

Prevalence and Variation in Estimates of Polycystic Ovary Syndrome Among Women in India: A Meta-Analysis

Tania Verma¹, V.K. Shivgotra^{*2}, Manu Saini³, Asha Ram⁴

¹ Ph.D. Scholar, Department of Statistics, University of Jammu, J&K, tania.verma0008@gmail.com , 0009-0003-7260-1964

² Associate Professor, Department of Statistics, University of Jammu, J&K, vijayshivgotra@gmail.com , 0000-0003-2554-5587

³ Ph.D. Scholar, Department of Statistics, University of Jammu, J&K, sainimanu2407@gmail.com , 0009-0007-8729-2403

⁴ Ph.D. Scholar, Department of Statistics, University of Jammu, J&K, asha150301@gmail.com , 0009-0008-2549-1906

Corresponding Author: Dr. V.K. Shivgotra

Abstract

Background: Polycystic Ovary Syndrome is a significant global public health problem. It is one of the most prevalent, heterogeneous and complex endocrinological disorders among the women which often apparent during reproductive years and even into the beyond stages of reproductive age. PCOS affects fertility, hormonal balance and overall well-being and its long-term health effects includes type 2 diabetes, high blood pressure, high cholesterol, heart disease, endometrial cancer, and mental health conditions like depression and anxiety are more recurrent in women with PCOS.

Aim: To estimate the pooled prevalence of PCOS among the women of reproductive age-group in India based on Rotterdam, AES, NIH diagnostic criteria and self-reported questionnaire based.

Method: An intensive search has been done exploring databases like Google Scholar, MEDLINE/PubMed and ResearchGate. Only published studies conducted in India that reported PCOS prevalence during (2011-2026) and met a minimum of one of the diagnostic criteria viz., Rotterdam's criteria, National Institutes of Health (NIH), or/and Androgen Excess Society (AES) were included for meta-analysis. R-software version 4.6.0. was implemented to conduct the meta-analysis. This study has chosen the random effect model over the fixed effect model to ascertain the pooled prevalence using 95% confidence interval. In view of the fact that random effect model accounts for variability (heterogeneity) among many research. The PRISMA guidelines has been followed. For this study, the modified Joanna Briggs institute (JBI) criteria was implemented for calculating the risk of bias.

Result: A total of 34 studies with 22904 subjects of reproductive age-group were considered for meta-analysis. The pooled prevalence of PCOS among the Indian women came out to be 13.15% (95% CI: 10.66 -16.11%) using random effect model. According to the different criteria of PCOS viz. Rotterdam, AE_PCOS and NIH criteria showed 14%, 11% and 10% prevalence respectively. The pooled prevalence of survey-based studies comes out to be 11% (95% CI: 7.03-16.93%). The pooled prevalence of PCOS was comparable across the three age groups classified as Group1 (5-15), Group2 (15-25) and Group3 (25-35) showing prevalence 14.18%, 12.13%, and 13.98%, yielding no statistically significant disparities across the groups ($p = 0.557$).

Conclusion: According to the findings of present study, the pooled prevalence of PCOS was 13%. Study showed that with the passing years, the prevalence is increasing among young age group and reproductive age-group. It is necessary to spread awareness and implement preventive measures by health experts to timely prevent the disease and treat syndrome.

Keywords: Polycystic Ovary Syndrome; Reproductive women; Adolescents, Prevalence, PICOS.

1 Introduction

Polycystic Ovary Syndrome (PCOS) in a woman of reproductive age is also known as Stein-Leventhal syndrome which is a heterogeneous endocrine/metabolic disorder. PCOS is linked to a spectrum of metabolic and reproductive complications including hypertension, dyslipidaemia, insulin resistance, hyperandrogenaemia, weight gain, obesity, risk of cardiovascular disease (CVD) and type 2 diabetes mellitus (T2DM).

The epidemiological burden of PCOS in a variety of population has been the centrepiece of numerous studies conducted globally. Across different geographic nations, the reported prevalence ranges from 2.2% to 26%, [1] this much variation seen in the prevalence of PCOS across the world might be due to the variations in the clinical and biochemical characteristic of individuals based on ethnic or racial background, demographic variables, applied diagnostic criteria and procedures. The prevalence of PCOS was estimated to be between 6.8-12.5% worldwide with the mean age range from 10-45 years [2]. In China, the overall estimated prevalence among Chinese women was from 8.3-11.9% [3]. A survey carried out in a developing country like India revealed the prevalence rate of PCOS using Rotterdam criteria which was ranging from 6.0-46.8% [4]. The studies considered for the analysis reported the prevalence of PCOS which varies from 4.0-41.0%.

The prominent factors linked to the development of PCOS are obesity, sedentary lifestyles and bad eating habits such as consuming excessive amount of fried and oily meals, broiler chicken and tetra packs[5]. Hirsutism, amenorrhea, menstrual irregularity and infertility are all common factors of PCOS[6]. With age-comparable groups, women with PCOS are eleven times more probable to develop metabolic syndrome and glucose intolerance[7]. Early diagnosis and management can help to prevent metabolic abnormalities. However, improving lifestyle, diet and add exercise in daily routine have been proven helpful in the mitigation of polycystic ovary syndrome[5,8].

The hormonal abnormalities in PCOS linked to the changes in luteinizing hormone (LH), prolactin serum and serum estrogen (testosterone and androstenedione). Hormonal measurements indicate that women with PCOS have increased LH/FSH ratio from 1:2 (normal) to 2:1 or occasionally 2:5 was considered as a measure of biochemical levels[9]. The etiology of PCOS is not yet fully understood. To standardize the diagnostic criteria for PCOS, repeated efforts have been implemented in the last few years, but the standardized diagnostic criteria is still questionable[10]. According to a meeting held at the National Institutes of Health (NIH) in 1990 a subset of criteria was initially put forward necessitating both chronic anovulation and clinical hyperandrogenism for the diagnosis[11]. Later that, a consensus workshop group supported by the American Society for Reproductive Medicine and the European Society of Human Reproduction and Embryology proposed that a minimum of two of the following: three requirements were mandatory (Rotterdam criteria)[12]:

Polycystic ovary (PCO) morphology on ultrasonography (each ovary contains ≥ 12 follicles measuring 2-9mm), Oligo-anovulation, Clinical/biochemical hyperandrogenism. The most recent study from the Androgen Excess and PCOS(AE-PCOS) society claimed that the ovulatory dysfunction such as oligo-anovulation or PCO, was necessary in addition to clinical or biochemical hyperandrogenism for diagnosis[13].

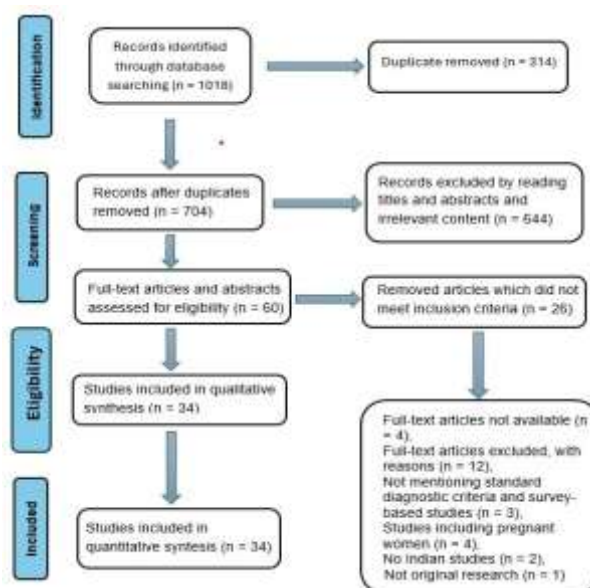
PCOS prevalence changes due to various factors including population ethnicity, geographic location, diagnostic criteria, and variations in androgen and ultrasonography-based examinations. Before management, the prevalence of a disease in a certain region is a prerequisite for planning control measure. With this objective, the present study was proposed to figure out the pooled prevalence of PCOS in Indian women from 2011-2026.

1.1 Methods and Data Extractions

1.2 Search Method: The review was conducted in accordance with the Preferred Reporting Items for Systematic-Review and Meta-Analysis (PRISMA)[14] guidelines and prospectively registered with PROSPERO[15] ID: CRD420261465356. To assess the prevalence of PCOS among the adolescents and women of reproductive age group in India, data sources such as Google Scholar, MEDLINE/PubMed, ResearchGate were thoroughly searched the published studies reporting on prevalence of PCOS in India from 2011-2026. Electronic database searches were performed using a combination of keywords including prevalence, Polycystic Ovary Syndrome, PCOS and different study design (cross-sectional, epidemiology, longitudinal, observational). The search strategy was restricted to Indian studies published in English language and only the human studies.

1.3 Study Selection: To compute the pooled prevalence of a disease in any area, the articles belonging to the area of interest were searched. Therefore, the articles were searched and then selected on the basis of the titles and abstracts published in a peer-reviewed journal from 2011-2026. The studies which did not state the diagnostic criteria (such as Rotterdam, NIH, AE-PCOS), no questionnaire-based study or had no data on total prevalence for the defined age-group were eliminated. The studies with insufficient data or duplicate data were also omitted from the study. The initial investigation and screening of titles and abstracts was done by both the authors. Any difference of opinion in study selection was resolved through discussion. And finally including only full-text studies for the analysis. A total of 1018 studies were found in the initial search across MEDLINE/PubMed, Google Scholar and ResearchGate. By thoroughly reviewing the studies, duplicate studies were removed firstly. After screening for the titles and abstracts, only 60 studies were undertaken for full-text reviewed. Studies that failed to meet the inclusion criteria were also excluded and lastly, only 34 studies were comprised in the quantitative synthesis as shown figure 1.

Figure 1: PRISMA flow diagram showing the study selection process



1.4 Data Extraction: Relevant papers were collected. The data was extracted and organized using a Microsoft Excel spreadsheet for the following variables namely: title, author, year of publication, sample size, sampling frame, study design, age-group, region, total prevalence, study population and criteria used to measure the prevalence of PCOS including self-reported studies as well. The adolescents and the women of reproductive age-group were included in the study.

1.5 Eligibility Criteria: For the eligibility criteria, PICOS guidelines provided the starting point for the layout of the study's inclusion and exclusion criteria.

- **Participants:** women of the reproductive age group residing in India taken into consideration for this study.
- **Intervention:** no intervention criteria were taken into considered; the study focused to determine the prevalence of PCOS.
- **Comparison:** studies that reported the prevalence of PCOS were assessed.
- **Outcome:** estimating the prevalence of PCOS among the women of reproductive age group in India.
- **Studies:** a literature review of cross-sectional studies were undertaken. Case-control, cohort, abstracts, reviews and case studies were all excluded.

1.6 Inclusion Criteria: Studies fulfilling the following criteria were considered for this study and the criteria were applied as: (i) Studies that were available in full-text and published as peer-reviewed original research article. (ii) Studies that mentioned a minimum of one of the three given criteria: Rotterdam, NIH, AE-PCOS. (iii) Include adolescents and reproductive age-group. (iv) Studies that employed the cross-sectional design. (v) Studies conducted among the Indian women. (vi) Non-pregnant women.

1.7 Exclusion Criteria: Those studies which didn't meet the aforementioned requirements were excluded from the studies. To guarantee that the data was normal, studies in which the calculated proportions identified as outliers were also eliminated.

1.8 Quality of studies: To evaluate the quality of selected studies, Modified Joanna Briggs Institute (JBI) criteria were used.[16] Both the authors thoroughly reviewed the articles and the individually appraised the bias risk by choosing the response "yes", "no", "unclear" or "not applicable". If there has been seen any discrepancy in the results, the shared opinion of any two investigators were consider the final result. JBI $\geq 70\%$ considered as a low risk of bias, JBI between 50% and 69% was considered as moderate risk of bias and JBI $< 50\%$ was considered as high risk of bias. And the articles were categorised on the basis of these three categories[6].

1.9 Statistical Analysis: To calculate the combined results from multiple studies, meta-analysis was performed using the statistical software R version (4.5.0). The pooled prevalence of PCOS was calculated by employing random effect model. As it reflects both between-study heterogeneity and within-study sampling variability, assuming that true effect follow a normal distribution. To determine whether heterogeneity existed, Cochran's Q explored the likely causes of heterogeneity. The degree of between-study heterogeneity among the studies

implementing each of the three diagnostic criteria was measured using I^2 statistics. Q test with $p < 0.10$ was considered statistically significant heterogeneity and $I^2 > 75\%$ was classified as high heterogeneity.[17] The analysis included 95% confidence intervals (CIs). To check publication bias, Egger's linear regression test, Begg and Mazumdar rank correlation test was applied. Egger's test with $p < 0.05$, shows the evidence of publication bias in the study. While the Bug's test with $p > 0.05$, shows that there is no statistically significant correlation between effect size and study size. For visual depiction, forest and funnel plots have been employed. Squares in the forest plot represent individual study effect estimates and size of the squares represent the study weights in the meta-analysis. Along with the 95% CIs, the overall prevalence of the study with random effect was demonstrated by a diamond figure. The existence of publication bias was investigated using funnel plots.

2 Results

2.1 Study Characteristics: A total of 34 studies summarizes in the meta-analysis. The selected studies of PCOS were based on reproductive as well as adolescents age group of women in India. **Table 1** highlights the characteristics of each study in the analysis after applying the exclusion criteria.

Table 1. Showing detailed characteristics of included studies.

Author, year	States	Age (years)	Criteria	Sample size	Cases	Prev. (%)
Nidhi R et al., 2011[18] (1)	A.P.	15-18	Rotterdam	460	42	9.13
Nidhi R et al., 2011[18] (1.1)	A.P.	15-18	NIH	460	12	2.61
Nair Mk et al., 2012[19]	Kerala	15-19	Rotterdam	136	49	36.03
Gill H et al., 2013[20]	U.P.	18-25	NIH	1520	56	3.7
Bhuvanashree N et al.,2013[21]	A.P.	10-19	Rotterdam	253	38	15.02
Joshi B et al., 2014[22] (1)	Maharashtra	15-24	Rotterdam	600	135	22.5
Joshi B et al., 2014[22] (1.1)	Maharashtra	15-19	Rotterdam	439	99	22.55
Joshi B et al., 2014[22] (1.2)	Maharashtra	20-24	Rotterdam	161	36	22.36
Joshi B et al., 2014[22] (1.3)	Maharashtra	15-24	AE-PCOS	600	64	10.67
Joshi B et al., 2014[22] (1.4)	Maharashtra	15-19	AE-PCOS	439	43	9.79
Joshi B et al., 2014[22] (1.5)	Maharashtra	20-24	AE-PCOS	161	21	13.04
Vijay and Bharatwaj 2014[23]	Puducherry	19-25	Rotterdam	238	28	11.76
Lakshmi K et al., 2015[24]	Tamil Nadu	18-35	Rotterdam	207	67	32.36
Balaji S et al., 2015[25] (1)	Tamil Nadu	12-19	Rotterdam	126	67	53.97
Balaji S et al., 2015[25] (1.1)	Tamil Nadu	12-19	NIH	126	31	24.6
Rajkumari P et al., 2016[26]	Odisha	14-17	Rotterdam	100	12	12
Gupta M et al., 2017[27] (1)	M.P.	15-18	Rotterdam	403	26	6.45
Gupta M et al., 2017[27] (1.1)	M.P.	18-21	Rotterdam	437	51	11.67
Choudhary A et al., 2017[28]	Uttarakhand	16-30	NIH	170	70	41.18
Bharathi V et al., 2017[29]	Tamil Nadu	18-24	Rotterdam	1068	51	4.78
Nanjaiah and Devi 2018[30]	Karnataka	18-30	Rotterdam	396	18	4.54
Gupta M et al., 2018[31] (2)	M.P.	17-20	Rotterdam	448	37	8.26
Gupta M et al., 2018[31] (2.2)	M.P.	20-24	Rotterdam	52	4	7.69
Singh A et al., 2018[32]	Telangana	15-19	Rotterdam	117	14	11.97
Desai N et al., 2018[33]	Gujarat	13-18	Rotterdam	881	119	13.51
Laddad S et al., 2019[34]	Maharashtra	14-19	Rotterdam	150	26	17.33
Deswal R et al., 2019[35]	Haryana	15-45	Rotterdam	2248	94	4.18
Aggarwal M et al., 2019[36]	Maharashtra	17-24	Quest	456	96	21.05
Kirthika V et al., 2019[37]	Tamil Nadu	14-18	Rotterdam	300	37	12.33
Ganie M et al., 2020[38] (1)	J&K	15-40	Rotterdam	964	340	35.27
Ganie M et al., 2020[38] (1.1)	J&K	15-40	NIH	964	279	28.94
Ganie M et al., 2020[38] (1.2)	J&K	15-40	AE-PCOS	964	331	34.34
Bhadhur A et al., 2020[39]	Uttarakhand	15-45	Rotterdam	263	31	11.79

Joseph N et al., 2016[40]	Karnataka	18-25	Quest	480	39	8.13
Mehreen T et al., 2021[41] (1)	Chennai	12-30	Rotterdam	518	42	8.11
Mehreen T et al., 2021[41](1.2)	Chennai	12-30	NIH	518	11	2.12
Mehreen T et al., 2021[41](1.3)	Chennai	12-30	AE-PCOS	518	15	2.9
Kusum P et al., 2021[42]	Telangana	15-45	Rotterdam	624	72	11.53
Jabeen A et al., 2022[43]	Telangana	13-25	Quest	250	17	6.8
Dhar S et al., 2023[44]	West Bengal	10-19	Rotterdam	799	113	14.14
Bhardwaj P et al., 2023[45]	Delhi	16-24	Quest	508	58	11.42
Shringarpure K et al., 2023[46]	Gujarat	16-22	Rotterdam	308	36	11.69
Ganie M et al., 2024[47]	All Regions	18-40	Rotterdam	972	202	20.78
Sharma A et al., 2025[48]	Delhi	18-25	Rotterdam	1164	202	17.35
Niranjani S et al., 2025[49]	Tamil Nadu	18-21	Rotterdam	824	161	19.53
Bhatt V et al., 2026[50]	Gujarat	13-35	Rotterdam	1025	138	13.46
Malshetty R et al., 2026[51]	Karnataka	18-40	Rotterdam	180	62	34.44

The data extracted mostly from the community-based studies. There were institutional based studies as well (Nidhi R et al.,[18] Nair MK et al.,[19] Shringarpure K et al.,[46] Bhardwaj P et al.,[45] Bhuvanashree N et al.[52]) which were also representing the community. Only six studies have been performed in the outpatient departments of hospitals. As per inclusion criteria, all the studies have reported at least one diagnostic criteria. All the chosen studies have adopted the Rotterdam's criteria, while the four of them also apply NIH criteria and two of them AE-PCOS criteria. Two studies have used NIH criteria only and one of them study have used AE-PCOS criteria to estimate the prevalence of PCOS. Jain A et al.[53] and Ganie MA et al.[54] reported the prevalence around 70% and 72.3% respectively, which showed considerably high prevalence among all studies. That is why, we excluded these two studies because it is overestimating the overall prevalence of PCOS. Oligomenorrhea and irregular menses are mostly reported by all the studies. Oligomenorrhea defined as absence of menstruation for 45 days or more and/or less than 8 menses per year in all the studies. To diagnose the clinical hyperandrogenism, majority of the studies have been used modified Ferriman-Gallway criteria with cut-off score 8. Furthermore, four studies estimated the prevalence on survey-based questionnaire. The risk of bias appraisal was evaluated by using modified JBI criteria. The selected studies showing the overall risk of bias was given in the **Table 2**.

Table 2: Risk of bias assessment of the included studies using the modifies JBI criteria.

Author	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Overall Risk of Bias
Nidhi R et al., 2011[18]	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Low
Nair M et al., 2012[19]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Gill H et al., 2012[20]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Joshi B et al., 2014[22]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Vijay and Bharatwaj 2014[23]	Yes	No	Unclear	Yes	Unclear	No	Unclear	Yes	No	Moderate
Lakshmi K et al., 2014[24]	No	No	No	Yes	Unclear	Yes	Yes	Yes	No	High
Rajkumari P et al., 2016[26]	No	No	Yes	Yes	Yes	No	Yes	Yes	Unclear	Moderate
Joseph N et al., 2016[40]	Yes	No	Yes	Yes	Yes	No	No	Yes	Unclear	Moderate

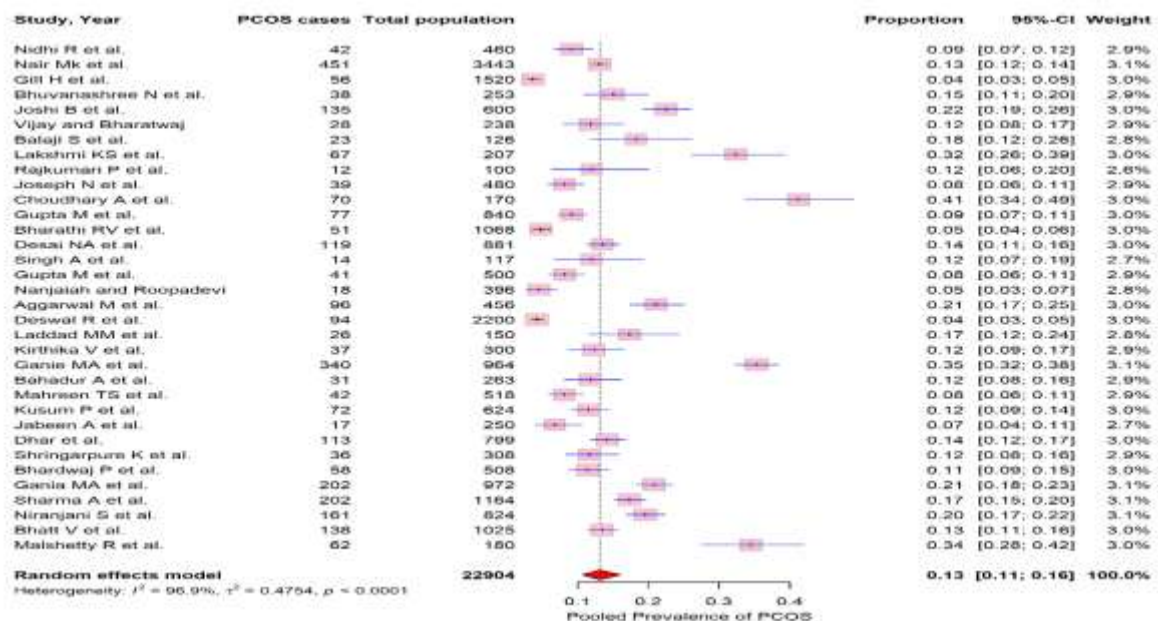
Choudhary A et al., 2017[28]	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Moderate
Gupta M et al., 2017[31]	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Moderate
Bharathi R et al., 2017[29]	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Moderate
Desai N et al., 2018[33]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Singh A et al., 2018[32]	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Moderate
Gupta M et al., 2018[27]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Low
Aggarwal M et al., 2019[36]	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Moderate
Deswal R et al., 2019[35]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Sharma A et al., 2025[48]	No	No	Yes	Yes	Yes	No	No	Yes	No	High
Balaji S et al., 2015[25]	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Bhadhur A et al., 2020[39]	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Moderate
Nanjaiah and Roopadevi 2018[30]	No	Yes	Yes	Yes	Unclear	No	Yes	Yes	Unclear	Moderate
Laddad M et al., 2019[34]	Yes	Unclear	Yes	Yes	Yes	No	Unclear	Yes	Unclear	Moderate
Kirthika V et al., 2019[37]	Yes	Unclear	Unclear	Yes	Yes	No	Unclear	Yes	Unclear	High
Ganie M et al., 2020[38]	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Unclear	Moderate
Mahreen T et al., 2021[41]	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Moderate
Kusum P et al., 2021[42]	Yes	Unclear	Yes	Yes	Yes	No	Yes	Yes	Unclear	Moderate
Jabeen A et al., 2022[43]	No	No	Yes	Yes	Yes	No	Yes	Yes	Unclear	Moderate
Dhar S et al., 2023[44]	No	No	Yes	Yes	Yes	Yes	Unclear	Unclear	Unclear	High
Shringarpure K et al., 2023[46]	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Moderate
Bhardwaj P et al., 2022[45]	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Moderate
Ganie M et al., 2024[47]	No	No	No	Yes	Yes	Yes	Yes	Yes	Unclear	Moderate
Bhuvanashree N et al., 2019[21]	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Moderate

Niranjani S et al., 2025[49]	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Low
Bhatt V et al., 2026[50]	Yes	Yes	Unclear	Yes	Yes	Yes	No	Yes	Unclear	Low
Malshetty R et al., 2026[51]	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear

- Q.1: Was the sample frame appropriate to address the target population?
Q.2: Were study participants sampled in an appropriate way?
Q.3: Was the sample size adequate?
Q.4: Were the study subjects and the setting described in detail?
Q.5: Was the data analysis conducted with sufficient coverage of the identified sample?
Q.6: Were valid methods used for the identification of the condition?
Q.7: Was the condition measured in a standard, reliable way for all participants?
Q.8: Was there appropriate statistical analysis?
Q.9: Was the response rate adequate and, if not, was the low response rate managed appropriately?

2.2 Pooled Prevalence: The prevalence of PCOS among Indian adolescents and the women of reproductive age-group included 22904 females from 34 studies. Using random effect model, the pooled prevalence of PCOS was 13.15% (95% CI: 10.66% - 16.11%) as shown in figure 2.

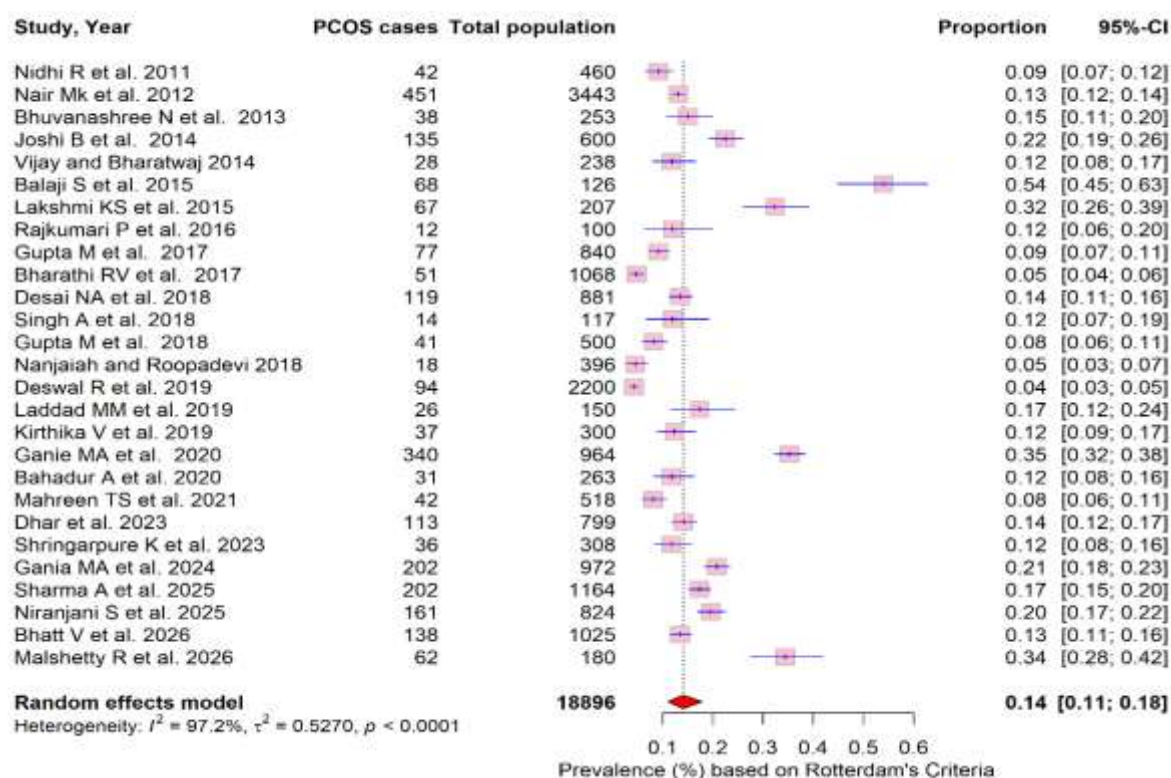
Figure 2: Forest plot showing pooled prevalence of PCOS according to Random effect model.



The selected 34 studies showed significant heterogeneity ($I^2 = 96.9\%$, Cochran's $Q = 1071.60$, $df = 33$, $p < 0.0001$). The proportion of subjects affected by PCOS in each study and the pooled prevalence of all selected studies have been demonstrated by forest plot figure 2 and funnel plot respectively in figure 6. Out of 34 studies, 27 studies followed Rotterdam's criteria to estimate the prevalences in their studies. Of these, 4 studies estimated the prevalence using NIH and additionally 3 studies applied AE-POCS Society criteria. Two studies estimated the prevalence using NIH criteria only[20,28]. Four studies estimated the prevalence of PCOS using self-designed questionnaire[36,40,43,45].

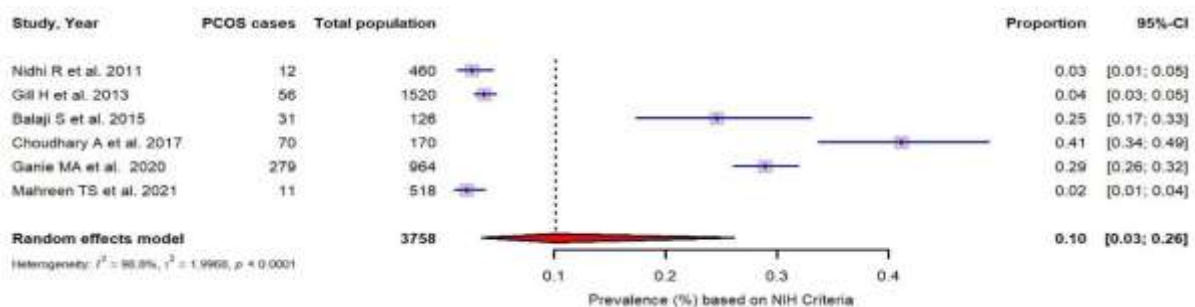
In the sub-group analysis by using diagnostic criteria, the prevalence of PCOS using Rotterdam's criteria included 18896 females from 27 studies. The pooled prevalence of these studies using Rotterdam's criteria was 14.11% (95% CI: 11.04% - 17.87%). The studies were identified as having significant variability ($I^2 = 97.2\%$, $Q = 919.29$, $p < 0.0001$) In figure 3, the estimated pooled prevalence was showing approximately 14% by forest plot.

Figure 3: Forest plot showing pooled prevalence of PCOS according to Rotterdam's criteria.



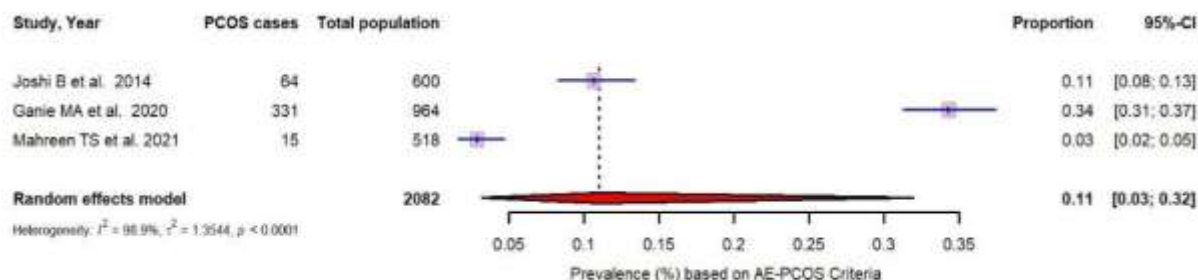
Analogously, the pooled prevalence of PCOS using NIH and AE-PCOS criteria was 10.13% (95% CI: 03.54% - 26.13%) and 11% (95% CI: 03.17% - 31.97%) respectively in figure 4 and figure 5.

Figure 4: Forest plot showing the pooled prevalence of PCOS according to NIH criteria.
NIH – National Institutes of Health



In the survey-based studies sub-group analysis, the pooled prevalence of PCOS based on self-reported questionnaire included 1694 subjects from 4 studies. The estimate of prevalence employing random effect model was 11.07% (95% CI: 7.03% - 16.93%). The studies evidenced the significant variation ($I^2 = 93.2\%$, $Q = 44.34$, $p < 0.0001$).

Figure 5: Forest plot showing the pooled prevalence of PCOS according to AES criteria.
AES – Androgen Excess Society



2.3 Age sub-group analysis: There was no statistically significant result shown between the prevalence of PCOS and the age-group with the p-value 0.55. Because of the fact that all studies' age-groups were overlap with each other. To minimize the overlapping, we categories the age-group into 3 groups, group-I (5-15), group-II (15-25), group-III (25-35). Sub-group analysis was performed using these three categories. The results showed only 2% difference among 3 groups as shown in the **Table 3**.

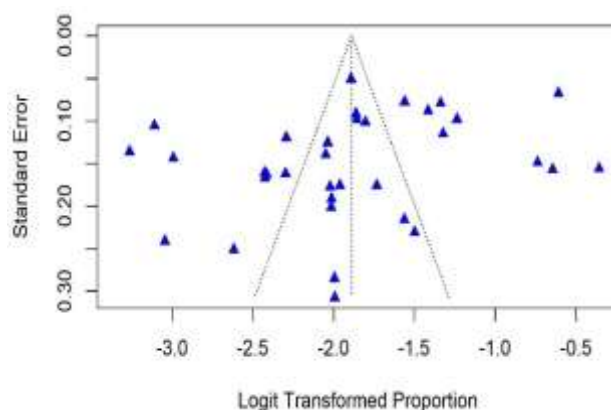
Table 3: Age group analysis

Age-Group	Number of Studies	Prev.	95%-CI	Tau ² (τ ²)	Tau (τ)
Group 1 (5-15)	4	0.1418	0.1242 – 0.1614	0.0000	0.0000
Group 2 (15-25)	23	0.1213	0.0938 – 0.1555	0.4703	0.6858
Group 3 (25-35)	7	0.1601	0.0902 – 0.2683	0.7643	0.8743

2.4 Heterogeneity and Publication bias

The 34 selected studies were scrutinized for heterogeneity and publication bias. The analysis revealed high heterogeneity, as indicated by the significant Q-test with $p < 0.0001$ and I^2 statistics ($I^2 = 97.8\%$). To visualize the publication bias, funnel plot has been employed as shown in the **figure 6**. The triangular shaped points have shown that the studies were unevenly distributed and a minor asymmetry indicating the presence of publication bias through the funnel plot. Egger's test evaluated p-value 0.11 and Bug's test evaluated p-value 0.44. Egger's test showed $p < 0.05$, also showing the presence of publication bias in the study. While the Bug's test showed $p > 0.05$, yielding no statistically significant correlation between effect size and study size.

Figure 6: Funnel Plot showing publication bias



2.5 Sensitivity Analysis

To see the contribution of each study on the pooled prevalence of PCOS in the current study, sensitive analysis was performed. The impact of each study has been examined by eliminating each study step by step using leave-one-out sensitive analysis as shown in Table 4. After eliminating the study of Balaji S et al.,(2015)[25] the lowest prevalence was 12.67% and highest prevalence was 14.25% after omitting the Deswal R et al.,(2019)[35] study. The heterogeneity ($I^2 = 97-98\%$) remained high after all iterations. The analysis showed that no single study

significantly influences the overall results. Balaji S et al. (2025) has a substantial impact on the prevalence of PCOS.

Table 4: Sensitive Analysis of Included Studies (Rotterdam's Criteria)

Excluded Studies	Proportion	95%-CI	tau ²	tau	I ²
Nidhi R et al., 2011[18]	0.1435	0.1115 – 0.1827	0.5379	0.7334	97.2
Nair M et al., 2012[19]	0.1415	0.1097 – 0.1808	0.5487	0.7408	97.2
Joshi B et al., 2014[22]	0.1384	0.1075 – 0.1765	0.5355	0.7218	97.2
Vijay & Bharatwaj 2014[23]	0.1421	0.1103 – 0.1813	0.5456	0.7387	97.3
Lakshmi KS et al., 2015[24]	0.1362	0.1066 – 0.1726	0.5030	0.7092	97.1
Gupta M et al., 2017[31]	0.1435	0.1115 – 0.1827	0.5383	0.7377	97.2
Bharathi RV et al., 2017[29]	0.1469	0.1156 – 0.1850	0.4896	0.6997	97.0
Singh A et al., 2018[32]	0.1420	0.1102 – 0.1811	0.5446	0.7380	97.4
Gupta M et al., 2018[27]	0.1440	0.1121 – 0.1832	0.5326	0.7298	97.3
Nanjaiah and Roopadevi(2018)[30]	0.1468	0.1155 – 0.1848	0.4902	0.7002	97.2
Laddad MM et al., 2019[34]	0.1401	0.1086 – 0.1788	0.5455	0.7386	97.3
Kirthika V et al., 2019[37]	0.1419	0.1100 – 0.1811	0.5468	0.7395	97.3
Mahreen TS et al., 2021[41]	0.1441	0.1122 – 0.1832	0.5320	0.7294	97.2
Dhar et al., 2023[44]	0.1411	0.1093 – 0.1803	0.5488	0.7408	97.3
Shringarpure K et al., 2023[46]	0.1422	0.1103 – 0.1814	0.5458	0.7388	97.3
Sharma A et al., 2025[48]	0.1399	0.1084 – 0.1787	0.5465	0.7393	97.3
Niranjani S et al., 2025[49]	0.1393	0.1080 – 0.1778	0.5426	0.7366	97.2
Bahadur A et al., 2020[39]	0.1421	0.1102 – 0.1813	0.5458	0.7388	97.3
Deswal R et al., 2019[35]	0.1476	0.1165 – 0.1852	0.4756	0.6896	96.5
Ganie MA et al., 2020[38]	0.1354	0.1063 – 0.1711	0.4872	0.6980	96.1
Gania MA et al., 2024[47]	0.1389	0.1078 – 0.1772	0.5398	0.7347	97.2
Bhuvanashree N et al., 2013[21]	0.1408	0.1091 – 0.1798	0.5478	0.7401	97.3
Balaji S et al., 2015[25]	0.1267	0.1013 – 0.1574	0.3721	0.6100	96.9
Rajkumari P et al., 2016[26]	0.1420	0.1102 – 0.1811	0.5442	0.7377	97.3
Desai NA et al., 2018[33]	0.1414	0.1095 – 0.1806	0.5487	0.7407	97.3
Malshetty R et al., (2026)[51]	0.1358	0.1064 – 0.1718	0.4951	0.7036	97.1
Bhatt V et al., (2026)[50]	0.1414	0.1095 – 0.1806	0.5487	0.7407	97.3

2.6 Discussion

The prevalence of PCOS in women has been the subject of many studies. To the best of our knowledge, no meta-analysis has yet estimated the prevalence of PCOS from the interval 2011-2026 in India. Therefore, we aimed to estimate the prevalence of PCOS among adolescents and the women of reproductive age-group in India as per the diagnostic criteria and self-reported studies. As the 34 studies were used for the analysis, the findings of the study showed the pooled prevalence of PCOS by implementing random effect model was 13.15%. The study's results based on Rotterdam's criteria have shown the prevalence of PCOS in India was 14%, 10% based on NIH and 11% based on AE-PCOS criteria. According to the self-report sub-group analysis, the prevalence was 11%. Comparing the results based on Rotterdam's criteria, the findings of present study is slightly elevated when compared to the meta-analysis conducted by Bharali MD et al.,[6] where the overall PCOS prevalence was 11.34% among the Indian women from the interval 2010-2021 and no meta regression was undertaken with age as a moderator. Due to the absence of uniformity in the age-groups, the current study classifies the age-group into three different categories. The results of the classification showed that Group 1, Group 2 and Group 3 has only 2% difference. Although a study that employed meta-regression taking age as a moderator verified that with the increasing age of women, the prevalence decreases[2]. The prevalence of the selected studies was varying from 3.68% - 41.18% and based on Rotterdam criteria the prevalence was varying from 4.18% - 54%. Ganie M.A. et

al.,[54] and Joshi et al.,[53] have shown the high prevalence of 72% and 73% respectively which inflates the overall pooled prevalence. So decided to exclude from the selected studies.

Significant variations were identified in the prevalence of PCOS by geography, occupation, age, survey population and diagnostic criteria[3]. In the present study, difference in the clinical assessment of PCOS were across the included studies. For the assessment of hyperandrogenism, the biochemical parameters measuring hormones for hyperandrogenaemia and the cut-off score of modified Ferriman-Gallwey criteria used for hirsutism was inconsistent across the studies. For instance, Joshi et al.,[22] reported the prevalence based on Rotterdam's criteria, where they have used mFG scale with the score cut-off of ≥ 8 over the 9 areas of body parts. Whereas Nair M.K. et al.[19] have used the mFG scale with the score cut-off of ≥ 8 over 11 areas of body parts. Furthermore, Nidhi R. et al.,[18] applied the mFG scale with the score cut-off of ≥ 6 to classify the hirsutism.

To define the polycystic ovaries morphology under the ultrasonography, different thresholds were set among the studies. For example, to define the PCOS morphology, Joshi et al.,[22] set the threshold of 12 or more follicles measuring 2-9mm in diameter with or without ovarian volume in their study. Nidhi R. et al.,[18] defined polycystic ovaries in the presence of > 10 cyst, 2-8mm of size in diameter with the ovarian volume greater than 10cm[3]. There may have been the variations among the studies since the threshold used to measure the PCOS morphology under the ultrasonography is not indicated across the selected studies. It might have caused the disparities among the studies[10].

A study discussed that including school and college-going adolescents in the meta-analysis studies might inflates the prevalence estimates[6]. Joshi et al.,[22] conducted a study in an urban area, reported the prevalence of PCOS among the reproductive age-group women was 41%. The study which has shown the lowest prevalence across the included studies was Gill H et al.,[20] with a prevalence of 3.7% among the women with the age-group 18-25 that was carried out in 5 colleges. Nair M.K. et al.,[19] performed a study where they have reported the prevalence of PCOS among the adolescents age-group was 36.03%. Variations in sample sizes, publication years, age of the investigated women, area and diagnostic criteria were the certain factors which can caused the high heterogeneity ($I^2 = 97.7\%$) in the present study.

The present study has shown a rise in the prevalence of PCOS as compared to the previous ones. The study classifies the age-groups and showed the results as per classification. As per the guidelines, certain factors must take into consideration for early detection and the awareness should be more and precise about PCOS. So that, all women report this problem earlier and understand the need of improving habits and lifestyle.

2.7 Conclusion

The results of the current study suggested the pooled prevalence of PCOS in India was 13%. Concerning various diagnostic criteria, the most frequently used tool to diagnose the PCOS was Rotterdam's criteria with a prevalence of 14% among the women in India and the least utilized tool according to the current study was AE-PCOS criteria showing 11% prevalence. It is necessary for health-care professional to communicate this information with public and educate them about this condition. Policymakers, government agencies, and medical professionals must use the evidence to help set standards for the management and awareness of PCOS in India.

3 References

1. March WA, Moore VM, Willson KJ, Phillips DIW, Norman RJ, Davies MJ. The prevalence of polycystic ovary syndrome in a community sample assessed under contrasting diagnostic criteria. *Hum Reprod.* 2010;25:544–51. doi:10.1093/humrep/dep399
2. Salari N, Nankali A, Ghanbari A, Jafarpour S, Ghasemi H, Dokaneheifard S, et al. Global prevalence of polycystic ovary syndrome in women worldwide: a comprehensive systematic review and meta-analysis. *Arch Gynecol Obstet.* 2024;310:1303–14. doi:10.1007/s00404-024-07607-x
3. Wu Q, Gao J, Bai D, Yang Z, Liao Q. The prevalence of polycystic ovarian syndrome in Chinese women: a meta-analysis. *Ann Palliat Med.* 2021;10:747–87. doi:10.21037/apm-20-1893
4. Kaur DS, Vohra DJG, Singh DG. Epidemiology of Polycystic Ovarian Syndrome in a Rural Medical College and Hospital- a Survey Based Research. *J Pharm Negat Results.* 2022;13(6):4058–73. doi:10.47750/pnr.2022.13.S06.538
5. Javed R, Ghafoor F, Mahboob A, Zubair H, Munir A. Frequency and relationship of polycystic ovarian syndrome with hirsutism. *J Fatima Jinnah Med Univ [Internet].* 2014;8. Available from: <http://jfjmu.com/index.php/ojs/article/view/130>
6. Bharali MD, Rajendran R, Goswami J, Singal K, Rajendran V. Prevalence of Polycystic Ovarian Syndrome in India: A Systematic Review and Meta-Analysis. *Cureus.* 2022;14(12):e32351. doi:10.7759/cureus.32351

7. Dokras A, Bochner M, Hollinrake E, Markham S, Vanvoorhis B, Jagasia DH. Screening women with polycystic ovary syndrome for metabolic syndrome. *Obstet Gynecol.* 2005;106:131–7. doi:10.1097/01.AOG.0000167408.30893.6b
8. Shen Y, Zhao S, Huang S, Han J, Zhao M. A review of weight loss management in patients with obesity polycystic ovary syndrome. *Chin J Pract Nurs.* 2018;36:1755-58.
9. Saadia Z. Follicle Stimulating Hormone (LH: FSH) Ratio in Polycystic Ovary Syndrome (PCOS) - Obese vs. Non-Obese Women. *Med Arch.* 2020;74:289. doi:10.5455/medarh.2020.74.289-293
10. Bozdag G, Mumusoglu S, Zengin D, Karabulut E, Yildiz BO. The prevalence and phenotypic features of polycystic ovary syndrome: a systematic review and meta-analysis. *Hum Reprod.* 2016;31:2841–55. doi:10.1093/humrep/dew218
11. Pena AS, Codner E, Witchel S. Criteria for Diagnosis of Polycystic Ovary Syndrome during Adolescence: Literature Review. *Diagnostics.* 2022;12:1931. doi:10.3390/diagnostics12081931
12. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. *Fertil Steril.* 2004;81:19–25. doi:10.1016/j.fertnstert.2003.10.004
13. Azziz R, Carmina E, Dewailly D, Diamanti-Kandarakis E, Escobar-Morreale HF, Futterweit W, et al. Criteria for Defining Polycystic Ovary Syndrome as a Predominantly Hyperandrogenic Syndrome: An Androgen Excess Society Guideline. *J Clin Endocrinol Metab.* 2006;91:4237–45. doi:10.1210/jc.2006-0178
14. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021;372:n71. doi:10.1136/bmj.n71 PubMed PMID: 33782057; PubMed Central PMCID: PMC8005924.
15. Page MJ, Shamseer L, Tricco AC. Registration of systematic reviews in PROSPERO: 30,000 records and counting. *Syst Rev.* 2018;7:32. doi:10.1186/s13643-018-0699-4 PubMed PMID: 29463298; PubMed Central PMCID: PMC5819709.
16. Munn Z, Moola S, Lisy K, Riitano D, Tufanaru C. Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and cumulative incidence data. *Int J Evid Based Healthc.* 2015;13(3):147. doi:10.1097/XEB.0000000000000054
17. Higgins JPT, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ.* 2003;327:557–60. doi:10.1136/bmj.327.7414.557
18. Nidhi R, Padmalatha V, Nagarathna R, Amritanshu R. Prevalence of Polycystic Ovarian Syndrome in Indian Adolescents. *J Pediatr Adolesc Gynecol.* 2011;24:223–7. doi:10.1016/j.jpog.2011.03.002
19. Nair MKC, Pappachan P, Balakrishnan S, Leena ML, George B, Russell PS. Menstrual Irregularity and Polycystic Ovarian Syndrome among Adolescent Girls—A 2 Year Follow-up Study. *Indian J Pediatr.* 2012;79:69–73. doi:10.1007/s12098-011-0432-y
20. Gill H, Tiwari P, Dabadghao P. Prevalence of polycystic ovary syndrome in young women from North India: A Community-based study. *Indian J Endocrinol Metab.* 2012;16:S389. doi:10.4103/2230-8210.104104
21. Venkatarao E, Anitha M, Bhuvanashree N, Gupta S. Polycystic ovarian syndrome: Prevalence and its correlates among adolescent girls. *Ann Trop Med Public Health.* 2013;6:632. doi:10.4103/1755-6783.140233
22. Joshi B, Mukherjee S, Patil A, Purandare A, Chauhan S, Vaidya R. A cross-sectional study of polycystic ovarian syndrome among adolescent and young girls in Mumbai, India. *Indian J Endocrinol Metab.* 2014;18:317. doi:10.4103/2230-8210.131162
23. Vijaya K, Bharatwaj P. Prevalence and Undetected Burden of Polycystic Ovarian Syndrome (PCOS) Among Female Medical Undergraduate Students in South India - A Prospective Study in Pondicherry. *Glob J Res Anal.* 2012;3:63–4. doi:10.15373/22778160/January2014/41
24. Lakshmi KS, Jayasutha J, Chandrasekar A. A Study on Prevalence of Polycystic Ovary Syndrome at a Tertiary Care Hospital. *Int J Pharm Sci Res.* 2015;6:383–5. doi:10.13040/IJPSR.0975-8232.6(1).383-85
25. Balaji S, Amadi C, Prasad S, Bala Kasav J, Upadhyay V, Singh AK, et al. Urban Rural Comparisons of Polycystic Ovary Syndrome Burden among Adolescent Girls in a Hospital Setting in India. *BioMed Res Int.* 2015;2015:158951. doi:10.1155/2015/158951
26. Rajkumari P, Sahoo J, Sujata P, Sahoo G, Hansa J. Awareness about PCOS and the Likelihood of Its Symptoms in Adolescent Girls in a Semi-Urban Set-Up: A Cross Sectional Study. *J Med Sci Clin Res.* 2016;04:14264–9. doi:10.18535/jmscr/v4i11.119

27. Gupta M, Singh D, Toppo M, Priya A, Sethia S, Gupta P. A cross sectional study of polycystic ovarian syndrome among young women in Bhopal, Central India. *Int J Community Med Public Health*. 2017;5:95. doi:10.18203/2394-6040.ijcmph20175603
28. Choudhary A, Jain S, Chaudhari P. Prevalence and symptomatology of polycystic ovarian syndrome in Indian women: is there a rising incidence? *Int J Reprod Contracept Obstet Gynecol*. 2017;6:4971. doi:10.18203/2320-1770.ijrcog20175010
29. Vidya Bharathi R, Swetha S, Neerajaa J, Varsha Madhavica J, Janani DM, Rekha SN, et al. An epidemiological survey: Effect of predisposing factors for PCOS in Indian urban and rural population. *Middle East Fertil Soc J*. 2017;22:313–6. doi:10.1016/j.mefs.2017.05.007
30. Nanjaiah R, Roopadevi V. Prevalence of Polycystic Ovarian Syndrome among Female Students: A Cross-Sectional Study. *Natl J Community Med*. 2018;9:187–91.
31. Gupta M, Melwani V, Priya A, Toppo M, Khan A, Sethia S. A Study to Assess the Prevalence of Polycystic Ovarian Disease among Girls Aged 15–21 Years from Selected Schools and Colleges in Bhopal City. *Indian J Youth Adolesc Health*. 2017;04:2–5. doi:10.24321/2349.2880.201717
32. Singh A, Vijaya K, Sai Laxmi K. Prevalence of polycystic ovarian syndrome among adolescent girls: a prospective study. *Int J Reprod Contracept Obstet Gynecol*. 2018;7:4375. doi:10.18203/2320-1770.ijrcog20184230
33. Desai N, Tiwari R, Patel S. Prevalence of Polycystic Ovary Syndrome and its Associated Risk Factors among Adolescent and Young Girls in Ahmedabad Region. *Indian J Pharm Pract*. 2018;11:119–25. doi:10.5530/ijopp.11.3.27
34. Laddad MM, Kshirsagar NS, Shinde GP, Shivade VS. Study of prevalence and determinants of polycystic ovarian syndrome among adolescent girls in rural area: a prospective study. *Int J Reprod Contracept Obstet Gynecol*. 2019;8:3135–9. doi:10.18203/2320-1770.ijrcog20193524
35. Deswal R, Nanda S, Ghalaut VS, Roy PS, Dang AS. Cross-sectional study of the prevalence of polycystic ovary syndrome in rural and urban populations. *Int J Gynecol Obstet*. 2019;146:370–9. doi:10.1002/ijgo.12893
36. Aggarwal M, Yadav P, Badhe S, Deolekar P. A cross sectional study on prevalence of PCOS and risk factors associated with it among medical students. *Indian J Obstet Gynecol Res*. 2019;6:522–6. doi:10.18231/j.ijogr.2019.112
37. Kirthika SV, Paul J, Sudhakar S, Senthil Selvam P, Sathya Priya V. Polycystic ovarian syndrome -Interventions for the emerging public health challenge: A scoping review. *Drug Invent Today*. 2019;12(03):398–401.
38. Ganie MA, Rashid A, Sahu D, Nisar S, Wani IA, Khan J. Prevalence of polycystic ovary syndrome (PCOS) among reproductive age women from Kashmir valley: A cross-sectional study. *Int J Gynecol Obstet*. 2020;149:231–6. doi:10.1002/ijgo.13125
39. Bahadur A, Mundhra R, Kashibhatla J, Rajput R, Verma N, Kumawat M. Prevalence of metabolic syndrome among women with different PCOS phenotypes – a prospective study. *Gynecol Endocrinol*. 2021;37:21–5. doi:10.1080/09513590.2020.1775193
40. Joseph N, Reddy AGR, Joy D, Patel V, Santhosh P, Das S, et al. Study on the proportion and determinants of polycystic ovarian syndrome among health sciences students in South India. *J Nat Sci Biol Med*. 2016;7:166–72. doi:10.4103/0976-9668.184704
41. Mehreen TS, Ranjani H, Kamalesh R, Ram U, Anjana RM, Mohan V. Prevalence of Polycystic Ovarian Syndrome Among Adolescents and Young Women in India. *J Diabetol*. 2021;12:319. doi:10.4103/JOD.JOD_105_20
42. Kusuma P, Anusha D, Jagannivas S, Shridevi K, Krishna N. A cross sectional study on, prevalence of polycystic ovarian syndrome and its health effects, in reproductive age women (15-45 years) in a rural area, Telangana, India. *Int J Clin Obstet Gynaecol*. 2021;5(3):371–6. doi:10.33545/gynae.2021.v5.i3f.949
43. Jabeen A, Yamini V, Rahman Amberina A, Dinesh Eshwar M, Vadakedath S, Begum GS, et al. Polycystic Ovarian Syndrome: Prevalence, Predisposing Factors, and Awareness Among Adolescent and Young Girls of South India. *Cureus*. 2022;14(8):e27943. doi:10.7759/cureus.27943
44. Dhar S, Mondal KK, Bhattacharjee P. Influence of lifestyle factors with the outcome of menstrual disorders among adolescents and young women in West Bengal, India. *Sci Rep*. 2023;13:12476. doi:10.1038/s41598-023-35858-2
45. Bhardwaj P, Yadav SK, Taneja J. Magnitude and associated factors of menstrual irregularity among young girls: A cross-sectional study during COVID-19 second wave in India. *J Fam Med Prim Care*. 2022;11:7769. doi:10.4103/jfmpc.jfmpc_1201_22

46. Shringarpure K, Baxi R, Sheth M, Patel P, Parmar V, Baxi S. Polycystic Ovarian Syndrome among Young Women of a University in Central Gujarat – A Cross-sectional Study. *Indian J Public Health*. 2023;67:575. doi:10.4103/ijph.ijph_1508_22
47. Ganie MA, Chowdhury S, Malhotra N, Sahay R, Bhattacharya PK, Agrawal S, et al. Prevalence, Phenotypes, and Comorbidities of Polycystic Ovary Syndrome Among Indian Women. *JAMA Netw Open*. 2024;7:e2440583. doi:10.1001/jamanetworkopen.2024.40583
48. Sharma A, Sarwal Y, Devi NK, Saraswathy KN. Polycystic Ovary Syndrome prevalence and associated sociodemographic risk factors: a study among young adults in Delhi NCR, India. *Reprod Health*. 2025;22:61. doi:10.1186/s12978-025-02019-9
49. Niranjani S, Prema K, Sahayarani G, Dinesh M, Carline K. Prevalence of Polycystic Ovarian Syndrome Among Young College Girls: A Cross-Sectional Study. *Cureus*. 2025;17(9):e92623. doi:10.7759/cureus.92623
50. Bhatt V, ShaikhGhanchi N, Chaudhary P, Chandel D. Insights into the Prevalence and Risk Factors of Polycystic Ovarian Syndrome Among Women in Gujarat. *Gynäkol Prax*. 2026. doi:10.1007/s41974-026-00419-8
51. Malshetty R, Tondare MB, Tondare S, Ganganahalli P. A Cross-Sectional Study on the Prevalence of Polycystic Ovary Syndrome and Its Association with Metabolic Syndrome in Reproductive-Age Women. *Int J Health Sci Res*. 2026;16(2):373–9. doi:10.52403/ijhsr.20260242
52. Bhuvanshree N VK, Daggumati H, K P, Paul J, Sudhakar S, P SS. Effect of Structured Awareness Programme on Polycystic Ovarian Syndrome (PCOS) among Adolescent Girls. *Res J Pharm Technol*. 2019;12:6097–100. doi:10.5958/0974-360X.2019.01059.X
53. Jain A, Neravi A, Kumar KSS, Shirahatti RS, Oli AK. A Prospective Study on the Prevalence of Polycystic Ovary Syndrome at a Tertiary Care Hospital of North Karnataka, India. *J Prev Diagn Treat Strateg Med*. 2024;3:171–9. doi:10.4103/jpdtsm.jpdtm_50_24
54. Ganie MA, Marwaha RK, Dhingra A, Nisar S, Mani K, Masoodi S, et al. Observation of phenotypic variation among Indian women with polycystic ovary syndrome (PCOS) from Delhi and Srinagar. *Gynecol Endocrinol*. 2016;32:566–70. doi:10.3109/09513590.2016.1141879