Effect of Educational Intervention Guideline on Quality of Life among Women with Polycystic Ovary Syndrome

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ABSTRACT

Contexts: Polycystic ovary syndrome is a common endocrine disorder among women at the childbearing period that diminished women's quality of life.

Aim: The current study evaluated the effect of educational intervention guidelines on quality of life among women with polycystic ovary syndrome.

Methods: The current study conducted at the outpatient gynecological clinic at Benha University Hospital. A Quasi-experimental design used to collect data from a purposive sample of 98 women diagnosed with polycystic ovary syndrome. Three tools used for data collection. A structured interviewing questionnaire, a healthy practice assessment scale, and health-related quality of life questionnaire for polycystic ovary syndrome.

Results: The study findings revealed that women's knowledge mean score was increased from (8.84±5.72) pre-intervention to (33.56±3.91) at post-intervention. Besides, the healthy practice was satisfactory improved, as practice mean score was increased from (11.41±4.56) to (28.85±2.47) at the post-intervention phase, with a statistically significant difference between the two phases, that subsequently affect the improvement of studied women's quality of life.

Conclusion: An educational intervention guideline is effectively improving the quality of life of women with polycystic ovary syndrome. Educational intervention guideline is essentially recommended for women with polycystic ovary in order to improve different quality of life domains. Counseling and health education program must be provided to all women attended gynecological clinics to increases women knowledge regarding PCOS and its management, to enable early detection, and to improve their quality of life. A replication of the study on a larger probability sample in order to obtain generalizability is highly recommended.

Keywords: An Educational Guideline, women, Poly Cystic Ovary, Quality of Life.

1. Introduction

Polycystic ovary syndrome (PCOS) is the most common hormonal disturbance among women at reproductive age. National Institutes of Health (NIH) reported a worldwide prevalence of PCOS is a similar between 6% and 9% documented across the United States, the United Kingdom, Spain, Greece, Australia, Asia, and Mexico *(Azziz, Dumesic, & Goodarzi 2011)*. This information suggests that there are no racial or ethnic influences on the prevalence of PCOS. World Health Organization (WHO) estimates that PCOS has affected 116 million women (3.4%) worldwide *(Wolf, 2018)*.

PCOS is manifested by hyperandrogenism ovulatory dysfunction, and polycystic ovarian morphology *(Sirmans & Pate 2015)*. The pathophysiology of polycystic ovary syndrome is not explained, but it may be caused by complex interactions between genetic, metabolic, and environmental factors *(Li et al., 2011)*. Risk factors for PCOS in adult women include obesity, especially upper body obesity. Obesity is present in at least 30% of women with PCOS. Hyperinsulinemia is secondary to insulin resistance. Insulin resistance will affect 50% to 70% of women with PCOS

leading to several comorbidities, including glucose intolerance, metabolic syndrome, dyslipidemia, and hypertension *(Stracquadanio & Ciotta 2015)*.

Besides, PCOS is usually associated with clinical complications, including reproductive (menstrual irregularity and infertility), metabolic (insulin resistance, diabetes mellitus, and cardiac disorders), and also psychological disabilities as anxiety and depression *(Veltman-Verhulst, Boivin, Eijkemans, & Fauser, 2012)*.

Health-related quality of life (HRQoL) defined as a multidimensional concept used to characterize the physical, emotional, and social aspects of particular diseases or their treatment *(Sirmans & Pate 2015)*. Chronic disorders as PCOS may have significant effects on the QoL that need to be accurately evaluated *(Stracquadanio & Ciotta 2015)*. HRQoL can be evaluated by using both general and specific tools. A lot of recent research studies designate a remarkable worsening of life quality and highly stressful life that is adversely affecting the psychological, social well-being, and sexuality of women with polycystic ovary syndrome *(Mani et al., 2015; Moghadam Fereidooni, Saffari, & Montazeri, 2018)*.

More than 52 full-text articles studied the impact of PCOS on women's quality of life; 9 of these studies were qualitative and had focused upon the impact of PCOS on

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woman's HRQoL *(Kitzinger & Willmott 2002; Williams, Sheffield, & Knibb, 2015)*. The remaining 43 studies were quantitative. The frequency of studies on QoL in PCOS women from various countries (n=52) was as follows: USA (n=13), UK (n=9), Iran (n=7), Australia (n=3), Germany (n=5), Sweden (n=2), Italy (n=2), Canada (n=2), the Netherlands (n=2), and Brazil (n=2) studies. Also, there was one article from each of the following countries: Belgium, Turkey, Austria, Taiwan, and Greece. These studies' results showed that PCOS is a major cause of psychological morbidity and has a negative impact on women's HRQoL. This feature has also been demonstrated in some other qualitative studies *(Stein, Jennifer, Sites, & Yang, 2016; Sirmans, Parish, Blake, & Wang, 2014; De Leo et al., 2016)*. In all the studies, different aspects of the QoL in PCOS women were evaluated, including physical, psychological, social, sexual as well as medical ones.

The nurse has an essential role in recognizing these concerns and applying therapy to improve the quality of life in women with PCOS. They are responsible for women's lifespan quality-of-care. Clinical-practice guidelines assist in guiding care for women with PCOS. These guidelines have been developed using a synthesis of research evidence, expert consensus, and patient's perspective *(Oostendorp & Huijbregts, 2011)*. Guidelines generally include statements of expected practice and specific standards of care against which providers can be audited. Improvements in quality of care and outcomes, as well as decreased costs and practice variation, have been demonstrated when clinical-practice guidelines followed *(Kredo et al., 2016)*.

The maternity nurse, in turn, had an essential role in counseling for the decline of this phenomenon. They are the key persons in the healthcare delivery system. Nurses can have a positive impact on women with PCOS through counseling, education, and providing support for women dealing with negative self-image secondary to the physical manifestations of PCOS. Education helps the women understand the syndrome and its associated risk factors to prevent long-term health problems, encourage women to make positive lifestyle changes, and make community referrals to local support groups to help the woman built her coping skills *(Karen, Lesley, & Hallam, 2010)*.

2. Significance of the Study

Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders in women of reproductive age. In Egypt, PCOS shows up to 26% of familial PCOS, and 5.4% of women do not have a familial history *(Abdelhafeez, Taha, Ahmad, & Khalaf 2003)*. Also, reports state that PCOS constitutes a significant health issue in Egyptian females *(Sanad, 2014)*.

PCOS has a significant adverse effect on women's quality of life. Nurses play a crucial role in gynecologic clinics in providing women with clear and accurate information regarding PCOS. They encourage them to ask their questions, to get their needed information, and to enhance their QOL. Educating women is a role for nurses in all health care settings. The nurse is often the main source of

information about health promotion. That is why they have a significant role in the current educational guidelines. Educational intervention guideline improves women's understanding of their condition and can clarify the expressed needs of women with PCOS. Therefore, the current study aimed to evaluate the effect of educational intervention guidelines on quality of life among women with polycystic ovary syndrome.

3. Aim of the study

The current study aimed to evaluate the effect of educational intervention guidelines on quality of life among women with polycystic ovary syndrome. This aim achieved through:
- Assess the quality of life among women with polycystic ovary.
- Design and implement an educational intervention guideline for women with polycystic ovary.
- Evaluate effect educational intervention guidelines on knowledge, self-care healthy practice, and quality of life among women with polycystic ovary.

3.1. Research hypotheses

H1: Women with polycystic ovary who exposed to the educational guidelines will have higher mean knowledge and self-care healthy practice scores compared to their pre-intervention mean score.

H2: Women with polycystic ovary who exposed to the educational guidelines will have a higher score of quality of life compared to their pre-intervention mean score.

4. Subjects and Methods

4.1. Research design

A quasi-experimental (pre and post-test) design was used to achieve the aim of the current study. Thus, quasi-experimental is an empirical interventional study used to estimate the causal impact of an intervention on the target population without random assignment *(Cook & Campbell, 1979)*.

4.2. Research Setting

The study carried out at an outpatient clinic affiliated to the obstetric department at Benha University Hospital, where women can get treatment and follow up of different gynecological disorders, including PCOS. Also, women can have antenatal and family planning care.

A purposive sample of 98 women recruited in the present study according to the inclusion criteria. The sample size was calculated based on the previous six months census report of outpatient clinics affiliated at the obstetrics and gynecology department at Benha University Hospital. The total number of polycystic women who admitted to the previous setting (130/year). The sample size calculated utilizing the following formula.

$$n = \frac{N}{1+N(e^2)}$$

Where:

n= sample size (98)

N= total population number (130).

e= margin error (0.05) *(Jaykaran & Tamoghna, 2011)*.

Inclusion criteria:

Women with polycystic ovary syndrome at childbearing age and free from medical disorders (such as diabetes mellitus).

4.3. Tools of the study

Three tools used for data collection.

4.3.1. A structured interview questionnaire

It was developed by the researchers in the Arabic language after reviewing polycystic ovary related literature. It encompassed three main parts:

Part I studied women's socio-demographic characteristics, such as age, educational level, residence, and occupational status. Part II included the obstetrical history, which comprised women's weight, women's height, menstrual history such as (menstrual duration in days, amount of menstrual bleeding, the regularity of menstruation, and duration of marriage). Also, it included women's history of polycystic ovary syndrome, such as (the onset of PCOS and treatment modalities used).

Part III concerned with women's knowledge regarding polycystic ovary syndrome. It designed by the researcher after reviewing related literature *(Mohamed, Mansour, & Ibrahim, 2015)*. It designed to assess the women's knowledge related to PCOs. It consisted of six multiple-choice questions. Each question had several correct answers as definition (3 correct answer), signs and symptoms (8 correct answers), risk factors (8 correct answers), complications (6 correct answers), treatment of (3 correct answers), and healthy practice for reducing symptoms of polycystic ovary (8 correct answers). Each woman instructed to select more than one answer. This part used before and after the utilization of educational intervention (pre/posttest format). The reliability was done by Cronbach's Alpha coefficient test. The internal consistency was (0.89).

Scoring system of knowledge

A correct answer scored as "one grade" and the incorrect as "zero." The total knowledge score was calculated by summation of the scores for the correct answers to each question. The total possible score ranged from (0 to 36 marks), means, and standard deviations calculated. The higher scores reflect higher levels of knowledge about polycystic ovary syndrome. The total knowledge score indicated the following

- Good: ≥ 75 % of total knowledge score.
- Average: 60 % - <75 % of total knowledge score.
- Poor:< 60% of total knowledge scores.

4.3.2. Healthy Self-Care Practice Assessment Scale

It was designed by the researchers after reviewing related polycystic research studies *(Mohamed et al., 2015)*.

It pertained to assess women's healthy self-care practice that reduces symptoms of polycystic ovary. It is a three points likers scale. It included (18) statements distributed on three primary self-care practices, including nutritional self-care practice (8 statements), physical activity (6 statements), and self-care practice toward treatment protocol (4 statements). The reliability was done by Cronbach's Alpha coefficient test. The internal consistency was (0.894).

Scoring system for self-care practice

Each statement scored as (0) for never done, (1) for sometimes done, and (2) for usually done. The total possible score ranged from (0 to 36 marks). Means and standard deviations calculated. The higher scores reflect a higher level of healthy self-care practice of women. The total practice score calculated as the following:

- Satisfactory practice: ≥ 60% of the total self-care practice score.
- Unsatisfactory practice < 60%% of total self-care practice score.

4.3.3. Health-Related Quality of Life Questionnaire

It adopted from *Amiri et al., (2016)* to assess the quality of life of women with polycystic ovary syndrome (PCOSQ-50). It included a total number of 50 statements. Statements grouped into six domains as follows: Psychosocial and emotional (12 statements), fertility (9 statements), sexual functions (7 statements), obesity and menstrual disorder (9 statements), hirsutism (6 statements), and coping (7 statements). An Arabic translation of the questionnaire has been provided.

The reliability was done by Cronbach's Alpha coefficient test. The internal consistency of health-related quality of life questionnaire for polycystic ovary syndrome (PCOSQ-50) was (0.95). For each domain, reliability was (0.84) for psychosocial and emotional, (0.92) for fertility domain, (0.85) for sexual functions, (0.92) for obesity and menstrual disorder domain, (0.94) for hirsutism domain, and (0.87) for the coping domain.

Scoring System of quality of life scale

Each item rated on a 5-point Likert scale (always, often, sometimes, rarely, never) ranging from (1) always (worst condition) to (5) never (best condition). The final score ranged from 50 to 250. The range for various subscales is dependent on its number of items. The average score in each domain calculated by dividing the sum scores of the answered items by the total number of answered items.

- Low quality of life: <60% of the total quality of life score.
- Moderate quality of life: 60-75% of total quality of life score.
- High quality of life: >75% of total quality of life score.

4.5. Procedures

The tool reviewed for comprehensiveness, appropriateness, and legibility by an expert panel consisting of five obstetrics and woman health nursing experts. The panel ascertained the face and content validity of the tools.

A pilot study carried out on 10% of the total number of sample (10) women to evaluate the tools clarity, objectivity,

and feasibility of the study process, as well as to estimate the time needed for data collection. Those women in the pilot study excluded from the mainstream sample, and certain modifications were done.

Educational intervention: The content of educational guidelines reviewed by the panel of experts in maternity nursing, obstetrics and gynecology medicine, and they approved and validated its contents.

The study began on the first of January 2018 to the end of August 2018. After receiving approval from the Dean of the Faculty of Nursing, Benha University, it delivered to the director of Benha University Hospital for facilitating data collection. A clear and proper explanation of the aim of the study included. The study carried out through four phases: assessment, planning, implementation, and evaluation. The previously mentioned setting was visited by the researchers three days/week (Sunday, Monday, and Wednesday) from 9.00 am to 12.00 pm, according to the schedule of the outpatient clinic at the studied setting.

Ethical consideration: Informed consent obtained from each woman in the first session. Each woman informed that participation in the study was voluntary, and she can withdraw at any time.

Assessment phase: Upon securing official permissions to conduct the present study, each woman interviewed individually. The aim and procedure of the study were explained and asked for her participation. Each woman's knowledge, healthy practices, and quality of life assessed utilizing the tools of data collection as a pretest. Based on the result of the pretest, the studied women's needs regarding knowledge and healthy practice were detected.

Planning phase: Based on the results obtained from the interview sheet, the pilot study, and the assessment phase, as well as reviewing the related literature, the educational intervention developed by the researchers. Detected needs, requirements, and deficiencies translated into general and specific objectives of the educational intervention. The contents of the educational health intervention selected based on identified needs. Different teaching strategies and methods selected to suit teaching in small groups in the form of group discussion.

An objective of the educational intervention guideline was to improve the quality of life among polycystic ovary women. The content of educational guideline included:
- Meaning signs and symptoms of polycystic ovary syndrome.
- Risk factors and complications of polycystic ovary syndrome.
- Health habits that reduce the intensity of polycystic ovary syndrome symptoms.
- Healthy nutritional habits.
- Importance of physical activity and practice of daily exercises.
- The commitment to the treatment protocol.

Implementation phase: The current educational intervention guidelines implemented through (12) separate sessions for all studied women. Women recruited into (6) groups. Each group had 16 or 17 women. Two sessions for each group. Each session ranged from 45-60 minutes,

followed by 10-15 minutes for summary and discussion to evaluate what has been taught. An educational handout (Booklet) developed by the researchers and gave for each woman. It contained knowledge concerning meaning, signs and symptoms, risk factors, complications, and health habits that reduce the intensity of PCOS. Also, it included instructions about healthy nutritional habits. Women instructed to increase intake of the following diets:
- A low glycemic index diet that included whole grains, legumes, nuts, seeds, fruits, starchy vegetables, and other unprocessed, low-carbohydrate foods.
- An anti-inflammatory diet: such as berries, fatty fish, leafy greens, and extra virgin olive oil, may reduce inflammation-related symptoms, such as fatigue.
- A DASH diet: Doctors often recommend the Dietary Approaches to Stop Hypertension (DASH) diet to reduce the risk or impact of heart disease. It may also help manage PCOS symptoms. This diet is rich in fish, poultry, fruits, vegetables, whole grain, and low-fat dairy produce. The diet discourages foods that are high in saturated fat and sugar.

Also, women instructed about the importance of weight loss during treatment and on improving their quality of life through participation in physical activity, the practice of daily exercises, and walking daily for more than 30 minutes. Besides, the mechanisms of action of medication explained to women in order to enhance the commitment to treatment protocol and attendance for follow up.

Evaluation phase: The pre-posttest format used in two times of assessment; the first was before the intervention. The second time was after three months of implementing the educational intervention for women through their follow up visits to evaluate their knowledge and self-care healthy practice and quality of life scores.

4.6. Data analysis

Data analysis performed using the IBM SPSS statistical software version 22. The data explored, cleaned, and computed. Descriptive statistics with mean and standard deviation (SD) for continuous variables and frequency for categorical variables analyzed. Qualitative variables compared using the chi-square test (x^2) as the test of significance, paired (t) test, used to determine whether the mean difference between two sets of observation was zero (pre and post-test). The correlation coefficient (r) used to evaluate the association between studied variables. The p-value is the degree of significance. A significant level value considered when p-value < 0.05 and a highly significant level value considered when p-value ≤ 0.001, while p-value > 0.05 indicates non-significant results.

5. Results

Table 1 shows that 50.0% of the studied women were aged (30-<40) years, with a mean age of 32.89±6.83. 59.2 % of women had secondary education. Also, it observed that more than half of the studied women were housewives (65.3%). Concerning residence, 65.3% resided in an urban area.

Figure 1 illustrates 90.8% of the studied women were overweight and obese at the pre-intervention phase, while after the intervention, the body mass index of the studied women was slightly decreased, and the percentage of obesity reduced from 48% to 36.7%.

Table 2 illustrates that more than half of the studied women (58.2%) had menstrual flow from (5-7) days, 58.2% of them had an excessive amount of menstrual blood flow. Moreover, the vast majority of them (85.7) had irregular menstruation.

Table 3 indicates that (46.9%) of women s' had the onset of the polycystic ovary syndrome from (1-2 years), and (51.0%) of them had medical treatment.

Table 4 reveals a highly statistically significant difference between mean scores of pre and post polycystic ovary related knowledge among the studied sample.

Figure 2 illustrates that (73.5%) of studied women had a good level of knowledge after educational guideline intervention as compared to (7.2%) before the intervention.

Table 5 reveals a highly statistically significant difference between mean scores of polycystic ovary related healthy practice pre and post-intervention among the studied women.

Figure 3 illustrates that (75.5%) of the studied women had a satisfactory healthy practice after educational guideline intervention compared to (26.5%) of them before intervention guidelines implementation.

Table 6 reveals a highly statistically significant difference between mean scores of the psychosocial and emotional domain of quality of life for studied women at the post-intervention (p<0.001).

Table 7 indicates a highly statistically significant difference between mean scores of the fertility domain of quality life of studied women at the post-intervention(p<0.001).

Table 8 illustrates that there was a highly significant statistical difference between mean scores of sexual function domain of quality of life at post guideline intervention (p<0.001).

Table 9 indicates there was a highly significant statistical difference between mean scores of obesity and menstrual disorder domain of quality of life at post guideline intervention (p<0.001).

Table 10 shows that there was a highly significant statistical difference between mean scores of the hirsutism domain of quality of life at post guideline intervention (p<0.001).

Table 11 reveals that there was a highly significant statistical difference between mean scores of the coping domain of quality of life at post guideline intervention (p<0.001).

Figure 4 illustrates the percentage distribution of total quality of life score of the studied women with polycystic ovary syndrome at pre and post-intervention, it indicates that the (53.1%) of them had a high level of quality of life after the intervention compared to (0%) before the intervention.

Table 12 indicates a statistically positive correlation between studied women's total quality of life score and their knowledge and practice score at the pre-intervention phase. On the other hand, there is a highly positive association between studied women's total quality of life score, their knowledge, and self-care practice score at the post-intervention phase.

Table (1) Frequency and percentage distribution of sociodemographic characteristics of the studied sample (N= 98).

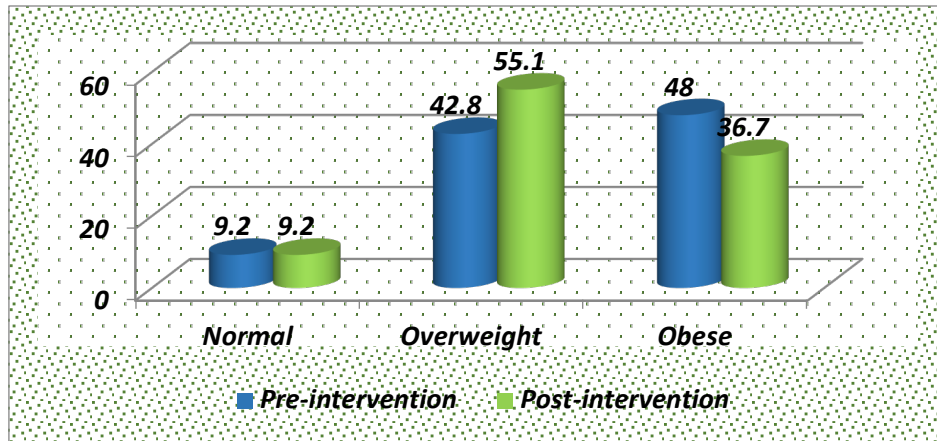| Personnel characteristics	No	%
Age in years		
20-<30	34	34.7
30-<40	49	50.0
40-45	15	15.3
Mean ±SD	32.89±6.83	
Educational level		
Read and write	11	11.2
Secondary education	58	59.2
University education	29	29.6
Residence		
Rural	34	34.7
Urban	64	65.3
Occupational status		
Working	34	34.7
Housewives	64	65.3

Figure (1): Percentage distribution of body mass index of the sample at pre and post intervention.

Table (2): Frequency and percentage distribution of the obstetric history of the studied sample (N=98).

Obstetric history	No	%
Menstrual history		
Duration in days		
3-5 days	11	11.2
5-7days	57	58.2
>7 days	30	30.6
Mean ±SD	6.98±1.98	
Amount of menstrual bleeding		
Normal	41	41.8
Excessive	57	58.2
Regularity of menstruation		
Yes	14	14.3
No	84	85.7
Duration of marriage		
1-<2 years	20	20.4
2-<3 years	39	39.8
>3 years	39	39.8
Mean ±SD	2.04±0.82	

Table (3): Frequency and percentage distribution of history of polycystic ovary among the studied sample (N= 98).

History of polycystic ovary	No	%
The onset of polycystic ovary		
Less than one year	27	27.6
1-2 years	46	46.9
>2 years	25	25.5
Treatment of polycystic ovary		
Medical	50	51.0
Surgical	29	29.6
Both surgical and medical treatment	19	19.4

Table (4): Comparison of studied sample knowledge mean score pre- and post-intervention guidelines.

| Knowledge	No of correct answers	Pre-intervention Mean ±SD	Post-intervention Mean ±SD	Paired t-test	p-value
Definition of polycystic ovary syndrome	3	1.03±0.71	2.73±0.44	-18.788	<0.001
Signs and symptoms of polycystic ovary syndrome	8	1.51±0.25	7.46±0.99	-35.548	<0.001
Risk factors of polycystic ovary syndrome	8	1.70±1.29	7.39±0.99	-34.141	<0.001
The complication of polycystic ovary syndrome	6	1.68±1.27	5.73±0.74	-32.956	<0.001
Treatment of polycystic ovary syndrome	3	0.96±0.66	2.77±0.42	-22.240	<0.001
Healthy practice for reducing symptoms of polycystic ovary syndrome	8	1.94±1.28	7.47±.96924	-33.578	<0.001
Total knowledge	36	8.84±5.72	33.56±3.91	35.19	<0.001
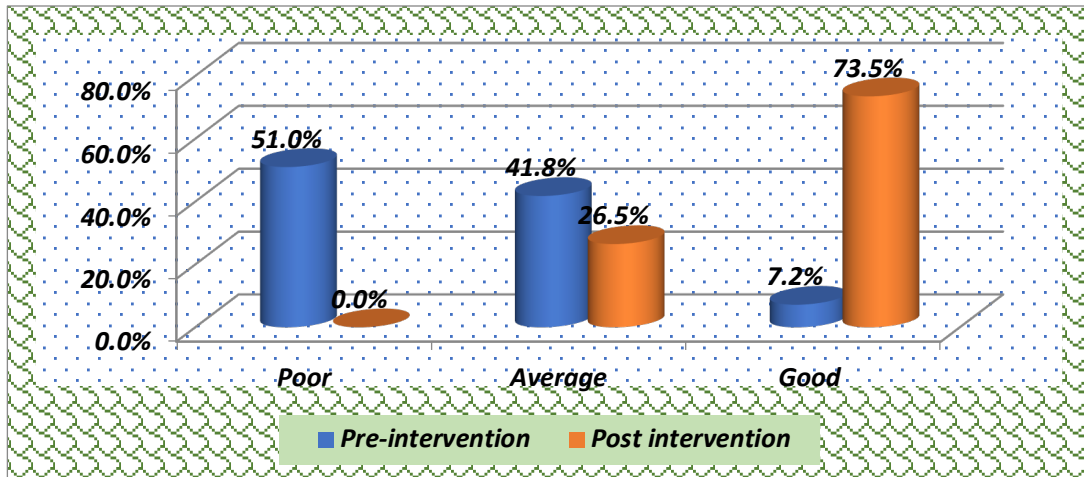
Figure (2): Percentage distribution of total knowledge score of the studied women regarding polycystic ovary syndrome at pre- and post-intervention.

Table (5): Comparison of studied sample self-care healthy practice means score pre- and post-intervention guidelines.

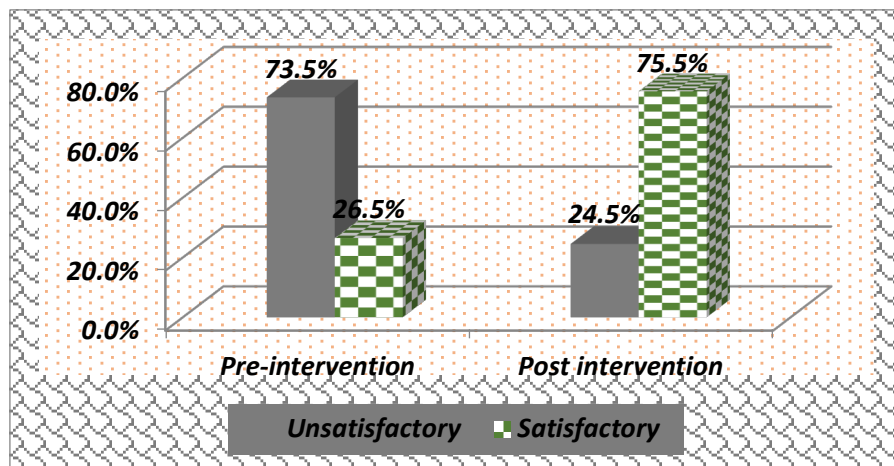| Self-care healthy practice	Items	Pre-intervention Mean ±SD	Post-intervention Mean ±SD	Paired t-test	p-value
Nutritional self-care healthy practice	8	5.77±2.13	12.29±1.25	-24.967	<0.001
Physical self-care healthy practice	6	4.12±2.22	9.81±1.00	-24.299	<0.001
Self-care practice toward treatment protocol	4	1.51±1.25	6.74±0.63	-36.118	<0.001
Total practice	18	11.41±4.56	28.85±2.47	-33.024	<0.001

Figure (3): Percentage distribution of total self-care healthy practice score of the studied women regarding polycystic ovary syndrome at pre and post intervention.

Table (6): Comparison of studied women's psychosocial and emotional domain of life quality between pre and post educational intervention.

Psychosocial and emotional domain	Pre-intervention Mean ±SD	Post-intervention Mean ±SD	Paired t-test	p-value
Women suffered from depression due to PCOS	1.95±0.60	3.68±0.60	20.01	<0.001
Women experienced impatience due to PCOS.	2.01±0.63	3.68±0.64	16.75	<0.001
Women blamed self for having PCOS	1.92±0.70	3.57±0.57	18.24	<0.001
Women experienced trouble dealing with others.	1.87±0.62	3.61±0.58	21.08	<0.001
Women suffered from low self-esteem due to PCOS	1.88±0.65	3.68±0.59	21.15	<0.001
Women experienced aggressiveness due to PCOS.	1.76±0.67	3.75±0.63	19.50	<0.001
Women felt pessimistic about the treatment.	1.80±0.62	3.73±0.64	22.77	<0.001
Women suffered from embarrassment due to appearance	1.82±0.61	3.79±0.69	20.21	<0.001
Women felt different to normal women.	1.81±0.63	3.62±0.62	20.72	<0.001
Women experienced a lack of control of emotions.	1.82±0.63	3.72±0.64	21.97	<0.001
Women felt ugly or unattractive	1.89 ±0.63	3.75±0.66	21.55	<0.001
Women felt easily tired	1.97±0.67	3.58±0.62	17.64	<0.001
Total	22.55±4.46	44.21±4.40	36.16	<0.001

Table (7): Comparison of studied women's fertility domain of life quality between pre and post educational intervention.

Fertility domain	Pre-intervention Mean ±SD	Post-intervention Mean ±SD	Paired t-test	p-value
Women felt sad seeing children	1.80±0.62	3.69±0.56	22.78	<0.001
Women felt sad about seeing pregnant women.	1.94±0.55	3.68±0.83	17.24	<0.001
Women experienced concern about infertility	1.98±0.40	3.88±0.78	19.92	<0.001
Women accept all other PCOS manifestations if assured of pregnancy	1.68±0.67	3.71±0.61	20.86	<0.001
Women felt fear of abortion	1.78±0.66	3.67±0.59	21.71	<0.001
Women felt concerned about infertility in the future.	1.78±0.65	3.57±0.59	20.93	<0.001
Women experienced a fear of divorce or separation	1.76±0.62	3.62±0.62	22.25	<0.001
Women felt the uselessness of sexual intercourse due to	1.82±0.63	3.50±0.54	21.49	<0.001
Women experienced concern about the long-term effects of PCOS medication	1.95±0.60	3.67±0.61	19.82	<0.001
Total	16.55±3.14	33.01±3.10	38.86	<0.001

Table (8): Comparison of studied women's sexual function domain of life quality between pre and post educational intervention.

Sexual function domain	Pre-intervention Mean ±SD	Post-intervention Mean ±SD	Paired t-test	p-value
Women felt unsatisfied with sex	2.01±0.63	3.65±0.63	16.88	<0.001
Women experienced a lack of sexual stimulation	1.92±0.70	3.57±0.57	18.24	<0.001
Women experienced a lack of sexual desire.	1.87±0.62	3.61±0.58	21.08	<0.001
Women experienced a lack of lubrication during sexual intercourse	1.88±0.65	3.68±0.59	21.15	<0.001
Women experienced a lack of orgasm.	1.76±0.67	3.75±0.63	19.50	<0.001
Women felt a lack of sexual responsiveness/coldness	1.80±0.62	3.73±0.64	22.77	<0.001
Women experienced a loss of libido because of PCOS	1.82±0.61	3.79±0.69	20.21	<0.001
Total	13.09±2.97	25.81±2.71	32.93	<0.001

Table (9): Comparison of studied women's obesity and menstrual disorder domain of life quality between pre and post educational intervention.

Obesity and menstrual disorder domain	Pre-intervention Mean ±SD	Post -intervention Mean ±SD	Paired t-test	p-value
Women felt concerned about being overweight	1.82±0.63	3.62±0.62	20.51	<0.001
Women felt the need to decrease the weight to control PCOS status	1.85±0.63	3.72±0.64	21.80	<0.001
Women felt concerned about a fast return to previous weight after any weight loss	1.91±0.63	3.75±0.66	21.40	<0.001
Women felt concerned about the complete cessation of menstruation	2.01±0.69	3.58±0.62	17.98	<0.001
Women felt concerned about menstruation at long intervals	1.84±0.66	3.69±0.56	21.00	<0.001
Women felt the willingness to reduce weight to be more attractive for the spouse	1.75±0.68	3.70±0.56	20.25	<0.001
Women experienced a fear of diseases such as diabetes, hypertension, and heart disease	1.58±0.59	3.74±0.50	27.83	<0.001
Women felt the urge to abandon treatments because of repetitive visits to doctors.	1.69±0.67	3.71±0.61	20.87	<0.001
Women experienced a fear of cancer	1.75±0.66	3.67±0.59	21.20	<0.001
Total	16.23±3.63	33.21±3.37	35.35	<0.001

Table (10): Comparison of studied women's hirsutism domain of life quality between pre and post educational intervention.

Hirsutism domain	Pre-intervention Mean ±SD	Post-intervention Mean ±SD	Paired t-test	p-value
Women felt embarrassed because of excess facial hair	1.75±0.65	3.42±0.84	16.04	<0.001
Women felt concerned about the progression of excess body and facial hair	1.73±0.62	3.57±0.69	20.47	<0.001
Women felt concerned about having excess facial hair	1.76±0.67	3.68±0.70	18.33	<0.001
Women felt concerned about the rapid re-growth of unwanted hair after its removal.	1.80±0.62	3.68±0.70	20.01	<0.001
Women felt embarrassed because of having excess body hair	1.82±0.61	3.74±0.74	18.73	<0.001
Women experienced the need to cover body and face because of excess hair	1.81±0.63	3.59±0.	20.09	<0.001
Total	10.71±2.66	21.70±3.09	27.20	<0.001

Table (11): Comparison of studied women's coping domain of life quality between pre and post educational intervention.

| Coping domain	Pre-intervention Mean ±SD	Post-intervention Mean ±SD	Paired t-test	p-value
Women felt a lack of family support and acceptance of the disease.	1.82±0.63	3.65±0.69	20.55	<0.001
Women felt a lack of satisfaction with being a woman.	1.89±0.61	3.63±0.74	20.09	<0.001
Women felt the desperate need for a cure.	2.03±0.62	3.51±0.68	16.13	<0.001
Women felt comfortable talking with others about PCOS	1.84±0.61	3.62±0.63	19.72	<0.001
Women felt easy communicating with others about PCOS	1.96±0.55	3.60±0.90	15.34	<0.001
Women felt a lack of satisfaction with the appearance (self-image)	1.98±0.40	3.77±0.91	16.73	<0.001
Women felt a lack of satisfaction with the role of a wife	1.68±0.67	3.48±0.78	17.39	<0.001
Total	13.23±2.42	25.30±3.12	30.60	<0.001
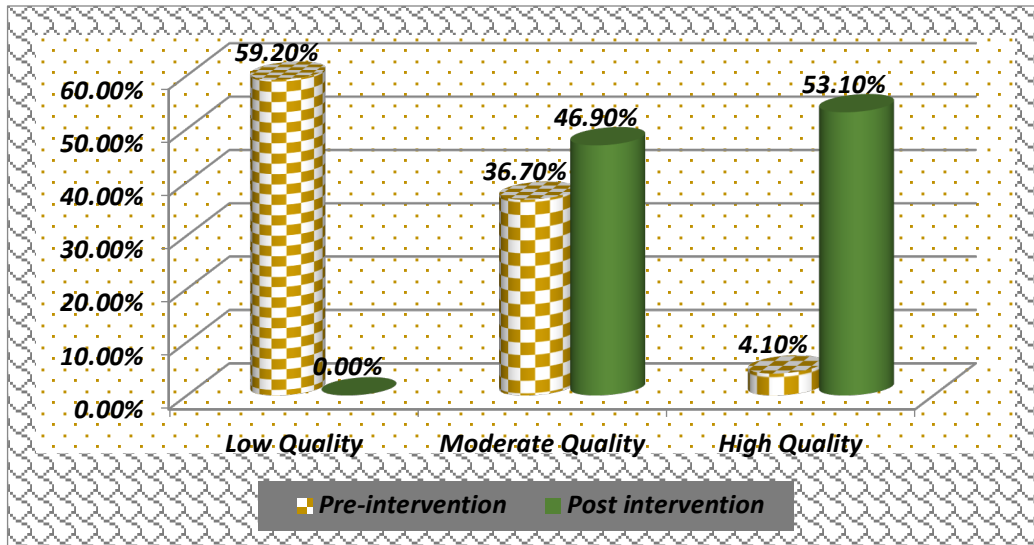
Figure (3): Percentage distribution of total quality of life of the studied women at pre and post-intervention.

Table (12): Correlation between studied sample total quality of life score and their total knowledge and practice score.

Variable	Times of assessment	Total Knowledge core		Total healthy practice score	
		r	p	r	p
Quality of life	Pre-intervention	0.212	<0.05	0.246	<0.05
	Post –intervention	0.534	<0.001	0.631	<0.001

6. Discussion

Polycystic ovarian syndrome (PCOS) has always been considered as a systemic problem that carries many risks at the time of presentation and later in a woman's life. These risks include infrequent menstrual flow that carries a threefold increased risk of endometrial hyperplasia and endometrial carcinoma. PCOS affects the quality of life. It can worsen anxiety and depression either due to its symptoms or due to the diagnosis of chronic disease. Nursing has a pivotal role in recognizing these concerns and implementing therapy to improve the quality of life in women with PCOS *(Fearnley, Marquart, Spurdle, Weinstein, & Webb, 2010).*

The current study aimed to evaluate the effect of educational intervention guidelines on quality of life among women with polycystic ovary syndrome. This aim was significantly achieved through the present study findings within the frame of the previously mentioned research hypothesis. They were women with polycystic ovary who exposed to the educational guidelines will have higher mean knowledge and self-care healthy practice scores compared to their pre-intervention mean score and will have a higher score of quality of life compared to their pre-intervention mean score.

The current study revealed that the mean age of women with PCOS was 32.89±6.83 years old. This finding is not matching with *Wijeyaratne et al. (2011),* who found that the average age of women with PCOS ranges between 25 and 26 years. On the other hand, *Bazarganipour Ziaei, Montazeri, Foroozanfard, and Faghihzadeh, (2012)* from Iran found that the average age of women with PCOS was 28.2 years. The present study revealed that about two-thirds of the studied women were housewives. This finding coincided with *Bazarganipour et al. (2012),* who found that the majority of their studied subjects had been housewives. On the contrary, the study of *Elsenbruch et al. (2003)* in German revealed that the majority of the studied patients had a college-degree and were working. The contradiction among the various studies addressing the above-mentioned socio-economic factors and the current one has been attributed to the cultural experience of the studied subjects.

The current study findings illustrate that the vast majority of the studied women were overweight and obese. This finding has a significant effect on the quality of women's lives and leads to poor QOL. The current study results were similar to *Bazarganipour et al. (2012)* in the USA and *Louwers et al. (2014)*, who reported a significant association between weight and QOL. The present study has also revealed that the body mass index of the studied women was slightly decreased, and the percentage of obesity reduced from about fifty percent to about one-third after the intervention.

Obesity increases some features of PCOS, such as hyperandrogenism, hirsutism, infertility, and pregnancy complications. Both obesity and insulin resistance increase diabetes mellitus type 2 and cardiovascular diseases. Moreover, obesity impairs insulin resistance and

exacerbates the reproductive and metabolic features of PCOS. It is well known that obesity is associated with anovulation, pregnancy loss, and late pregnancy complications (pre-eclampsia, gestational diabetes). Obesity in PCOS is also linked to failure or delayed response to various treatments, including clomiphene citrate, gonadotropins, and laparoscopic ovarian diathermy. Weight loss is considered first-line therapy in obese women with PCOS *(Motta, 2012)*.

The present study has also revealed that more than three-quarters of the studied women had irregular menstruation. This result agreed with *Zandi, Farajzadeh, and Safari (2010),* who stated that 59.4% of their studied subjects had irregular menstruation.

Concerning knowledge of the studied women with polycystic ovarian syndrome, the present study revealed that about three-quarters of studied women had a good level of knowledge post-intervention compared to less than one-tenth before the intervention. This study finding is consistent with the previous study that investigated the effect of a structured education program for women with polycystic ovary syndrome. Such a study concluded that providing information in a structured approach leads to improve their understanding of their disease.

The previous finding was also according to *Abdel Azim, (2016),* who conducted a study at the faculty of nursing at Minia university on 86 female students to evaluate the effect of educational program on the level of knowledge regarding PCOS among adolescent girls and revealed that educational program is effective in improving the knowledge of adolescent girls.

This result was at the same line with *Rani, (2015),* who carried out the study in Janet Nursing Home, Trichy, Thanjavur, on 40 women with PCOS to assess the effectiveness of lifestyle modification package on knowledge and attitude regarding weight reduction among women with PCOS. The study reported that there was a significant difference between pre and post-test levels of knowledge and attitude. This finding means that the lifestyle modification package was effective for women with PCOS.

The previous finding was also supported with *Mohamed et al. (2015),* who conducted study in Mansoura, Egypt to evaluate the effect of educational sessions about polycystic ovarian syndrome for late-adolescent girls: self-protective measures, and reported a statistical significance difference of mean knowledge score before and after educational sessions in all variables at ($p>0.05$). Thus, the utilization of educational sessions was found to be effective in increasing awareness of late adolescent about the polycystic ovarian syndrome.

Also, the present study results were similar to a study reported that adolescent girls have a remarkable increase in knowledge due to the effectiveness of the self-instruction module *(Simu, 2013)*. Besides, the study on the effectiveness of self-instructional module on knowledge regarding polycystic ovary syndrome among engineering students which showed that planned teaching program on knowledge regarding polycystic ovary syndrome found to be effective *(Nimo, 2015)*.

This study finding is consistent with the previous study of *Hassan and Farag (2019),* who conducted a study on a purposive sample of 300 women in reproductive age with PCOS in the gynecological outpatient clinic at Beni-Suef General Hospital, Egypt. The study designed to assess phenotypic characteristics of women with PCOS, discover the association between women's QOL and the occurrence of PCOS and improve women's knowledge, and increase awareness regarding PCOS. The results proved that there is an improvement of women's knowledge in allover items (definition, prevalence, etiology, risk factors, diagnosis, clinical features, complications, laboratory investigation, management, and balanced and healthy food) with a highly significant relation ($p<0.001$).

Moreover, the total mean score (Mean±SD) of women's knowledge was improved from 9.01±4.69 to 36.31±3.89. Such an agreement between our findings and other studies' findings may be related to the application of educational guidelines. The improvement of knowledge's score may be attributed to comprehensive varieties of educational methods used by the researcher as audiovisual materials, pamphlets, lectures, videos, and discussion as well as Arabic booklet. This finding is in accordance with *Dale's (1969)* Pyramid of Learning as cited by many authors as the pyramid illustrated that individuals could retain 50% of what they discussed, 20% of what they see/hear, and 10% of what they read.

As regards the healthy practice, the current study illustrated that more than three-quarters of the studied women had a satisfactory healthy practice after educational guideline intervention compared to about one-fourth of them before intervention guidelines implementation. Also, there was a highly statistically significant difference between mean scores of polycystic ovary syndrome-related healthy practice among the studied women post-intervention as compared to pre-intervention. This study finding is consistent with the previous study of

Colwell, Lujan, Lawson, Pierson, and Chizen, (2010), who evidenced that women with PCOS felt that they had more knowledge and motivation to implement preventive health strategies after participating in a clinical research study. Education about how PCOS affects their immediate and long-term health enabled women with PCOS to feel physical and psychological benefits and to engage more with their health care providers. These findings were supporting the first research hypothesis.

Regarding the quality of life (QoL), the present study showed that more than half of the studied women had a high level of quality of life after the educational intervention compared to none before the intervention. This result was in agreement with *Mani, Khunti, Daly, Barnett, and Davies, et al. (2018)*, who reported that providing a structured education in parallel to routine medical treatment can be beneficial for participants' understanding of their condition, reducing their anxiety and improving their QoL. The previous finding also was in agreement with *Abd Elmenim and Emam (2016)*, who conducted a study in the

Faculty of Nursing at Benha University to evaluate the effect of lifestyle changes on symptoms of polycystic ovarian syndrome in obese girls. The study concluded that the lifestyle changes positively affect in reducing symptoms of PCOS which subsequently reflected positively on their QoL. The previous finding also was congruent with *Antoniu, Popescu, Banacu, and Dimitriu (2018),* who studied lifestyle changes and weight loss: Effects on PCOS. The study concluded significant importance to the adoption of a healthy lifestyle (that composed of a hypocaloric diet and physical exercise) that will generate weight loss. Unlike any other treatment, weight loss without adjuvant medication (which brings various side effects) in many cases leads to at least partial resolution of PCOS symptoms. Lifestyle changes continue to be the first line of treatment.

Also, the current result supported by *Van Dammen (2018),* who reported that lifestyle modification not only affects a woman physically but also influences the mental status. The study also revealed a significant improvement in psychological health related QoL of the studied sample post-intervention compared to the pre-intervention level. These similarities may be due to acquired knowledge regarding PCOS, and its management may help them to implement self-care healthy practices and accommodate with the disease, which reflected finally positively on QoL.

Taking into consideration PCOS as heterogeneous with a wide range of symptoms, health care providers working in gynecology clinics need a full understanding of its pathophysiology, diagnostic measures, and symptoms management. This study and others stress nurses' role to make sure patients receive enough oral and written information on PCOS, and its management to be a guide for them. In summary, our results indicate that educational intervention guidelines affect the quality of life among women with polycystic ovary positively. This finding supported the second research hypothesis.

7. Conclusion

The results of this study supported research hypotheses, concluded that an educational intervention guideline is effectively improving mean knowledge, self-care healthy practice, and quality of life scores compared to their pre-intervention score.

8. Recommendations

In light of the results of the study, the researcher recommends:
- Educational intervention guideline is highly recommended for women with polycystic ovary in order to improve their quality of life.
- Counseling and health education program must be provided to all women attended gynecological clinics to increases women knowledge regarding PCOS and its management to enable early detection and improve their quality of life.
- Replication of the current study on a larger probability sample on wider geographical areas to obtain generalization.

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