Educational Program: Its Effect on Knowledge and Lifestyles among Paramedical Students with Polycystic Ovarian Syndrome (PCOS)

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Abstract

Background: Polycystic Ovarian Syndrome (PCOS) is one of the most common female endocrine disorders, which affect about 5%-10% of women worldwide during their reproductive age of 12–45 years. In addition, it can affect a woman's menstrual cycle, fertility, hormones, and aspects of her appearance. **Aim**: To evaluate the educational program and its effect on knowledge and lifestyles among paramedical students with polycystic ovarian syndrome. **Setting:** The study conducted at two government colleges in Jordan. **Study Design:** A Quasi- experimental (pre-test and post-test) design**. Sample:** A purposive sample. **Size:** 68 students who confirmed with PCOS. **Tools:** Identification of students with PCOS tool, Assessment of lifestyle habits tool, POCS structured interviewing questionnaire tool, follow up sheet, and Psychological assessment tool. **Results**: The present study findings revealed that a highly significant improvement in knowledge and lifestyle among the studied sample pre intervention compared to post and follow-up intervention $P < 0.01$. Additionally, 91.2% of the study sample feels improving regarding the knowledge which included in the educational program. **Conclusion:** The present study findings a significant improvement among studied sample' knowledge and lifestyles post intervention. Also, the majority among the studied sample were feeling improve regarding the knowledge which included in the educational program. **Recommendations:** Applying screening program for PCOS in young students is a very important to reduce the long-term health complications associated with PCOS.

Keywords: *Polycystic ovarian syndrome, Lifestyle, Educational program.*

Introduction

Polycystic ovarian syndrome (PCOS) is one of the female widespread endocrinopathies and metabolic alterations that affect 5% to 10% of women worldwide during their reproductive age of 12–45 years. This may lead to changes in the menstrual cycle, cyst in the ovary, failure to conceive, and other health problems [9]. However, the exact underlying causes of PCOS are remaining unknown and largely unclear. Nevertheless, strong evidence supports the possibility the condition is probably due to a combination of genetic, epigenetic, and environmental factors, including in utero exposure to androgens in disease development. [19]

According to World Health Organization (WHO) in 2012, the statics indicated that PCOS affected 116 million (3.4%) of women worldwide. Although, up to 70 % of women suffer from PCOS remain undiagnosed [20] Moreover, the variation in prevalence rates of PCOS depends on the select of different diagnostic criteria, which are includes the National Institutes of Health (NIH) criteria, censuses women are considered to have PCOS if they present with a combination of chronic oligo-or anovulation and clinical or biochemical signs of hyperandrogenism. [6]

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However, the Rotterdam criteria suggested the addition of a third criterion – the presence of polycystic ovaries – as well as a statement that any two of the three criteria are sufficient for a positive diagnosis of PCOS .In contrast, the Androgen Excess Society (AES) criteria depend on the presence of hyperandrogenism as a central feature of the disease in combination with oligo-anovulation and/or polycystic ovaries**.** [14]

PCOS treatment strategies chiefly aim at resolving the four major elements of PCOS including regularity of menstrual periods, control of hyperandrogenism like acne and hirsutism, management of infertility, and insulin-resistant (IR) along with its associated risk factors includes type 2 diabetes mellitus, hyperlipidemia, and obesity [8]. Lifestyle modification is considered the first-line treatment, of PCOS. For this reason, educational program play important role in increase awareness women among PCOS by improving their understanding of their condition and can address the expressed needs during change lifestyle such as increase physical activity. [10]

In Jordan, incidence of polycystic ovarian syndrome is difficult to determine due to the community believed it is stigma, lead to poor statistics related this subject .In most studies reports are very rare regarding the clinical and biochemical features of Arabic women with PCOS**.** [2] Currently, there is no cure for PCOS, but symptoms can be managed through medical therapy to prevent major negative consequences besides lifestyle modification. [15] Lack of knowledge and negative lifestyle attitude toward POCS are considered to be the major factor leading to this disorder. There is a need to increase awareness among students and improve their lifestyle behaviors to avoid major problems in the future. [17]

Aim of the Study: To evaluate the educational program and its effect on knowledge and lifestyles among paramedical students with polycystic ovarian syndrome.

Research Hypothesis: Using of educational program among paramedical students with PCOS will improve their knowledge scores and their lifestyles than before applying the educational program.

Subject and Methods

Study design: A Quasi-experimental pre-test & post-test was used in this study.

Setting: The study conducting in two government colleges in Jordan.

1. Rafidah Al-Aslamia College of Nursing/ Midwifery and Paramedical.

2. Nusaiba Al-Maznieh College of Nursing/ Midwifery and Paramedical.

Sample size and Technique:

- All students in all grades of both colleges (745) were included to assess with PCOS. The students diagnosed with PCOS for the intervention study (68).

- A total number (**68**) of was a participant from Rufaida College (n= 48) and the (n= 20) was a participant from Nusaiba College.

Sample type: Purposive sample.

Sample Criteria: All students in all grades with previous diagnosis of PCOS,age from 18 to 25 years, not married and had no medical and gynecological problem except PCOS.

Tools of Data Collection: A data collection tools were developed by the researcher after reviewing the related literature, its including the following:-

Tool (I): Identification of student with PCOS was used to assess clinical and biochemical parameters of PCOS.

Tool (II) POCS Structured Interviewing Questionnaire: It encompassed three main parts:-

Part (1): General and physical characteristics of the students such as age, residence, level of fathers and mother's education, and family history of the polycystic ovarian syndrome and anthropometric measurements (height, weight, body mass index and waist circumference).

Part (2): The menstrual history of the students such as the age of menarche, cycle length, duration of menstrual

blood flow, and number and rhythm of menstrual cycles through the previous year.

Part (3): This part was used to assess students' knowledge regarding polycystic ovarian syndrome such as (definition, causes, signs and symptoms, complications, and treatment).Student's knowledge would be checked with a model key answer, the score range was assigned to each answer as follows; correct = 2 score, while incorrect = 1 score.

Tool (III): Assessment of Lifestyle Habits Tool: This tool was designed by the researcher in the Arabic language to assess the student's lifestyles habits. It encompassed four main parts: food habits, physical activity, leisure time, and sleep pattern.

Tool (IV): Follow up sheet: Was constructed by the researcher to assess the outcome measures and was filled by the students.

Tool (V): Psychological Assessment Tool: This tool was developed by the researcher to assess psychological health such as anxiety, depression, and mood fluctuation for students related to lifestyle before & after the intervention. The score range was assigned to each answer as follows; no problem = 3 score, medium degree problems = 2, while large degree problems = 1 score.

Supported material:

The educational program was designed by the researcher and written in simple Arabic language using illustrated pictures to facilitate the students' understanding the information about PCOS.

Content validity and reliability: All tools of data collections were developed and sent to three experts at gynecological department to assess the content. Also, assess reliability of tool through Coronbach alpha test = 0.826.

Ethical Considerations:

- An official approval was granted from the Scientific Research Ethical Committee in the Faculty of nursing at Ain Shams University before starting the study.
- An official approval was granted from the Scientific Research Ethical Committee in the Ministry of Health of Jordan to conduct the study in colleges mentioned above.
- The aim of the study was explained to each student before applying the tools to gain her confidence and trust. And Ooral consent was obtained from each student before participating in the study.
- Data was confidential and using coding system for it. The study did not cause any harmful effects on participating students. Each student has right to withdraw from the study at any time.

Field work:

The study was carried out through four phases: Preparatory, implementation, follow-up, and evaluation phase.

- **Preparatory phase**: The researcher reviewed the current advanced and past relevant literature related by using the available local and international books, magazines, and computer search, then designed and prepared tools for data collection.
- **Implementation phase:**

The study conducted from the beginning of October 2018 until July2019. At the beginning of the interview, the researcher greeted the students, introduced herself to all students and explained the purpose of the current study; the researcher distributed the identification students with PCOS tool for all students and analyzed it to exclude the students without PCOS.

The researcher took the students included in the study who suffer from PCOS in another session. Oral approval of the student was obtained after explaining the purpose of the study. Then distribute all tools of research to all the years as (pre-test). The average time needed for the completion of each questionnaire was (30-50) minutes.

The study group was divided into subgroups (10 groups) and every group contained (5) students. The researcher has implemented 5 sessions for each group (5 days / week), 1 hour for each session according to the students' schedule. In the first session, the researcher was distributed the educational program for the students

based on their needs and baseline data obtained from pre-test.

After the final session, the post-test was conducted by using the same tool used in the pre-test. The researcher was repeated the post-test after three months of the conduction first post-test. The researcher has applied the follow-up after six months. The same previous fieldwork steps were applied to all subgroups in both colleges.

- **Follow-up phase:** It took nine months for students after receiving the educational program, the researcher followed up with the students for assuring that they followed the diet and exercise program.

- Evaluation phase: was started post-intervention to evaluate the effect of educational program on lifestyle for paramedical students with PCOS by using the same questionnaire used before the implementation of the program. In the six month, the follow up test was conducted.

Results

Figure (1): Shows that, 745 of the studied sample students were screened for PCOS, using Identification of student with PCOS tool. 90.87% of them were free from the symptom of PCOS, while 9.12% of them diagnosed of PCOS.

Table (1): Reveals that, more than two third of the studied sample (73.5%) had age ranged between 18-20 years with mean age 19.89 years, more than one third grade had 2nd grade, more than half of students' lives in city ,and the majority of the studied sample (80.9%) lives in the nucleolus family. Also, half of the studied sample had educated mothers at the secondary level, while (44.1%) of them had educated fathers at the university level.

Table (2): Shows that, there was a highly significant difference in all items related to the studied students' lifestyle about diet pattern as compared pre, post, and follow-up intervention (P≤0.001) except the place of daily meals there was no statistical differences between pre, post, and follow up applying to the educational program.

Table (3): Clears that, there was a highly significant difference in studied students' lifestyle regarding their exercise as compared pre, post, and follow-up applying to the educational program (P≤0.001).While there was no significant differences in times of exercise as compared pre, post, and follow-up applying to educational program (P>0.05).

Table (4): Illustrates that, there was a highly significant improvement in the studied students' physical characteristics about weight, body mass index, and waist circumference as compared before and after the educational program.

Table (5): Demonstrates that, there was a highly significant improvement in the studied students' knowledge about PCOS definition, causes, risk factors, signs and symptoms, and the healthy lifestyle of PCOS as compared to pre, post, and follow-up applying the educational program (P≤0.001).

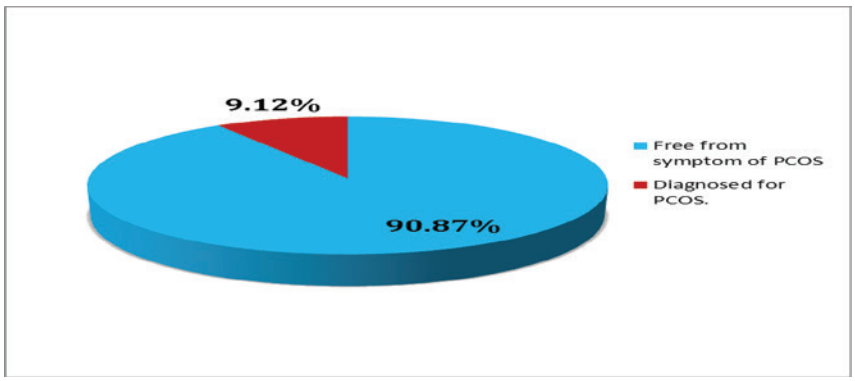

Figure (1): Percentage distribution of the students regarding the diagnosed of PCOS (n=745).

Table (1): Frequency distribution of the students diagnosed with PCOS according to their general characteristics (n=68).

General characteristics	N	%
Age		
18-20 years	50	73.5
21-23 years	15	22.1
24 - 25 years	3	4.4
Mean ± SD	19.89±1.7	
Residence		
City	35	51.5
Village	33	48.5
Family type		
Nucleolus	55	80.9
Extended	13	19.1
Mother education		
Illiterate	3	4.4
Primary	11	16.2
Secondary	34	50.0
University	20	29.4
Father education		
Illiterate	3	4.4
Primary	14	20.6
Secondary	21	30.9
University	30	44.1

Table (2): Frequency distribution of the students diagnosed with PCOS according to their diet pattern pre, post, and follow up applying for the educational program (n=68).

Items	Pre intervention		Post intervention		Follow up		X^2	P-value
Number of meals/day	NO	%	NO	%	NO	%		
One meal/day	5	7.4	4	5.9	3	4.4		
Two meals/day	35	51.4	16	23.5	14	20.6	33.18	0.001**
Three meals/day	11	16.2	33	48.5	42	61.8		
Four meals or more/day	17	25.0	15	22.1	9	13.2		
Place of daily meals								
Inside the house	13	19.1	16	23.5	22	32.4		
Outside the house	41	60.3	35	51.5	30	44.1	4.903	0.297
The college housing	14	20.6	17	25.0	16	23.5		

Eat meals from outside the home/week								
Rarely	8	11.8	21	30.9	33	48.5	7.543	0.05*
Once a week	14	20.6	10	14.7	10	14.7		
2-3 times a week	25	36.8	19	27.9	13	19.2		
4 or more	21	30.9	18	26.5	12	17.6		
Type of highly used food/day								
Meat	8	11.8	7	10.3	5	7.4	39.544	0.001**
Fish	4	5.9	6	8.8	8	11.8		
Vegetables and fruits	10	14.7	13	19.1	13	19.1		
Carbohydrate	25	41.2	13	19.1	8	11.8		
Sugar food	16	16.2	10	14.7	5	7.4		
Legumes	3	10.3	3	4.4	2	2.9		
All of them	2	2.9	16	23.5	27	39.7		
Meals skip/day								
Rarely	9	13.2	10	14.7	15	22.1	26.039	0.001**
Once a week	12	17.6	22	32.4	34	50.0		
2-3 times a week	34	50.0	25	36.8	10	14.7		
4 or more	13	19.1	11	16.2	9	13.2		
Eat fast food/week								
Rarely	11	16.2	16	23.5	32	47.1	33.398	0.001**
Once a week	10	14.7	25	36.8	18	26.5		
2-3 times a week	37	54.4	20	29.4	15	22.1		
4 or more	10	14.7	7	10.3	3	4.4		
Eat sweets, chocolate, cake								
Once a week	11	16.2	30	44.1	49	72.1	43.745	0.001**
2-3 times a week	20	29.4	13	19.1	9	13.2		
4 or more	37	54.4	25	36.8	10	14.7		
Freq. eating fruits/day								
Sometimes	34	50.0	16	23.5	7	10.3	30.464	0.001**
Once	25	36.8	31	45.6	34	50.0		
Twice	7	10.3	15	22.1	2	2.9		
Three more times	2	2.9	6	8.8	6	8.8		
Freq. eating meat/day								
Sometimes	43	63.2	20	29.4	11	16.2	35.200	0.001**
Once	22	32.4	40	58.8	50	73.5		
Twice	3	4.4	8	11.8	7	10.3		
Amount of water consumed daily in cups								
2 Cups	29	42.6	10	14.7	6	8.8	31.018	0.001**
3-4 Cups	18	26.5	25	36.8	20	29.4		
5-6 Cups	13	19.1	14	20.6	16	23.5		
7-8 Cups	8	11.8	19	27.9	26	38.2		

*significant (P < 0.05) non-significant (P>0.05) **highly significant (P≤0.001)

Table (3): Frequency distribution of the students diagnosed with PCOS according to their exercise pattern pre, post, and follow up applying for the educational program (n=68).

Items	Pre intervention		Post intervention		Follow up		X 2	P-value
Practice Exercise regularly	NO	%	NO	%	NO	%		
No	43	63.2	21	30.9	8	11.8	49.095	0.001**
Sometimes	9	13.2	14	20.6	13	19.1		
1-2 a week	11	16.2	19	27.9	17	25.0		
3-4 a week	5	7.4	14	20.6	30	44.1		
Kind of sport practiced								
Walking	7	25.0	20	29.4	25	36.8	57.145	0.001**
Running	1	1.5	1	1.5	1	1.5		
Aerobics exercise	6	8.8	13	19.1	12	17.6		
Swimming	1	1.5	1	1.5	1	1.5		
House sports machines	10	41.7	33	48.5	29	42.6		
Times of Exercise								
Morning	25	36.8	30	44.1	26	38.2	3.005	0.557
Afternoon	6	8.8	4	5.9	2	2.9		
Evening	37	54.4	34	50.0	40	58.8		

*significant (P < 0.05) non-significant (P>0.05) **highly significant (P≤0.001)

Table (4): Frequency distribution of the diagnosed studied sample according to the physical characteristics pre, post, and follow up applying the educational program (n= 68).

Characteristics	Pre intervention		Post intervention		X 2	P value
	No	%	No	%		
Weight (Kg)					39.088	0.001**
<=60 kg	2	2.9	11	16.2		
61-70 kg	12	17.6	36	52.9		
71-80 kg	37	54.4	21	30.9		
81-90 kg	14	20.6	3	4.4		
>90kg	3	4.4	0	0.0		
Mean ±SD	76.6 ±7.7kg		68.6±6.6kg			
Body Mass index (kg / m 2)					37.758	0.001**
Underweight <18.5 (kg / m²)	1	1.5	1	1.5		
Normal weight 18.5-24.9 (kg / m²)	2	2.9	20	29.4		
Over weight 25-29.9 (kg / m²)	43	63.2	45	66.2		
Obese 30-39.9 (kg / m²)	22	32.4	2	2.9		
Mean ±SD	29.1 ± 2.2		26.1 ±1.9			
Waist circumference (cm)					45.083	0.001**
<76 cm	0	0.0	11	16.2		
76-80 cm	5	7.4	28	41.2		
81-88 cm	31	45.6	14	20.6		
≥88 cm	32	47.1	15	22.1		
Mean ±SD	90.7±7.2		81.4±6.4			

Table (5): Frequency distribution of the students diagnosed with PCOS regarding their knowledge about PCOS pre, post, and follow up applying the educational program (n=68).

Items	Pre intervention				Post intervention				Follow up				X^2	P value
	Correct		Incorrect		Correct		Incorrect		Correct		Incorrect			
	No	%	No	%	No	%	No	%	No	%	No	%		
Definition of PCOS	2	2.9	66	97.1	57	83.8	11	16.2	59	86.8	9	13.2	149.13	0.001**
Definition of menstrual cycle	15	22.1	53	77.9	53	77.9	15	22.1	63	92.6	5	7.4	7.323	0.05*
Female internal genital organs	25	36.8	43	63.2	55	80.9	13	19.1	64	94.1	4	5.9	71.830	0.001**
Causes of PCOS	2	2.9	66	97.1	48	70.6	20	29.4	58	85.3	10	14.7	121.80	0.001**
Risk factors of PCOS	7	10.3	61	89.7	57	83.8	11	16.2	65	95.6	3	4.4	154.96	0.001**
Signs & symptoms of PCOS	3	4.4	65	95.6	60	88.2	8	11.8	62	91.2	6	8.8	178.16	0.001**
Complications of PCOS	4	5.99	64	4.1	62	91.2	6	8.8	67	98.5	1	1.5	201.97	0.001**
Investigations of PCOS	5	7.49	63	2.6	64	94.1	4	5.9	66	97.1	2	2.9	7.506	0.05*
Treatment of PCOS	13	19.1	55	80.9	59	86.8	9	13.2	60	88.2	8	11.8	121.15	0.001**
Healthy life style (diet & exercise) of PCOS	10	14.7	58	85.3	61	89.7	7	10.3	63	92.6	5	7.4	154.82	0.001**

***significant (P < 0.05) non-significant (P>0.05) **highly significant (P≤0.001)**

Discussion

Polycystic ovarian syndrome is a complex gynecological endocrine disorder that affects many adolescent girls and women of child-bearing age. It is described by a combination of signs and symptoms of androgen excess and ovarian dysfunction in the absence of other specific diagnoses. In addition, PCOS may occur at birth but does not cause symptom until puberty. [7]

Therefore, the current study aimed to evaluate the educational program and its effect on knowledge and

lifestyles among paramedical students with polycystic ovarian syndrome. The results of the current study aimed to test the research hypothesis "Using of educational program among paramedical students with PCOS will improve their knowledge scores and their lifestyles than before applying the educational program". Additionally, this study is quasi-experimental (pre-test and post-test) design conducted in two government colleges in Jordan.

Regarding the distribution of the total studied sample, the finding of the current study revealed that, the prevalence of PCOS was found to be 9.12% among the total study sample.

The finding in the current study is congruent with the study conducted by **Vidya Bharathi, et al.,** [21] in India to assess the prevalence of PCOS, which reported that 10% of the Indian women suffered from PCOS. On the contrary, the finding of the current study does not match with the finding of the study conducted by **Biradar & Shamanaewodi** [5] who reported that, the prevalence of PCOS was 23.8%. From the researcher's point of view, the prevalence of PCOS in the current study was within the worldwide range (5%-10%) according to the National Institute of Health 2012.

Regarding the distribution of the study sample according to their general characteristics, the current study revealed that, more than two-thirds of them had from 18-20 years old, with mean age 19.89 years, and the majority of them live in nucleolus family. Moreover, more than half of them live in the city. Also, half study sample mothers educated at the secondary level, while less than half of fathers educated at the university level.

The findings in the current study are congruent with the study conducted by **Shrivastava & Jagdev** [18] who studied the effectiveness of self-instructional module on knowledge regarding polycystic ovarian syndrome among B.Sc. nursing students of selected nursing college and stated that, the age of the majority of the participated students was between 17 to 20 years and more than half of them lived in the city.

On the contrary, the finding of the current study does not match with the finding of the study conducted by **Mazia** [12] who studied knowledge and awareness of polycystic ovarian syndrome among university students in Narayangonj and mentioned that, the age of more than two-thirds of the participants ranged from 21 to 25 years old.

Regarding the studied samples diet pattern revealed that, there was a highly significant difference related to the studied students' lifestyle about diet pattern as compared pre, post, and follow-up intervention.

The current study is in agreement with **Pitchai, et al.,** [16] who studied the awareness of lifestyle modification in females diagnosed with polycystic ovarian syndrome in India and reported that, the majority of the studied sample altered their diet primarily in diet composition after intervention.

In the same line, present result is supported by **Batool, et al.,** [4] who studied the mean intake of different dietary factors in young females with polycystic ovarian disease in comparison with control individuals and revealed that, dietary interventions focused on improvement of diet quality such as diet with low fat and high fiber content is advised for patients with PCOS.

Regarding the studied samples exercise pattern, the current study reported that, there was a highly significant difference in the studied students' lifestyle regarding their exercise pattern compared pre, post, and follow-up applying to the educational program.

The current study is in agreement with study done by **Abdolahian, et al.,** [1] who studied the effect of lifestyle modifications on anthropometric, clinical, and biochemical parameters in adolescent girls with PCOS in Iran and revealed that, exercise interventions were associated with significant changes in the menstrual cycles, also improvement in metabolic and hormonal findings.

From the researcher's point of view, this result may be because the majority of students had a wish to good body image and conceive in the future.

Regarding the studied sample knowledge about PCOS, the current study revealed that, there was a highly significant difference regarding their knowledge about PCOS as compared to pre, post, and follow up applying the educational program.

The present result is supported by **Mohamed** [13] who studied effect of educational program on the level of knowledge regarding polycystic ovarian syndrome among adolescent girls and stated that there is a highly statistically significant improvement in students' knowledge immediately after program implementation. In the same line, the current study is supported by **Rawat, et al.,** [17] who reported that, the mean post-test score was higher than that the pre-test mean knowledge score after intervention.

From the researcher's point of view, this result may be due to the clarity and consistency of the educational sessions and using suitable teaching methods.

Regarding anthropometric measures of the studied sample, the current study revealed that, there was a highly significant difference in all items concerning the studied students' anthropometric measures (weight, body mass index, and waist circumference) as compared pre, post, and follow-up applying the educational program.

The present result is in agreement with study done by **Marzouk et al.,** [11] who studied the impact of a lifestyle modification program on menstrual irregularity among overweight or obese women with PCOS and concluded that, significant improvement in body mass index, and waist circumference post intervention. Similarly, this result is in agreement with **Almukhtar** [3] who studied the effect of an educational program about polycystic ovarian syndrome on knowledge of adolescent female students in Iraq and indicated that, presence of significant improvement in adolescent female students' weight and their body mass index.

On the contrary, the finding of the current study did not match with the finding of the study conducted by **Mani, et al.,** [10] who studied the effectiveness of structured education programs in women with polycystic ovary syndrome and stated that, structured education programs did not increase physical activity or improve biochemical markers in overweight and obese women with PCOS.

From the researcher's point of view, this result may be due to adherence to the instructions and diet system that affect their anthropometric measures positively.

Conclusion

Applying of an educational program for students with PCOS will significant improvement knowledge scores and also lifestyles. The conclusion of present study will support the hypothesis of study and aim.

Recommendations

1. Applying screening program for PCOS in young students is a very important to reduce the long-term health complications associated with PCOS.

2. Providing an educational program about knowledge related to PCOS and hazards effects on reproductive health for paramedical students.

3. Integrating health education and counseling to support the student suffering from PCOS and their families for decreasing obesity which effect on students lifestyle.

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