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Awareness of Polycystic Ovary Syndrome among Female University Students in Peradeniya, Sri Lanka

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ABSTRACT

Introduction: Understanding polycystic ovarian syndrome (PCOS), its symptoms, and consequences is crucial for early treatment and the prevention of future major issues. The exact cause of PCOS remains unknown, making it challenging for physicians to provide an accurate diagnosis. **Objectives:** This study aims to evaluate the awareness of the prevalence and features of PCOS among female university students in Peradeniya, Sri Lanka. **Methodology:** A descriptive-cross-sectional study was conducted among female undergraduate university students in Peradeniya, Sri Lanka. A random sampling method was used. Self-administered questionnaires were administered, which included demographic data and questions related to awareness, such as symptoms, complications, and specific control measures. All responses were compiled into an Excel spreadsheet and analyzed using SPSS 25. All information was presented as percentages. The mean pain score and standard deviation were calculated, and statistically significant differences ($P<0.005$) were reported. **Results:** The overall degree of awareness is relatively low (<40%), excluding the symptom of an irregular menstrual cycle. While the internet is the most commonly used method (49%), students who acquired knowledge from health care practitioners scored higher (17.56±3.719). The highest mean awareness score was reported by students in the medical faculty (18.22±5.345). There was a significant difference in mean scores based on the field of study and information sources ($P<0.05$). **Conclusions:** Female undergraduate students at the University of Peradeniya have a significant knowledge gap regarding PCOS. Awareness programs should be enhanced by involving qualified parties specializing in relevant subjects through Google and social media.

Keywords: Awareness, Polycystic Ovarian Syndrome, Undergraduate Students, Symptoms and Complications

INTRODUCTION

PCOS is considered to be the most common heterogeneous endocrine disorder in women, affecting 6–20% of women of reproductive age, usually commencing at puberty [1,2,3,4]. It has been reported that 30% of women with infertility problems have been diagnosed with PCOS [5].

In 2005, a community-based cross-sectional study identified 220 women (7.5%) with PCOS, with oligo/amenorrhea and polycystic ovaries

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being the most common phenotypes, respectively (48.3% and 91.4%) [6]. Globally, the prevalence of PCOS ranges from 2.2% to 26%, which varies among different ethnicities and across various geographical and social settings [7]. PCOS is a multi-organ syndrome characterized by menstrual disorders, miscarriage, infertility, hirsutism, acne, obesity, and metabolic syndrome [8]. In most of the Asian countries, awareness, prevalence, and phenotype of PCOS among adolescent girls are unknown [7].

Existing Sri Lankan research has focused largely on adult populations. A study conducted in Sri Lanka in 2021 further reported lifestyle data, finding that women with hirsute PCOS had reduced physical activity and distinct dietary patterns, consuming fewer nutrient-rich foods such as dairy, pulses, grains, and fish compared to controls [9]. Furthermore, a genetic study in 2021 proposed a tool, which was simple and cost-effective for simultaneous screening of multiple single-nucleotide polymorphisms (SNPs) associated with PCOS in Sri Lankan women called allele-specific qPCR tool [10].

A study conducted in India reported a variety of clinical pictures are ascribed to PCOS that range from, but are not limited to, those related to androgen excess, including hirsutism, acne, weight gain and male-pattern hair loss, symptoms resulting from anovulation such as irregular and heavy menstrual bleeding, and oligomenorrhea, amenorrhea, subfertility, to those due to the effect of insulin resistance like acanthosis nigricans and dyslipidemia [11].
Thus, this study aims to evaluate the awareness of the prevalence and features of PCOS among female university students in Peradeniya, Sri Lanka, including knowledge of symptoms, complications, risk factors, and health-seeking behavior.

METHODOLOGY

This descriptive cross-sectional study was conducted from May 2019 to May 2020 to assess awareness of the features, complications, and control measures of PCOS. The research took place at the University of Peradeniya in Sri Lanka.

For a prevalence of approximately 10% of PCOS through symptoms and signs, a sample of 198 is required at a precision of 0.03 and a confidence level of 95%. For contingencies sample size will be inflated by 10% to 420.

By using simple random sampling method, the total student population in their first and second years from all faculties at the University of Peradeniya, Sri Lanka, was recruited for this study. Only those who met the inclusion and exclusion criteria, with ages ranging from 18 to 28, were invited to participate until the required sample size was reached. Students diagnosed with thyroid dysfunction, hyperprolactinemia, congenital adrenal hyperplasia, androgen-secreting tumors, and Cushing's syndrome were excluded.

This study was analyzed using SPSS 25 version. Data entry was a single-entry process, and a standard data cleaning procedure was followed. Prevalence of socio-demographic characteristics was assessed by using descriptive statistics. The knowledge of symptoms, complications, and reduction methods of PCOS was assessed by using the total score of the knowledge-based questionnaire. Total mean scores for the knowledge of the participants about PCOS based on ethnicity, faculty, and source of knowledge were assessed by using the ANOVA statistical test. The statistical significance level was set at $p < 0.05$. The data was presented as percentages and Mean ± SD. To that end, significant differences between domain variable subcategories were presented based on a P value of < 0.05.

This study was approved by the Ethical Committee of Faculty of Medicine, University of Peradeniya, Sri Lanka under 2019/EC/24. After that, verbal consent was requested from the groups of students, and those who gave consent were recruited for the study. An initial introduction about the questionnaire was provided by the research group, followed by the provision of a pre-tested and semi-structured questionnaire. Finally, all the participants were provided with a leaflet containing information related to the diagnosis of PCOS, to create awareness among the participants with the clarification of any doubts. It was provided in all three languages (Sinhala, Tamil & English) to include all the ethnic groups. Any

student who wanted to withdraw voluntarily from the study for any reason at any stage of study was immediately withdrawn from the study. None of their details were either saved in the database or used in this or any other studies.

RESULTS

402 female undergraduate students out of a total of 420 replied to the questionnaire based on their knowledge about PCOS. The sample population consisted of students aged 18 to 29, with a mean age of 22.88 ± 1.746 years.

When comparing the residential areas of the participants, most of them were from Kandy district (27.6%), whereas the least number of participants were from Mannar (0.2%) (Figure 1).

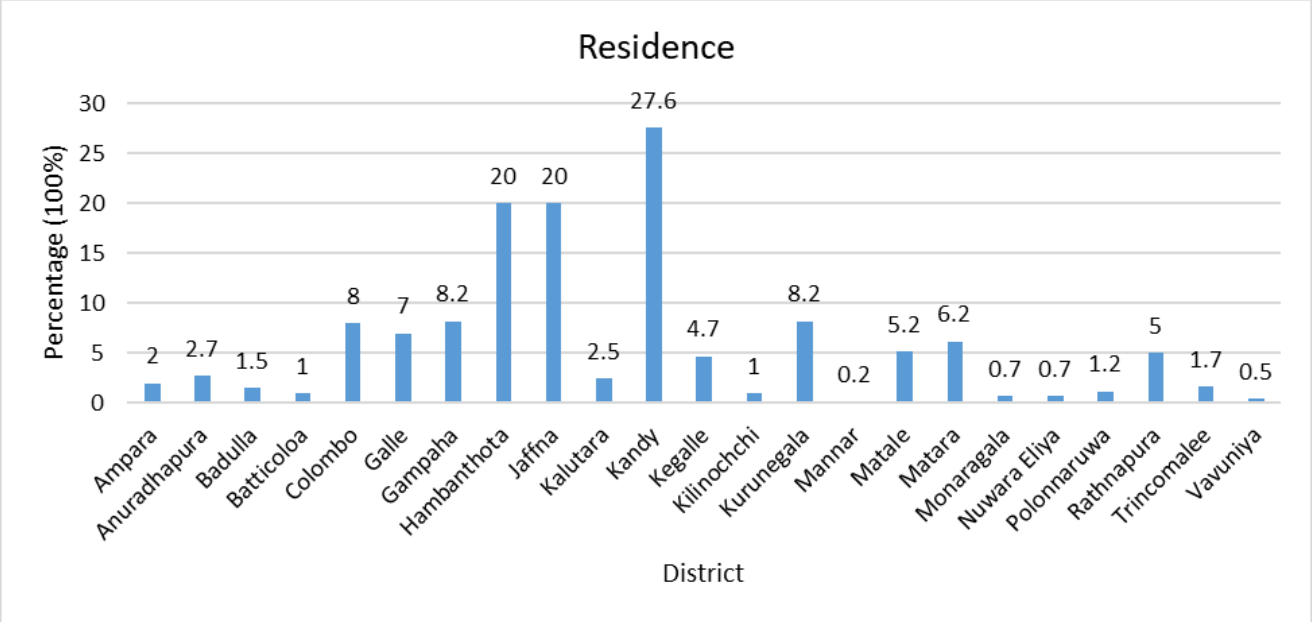

Figure 1. Residential areas of participants

Concerning the ethnic groups as shown in Table 1, the highest percentage of students was Sinhalese, whereas the lowest percentage of students was Burgher (85% and 0.5% respectively). The participants were selected from all 9 faculties in the University of Peradeniya, Sri Lanka. The highest percentage of students were from the Faculty of Medicine (41.5%), whilst the lowest percentage of students were from the Faculty of Dental Sciences (2.2%).

Table 1. Socio-demographic characteristics of the participants

Characteristics	n (%)
Ethnicity (n= 377)	
Sinhala	339 (85)
Tamil	19 (4.8)
Moor	17 (4.3)
Burgher	2 (0.5)
Study field (n=402)	
Medical Faculty	167(41.5)
Faculty of Dental Sciences	9 (2.2)
Faculty of Veterinary Medicine and Animal Sciences	24 (6)
Faculty of Sciences	44 (10.9)
Faculty of Allied Health Sciences	10 (2.5)

Characteristics	n (%)
Faculty of Agriculture	20 (5)
Faculty of Engineering	17 (4.2)
Faculty of Management	18(4.5)
Faculty of Arts	93 (23.1)

More than half of the students were not aware of the term PCOS (58.5 %). The participants had different sources to acquire knowledge about PCOS. The highest percentage of participants (49%) had selected internet as the source of information, whereas the least percentage had chosen newspaper (Figure 2).

Table 2 shows knowledge of the participants regarding the symptoms of PCOS, such as irregular menstrual flow, weight gain, facial acne, hirsutism, frontal hair loss, alopecia, anxiety, psychiatric issues, and a rise in androgen levels. Over half of the students (53.3%) knew that irregular menstruation is a sign of PCOS. Despite that, a significantly higher percentage of students were ignorant about the consequences, such as weight gain (68.2%), facial acne (73.1%), hirsutism (83.5%), Alopecia (93%), anxiety (81.3%), and psychiatric issues (80%).

Table 2. Knowledge of the participants regarding Symptoms, complications, and reduction measures of PCOS

Feature	Yes n (%)	No n (%)
Clinical presentation of PCOS		
Irregular menstrual cycle	213 (53.3)	187 (46.7)
weight gain	128 (31.9)	272 (68.1)
Facial acne	108 (26.9)	292 (73.1)
Hirsutism	66 (16.5)	334 (83.5)
Alopecia	28 (7)	372 (93)
Anxiety	75 (18.7)	325 (81.3)
Psychological disturbances	80 (20)	320 (80)
Increase the androgen level	113 (28.4)	285 (71.6)
Complications of PCOS		
Type II Diabetes Mellitus	64(16)	337 (84)
Hypertension	92 (22.9)	309 (77.1)
Cardiovascular disease	68 (17)	332 (83)
Endometrial cancer	153(38.2)	247(61.8)
Measures to decrease the symptoms of PCOS		
Exercise	123 (30.8)	277 (69.2)
Use of hormonal contraceptives	114(28.6)	285 (71.4)
Losing weight	117(29.3)	282(70.7)

Also, it depicts knowledge of the participants regarding the common prevalent consequences of POCS, namely type II diabetes, hypertension, cardiovascular disease, and endometrial cancer. Except for endometrial cancer, more than 75% of students had no awareness about the effects, such as diabetes mellitus, hypertension, and cardiovascular diseases. A significantly higher percentage of students were unaware of the measures that can be taken, such as regular exercise (69.2%), hormonal contraception (71.4%), and weight loss (70.7%), to decrease the symptoms of PCOS.

Total mean scores for the knowledge of the participants about PCOS concerning their ethnicity, faculty, and source of knowledge are

depicted in Table 3. When ethnicity is concerned, there was no significant difference between the mean scores of Sinhalese, Tamils, and Moors. The knowledge of Burgher students was significantly lower compared to the other three ethnicities.

When considering the study field or the faculty of the participants as shown in Table 3, the students from the Faculty of Medicine and Faculty of Allied Health Sciences had higher total mean scores compared to the students from other faculties (18.22±5.345 and 17.40±4.088). Students of veterinary medicine and animal sciences had the lowest mean total score (9.25±4.1625). There was a significant difference among the mean scores of the students from the Faculties of Science, Management, Agriculture, Engineering, and Arts (P <0.05).

Table 3. Total mean scores for the knowledge of the participants about PCOS based on ethnicity, faculty, and source of knowledge

Domain	Sub-categories	Mean ±SD	Significance (P value)
Ethnicity	Sinhala	13.89± 5.671	0.184
	Tamil	13.49± 4.677	
	Moor	13.24± 5.118	
	Burger	4.00 ± 0.000	
Faculty	Medical	18.22± 5.345	<0.000
	Dental sciences	13.67± 7.533	
	Veterinary and animal sciences	9.38± 4.095	
	Science	15.86± 5.424	
	Allied health science	17.40± 4.088	
	Agriculture	11.15± 6.141	
	Engineering	16.06± 6.240	
	Management	14.11± 6.057	
	Arts	13.14± 4.847	
	Dental sciences	13.67± 7.533	
Source of Information	TV/Radio	13.43± 5.511	<0.000
	Newspaper	8.14 ± 4.18	
	Friends/ Family	10.48± 4.890	
	Text books	13.21± 4.040	
	Internet	12.75± 5.389	
	Health care provider	17.56± 3.719	

Figure 2 shows the percentage of students who had obtained awareness regarding PCOS via different sources of knowledge. Even though the internet is the most widely utilized source, health care providers give the highest mean score (17.56±3.719). The findings highlighted that the newspapers had been provided the lowest mean score (9.48±5.344). Mean scores for the overall knowledge of the participants who had gained awareness via internet, textbooks, and health care providers were not significantly different (P>0.05).

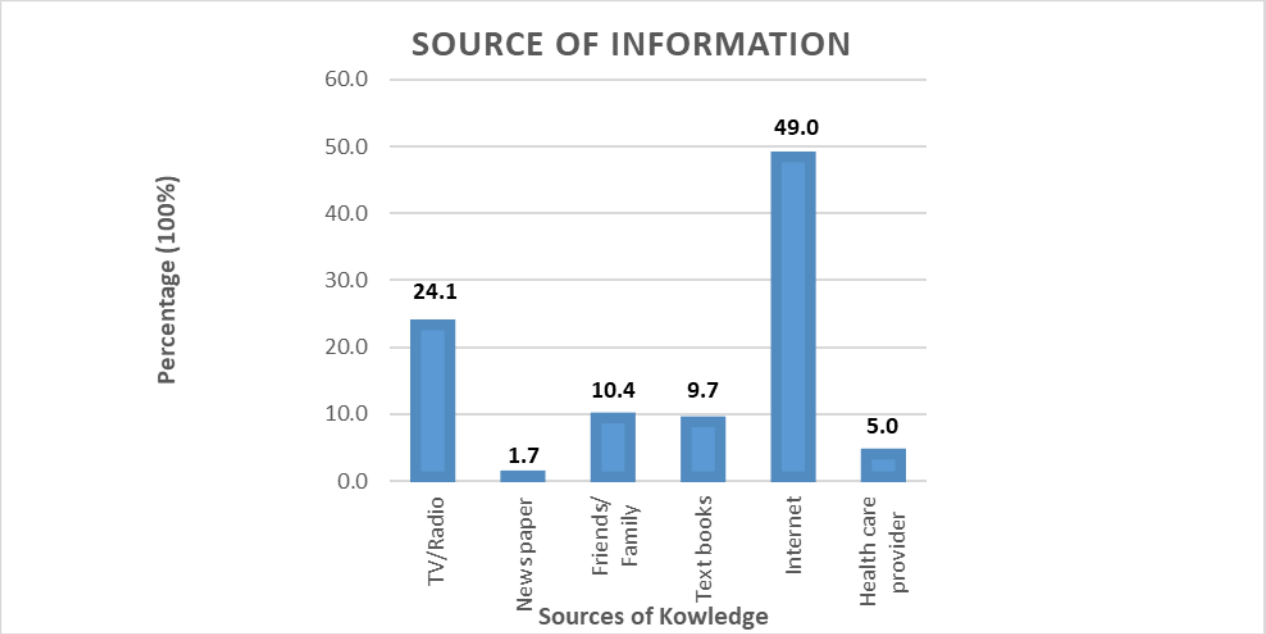

Figure 2. Percentage distribution of different sources of knowledge about PCOS

DISCUSSION

PCOS is one of the most common conditions that has resulted in adverse effects on women's health, especially in the reproductive age [12]. Numerous studies have been conducted to investigate the prevalence, etiological factors, complications, and treatments concerning PCOS. Although few studies have been formulated to evaluate the awareness of PCOS among reproductive age female students in Sri Lanka. Hence, this study was conducted to evaluate the awareness of PCOS concerning the aspects of its symptoms, complications, and measures for management among undergraduate female students in the University of Peradeniya, Sri Lanka.

According to the findings of this study, less than 35% of the students were aware of each of the symptoms except irregular menstrual cycle. When it comes to each of the complications, less than 25% of the students had known of those, except endometrial cancer. Concerning the control methods, less than 30% of students had the knowledge regarding each control method, except regular exercises, which is marginally above 30%. Therefore, it can be stated that students had relatively less knowledge regarding the complications and control measures compared to the symptoms. Also, it can be assumed that the awareness regarding this disease is further minimal in the outside general society when considering the results of this study. A similar trend was observed in a study that was conducted by Zaitoun et al (2022) [13], where 83.4% of females were familiar with the term PCOS, but only 21.7% of them had sufficient awareness regarding its symptoms, complications, prevention, and treatment. Jakhar et al (2022) [14] also highlighted the existing poor knowledge among females, such that only 18.22% of college female students had heard about the term PCOS. Additionally, Rizvi et al. (2023) [15] noted that 31.6% of Pakistani undergraduate students lacked self-awareness. In contrast to the findings of this study, a study conducted in Jordan by Alshdaifat et al., 2021) [16] highlighted that the students had a good level of knowledge regarding PCOS, and there was no correlation between age and the knowledge of students. Furthermore, Saudi women were well aware of the existence of PCOS according to the findings of Alessa et al (2017) [17].

However, a study conducted among Saudi Arabian women revealed that 69% and 56.2% of participants were aware that metabolic syndrome and high insulin levels can be associated with an increased risk of developing diabetes mellitus and cardiac diseases, respectively [18]. Despite the fact that 16% and 17% of the students in this survey were aware of the above-mentioned issues [19].

Concerning the preventive and self-management measures for PCOS, one of the basic self-management approaches is lifestyle modifications, generally through a healthy diet and increased physical activity to prevent weight gain. In a previous study, approximately two-thirds of participants (77% and 72.2%, respectively) were aware of the value of regular exercise and a healthy diet in reducing the effects of PCOS [11]. This study assessed weight loss awareness rather than healthy eating habits since weight reduction has a substantial direct impact on PCOS management measures. Indeed, weight loss may be achieved by fasting since the caloric restriction can have a major influence on polycystic ovaries that are hyperandrogenemic and moderately insulin resistant [20,21].

Based on the findings of this study, the field of study of the students had a strong impact on their level of knowledge about PCOS. The students who were studying health-related disciplines (Faculty of Medicine and Faculty of Allied Health Sciences) had a greater awareness compared to the students in the other fields of study. Similarly, according to Alshdaifat et al (2021) [16], majoring in some disciplines such as veterinary medicine, nursing, pharmacy, medicine, or dentistry is the biggest independent predictor of identifying the phrase PCOS. Lectures and clinical exposure can be considered as the major contributing components to the increased knowledge. In addition, they also get the opportunity to take part in numerous types of awareness programs and initiatives. Furthermore, Alessa et al (2017) [17] have revealed that women with higher educational backgrounds and women with health-related degrees were substantially aware of PCOS.

Women with PCOS have a great need for information, along with proper guidance to manage and limit its negative impacts on their health and lifestyle. Information sources such as advice from physicians, books, PCOS support groups, and the internet can be cited to gain satisfactory, reliable information. In this study, the main source of knowledge for the participants was the internet. Similarly, 21.3% have known about PCOS via internet according to Alessa et al (2017) [17]. However, there is a limitation regarding this source because all the information available on the internet cannot be guaranteed 100% accurate. In contrast, the findings of (Jakhar et al., 2022) [14] and Alshdaifat et al (2021) [16] highlight that healthcare professionals were the most common source of information as reported by participants. Alduraywish et al (2020) [22] have stated that although physicians or healthcare professionals were preferred and highly trusted, internet sources appeared to impact the medical knowledge of the population. The population still preferred to use internet search to obtain health information prior to a doctor's visit. Internet is the most common source of information reported by the participants, while the health care professionals were the most trusted source in increasing awareness, but were poorly utilized.

CONCLUSION

Therefore, it is vital to expand the depth of knowledge given under the educational program based on reproductive health, and that would be another better source of information for the younger generation. Furthermore, the awareness level of students can be improved via the school curriculum. Conduction of planned teaching programs is necessary to increase comprehensive knowledge concerning the detection of presenting symptoms and foster early diagnosis and treatment of the syndrome, thereby promoting overall health. It is also suggested that, internet as a source can be considered as one of the best tools with regulated information by healthcare authorities for educating target groups.

Author declaration

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Authors' contributions:
ICK: Conceptualization, methodology, data analysis, and writing the original draft; UNW: Data collection, formal analysis, data analysis, writing, review, and editing; ANFA: Data collection, formal analysis, data analysis, writing, review, and editing; ST: Supervision, project administration, and critical revision of the manuscript

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Statement on data availability:
Data will be available on request from the corresponding author.

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