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Prevalence of Polycystic ovarian disease among undergraduate medical students.

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Introduction
Polycystic ovarian syndrome (PCOS), a prevalent endocrine disruption in women of reproductive age, intertwines androgen excess, anovulation, infertility, and obesity. This study delves into the PCOS prevalence among female medical students.

Methodology Overview:
A meticulous descriptive cross-sectional exploration unfolded amidst the female undergraduates of a tertiary healthcare institution during the window of January 1st to March 31st, 2022. Ethical clearance was secured from the Institutional Review Committee. The sampling calculus was tailored, employing systematic random sampling techniques. The analytical journey was paved using Statistical Package for the Social Sciences version 22.0. A fresh statistical canvas emerged, adorned with novel point estimates at a 95% Confidence Interval, enlivened by recalibrated frequency and proportion analyses catering to binary data.

Result:
Within a cohort of 420 participants, the prevalence of polycystic ovarian syndrome manifested in 38 individuals, constituting 9.05% (95% CI: 6.58-11.52). Notably, 88 participants (20.95%) reported extended menstrual cycles, 29 individuals (6.90%) exhibited a tendency for the growth of dark, coarse hair, while 83 participants (19.76%) acknowledged grappling with obesity or overweight concerns. A subtle milky discharge from the nipple was observed in 3 individuals, representing 0.71% of the cohort.

Conclusion:
The detected prevalence of polycystic ovarian syndrome aligns with findings from akin studies in comparable environments. However, the persisting prevalence underscores the escalating nature of this endocrinological challenge among females in the reproductive age bracket. Emphasizing the urgency for early screening becomes imperative as a preventive measure against potential lifelong complications.

Introduction:
Polycystic Ovarian Syndrome (PCOS) is a multifaceted endocrine disorder that has gained prominence among females due to its triad of androgen excess, anovulation, infertility, and obesity. Characterized by manifestations such as enlarged polycystic ovaries, secondary amenorrhea, and hirsutism, PCOS poses a considerable challenge with lifelong complications. Its incidence is on the rise globally, with lifestyle changes and increased stress being identified as contributing factors.[1] Unfortunately, India lacks accurate prevalence data, prompting our study to investigate the prevalence of PCOS among a specific demographic – female medical students in the reproductive age group. [2]

Epidemiological Landscape:
The increasing incidence of PCOS is a global phenomenon, and India faces a notable gap in understanding its prevalence. Focusing on female medical students allows us to explore the prevalence and

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potential implications of PCOS within a specific demographic that mirrors broader societal trends. The absence of accurate statistics hinders comprehensive healthcare planning, making it crucial to address this gap in our understanding of PCOS within the local context. [3]

Connection with Long-Term Health Outcomes:

PCOS extends beyond its immediate reproductive implications, with research highlighting associations with cardiovascular disease (CVD), hypertension, endometrial cancer, and type II diabetes later in life. Recognizing this link is essential for developing holistic healthcare strategies that consider the long-term health outcomes associated with PCOS. Early detection and management of PCOS become critical in mitigating potential risks, underscoring the importance of our study in shedding light on these connections. [4]

Impact of Lifestyle and Stress:

The surge in PCOS incidence is intricately linked to contemporary lifestyles characterized by sedentary habits, poor dietary choices, and heightened stress levels. Our study seeks to unravel the complex relationship between lifestyle factors and PCOS, recognizing the role of sedentary behaviours, dietary patterns, and stress in the onset and progression of PCOS symptoms. Understanding these dynamics is crucial for the development of targeted interventions that address both immediate symptoms and underlying lifestyle-related factors. [5]

The Unmet Need for Comprehensive Healthcare:

The lack of accurate prevalence data on PCOS reveals challenges in healthcare infrastructure and awareness programs. Bridging this gap is vital for effective policy formulation and healthcare delivery. Our study contributes to addressing this unmet need by providing valuable insights into the prevalence of PCOS among female medical students, paving the way for evidence-based decision-making in healthcare policies tailored to the local population. [6]

Challenges and Ethical Considerations:

Research on sensitive topics like PCOS presents challenges, both methodological and ethical. Ensuring participant confidentiality, privacy, and psychological well-being are paramount considerations. Our study addresses these challenges by incorporating stringent ethical guidelines, obtaining informed consent, and safeguarding participant anonymity. The incorporation of supportive mechanisms within the study framework further mitigates potential psychological impacts associated with a PCOS diagnosis. [7]

Potential Implications for Medical Education:

Our study has implications beyond contributing to the scientific understanding of PCOS. By focusing on medical students, the future healthcare workforce, our research can inform medical education. Integrating PCOS awareness and management into medical curricula empowers future healthcare professionals to advocate for comprehensive healthcare policies and interventions. This proactive approach can enhance the preparedness of healthcare providers to address the evolving landscape of women's health. [8]

Through these insights, our study aims to not only contribute to the scientific understanding of PCOS but also to inform healthcare policies, medical education, and interventions tailored to the unique needs of the population. As PCOS continues to impact women's lives globally, addressing these multifaceted aspects is crucial for effective healthcare planning and delivery. [9]

Methodology

Methodology: Prevalence Study of Polycystic Ovarian Syndrome Among Undergraduate Medical Students

Study Design:

A meticulous descriptive cross-sectional study was conducted among female undergraduate students at a tertiary healthcare institution over the period of January 1st to March 31st, 2022.

Ethical Approval:

Prior to the initiation of the study, ethical clearance was obtained from the Institutional Review Committee. This step ensured the protection of participants' rights and adherence to ethical guidelines throughout the research process. [10]

Sampling Technique:

The sampling strategy employed systematic random sampling techniques to ensure representative participant inclusion. This approach enhances the generalizability of the findings to the larger population of female undergraduate students at the healthcare institution. The systematic random sampling method involved selecting

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every k-th participant from a predetermined starting point, where k was calculated based on the total number of students. [11]

Sample Size Calculation:[12]

The sample size was determined with precision to achieve reliable results. Considering the prevalence estimate from previous literature, the desired confidence level, and margin of error, the sample size calculation utilized a standard formula:

$$n = E2Z2 \times P \times (1 - P)$$

Where:

- ***n* = required sample size**
- ***Z* = Z-score corresponding to the desired confidence level**
- ***P* = estimated prevalence from previous studies**
- ***E* = margin of error**

Additionally, considering the finite population of female undergraduate students, the adjusted sample size was calculated using the formula:

$$\text{Adjusted sample size} = 1 + Nn - 1n$$

Where:

N = total number of female undergraduate students

A 10% non-response rate was anticipated, and the final sample size was determined accordingly.

Data Collection:

Data collection was executed using a structured questionnaire designed to capture relevant information on the prevalence and clinical symptoms of polycystic ovarian syndrome (PCOS). The questionnaire included queries related to menstrual patterns, hirsutism, obesity, and other pertinent aspects associated with PCOS. Trained researchers administered the questionnaire during face-to-face interviews with the participants. [13]

Statistical Analysis:

The collected data were entered and analysed using the Statistical Package for the Social Sciences (SPSS) version 22.0. A fresh statistical canvas was created, incorporating novel point estimates at a 95% confidence interval. Recalibrated frequency and proportion analyses were conducted, specifically tailored to accommodate binary data related to the presence or absence of PCOS and its associated clinical symptoms.[14,15]

Result & Discussion

Study Population and Prevalence:

In the examined cohort of 420 participants, the prevalence of polycystic ovarian syndrome (PCOS) was identified in 38 individuals, representing a prevalence rate of 9.05% (95% CI: 6.58-11.52). This finding is significant in unveiling the magnitude of PCOS within the studied population and provides a basis for understanding the potential impact on the health and well-being of female medical students.

Clinical Symptoms:

Among the participants, diverse clinical symptoms associated with PCOS were reported. Notably, 88 participants (20.95%) disclosed experiencing extended menstrual cycles, indicative of irregularities in the menstrual pattern. This observation aligns with a common manifestation of PCOS, contributing to a better understanding of the disorder's impact on reproductive health within this specific demographic.

Additionally, 29 individuals (6.90%) exhibited a tendency for the growth of dark, coarse hair, a characteristic known as hirsutism. Hirsutism is often associated with elevated androgen levels, a hallmark feature of PCOS. This clinical symptom further accentuates the varied ways in which PCOS can manifest and emphasizes the importance of recognizing these manifestations for timely intervention and management.

Furthermore, 83 participants (19.76%) acknowledged grappling with obesity or overweight concerns. The association between PCOS and metabolic disturbances, including obesity, is well-documented. This finding highlights the potential long-term health implications of PCOS and emphasizes the need for comprehensive healthcare strategies that address both the immediate symptoms and associated risk factors.

Nipple Discharge Observations:

A subtle milky discharge from the nipple was observed in 3 individuals, representing 0.71% of the cohort. While nipple discharge is not a classic symptom of PCOS, its inclusion in the study is essential for several reasons. Firstly, it allows for the exclusion of other endocrine abnormalities that may mimic PCOS symptoms. Secondly, its observation underscores the meticulous approach taken in the study to comprehensively assess and differentiate symptoms, contributing to the overall validity of the findings.

Implications and Further Considerations:

The identified prevalence rate and the spectrum of clinical symptoms within this cohort of female medical students hold significant implications. PCOS, with its diverse manifestations, not only impacts reproductive

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health but also extends to metabolic and endocrine imbalances, potentially influencing long-term health outcomes.

These findings call for a multifaceted approach to healthcare, encompassing not only the recognition and management of PCOS symptoms but also proactive measures addressing associated risk factors such as obesity. Furthermore, the observed prevalence underscores the importance of integrating PCOS awareness and education programs within medical curricula, empowering future healthcare professionals to navigate the complexities of this prevalent disorder.

As this study focuses on a specific demographic within a medical education setting, the results serve as a foundation for targeted interventions and healthcare policies tailored to the unique needs of female medical students. The data generated from this study contribute not only to the scientific understanding of PCOS but also provide practical insights for healthcare practitioners, educators, and policymakers alike.

Challenges and Opportunities for Intervention:

The identified prevalence of PCOS among female medical students brings attention to the challenges and opportunities for intervention within the academic and healthcare setting. Recognizing PCOS early in its manifestation allows for timely intervention, potentially mitigating the long-term health risks associated with the syndrome. However, it also poses challenges in terms of the multifaceted nature of PCOS symptoms and the need for a comprehensive and personalized approach to healthcare.

Educational institutions, particularly medical schools, play a crucial role in shaping the knowledge and attitudes of future healthcare professionals. Integrating PCOS awareness into the curriculum can enhance early recognition and understanding of the syndrome among medical students. Additionally, providing resources for mental health support, given the potential psychological impact of a PCOS diagnosis, becomes essential.

Future Research Directions:

The study's findings pave the way for future research endeavours aimed at delving deeper into the intricacies of PCOS within specific demographics. Further investigations could explore the impact of lifestyle factors, stress, and genetic predispositions on the prevalence and manifestation of PCOS. Longitudinal studies tracking the progression of PCOS from the academic years into professional practice could offer insights into the evolving health needs of women in the medical field.

Moreover, understanding the socio-cultural factors influencing PCOS awareness, healthcare-seeking behaviour, and adherence to treatment regimens would contribute to the development of targeted interventions. Comparative studies across diverse populations and geographical locations could elucidate variations in PCOS prevalence and presentation, aiding in the formulation of region-specific healthcare policies.

Public Health Implications:

The study's implications extend beyond the academic realm, emphasizing the broader public health considerations associated with PCOS. The observed prevalence underscores the need for community-wide awareness campaigns, early screening programs, and accessible healthcare services for women of reproductive age.

Public health initiatives can benefit from incorporating PCOS awareness into existing reproductive health programs, fostering a proactive and preventive healthcare approach. Addressing lifestyle factors and promoting healthy habits can contribute to reducing the overall burden of PCOS-related complications in the community.

Discussion:

The findings of the study on the prevalence of polycystic ovarian syndrome (PCOS) among female medical students at Krishna Institute of Medical Sciences, KVV offer a comprehensive understanding of the multifaceted nature of PCOS within this specific demographic. The discussion will delve into the implications, limitations, and relevance of the study.

Interpretation of Prevalence and Clinical Symptoms:

The identified prevalence rate of 9.05% among the cohort of 420 participants underscores the significance of PCOS as a notable health concern within the studied population. This prevalence aligns with global estimates, emphasizing the universality of PCOS as a widespread endocrine disorder.

The clinical symptoms reported, such as extended menstrual cycles, hirsutism, and obesity, are consistent with established diagnostic criteria for PCOS. The prevalence of these symptoms provides valuable insights into the varied ways in which PCOS manifests,

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reinforcing the need for a nuanced approach to its diagnosis and management.

Comparative Analysis and Global Context:

Comparisons with existing literature and global prevalence rates for PCOS could enhance the study's significance. While the prevalence observed in this study falls within the reported global range, contextualizing the findings within the unique sociodemographic and lifestyle factors of the Indian population would enrich the discussion. It would be pertinent to explore whether the observed prevalence aligns with or diverges from regional and international patterns, shedding light on potential contributing factors specific to this setting.

Challenges and Opportunities in Medical Education:

The study's focus on female medical students introduces a compelling dimension to the discussion. The prevalence of PCOS within this demographic not only emphasizes the relevance of women's health in medical education but also highlights the potential impact on the future healthcare workforce. Integrating PCOS awareness into the curriculum becomes crucial not only for early detection among students but also for cultivating a healthcare workforce attuned to the complexities of reproductive health.

The observed prevalence also prompts reflections on the mental health aspects of PCOS, given its potential to impact self-esteem and body image. Initiatives aimed at fostering a supportive and empathetic environment within medical education are warranted, recognizing the psychological dimensions of living with a chronic condition such as PCOS.

Methodological Considerations:

While the study provides valuable insights, certain methodological considerations merit discussion. The use of a self-administered closed-ended questionnaire and the clinical tool for PCOS diagnosis by Pedersen SD, et al.6 enhance the study's efficiency but may introduce biases such as information bias and social desirability bias. Additionally, the exclusion criteria for pre-existing diagnosis might have implications for the generalizability of the findings, as individuals with diagnosed PCOS might have unique perspectives and experiences.

The calculation of the sample size, the use of systematic random sampling, and the meticulous consideration of a 10% non-response rate contribute to the study's robustness. However, the potential impact of biases on the observed prevalence and clinical symptomatology should be acknowledged in interpreting the results.

Public Health and Future Directions:

The study's implications extend beyond the academic realm, emphasizing the potential public health impact of PCOS. Integrating PCOS awareness into broader public health initiatives, particularly those addressing reproductive health, could contribute to early detection and preventive measures.

Future research directions could explore the long-term health outcomes and healthcare-seeking behaviours of individuals diagnosed with PCOS during their academic years. Additionally, collaborative efforts between healthcare providers, educators, and policymakers could lead to the development of targeted interventions addressing the unique needs of women in medical education facing PCOS.

Conclusion:

In culmination, the research on the prevalence of polycystic ovarian syndrome (PCOS) among female medical students at Krishna Institute of Medical Sciences provides valuable insights into the intricate interplay of reproductive, metabolic, and endocrine health within this specific demographic. The study has shed light on the multifaceted nature of PCOS, unravelling not only its prevalence but also the varied clinical manifestations observed among the participants.

The identified prevalence rate of 9.05% underscores the significance of PCOS as a noteworthy health concern among female medical students. The diverse clinical symptoms reported, such as extended menstrual cycles, hirsutism, and obesity, contribute to a nuanced understanding of the syndrome's manifestation within this unique population.

The implications extend beyond the academic realm, emphasizing the need for targeted interventions within medical education. Integrating PCOS awareness into the curriculum emerges as a crucial aspect, fostering early recognition and understanding among future healthcare professionals. The observed prevalence also highlights the importance of addressing the mental health dimensions associated with PCOS, acknowledging the potential psychological impact on affected individuals.

Methodological considerations, including sample size calculation, systematic random sampling, and meticulous exclusion criteria, contribute to the study's robustness.

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However, the potential biases introduced through self-administered questionnaires warrant acknowledgment, urging a careful interpretation of the results.

Looking forward, the study paves the way for future research endeavours exploring the socio-cultural factors influencing PCOS awareness, healthcare-seeking behaviours, and adherence to treatment regimens. Comparative analyses with global prevalence rates and long-term health outcomes of individuals diagnosed during their academic years present promising avenues for further exploration.

In essence, this research not only adds to the scientific understanding of PCOS but also carries practical implications for healthcare providers, educators, and policymakers. As we navigate the evolving landscape of women's health, this study serves as a foundation for targeted interventions, advocacy, and healthcare policies, ultimately contributing to the overall well-being of female medical students and, by extension, the broader community.

Table 1 "Prevalence of Symptoms in Study Participants."

Symptom	Number of Participants
Prolonged Menstrual Cycles	88
Hirsutism	29
Obesity or Overweight	83
Nipple Discharge	3

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