

Implemented Nursing Strategy Based on Health Promotion Model for Alleviating Endometriosis Relating Symptoms

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Abstract: Endometriosis is a life-threatening gynecological health problem for women in their reproductive age that cause chronic pelvic pain, subfertility, bowel and urinary dysfunction. This study aimed to evaluate the effect of implemented nursing strategy based on health promotion model on alleviating endometriosis related symptoms. A quasi experimental study was conducted at out-patient gynecological clinic at Ain Shams Maternity University Hospital. A purposive sample was used to recruit ninety women already diagnosed with endometriosis. Three tools of data collection were used first was structure interviewing questionnaire, second tool was Health Promotion Lifestyle Profile-II, and third tool was, Endometriosis Health Profile questionnaire (EHP-30). The result of the study displays that, highest endometriosis related symptoms are fatigue, dyspareunia, chronic pelvic pain, and dysmenorrhea that represent 86.4%, 86.4%, 81.8% and 65.9% respectively among women in control group as compared to 84.8%, 86.9%, 80.4%, and 65.2% of intervention group pre intervention. In addition, there is a statistical significant difference between women in both groups regarding endometriosis related symptoms pre-intervention ($X^2 = 1.95$ $P=0.83$). While, there is a highly statistical significant difference between women in both groups regarding endometriosis related symptoms post-intervention ($X^2 = 8.37$ $P=0.001$). Furthermore, there is a highly statistical significant improvement on health promoting lifestyle profile II and endometriosis health profile after implementation of nursing strategy. Conclusion and recommendations: The study concluded that implemented nursing strategy based on health promotion model was effective on alleviating endometriosis related symptoms. Accordingly, the following recommendation is proposed: Implemented nursing strategy based on health promotion model to alleviate endometriosis related symptoms at out-patient gynecological clinic and other health care services providing care for women suffering from endometriosis.

Keywords: Nursing Strategy, Health Promotion Model, Endometriosis Related Symptoms.

1. INTRODUCTION

Endometriosis is an estrogen-dependent disease described by presence of endometrial tissue that normally grows inside the uterus in an abnormal anatomical location as "ovarian, uterine ligaments, cervix, sigmoid colon, and peritoneal pelvis"(Zondervan, et al,2018).The exact prevalence rates of endometriosis in the general population are not known as a consequence of diagnosis is often overlooked by physicians and is postponed for an average of 10 years (Fuldeore, and Soliman, 2017). However, the prevalence of endometriosis in women of reproductive age is around 10% that means "one woman in ten affected by the disease". Moreover, one hundred seventy six million women were suffering from endometriosis all over the world (Eisenberg, et al, (2018).

Endometriosis is likely caused by a combination of genetic, immunological, physiological, and environmental risk factors. Although the pathophysiology of endometriosis remains unknown, there are many theories developed to address this issue, the most accepted theories propose four potential causes: retrograde menstruation; coelomic metaplasia; vascular and lymphatic spread and altered immune-surveillance (Ahn, et al; (2015)&Braundmeier, Lenz, and Fazleabas, 2016).

The clinical presentation of endometriosis is highly variable in severity and symptoms, which include dysmenorrhea, chronic non-menstrual pelvic pain, dyspareunia, menorrhagia, lower abdominal pain, subfertility and infertility. Other

symptoms were fatigue, tiredness, bloating, bladder urgency, and sleep disturbances due to pain (*DiVasta, et al, 2018*). Moreover, the chronic symptoms of endometriosis can significantly affect women's physical, psychological, emotional well-being and quality of life (*Soliman, et al, 2017*). Furthermore, woman with endometriosis has unfavorable pregnancy out-come as endometriosis statistically significantly higher risk of pre-term birth (PTB), miscarriage, placenta previa, and cesarean delivery (*Harada, et al, (2016) & Zullo, et al, (2017)*).

Endometriosis is typically classified according to revised criteria formulated by the American Fertility Society (AFS) and American Society of Reproductive Medicine (ASRM) into four stages: minimal, mild, moderate and severe, and can also be listed as a grade or stage I through to IV, based on the location, extent and depth of endometriosis implants, the severity and presence of adhesions. Although the staging system is useful, it has limitations, as the level of endometriosis present does not correlate to the severity of symptoms a woman may experience. Because of woman with stage I endometriosis could be felt much pain than woman with stage IV endometriosis (*Brown, et al, 2017*). Furthermore, diagnosis of endometriosis could be done through complete history and physical examination, including speculum and bimanual examination. Because of imaging has limited utility in the diagnosis of endometriosis, as ultrasound & MRI it's necessary to visualize the lesion through a laparoscope and biopsy to confirm the diagnosis (*Hirsch, et al, (2018) & Agarwal, et al, (2019)*).

Treatment options for endometriosis depend on whether the primary goal is the management of endometriosis-associated pain or preserving fertility. Management options for treating endometriosis-associated pain depend on the type and severity of symptoms, as well as an individual patient's age and reproductive plans (*Dunselman, Vermeulen, and Becker; (2014) & Kodaman, (2015)*). In addition to, a multi-disciplinary holistic approach is considered best practice treatment for endometriosis aiming for relieving symptoms and minimizing complications, which includes medical treatment "as pain relieving and hormone treatment", surgical treatment "laparoscopic & hysterectomy is sometimes recommended where symptoms have significantly affected a woman's quality of life" and evidence based self-management practices through "lifestyle modification as exercise, nutritional changes & good sleep habits" (*Becker, et al, 2017*).

Pender Health promotion model was first created in 1982. Pender describes the function of this model that health is a lifestyle acquainted by the amount of choices made by the different person to essentially live a healthy lifestyle (*Pender, Murdaugh, and Parsons, 2011*). Health promotion model focuses mostly on three areas namely: individual characteristics and experiences, behavior-specific cognitions and affect and behavior outcomes. The *first category* is individual characteristics and experiences which are later divided into sub-categories of prior related behavior and personal factors. The *second category* included is behavior specific reasons and affect, sub-categories are:- perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity related affect, interpersonal influences and situational influences; commitment to plan of action, immediate competing demands and preferences. The *final category* is the behavior outcome, hoped to be health promoting behavior (*George, 2016*).

Today, improving lifestyle and health promotion is a basic requirement in human societies. Health promotion is the science and art of lifestyle change in order to reach the desirable perfection. The main goal of health promotion is achieving healthy lifestyle behaviors (*Dima-Cozma, Gavriluta, Mitrea, & Cojocaru1, 2014*). Nurses and other health professionals in primary care plays an essential role in health promotion through disease management by providing support and much needed information to the patient with endometriosis. They can also facilitate quality of care and manage treatments effectively to improve quality of life, reduce pain, and prevent further progression of disease (*Buggio, 2016*).

So, that nursing strategies for women with endometriosis which include active participation of the woman in planning, decision making, and tasks to manage the symptoms as simple life style changes; "diet, exercise, and pain & stress management" through providing proper knowledge & healthy practices regarding their disease that aiming to improve endometriosis women health and wellbeing, and coping with physical and psychosocial changes associated with this chronic condition (*Laverack, 2017*).

Justification of the study:

Incidence of endometriosis is difficult to determine in Egypt due to poor statistics. In Africa, Egypt considers the 6th country losing the most of healthy life from endometriosis about "18 per 100.000 women" according to (*Ghonemy, and*

El Sharkawy, 2017). Nursing research regarding to the care of women with endometriosis is very limited. Although it is a long-term condition that has a significant and severe impact on the woman's aspects of life including physical, social, psychological, sexual and mental health (*Mette, et al, 2016*). So that maternity and gynecological nurses has a golden role to improve endometriosis women health and wellbeing through nursing strategies that enhance women's healthy life style as "nutrition, exercise, sleep habits, pain and stress management".

Aim of the study:

To evaluate the effect of implemented nursing strategy based on health promotion model on alleviating endometriosis related symptoms. This will be attained through fulfilling the following objectives:

1. Assessing women's endometriosis related symptoms before implementing nursing strategy based on health promotion model.
2. Assessing women's healthy lifestyle before implementing nursing strategy based on health promotion model.
3. Implementing nursing strategy based on health promotion model to alleviate endometriosis related symptoms on intervention group.
4. Examining the effect of implemented nursing strategy on women's healthy lifestyle.
5. Evaluating the effect of implemented nursing strategy based on health promotion model on alleviating endometriosis related symptoms

Research Hypothesis: Implementing nursing strategy based on health promotion model will be effective on alleviating endometriosis related symptoms more than self-care only.

2. SUBJECTS AND METHODS

Research design: A quasi-experimental study design was used.

Setting: The study was conducted at out-patient gynecological clinic at Ain Shams Maternity University Hospital and women homes.

Sample: was calculated according to formula statistics $n = Z^2 p (1-p) / d^2$.

- Z: statistic for a level of confidence. (For the level of confidence of 95%, which is conventional, Z value is 1.96).
- P: expected prevalence or proportion. (P is considered 0.5)
- d: precision. (d is considered 0.05 to produce good precision and smaller error of estimate)

A purposive sample consisting of (96) women were recruited on the study under the following inclusion criteria; women who diagnosed with (mild or moderate grade) of endometriosis regardless of their age, and parity. Women free from any medical, gynecological disorders except endometriosis. Women were randomly divided into two equal groups; control group (48 women receive routine self-care), intervention group (48 women receive healthy life-style as health promotion strategy for alleviating endometriosis related symptoms). This sample size reached ninety (90) women as two women were lost at time of follow up from control group, in addition to two women had surgical intervention for treatment of endometriosis. While, two women were lost at time of follow up from intervention group.

Inclusion criteria:

- All women diagnosed with endometriosis "mild & moderate grade" regardless of their age, and parity
- Women's free from any medical or gynecological problems except endometriosis

Tools of the study:

Three tools of data collection were used

I. Structured Interviewing Questionnaire Sheet: was designed by researchers based on literature review, and written in simple clear Arabic language named "Effect of implemented nursing strategy based on health promotion model on alleviating endometriosis related symptoms ". It was consisted of three parts as follow;

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Part I: Designed to collect data about the general characteristics of women. It included data; age, educational level, residence, occupation and family income.

Part II: It was consisted with endometriosis related signs & symptoms.

Part III: It was used to assess woman's knowledge regarding endometriosis. It was adapted from *O'Hara, Rowe, and Fisher; (2019)*. It included 16 questions that divided into three main parts; first part concerned with endometriosis as (definition, risk factors, causes, signs and symptoms, treatment), second part focused on impact of endometriosis on woman life, and third part consisted with strategies for management of endometriosis. Cronbach's alpha revealed an internal reliability of 0.88.

Scoring system:

Woman's knowledge was evaluated according to the following; each question had 2 score if the woman's given correct answer, and had one the score if the woman's given incorrect answer. Then total score was sum and converted into two categories satisfactory knowledge if total score more than 75%, and unsatisfactory knowledge if total score was less than 75%.

II. Health Promotion Lifestyle Profile-II (HPLPII) it was adapted from *Pinar, Celik, and Bahcecik; (2014)*. It contains 43 items and five subscales as follow; health responsibility (9 items), physical activity (8 items), nutrition (9 items), spiritual growth (9 items), and stress management (8 items). These items are scored based on a 4-point Likert scale with four possible responses: 1 (never), 2 (sometimes), 3 (often), and 4 (routinely). The total score of health-promoting lifestyle is obtained by calculating the mean of responses to all the 43 items. In addition, the total score of each subscale is computed by calculating the mean of responses to that subscale's items. Overall, HPLP-II scores range from 43 to 172. Cronbach's alpha revealed an internal reliability of 0.92.

III. Endometriosis health profile questionnaire (EHP-5) adapted from *Aubry et al, (2017)*. It was used to measure effect of endometriosis on women's quality of life and it is considered as a 'Patient-Reported Outcome' (PRO). It consisted of *two parts*, **first part** involved 5-item core questionnaire about (pain, powerlessness, emotions, social support, self-image) and **second part** comprised 4-item linked questionnaire regarding (work life, relation with children, sexual intercourse, and treatment). The response system consists of five levels ranged in order of severity: 'never = 1', 'rarely = 2', 'sometimes = 3', 'often = 4' and 'always = 5'. Cronbach's alpha coefficient was 0.90.

Validity and Reliability: Tools were reviewed by a panel of 5 experts (three of them from obstetric and gynecological nursing at faculty of nursing Ain Shams University and other two experts from obstetric and gynecological medicine at faculty of medicine, Ain Shams University) to test the face and content validity of tools. Each of experts was asked to examine tools for content coverage, clarity, wording, length, format and overall appearance. Modifications were done according to the comments "rephrasing and cancelling for four questions".

Ethical Considerations:

An official approval was obtained from Scientific Research Ethical committee in Faculty of Nursing, Ain Shams University before starting the study. Researchers introduced themselves to women who met the inclusion criteria and informed them about the purpose of this study in order to obtain their acceptance to share in this study. Researchers ensured that, the study posed no risk or hazards on their health. Researchers ensured that women's participation in the study is voluntary. Women who were willing to participate in the study and met the inclusion criteria were approached by researchers and asked for verbal consent to confirm their acceptance. Each participant had right to withdrawal from the study at any time and all data that obtained were considered confidential.

Pilot study after the development of tools a pilot study was carried out on 10% of the predicted total sample size (nine women). The purposes of the pilot study were to ascertain the relevance and content validity of tools, estimating the exact time needed for data collection and detect any problem that might face the researchers and interfere with data collection.

Field work:

Data collection for this study was carried out over a period of 12 months from beginning of February 2018 up to the end of February 2019. Researchers were available in the study setting 3 days/week from 9.00 A.m. to 2.00 P.m. Researchers first explained the aim of the study to the participants and reassure women that information collected would be treated

confidentiality and that would be used only for the purpose of the research. Data collection procedure has been done through four phases; assessment, implementation, follow up and evaluation phase.

Phase I (Assessment phase) done at gynecological clinic for participants in both groups by researchers. Researchers met each participant individually and fill tools of data collection. Tools of data collection require 25-30 minutes to fill by each participant.

Phase II (implementation phase)

a. Intervention group:

Nursing strategy that based on health promotion model was concerned mainly with women healthy life style through three main components; (diet, exercise and stress management).

Researchers conducted orientation session plus three instruction sessions with each participant based on woman's needs after revising tools of data collection at base line assessment. The duration of each session ranged between 30-40 minutes.

Researchers started the *orientation session* by providing women knowledge about endometriosis, its cause, risk factors, signs & symptoms, impact of endometriosis on woman quality of life, and different management modalities for endometriosis.

First instruction session was concerned with diet where researchers set a diet plan for each woman based on base line assessment and requirement needed. On this instruction session researcher used different method as example for daily meals, Visual aid "illustrated pictures", and discussion. Women instructed to follow healthy nutritional habits (food rich with Omega3, fruits, and vegetables that have anti-inflammatory, anti-oxidant, and anti-estrogen effect).

Second instruction session was focus on exercises where researchers evaluate woman physical activity based on base line assessment then researchers explained different types of exercises that should be performed by woman "as walking or Nordic walking, jogging, cycling, aerobics and/or gymnastics. On this instruction session researcher used different method as role play, demonstration, and redemonstration. Women instructed to perform 30 min of moderate intensity aerobic activity as walking or Nordic walking at least five days per week.

Third instruction session was focus on pain and stress management. Researchers teach women several methods to relieve pain including heat and massage for relieving dysmenorrhea. In addition to, increase amount of foreplay, use alternative sexual position to decrease dyspareunia. While, stress management consisted of instruction for yoga, breathing exercises, and engaging in support group.

At the end of three instruction sessions supportive material (Arabic booklet) were distributed on each woman.

b. Control group

Women in the control group received only self-care without any instructions.

Phase III (Follow up phase and evaluation phase)

Researchers follow up women in both groups for diet, exercises, and pain & stress management at third month, and six month after implementing of nursing strategy.

Researchers conduct two refreshment instruction sessions to each woman on the intervention group at second and fourth months its purpose was ensure that woman committed to health promotion life style strategy. Moreover, woman informed that she can made contact with research team through phone or Whats-App if woman had any problem.

The evaluation phase was done to assess the effect of implemented health lifestyle promoting strategy on alleviating endometriosis related symptoms. Comparison between two groups control and study was conducted to investigate study hypothesis.

Statistical design:

Data was tabulated and analyzed, all statistical calculations were done using computer session SPSS (Statistical Package for the Social Science; SPSS version 20). Descriptive statistics: data were presented in the form of mean \pm standard deviation or frequencies and percentages. Inferential statistics: independent T test was used to determine the difference

between couple. Chi-square test was used to study association between two qualitative variables. ANOVA test was used to compare qualitative variables within-group. P values less than 0.05 will considered statistically significant.

3. RESULT

Table (1) shows that, 39.1% of the intervention group has high education as compared with 41.0% of control group. As regard place of residence; 84.8% of intervention group are from urban area as compared with 88.7% of control group. On the other hand 80.4% of intervention group has work as compared with 81.8% of control group. Concerning marital status 91.3% of intervention group are married as compared with 93.2% of control group. Relating to family income 65.2% of intervention group has satisfactory income as compared to 65.9% of control group. In addition there is no statistical difference between women on both as regard their general characteristics.

Figure (1) displays that, highest endometriosis related symptoms are fatigue, dyspareunia, chronic pelvic pain, and dysmenorrhea that represent 86.4%, 86.4%, 81.8% and 65.9% respectively among women in control group as compared to 84.8%, 86.9%, 80.4%, and 65.2% of intervention group pre intervention. In addition, there is a statistical significant difference between women in intervention and control group regarding endometriosis related symptoms pre-intervention ($X^2 = 1.95$ P=0.83).

Figure (2) points out that, there is a highly statistical significant difference between women in both groups regarding endometriosis related symptoms post-intervention ($X^2 = 8.37$ P=0.001). In addition to, decrease percentage of endometriosis symptoms among women in intervention group fatigue, dyspareunia, chronic pelvic pain, and dysmenorrhea represent 65.2%, 69.6%, 76.1%, 54.3% respectively.

Table (2) indicates 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.

Table (3) reveals that there is a highly statistical significant improvement on endometriosis health profile among women on intervention group post intervention and at follow-up. Conversely, the improvement among women on control group was not significant.

Table (1): Comparison between general characteristic of the studied women in intervention and control groups

Items	Intervention group (n=46)		Control group (n=44)		X2	P Value
	No.	(%)	No.	(%)		
Education						
Reads & writes	6	13.1	5	11.3	1.97	0.082
Secondary	20	47.8	21	47.7		
Higher	18	39.1	18	41.0		
Residence						
Rural	7	15.2	5	11.3	2.63	0.271
Urban	39	84.8	39	88.7		
Occupation						
Not work	9	19.6	8	18.2	1.08	0.621
Working	37	80.4	36	81.8		
Marital status						
Married	42	91.3	41	93.2	1.51	0.371
Divorced	4	8.7	3	6.8		
Family income						
Satisfactory	30	65.2	29	65.9	1.47	0.251
Unsatisfactory	16	34.8	15	34.1		
Mean Age ±SD	27.23 ± 4.56		28.14 ± 3.92		T= 1.87	0.72

Figure (1): Percentage distribution of the studied women in control and intervention groups according to endometriosis symptoms Pre- intervention

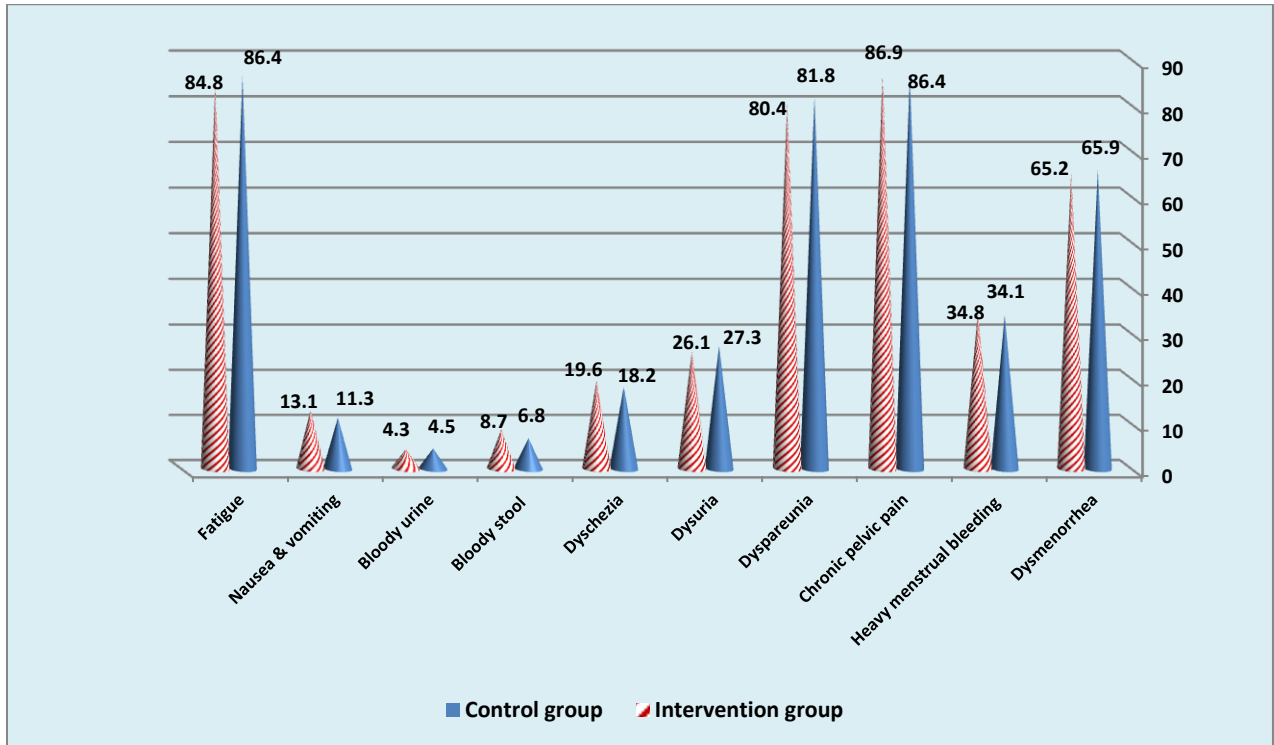


Figure (2): Percentage distribution of the studied women in control and intervention groups according to endometriosis symptoms post- intervention

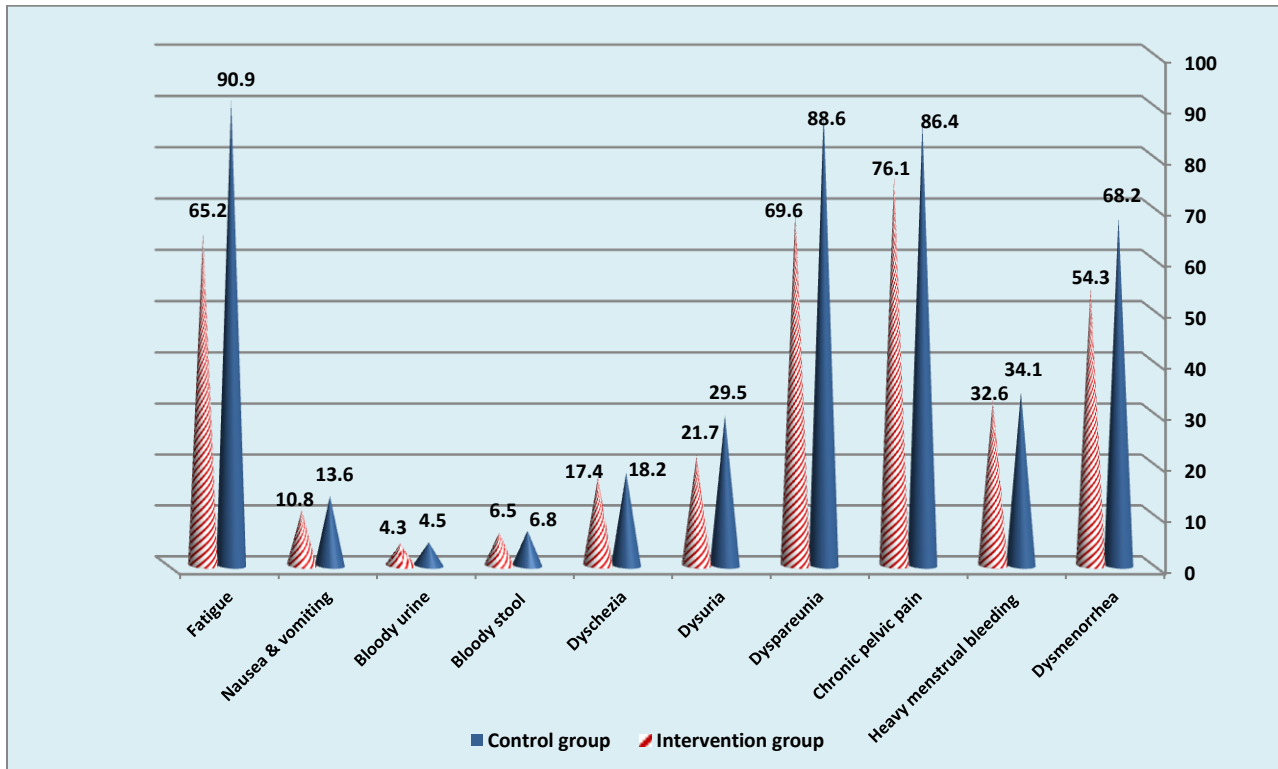


Figure (3): Percentage distribution of the studied women in intervention and control groups according to endometriosis symptoms pre, post- intervention and at follow-up

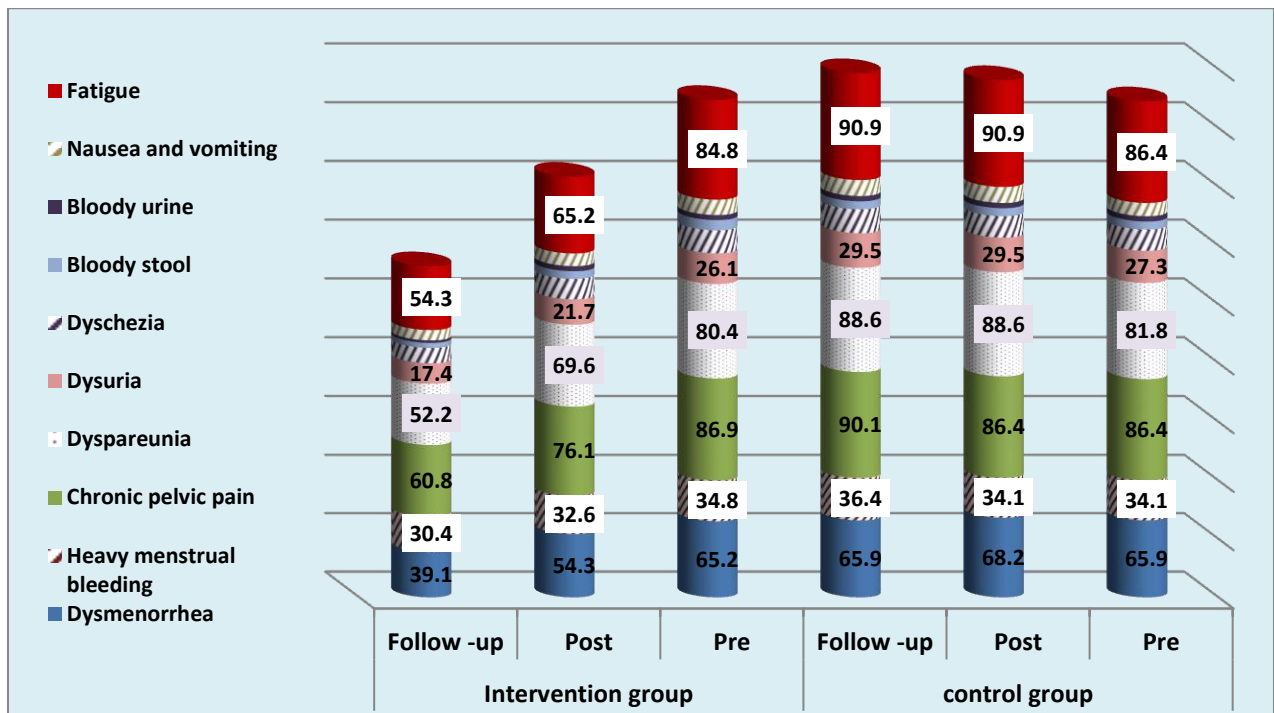


Table (2): Comparison of health promotion lifestyle profile-II at pre, post intervention and follow up among studied women on both groups.

Items	Pre intervention	Post-intervention (3 months)	Follow up (6 months)	F test	P value
Health responsibility					
Intervention group	17.02 ± 3.5	19.49±3.08	22.02 ± 3.43	18.66	0.001**
Control group	17.58 ± 4.9	17.29 ±5.07	17.34± 5.32	3.34	0.787
Physical activity					
Intervention group	13.33 ± 3.99	17.02 ± 4.73	19.34 ± 4.34	16.88	0.001**
Control group	13.64 ± 3.22	13.67 ±2.17	12.08 ±3.05	3.06	0.754
Nutrition					
Intervention group	23.39 ± 2.79	26.71 ± 2.43	28.84 ± 4.52	18.36	0.001**
Control group	22.27 ± 2.98	22.33 ± 2.17	22.08 ±2.12	2.56	0.421
Interpersonal relation					
Intervention group	24.04 ± 3.61	26.53 ± 4.26	28.04 ± 4.03	17.24	0.001**
Control group	22.23 ± 2.35	22.18± 2.16	21.30±2.67	2.32	0.806
Spiritual growth					
Intervention group	21.39 ± 2.79	23.85 ± 3.46	27.04 ± 3.88	17.24	0.001**
Control group	21.23 ± 2.35	21.33 ± 2.30	20.67±2.28	2.05	0.826
Stress management					
Intervention group	19.14 ± 2.6	21.58±3.66	24.86±4.61	19.31	0.001**
Control group	18.92 ± 2.4	18.03 ±2.15	17.96±2.04	3.13	0.782
Total					
Intervention group	151.42 ± 8.3	160.23±4.31	170.3±1.75	18.36	0.001**
Control group	127.65 ± 9.1	125.46 ±6.82	124.26±6.02	3.26	0.741

Table (3): Comparison of endometriosis health profile at pre, post intervention and follow up among studied women on both groups.

Items	Pre intervention	Post-intervention (3 months)	Follow up (6 months)	F test	P value
Pain					
Intervention group	40.7 ± 25.9	29.4±13.1	20.9±8.4	17.32	0.001**
Control group	41.5 ± 24.5	43.9 ±25.2	43.8±25.3	2.86	0.501
Powerlessness					
Intervention group	53.3 ± 27.3	40.4 ± 15.6	31.3 ± 8.3	18.41	0.001**
Control group	54.6 ± 27.2	55.2 ± 27.7	55.6 ± 27.5	1.85	0.891
Emotions					
Intervention group	42.2 ± 23.7	34.1 ± 17.4	28.8 ± 10.5	16.04	0.001**
Control group	42.3 ± 23.8	41.8± 23.7	42.2±22.8	3.72	0.621
Social support					
Intervention group	39.4 ± 27.4	30.3 ± 20.2	26.6 ± 14.3	18.52	0.001**
Control group	39.3 ± 27.6	39.8± 26.9	39.5±27.2	1.58	0.882
Self-image					
Intervention group	36.5 ± 29.1	30.8 ± 20.6	27.4 ± 14.8	19.04	0.001**
Control group	36.3 ± 29.5	36.2± 28.9	36.0±29.8	0.952	0.875
Work life					
Intervention group	32.9 ± 28.4	29.2±22.1	20.3±8.5	16.52	0.001**
Control group	32.5 ± 28.2	32.3 ±27.8	32.6±28.0	2.06	0.831
Relation with children					
Intervention group	28.2 ± 28.5	22.2±21.3	18.8±15.3	17.32	0.001**
Control group	28.4 ± 28.2	28.3 ±27.9	27.6±28.7	1.83	0.952
Sexual intercourse					
Intervention group	44.1 ± 33.2	38.5±27.3	32.3±19.2	18.30	0.001**
Control group	44.3 ± 33.1	44.4 ±32.8	44.2±33.0	0.961	0.983
Treatment					
Intervention group	36.6 ± 29.5	32.2±21.1	28.3±12.5	19.34	0.001**
Control group	36.5 ± 29.7	36.3 ±29.6	36.4±29.5	2.53	0.648

4. DISCUSSION

Endometriosis is a chronic and incurable condition associated with debilitating pain and subfertility that affects approximately 176 million women worldwide (Horne, et al, 2017). Endometriosis constitutes a significant burden on the quality of life of women, their families and healthcare systems (Giuliani, et al, 2016). As endometriosis has no cure so, nurses play vital role in health promotion of women through disease management in order to improve women's quality of life, prevent further progression of disease and reduce burden of disease at individual and community levels. In concern to the previous concept researchers conducted the present study which was aiming to evaluate the effect of implemented nursing strategy based on health promotion model on alleviating endometriosis related symptoms.

Concerning socio-demographic characteristics of the studied sample the result of the present study showed that mean age for women on intervention group was 28.14 ± 3.92 compared to 27.23 ± 4.56 for women on control group respectively. Regarding level of education the result of the current study displayed that nearly half of the studied women on both groups had secondary education. Considering place of residence most of the studied women on both groups were lived in urban area. This finding was in the same line with (Ghonemy, and El Sharkawy, 2017) who conducted a quasi-experimental time series study to evaluate the impact of changing lifestyle on endometriosis related pain among 50 women diagnosed with endometriosis at gynecological in-patient departments and out-patient clinic at El Galaa Maternity Hospital and found that women age ranged between 19-39 years old with mean of 29.8 ± 4.02. In addition they reported

that (76%) of the women had completed technical secondary school education. Moreover, they mentioned that sixty eight percent of women lived in urban area. This similarity could be justified by both study carried out at the same community.

Regarding endometriosis related symptoms the present study finding displays that, most of the studied women and nearly two third of them had fatigue, dyspareunia, chronic pelvic pain, and dysmenorrhea pre intervention. This finding was in accordance with *AL-Jefout, et al, (2017)* who accomplished a cross section study to estimate the prevalence of endometriosis, risk factors and related health problem in Jordanian women aged 15-5 years they mentioned that 24.4%, and 70% of the studied women had dysmenorrhea and chronic pelvic pain also dyspareunia mainly affects young women with endometriosis in their most sexually active years. Also, this finding was in harmony with *Moradi, et al, (2014)* who carried out a descriptive study among 35 Australian women with endometriosis to explore women's experiences of the impact of endometriosis and whether there is difference across age groups they found that 77.1%, and 71.4% of the studied women had dysmenorrhea, and dyspareunia as main symptoms of endometriosis.

Moreover, the result of the current study points out that there is a highly statistical significant difference between women in both groups regarding endometriosis related symptoms post-intervention ($X^2 = 8.37$ $P=0.001$). In addition to, endometriosis related symptoms were alleviate among women in intervention group "fatigue, dyspareunia, chronic pelvic pain, and dysmenorrhea" after intervention and at follow-up. This finding was matching with *Marziali, et al; (2012)* who conducted a retrospective study to evaluate the effectiveness of gluten-free diet for 12 months on endometriosis-related pain and quality of life in patients with endometriosis-related chronic pelvic pain. Two hundred and seven patients with severe painful endometriosis-related symptoms entered the study. A gluten-free diet was submitted to all patients and a new evaluation was performed after 12 months of diet. At 12 month follow-up, 156 patients (75%) reported statistically significant change in painful symptoms. This finding also came in the same line with *Gonçalves, et al; (2016)* who evaluated the effects of yoga on 15 women with symptomatic endometriosis. They reported that all patients attended yoga practice twice a week for 8 weeks reported a beneficial effect of yoga in pelvic pain management. This may be due to supporting healthy behavior is the main goal of health promotion, and healthy behavior is a result of a multidimensional approach (healthy nutrition, physical exercise, social & psychological support) (*Leischik, et al, 2016*). Moreover, researchers' point of view that implementing nursing strategy based on health promotion model help women to acquire knowledge of how to adapt with endometriosis through promoting their healthy behavior that enable them to alleviate the symptoms.

As regard endometriosis health profile the result of the present study displayed that there is a highly statistical significant improvement on endometriosis health profile (pain, powerlessness, emotions, social support, self-image, work life, relation with children, sexual intercourse, and treatment) among women on intervention group post intervention and at follow-up. This finding was correspond with *Soliman, et al; (2017)* who carried out a cross sectional web-based survey study to examine the symptomatic burden of endometriosis on health-related quality of life (HRQL) in women in the United States (US). They reported that EHP-30 scores ranged from 36.4 to 39.3 (pain), from 40.1 to 37.8 (powerlessness), from 35.8 to 38.9 (emotion), from 35.8 to 33.6 (social support), from 30.1 to 28.8 (work life), from 26.4 to 24.8 (relation with children), from 37.5 to 35.7 (sexual intercourse), and from 33.6 to 31.7 (treatment) indicating moderate HRQL impact. EHP-30 scores were significantly higher (worse) for women who had endometriosis-related symptoms than for those who did not. EHP-30 scores consistently deteriorated with each increase in the number of symptoms experienced and by increasing perceived disease severity.

This finding was also matched with *Vercellini, et al; (2013)* who conducted a parallel cohort study with 12-month follow-up for total of 51 patients chose repeat surgery and 103 progestin treatment. To examine variations in sexual function, psychological well-being and quality of life using Female Sexual Function Index (FSFI), the Hospital Anxiety and Depression Scale (HADS) and the Endometriosis Health Profile-30 (EHP-30). They stated that a significant improvement in average EHP scores from baseline to 12-month follow-up was observed for all domains in both the surgical and the progestin group. For women who underwent surgery, mean scores showed a dramatic reduction at 3 months, but crept back at 12 months, whereas for those women who underwent progestin treatment, the EHP-30 score reduced slowly over time. Furthermore, this finding was supported by *Fourquet, et al; (2015)* who conducted a descriptive study to assess the burden of endometriosis by obtaining Patient Reported Outcome (PRO) data describing the experience of living with this disease for one hundred and seven women with surgically diagnosed endometriosis. They mentioned that the majority of patients in this study (85%) perceived that there was a noticeable decrease in the quality of their work and almost 20%

reported being unable to work due to pain. Logistic regression analysis showed that symptoms significantly predict negative impact on daily life activities, work performance, and social life of patients (all $p = 0.01$). This could be justified by implemented nursing strategy based on health promotion model (nutrition, exercise, stress & pain management) improve health behavior among studied women that reflected upon their compliance with nursing strategy and reflected on alleviating symptoms so, that Endometriosis Health Profile-30 (EHP-30) score improved throughout study phases with-out crept at the end as other studies.

Concerning health promotion lifestyle profile-II the result of the current study indicates that there is a highly statistical significant improvement on total score of health promotion lifestyle profile-II post intervention (health responsibility, physical activity, nutrition, stress management, spiritual growth, and interpersonal relation). This finding was consistent with *Moradi, et al; (2014)* who pointed out that lifestyle changes such as exercise, diet and sleep are used for the management of endometriosis. The finding also, was in harmony with *Altman, and Wolczyk; (2017)* who stated that education is imperative for patients with endometriosis. As, knowledge provided to women enable them to cope with the disease and make informed decisions regarding care.

5. CONCLUSIONS

The findings of present study confirmed the study hypothesis; implementing nursing strategy based on health promotion model was effective on alleviating endometriosis related symptoms. This was clarified by a statistical significant reduction of endometriosis related symptoms among women on intervention group at post intervention and follow up. In addition to, endometriosis health profile was significant improved among women on intervention group at post intervention and follow up.

6. RECOMMENDATIONS

In the light of results of the present study the following recommendations are suggested; implemented nursing strategy based on health promotion model to alleviate endometriosis related symptoms at out-patient gynecological clinic and other health care services providing care for women suffering from endometriosis. Researchers recommended further research to study the effect of nursing strategy based on health promotion model versus medical treatment or surgical treatment on endometriosis related symptoms.

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