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RESEARCH ARTICLE

KNOWLEDGE REGARDING POLYCYSTIC OVARIAN SYNDROME AMONG STUDENTS OF SELECTED NURSING INSTITUTE OF GANGTOK, EAST SIKKIM

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ABSTRACT

Introduction: Polycystic Ovarian Syndrome (PCOS) is a growing problem with adolescent girls. in addition young women during their reproductive years. It can be very difficult to diagnose PCOS in teenage girls as they often experience irregular or absent menses and acne. 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.

Objectives: The primary purpose of this study was to explore the knowledge of nursing students regarding different area of PCOS and to assess the self preventive measures adopted by the students diagnosed with PCOS. Hence the present study was planned to assess the level of knowledge regarding PCOS among nursing students and to identify the self preventive measures taken by the students diagnosed with PCOS to prevent future complication.

Methods: Investigators adopted the survey approach with descriptive survey research design where 100 nursing students studying in third year B.Sc. nursing programme were recruited through non probability purposive sampling technique from Sikkim Manipal College of Nursing, at Sikkim Manipal University, Gangtok, East Sikkim. Structured knowledge questionnaire on PCOS and Self preventive measures regarding PCOS were used to collect data on nursing student's knowledge and self preventive measures regarding PCOS for which validity and reliability was ensured.

Results: The finding of the study shows that majority of the students were in the age group of 20 to 21 years (78%) and almost all (100) students had inadequate knowledge regarding PCOS with the mean score of 14.97 out of 32. The findings also shows that the minimum knowledge scores were found in the meaning of PCOS (29%) and causes & risk factors for developing PCOS (44%). The study also reveals that five students were diagnosed with PCOS had a very unhealthy life practices i.e. (60%) had never adopted any health measure to control weight, 4(80%) drinks alcohol sometime, 2 (40%) smoke cigarette always and 3 (60%) of the students' diet include foods rich in calorie. Statistically significant difference was found between demographic characteristics such as sources of information on PCOS (41.6%) with students' knowledge ($P \leq 0.05$).

Conclusions: Based on the results of the present study it can be concluded that, all of the students (100%) had poor knowledge regard polycystic ovarian syndrome. but it was having its association with the sources of information, which indirectly reflected that if the students were given enough needed information regarding the PCOS and its management then the syndrome can be identified at its early stage. Nursing curriculum should be updated to include comprehensive information about PCOS to improve the awareness of other women once in practice.

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INTRODUCTION

PCOS is a complex multifaceted heterogeneous disorder that affects 5-10% of women of reproductive age. It is characterized by hyperandrogenism, polycystic ovaries and chronic anovulation along with insulin resistance, hyperinsulinemia, abdominal obesity, hypertension and dysplipidemia, as frequent metabolic traits. (Wilson Hockenberry, 2007) Polycystic ovarian syndrome usually happens when the luteinizing hormone levels or the insulin levels are too high, which then causes the ovaries to make extra amounts of testosterone.

(Pramila D'Souza, 2013; Shannon and Wang, 2002) World Health Organization (WHO) estimates that it affected 116 million women worldwide in 2012 (3.4% of women). Globally, prevalence estimates of polycystic ovarian syndrome are highly variable, ranging from 2.2% to as high as 26%. In India, the prevalence is gradually increasing. (Vos *et al*., 2012) According to a prospective study conducted by R.Nidhi *et al* on 460 girls aged 15-18 years in a residential college in Andhra Pradesh, South India, the prevalence of PCOS was found to be 19.13% in adolescents. (Joshi and Mukherjee, 2014) 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. (Healthwise webmed, 2016) The women who are diagnosed with polycystic ovarian syndrome have less information regarding its effects on health and the preventive aspects. Many of the women do not know where to look for the information. (Anery and Mayor, 2007) Proper diagnosis and management of polycystic ovarian syndrome is essential as polycystic ovarian syndrome has many potential metabolic and cardiovascular risks, if not managed appropriately. Although treatment should be individualized, it should also focus on all metabolic consequences and decreasing future complication. (Nidhi *et al*., 2011)

Need for Study

Prevalence of polycystic ovarian syndrome worldwide based on national institute of child health and human disease of the united state was 6.8% and based on ultrasound was 4.41%. Prevalence of polycystic ovarian syndrome in India based on metropolis health care ltd. in 2014 was 17.60%. The increase in trends of polycystic ovarian syndrome is predominantly seen in age group 15-30 years where East India had 25.88%. (Azziz *et al*., 2004)

Joshi B, Mukherjee M and Jaidya R conducted a cross sectional study to assess the prevalence of PCOS among 900 adolescents' girls and young women aged 15-24 years in Greater Mumbai, India, 2014. It was found out that about 600 adolescents completed the investigation and out of which majority 71.8% were diagnosed as polycystic ovarian syndrome. (Kashar Miller Nixon *et al*., 2011) 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. (Hadayat *et al*., 2014) Polycystic ovarian syndrome is most commonly reported endocrine disorder which has lifelong potential health consequences. Life style modification and diet can prevent obesity, polycystic ovarian syndrome and risk factors. It was also felt that very less study was conducted on polycystic ovarian syndrome in India and no such study has been conducted in Sikkim so far. With a view to understand and identify gap in knowledge related to this health problems, researchers felt the need to conduct this study among the nursing students. (Nair *et al*., 2011)

Problem statement: Knowledge regarding polycystic ovarian syndrome among students from selected nursing institute of Gangtok, East Sikkim.

Objectives

- To assess the level of knowledge regarding polycystic ovarian syndrome among students from selected nursing institute.
- To identify the self preventive measures taken by the students with polycystic ovarian syndrome to prevent future complication
- To determine the association between level of knowledge regarding polycystic ovarian syndrome among students with the selected demographic variables.
- To develop an educational material on knowledge regarding polycystic ovarian syndrome and distribute to the students having low knowledge.

Hypothesis

H1: There is significant association between knowledge regarding polycystic ovarian syndrome among students with the selected demographic variables.

MATERIALS AND METHODS

Non experimental survey approach with descriptive research design was used to quantify the student's knowledge regarding polycystic ovarian syndrome and self preventive measures adopted by the students with polycystic ovarian syndrome in selected nursing institution of Sikkim. The research was conducted in Sikkim Manipal College of Nursing. Purposive sampling technique was used were 100 students studying in third year B Sc nursing at Sikkim Manipal College of Nursing were selected and were explained about the study and the related purposes and their informed consents were obtained. 92 student nurse midwives who were currently undergoing 3rd yr B.Sc.nursing programme, attended regular classes, available at the time of data collection and willing to participate were enrolled.

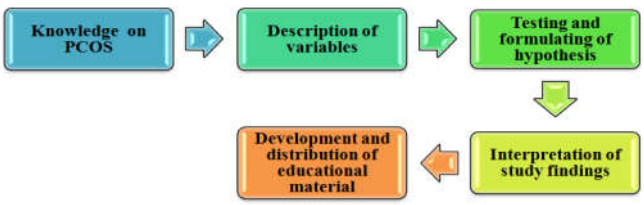

Figure 1. Schematic representation of descriptive research design

Instrument: The data was collected through structured knowledge questionnaire on polycystic ovarian syndrome and Self preventive measures adopted by students to prevent further complication of polycystic ovarian syndrome. Ethical consideration was taken from concerned authority that is Institutional Review Committee of Sikkim Manipal University. Written consent was taken from the respondent prior to the administration of the questionnaire. The finding was presented for both descriptive and inferential statistics.The study was carried out by using a structured knowledge questionnaire and self preventive measures. It consists of 2 sections:

Section-I, Part A: This consists of socio demographic data such as student's age, year of study, religion, family income, type of family, family history, mother's education, source of information on polycystic ovarian syndrome.

Part B: This consists of question on Self preventive such as measures exercise, weight, and diet management among nursing students regarding polycystic ovarian syndrome.

Section-II: This consist of the question on knowledge areas of polycystic ovarian syndrome such as meaning, definition, causes, risk factor symptoms, diagnosis, treatment, management and complications:

The content validity of structured knowledge questionnaire regarding PCOS was done by 7 experts from the field of Obstetrics and Gynaecology, Endocrinology and Faculty members of Sikkim Manipal College of Nursing. The experts were chosen based on their clinical experience, expertise and interest in the problem area. The reliability of the pretested structured questionnaire was tested by split half method, for which the value was found 0.89 and socio demographic profile by intra-rater method.

Section I: Findings related to demographic data of students from selected nursing institute

Table 1. Frequency and percentage distribution of the student in term of their demographic variables

N=100

Sl no.	Demographic variables	*f*	%
1	Age in years:-		
	1.1 18 – 19	03	03%
	1.2 20 – 21 (3 PCOS)	78	78%
	1.3 22 – 23 (2 PCOS)	19	19%
2	Education qualification of mother :-		
	2.1 No formal education	07	07%
	2.2 Primary	05	05%
	2.3 Secondary	31	31%
	2.4 Higher secondary	36	36%
	2.5 Graduate	19	19%
	2.6 Post graduate	02	02%
3	Types of family		
	3.1 Joint	11	11%
	3.2 Nuclear	89	89%
	3.3 Extended	-	-

The data in table 1 shows the frequency and percentage distribution of the personal background information of the students. It is depicted that majority i.e. 78% of the students were in the age group of 20- 21 years, 19% in the age group of 22-23 and 3% in the age group of 18-19 years. The data also highlighted that, more than one third (36%) of students' mothers' education were higher secondary educated, 31% were educated up to secondary, 19% up to graduate level, 2% up to post graduate level, while (5%) of them had primary and 7% had no formal education. Among students 89% were from nuclear family, 11% were from joint family and none of them had extended family.

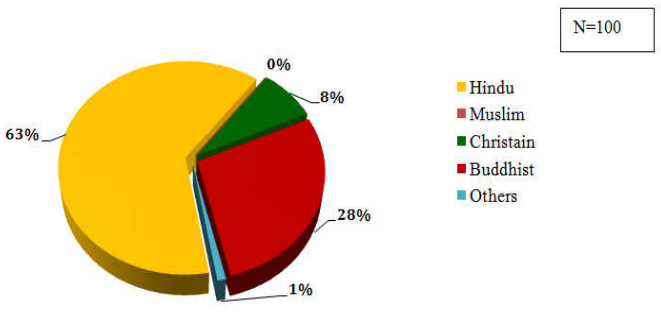

Figure 2. Distribution of students in terms of their religion

The data presented in figure 2 shows that 63% of the students were Hindu by religion, 28% were Buddhist and 8% were Christian whereas 1% belongs to the other religion.

Table 2. Frequency and percentage distribution of the student in term of their demographic variables

N=100

Sl no.	Demographic variables	*f*	%
5	Have you ever heard about PCOS :-		
	5.1 Yes	96	96%
	5.2 No	04	04%
	If yes, please specify the sources of information:(n= 96)	02	02%
	5.1.1 family members	63	66%
	5.1.2 health care providers	07	07%
	5.1.3 friends	13	14%
	5.1.4 mass media (T.V. newspaper, radio)	11	11%
	5.1.5 others		
6	History of PCOS in family members:-		
	6.1 Yes	08	08%
	6.2 No	92	92%
	If yes, Please specify (n=8)		
	6.1.1 Aunty(2PCOS)	4	50%
	6.1.2 Sister	1	12.5%
	6.1.3 Mother	3	37.5%
7	Do you have any other health problem apart from PCOS:-	20	20%
	7.1 Yes	80	80%
	7.2 No		

The data also reveals that majority (96 %) of the students were aware about term PCOS before participating in this study whereas 4% were not aware of the same. When students were asked about the sources of information 66% of the students said from health care providers, 14% from mass media, 7% from friends and 2% from family members. The data regarding the history of PCOS in family members, most of the students i.e. 92% had no family history of PCOS whereas 8% had the positive family history of PCOS. Among those 8 students majority (50%) had PCOS among their Maternal aunt, whereas 37.5% among their mother and 12.5% had among their own sister. The data also reveals that 80% of the students apart from PCOS where not having any other health problem whereas 20% mentioned about other health problems apart from PCOS in which Gastritis and constipation were the common (20%).

N=100

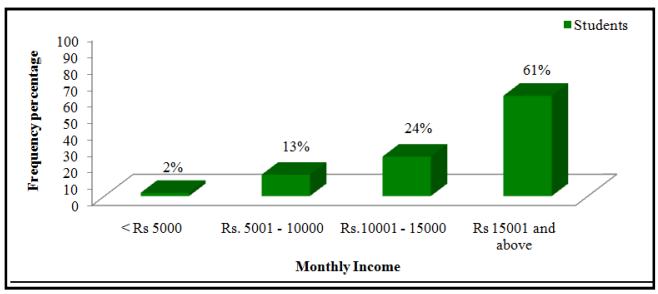

Figure 3. Distribution of students in terms of their family monthly income

The data presented in figure 3 reveals that majority of the students (61%) reported their family monthly income were in the range of Rs 15001 and above per month, 24 % of students reported in the range of Rs10001to Rs 15000/ month, 13 % within the range of Rs.5000 to 10000 and 2% reported their family monthly income less Rs.5000 per month.

Section II: Findings related to self preventive measure taken by students with PCOS to prevent future complication.

The data presented in figure 4 reveals that among 100 students only 5% students were diagnosed with PCOS whereas 95% of participants are not diagnosed with PCOS. Almost all of them (100%) are on Hormonal treatment prescribed by their Physician currently.

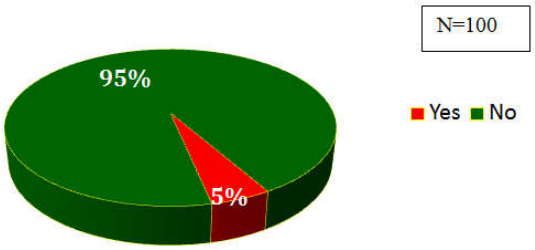

Figure 4. Distribution of students in terms of their diagnosis with PCOS

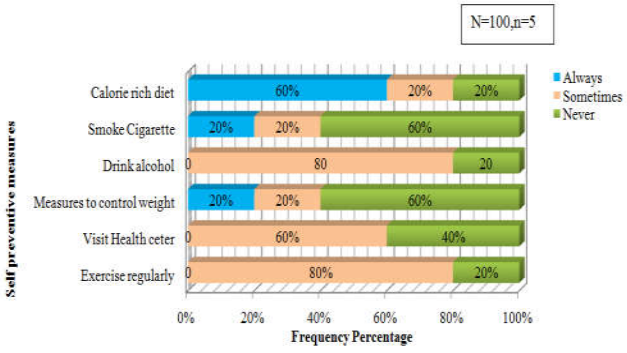

Figure 4. Distribution in terms of self preventive measure taken by students with PCOS to prevent future complication

The data presented in Figure 4 shows that most of the students i,e 4 (80%) do exercise sometime where as 1(20%) never do the same. Majority of the students i.e 3(60%) sometime visit health center for regular check up. Among all diagnosed participants 3 participants (60%) have never adopted any health measure to control weight.

Most of them 4(80%) drinks alcohol sometime. Among 5 diagnosed students 2 (40%) smoke cigarette always where as 2(40%) sometimes and 3 (60%) never smokes. Majority 3 (60%) of the students' diet include foods rich in calorie.

Section III- Findings related to knowledge regarding PCOS among students from selected nursing institute

- in terms of their overall knowledge score regarding PCOS
- in terms of their area wise knowledge score regarding PCOS
- in terms of their level of knowledge score regarding PCOS

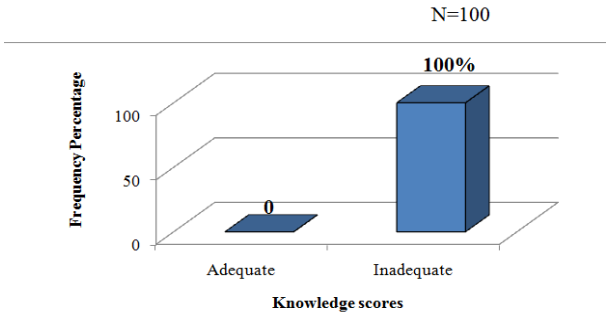

Figure 5. Knowledge scores regarding PCOS among students from selected nursing institution

The data presented in Figure 5 shows that the knowledge regarding PCOS was found to be inadequate among the 100% students, even though the theory regarding PCOS has already been covered in the nursing syllabus for third year students but still none of the students had score adequately. The data presented in table 3 depicts that the knowledge score of students in various areas of PCOS. The maximum score was found in the diagnosis of PCOS (66%) followed by symptoms of PCOS (56%) and Self preventive measures to prevent complication of PCOS (56%), but minimum scores were found in meaning of PCOS (29%), Causes & Risk factors for developing PCOS (44%), Medical & Surgical management for PCOS (44%), Medical & Surgical management for PCOS (44%) and Definition of PCOS (45%).

Table 4 depicts the level of knowledge score between students diagnosed with PCOS and without PCOS, it was found that all 5 students who are diagnosed with PCOS had inadequate knowledge regarding PCOS with the mean of 17.2(3.28), whereas on the same side students who are not diagnosed with

Table 3. Distribution of nursing students in terms of their area wise knowledge score regarding PCOS

N=100

Area of knowledge	Knowledge scores				
	Total Questions	Total maximum score	Total obtained score	Mean	Mean%
1. Meaning of PCOS	3	3	88	0.88	29%
2. Definition of PCOS	3	3	136	1.36	45%
3. Causes & Risk factors for developing PCOS	4	4	174	1.74	44%
4. Symptoms of PCOS	3	3	169	1.69	56%
5. Diagnostic criteria	2	2	132	1.32	66%
6. Treatment Strategies	6	6	263	2.63	44%
7. Self preventive measures to prevent complication	4	4	224	2.24	56%
8. Complication	7	7	311	3.11	44%

Table 4. Comparison of level of knowledge scores in terms of students diagnosed with PCOS and without PCOS

Distribution of Students	Knowledge Score regarding PCOS			
	Adequate Knowledge		Inadequate knowledge	
	Mean ± SD	Mean %	Mean ± SD	Mean %
Students with PCOS, n=5	n=0		n=5(5%)	
			17.2 ± 2.28	3.28%
Students without PCOS, n=95	n=0		n=95(95%)	
			14.85±3.26	62.3%

PCOS (95%) were also found with inadequate knowledge regarding PCOS with the mean of 14.85 (62.3%).

PCOS and consist of information on PCOS, its causes, clinical features, complications, and management including lifestyle modification, medical as well as surgical management.

Table 5. Association brtween knowledge regarding PCOS with selected demographic variable

N=100

Sl no.	Demographic Variable	Level of Knowledge score		df	χ^2	P value
		≥ Median	< Median			
1	Age in years:-					
	1.1 18 – 19	01	02	2	0.08	P≥0.05
	1.2 20 – 21	32	46			
	1.3 22 – 23	08	11			
2	Religion :-					
	2.1 Hindu	23	40	4	0.00	NA
	2.2 Muslim	00	00			
	2.3 Christain	05	03			
	2.4 Buddhist	12	16			
	2.5 Others	01	00			
3	Education qualification of mother :-					
	3.1 no formal education	02	05	5	2.68	P≥0.05
	3.2 primary	03	02			
	3.3 secondary	14	17			
	3.4 higher secondary	12	24			
	3.5 graduate	09	10			
	3.6 post graduate	01	01			
4	Types of family					
	4.1 joint	08	03	2	0.00	NA
	4.2 nuclear	33	56			
	4.3 extended	00	00			
5	Family monthly income:-					
	5.1 below 5000	00	02	3	0.00	NA
	5.2 5000 – 10000	07	06			
	5.3 10001 – 15000	10	14			
	5.4 15001 and above	24	37			
6	Have you ever heard about PCOS :-					
	6.1 Yes	40	56			
	6.2 No	01	03			
	If yes, source of information					
	6.1.1 family members	01	01			
	6.1.2 health care providers	23	40	4	12.21	P≤0.05
	6.1.3 friends	06	01			
	6.1.4 mass media(T,V. newspaper, radio etc)	08	05			
	6.1.5 others	02	09			
7	History of PCOS in family members:-					
	7.1 Yes	02	06			
	7.2 No	39	53	1	1.78	P≥0.05
8	Do you have any other health problem apart from PCOS:-					
	8.1 Yes	09	11	1	0.165	P≥0.05
	8.2 No	32	48			
9	Have you been diagnosed with PCOS:-					
	9.1 Yes	00	05	1	0.00	NA
	9.2 No	41	54			

Section III- Findings related to association between levels of knowledge regarding PCOS with the selected demographic variable

The data presented in table 5 reveals that the obtained chi square value for sources of information regarding PCOS (12.21^{*}, P≤0.05) at df 4 was found statistically significant at 0.05 level of significance, hence, research hypothesis is accepted which shows that there is signficant association between level of knowledge scores regarding PCOS among students with sources of information. It is inferred that the level of knowlede regarding is independent of age, religion, educational qualification of mother, family monthly income, history of PCOS in family members, types of family and any other health problems. So, research hypothesis is rjected for above mention demographic variables.

Development of Educational material: On the basis of the findings of the study, a educational material is developed in the form of Pamphlet providing information on Dos and Don'ts of

The pamphlet was given to three experts for its validation. After correction and modification as suggested by the experts, the pamphlet was given to all 100 students as all of them had inadequate knowledge regarding the PCOS.

DISCUSSION

The study was conducted on 100 third year B.Sc. nursing students to assess the knowledge regarding PCOS. Students above 18 years of age were included in this study. Most of the students were in the age group of 20-21 years (78%). The level of knowledge was categorized into adequate and inadequate (100%). The finding of the study shows that all (100) students had inadequate knowledge regarding PCOS with the mean score of 14.97 out of 32.While the results were consistent with the study conducted by HAA Mohamed (2016) 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 regard polycystic ovarian syndrome.

The investigators in the present study found inadequate knowledge in different area of PCOS among students. The maximum score was found in the diagnosis of PCOS (66%) followed by symptoms of PCOS (56%) and Self preventive measures to prevent complication of PCOS (56%) but minimum scores were found in meaning of PCOS (29%) and Causes & Risk factors for developing PCOS (44%). The similar findings were obtained by Manita D, Molly B, Sharda R (2014) in their study on exploration of various aspects related to PCOS conducted in Gynecology OPD of Safdarjung Hospital, New Delhi in which women had least knowledge in the dietary modifications needed in Management of PCOS with the modified mean of 0.033, concept and clinical features (0.367), complications of PCOS (0.346) and Causes of PCOS (0.342). The results of the current study showed that there was no statistically significant association between age of the students, family history and their mother education with level of knowledge regarding PCOS.These results were congruent with the study done by Kalpana (2013) which indicated that there is no relation between knowledge scores regarding PCOS and age of students. In present study the findings shows that about 40(41.6%) had their level of knowledge associated with the source of information on PCOS. The result is similar to the findings of the study conducted by Sunanda *et al*. (2016) where 76% of the sample had average knowledge and demographic variable like source of information was associated with the level of knowledge on PCOS.

Recommendation

- Similar study can be conducted to assess the prevalence of PCOS among nursing students
- A survey to identify the adolescents with high risk for Polycystic Ovarian Syndrome (PCOS) can be conducted.
- A similar study can be replicated with a experimental and control group
- A similar study can be conducted to the group of adult women.
- The study can be replicated on a larger sample for generalizing the findings.
- A experimental study can be conducted to find out the effectiveness of awareness programme.

Conclusion

Majority of the students diagnosed with PCOS had a very unhealthy life practices i.e (60%) have never adopted any health measure to control weight, 4(80%) drinks alcohol sometime, 2 (40%) smoke cigarette always and 3 (60%) of the students' diet include foods rich in calorie while PCOS cannot be prevented or cured; it can be controlled, with varying degrees of success, with healthy lifestyle choices. Hence awareness among adolescents about PCOS will help them to modify their life style, have better reproductive life and prevent future complication. It was also noted that the two students out of 5 with PCOS had family history of PCOS which act as a additive factor for the development of PCOS although due to small sample size, the variable failed to show its association with the level of knowledge regarding PCOS among students. In conclusion, PCOS is a common endocrine disorder of female adolescence and adulthood with exact etiology unknown but pathophysiology rooted in insulin resistance, hyperandrogenism, and chronic anovulation.

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Declarations

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

REFERENCES

Anery, J.C., Mayor, A.J.B. The information needs of women diagnosed with PCOS implication for treatment and health outcomes ; BMC women's health(9);2007;p.7-8.

Azziz R, Sanchez L, Knochenhauer ES, Androgen excess in women: experience with over 1000 consecutive patients. J Clin Endocrinol Metab. 2004;89(2):453–462.

Hadayat A. Amasha, Manar F. Heeba. Implementation and Evaluation of Effectiveness of Educating Program for Upgrading Nurses' Knowledge Regarding Polycystic Ovaries Syndrome. Journal of Nursing and Health Science. Jan. 2014;3(1):PP 01-08.

Healthwise webmed may 1;2016;available from;http//women webmwd.com/tc/polycystic ovarian syndrome PCOS-topic-overview.

Hoda Abdel Azim Mohamed. Effect of educational program on the level of knowledge regarding polycystic ovarian syndrome among adolescent girls. Journal of Nursing Education and Practice. 2016; 6(10):pp 80-87.

Joshi, Mukherjee S, Across sectional study of PCOS among adolescent and young girls in Mumbai, Indian J Endocrinol Metab, 2014 may-june; 8(3):317-324.

Kalpana SP. A study to evaluate the effectiveness of structured teaching program (STP) regarding knowledge on polycystic ovaries among the students of selected pre-university college in Bangalore. Unpublished Master thesis in Master of Science in nursing in community health nursing. 2013.

Kashar Miller Nixon C.Boot Lr,Gorc.Azziz R. Journal on fertility sterility.2011 jan.75(1).53-58.

Manita D, Molly B, Sharda R. An Exploratory Survey To Assess The Knowledge, Practice And Prevalence Of Polycystic Ovarian Syndrome Among Women Attending Gyne OPD Of Selected Hospital Of Delhi With A View To Develop A Health Care Package On Polycystic Ovarian Syndrome And Its Management. Journal of Nursing and Health Science.2014; 3(6): 39-42.

*Nair MK, Pappachan P, Balakrishnan S.*Menstrual Irregularity and Poly Cystic Ovarian Syndrome among Adolescent Girls-A 2 Year Follow-up Study. 2011 Jul 16.Available from: URL:www.ncbi.nlm.nih.gov/pubmed/21769526

Nidhi R, padmalathaV, NagarathnaR, AmritanshuR. Prevalence of PCOS in India adolescents. Journal pediatre Adolenc Gynecol 2011;24(4):223-7.

Pramila D'Souza. A study to assess the effectiveness of planned teaching programme (ptp) on polycystic ovarian

syndrome (PCOS) among adolescent girls in selected high schools at mangalore. Nitte University Journal of Health Science. NUJHS Vol. 3, No.3, September 2013, ISSN 2249-7110)

Shannon and Wang Y. PCOS a common but often unrecognized condition;journal of midwifery and women's health.57.2002.221-230.

Sunanda B, Sabitha N. A Study to Assess the Knowledge Regarding PCOS (Polycystic Ovarian Syndrome) among Nursing Students at NUINS. Nitte University Journal of Health Science. September 2016; 6(3):pp 2249-7110.

Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, *et al*. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012;380(9859):2163-96.

Wilson Hockenberry; Nursing care of infant and children.8th edition Elseiver Publisher.2007.

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