

A Review Of Polycystic Ovary Syndrome Prevalence In The Indian Population

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Abstract:

Background: Polycystic ovarian syndrome (PCOS) is still an enigma. It is the most common disorder in about 5-18 % of women. It is associated with hyperandrogenism and menstrual disorders predisposing to metabolic syndrome, type 2 diabetes and nonalcoholic fatty liver disease. It is an iceberg of future catastrophe. The aim is to study the prevalence of polycystic ovarian syndrome and pathophysiology of risk factors to avoid complications in the future.

Materials and Methods: A systematic literature search was conducted using PubMed, Scopus, Google scholar, Research Gate and Web of Science to find published studies reporting the prevalence and diagnostic criteria for Polycystic Ovary Syndrome (PCOS) up to September 2024. The search utilized the following terms: "Polycystic Ovary Syndrome," "Prevalence," "Diagnostic Criteria," and "Hyperandrogenism". The inclusion criteria for the study was based on NIH and Rotterdam for PCOS published in English till 2024. The diagnostic criteria for PCOS is changing from time to time. In 1990, the criteria by National Institute of Health was followed. In 2003, Rotterdam criteria was followed. In 2006, Androgen Excess Society criteria were given showing clinical/biochemical hyperandrogenism with either oligo/anovulation or polycystic ovaries.

Results: The results showed that highest prevalence was found in West Bengal with 28% and the least in Haryana with 4.17%.

Conclusion: A universal screening in general population is a must especially in developing countries due to increase in the incidence of metabolic syndrome among the population especially in India.

Keywords: PCOS, Prevalence, Diagnostic Criteria, Metabolic Syndrome, Menstrual Disorders, Universal Screening

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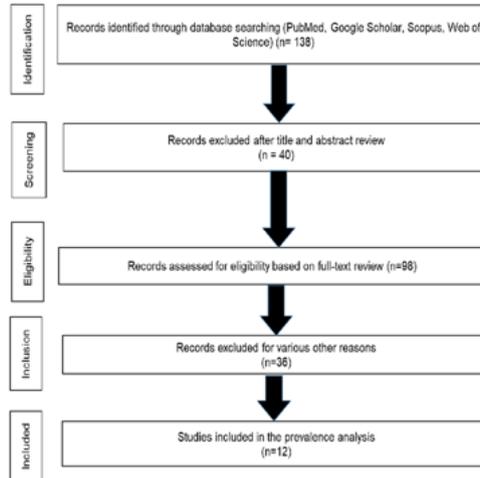
I. Introduction

The occurrence of PCOS varies significantly, ranging from 2.2% to 26%^{1,2}. Early detection of PCOS is crucial due to its associated complications. Lifestyle changes play a vital role in management, yet many individuals lack awareness about this condition³. There is a need for increased public education, particularly among reproductive-age individuals with obesity, as they are at higher risk. The rising prevalence is likely linked to lifestyle factors. To facilitate early diagnosis and prevent future complications such as metabolic syndrome, diabetes, endometrial cancer, cardiovascular disease, and nonalcoholic fatty liver disease, young women in the population should be given research questionnaires⁴. For obese PCOS patients, emphasis should be placed on understanding BMI and the importance of weight reduction⁵. PCOS patients often experience menstrual irregularities, hirsutism, insomnia, and mental health issues, which negatively impact their quality of life. The exact cause remains unknown and is believed to be multifactorial. Further research into genetic, environmental, and hormonal aspects of PCOS is necessary. In Asia, particularly southern India, the prevalence is notably high, around 20-30%. PCOS patients are categorized into two phenotypes: phenotype A (classical type) and phenotypes B, C, and D (lean phenotype)⁶. Adolescent PCOS is considered a post-pubertal central obesity syndrome. In 2003, the European Society for Human Reproduction and Embryology (ESHRE) and American Society of Reproductive Medicine (ASRM) redefined PCOS. The incidence of PCOS ranges from 6% to 9% in various countries, including the United States, the United Kingdom, Spain, Greece, Australia, Asia, and Mexico⁷. In India, the prevalence of Polycystic Ovarian Syndrome varies based on race, nationality, and diagnostic criteria, complicated by the lack of a well-designed methodology and the high cost of investigations.

II. Materials And Methods

A comprehensive literature search was performed using multiple databases, including PubMed, Google Scholar, Scopus, and Web of Science, employing the search terms "PCOS," "Polycystic Ovarian Syndrome," and "Prevalence." The initial search yielded 138 records, of which 40 were eliminated. Full-text assessment for eligibility resulted in 98 studies. Subsequently, 36 records were excluded for various reasons. Ultimately, 12 studies were selected for inclusion in the prevalence analysis.

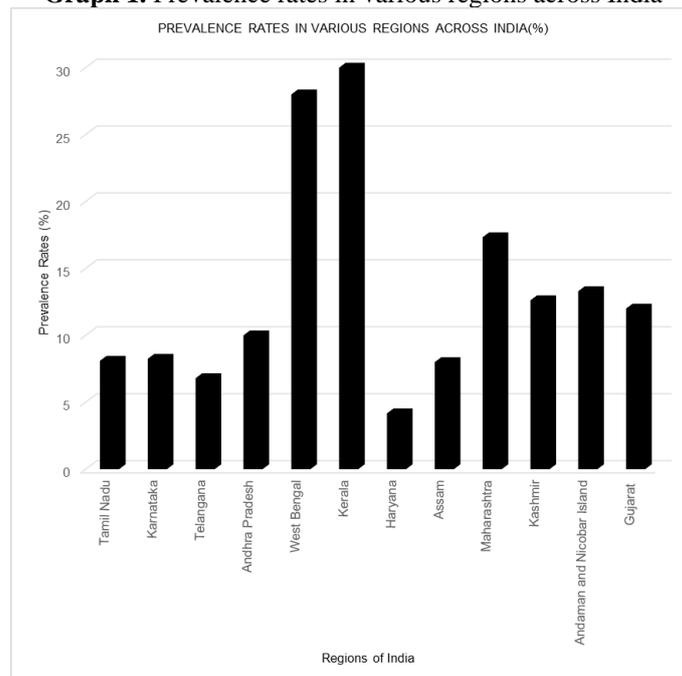
Figure 1. Search Strategy



III. Results

Polycystic ovarian syndrome (PCOS) represents a major health issue for women worldwide, with its prevalence fluctuating between 2.2% and 26% based on geographic location and diagnostic methods. This range highlights the importance of establishing uniform diagnostic protocols. Our analysis identified 12 studies examining PCOS prevalence across various Indian regions, emphasizing its considerable impact on women's health. These studies revealed significant regional differences in PCOS prevalence: West Bengal showed the highest rate at 28%, suggesting potential environmental, genetic, or lifestyle influences⁸. Other states such as Maharashtra (17.33%), Andhra Pradesh (10%), and Tamil Nadu (8.1%) exhibited lower, yet still concerning, prevalence rates. Haryana's prevalence of 4.17% was comparatively low. These findings underscore the necessity for region-specific research and customized health initiatives to effectively address PCOS.

Graph 1. Prevalence rates in various regions across India



Graph 2. Prevalence Rates as Quoted by Authors (%)

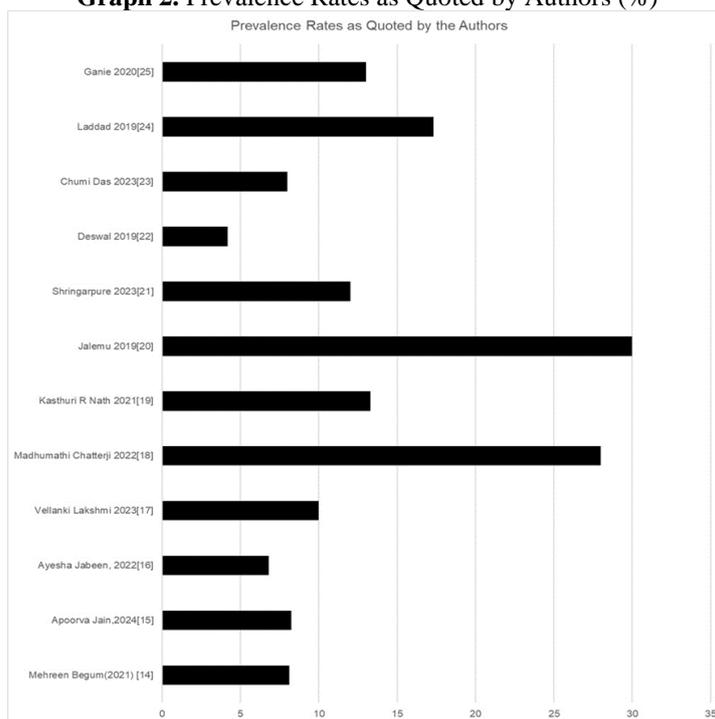


Table 1: Region wise prevalence of PCOD by different authors across the country

Sl. No	Region	Prevalence (%)	Age Group	Sample Size	Criteria Diagnose	First Author And Year Of Publication
1	Tamil Nadu	8.1	10-30	518	Rotterdam	Mehreen Begum 2021[14]
2	Karnataka	8.25	18-40	150	Rotterdam	Apoorva Jain, 2024[15]
3	Telangana	6.8	13-25	250	Rotterdam	Ayesha Jabeen 2022[16]
4	Andhra Pradesh	10	18-24	200	Rotterdam	Vellanki Lakshmi 2023[17]
5	West Bengal	28	18-30	125	Rotterdam	Madhumathi Chatterji 2022[18]
6	Andaman And Nicobar Islands	13.3	13-22	120	Rotterdam	Kasthuri R Nath 2021[19]
7	Kerala	30	16-24	170	Rotterdam	Jalemu 2019[20]
8	Gujarat	12	18-22	308	Rotterdam	Shringarpure 2023[21]
9	Haryana	4.17	16-45	2253	Rotterdam	Deswal 2019[22]
10	Assam	8	18-35	200	Rotterdam	Chumi Das[23] 2023
11	Maharashtra	17.33	10-19	150	Rotterdam	Laddad 2019[24]
12	Kashmir	13	15-40	964	Rotterdam, Nih, Aes	Ganie 2020[25]

IV. Discussion

Areas with lower socioeconomic conditions may experience limited healthcare access, potentially leading to under diagnosis⁹. Enhanced public awareness, especially among women of reproductive age, is crucial. Many women are unaware of PCOS symptoms, which can result in delayed diagnosis and treatment¹⁰. Sedentary lifestyles and dietary habits common in urban areas may contribute to rising obesity and metabolic syndrome rates, further increasing PCOS prevalence. Women with PCOS face elevated risks for various health complications, including obesity, insulin resistance, and dyslipidemia, which can progress to type 2 diabetes¹¹. Due to increased metabolic risk factors, women with PCOS may experience a higher incidence of heart

disease¹². Extended unopposed estrogen exposure resulting from anovulation raises the risk of endometrial hyperplasia and cancer¹³. The syndrome is frequently associated with anxiety, depression, and reduced quality of life, necessitating comprehensive treatment approaches.

A Tamil Nadu investigation reveals an 8.1% prevalence, offering valuable regional insights but lacks discussion on consequences or remedial actions¹⁴. A recent 2024 Karnataka study shows 8.25% prevalence, though it could improve by delving deeper into demographic aspects¹⁵. Research in Telangana concentrates on younger females (13-25 years), stressing early detection, but its limited 250-person sample may affect broader applicability¹⁶. An Andhra Pradesh study finds 10% prevalence but requires more focus on health effects and lifestyle changes¹⁷. West Bengal research uncovers a concerning 28% prevalence, yet lacks transparency in methods¹⁸. The Andaman and Nicobar Islands study highlights 13.3% prevalence in an under-researched area but may be hindered by sample size issues¹⁹. Kerala research reports a notably high 30% prevalence, though it inadequately explores PCOS's psychosocial dimensions²⁰. Gujarat's study indicates 12% prevalence but needs clearer emphasis on public health implications²¹. Haryana's research shows a low 4.17% prevalence, suggesting regional differences, but may require further investigation into healthcare accessibility²². An Assam study provides insights into a less-studied region with 8% prevalence, though its small sample size limits broader conclusions²³. Maharashtra research reports 17.33% prevalence, underscoring a significant issue in a major state, but needs more detailed methodologies and health impact analysis²⁴. Lastly, a Kashmir study employs multiple diagnostic criteria, enhancing reliability, but variations in studied age groups could affect overall findings²⁵.

V. Conclusion

The incidence of PCOS varies due to the lack of standardized diagnostic methods. Comprehensive screening of the general population is essential, particularly in developing nations where metabolic syndrome rates are rising. Community health workers should be educated about this condition, similar to cervical cancer screening awareness. In rural settings, where costly tests are not feasible, diagnosis can rely on clinical signs and symptoms. Our review underscores the urgent need for additional studies on the genetic, environmental, and hormonal aspects of PCOS. Moreover, public health campaigns should prioritize increasing awareness and offering resources for early detection and treatment. A holistic approach to PCOS is crucial for enhancing affected women's quality of life and reducing associated health risks. Future research should focus on creating uniform diagnostic criteria for PCOS across different populations, exploring the impact of genetics and environmental factors on PCOS development, and assessing the efficacy of lifestyle changes in decreasing PCOS prevalence and complications. These endeavors will be crucial in developing effective strategies to combat PCOS and improve women's health outcomes worldwide.

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