

# Effect of nursing program regarding lifestyle modification on selected outcomes among women with endometriosis

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## Abstract

Endometriosis is one of the most common benign gynecological disorders that affects approximately 5-15% of women within their reproductive age. Endometriosis-related pain and fatigue are common and adversely impact several areas of many women's lives. **Aim:** The study aimed to investigate the effect of nursing program regarding lifestyle modification on selected outcomes among women with endometriosis **Design:** A quasi-experimental study design control, and study group was used. **Setting:** The study was conducted at the outpatient gynecological department at Beni-Suef University Hospital. Data collected for 9 months from the beginning first September 2019 to the end of May 2020. **Sample:** A purposive sample approach of 60 women was included in the study. **Tools:** Five tools were used for data collection, Sociodemographic characteristics, Self-care practice, Endometriosis health profile questionnaire, Hamilton Rating Scale for depression, and Hamilton Anxiety Rating Scale. A procedure was carried out through four phases as initial assessment, planning, implementation, and evaluation phase. **Results:** There were statistically significant differences between pre- and post-program implementation in study group regarding all selected outcomes: knowledge (f:0.169, p:0.001), practice (f:3.058, p:0.017), fatigue (f:4.887, p:0.001), pain (f:5.58, p:0.002), and depression (f:2.257, p:0.040). moreover, there were significant statistical differences for all items in the study group regarding lifestyle modification. **Conclusion:** The implementation of nursing programs regarding lifestyle modifications such as (healthy dietary habits, physical activity, and stress management) for women with endometriosis has shown improvement in their knowledge and reduce endometriosis-related symptoms (depression, anxiety, fatigue, and pain). **Recommendation:** Nursing programs regarding lifestyle modifications should be applied for all women with endometriosis, and online easily accessible nursing programs regarding lifestyle are also needed, with further research on their utilization and usefulness

**Keywords:** Nursing program, lifestyle modification, fatigue, pain, depression, selected outcomes, and endometriosis.

## Introduction

Endometriosis is one of the most common benign gynecological diseases that affects approximately 5-15% of females within their reproductive age. It is characterized by the existence of endometrial tissue outside the uterine cavity and commonly causes several problems, as multiple surgeries, pelvic pain, adnexal mass, and infertility. It is described as the foundation of endometrium-like tissue that grows outside the uterus in areas that may include the ovaries, fallopian tubes, and peritoneum (Zanden, et al., 2018).

This condition can have a significant physical, psychological, and social impact on the lives of affected women, including a negative impact on work and education. Overlapping impacts quality of life and lead to extensive problems with infertility that harm, day to day activities, marital relationships, and self-confidence and cause mental disorders (Vitale et al., 2017). Fertility problems seem to be an independent risk factor for psychological problems. Higher incidence of h symptoms and sexual dysfunctions are detected more often among couples suffering from infertility (Shahraki et al., 2018).

Clinical manifestation of endometriosis can vary in women, and it may be asymptomatic. Patients often present with symptoms as intermenstrual bleeding, dysmenorrhea, and painful urination and defecation. Pelvic may be present before menstruation begins. chronic pelvic pain is the most common cause of endometriosis with 24 to 40% that include a variety of pain symptoms including dysmenorrhea, dyspareunia, fatigue, pain on bowel motions, and dysuria. (parasar& Ozcan, 2017).

Endometriosis-related fatigue is common and hurts women's lives, particularly in the activity of daily livings, physical activities, social activities, mood and emotions, relationships with her partner or family, and ability to go to work or school (Ramin-Wright et al. 2018). Endometriosis is considered a disabling condition that affects patients functionally, psychologically, and sexually, and they are mental health. Psychological problems related to endometriosis include anxiety, depression, and mood swings. Endometriosis-related fatigue and pain, but not the disease itself, seems to increase the prevalence of depression. Fatigue is commonly accompanied by other symptoms as menstrual, and non-menstrual pain, anxiety, stress, and irregular bleeding (Singh et al., 2020). Reduced physical and sexual activity due to the symptoms related to endometriosis is observed in most affected women (Warzecha et al., 2020).

Endometriosis is undiagnosed in a large proportion of affected women resulting in ongoing and progressive symptoms with an associated negative impact on health and wellbeing (Agarwal et al., 2019). It is diagnosed by physical pelvic examination and inspecting the pelvis by using a Laparoscope. The laparoscopy is usually followed by a histological examination of the excised tissue to confirm the diagnosis but may be delayed in diagnostic of endometriosis due to a lack of non-invasive reliable diagnostic testing, and to the lack of awareness in medical professionals to symptoms. This delay in diagnosis can be from 7–10 years from the onset of pelvic pain (Van der Zanden et al., 2018).

Now, there is no cure for endometriosis, but there are different treatment options that help women to manage symptoms as combined medical, surgical, and alternative treatment. many women feel the need to be in control of this disease themselves so. Empowering women with endometriosis, by giving them opportunities to positively influence their fatigue could result in decreased feelings of helplessness and increased quality of life (O'Hara et al., 2019).

Physical activity and diet were playing a significant role in the management of endometriosis symptoms. Endometriosis has been linked to a low intake of vegetables, fruit, and vitamin D and a high intake of trans-fatty, meat, and other animal products. (Youseflu et al., 2020). On the other hand, the use of omega-3 fatty acids, antioxidants, and a combination of vitamins and minerals influence the symptoms of endometriosis (Huijs & Nap, 2020).

### Significance of the study

Endometriosis is a serious disease that affects approximately 190 million reproductive-age women and girls' women worldwide (Zondervan et al., 2020). The prevalence of endometriosis in Egypt is difficult due to insufficient data and deficiency of documentation or filling system for cases of endometriosis and the only reliable diagnostic test is laparoscopy (Gad et al., 2018). Conversely, it is estimated that globally, one in ten women during their reproductive age has endometriosis. Nurses can play the role of health teaching to help women with endometriosis to cope with their condition throughout support women and her family to adapt to this condition and provide a source of follow up. Nurses also have an active role in providing health education about lifestyle modifications that can affect endometriosis-related symptoms (Asencio et al., 2019).

There is a lack of evidence about published studies in Egypt about the importance of health education related to improving lifestyle that could affect endometriosis-related fatigue and depression. Therefore, the present study aimed to evaluate the effect of lifestyle modification nursing programs on women with endometriosis-

related to fatigue, depression, and pain. Moreover, applying healthy lifestyle modifications, achieving unmet needs through educational intervention for those women will reduce the symptoms of endometriosis by improving patient's knowledge, and practices regarding endometriosis and important in clarifying gaps and strengthening awareness among women.

### Operational definition:

**Lifestyle modification:** Lifestyle (physical activity and dietary habits) plays an important role in reducing symptoms of endometriosis (fatigue, anxiety, depression, and pain).

**Endometriosis Related fatigue:** In the present study fatigue is caused by body efforts to eliminate disease tissue. It is accompanied by dysmenorrhea, dyspareunia, bowel symptoms, menstrual bleeding that is also called endometriosis-associated symptoms.

**Endometriosis Related Pain:** In the present study, pain is caused by an inflammatory reaction and shedding of endometrial cells in the form of pelvic/abdominal or lower back pain, headache, joint pain, heavy blood flow during period, gastrointestinal symptoms, dysmenorrhea, and dyspareunia, that is also called endometriosis-associated symptoms.

**Endometriosis Related depression:** In the present study, depression is a psychopathological feeling of sadness caused by symptoms of endometriosis (pain and fatigue) that led to an alteration of mood.

### Aim:

The current study aimed to investigate the effect of nursing program regarding lifestyle modification on selected outcomes among women with endometriosis. This aim was attained through:

- Assess women's knowledge related to endometriosis.
- Assess women's self-care practices related to endometriosis.
- Assess women's pain level, and fatigue level associated with endometriosis.

- Assess women's depression level and anxiety associated with endometriosis.
- Evaluate effect of nursing program regarding lifestyle modification on women's knowledge, Self-care practices & symptoms related endometriosis.

### Research Hypotheses:

Nursing Program Regarding Lifestyle Modification has positive effect on women's knowledge, Self-care practices & symptoms related endometriosis.

### Subject and method:

**Research Design:** A Quasi-experimental design (pre/post-test) control, and study group was utilized to fulfill the aim of this study.

### Setting:

This study was conducted at the Obstetric and Gynecological Outpatient clinic at Beni-Suef University Hospital, which was located on the ground floor that includes two rooms. It starts from 9 AM to 1 PM. Women attended treatment, counseling, and any gynecological procedure.

### Sampling:

**Sample Type:** A purposive sample was used in this study.

### Sample Size:

Using Steven and Thompson's equation to calculate the sample size.

$$n = \frac{Np(1 - p)}{(N - 1)(d^2/z^2) + p(1 - p)}$$

N= Population (72)

Z=

confidence level 95% (1.96)

P= probability (50%)

d= margin

of error (0.05)

So, Sample size (N)

= 60

**Sample Size:** 60 women were included (30 women in the study group & 30 women in the control group), who are residents at previously mentioned settings over 9 months from beginning at first September 2019 to the end of May 2020. Women were classified into 30 women for each group.

### Inclusion Criteria

The sample was recruited according to the following inclusion criteria: women diagnosed with minimal, mild, and moderate grades of endometriosis during their reproductive years even their age and parity.

### Exclusion Criteria

Women with medical and gynecological problems excepting endometriosis, and women with surgical proof of endometriosis.

**Tool of data collection:** five tools were used for data collection: The survey questionnaire was designed in Arabic, and it covered the demographic characteristics, self-care practice, endometriosis health profile questionnaire, Hamilton Rating Scale for depression, and Hamilton Anxiety Rating Scale.

**First tool: Demographic and clinical data structured interviewing sheet:** To assess women's data and knowledge regarding endometriosis. It was designed by the researcher after reviewing related literature and was consisted of **two** parts (Demographic, and knowledge).

**First part:** Demographic data of women, it consisted of two main parts: **Part I:** women's socio-demographic characteristics (age, residence, level of education, occupation, telephone number, and family history).

**Part II: Women history** (menstrual, obstetric, and endometriosis history).

**Second part:** Assessment of women's knowledge about endometriosis: It consisted of 12 questions, as a concept of endometriosis, clinical manifestation, stages, risk factors, the effect of disease on ADLs, diagnosis, complications, medical, and nursing management of endometriosis.

**Scoring:** Women who checked the complete correct answer were given (2), while the one who checked the incomplete correct answer was given (1), and women who checked the incorrect answer were given (0). Thus, women's total knowledge score was classified as the following:

- Poor knowledge when the total score was ( $\leq 60\%$ ).
- Average when the total score was (60% - 80%).
- Good when the total score was  $\geq 80\%$ .

**Tool (2): Women Practices Questionnaire; (Jenkinson et al., 2004)** this tool was modified by the researcher to assess women's practice which includes measures that the women follow for better health as physical activity, dietary habits, and pain management.

**Scoring:** women who checked high were scored "2" and who checked average was scored "1", while those who checked low were scored (0). Women practice was classified as the following:

- ( $\leq 50\%$ ): Incompetent practices.
- (50% - 75%): Acceptable practice.
- ( $\geq 75\%$ ): Competent practices.

**Tool (3): Endometriosis Health Profile (EHP-30) Questionnaire (Jenkinson et al., 2004):** This tool was modified by the researcher. It is a specific HRQoL scale derived from interviews of patients with endometriosis to evaluate the outcomes of treatment for endometriosis upon a woman's health status. It consists of three parts as following:

**First part:** This part includes an 18-item core questionnaire which applies to all women with endometriosis as following: 9 Questions related to the impact of endometriosis on general **health** as (inability to carry out normal social interactions, inability to adapt due to symptoms, I feel nervous because of the symptoms, the disease affects my appearance, I feel alone because of the disease). 5 Questions related to **work-life** as (Taking time off work due to symptoms, inability to do duties due to illness, embarrassment, and frustration at not being able to do work)), and 4 questions related to **sexual intercourse** as (pain before and after relation, anxiety, I feel like that I want to have a marital relationship and depression toward relation).

**Scoring system for the answer was:**

Using Likert Scale the scoring system for this tool consider if it never takes (1) if rarely it takes (2) if sometimes it takes (3) if it often it takes (4) if it always it takes (5).

- **Second part: The Fatigue Severity Scale (FSS):** It was adapted from (Lerdal et al., 2011), this tool was modified by the researcher to measure the severity of fatigue on women's activity and lifestyle. The FSS questionnaire contains 7 statements that rate the severity of subject fatigue symptoms.

**Scoring System for the answer was:**

- Low fatigue level: indicated strong disagreement with the statement.
- Mild and moderate: fatigue level indicated uncertainly.
- High fatigue level (worst possible): indicates strong agreement.

**Third part: Visual Analogue Scale (VAS),** It was determined by measuring in centimeters from the left of the line with the range 0-10. The patient pointed marks on the scale and the numerical value obtained indicates the intensity of endometriosis-related pain as pelvic pain, dysmenorrhea, pain during sexual relation. VAS is reported to be more sensitive and reliable in measuring pain intensity in comparison to other one-dimensional scales (Aslan & Öntürk, 2015).

**Scoring System for answer:** It was translated to the corresponding pain intensity as follows:

- ( $\leq 5$ ): Mild response to pain
- (6–7): Moderate response to pain.
- ( $\geq 8$ ) a severe response to pain.

**Tool (IV): Hamilton Rating Scale for Depression (HAM-D) (Hamilton., 2015).**

**Scoring:** It was adopted from Sharp (2015). It is 17 self-reporting items to assess the severity of, and change in, depressive symptoms. Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to

moderate severity, and 25–30 moderate to severe.

**Tool (V): Hamilton Anxiety Rating Scale (HAM-A)**

**Scoring:** It was adopted by Thompson (2015).

The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety). Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity, and 25–30 moderate to severe.

**Method of data collection:**

The study was executed according to the following steps:

**1) Validity**

The tools' validity was tested by 5 experts in the professors in maternal and neonatal nursing and psychiatric and mental health nursing to check the clarity, applicability, and comprehensiveness of the questions. Recommended modifications were done accordingly, and the final form was modified.

**2) Reliability**

The reliability was done by Cronbach's Alfa Coefficients test which revealed that each of these tools consisted of relatively homogenous items as indicated by the moderate to the high reliability of each tool, which are 0.768 for knowledge, 0.781 for practices, and 0.863 for fatigue, 0.811 for pain, and 0.785 for depression.

**3) A Pilot study**

The pilot study was carried out on 10% of the total sample (6 t women) to test the clarity and applicability of the study tools as well as estimation of the time needed to fill the questionnaire. women involved in the pilot study were excluded from the sample because a certain correction was carried out on the tool after piloting.

## Fieldwork

Collection of data covered 9 months from beginning at first September 2019 to the end of May 2020. The researcher attended the outpatient gynecological department at the Beni-Suef University hospital, 3 days/ week from 9 am to 1 pm (Saturday, Sunday, and Wednesday).

**Preparatory phase:** The researchers reviewed the current local and international related literature using books, articles, and scientific magazines and prepared the data collection tools including Structured Interviewing socio-demographic as well as endometriosis symptoms (fatigue, pain & depression) among women regarding endometriosis.

## Educational program Construction

To fulfill the aim of the study, the following phases were adopted. Initial assessment, planning, implementation, and evaluation phase.

**1- Initial assessment phase:** During this stage, the researcher met the women recruited for the study at the outpatient gynecological department at Beni-Suef University Hospital. Oral consent to participate in the study was obtained from them. Interviewed with women to collect data after the researcher introduced herself and explained the purpose of the study. In this phase, the researcher assesses general characteristics, medical records, and baseline of knowledge regarding endometriosis. The data obtained during this phase constituted the baseline for further comparisons to evaluate the effect of lifestyle modification's nursing program on selected outcomes. Average time for the completion of interviewing questionnaire 20-25 minutes. The questionnaire is filled by the researcher during the waiting time of the women during their visits. At the end of the session, the woman was allowed to ask questions related to suitable interventions in case of endometriosis problems. The researcher provided explanations, necessary consultations, and information according to their needs.

**2- Planning phase:** Based on the data obtained from the initial assessment, in addition to literature, the intervention was designed by the researchers in an Arabic booklet to satisfy the participant's deficit knowledge. This booklet included information about definition, risk factors, signs and symptoms, diagnosis, and treatment. Also, it had the recommended lifestyle modifications about nutrition, exercise, and stress management. The booklet was written in simple Arabic language supported by illustrative pictures as a guide for illiterate women. The booklet was tested by the experts in maternal and neonatal health nursing, and psychiatric - mental health nursing to check the content relevance, clarity, and feasibility. The study groups were classified into subgroups, each group consisted of (4-5 women). The educational intervention was classified into 4 sessions each session was planned to provide information including the definition, causes, risk factors, and complications of endometriosis and healthy lifestyle (exercise, dietary recommendations, and stress management).

**3- Implementation phase:** The educational intervention was implemented by researchers through 4 sessions each session took about 25-30 minutes; the researcher started by giving a summary about the previous session and explain the nature of the new session, including items regarding knowledge about endometriosis. Each session had a maximum of 4-5 women, The total number of groups was 6 groups. At the start of the session, each patient obtained a copy of a simplified booklet was constructed by the researcher after reviewing related literature based on the level of women knowledge according to deficiency of information regarding endometriosis & ways of management, then assess pain level through the utilization for visual analog scale (VAS) for both groups within 20 minutes for every session with each woman. **The first session**, this session was ranged from 25 -30 minutes. The researchers started with verbal instructions and pictures and discussion regarding endometriosis included definition, causes signs & symptoms, diagnosis & treatment. Measures that important to reduce

the disease were introduced as nutrition, exercise, and stress management that could affect the endometriosis symptoms. **Second session:** The researcher advises women to start eating a healthy diet (fresh and vegetables) and natural foods have been recommended and their diet should be rich in antioxidants (vitamins A, C, E, etc.), high in fruits and vegetables, low in saturated fats. And advice him about the importance of physical activity in a healthy lifestyle and relief of symptoms of endometriosis (pain, fatigue, and depression) were explained in a clear tone to cover the role of exercise in improving blood flow, releasing endorphin (a hormone that makes the body feel good), reducing the levels of estrogen, improving sleep, and reducing stress, anxiety, and depression. **Third session:** The researcher provides psychological support for women with endometriosis, encourages women to express their complaints, and helps women to cope with symptoms associated with depression and anxiety. **Fourth session:** After one month of education was done to provide the last point of a program that contains what is the management of endometriosis. Women who missed sessions throughout the program have been given, the researcher repeated it to her before started a new session. Certain women call for discussing certain issues related to that teaching content & they received their need using phone answered from the researchers. The control group received routine care.

- 4- **Evaluation phase:** The evaluation conducted immediately at the end of the last fourth educational session, women were re-assessed regarding the five aspects using the same questionnaire (Immediate after one month). The interview usually takes around half an hour (40-45) minutes as all the participants completed the same previously used tools using face-to-face interview.

#### **Administrative design:**

An official letter approved to conduct this study was obtained from the dean of the faculty of nursing of Beni-Suef University to the director of Beni-Suef university hospital, to obtain their agreement to conduct the study after explaining its purpose.

#### **Statistical analysis:**

The collected data were organized, revised, stored, tabulated, and analyzed using the number and percentage distribution, statistical analysis was done by computer. A proper statistical test was used (chi-square, ANOVA, Pearson correlation) to determine whether there was a significant difference or not, using the statistical package for social science program (SPSS) version 20.

#### **Limitation of research:**

- Some women (8) refuse to abide by instructions related to lifestyle and asked to be withdrawn from research.
- Laparoscopy has a malfunction, so it extended the time required for data collection.

#### **Results**

**Table (1)** shows that the mean age for the control group was (32.45) with SD (5.23), while the mean age for the study group was (37.17) with SD (6.99). Regarding their residence, (53.3%) in the control group was rural resident, while (60%) in the study group was urban residents. Most of both control and study groups was a housewife (50%, 56.7%) respectively. About (60%) of the sample had high education in both groups. Concerning sample income, (66.7%) of the control group had enough income, while (80%) of the study group had not enough income. Regarding sample family' history, (56.7%, 60%) had a family history of endometriosis in the control and study group, respectively. Also, there was no significant statistical difference between the control and study groups regarding all socio-demographic items.

**Table (2)** illustrates that about (70%, 63.3%) in the control and study group were aged 12 to 13 years at menarche, respectively. (50%) participants in both groups had irregular menstrual cycles. (83.3%, 80%) in the study and control had dysmenorrhea, respectively. Regarding gravidity, most participants in both groups (66.7%) were null gravida. Moreover, about (43.3%, 46.7%) time for diagnosis was - <3 years in study, and control group, 50% of the time of onset of diagnosis was-<7years, and (66.7%, 56.7% in the study, and the control group had a mild stage of endometriosis.

**Table (3)** depicts that the distribution of the sample regarding endometriosis symptoms. About (23.3%, 26.7%) in the study, and the control group had dysmenorrhea, respectively. About (36.7%, 40%) of the study and the control group had pelvic pain. Also (83.3%, 76.7%) in the study, and the control group had fatigue and low energy, respectively.

**Table (4)** shows that there were no significant statistical differences between pre- and post-program implementation in the control group regarding all outcomes. There were statistically significant differences between pre- and post-program implementation in study group regarding all selected outcomes: knowledge (f: 0.169, p: 0.001), practice (f: 3.058, p: 0.017), fatigue (f: 4.887, p: 0.001),

pain (f: 5.58, p: 0.002), depression (f: 2.257, p: 0.040) and anxiety (f: 2.257, p: 0.040).

**Table (5)** summarizes that there were no significant statistical differences in lifestyle modifications in the control group for all items, while there were significant statistical differences for all items in a study group.

**Table (6)** Indicates that 89.4% of the study sample have uncertain fatigue interferes with my physical functioning from the total fatigue severity scale and there was highly statistical Significance at ( $p \leq 0.01$ ).

**Table (7)** illustrates a correlation between endometriosis symptoms of the studied sample, and women's compliance for diet, exercise, and stress management, there was a significant statistical correlation among all items.

**Table (1):** Distribution of the study sample according to their socio-demographic characteristics.

(N=60)

Characteristic	Control Group n2 =30		Study Group n1=30		X <sup>2</sup> (p-value)
	No	%	No	%	
<b>Age:</b>					
21-30 year	6	20.0	5	16.7	5.770 (0.056)
31-40 year	16	53.3	15	50.0	
41-50 year	8	26.7	10	33.3	
Mean±SD	32.45±5.23		37.17±6.99		
<b>Residence:</b>					
Urban	14	46.7	18	60.0	1.071 (0.301)
Rural	16	53.3	12	40.0	
<b>Women Occupation:</b>					
Work	15	50.0	13	43.3	0.268 (0.604)
Housewife	15	50.0	17	56.7	
<b>Women Education:</b>					
Secondary	12	40.0	12	40.0	0.000 (1.000)
High	18	60.0	18	60.0	
<b>Marital status:</b>					
Single	11	36.7	9	30.0	0.300 (0.584)
Married	19	63.3	21	70.0	
<b>Income:</b>					
Enough	20	66.7	24	80.0	1.364 (0.243)
Not enough	10	33.3	6	20.0	
<b>Family history:</b>					
Yes	13	43.3	12	40.0	0.069 (0.793)
No	17	56.7	18	60.0	



**Table (2):** Distribution of the study sample according to their history. (N=60)

Item	Study Group n <sub>1</sub> =30		Control Group n <sub>2</sub> =30		X <sup>2</sup> p-value
	No	%	No	%	
<b>Menstrual history:</b>					
Age at menarche: - 12-13 years	21	70.0	19	63.3	0.300 (0.584)
- >14year:	9	30.0	11	36.7	
Menstrual cycle: - Regular	15	50.0	15	50.0	0.000 (1.000)
- Irregular	15	50.0	15	50.0	
Length of menses: - 3-5 days	20	66.7	23	76.7	0.739 (0.390)
- > 6days	10	33.3	7	23.3	
Dysmenorrhea: - Yes	25	83.3	24	80.0	0.111 (0.739)
- No	5	16.7	6	20.0	
<b>Obstetric history:</b>					
Gravidity: - Null-gravida	20	66.7	20	66.7	0.000 (1.000)
- Gravida 1 or more	10	33.3	10	33.3	
Parity: - Null-Para	21	70.0	17	56.7	1.148 (0.284)
-Para 1 or more	9	30.0	13	43.3	
<b>Endometriosis history</b>					
Time onset of symptoms: - < 3 years	4	13.3	5	16.7	3.464 (0.177)
- 4-6 years	11	36.7	10	33.3	
- <7years	15	50.0	15	50.0	
Time from diagnosis: - 1year	7	23.4	6	20	4.706 (0.095)
- 2-3 years	10	33.3	10	33.3	
- <3 years	13	43.3	14	46.7	
Stage of endometriosis: - Mild	20	66.7	17	56.7	0.635 (0.426)
- Moderate	10	33.3	13	43.3	

**Table (3):** Distribution of the study sample according to endometriosis symptoms. (N=60)

Item	Study Group n <sub>2</sub> =30		Control Group n <sub>1</sub> =30		X <sup>2</sup>	P-value
	No.	%	No.	%		
Dysmenorrhea	7	23.3	8	26.7	0.089	0.766
Fatigue, low energy	25	83.3	23	76.6	0.068	0.782
Pelvic/abdominal or lower back pain	11	36.7	12	40.0	0.071	0.791
Pain with sexual intercourse	6	20.0	5	16.7	0.111	0.739
Gastrointestinal symptoms (diarrhea, constipation, bloating)	6	20.0	5	16.7	0.111	0.739

\*The results not mutually exclusive

**Table (4):** The effect of the lifestyle modification nursing program on the selected outcomes. (N=60)

Item	Before the Program n=30	After the Program n=30	F (p-value)
	Mean±SD	Mean±SD	
<b>Knowledge:</b>			
Control Group	9.18±2.14	10.56±2.46	0.968 (0.342)
Study Group	10.43±2.33	16.83±3.12	
<b>Practice:</b>			
Control Group	18.66±4.23	19.02±3.91	1.063 (0.376)
Study Group	19.88±4.52	34.89±5.42	
<b>Fatigue:</b>			
Control Group	15.11±2.46	16.05±5.75	2.465 (0.062)
Study Group	16.73±4.02	12.52±5.04	
<b>Pain:</b>			
Control Group	7.83±1.16	8.03±1.65	-1.241 (0.216)
Study Group	6.96±1.32	3.52±0.98	
<b>Depression:</b>			
Control Group	49.67±6.18	51.84±7.55	-0.893 (0.391)
Study Group	47.51±7.02	33.86±8.03	
<b>Anxiety:</b>			
Control Group	7.69±5.29	6.54±4.51	1.375 (0.395)
Study Group	9.29±7.34	7.61±4.10	

\*\* Correlation is significant at the 0.01 level (2 tailed)

\* Correlation is significant at the 0.05 level (2 tailed)

**Table (5):** Comparison between control and study groups for lifestyles modification on women with endometriosis-related to symptoms ( Pre, Post ) intervention. (N=60)

Item		Control Group		P-Value	Study Group		P-Value
		pre	post		Pre	post	
Pain management	Low	83.3%	81.0%	0.064	90.0%	3.7%	0.000**
	Average	0.0%	13.0%		0.0%	20.0%	
	High	16.7%	6.0%		10.0%	73.3%	
Dietary habits	Low	90.0%	93.0%	1.000	90.0%	6.7%	0.000**
	Average	0.0%	0.0%		0.0%	0.0%	
	High	6.7%	10.0%		10.0%	93.3%	
Physical activities	Low	83.0%	83.3%	0.310	13.3%	3.3%	0.031*
	Average	0.0%	0.0%		23.3%	6.3%	
	High	16.3%	6.7%		63.3%	93.3%	
Sexual function	Low	100.0%	96.6%	0.122	83.3%	3.3%	0.000**
	Average	0.0%	0.0%		0.0%	0.0%	
	High	0.0%	4.3%		16.7%	96.7%	

\*\* Correlation is significant at the 0.01 level (2 tailed)

\* Correlation is significant at the 0.05 level (2 tailed)

**Table (6):** Distribution of the study sample according to fatigue. (N=60)

Item	Study Group n <sub>2</sub> =30			Control Group n <sub>1</sub> =30			X <sup>2</sup>	P-value
	Agree	Uncertain	Disagree	Agree	Uncertain	Disagree		
Motivation is lower when I am fatigue	32.4	64.2	3.4	16.7	35.7	47.6	14.876 <sup>FE</sup>	0.000**
Exercise brings on my fatigue	41.1	52.4	6.5	12.0	5.0	83.0	33.373	0.000**
Easily fatigued	34.4	53.3	12.3	19.0	21.0	60.0	14.255 <sup>FE</sup>	0.000**
Fatigue interferes with my physical functioning	1.3	89.4	9.3	16.6	17.7	65.7	36.857 <sup>FE</sup>	0.000**
Fatigue causes frequent problems for me	25.7	47.6	26.7	24.3	25.7	50.0	6.617 <sup>FE</sup>	0.000**
Fatigue is among the three most disabling symptoms	15.6	65.7	18.7	14.7	24.3	61.0	12.915 <sup>FE</sup>	0.000**
Fatigue interferes with different activities	32.3	67.7	0.0	20.0	0.0	80.0	44.525	0.000**

<sup>FE</sup> Expected cell count less than 5, Fisher's Exact Test was used.

\*\* Highly Statistical Significance at  $p \leq 0.01$ .

**Table (7):** Correlation between Endometriosis symptoms of the studied sample, and women's compliance with diet, exercise, and stress management. (N=60)

Item	Woman's compliance for					
	Diet		Exercise		Stress management	
	r	p	r	P	r	P
<b>Pelvic pain</b>						
Dysmenorrhea	0.80	0.02*	0.98	0.02*	0.78	0.04*
Dyspareunia	0.78	0.04*	0.83	0.03*	0.80	0.03*
Non menstrual pelvic pain	0.84	0.04*	0.83	0.03*	0.80	0.03*
<b>Fatigue</b>	0.85	0.02*	0.84	0.03*	0.84	0.03*
<b>General health</b>	0.77	0.04*	0.82	0.03*	0.72	0.04*
<b>Work</b>	0.74	0.04*	0.84	0.03*	0.70	0.04*
<b>Sexual relation</b>	0.72	0.04*	0.85	0.03*	0.70	0.04*
<b>Total EHP-30</b>	0.89	0.01**	0.97	0.001**	0.80	0.03*

\* Statistically significant at  $p \leq 0.05$

\*\* Highly statistically significant at  $p \leq 0.05$

## Discussion

Endometriosis is a long-term condition that causes pain, and fatigue. It has negatively impacted many areas of women's lives, mainly day-to-day activities, mental disorders, especially depression, stress, social activities, relationships with family, work, and physical activities. (DiBenedetti, et al,2020). It is considered that the appropriate evaluation and screening carried out by the nurse significantly facilitates the task of diagnosing, early detection of the disease, and ease the consequences of the disease. Nursing has as its main role the promotion of education, guidance, and support for women carriers (Souza, et al, 2019). It is requiring a life-long personalized management plan so changing lifestyle for controlling disease themselves. Women often use complementary therapies as dietary intake and physical exercise to reduce their symptoms, maintain physical and mental health. Exercises and nutrition play a vital role in endometriosis's pathogenesis as they have an effect on various processes associated with the disease, and increase patient satisfaction (Huijs&Nap, 2020). So, this study aimed to evaluate the effect of lifestyle modification's nursing program on selected outcomes among women with endometriosis.

The result of the present study showed that there was no statistical significance difference between study and control groups regarding socio-demographic characteristics. which indicates that both groups had similar characteristics at the beginning of the program and may be due to the harmony of the study sample. The present study revealed that most of the studied sample was between (32.45, 37.17) the mean age for the control group, and the study group was (32.45), respectively. Regarding their residence, more than half of the studied sample housewives, and were highly educated. Most of the sample were married. The present study finding was partially in agreement with Abd El-Kader et al. (2019) who illustrated that the mean age of cases was  $32.1 \pm 5.6$  while half of the study sample was higher education, also most of the studied sample were married, and housewives. This result may be due to both studies conducted out in the constant society. Moreover, El-Maraghy et al. (2017) reported

that the mean age of the women with endometriosis was 37.3 years (range: 24 to 45 years)

Regarding menstrual history, the current study illustrated that; about three-quarters of the study sample were aged 12 to 13 years at menarche. Half of the study sample had irregular menstrual cycles. More than half of the study sample their length of menses 3-5 days. The present study finding was partially similar with Al-Jefout et al. (2017), who reported that 40% of women their age at menarche 12-13 years, while more than three-quarters of them their menstrual cycle was irregular, and half of the women their length of menses was 3-6 days.

The current study showed that slightly more than two-thirds of the study sample were null-gravida & more than half of them were null-para. These results were in the same line with Mohamed (2020) stated that mentioned that less than three-fourths of the study sample were null-gravida and null-para. The finding could be due to endometriosis women's fertility is often reduced due to scarring in the pelvis makes it hard for an egg and sperm to meet and fertilize subsequent in infertility.

Regarding the history of endometriosis, the present study pointed that slightly less than half of the study sample time for diagnosis was <3 years, half % of their time of onset of diagnosis was <7 years, and more than half of them had a mild stage of endometriosis. These results were nearly following Mohamed (2020) who noted that more than half of the study sample's time onset of symptoms was > 8 years, while more than one-third of their time from diagnosis was > 3 years. Moreover, slightly less than half of the study sample had a mild stage of endometriosis. Results by Agarwal et al. (2019) also reported delays from symptom onset to symptoms and diagnosis ranging from 4 to 11 years. Several factors exacerbate this delay, including "normalization" of symptoms and misdiagnosis. The presence of diagnostic delays is a global phenomenon, Consequences of the delay in diagnosis are experienced by patients, involving persistent symptoms and a commensurate detrimental impact on quality of life, erosion of the patient-physician relationship, and development of central sensitization.

Endometriosis symptoms reported by women were fatigue as more than three-quarters of the study sample. Nearly half of the study sample had pelvic pain. Moreover, about one-quarter of the study group and control group had dysmenorrhea. These results come in according to **Ramin-Wright et al. (2018)** illustrated that frequent fatigue was experienced by most women diagnosed with endometriosis in the control group, and Fatigue in endometriosis was associated with insomnia, depression, pain, and occupational stress. These symptoms adversely influence the quality of life, as well as the physical and psychological health, and efficiency at work. These results were in contradict **Ghonemy & El Sharkawy (2017)** reported that the commonest symptoms were severe dysmenorrhea followed by pelvic pain was the most prominent symptom of women with endometriosis.

The current study revealed that there was a high improvement of lifestyle modification nursing program regarding all selected items as following Knowledge (f: 0.169, p: 0.001), and self-care practices (f: 3.058, p: 0.017). This in agreement with **El Sayed (2021)** who found a significant increase in the level of women's knowledge, and practice after receiving an educational program as healthcare providers play an important role in patients management, coping with endometriosis, and develop practical ways of managing symptoms. The previous findings were also consistent with **Abd El-Mouty et al. (2016)**, who stated that there were significant changes in the knowledge level of the studied women about all items of the educational session regarding endometriosis at post education and follow uptime. This is maybe due to the implementation of educational sessions increase the level of women's knowledge and practice. Also, the high level of education of women is better subjected to various sources of information regarding disease management. The higher educational attainment had a positive effect on their knowledge and practice.

The current study revealed that there was a highly statistically significant decrease in the intensity of endometriosis-related, fatigue, pain, and depression occurred in the study group compared with the control group after lifestyle modification nursing program implementation. This result was consistent with **El Sayed &**

**Aboud (2018)**, who reported, a statistically significant decrease in the intensity of endometriosis-related pain symptoms occurred in the study group compared with the control group after one month and two months of educational intervention implementation. In addition, **Ghonemy & El Sharkawy (2017)** results showed a significant reduction of endometriosis-related pain.

The previous finding was in the same line with **Mohamed (2020)** who revealed a highly statistically significant reduction in women pelvic pain, and fatigue after the implementation of the nursing program compared to their level before it, as instructional nursing programs empower women to manage their pain, fatigue, and depression. This might be due to women interested in lifestyle modification as a healthy diet, physical activity, and non-pharmacological management that help them to gain knowledge of how to adjust with endometriosis for overcoming the symptoms like pain, fatigue, and depression.

Previous findings were also in line with **Van Niekerk et al. (2019)** who revealed a highly statistically significant reduction in the severity of depression in women after the implementation of the nursing program compared to their level before, as in some aspects of mental functioning, mental health, and quality of life and that women with endometriosis suffered from depression (86%), moderate to severe anxiety (29%), and mood disorders (68%). The results showed a change in anxiety level among the study group with statistically significant differences while no change was observed among the control group. In the accordance with the study results, the results of **Farshi et al. (2020)** reported a change in anxiety among women with endometriosis after the application of a self-care counseling program for anxiety and depression.

The present study revealed positive a correlation between Endometriosis Health Profile (endometriosis-related symptoms), pain, fatigue, and women's compliance for exercises, general health, sexual function, and stress management. These results were supported by **El Sayed & Aboud (2018)**, The mean total score of EHP-30 was significantly lowered in the study group compared with the control group, after implementation of

educational intervention, which indicates better quality of life in the study group. This improvement may be related to the effect of educational intervention sessions to lifestyle modification enhance awareness as (balanced diet, application of heat to lower abdomen, regular physical exercise, frequent rest period) that led to managing and overcoming its painful symptoms as less pain, and fatigue, slow down for progression of the disease and long-term burden of symptoms and improve general health. Also, this might be attributed to the educational intervention of health teaching to help women with endometriosis to cope with these sexual problems. In addition, psychological support offered to women helps to express complaints, and concerns.

As endometriosis may exert a profound negative influence on the lives of individuals with the disorder, adversely affecting the quality of life, participation in daily and social activities, physical and sexual functioning, relationships, educational and work productivity, mental health, and well-being. So, these daily challenges completing educational opportunities as impact health and well-being across the life course of affected individuals. positively influence mental and emotional health. **therefore**, it is time to make a serious investment in preventing this debilitating condition in the next generation of women improving the collective level of awareness of endometriosis, its detection, and its treatment (Misser, et al, 2021).

### Conclusions:

Our findings show that:

- Nursing programs regarding lifestyle modifications such as correct nutritional strategy, regular exercise, and psychological support has a major impact on endometriosis symptoms (fatigue, depression, and pain).
- Fatigue, pain, anxiety, and depression can be a symptom of endometriosis causing major distress impacting the daily physical activities and sexual activities of women with endometriosis.
- Pain and fatigue, anxiety, and depression were decreased after educational intervention in the study group compared with the control group.

**Recommendations:** In the light of the findings of the study, the following are recommended:

- Nursing programs regarding lifestyle modification should be applied for all women with endometriosis, and online easily accessible nursing programs are also needed, with further research on their utilization and usefulness.
- Dietary status and exercise can impact women with endometriosis-related symptoms. Therefore, counseling about diet and exercise for these women is recommended.
- Replication of the present study on a larger representative probability sample size in various Egypt governorates is recommended to achieve more generalization of the results.

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