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Effect of Self Instructional Module on awareness of Polycystic Ovarian Syndrome among Adolescent Students

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Abstract **Background**: Polycystic ovary syndrome (PCOS) is a complex endocrine disorder that affects 6% to 10% of women of reproductive age**.. Aim** of the research was to examine the effect of self instructional module on awareness of polycystic ovarian syndrome among adolescent students. **Design:** A quasi-experimental research design was adopted to fulfil the aim of this study. **Setting:** The study was conducted at nursing institute of Benha teaching hospital and nursing institute of health insurance hospital. **Sample:**A purposive sample of one hundred and seventy five adolescent girls among those attending the above mentioned setting. **Tools**: Data were collected through four main tools: A Structured interviewing questionnaire, knowledge questionnaire regarding polycystic ovarian syndrome, adaptive healthy measures questionnaire regarding PCOS and adolescent student's satisfaction sheet. **Results**: showed that the majority of adolescent students (89.7) had no information about PCOS while minority of them had source of information from health team , mass media ,family and friends respectively. and only 6.3 %of adolescent girls had adequate knowledge pre implementation increased to 90.3 % post implementation. Also there was a highly statistically significant difference between total knowledge and total adaptive healthy measures score related to PCOS at the pre and post implementation phases ($p<0.001$). Additionally the majority of adolescent students were satisfied with the self instructional module implementation. **Conclusion:** the study concluded that research hypotheses are supported and adolescent students exhibited better awareness regarding polycystic ovarian syndrome after implementation of self instructional module and this support the first hypothesis. Also the majority of adolescent students were satisfied with self instructional module regarding polycystic ovarian syndrome and this support the second hypothesis. **Recommendations:** Nursing curriculum should be updated to include comprehensive information about PCOS to improve the awareness of adolescents.

Keywords: *self instructional module, polycystic ovarian syndrome, adolescent students*

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1. Introduction

Adolescent is a stage of transition from childhood to adulthood. That includes several physiological changes as body growth, hormonal changes, and sudden development of primary & secondary sex characteristics [1]. Adolescent are more prone to health risk due to hormonal changes, lifestyle changes and lack of knowledge. So, it is important to minimize the complication in later adolescent or health is maintained by increasing awareness, adapting healthy lifestyles, early recognition of health problems [2].

Now a day's polycystic ovarian syndrome (PCOS) is considered as common and widespread health problem among adolescent girls and one of the leading causes of infertility. Polycystic disease is a most common female endocrine disorder which occurs in 4–18 % of women in their reproductive age worldwide [3].

Polycystic ovarian syndrome (PCOS) is a condition in which woman has an imbalance of female sex hormones [4]. However, it is very crucial to diagnose polycystic ovarian syndrome early to reduce the disease undesirable complications. There are some alarming symptoms that suspect PCOS case diagnosis, amenorrhea make a 90% chance of having PCOS [5]. Menstrual irregularity in adolescence is a good sign of hyperandrogenemia, and it is a leading cause of the development of PCOS and other associated symptoms include: Hirsutism, acne, central obesity, and sub fertility. In many cases, women will not be diagnosed until they try to conceive [6].

Having polycystic ovarian syndrome implies an increased risk of infertility, dysfunctional bleeding, endometrial carcinoma, obesity, Type 2 diabetes mellitus (T2DM), dyslipidemia, hypertension, and possibly cardiovascular disease. Clinical symptoms of PCOS include menstural irregularities, infertility, hirsutism, thinning of hair, weight gain and acne [7]. PCOS has substantial psychological,

social, economic consequences, symptoms of depression, decreased sexual satisfaction, and problems with female self-esteem and self image have been reported [8].

A Nurse holds a critical role in health care that goes beyond the day to day duties. Nurses are in a position to provide comprehensive care to adolescent afflicted with PCOS. Essential elements of nursing practice should be included in the nursing education. So upgrading the knowledge regarding PCOS to nursing students will enhance the adolescent girls to modify their lifestyle and reduce the risk [4].

Nursing students play a key role in imparting direct patient health education in the community and hospital setting. Upgrading the knowledge not only helps in imparting health education to the patient but also encourage them to modify their lifestyle and reduce the possible complication of polycystic ovarian syndrome [9].

1.1. Significance of the Study

Polycystic Ovarian Syndrome (PCOS) is a growing problem with adolescent girls and young women during reproductive years. It can be very difficult to diagnose PCOS in teenage girls as they often experience irregular or absent menses and acne [10]. It is one of the most endocrine disorders with prevalence of 5%-10% in different ethnic populations and 22% of women in general population. PCOS is a heterogeneous endocrine disorder which affects one in 15 women worldwide [11].

Education is one of the generality widely adopted health promotion strategies. So, there is more importance to create awareness programme regarding polycystic ovarian syndrome among female especially the adolescent girls to recognize the early sign of PCOS. So that the researcher was motivated to conduct the self instructional module to increase the awareness of adolescent students regarding PCOS [12].

1.2. Aim of the Study

The aim of the study was to examine the effect of self instructional module on awareness of polycystic ovarian syndrome among adolescent students.

1.3. Research Hypotheses

H1- Adolescent students will exhibit better awareness regarding polycystic ovarian syndrome after implementation of self instructional module.

H2- Adolescent students will be satisfied with self instructional module regarding polycystic ovarian syndrome.

2. Subjects and Method

2.1. Research Design

A quasi-experimental research design was used (pre/post-test) , one group was studied.

2.2. Setting

This study was conducted at nursing institute of Benha teaching hospital and nursing institute of health insurance hospital. This setting was choosen because large number of students attend it.

2.3. Sampling

Type:- A purposive sample

Size:- one hundred and seventy five(175) adolescent students. (103 adolescent students studying in first, second and third year of nursing institute of Benha teaching hospital and 72 adolescent students studying in first, second and third year of nursing institute of health insurance hospital. Adolescent students of pilot study (17 girls) were included in the sample. The studied sample was selected according to the following **inclusion criteria:** Adolescent students, agree to participate in the study and free from any medical disorder. **Exclusion criteria:** Adolescent students who were already diagnosed and in treatment of polycystic ovarian syndrome.

2.4. Tools of Data Collection

Data were collected through four main tools.

2.4.1. First Tool

A Structured interviewing questionnaire.

It was designed by the researchers after reviewing related literature, it was written in an Arabic language. It was consisted of two parts:

The first part: - Socio-demographic data of adolescent students, it consisted of (age, mother`s education, mother`s occupation, type of family, socio economic status, area of residence).

The second part: Source of previous information regarding polycystic ovarian syndrome.

2.4.2. Second Tool

Knowledge questionnaire regarding polycystic ovarian syndrome.

It consist of 30 multiple choices question. Fact ideal had four choices out of which one were correct answers and the remaining there where wrong answers.

Scoring:

The adolescent students who checked correct answer was given (2), while the one who checked incorrect answer was given (1). As well as, adolescent students' total knowledge score was classified as the following:

- Inadequate when the total score was less than 75%
- Adequate when the total score was more than 75%

2.4.3. Third Tool

Adaptive healthy measures regarding PCOS:

It consist of 10 items (decreasing weigh of 5 – 10%, doing exercise, decreased calorie intake, small frequent diet every day 4 – 5 times, balanced meals with CHO, protein, fat increased fiber intake as vegetables and fruits, decreased fat intake, prevent smoking and minimize alcohol intake, limit salt intake, food which contain sugar should be reduced).

Scoring:

The adolescent students who checked correct answer was given (2), while the one who checked incorrect answer was given (1). As well as, adolescent students' total adaptive healthy measures was classified as the following:

- Unhealthy when the total adaptive measures score was less than 60%
- Healthy when the total adaptive measures score was 60-100%

2.4.5. Fourth Tool

Adolescent students 's Satisfaction sheet:

Adolescent students 's satisfaction was evaluated by using a visual analog satisfaction scale (VASS). The VAS was adopted from [13]. The VAS scale is an instrument in which 0 (zero) represents that the sample was unsatisfied with the self instructional module implementation and 10 fully satisfied.

Scoring:

- 0 = Unsatisfied
- 1-9 = Satisfied
- 10 = Highly satisfied.

2.5. Method

The study was executed according to the following steps:

2.5.1. Administrative Approval

This study was conducted under the approval of the Faculty of Nursing Ethical Committee, Benha University. An official permission was obtained from the directors of the pre-mentioned setting (nursing institute of Benha teaching hospital and nursing institute of health insurance hospital) to conduct the study after explaining its purpose.

2.5.2. A Pilot Study

The pilot study was carried out on ten percent of the total sample (17 students) to test the clarity and applicability of the study tools as well as estimation of the time needed to fill the questionnaire. Adolescent students involved in the pilot study were included in the sample.

2.5.3. Validity

The tools of data collection were submitted to a panel of three nursing experts in the field of obstetrics and genecology to test the content validity, modification were carried out according to the panel' judgments on clarity of sentences and the appropriateness of content.

2.5.4. Reliability

The reliability was done by Cronbach's Alpha coefficient test which revealed that each of the four tools consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool was (0.86).

2.5.5. Ethical Considerations:

- Approvals of adolescent students were obtained before data collection and after explaining the purpose of the study.
- Anonymity was assured as the filled questionnaire sheets were given a code number (not by names).
- The adolescent students were ensured that questionnaire sheet will be used only for the purpose of the study and will be discarded at the end of the study.
- The study maneuvers do not entail any harmful effects on participation.
- The adolescent students who participated in the study were informed about having the right to withdraw at any time without giving any reason.

2.5.6. Field Work

To fulfil the aim of the study, the following phases were adopted. Preparatory, assessment phase, planning phase, implementation of the self instructional module phase and evaluation phase. These phases were carried out from the beginning of October, 2018 and completed at the end of May, 2019 covering eight months. The researcher visited the previously mentioned settings three days/week, (Saturday, Monday, Tuesday,), from 9.00 Am to 2.00 Pm by rotation at previously mentioned settings respectively and according to the spare time of the studying lecture of the students.

A. Preparatory phase:

The preparatory phase was the first phase of the study, the researchers carried out through review of local and international related literature about the various aspects of the research problem. This helped the researchers to be acquainted with magnitude and seriousness of the problem, and guided the researchers to prepare the required data collection tools. The tool was distributed to three experts in the field, these included two maternity nursing professors and one obstetrician, the aim was to test its appropriateness, comprehensiveness, clarity, importance and applicability. The jury recommended omissions of some items or addition which were done.

B. Interviewing and assessment phase:

At the beginning of interviewing the researcher greeted the students, introduced herself to all students included in the study, explained the purpose of the study and provided the adolescent students with all information about the study (purpose, duration, and activities) and take oral consent to participate in the study. The researchers distributed the questionnaires to find out the socio-demographic characteristics of the adolescent students from 15 to 20 minute.

Planning phase:

Based on results obtained from adolescent girls during assessment phase, the self instructional module regarding PCOS was developed by the researchers in a form of printed Arabic booklet to satisfy adolescent girls's deficit knowledge and healthy measures regarding PCOS. Sessions number and its contents, different methods of teaching, and instructional media were determined. Objectives of self instructional module were constructed and included the following:

General objectives:

By the end of the self instructional module sessions, each adolescent students will be able to acquire essential knowledge and adaptive healthy measures regarding PCOS and satisfied with the self instructional module regarding PCOS.

Specific objectives:

By the end of the self instructional module sessions, each adolescent students will be able to:

- Identify anatomy and physiology of ovaries.
- Define polycystic ovarian syndrome.
- Identify risk groups of polycystic ovarian syndrome.
- Enumerate etiology of polycystic ovarian syndrome.

- Discuss signs and symptoms of polycystic ovarian syndrome.
- Identify diagnostic evaluation of polycystic ovarian syndrome.
- Discuss complications of polycystic ovarian syndrome.
- Identify medical & surgical management of polycystic ovarian syndrome.
- Adopt healthy measures regarding polycystic ovarian syndrome.

C. Implementation of the self instructional module phase:

The adolescent students were provided with self instructional module through three educational sessions in small groups (n=8- 10 students) with duration of approximately 45-60 minutes for each session. anatomy and physiology of ovaries, definition polycystic ovarian syndrome in addition to risk groups of polycystic ovarian syndrome were discussed during the 1st session, while the 2nd session concerned with etiology of polycystic ovarian syndrome, signs and symptoms of polycystic ovarian syndrome and diagnostic evaluation of polycystic ovarian syndrome while 3rd session concerned with complications of polycystic ovarian syndrome, identify medical & surgical management of polycystic ovarian syndrome, healthy measures regarding polycystic ovarian syndrome. All sessions were presented in a power point presentation by the researcher.

All adolescent students was provided with an instructional booklet to be used as a guide for them. Each adolescent students was informed about the time of the next sessions at the end of session. The subsequent session started by a feedback about the previous session and the objectives of the new session, At the end of each session, students questions were discussed to correct any misunderstanding. Different methods of teaching were used such as discussion, demonstration, re-demonstration and brainstorming. Instructional media included video contain all content of the self instructional module .

D- Evaluation phase:

The effectiveness of the self instructional module was evaluated one week after self instructional module implementation using the same format of tools which used before implementation (post-test). Also the researchers distribute the satisfaction sheet among adolescent students to evaluate degree of their satisfaction.

Statistical design:

Data was verified prior to computerized entry. The Statistical Package for Social Sciences (SPSS version 22.0) was used for that purpose, followed by data tabulation and analysis. Descriptive statistics were applied (e.g., mean, standard deviation, frequency and percentages). Test of significance (t test, chi-square). A significant level value was considered when $p \leq 0.05$. In addition, A highly significant level value was considered when $p < 0.001$.

Limitation of the study:

- The time for giving session for adolescent students was difficult to be organized and coordinate between students lecture time and practical training for the researchers; this was the main obstacle facing the researchers.
- Sometimes the sessions were protracted due to noise and other individuals' interruption.

3. Results

Table 1. Distribution of studied adolescents regarding socio-demographic characteristics (n=175)

Socio-demographic characteristics	no	%
Age		
15- <16 years	17	9.7
16 - <17 years	135	77.1
17 - <18 years	23	13.1
Mean ±SD	16.10±0.60	
Mother's education		
Illiterate	11	6.3
Read & write	37	21.1
Primary education	9	5.1
Secondary education	86	49.1
University education	32	18.3
Mother's occupation		
Housewife	112	64.0
Private employed	15	8.6
Government employed	48	27.4
Type of family		
Nuclear	147	84.0
Extended	28	16.0
Residence		
Ruler	130	74.3
Urban	45	25.7
Socioeconomic status		
Lower class family	26	14.9
Middle class family	116	66.3
Upper class family	33	18.9
Previous family history		
No	143	81.7
yes	32	18.3

Table 1 reveals that more than three quarters (77.1%) of the studied adolescents were in the age group of (16 - <17) years old with mean age of (16.10±0.60). Nearly half (49.1%) of them had mothers with secondary education. In addition about two thirds (64.0%) of the studied adolescents mothers were housewife and (66.3%) of them had middle class family and also more than three quarters (81.7%) of them had no previous family history.

Figure 1 shows that the majority of the studied adolescents had no information about PCOS while minority of them had source of information from health team, mass media ,family and friends respectively.

Table 2 Shows that, there was a highly statistically significant difference between mean scores of knowledge about ovaries and PCOS at the pre and post implementation phases ($p < 0.001$).

Table 3 shows that, there was a highly statistically significant difference between mean scores of knowledge about causes and risk groups of PCOS at the pre and post implementation phases ($p < 0.001$).

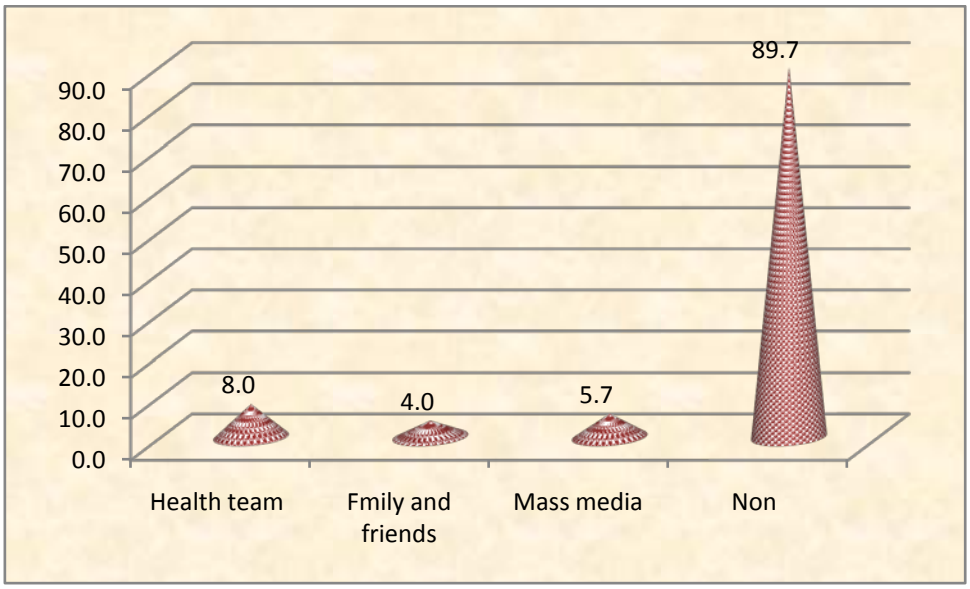

Figure 1. Distribution of studied adolescents regarding source of knowledge about PCOS

Table 2. Distribution of studied adolescents regarding knowledge about ovaries and PCOS pre and post implementation (n=175)

knowledge about ovaries and PCOS	Pre implementation				Post implementation				X^2	p-value
	Correct		Incorrect		Correct		Incorrect			
	no	%	no	%	no	%	no	%		
Site of the ovaries situated in female reproductive system.	43	24.6	132	75.4	166	94.9	9	5.1	179.6	0.000
Number of ovaries are present in female reproductive system.	87	49.7	88	50.3	168	96.0	7	4.0	94.7	0.000
Shape of the ovaries.	79	45.1	96	54.9	150	85.7	25	14.3	63.6	0.000
Types of cells present in the ovaries.	51	29.1	124	70.9	164	93.7	11	6.3	153.9	0.000
Female hormones are produced by ovaries.	89	50.9	86	49.1	150	85.7	25	14.3	49.0	0.000
Definition of polycystic ovarian syndrome (PCOS).	16	9.1	159	90.9	160	91.4	15	8.6	236.9	0.000

Table 3. Distribution of studied adolescents regarding knowledge about causes and risk groups of PCOS pre and post implementation (n=175)

knowledge about causes and risk groups of PCOS	Pre implementation				Post implementation				X^2	p-value
	Correct		Incorrect		Correct		Incorrect			
	no	%	no	%	no	%	no	%		
Age group people that are mostly affected by polycystic ovarian syndrome.	74	42.3	101	57.7	159	90.9	16	9.1	92.7	0.000
Risk people for develops polycystic ovarian syndrome.	41	23.4	134	76.6	137	78.3	38	21.7	105.3	0.000
Hormone responsible for develops polycystic ovarian syndrome.	33	18.9	142	81.1	136	77.7	39	22.3	121.3	0.000
Causes of polycystic ovarian syndrome.	22	12.6	153	87.4	147	84.0	28	16.0	178.7	0.000
Definition of hyperinsulinemia.	74	42.3	101	57.7	161	92.0	14	8.0	98.0	0.000
Enzyme that is released by ovarian follicles due to hyperinsulinemia in polycystic ovarian syndrome.	13	7.4	162	92.6	122	69.7	53	30.3	143.2	0.000
Enzyme that is essential for converting androgen to estrogen.	24	13.7	151	86.3	99	56.6	76	43.4	70.5	0.000
Enzyme that is the protein essential to bind with testosterone and estrogen in blood.	24	13.7	151	86.3	137	78.3	38	21.7	146.8	0.000
How the hyper estrogenic (increased estrogen level) stage will occur.	38	21.7	137	78.3	148	84.6	27	15.4	138.8	0.000

Table 4. Distribution of studied adolescents regarding knowledge about symptoms of PCOS pre and post implementation (n=175)

knowledge about symptoms of PCOS	Pre implementation				Post implementation				X^2	p-value
	Correct		Incorrect		Correct		Incorrect			
	no	%	no	%	no	%	no	%		
Definition of Hirsutism.	75	42.9	100	57.1	167	95.4	8	4.6	113.3	0.000
The location of Acanthosis Nigrians in polycystic ovarian syndrome.	66	37.7	109	62.3	155	88.6	20	11.4	97.2	0.000
Number of menstrual cycles occur in polycystic ovarian syndrome patient per year.	49	28.0	126	72.0	161	92.0	14	8.0	149.3	0.000

Table 5. Distribution of studied adolescents regarding knowledge about investigations of PCOS pre and post implementation (n=175)

knowledge about investigations of PCOS	Pre implementation				Post implementation				X^2	p-value
	Correct		Incorrect		Correct		Incorrect			
	no	%	no	%	no	%	no	%		
Diagnosis of polycystic ovarian syndrome through blood test.	62	35.4	113	64.6	175	100.0	0	0.0	166.8	0.000
The major diagnostic tool for polycystic ovarian syndrome.	61	34.9	114	65.1	154	88.0	21	12.0	104.2	0.000

Table 6. Distribution of studied adolescents regarding knowledge about treatment and complications of PCOS pre and post implementation (n=175)

knowledge about treatment and complications of PCOS	**Pre implementation**				**Post implementation**				**X^2**	**p-value**
	Correct		Incorrect		Correct		Incorrect			
	no	%	no	%	no	%	no	%		
The first line treatment for PCOS	47	26.9	128	73.1	148	84.6	27	15.4	118.1	0.000
Type of diet should be taken for PCOS	46	26.3	129	73.7	150	85.7	25	14.3	125.4	0.000
Type of diet should be avoided for PCOS	56	32.0	119	68.0	169	96.6	6	3.4	158.9	0.000
Salt requirement per day in PCOS patient	34	19.4	141	80.6	140	80.0	35	20.0	128.4	0.000
What is to be used instead of salt in dietary management of PCOS?	53	30.3	122	69.7	155	88.6	20	11.4	123.2	0.000
The drugs used to correct irregular menstruation in PCOS	44	25.1	131	74.9	159	90.9	16	9.1	155.1	0.000
The cream is used for unwanted hair growth in PCOS	12	6.9	163	93.1	130	74.3	45	25.7	164.9	0.000
The drugs used to treat infertility in PCOS	32	18.3	143	81.7	158	90.3	17	9.7	182.7	0.000
The surgical treatment for PCOS	28	16.0	147	84.0	169	96.6	6	3.4	230.8	0.000
The complication of PCOS	17	9.7	158	90.3	175	100.0	0	0.0	288.0	0.000

Table 7. Distribution of studied adolescents regarding total knowledge score pre and post implementation (n=175)

Total knowledge score	**Pre implementation**				**Post implementation**				**X^2**	**p-value**
	Correct		Incorrect		Correct		Incorrect			
	no	%	no	%	no	%	no	%		
Total knowledge score 1 (anatomy & physiology)	8	4.6	167	95.4	159	90.9	16	9.1	261.1	0.000
Total knowledge score 2 (causes and risk groups)	1	.6	174	99.4	98	56.0	77	44.0	132.5	0.000
Total knowledge score 3 (symptoms)	19	10.9	156	89.1	151	86.3	24	13.7	199.2	0.000
Total knowledge score 4 (investigations)	39	22.3	136	77.7	154	88.0	21	12.0	152.7	0.000
Total knowledge score 5 (treatment & complications)	2	1.1	173	98.9	156	89.1	19	10.9	273.6	0.000

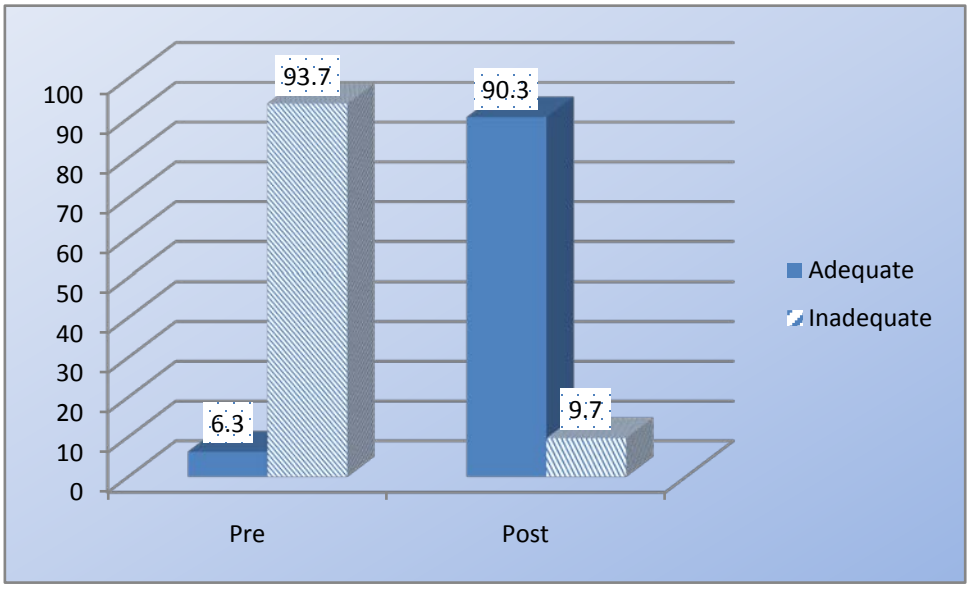

Figure 2. Percentage of studied adolescents regarding total knowledge score pre and post implementation

Table 4: Shows that, there was a highly statistically significant difference between mean scores of knowledge about symptoms of PCOS at the pre and post implementation phases (p<0.001).

Table 5: Shows that, there was a highly statistically significant difference between mean scores of knowledge about investigations of PCOS at the pre and post implementation phases (p<0.001).

Table 6: Shows that, there was a highly statistically significant difference between mean scores of knowledge related to treatment and complications of PCOS at the pre and post implementation phases (p<0.001).

Table 7: Shows that, there was a highly statistically significant difference between total knowledge score related to PCOS at the pre and post implementation phases (p<0.001).

Figure 2 represents that total knowledge score regarding PCOS were improved after implementation than pre implementation.

Table 8 shows that, there was a highly statistically significant difference between total adaptive healthy measures score related to PCOS at the pre and post implementation phases (p<0.001).

Figure 3 clarifies that total adaptive healthy measures score regarding PCOS were improved after implementation than pre implementation.

Table 9 shows that there was a highly positive correlation between total knowledge and total adaptive health measures scores of studied adolescents at pre and post implementation phases.

Table 10: Shows that, there was no statistically significant relation between total knowledge score and socio demographic characteristics (age, , occupation, type of the family, residence, socioeconomic status) at both pre and post implementation phases. While there was statistical significant relation between total knowledge score and mother education at pre implementation phase and there was highly statistical significant relation between total knowledge score and previous family history at pre implementation phase.

Table 11: Shows that, there was no statistically significant relation between total adaptive healthy measures score regarding PCOS and socio-demographic characteristics (age, Mother's education, mother's occupation, type of the family, residence) at both pre and post implementation phases. While there was highly statistical significant relation between total adaptive healthy measures score and (mother education, previous family history) at pre implementation phase and there was highly statistical significant relation between total adaptive healthy measures score and socioeconomic status at post implementation phase.

Table 8. Distribution of studied adolescents regarding adaptive healthy measures pre and post implementation (n=175)

Adaptive healthy measures	Pre implementation				Post implementation				X^2	p-value
	Correct		Incorrect		Correct		Incorrect			
	no	%	no	%	no	%	no	%		
Weigh loss of 5 – 10%	26	14.9	149	85.1	153	87.4	22	12.6	184.4	0.000
Doing exercise	91	52.0	84	48.0	161	92.0	14	8.0	69.4	0.000
Decreased calorie intake	45	25.7	130	74.3	162	92.6	13	7.4	161.8	0.000
Small, frequent diet (every day 4 – 5 times)	27	15.4	148	84.6	161	92.0	14	8.0	206.3	0.000
Balanced meals with CHO, protein, fat	83	47.4	92	52.6	160	91.4	15	8.6	79.8	0.000
Increased fiber intake (vegetables and fruits)	48	27.4	127	72.6	158	90.3	17	9.7	142.7	0.000
Decreased fat intake	31	17.7	144	82.3	153	87.4	22	12.6	170.5	0.000
Prevent smoking and Minimize alcohol intake	84	48.0	91	52.0	160	91.4	15	8.6	78.1	0.000
Limit salt intake.	47	26.9	128	73.1	169	96.6	6	3.4	179.9	0.000
Food which contain sugar should be reduced:	27	15.4	148	84.6	162	92.6	13	7.4	209.6	0.000

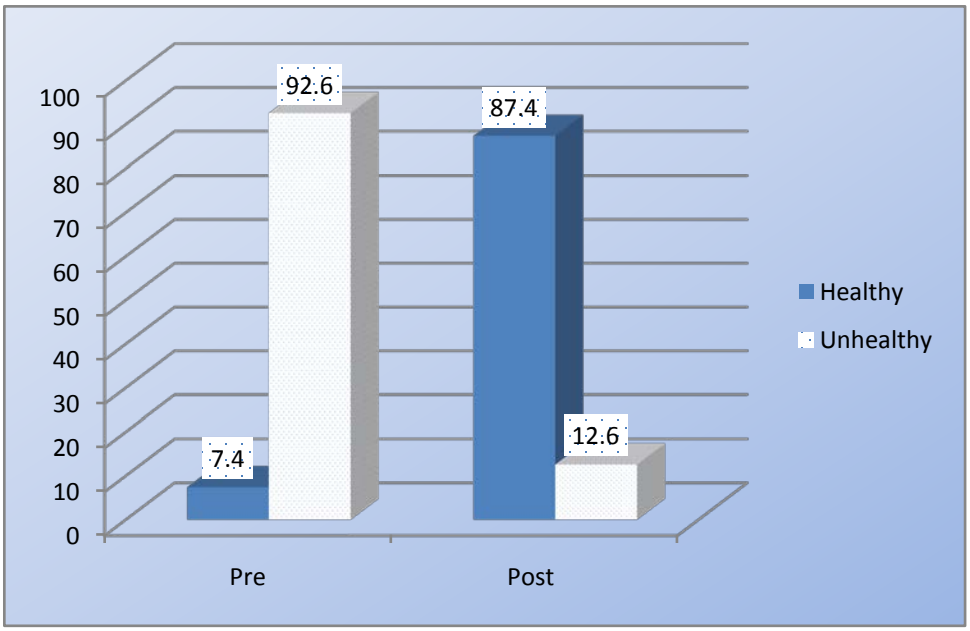

Figure 3. Percentage of studied adolescents regarding total adaptive healthy measures score pre and post implementation

Table 9. Correlation between total knowledge and total adaptive health measures regarding PCOS pre and post implementation

	Total knowledge			
Total adaptive health measures	Pre implementation		Post implementation	
	r	p-value	r	p-value
	0.66	0.000**	0.32	0.000**

Table 10. Relation between total knowledge score and socio-demographic characteristics of studied adolescents pre and post implementation

Socio-demographic characteristics	Pre implementation				Post implementation				$X^2$1	p-value	$X^2$2	p-value
	Incorrect (n=164)		Correct (n=11)		Incorrect (n=17)		Correct (n=158)					
	no	%	no	%	no	%	no	%				
Age												
15- <16	15	9.1	2	18.2	2	11.8	15	9.5	2.44	0.29	0.47	0.78
16 - <17	126	76.8	9	81.8	12	70.6	123	77.8				
17 - <18	23	14.0	0	0.0	3	17.6	20	12.7				
Mother's education												
Illiterate	8	4.9	3	27.3	1	5.9	10	6.3	11.84	0.01*	2.01	0.73
Read & write	34	20.7	3	27.3	4	23.5	33	20.9				
Primary	9	5.5	0	0.0	1	5.9	8	5.1				
Secondary education	84	51.2	2	18.2	10	58.8	76	48.1				
University education	29	17.7	3	27.3	1	5.9	31	19.6				
Mother's occupation												
Housewife	46	28.0	2	18.2	9	52.9	39	24.7	0.5	0.77	4.79	0.06
Private employed	14	8.5	1	9.1	3	17.6	12	7.6				
Government employeed	104	63.4	8	72.7	5	29.4	107	67.7				
Type of family												
Nuclear	137	83.5	10	90.9	16	94.1	131	82.9	0.41	0.51	1.43	0.23
Extended	27	16.5	1	9.1	1	5.9	27	17.1				
Residence												
Nuclear	121	73.8	9	81.8	15	88.2	115	72.8	0.34	0.55	1.91	0.16
Extended	43	26.2	2	18.2	2	11.8	43	27.2				
Socioeconomic status												
low	22	13.4	4	36.4	2	11.8	24	15.2	4.49	0.1	0.18	0.91
Moderete	110	67.1	6	54.5	12	70.6	104	65.8				
High	32	19.5	1	9.1	3	17.6	30	19.0				
Previous family history												
No	136	82.9	7	63.6	14	82.4	129	81.6	12.56	0.000*	0.005	0.94
yes	28	17.1	4	36.4	3	17.6	29	18.4				

Table 11. Relation between total adaptive healthy measures score and socio-demographic characteristics pre and post implementation

Socio-demographic characteristics	Pre implementation				Post implementation				$X^2$1	p-value	$X^2$2	p-value
	Unhealthy (n=162)		Healthy (n=13)		Unhealthy (n=22)		Healthy (n=153)					
	no	%	no	%	no	%	no	%				
Age												
15- <16	16	9.9	1	7.7	0	0.0	17	11.1	0.47	0.78	4.95	0.08
16 - <17	124	76.5	11	84.6	21	95.5	114	74.5				
17 - <18	22	13.6	1	7.7	1	4.5	22	14.4				
Mother's education												
Illiterate	10	6.2	1	7.7	0	0.0	11	7.2	17.03	0.000*	4.68	0.32
Read & write	31	19.1	6	46.2	4	18.2	33	21.6				
Primary	9	5.6	0	0.0	2	9.1	7	4.6				
Secondary education	83	51.2	3	23.1	14	63.6	72	47.1				
University education	29	17.9	3	23.1	2	9.1	30	19.6				
Mother's occupation												
Housewife	46	28.4	2	15.4	5	22.7	43	28.1	2.87	0.23	0.27	0.87
Private employed	15	9.3	0	0.0	2	9.1	13	8.5				
Government employed	101	62.3	11	84.6	15	68.2	97	63.4				
Type of family												
Nuclear	134	82.7	13	100	20	90.9	127	83.0	2.67	0.1	0.89	0.34
Extended	28	17.3	0	0.0	2	9.1	26	17.0				
Residence												
Rural	120	74.1	10	76.9	14	63.6	116	75.8	0.05	0.82	1.49	0.22
Urban	42	25.9	3	23.1	8	36.4	37	24.2				
Socioeconomic status												
low	25	15.4	1	7.7	0	0.0	26	17.0	0.81	0.66	9.7	.008*
Moderate	106	65.4	10	76.9	21	95.5	95	62.1				
High	31	19.1	2	15.4	1	4.5	32	20.9				
Previous family history												
No	131	80.9	12	92.3	19	86.4	124	81.0	11.05	0.000*	0.36	0.54
yes	31	19.1	1	7.7	3	13.6	29	19.0				

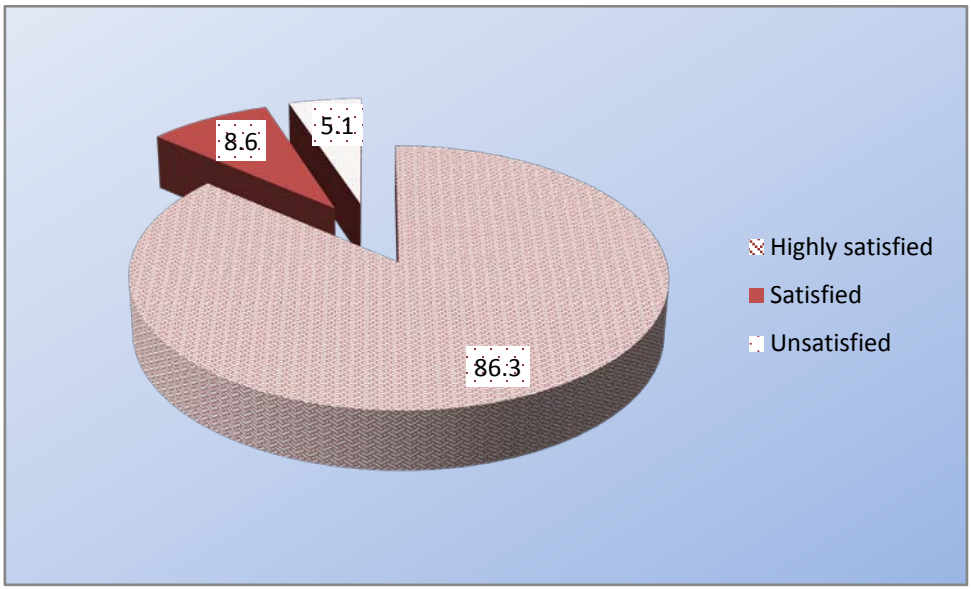

Figure 4. Frequency distribution of studied adolescents regarding satisfaction from self instructional module (n=175)

Figure 4 reveals that the majority of studied adolescents (86.3%) were highly satisfied from the self instructional module.

4. Discussion

Poly Cystic Ovarian Syndrome is a relatively common endocrine disorder in women of reproductive age group. It is found in around 70% of women who have ovulation difficulties leading to sub-fertility. Fertility problems experienced by women with Poly Cystic Ovarian Syndrome may be related to the elevated hormones (androgen and estrogen), insulin or glucose levels, all of which can interfere with implantation as well as development of the embryo [14].

PCOS is a condition lead to enormous health problems and affects the reproductive health if it is not treated well. Increase awareness of girls about PCOS can helps them to gain knowledge, early detect and prevent the PCOS. Awareness and accurate diagnosis is the first step in managing PCOS as it improves quality of life of the patient [10].

The aim of the current study was to examine the effect of self instructional module on awareness of polycystic ovarian syndrome among adolescent students. The present study results revealed that there were improvements of all variables of knowledge after implementation of self instructional module. So, the research hypotheses (Adolescent students will exhibit better awareness regarding polycystic ovarian syndrome after implementation of self instructional module, Adolescent students will be satisfied with self instructional module regarding polycystic ovarian syndrome are accepted and indicates that the self instructional module regarding polycystic ovarian syndrome was effective.

Regarding to the studied adolescents total knowledge about PCOS at the pretest, the study revealed that most of the studied adolescents had inadequate knowledge and only 6.3% of them had adequate knowledge. This lack of knowledge regarding PCOS may be due to that studied adolescents did not receive the needed information about PCOS. These results are consistent with the study conducted by [15] among ninety six (96) female students recruited from Faculty of Nursing at Minia University to evaluate the effect of educational program on the level of knowledge regarding PCOS and found that before utilization of educational sessions, most of the students (84.4%) had poor knowledge regarding polycystic ovarian.

Also, the current study results were supported by [16] who studied the effectiveness of structured teaching program regarding knowledge on polycystic ovaries among the students. It showed that before program the majority of students had inadequate knowledge, whereas (9.17%) of them had moderate knowledge.

The findings of the present study revealed that the majority had no information about PCOS while minority of them had source of information from health team , mass media, family and friends respectively. These results were similar to [17] Who studied across sectional study of polycystic ovarian syndrome among young women in Bhopal, Central India and found lack of awareness among majority of girls (78.4%).

These results were incongruent with [6] who studied awareness of polycystic ovarian syndrome among Saudi females and reported that a number of females included in the study had prior knowledge about PCOS is up to 56.7%. and the source of their knowledge was mostly from internet, followed almost equally by asking doctors or patients and the last used resource is reading. Also [10] who studied awareness of PCOS (polycystic ovarian syndrome) in adolescent and young girls in India and found that 72% girls were aware of PCOS while 28% were unaware of PCOS and the source of their knowledge was mostly from teacher, friend, a doctor, newspaper and the last used resource is internet. In the researchers point of view this may be due to the difference of the culture of the studied samples.

The findings of the present study revealed that there was a highly statistically significant difference between mean scores of knowledge about symptoms of PCOS at the pre and post implementation phases ($p<0.001$). The present study findings were in the same line with results found in a study that majority of respondents had adequate knowledge regarding signs and symptoms after educational implementation [12].

The current study revealed that there was a highly statistically significant difference between mean scores of knowledge related to treatment and complications of PCOS at the pre and post implementation phases ($p<0.001$). These results were congruent with [6] who reported that most participants were unaware of the long-term complications as hypertension, diabetes mellitus, and cardiovascular abnormality. They were mostly unaware of its relationship to early puberty and inheritance as well.

The results of the current study revealed that, there was a highly statistically significant difference between total knowledge score related to PCOS (anatomy & physiology, causes and risk groups, investigations, symptoms, treatment & complications) at the pre and post implementation phases ($p<0.001$). This result agree with [18] Who studied effect of lifestyle changes on symptoms of polycystic ovarian syndrome in obese girls and reported that there was a statistical significant differences in knowledge regarding definition, causes, and signs & symptoms of PCOS post implementation ($p<0.05$). While there was a highly statistical significant differences regarding their knowledge about complications of PCOS post implementation as compared to pre implementation ($p<0.000$). In addition, the study on effectiveness of educating program showed highest improvement of knowledge regarding all the program content and mean posttest score was higher than the mean pretest knowledge score [19].

Highly statistically significant difference was found between pre and post-implementation regarding total knowledge scores of polycystic ovarian syndrome. This may be due to clarity and consistency of the self instructional module and suitable media used, also this indicated that studied adolescents gained knowledge regarding PCOS after implementing the self instructional module.

Theses study results were supported by [20] who conducted a study to assess effectiveness of structured teaching program on knowledge of polycystic ovarian syndrome among adolescent girls and reported that teaching program on polycystic ovarian syndrome was effective and statistically highly significant at 0.001 level.

Moreover, study results are consistent with [21] who studied effectiveness of awareness program regarding PCOS and also found that the awareness program was effective in improving the knowledge on PCOS. In additional to [19] who studied the effectiveness of educating program for upgrading nurses' knowledge regarding polycystic ovarian syndrome and showed that the highest improvement of knowledge regarding all the program content and mean post-test score was higher than the mean pre-test knowledge score.

Also the present study results were supported by those in a study conducted by [22] who evaluated the effectiveness of self-instructional module on knowledge regarding polycystic ovarian syndrome among adolescent and reported that adolescent girls have remarkable increase in knowledge due to the effectiveness of self-instruction module.

The findings of the present study revealed that there was a highly statistically significant difference between total adaptive healthy measures score related to PCOS at the pre and post implementation phases ($p<0.001$). These results were congruent with [5] who stated Some of the studied females were aware of the effect of doing excises, decreasing the weight, using contraceptives, and eating fruit and vegetables on reliving PCOS symptoms.

The results of the current study revealed that there was no statistically significant relation between total knowledge score and socio demographic characteristics (age, occupation, type of the family, residence, previous family history) at both pre and post implementation phases. While there was highly statistical significant relation between total knowledge score and mother education at pre implementation phase. This results is supported by [6] reported that the level of monthly income, urban versus rural background, region of residence in Saudi Arabia and marital status did not seem to have any significant impact on PCOS knowledge. While the level of awareness of PCOS was significantly related to educational levels, it increased with higher education level ($P = 0.000$).

In contrast of findings of the current study [11] stated there was no statistically significant association students mother education with level of knowledge regarding PCOS.

Also [14] who studied effectiveness of self instructional module on knowledge regarding polycystic ovarian syndrome among adolescent girls in a selected college at Sivagangai and stated that the demographic variables such as age, religion, mother education pretest shows no associations with total knowledge score.

In contrast of findings of the current study [15]. showed that there was highly statistically significant relationship between age of the students, family history and their mother education with level of knowledge at pre-test These results were congruent with [20] who showed that there was relation between the age in years with pre-test knowledge scores.

The results of the current study revealed that, there was no statistically significant relation between total adaptive healthy measures score regarding PCOS and socio-demographic characteristics (age, mother occupation, type of the family, residence) at both pre and post implementation phases. While there was highly statistical significant relation between total adaptive healthy measures score and mother education and previous family history at pre implementation phase and there was highly statistical significant relation between total adaptive healthy measures score and socioeconomic status post implementation phase.

In contrast of findings of the current study [23] reported that there was a significant association with the demographic Variables of experimental group such as age, religion, place of residence, type of family, and food habit with preventive measures.

The results of the current study revealed that there was a highly positive correlation between total knowledge and total adaptive health measures scores of studied adolescents at pre and post implementation phase. In the researchers point of view, this could be attributed to the fact that any instructional program increase woman knowledge in turn changes their attitudes to adapt health measures and also increase their satisfaction as the results of the current study revealed that, the majority of studied adolescents were highly satisfied from the self instructional module.

5. Conclusion

Based on the findings of the current study; the study concluded that research hypotheses are supported and adolescent students exhibited better awareness regarding polycystic ovarian syndrome after implementation of self instructional module and this support the first hypothesis. Also the majority of adolescent students will be satisfied with self instructional module regarding polycystic ovarian syndrome and this support the second hypothesis.

6. Recommendations

Based on the findings of the current study, the following recommendations are suggested:

- Nursing curriculum should be updated to include comprehensive information about PCOS to improve the awareness of adolesents.
- Counseling for adolescents should be included in the curriculum which will provide an awareness towards the disorder and lifestyle modification.
- Application of educational program for adolescent girls in different setting should be conducted in order to increase level of knowledge regarding PCOS,
- Further research:

- Replication of the present study on larger representative probability sample size at different institutions is recommended to achieve more generalization of the results.

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