
Total Level	Low	35	57.4%	10	16.4%	31.722	.000*
	Moderate	25	41.0%	31	50.8%		
	High	1	1.6%	20	32.8%		

\*. The Chi-square statistic is significant at the .05 level.

**Table 5: Relation between women's personal characteristics and level of women's information about endometriosis before and after nursing strategies (n = 61)**

Women's personal characteristics	Women's information about endometriosis											
	Before						After					
	Poor		Average		Good		Poor		Average		Good	
	No	%	No	%	No	%	No	%	No	%	No	%
Women's age												
<20years	3	5.9	0	0.0	0	0.0	1	14.3	1	4.0	1	3.4
20-<30 years	22	43.1	3	50.0	2	50.0	1	14.3	13	52.0	13	44.8
30 - <40 years	24	47.1	2	33.3	1	25.0	3	42.9	10	40.0	14	48.3
>40 years	2	3.9	1	16.7	1	25.0	2	28.6	1	4.0	1	3.4
Chi-square	4.815						9.242					
P Value	.568						.16					
Residence												
Rural	37	72.5	2	33.3	3	75.0	5	71.4	17	68.0	20	69.0
Urban	14	27.5	4	66.7	1	25.0	2	28.6	8	32.0	9	31.0
Chi-square	3.925						.030					
P Value	.14						.985					
Level of education												
Read and write	17	33.3	1	16.7	0	0.0	2	28.6	6	24.0	10	34.5
Primary	4	7.8	0	0.0	0	0.0	1	14.3	2	8.0	1	3.4
Secondary	19	37.3	2	33.3	3	75.0	2	28.6	13	52.0	9	31.0
University	11	21.6	3	50.0	1	25.0	2	28.6	4	16.0	9	31.0
Chi-square	5.722						4.665					
P Value	.455						.587					
Marital status												
Single	3	5.9	0	0.0	0	0.0	0	0.0	2	8.0	1	3.4
Married	44	86.3	6	100.0	4	100.0	6	85.7	21	84.0	27	93.1
Divorced	2	3.9	0	0.0	0	0.0	0	0.0	2	8.0	0	0.0
Widowed	2	3.9	0	0.0	0	0.0	1	14.3	0	0.0	1	3.4
Chi-square	1.55						7.376					
P Value	0.956						.287					
Occupation												
Housewife	38	74.5	4	66.7	3	75.0	5	71.4	18	72.0	22	75.9
Employee	13	25.5	2	33.3	1	25.0	2	28.6	7	28.0	7	24.1
Chi-square	.174						.126					
P Value	.9						.939					

**Discussion:**

Endometriosis is a common gynecological disorder, with a reported prevalence of 2–10% in women of reproductive age which affect the physical and mental well-being and quality of life. It profoundly impairs the pattern of life of the women with a negative impact on social and family life (Méar et al., 2020) <sup>(16)</sup>. Health promotion model is a descriptive model that help people achieve higher levels of well-being and detects underlying factors that contributes to better healthy behaviors. (Khodaveisi et al., 2020) <sup>(17)</sup>.

Regarding personal characteristics of the studied women, the result of the present study showed that less than half of women had age 20-<30 years and 30 - <40 years with mean age of  $29.62 \pm 7.17$  years. Also more than two thirds of them were from rural areas and majority of them were married and nearly three quarters of them were housewife, respectively. These findings were in harmony with Yousif et al., (2019) <sup>(18)</sup> who studied "implemented nursing strategies based on health promotion model for alleviating endometriosis relating symptoms, Egypt" illustrated that the mean age of the women of both groups respectively were ( $28.14 \pm 3.92$  &  $27.23 \pm 4.56$  years), nearly half of the studied women on both groups had secondary education. Most of studied women on both groups were married.

Concerning level of education, it was clear that more than one third of studied women attended Secondary education. Level of education might affect the size of the information because scientific level increased, the bulk of knowledge must be increased. In addition this may help to be able to understand the steps of nursing strategies and encourage them to apply the model well. This result of the current study came in agreement with Ghonemy & El Sharkawy, (2017) <sup>(15)</sup>. who conducted a quasi-experimental study under a title "impact of changing lifestyle on endometriosis related pain, Cairo, Egypt" reported that women age ranged between 19-39 years old with mean of ( $29.8 \pm 4.02$ ). More than three quarters of the women had completed technical secondary school education.

The result of the current study disagreed with Sayed and Aboud, (2018) <sup>(19)</sup>. who studied " effect of an educational intervention on quality of life and sexual Function in women with Endometriosis, Benha, Egypt" indicated that the mean age of the study and control groups was ( $32.29 \pm 2.58$  &  $31.54 \pm 2.91$  ) respectively. More than three quarters of both groups lived in rural area and more than half of both groups respectively were housewives. Less than two thirds of both groups had a secondary education.

Additionally, there is a statistically significant difference between the mean scores of women's information about endometriosis before and after implementation of nursing strategies. Additionally, there is a statistically significant difference between the level of women's information about endometriosis before and after nursing strategies. This may be

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due to, before implementation of nursing strategies the endometriosis topic is vague, not easy to detect, diagnose and differentiate it from other similar manifestation of other diseases and reduced role of mass media in handling this health problem. Also, Egyptian women tolerate pain and don't make annual follow up check. While after implementation of nursing strategies, women are interested in contents used during the educational session that included a healthy diet, exercise and non-pharmacological management that help them to acquire knowledge of how to adapt with endometriosis to change patterns of life.

This result was in accordance with Mohamed & Hassan, (2020)<sup>(13)</sup> who studied " effect of instructional supportive guideline for improving women's awareness towards endometriosis, Egypt" demonstrated that there was a statistical significant difference of the studied women's knowledge about the endometriosis after the educational session and at follow up time compared to their knowledge before it (p-value <0.001). This result was consisted with Abd El-Mouty et al., (2016)<sup>(14)</sup>. who studied "raising awareness of working women in Mansoura university towards endometriosis: a follow up study, Egypt" stated that score of knowledge after program implementation was significantly increased compared to pre implementation.

Concerning mean total score of health promoting model constructs before and after nursing strategies implementation, the result of current study clarified that there is significant difference between the mean scores of health-promoting model constructs before and after implementation. This result confirmed the achievement of current research hypothesis. These finding may be due to support healthy behavior is the main goal of health promotion and healthy behavior is a result of a multidimensional health patterns (healthy nutrition, physical exercise, social & psychological support).

The results of current study were supported by Yousif et al., (2019)<sup>(18)</sup> who showed that there is a highly statistical significant improvement on total score and subtotal score of health promotion lifestyle profile-II five domains post intervention and at follow-up on intervention group. Conversely, the improvement on all score and subtotal score on control group was not significant.

Concerning health responsibility, the results of the present study clarified that there was a highly statistical significant difference regarding health responsibility before and after nursing strategies implementation (P < 0.001). This may be due to women accepted the disease meant that they focused on learning to live with endometriosis. Having a good knowledge base and understanding of the disease is more important for women to regain some control of their health, more women control is associated to improved health outcomes.



As regards physical activity, the results of the current study showed that there was a highly statistical significant difference regarding physical activity before and after nursing strategies implementation. The results of current study were in the same line with *Awad et al., (2017)*<sup>(20)</sup> who conducted a study in Egypt under a title " efficacy of exercise on pelvic pain and posture associated with endometriosis: within subject design" illustrated that eight weeks of an exercise program is very effective in decreasing pain and postural abnormalities associated with endometriosis.

Regarding nutrition, the results of the present study cleared there was a highly statistical significant difference regarding nutrition before and after nursing strategies implementation. This result was in harmony with *Karlsson et al., (2020)*<sup>(21)</sup> who studied " experiences of health after dietary changes in endometriosis: a qualitative interview studies, Sweden "illustrated that women experienced an increase in well-being and a decrease in symptoms following their dietary and lifestyle changes. They also felt that the dietary changes led to increased energy levels and a deeper understanding of how they could affect their health by listening to their body's reactions.

As regards spiritual growth, the results of the present study showed that there was a highly statistical significant difference regarding spiritual growth before and after nursing strategies implementation. It may be due to women who received good spiritual care reported greater quality of life, better coping and such support is strongly associated with greater well-being, hope, optimism and reduction of despair at end of life.

This result was in accordance with *Roomaney & Kagee, (2016)*<sup>(22)</sup> who studied "coping strategies employed by women with endometriosis in a public health-care setting, South Africa" demonstrated that spirituality was an important coping resource for them. Women reported that during times of pain they questioned God, spoke to God or read from the bible for relief.

Concerning interpersonal relationship, the results of the present study demonstrated that there was a highly statistical significant difference regarding interpersonal relations before and after nursing strategies implementation. It may be due to when women received support from family and friends improve their self-esteem, help them compliance with treatment and have a positive effect on women well-being and quality of life.

The results of the present study were supported by *Van Niekerk et al., (2020)*<sup>(23)</sup> who studied "emotional intimacy, empathic concern and relationship satisfaction in women with endometriosis and their partners, Australia" reported that healthcare providers are encouraged to engage partners of women diagnosed with endometriosis in education and treatment processes to ascertain and improve where needed, the emotional intimacy and empathic concern experienced by the couple.

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According to stress management, the result of current study demonstrated that there was a highly statistical significant difference regarding stress management before and after nursing strategies implementation. This result of current study agreed with *Evans et al., (2019)*<sup>(24)</sup> who studied "psychological and mind-body interventions for endometriosis: a systematic review, USA" pointed out that psychological and mind-body interventions such as (yoga, mindfulness and relaxation) show promise in alleviating pain, anxiety, depression, stress and fatigue in women with endometriosis. This may be due to when women focused on other things such as exercise and yoga, this leads to decrease stress and alleviating depression.

The result of current study showed that total health promotion lifestyle profile-II improved before and after nursing strategies implementation. This may be due to women's active participation and good communication with researchers besides educational nursing strategies that plays a very important role in helping woman to adapt healthy patterns regarding endometriosis.

As regards relation between total knowledge score and personal characteristics of studied women before and after program implementation, these findings indicated that there were no statistical significant relation between total knowledge and personal characteristics of studied women before and after program implementation. This might be due to disease is not common among a large slide of women so there was limited information of women about endometriosis. In addition to researcher's point of view that lacks of attentiveness, awareness and understanding of the endometriosis have harmful impact on the course of disease so it becomes worse.

On the other hand, *Mohamed & Hassan, (2020)*<sup>(13)</sup> mentioned that there was statistical significant relations between the women's total level of knowledge and their age and women's educational level ( $p\text{-value} < 0.05$ ). These findings stated that aging and levels of education of women play an important role in achieving more information about the disease as woman with higher education were more likely to have adequate and correct knowledge. Also the result of current study agreed with *Abd El-Mouty et al., (2016)*<sup>(14)</sup> who demonstrated that the average score of knowledge was significantly differ at different age groups before education session and after education. This may be due to the average score of women's knowledge about endometriosis was significantly increased with raising the educational level at all times.

In the view of the above mentioned findings, hypothesis which stated that "Educational nursing strategies based on health promotion model will have a positive effect on promoting healthy patterns of women with endometriosis." was supported.

**Conclusion:**

On the light of the current study findings, it was concluded that; implementation of nursing strategies based on health promotion model improved women's knowledge and had a positive effect on health patterns of women with endometriosis. There was a highly statistical significant difference regarding knowledge and all health promotion lifestyle profile-II items (health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management) at pre and post nursing strategies implementation ( $P < 0.001$ ).

**Recommendations:**

The following recommendations can be suggested based on the current study findings:

Use booklet and posters as methods to increase women's awareness regarding endometriosis to encourage them to adapt healthy pattern.

Educational program for women to raise their awareness about endometriosis related factors should be a priority to ensure early diagnosis of the disease.

Provide guidelines and counseling to women to deal with pain caused by endometriosis.

Further studies :Replication of the study on large sample size in different setting.

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## المخلص العربي

### تأثير الاستراتيجيات التمريضية التعليمية القائمة على نموذج تعزيز الصحة على الأنماط الصحية للنساء المصابات ببطانة الرحم المهاجرة

**المقدمة:** تعد بطانة الرحم المهاجرة أحد أكثر أمراض النساء شيوعاً ، حيث تصيب ما يقرب من 6-10% من جميع النساء

**الهدف من الدراسة:** هدفت الدراسة إلى تأثير الاستراتيجيات التمريضية التعليمية القائمة على نموذج تعزيز الصحة على الأنماط الصحية للنساء المصابات ببطانة الرحم المهاجرة **فرضية البحث:** سيكون للاستراتيجيات التمريضية التعليمية القائمة على نموذج تعزيز الصحة تأثير إيجابي على تعزيز الأنماط الصحية للنساء المصابات ببطانة الرحم المهاجرة

**تصميم البحث:** تصميم شبه تجريبي.

**منهجية البحث:** أجريت الدراسة في وحدة المناظير والعيادة الخارجية لأمراض النساء في مستشفى جامعة الزقازيق. العينة: عينة غرضية من 61 امرأة ببطانة الرحم المهاجرة مشخصه بالمنظار. أدوات جمع البيانات: استبيان المقابلة الشخصية و الملف التعريفي لنمط الحياة لتعزيز الصحة

**النتائج:** لقد أسفرت نتائج البحث عن الآتي: كان هناك فروق ذات دلالة إحصائية بين كل من مستوى ومتوسط درجات معلومات المرأة حول بطانة الرحم المهاجرة قبل وبعد الاستراتيجيات التمريضية القائمة على أساس نموذج تعزيز الصحة. بالإضافة إلى ذلك زاد متوسط الدرجات الإجمالية لنموذج تعزيز الصحة من  $114.16 \pm 14.89$  قبل التنفيذ إلى  $173.79 \pm 7.73$  بعد تنفيذ الاستراتيجيات التمريضية. كذلك ، لم تكن هناك علاقة ذات دلالة إحصائية بين خصائص المرأة ومستوى معلومات المرأة حول بطانة الرحم المهاجرة قبل وبعد تنفيذ الاستراتيجيات التمريضية.

**الخلاصة:** على ضوء هذه النتائج نستخلص التالي:- تطبيق الاستراتيجيات التمريضية القائمة على نموذج تعزيز الصحة حسن معرفة المرأة وكان له تأثير إيجابي على الأنماط الصحية للنساء المصابات ببطانة الرحم المهاجرة. لذلك تم دعم فرضية الدراسة.

**التوصيات:** افضت نتائج هذه الدراسة الى التالي: استخدم الكتيبات والملصقات كطرق لزيادة وعي المرأة فيما يتعلق ببطانة الرحم المهاجرة لتشجيعها على التكيف مع أسلوب حياة صحي.