Screening for Polycystic Ovarian Syndrome and Effect of Health Education on its Awareness among Adolescents: A Pre-Post Study

Sabah Lotfy Mohamed El Sayed[1], Mohamed Lotfy Mohamed El Sayed[2], Godpower Chinedu Michael[3]

[1]Assistant Professor of Obstetrics & Gynecology Nursing, Faculty of Nursing, Zagazig University, Egypt,
[2]Professor of Obstetrics & Gynecology, Faculty of Human Medicine, Zagazig University, Egypt,
[3]Consultant, Family Medicine, Aminu Kano Teaching Hospital, Kano, Nigeria

Abstract

Background: Polycystic ovariansyndrome is an endocrine disorder that can affect adolescent females. Screening and awarenessare important initial steps in PCOS management. Health education of the population at risk is crucial to health-seeking behavior that can improve quality of life.

Aim: Screening for features of PCOS and determining the effect of health-education on PCOS awareness among female university students.

Method: This study was of a pre-post research design. The current study involved 900 childbearing age females, who were randomly selected from students of Zagazig University. Data were collected using a structured questionnaire. PCOS screening was based on anthropometric measurements, as well as Rotterdam criteria. A structured lecture on PCOS was received by all participants.

Results: The participants' mean age was 19.01±0.7 years. Three-quarters of them had no information about PCOS. Less than one quarter of them were sufficiently aware of PCOS pre educational while 84.0% of them were sufficiently aware after the educational program.

Conclusion: The participants' awareness were improved after PCOS structured educational program.

Recommendation: Early screening and inclusion of PCOS in the student's curriculum are therefore recommended.

Keywords: *Awareness, Polycystic Ovary Syndrome, Screening, Structured Teaching Program.*

Introduction

Polycystic **ovarian** syndrome (PCOS) is a condition associated with an imbalance infemale sex hormones. It is a common health problem among female adolescents and young women. It affects 5-10% of women in their reproductive ages.[1] The WHO reported that 116 million women (3.4%) were affected by PCOS worldwide.[2] Globally, the prevalence of PCOS is varied and ranging from 2.2% to 26%.[3] This could be due to the criteria used for its estimation. Aprevalence of 22.5% was obtained using Rotterdam criteria,whereas it was 10.7% when the excess androgen association criteria were used.[3]

Adolescence is a transitional period of physical and psychological development, generally occurring during the period between puberty and adulthood; functional variants in the hypothalamic-pituitary-ovary axis

Corresponding Author:
Sabah Lotfy Mohamed El Sayed
Department of Obstetrics & Gynecology Nursing,
Faculty of Nursing, Zagazig University, Egypt
Telephone: 02-01128182813
e-mail:: sabahlotfy78@yahoo.com

during normal puberty leads to changes in reproductive hormones and menstrual patterns that imitator some of PCOS features, complicating the diagnosis of PCOS in adolescent female populations.[4] Using adult diagnostic criteria for adolescents with suspected PCOS has always raised concerns about mis- or over diagnosis in this age group.[5]

There are knowledge gaps in relation to the various aspects of PCOS in adolescents. This meaning absence of longitudinal studies during adolescence, the absence of specific diagnostic criteria to determine PCOS during this period, the absence of normative values for a number of biochemical markers and the lack of clarity as to whether the severity of symptoms during this stage predicts the extent of disruption in later life.[6]

Although early identification and management of adolescents with PCOS can prevent the long-term reproductive, cardio-metabolic and emotional consequences associated with syndrome in their future, over diagnosis can also influence an adolescents' quality of life and create an early and unwarranted anxiety about future fertility. [7]

PCOS have risk factors which include obesity, inadequate physical exercise and family history of PCOS during puberty transition.[1] It is accompanied by a wide range of manifestations, e.g., anovulation, obesity, abnormal facial and skin hair growth . It causes alterations in the menstrual cycle, ovary cysts, failure to become pregnant and other health complications that cause infertility.[1]

Screening during adolescence can provide the opportunity for early detection of risk factors, promotion of a healthy lifestyle and early intervention to prevent the development of PCOS disorder in the future.[3]Public information and awareness of the symptoms and the incurable nature of the disorder are critical to identifying women who need treatment. Awareness of PCOS is not only about recognizing the disease, but it also helps in encouraging healthy living, which impacts on the quality of life and longevity of women.[4]

Studies on knowledge of PCOS have been done in 50 engineering students in Thandalam, India,[9] 95 secondary school students in Mansoura, Egypt[10] and 96 university students in El Minia, Egypt. [11] Another PCOS knowledge study was also conducted in Karachi on 177 urban Pakistani women.[12] The increased prevalence of PCOS in the community may be due to lack of awareness. This makes exploring the symptoms of PCOS a vital policy for early identification of the syndrome. Early diagnosis has the potential of encouraging young women to seek medical advice early and prevent long-term complications. In addition, improving awareness and understanding of PCOS is regarded as acrucial first step in the management of the syndrome.[13]

However,studies with large sample size that assessed features of PCOS and the effect of health education on its awareness are scarce in Egypt. Therefore, this study aimed at determining the prevalence of symptoms of PCOS, PCOS awareness and the effect of health education of female adolecsents on their level of PCOS awareness. This study finding will add to a robust literature about the disease in Egypt to stimulate necessary interventions to prevent the disease and its complications by stakeholders.

Subjects and Method

Study design and setting: This study was of a single-arm, pre-post (quasi-experimental) design. It was carried at Zagazig University among students of Faculties of Technology and Development & Science over a three-month period. Zagazig is a city in Lower Egypt and is host to the Zagazig University (ZU). Located in the eastern part of the Nile Delta, Zagazig is the capital of Sharkia Governorate. ZU was established in 1974, as a nonprofit public higher education institution. It is accredited and recognized by the Ministry of Higher Education of Egypt. ZU is a coeducational higher education institution. It offers courses and programs for higher education degrees such as bachelor, diploma, master and doctorate degrees in several areas of study. It has several faculties including those of human medicine, nursing, engineering, veterinary medicine, pharmacy, education, agriculture, technology & development and science.

Eligibility criteria: Female students between the ages of 18-26 and who were willing to participate in the study were included. Students with thyroid or adrenal abnormalities or who declined consent were excluded from the study.

Sample size estimation: The study was conducted on 900 students based on Cochran's sample size formula $n_o = \frac{Z^2 pq}{e^2}$; where: e is the level of accuracy (5%); p is the estimated proportion of the population (p = 0.5); q is 1 – p. The value of z is 1.96.Therefore, a random sample

of 385 female students was obtained from each of the two faculties to make a total of 770. However, 10% was added for possible non-responses (i.e. a total of 847). Finally, this was rounded off to a total of 900.

Sampling technique: A simple random sampling technique was used based on a list obtained from the Student Affairs Administrative Department of the university and computer-generated random numbers.

Data collection: A questionnaire was developed by the researcher based on literature review. The validity of the content of the questionnaire was assessed by a panel of experts in Gynaecology and Obstetrics Nursing prior to the study. A pilot study was conducted to assess the reliability of the questionnaire. The reliability of the questionnaire was Cronbach Alpha = 0.8. This questionnaire consisted of two tools:

1. Structured interview questionnaire participants'**.** It had 4 sections: Section oneconsisted of participants' sociodemographic data (age, faculty, marital status and location of residence).Section two consisted of participants' menstrual history (age at menarche, the regularity of the menstrual cycle, menstrual bleeding and menstrual pain).Section three consisted of participants' family history of PCOS. The fourth section consisted of the general assessment of the participants (weight, height, [BMI calculated]), anthropometric measurements (blood glucose, systolic and diastolic blood pressure) and examining for the clinical manifestations of PCOS (hirsutism, acne and alopecia).An average of two blood pressure measurements (to the nearest 1 mmHg) was used. It was measured using aneroid sphygmomanometer following standard precautions. Height was measured (to the nearest 1 cm) barefooted and facing straight frontwards using a stadiometer. Weight was measured (to the nearest 1 kg) using a regularly calibrated bathroom weighing scale. Blood glucose was measured (mg/dL) using a glucometer and finger-prick blood from the participant.
2. A structured questionnaire on participants' awareness of PCOS. This had two sections. Section one assessed participants' information regarding PCOS (definition, criteria, risk factors and complications).Section two contained a question regarding the source of PCOS information.

Scoring of the questionnaires was done as follows:

1. Awareness level: There were a total of 16 awareness questions. A score of 1 point was given for each correctly answered question, whereas a score of zero (0) was given for each incorrectly answered or unanswered question. A total score of 11 points was the cutoff mark (corresponding to 69%). Hence, a total score of $\leq$ 11 was considered insufficient awareness while $\geq$ 12 was considered sufficient awareness.
2. Body mass index (Misra *et al*) [14]: Body mass indices of 18-22.9 kg/m^2, $\leq$17.9 kg/m^2, 23.0-24.9 kg/m^2 and $\geq$ 25 kg/m^2 were categorized as normal, underweight, overweight and obese, respectively.
3. Hirsutism was scored according to the modified Ferman Galloway score.[15] The severity scores were classified as follows: <4 mild, moderate 4-7, severe>7.

Study procedure: The researcher obtained oral consent from the students after explaining the aim of the research but before collecting data. The questionnaire was initially distributed among the consenting students and responses were collected. After retrieving the filled questionnaires, a structured short lecture (health education) was given to the students on the definition, causes, risk factors, clinical manifestations, diagnosis, lifestyle, complications and management of PCOS; thereafter, the same questionnaire was re-distributed to the participating students to answer. Their second responses were then collected.

Ethical considerations: The study was conducted following ethical guidelines. The study was approved by the Ethical Research Committee, Faculty of Nursing, Zagazig University. Written approval was obtained from the deans of the selected faculties at Zagazig University before collecting research data. Verbal informed consent was obtained from each study participant.

Statistical analysis: Data were entered and analyzed using the Statistical Package for Social Sciences (IBM SPSS version 21). Descriptive analysis of each element in the questionnaire was performed using frequencies and percentages. Chi-square test of significance was used to find the relationship between categorical variables.

Results

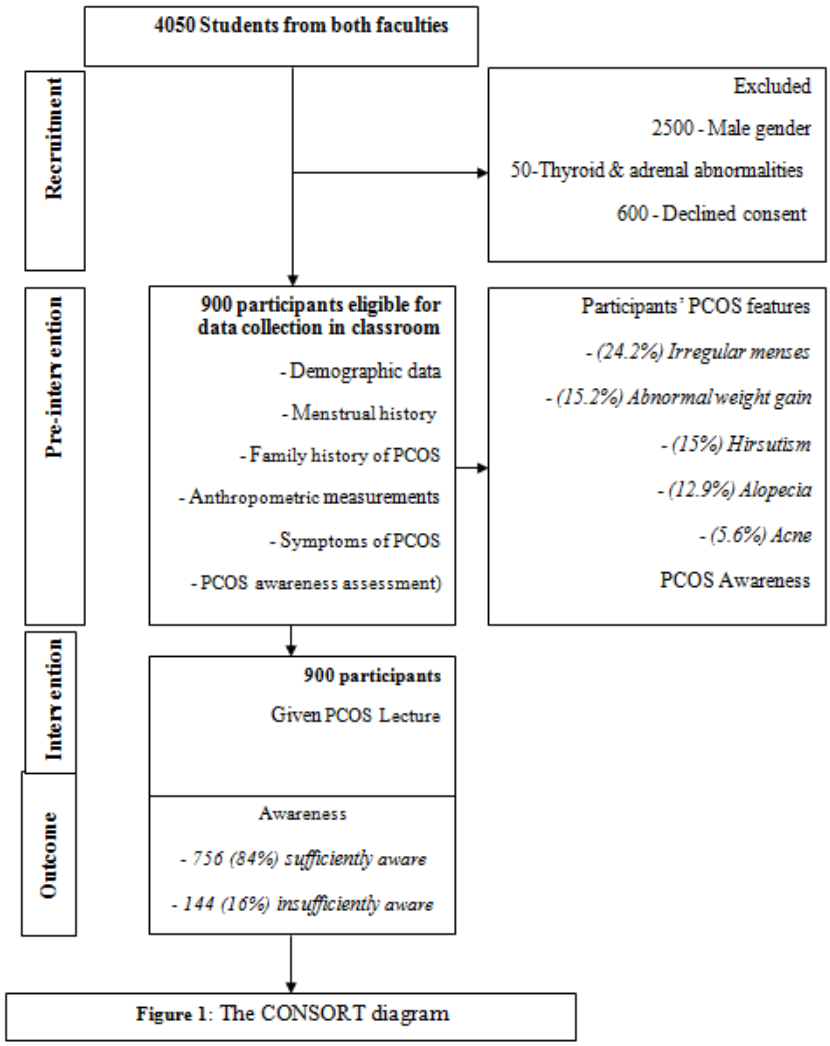

Figure 1: The CONSORT diagram

A total of 900 participants was recruited for this study and were used for analysis. The CONSORT diagram of this study is shown in Fig 1.

Table 1: Participants' demographic characteristics (n = 900)

Variable	Number	Percent
Age (years);		
18-20 years	375	41.7%
21-23 years	510	56.6%
24-26 years	15	1.7%
Mean	19.4 ±0.7	
Faculty		
Technology & Development	458	50.9
Science	442	49.1
Marital status		
Married	225	25.0
Single	675	75.0
Location of residence		
Rural	550	61.1
Urban	350	38.9

Table 1 shows that the mean age of participants was 19.4 ± 0.7 years with mostthem (56.6%) belonging to the 21-23 years age group. Half (50.9%)of them were from the Faculty of Technology & Development. Moreover, 75% & 61.1% of them were unmarried and were from rural areas, respectively.

Table 2: Distribution of students' menstrual history (n = 900)

Variable	N	%
Menstrual history		
Age of Menarche (years) Mean ±SD	12.5 ± 1.6	
Regularity of Menstrual cycle		
Irregular cycle (> 35 days or ≤ 8/year)	218	24.2
Regular cycle (21 - 35 days)	682	75.8
Menstrual bleed		
Heavier or lighter bleeding	196	21.8
Normal bleeding	704	78.2
Menstrual pain		
Yes	708	78.7
None	192	21.3

Table 2 shows thatparticipants' mean age of menarchewas 12.5±1.6 years. Most (75.8%)of them had a regular cycle; 78.2% and 78.7% of them had normal menstrual bleeding andno menstrual pain, respectively.

Table 3: Distribution of students' anthropometric measurements (n = 900)

Anthropometric measurements	Mean ± SD
Weight (Kg)	61.9±1.6
Height (cm^2)	164±13.1
Waist circumference	74.5±7.4
BMI (kg/m^2)	26.7±23.3
Level of blood glucose (mmol/L)	99.8±14.6
Systolic Blood pressure (mmHg)	115±1.6
Diastolic Blood pressure (mmHg)	72.5±10.3

BMI: Body Mass Index

Table 3 shows thatmean weight, height and BMIof participants were 61.9±1.6kg, 164±13.1cm, 26.7±23.3 kg/m^2, respectively. The mean blood glucose level of themwas 99.8±14.6 mg/dL.

Table 4: Participants' level of awareness about PCOS (n =900)

Items	Correct information no (%)	Wrong information no (%)
Definition		
Do you know the meaning of the term "polycystic ovary syndrome"?	209(23.2%)	691 (76.8%)
Criteria		
PCOS is characterized by a high level of androgens	324(36%)	576(64%)
PCOS is characterized by irregular or absence of menstrual cycle	233 (25.9%)	667(74.1%)
PCOS is characterized by abnormal hair growth on different parts of the body (upper lip, chin, neck, chest, upper or lower abdomen, upper arm, thigh)	138 (*15*.3%)	762 (84.7%)

Items	Correct information no (%)	Wrong information no (%)
PCOS is characterized by polycystic ovary	290 (32.2%)	610(67.8%)
PCOS is characterized by hair loss from the scalp more than usual	110 (12.2%)	790(87.8%)
Risk factors		
Obesity may cause PCOS	210(23.3%)	690(76.7%)
Prediabetes condition (due to decreased insulin action in the body) may cause PCOS	190(21.1%)	881(97.9%)
Complications		
PCOS may cause diabetes	52(5.8%)	848(94.2%)
PCOS may cause heart disease	70(7.8%)	830(92.2%)
PCOS may cause anxiety and depression	174(19.3%)	726(80.7%)
PCOS may lead to infertility	237(26.3%)	663(73.7%)
Diagnosis		
PCOS can be diagnosed by ultrasound	348(38.7%)	552(61.3%)
PCOS can be diagnosed by a specific type of blood test	224(24.9%)	676(75.1%)
Management		
PCOS can be treated with hormone therapy	162(18.0%)	738(82.0%)
PCOS can be treated with antidiabetic drugs	330 (36.7%)	570(63.3%)

PCOS: Polycystic ovary syndrome

Table 4 shows the participants' level of awareness about PCOS. It was observed that most participants gave the wrong answer to all questions related to PCOS. For instance, 76.7% of them gave the wrong answer about the meaning of the term PCOS.

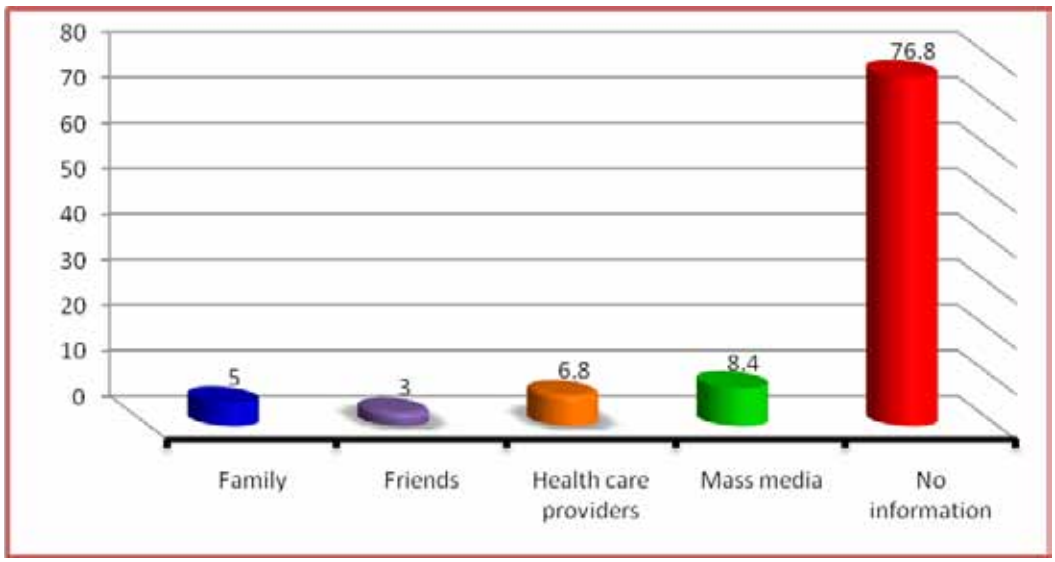

Figure 2: Percentage distribution of students in relation to their source of information about PCOS.

Figure 2 shows the distribution of participants in relation to their source of information about PCOS. It was observed that more than three-quarters (76.7%) of them had no information on PCOS, 8.4% received information from the mass media, 6.9% received their information from health care providers, 5.0% received information from the family and 3.0% received information from friends.

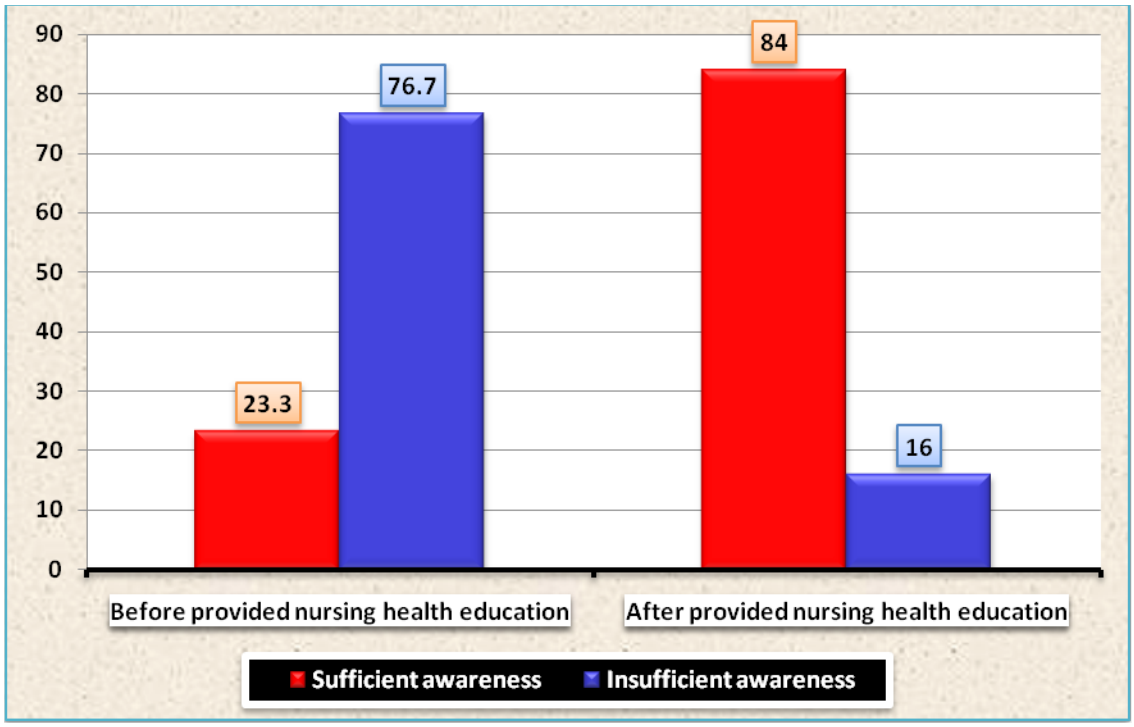

Figure 3: Percentage distribution of students in relation to their level of awareness before and after provided nursing health education on PCOS.

Figure 3 reveals the distribution of participants in relation to their level of awareness before and after providing nursing health education on PCOS. Regarding the level of awareness before providing health education on PCOS, 76.7%of them were insufficiently aware of PCOS while 23.3% were sufficiently aware. Concerning the level of awareness after the provision of health education on PCOS, 84.0%of them became sufficiently aware of PCOS while only 16.0% had insufficient awareness.

Table 5: Relationship between participants' variables and level of PCOS awareness (n = 900).

	Sufficiently aware (N=209)	Insufficiently aware (N=691)	X^2 test	P-Value
	n (%)	n (%)		
Age (years)				
18-20	200 (95.7)	663 (95.9%)	0.71	0.06
≥ 21	9(5.3)	28 (4.1%)		
Faculty				
Technology & Development	125 (59.8%)	386 (55.9%)	0.606	0.3
Science	84 (40.2%)	305(44.1%)		
MaritalStatus				
Married	7 (3.3%)	14 (2%)	0.134	0.4
Unmarried	202 (96.6%)	677(98%)		
Residential area				
Rural	135 (64.6%)	674(67.3%)	5.4	0.02*
Urban	74 (35.4%)	226 (32.7%)		

*Significant level < .05

Table 5 shows that there was a statistically significant association between participants' residential area and level of PCOS awareness (χ^2 =5.4, p=0.02). However, there were no significant associations between participants' age, marital status, faculty and level of PCOS awareness (p>0.05).

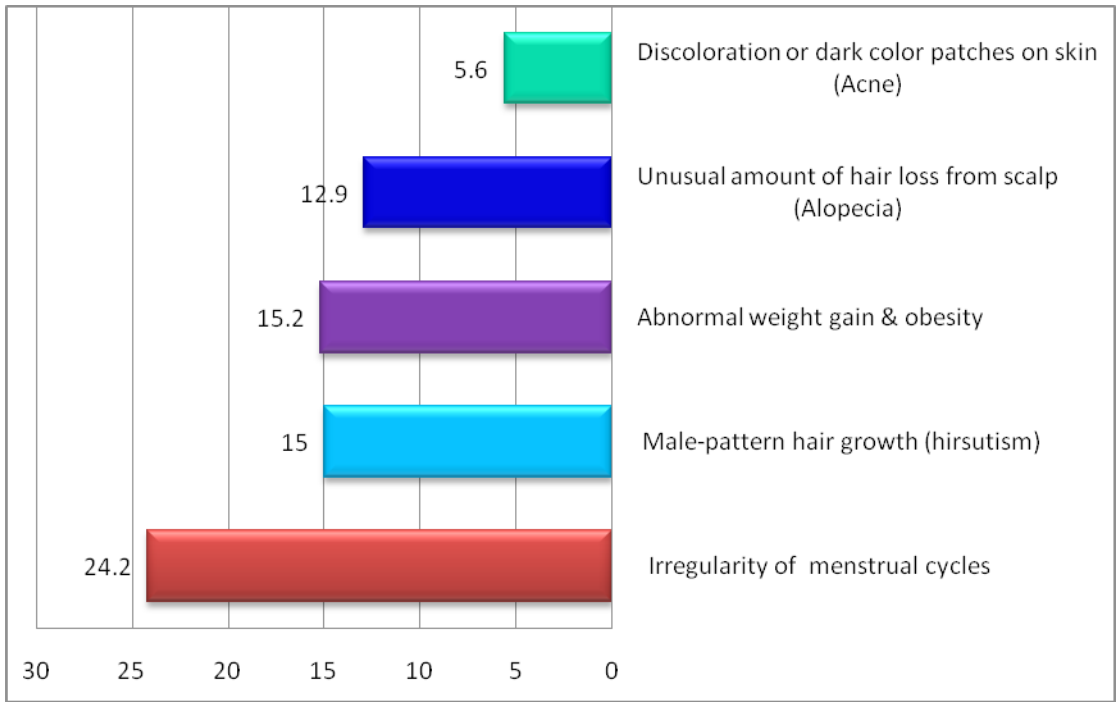

Figure 4: Percentage distribution of female students in relation to their clinical manifestations (alone or combined) of PCOS

Figure 4 shows the distribution of participants in relation to their clinical manifestations of PCOS. Only 24.2% of participants had irregular menstruation, 15.3% had hirsutism, 14.9% had an abnormal weight gain, 12.9%, had alopecia and 5.6% had acne.

Discussion

PCOS is the predominant endocrinopathy in females, characterized by chronic oligo-anovulation, increase level of androgen and polycystic ovary, all of which can lead to a deterioration in the quality of life of these patients.[16] The prevalence of PCOS in adolescents is unknown, but a recent study of females, between the ages of 15 and 19, was estimated to be 1.14%, using the NIH criteria.[17] It can be associated with a wide range of heart metabolic disorders, including obesity, type 2 diabetes, hyperlipidemia, metabolic syndrome, high blood pressure and risk factors for cardiovascular disease.[18,19]

This was a pre-post study with screening for features of PCOS among university female students in Egypt. It revealed that the highest proportion of participants were in the 21-23 years age group. This is similar to findings in Mangalore and El Minia were the modal age groups were 21-22 and 21-25 years, respectively.[1, 11]

The current results observed that a significant number of the participants had features of PCOS; nearly a quarter had irregular menses and nearly one fifth had an abnormal weight gain, hirsutism and had a family history of PCOS. This is similar to findings by Nazir *et al* in Pakistan and Zandi *et al* in Iran, where a significant proportion of females with PCOS had oligomenorrhea and hirsutism.[20,21] However, despite these features, the awareness of our study participants about features of PCOS was poor. Only about a quarter was sufficiently aware of PCOS.

Furthermore, in corroboration with earlier studies[9-11,22] health education remarkably improved the proportion of participants with sufficient awareness about the disease. In addition, whereas other studies

have reported an association between age[10,11], dietary pattern[1], family type[9] and knowledge of PCOS. Additional,most participants with sufficient PCOS awareness were found among those living in rural areas. Though a higher proportion of the study participants lived in rural areas, the complete link between rurality and sufficient awareness of PCOS may require further investigation. Differences in study variables examined and sample sizes may explain differences in the results of our study and previous works.

Implication for policy: The significant proportion of participants with manifestations of PCOS in this study suggest the need for strategic planning for regular screening of students. Similarly, the high proportion of participants that we're unaware of the features of PCOS and the improvement in PCOS awareness following health education also suggests the need to include PCOS in the educational programs of the university.

Study limitations: Among the limitations of this study was that we did not assess the hormonal profile and other specific investigation for definitive diagnosis of PCOS. Second, the pre-post design of this study precludes conclusive assertion that health education alone was responsible for the improved PCOS awareness post-intervention. Being an institutional-based study, a community-based study will be required to unveil the complete prevalence of the features of PCOS, PCOS awareness and the effect of health education on PCOS awareness.

Conclusion

A significant proportion of participants had manifestations of PCOS. However, their PCOS awareness was low. Awareness improved with PCOS structured teaching program.

Recommendations: Early screening and inclusion of PCOS in the student's curriculum are therefore recommended.

Conflict of Interest: No conflict of interest.

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References

1. Sunanda B, Nayak S. A Study to Assess the Knowledge Regarding PCOS (Polycystic Ovary Syndrome) among Nursing Students at NUINS. Nitte University Journal of Health Science 2016; 6(3):24.
2. Vaidya R, Joshi B. PCOS-epidemic in India: An emerging public health challenge. International Conf PCOS Society India with AE-PCOS Society USA, 2016. Available from: http://www.pcosindia.org/files/education/pcos.
3. Joshi B, Mukherjee S, Patil A, Purandare A, Chauhan S, Vaidya R. A cross-sectional study of the polycystic ovary syndrome among adolescent and young girls in Mumbai, India. Indian J Endocrinol Metab 2014;18(3):317-24.
4. Spritzer, P. M., & Motta, A. B. (2015). Adolescence and polycystic ovary syndrome: current concepts on diagnosis and treatment. International journal of clinical practice, 69(11), 1236-1246.‏ Rosenfield, R. L. The diagnosis of polycystic ovary syndrome in adolescents. Pediatrics, 2015; 136(6), 1154-1165.‏
5. Witchel, S. F., Oberfield, S., Rosenfield, R. L., Codner, E., Bonny, A., Ibáñez, L., ... & Tfayli, H. The diagnosis of polycystic ovary syndrome during adolescence. Hormone research in paediatrics, 2015; 83(6), 376-389.‏
6. Fauser, B. C. J. M., Tarlatzis, B. C., Rebar, R. W., Legro, R., Balen, A. H., Lobo, R., ... & Boivin, J. Consensus on womens health aspects of polycystic ovary syndrome (PCOS). Human Reproduction, 2012; 27(1), 14-24.‏
7. Goodman, N. F., Cobin, R. H., Futterweit, W., Glueck, J. S., Legro, R. S., & Carmina, E. American Association of Clinical Endocrinologists, American College of Endocrinology, and androgen excess and PCOS society disease state clinical review: guide to the best practices in the evaluation and treatment of polycystic ovary syndrome-part 1. Endocrine Practice, 2015; 21(11), 1291-1300.‏
8. Dezarn, C. Effectiveness of structured teaching Programme on knowledge of polycystic ovary syndrome among adolescent girls. Nitte University Journal of Health Science, 2013; 3(3). Retrieved from https://www.pcos. com/blog/199/september-is-PCOS-awareness-month/Fernandes.
9. Biam, N, Bhuvaneshwari P. Effectiveness of Self-Instructional Module on Knowledge Regarding

Polycystic Ovary Syndrome among Engineering Students. International Journal of Novel Research in Healthcare and Nursing 2015; 2 (3):66-69

10. Mohamed HE, Mansour SE, Ibrahim AE. Effect of Educational Sessions about Polycystic Ovary Syndrome for Late Adolescent Girls Self Protective Measures. International Journal of Nursing Didactics 2015; 5(8):5-11.
11. Mohamed HA. Effect of educational program on the level of knowledge regarding polycystic ovary syndrome among adolescent girls. Journal of Nursing Education and Practice 2016; 6(10):80-7.
12. Gul S, Zahid SA, Ansari A. PCOS: symptoms and awareness in urban Pakistani women. International Journal of Pharma Research and Health Sciences 2014; 2(5):356-360.
13. Colten HR, Altevogt BM. Improving awareness, diagnosis, and treatment of sleep disorders. In Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem 2006. National Academies Press (US).6:173.
14. Misra A, Chowbey P, Makkar BM, Vikram NK, Wasir JS, Chadha D, Joshi SR. Consensus statement for diagnosis of obesity, abdominal obesity and the metabolic syndrome for Asian Indians and recommendations for physical activity, medical and surgical management. JAPI, 2009; 57(2):163-70.
15. Hatch R, Rosenfield RL, Kim MH, Tredway D. Hirsutism: implications, etiology, and management. American Journal of Obstetrics and Gynaecology 1981;140(7):815-30.
16. Amiri, M., Ramezani Tehrani, F., Nahidi, F., Bidhendi Yarandi, R., Behboudi-Gandevani, S., & Azizi, F. Association between biochemical hyperandrogenism parameters and Ferriman-Gallwey score in patients with polycystic ovary syndrome: A systematic review and meta-regression analysis. Clinical endocrinology, 2017; 87(3), 217-230.
17. Christensen, S. B., Black, M. H., Smith, N., Martinez, M. M., Jacobsen, S. J., Porter, A. H., & Koebnick, C. Prevalence of polycystic ovary syndrome in adolescents. Fertility and sterility, 2013; 100(2), 470-477.
18. Behboudi-Gandevani, S., Amiri, M., Bidhendi Yarandi, R., Noroozzadeh, M., Farahmand, M., Rostami Dovom, M., & Ramezani Tehrani, F. The risk of metabolic syndrome in polycystic ovary syndrome: A systematic review and meta-analysis. Clinical endocrinology, 2018; 88(2), 169-184.
19. Jaliseh, H. K., Tehrani, F. R., Behboudi-Gandevani, S., Hosseinpanah, F., Khalili, D., Cheraghi, L., & Azizi, F. Polycystic ovary syndrome is a risk factor for diabetes and prediabetes in middle-aged but not elderly women: a long-term population-based follow-up study. Fertility and sterility, 2017; 108(6), 1078-1084.
20. Nazir F, Tasleem H, Tasleem S, Sher Z, Waheed K. Polycystic ovaries in adolescent girls from Rawalpindi. JPMA-Journal of the Pakistan Medical Association. 2011;61(10):960.
21. Zandi S, Farajzadeh S, Safari H. Prevalence of polycystic ovary syndrome in women with acne: hormone profiles and clinical findings. Journal of Pakistan Association of Dermatology. 2016; 20(4):194-8.
22. Sowmya MA, Fernandes P. Effectiveness of structured teaching programme on knowledge of Polycystic Ovary Syndrome among adolescent girls. Nitte University Journal of Health Science. 2013; 3 (3):54.