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Evaluating PCOS Awareness among Allied Health Sciences Students at Jinnah Sindh Medical University

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ABSTRACT

Background: The hormonal disorder PCOS produces elevated male androgen levels from the ovaries. PCOS develops as a continuous medical problem which leads to several symptoms including weight change, disrupted period schedules, skin complications, unexpected facial or body hair growth and interrupted sleep patterns yet individual symptom patterns differ. Many females do not have sufficient knowledge about the mounting global incidence of PCOS. **Objective:** Previous literature showed no research has evaluated PCOS understanding among Jinnah Sindh Medical University (JSMU) students working in allied health who will not practice clinically. A research objective sought to determine the knowledge base about PCOS among students enrolled in Health Management as well as Pharmaceutical Sciences and Physiotherapy. **Methodology:** A cross-sectional study was conducted from March to August 2022 among 302 male and female allied sciences students aged 18–25 years at JSMU, using a systematic random sampling technique. A questionnaire-based tool was used to both assess and provide information about PCOS. **Results:** The study revealed that 93.40% of respondents were aware of the term PCOS. Many demonstrated knowledge of increased androgen levels and the association of PCOS with diabetes, heart disease, and anxiety. Regarding diagnosis, 73.60% recognized ultrasound as a diagnostic tool, while 56.77% acknowledged specific blood tests. Many were also aware of available treatment options. **Conclusion:** Overall, the study found a satisfactory level of awareness and knowledge about PCOS among allied sciences students, including symptoms, associated conditions, diagnostic methods, and treatments.

Keywords: PCOS awareness, allied health sciences, medical students, hormonal imbalance, reproductive health

INTRODUCTION

According to World Health Organization PCOS represents a group II ovulation disorder within hypothalamic pituitary ovarian disorders (4-6) while the presence of ovarian hormones along with excess male androgens causes this hormonal imbalance (1-3). PCOS exists as a persistent condition which primarily shows abnormal weight gain combined with irregular menstruation periods and facial and body acne and hair growth abnormalities and sleep disorder but exact symptoms differ between women (7,8). The National Institute of Health set the first PCOS diagnostic criteria in 1990 focusing on testosterone elevation and hormonal irregularities (9). In 2003 the Rotterdam Criteria established multiple cysts discovered through ultrasound imaging as a new diagnostic requirement in addition to those specified by the NIH criteria (10,11). The European Society of Human Reproduction and Embryology and American Society for Reproductive Medicine -Rotterdam consensus (ESHRE and ASRM) created a PCOS diagnosis that depends on two out of three key elements: anovulation or oligo ovulation, hyperandrogenism, and multiple cysts on ultrasound imaging (12,13). The metabolic risks for endometrial hyperplasia and endometrial cancer are higher because PCOS patients maintain more than half of their body mass index level at a level of obesity (14-16).

Bozdog conducted a study in 2016 that systematically analyzed data from published research documents reporting PCOS prevalence rates (17,18). The results from his meta-analysis showed the worldwide PCOS occurrence ranges from 6 to 26%. Parallel to this finding a cross-sectional investigation at King Edward Medical University and the Mayo Hospital Lahore, Pakistan demonstrated that the PCOS incidence in South Asian females, specifically Pakistani women exceeded the rate of Whites by 52% (19,20). The incidence study performed in Mumbai through a cross-sectional community-based method revealed PCOS affected 23% of adolescent and young female participants aged 15-24 years (21-23). Researchers used multistage probability cluster sampling to select 1126 reproductive aged women from different Iranian geographic areas where they discovered PCOS affected 15% of participants (24).

METHODOLOGY

This study employed a cross-sectional research design to investigate the selected variables over a specified period. The research was conducted at Jinnah Sindh Medical University, a well-established institution providing education in various health disciplines. The duration of the study extended over a period of six months, commencing in March 2022 and concluding in August 2022. A systematic random sampling technique was used to ensure a representative sample of participants from the target population.

An adopted structured questionnaire was used for data collection. The primary study tool used was this questionnaire. It was disseminated among the participants. The instrument was designed to collect the information in a consistent and standardized manner. A total sample size was obtained using the RAO software calculator, considering a total population of 100,000 people. The estimated sample size of 302 participants, with 5% margin of error and 95% confidence level was used with a sample size calculation.

This study has applicable inclusion criteria of audience, i.e. students who are in the age bracket 18–25 years and studying in the fields of pharmacy, physiotherapy, allied health sciences in Jinnah Sindh Medical University. Students who were not willing or did not give consent to participate or did not complete the questionnaires were excluded from the study. Doing so made sure that all

participants were willing to give their response and were eligible for the research, improving the reliability and ethics of the research.

Data gathering process was initiated after approval by the Institutional Review Boards (IRB) of Jinnah Sindh Medical University. After getting institutional review board approval, data collection began through structured questionnaires. Responses were surveyed into a good data entry and analysis organization using a systematic coding system. After the researchers ended data collection and coding phase, the researchers entered the data in SPSS software. Statistical analysis through descriptive methods included calculation of mean, median standard deviation frequencies and percentages for relevant numerical and categorical variables. Results were mostly presented as a percentage breakdowns to ensure ease of consumption to the readers.

The entire study was conducted with ethical considerations in mind. The confidentiality and anonymity of the study participants was maintained strictly. The collected data were neither personal identifiers nor collection or disclosure of personal identifiers, and only the authorized members of the research team had access to that information. The results obtained from the participants were utilized only for academic and scientific purposes. The findings of the study could ultimately be published in scientific journals, or presented at academic conferences, but not with any names or identifying details of any participant included in published material. The study process also ensured that all records and related data would remain subject to inspection by the Review Committee Members of Jinnah Sindh Medical University to check their compliance with institutional research standards and ethical guidelines.

This study sought to produce reliable, valid and generalizable results by using systematic methodology and following set ethical principles. The use of a standardized questionnaire, systematic sampling, rigorous data analysis and ethical safeguards reinforced the credibility of the research findings and ensured the rights and the privacy of the participants.

RESULTS

Demographic Characteristics

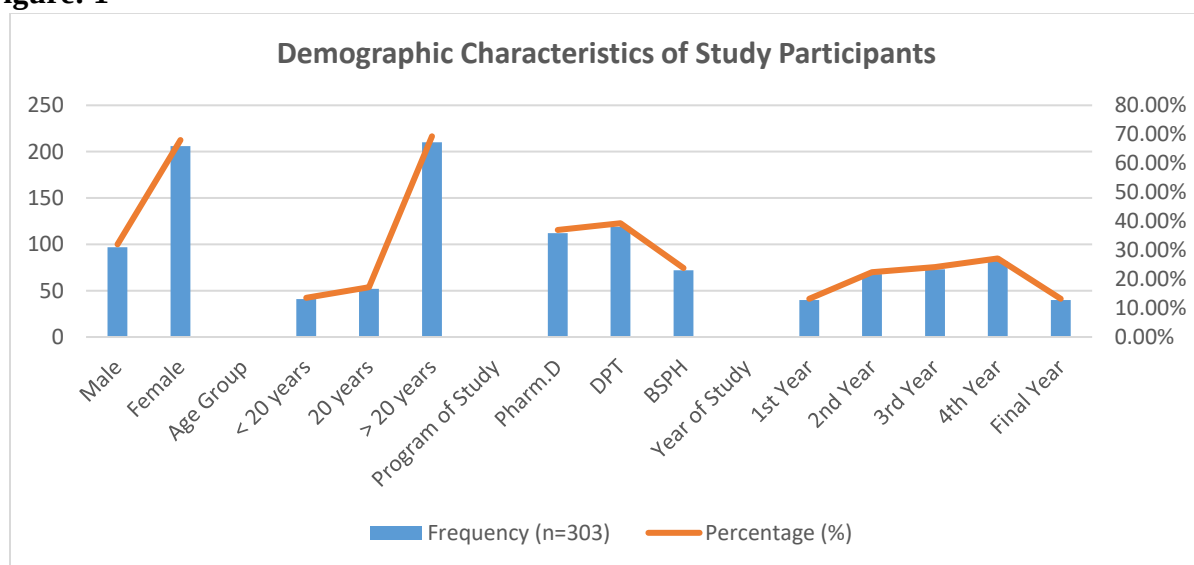
This cross sectional survey was conducted among 303 undergraduate students who were enrolled in Allied Health Sciences programs at Jinnah Sindh Medical University. Participants (mean age = 21.1 ± 1.8 years; 69.3% > 20 years) were investigated. Of the sample, 32% (n = 97) were males and 68% (n = 206) were females. The study participants were mostly DPT (39.3%), Pharm.D (37%), as well as Bachelor of Science in Public Health (BSPH) (23.8%). Among year wise distribution, 27.1 % was of 4th year students, next 24.1 % of 3rd year students and rest are distributed at other academic years. Table 1 shows these demographic details.

Table 1. Demographic Characteristics of Study Participants

Description	Frequency (n=303)	Percentage (%)
Gender		
Male	97	32.0%
Female	206	68.0%
Age Group		
< 20 years	41	13.5%
20 years	52	17.2%
> 20 years	210	69.3%
Program of Study		

Pharm.D	112	37.0%
DPT	119	39.3%
BSPH	72	23.8%
Year of Study		
1st Year	40	13.2%
2nd Year	68	22.4%
3rd Year	73	24.1%
4th Year	82	27.1%
Final Year	40	13.2%

Figure: 1



Knowledge Assessment of Polycystic Ovary Syndrome (PCOS)

To evaluate participants' understanding of PCOS, a 21-item structured questionnaire was employed and divided into four thematic domains:

- **Domain I: General Awareness (3 items)**
- **Domain II: Etiology and Risk Factors (5 items)**
- **Domain III: Clinical Presentation (7 items)**
- **Domain IV: Diagnosis and Treatment (6 items)**

Each correct response was awarded one point, leading to a maximum cumulative score of 21. Scores were categorized into three levels: *Poor Knowledge* (0–10), *Moderate Knowledge* (11–16), and *Good Knowledge* (17–21).

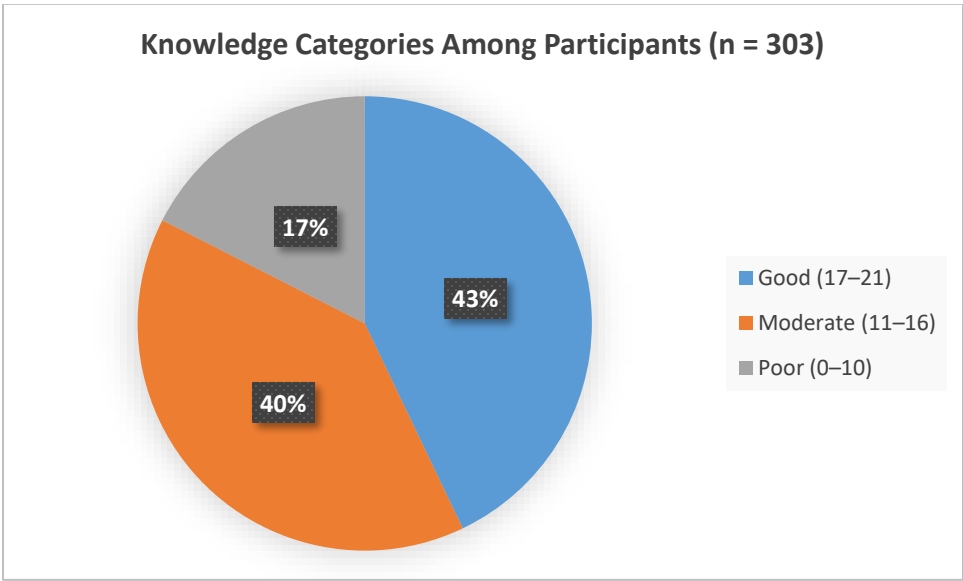
The mean knowledge score was 15.6 ± 3.4 , with 42.9% (n = 130) of students demonstrating *good knowledge*, 39.6% (n = 120) with *moderate knowledge*, and 17.5% (n = 53) with *poor knowledge* regarding PCOS.

Table 2. Knowledge Categories among Participants (n = 303)

Knowledge Level	Frequency	Percentage (%)
Good (17–21)	130	42.9%
Moderate (11–16)	120	39.6%

Poor (0–10)	53	17.5%
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Figure: 1



Domain-Specific Insights

The domain-specific insights reveal a high level of general awareness about polycystic ovary syndrome (PCOS), with 93.4% of respondents indicating they had heard of the condition. The internet was the most commonly cited source of information (30%), followed by textbooks (27.7%) and family or friends (20.5%). Regarding etiology and risk factors, 73.3% of participants recognized obesity as a contributing factor to PCOS, although fewer (47.9%) were aware of the role of insulin resistance. When it came to clinical features, irregular menstruation (84.5%), hirsutism (78.9%), and infertility (84.8%) were widely recognized, but awareness was lower for male-pattern baldness (56.8%) and acne (67.9%). In terms of diagnosis and management, 73.6% identified ultrasound as a diagnostic tool, while only 56.8% acknowledged the utility of blood tests. Knowledge about treatment options was varied, with 74.9% of respondents aware of hormonal therapy and 55.1% recognizing the use of metformin in PCOS management. Female students had significantly higher mean knowledge scores (16.3 ± 2.9) compared to male students (14.1 ± 3.8) ($p < 0.01$, independent samples t-test). Program-wise analysis showed that BSPH students scored highest on average (16.7 ± 2.8), followed by DPT (15.5 ± 3.3) and Pharm.D (14.9 ± 3.5), indicating a statistically significant association between program of study and PCOS knowledge levels (ANOVA, $p < 0.05$).

This comprehensive analysis underscores a generally high awareness of PCOS among health sciences students, although specific gaps remain in understanding etiological and diagnostic aspects. These findings suggest a need for integrated reproductive health education within the undergraduate curriculum to enhance awareness and early recognition of PCOS.

DISCUSSION

The purpose of this study was to assess the level of awareness about Polycystic Ovary Syndrome (PCOS) of Jinnah Sindh Medical University (JSMU), Karachi. The results showed that the male and female students, almost a significant majority, understood PCOS through various communication the way as acquired through the academic sources, the social media, hobbies discussed by the healthcare professionals, etc. This finding suggests generally a well-informed population within the selected academic environment.

Very many respondents possessed adequate knowledge on what PCOS is usually associated with. For example, they were aware of the elasticity to elevated androgen levels, often with clinical manifestation of hirsutism, male pattern baldness, and acne. Furthermore, many participants considered ovarian cysts and abnormalities in menstrual cycle as PCOS hallmark features. Respondents also acknowledged the well-known association of PCOS with mental health issues such as anxiety and depression. Additionally, most participants knew that PCOS can be associated with so called systemic comorbidities such as overweight, diabetes and cardiovascular disease, which are often considered a chronic disease of the syndrome.

However, high awareness existed in terms of diagnosis tools where pelvic ultrasound was used for the detection of ovarian cysts and specific blood tests for hormone evaluation. Students were also aware of the various treatment options for PCOS. It included metformin particularly in insulin resistant patients and symptomatic management strategies. Known treatment modalities were also mentioned as hormonal therapy, such as oral contraceptives or antiandrogens and surgical interventions like ovarian drilling.

The findings of this research are aligned with several other studies. For example, in Karachi, Rawalpindi, and Iran, PCOS women have been found to be at high risk of hirsutism and menstrual irregularities, as was evident with JSMU students. The study, which was also referenced in a study in Human Reproduction Open by the European Society of Human Reproduction and Embryology (ESHRE) in 2018 also points to infertility being a major issue in PCOS patients, including the participants in the current study.

Results are further supported by research published by PLOS Journal in California where 68.4% of their participants experienced hirsutism and 33.2% reported infertility, both statistics showing similar levels of awareness among study participants. Furthermore, Shaw et al. (2008) also pointed out that PCOS was associated with obesity and certain cardiovascular diseases. Participants in our study also understood this link, beyond the impact on the individual.

PCOS was also associated with mental health issues such as depression. Finally, our study participants were aware of another mental health component in PCOS management — another area in which they accurately reflected the science of their illness — as noted by Bernard et al. who reported a prevalence of depression at 61.8% among PCOS patients.

In contrast, a study published in the *International Journal of Innovative Research (IJIR)* from Quetta found that their participants had limited knowledge of core symptoms like menstrual irregularities, hirsutism, acne, and obesity. This difference may highlight geographical or educational disparities in awareness levels, underlining the importance of targeted awareness programs in underserved areas.

Lastly, recent global statistics published by Baishideng Publishing Group Inc. suggest that 6% to 15% of individuals with PCOS worldwide suffer from diabetes, further supporting the known endocrine and metabolic associations of the syndrome. Cardiovascular risks, as emphasized in *Human Reproduction Update* (Volume 17, ESHRE 2011), are also frequently discussed in global literature and were well recognized by participants of this study.

In summary, the current study reflects a high level of PCOS awareness among medical students in Karachi, including understanding of its symptoms, diagnostic tools, complications, and treatment options. However, varying findings across different regions suggest the need for widespread public health campaigns to enhance PCOS awareness at a national level.

Limitations

The reliability of data was impacted by conduction in just one area so it cannot be generalized. Less recruitment of participants caused the study to be limited. In addition, the students participated may not be the representative of patients having PCOS in general population. Further due to lack of financial resources, study lack experimental work.

Recommendations

The findings of study showed that majority of students of allied sciences are aware of PCOS though there were certain gaps which could be sorted by arranging different education programs to provide knowledge about such syndromes.

CONCLUSION

This study demonstrates a high presence of awareness and information on Polycystic Ovarian Syndrome (PCOS) among the students of allied health science at Jinnah Sindh Medical University. A staggering 93.4% percent of respondents had heard of PCOS, and many expressed level 1 knowledges of key areas about the syndrome, such as its hormonal basis, symptoms, diagnostic methods as well as risks such as diabetes and cardiovascular diseases. The results suggest that students with little or no direct clinical exposure, such as students in pharmaceutical sciences, physiotherapy and health management, do in fact have a fair amount of awareness of PCOS. The availability of information through the internet, textbooks and peer communication is just a possible explanation of this.

In reality, though, there were some knowledge gaps as to how PCOS influenced metabolism and reproductive potential, including how it related to insulin resistance and obesity. A relatively lower awareness regarding some symptoms like baldness and acne was also observed in the study. These insights highlight the need for targeted educational interventions and awareness campaigns to fill existing knowledge gaps and promote total understanding throughout all medical students. They stress the importance of early education and early proactive awareness about PCOS to enable early diagnosis, appropriate management and prevention of the long term health complications of the syndrome. In the end, such initiatives will ultimately improve reproductive and metabolic health outcomes for the general population.

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