



(RESEARCH ARTICLE)



## Prevalence, Knowledge and Awareness of polycystic ovary syndrome: A study among the Bengali speaking Hindus and Muslims of Kolkata, West Bengal

Titas Ghosh <sup>1,\*</sup>, Baidyanath Pal <sup>2</sup>, Suwendu Maji <sup>3</sup> and Monali Goswami <sup>4</sup>

<sup>1</sup> Department of Anthropology, University of Calcutta, Kolkata, 700019, West Bengal, India.

<sup>2</sup> Biological Anthropology Unit, Indian Statistical Institute, Kolkata, West Bengal, India.

<sup>3</sup> Department of Anthropology, University of Calcutta, Kolkata, 700019, West Bengal, India.

<sup>4</sup> Department of Anthropology & Tribal Studies, MSCB University, Baripada, 757003, Odisha, India.

International Journal of Science and Research Archive, 2024, 11(02), 630–641

Publication history: Received on 09 February 2024; revised on 17 March 2024; accepted on 20 March 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.11.2.0480>

### Abstract

Polycystic Ovary Syndrome, or PCOS is one of the most prevalent endocrine disorders that leads to ovulatory failure and infertility in women of reproductive age. It is evident that both genetic and environmental factors may contribute to the development of PCOS and its phenotypic manifestations, while the pathophysiology of the condition is yet unknown. Sometimes patients with having PCOS may not receive appropriate treatment since the condition tends to be underdiagnosed. The present cross-sectional study was undertaken among to ascertain the incidence of PCOS, the level of knowledge and awareness of PCOS, and the health-related behaviors among the Hindu and Muslim adolescents and young adult women of Kolkata, West Bengal, India. In this cross-sectional a study, 723 Bengali women between the ages of 15 and 30 participated (371 Hindus and 352 Muslims). The current study reveals a noteworthy association between the level of information of PCOS among Hindu and Muslim PCOS participants. Additionally, the majority of the participants obtained their knowledge from health experts. Adequate intervention initiatives are thus needed to inform young girls and prevent them from the long-term effects of PCOS.

**Keywords:** Polycystic Ovary Syndrome (PCOS); Knowledge; Awareness; Pathophysiology

### 1. Introduction

Polycystic Ovary Syndrome (PCOS) is one of the most prevalent endocrine disorders and major causes of ovulatory dysfunction and infertility in women of reproductive age [1, 2]. Amenorrhea, oligomenorrhea, hirsutism, obesity, infertility, anovulation, and acne are the symptoms commonly linked to PCOS. Numerous metabolic and cardiovascular abnormalities, as well as a variety of psychological diseases like anxiety, mental worries, social problems, and sexual dysfunction, are also seen in women with PCOS [3].

The pathophysiology of PCOS is still uncertain, and there is evidence that both genetic and environmental factors may play a role in the development of PCOS and its phenotypic expressions [4-12]. Familial clustering of the disorder and environmental risk factors such as obesity support the hypothesis that genetics and environment may be interconnected. PCOS impacts women of all races and ethnicities who are of reproductive age and the genetic predisposition to PCOS based on ethnicity is significantly influenced by the environment [9, 13-20].

PCOS shows a wide variety of manifestations like hyperandrogenism (hirsutism, acne, alopecia), menstrual disturbance, infertility, obesity, type II diabetes mellitus, dyslipidemia, hypertension, cardiovascular disease, endometrial carcinoma, etc. Because of these risk factors, an early diagnosis and treatment of PCOS are crucial to prevent future long-term complications and reduce the healthcare burden.

\* Corresponding author: Titas Ghosh

PCOS appears to be underdiagnosed and, as a result, patients may not be managed appropriately [21]. Moreover, underdiagnosis could be common because of women's potential ignorance and unawareness [22]. Although the long-term reproductive, cardio-metabolic, and emotional effects of PCOS can be avoided in adolescents with early detection and management of the syndrome, overdiagnosis can also negatively impact an adolescent's quality of life and cause premature and unjustified anxiety about future fertility. The prognosis is impacted by ignorance of PCOS, its management, and lifestyle modifications [2, 23]. Therefore, to minimize the adverse consequences of PCOS in later years, appropriate knowledge and understanding are necessary.

Studies on the prevalence, knowledge, and health-related practices of PCOS are lacking among adolescents and young adult girls. Hence, this study aimed to determine the prevalence of PCOS, knowledge and awareness of PCOS, and health-related practices among the Hindu and Muslim adolescents and young adult girls of Kolkata, West Bengal, India.

---

## 2. Materials and methods

The present cross-sectional study was carried out on the Bengali Hindu and Muslim adolescents and young adult girls aged between 15 to 30 years of Kolkata, West Bengal. The study was carried out from November 2021 to December 2023. Written informed consent was obtained from the study participants, and those who had attained menarche more than 2 years before the study and unmarried and willing to participate in the study were enrolled in the study. Pre-structured and pre-tested schedule was used for data collection.

For the diagnosis of PCOS, the Rotterdam criteria [24] are widely used worldwide, and its use is recommended by the Endocrine Society in 2013 [25], the American Academy of Family Physicians (AAFP) Guidelines in 2016 [26], and the International Evidence based Guideline for the assessment and management of polycystic ovary syndrome 2018 [27]. These criteria stated that women must have at least two out of the three criteria for diagnosing PCOS, including the presence of oligomenorrhea or anovulation, clinical or biochemical hyperandrogenism and/or ovarian cysts.

Individuals not fulfilling the inclusion criteria are excluded from the present study. Women under the age of 15 years and above 30 years and suffering from any known diseases like Infections, Inflammatory Conditions, Congenital Adrenal Hyperplasia, Hyperprolactinemia, Cushing's syndrome and Thyroid Disorders and those who did not want to participate was excluded from the present study. Hirsutism and acne were measured by using the Ferriman-Gallwey Hirsutism Scoring System [28] and The Global Acne Grading System (GAGS) [29].

The data were computed and analysed using IBM statistical package for social sciences version 26 (IBM SPSS version 26). Descriptive statistics was used as frequency and percentage. In inferential statistics Chi square and Fisher's exact test was used to find out the association. A minimum p value of  $\leq 0.05$  was considered as statistically significant for all inferential statistics.

---

## 3. Results

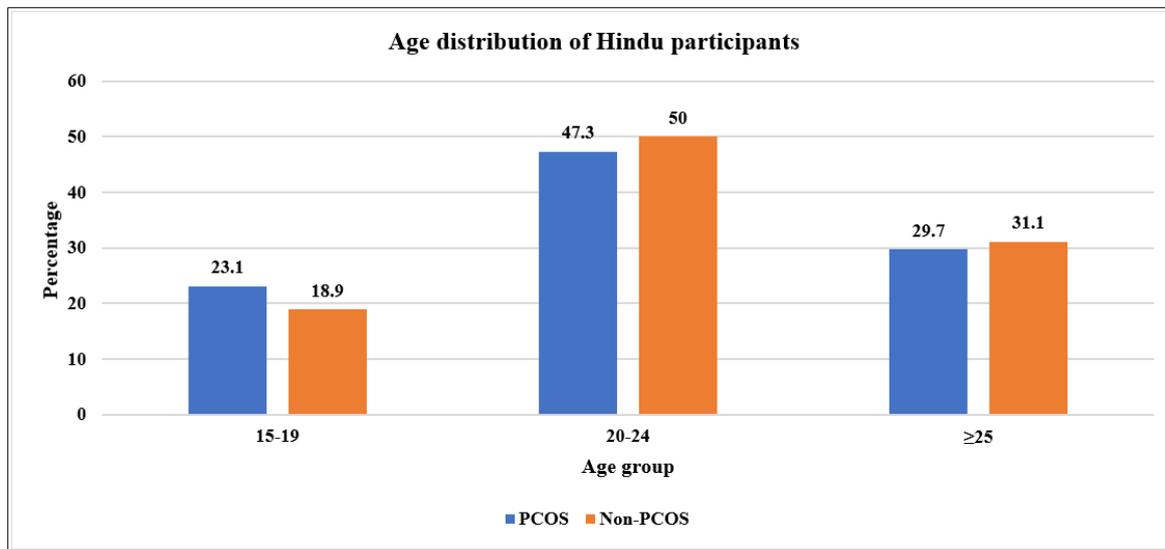
Table 1 shows the prevalence and clinical presentation of PCOS among the study participants. The incidence of PCOS is 24.5% among the Hindus and 22.2% among the Muslims. The clinical presentation indicates that among the Muslims and Hindus, the most common symptom was irregular menstrual cycle, which was followed by hirsutism and acne.

Table 2 describes the general characteristics of the participants. Family history of PCOS, i.e., siblings or cousins with PCOS, presence of Anorexia, presence of Stretch marks, presence of Acanthosis Nigricans show significant association between Hindu PCOS and Non-PCOS participants except history of mother with PCOS. On the other hand, among Muslim PCOS and Non-PCOS participants history of mother with PCOS, Anorexia, stretch marks and Acanthosis nigricans showed significant association. It was also observed that, the Hindu and Muslim PCOS participants showed significant association with history of mother with PCOS, presence of Anorexia and Acanthosis Nigricans.

Table 3 describes the socio-economic characteristics of the participants. The majority of the Hindu and Muslim participants are in the early young adult age range (20–24 years). The educational status of the participants indicates that the majority of them, both Muslim and Hindu, were graduates. and belong to the upper middle socioeconomic class.

**Table 1** Prevalence (n=723) of PCOS and Clinical features of the PCOS participants (n=169)

Total Women	PCOS	Non-PCOS
	Frequency (%)	Frequency (%)
Hindu (n=371)	91 (24.5)	280 (75.5)
Muslim (n=352)	78 (22.2)	274 (77.8)
Clinical Presentation	Hindu (n=91)	Muslim (n=78)
	Frequency (%)	Frequency (%)
Hirsutism	50 (54.9)	40 (51.3)
Acne	23 (25.3)	25 (32.1)
Obesity	18 (19.8)	5 (6.4)
Acne + Hirsutism	11 (12.1)	10 (12.8)
Acne + Hirsutism + Obesity	1 (1.1)	1 (1.3)
Irregular menstrual cycle	67 (73.6)	56 (71.8)



**Figure 1** Age distribution of Hindu [PCOS (n=91) and non-PCOS (n=280)] participants

**Table 2** General Characteristics of the participants (n=723)

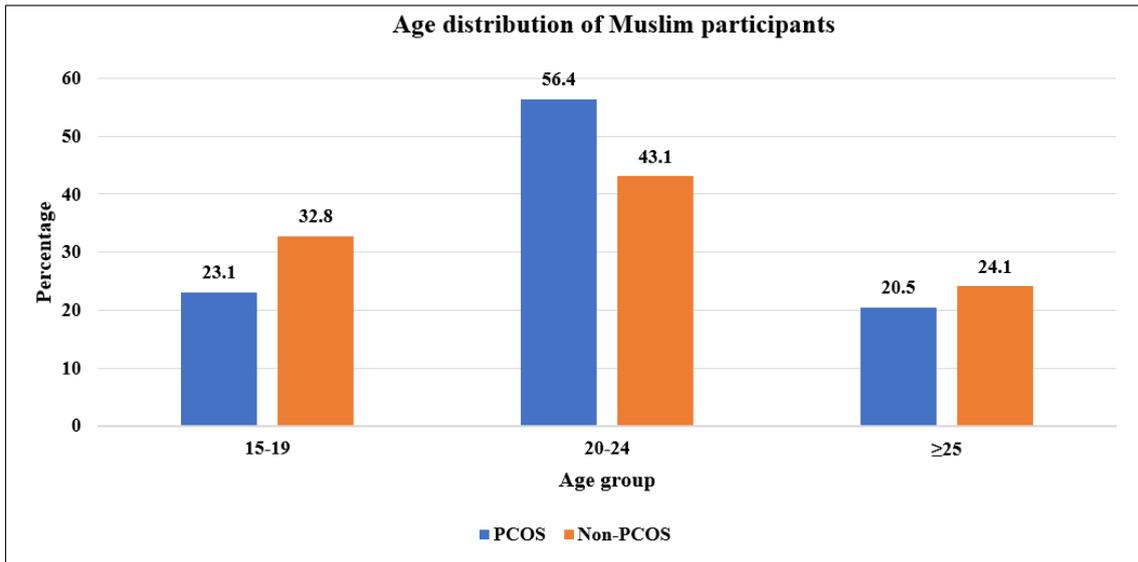
Variables		Hindu (n=371)			Muslim (n=352)			Hindu vs Muslim PCOS		
		PCOS (n=91)	Non-PCOS (n=280)	Chi-Square (p value)	PCOS (n=78)	Non-PCOS (n=274)	Chi-Square (p value)	Hindu PCOS (n=91)	Muslim PCOS (n=78)	Chi-Square (p value)
Mother with PCOS	Yes	13 (14.3)	37 (13.2)	0.068 <sup>^</sup> (0.795)	30 (38.5)	20 (7.3)	48.380 <sup>^</sup> (0.000) *	13 (14.3)	30 (38.5)	12.940 <sup>^</sup> (0.000) *
	No	78 (85.7)	243 (86.8)		48 (61.5)	254 (92.7)		78 (85.7)	48 (61.5)	
Siblings or Cousins with PCOS	Yes	22 (24.2)	17 (6.1)	23.930 <sup>^</sup> (0.000) *	11 (14.1)	21 (7.7)	3.045 <sup>^</sup> (0.081)	22 (24.2)	11 (14.1)	2.712 <sup>^</sup> (0.100)
	No	69 (75.8)	263 (93.9)		67 (85.9)	253 (92.3)		69 (75.8)	67 (85.9)	
Anorexia	Yes	57 (62.6)	70 (25.0)	43.213 <sup>^</sup> (0.000) *	35 (44.9)	47 (17.2)	26.107 <sup>^</sup> (0.000) *	57 (62.6)	35 (44.9)	4.694 <sup>^</sup> (0.030) *
	No	34 (37.4)	210 (75.0)		43 (55.1)	227 (82.8)		34 (37.4)	43 (55.1)	
Stretch Marks	Yes	52 (57.1)	78 (27.9)	25.878 <sup>^</sup> (0.000) *	37 (47.4)	56 (20.4)	22.765 <sup>^</sup> (0.000) *	52 (57.1)	37 (47.4)	1.587 <sup>^</sup> (0.208)
	No	39 (42.9)	202 (72.1)		41 (52.6)	218 (79.6)		39 (42.9)	41 (52.6)	
Acanthosisnigricans	Yes	42 (46.2)	36 (12.9)	45.858 <sup>^</sup> (0.000) *	22 (28.2)	24 (8.8)	20.210 <sup>^</sup> (0.000) *	42 (46.2)	22 (28.2)	5.751 <sup>^</sup> (0.016) *
	No	49 (53.8)	244 (87.1)		56 (71.8)	250 (91.2)		49 (53.8)	56 (71.8)	

\*p≤0.05; <sup>^</sup>Chi square

**Table 3** Socio-economic characteristics of the participants

Characteristics		Hindu (n=371)			Muslim (n=352)			Hindu PCOS vs Muslim PCOS		
		PCOS (n=91)	Non-PCOS (n=280)	Chi square (p value)	PCOS (n=78)	Non-PCOS (n=274)	Chi square (p value)	Hindu PCOS (n=91)	Muslim PCOS (n=78)	Chi square (p value)
		Frequency (%)	Frequency (%)	0.742 (0.690)	Frequency (%)	Frequency (%)	4.571 (0.102)	Frequency (%)	Frequency (%)	2.068 (0.356)
Age category	15-19	21 (23.1)	53 (18.9)	0.742 (0.690)	18 (23.1)	90 (32.8)	4.571 (0.102)	21 (23.1)	18 (23.1)	2.068 (0.356)
	20-24	43 (47.3)	140 (50.0)		44 (56.4)	118 (43.1)		43 (47.3)	44 (56.4)	
	≥25	27 (29.7)	87 (31.1)		16 (20.5)	66 (24.1)		27 (29.7)	16 (20.5)	
Education of the participant	Secondary	5 (5.5)	21 (7.5)	1.749 (0.626)	11 (14.1)	41 (15.0)	1.135 (0.769)	5 (5.5)	11 (14.1)	8.141 (0.043) *
	Higher secondary	15 (16.5)	49 (17.5)		15 (19.2)	67 (24.5)		15 (16.5)	15 (19.2)	
	Graduation	44 (48.4)	145 (51.8)		41 (52.6)	129 (47.1)		44 (48.4)	41 (52.6)	
	Post-Graduation and above	27 (29.7)	65 (23.2)		11 (14.1)	37 (13.5)		27 (29.7)	11 (14.1)	
Occupation of the participant	Student	57 (62.6)	157 (56.1)	3.339 (0.342)	52 (66.7)	167 (60.9)	0.938 (0.816)	57 (62.6)	52 (66.7)	4.710 (0.194)
	Service	16 (17.6)	49 (17.5)		8 (10.3)	31 (11.3)		16 (17.6)	8 (10.3)	
	Business	12 (13.2)	36 (12.9)		7 (9.0)	27 (9.9)		12 (13.2)	7 (9.0)	
	Others	6 (6.6)	38 (13.6)		11 (14.1)	49 (17.9)		6 (6.6)	11 (14.1)	
Socio- economic class	Upper Lower (IV)	2 (2.2)	6 (2.1)		1 (1.3)	18 (6.6)		2 (2.2)	1 (1.3)	-
	Lower Middle (III)	16 (17.6)	67 (23.9)		19 (24.4)	107 (39.1)		16 (17.6)	19 (24.4)	
	Upper Middle (II)	70 (76.9)	200 (71.4)		56 (71.8)	144 (52.6)		70 (76.9)	56 (71.8)	
	Upper (I)	3 (3.3)	7 (2.5)		2 (2.6)	5 (1.8)		3 (3.3)	2 (2.6)	

\*p≤0.05



**Figure 2** Age distribution of Muslim [PCOS (n=78) and non-PCOS (n=274)] participants

Table 4 reveals the Knowledge and Awareness on PCOS among the Hindu (PCOS and Non-PCOS) and Muslim (PCOS and Non-PCOS) participants. Knowledge about menstruation, awareness on PCOS, sources of information and knowledge about PCOS shows significant association among both the Hindu and Muslim (PCOS and Non-PCOS) participants. On the other hand, in the case of Hindu PCOS and Muslim PCOS participants except knowledge about PCOS, other factors were not found significant.

**Table 4** Prevalence of knowledge and awareness on PCOS among the participants (n=723)

Characteristics		Hindu (n=371)			Muslim (n=352)			Hindu PCOS vs Muslim PCOS		
		PCOS (n=91)	Non-PCOS (n=280)	Chi Square (p value)	PCOS (n=78)	Non-PCOS (n=274)	Chi Square (p value)	Hindu PCOS (n=91)	Muslim PCOS (n=78)	Chi Square (p value)
Knowledge about menstruation	Yes	77 (84.6)	259 (92.5)	4.997 <sup>Δ</sup> (0.025) *	67 (85.9)	262 (95.6)	9.399 <sup>Δ</sup> (0.002) *	77 (84.6)	67 (85.9)	0.055 <sup>Δ</sup> (0.815)
	No	14 (15.4)	21 (7.5)		11 (14.1)	12 (4.4)		14 (15.4)	11 (14.1)	
Awareness on PCOS	Yes	15 (16.5)	124 (44.3)	22.658 <sup>Δ</sup> (0.000) *	17 (21.8)	97 (35.4)	5.133 <sup>Δ</sup> (0.023) *	15 (16.5)	17 (21.8)	0.772 <sup>Δ</sup> (0.380)
	No	76 (83.5)	156 (55.7)		61 (78.2)	177 (64.6)		76 (83.5)	61 (78.2)	
Source of information	Not applicable	13 (14.3)	133 (47.5)	112.931 <sup>Δ</sup> (0.000) *	20 (25.6)	106 (38.7)	39.951 <sup>Δ</sup> (0.000) *	13 (14.3)	20 (25.6)	5.986 <sup>Δ</sup> (0.308)
	Health personnel	50 (54.9)	18 (6.4)		34 (43.6)	36 (13.1)		50 (54.9)	34 (43.6)	
	Friends	7 (7.7)	44 (15.7)		4 (5.1)	42 (15.3)		7 (7.7)	4 (5.1)	
	Parents	5 (5.5)	14 (5.0)		5 (6.4)	12 (4.4)		5 (5.5)	5 (6.4)	
	Teachers	6 (6.6)	34 (12.1)		9 (11.5)	32 (11.7)		6 (6.6)	9 (11.5)	

	Mass media	10 (11.0)	37 (13.2)		6 (7.7)	46 (16.8)		10 (11.0)	6 (7.7)	
Knowledge about PCOS	Not applicable	15 (16.5)	128 (45.7)	78.762 <sup>^</sup> (0.000) *	18 (23.1)	110 (40.1)	17.976 <sup>^</sup> (0.003) *	15 (16.5)	18 (23.1)	28.110 <sup>^</sup> (0.000) *
	Definition	6 (6.6)	12 (4.3)		4 (5.1)	22 (8.0)		6 (6.6)	4 (5.1)	
	Causes	8 (8.8)	37 (13.2)		8 (10.3)	31 (11.3)		8 (8.8)	8 (10.3)	
	Symptoms	20 (22.0)	58 (20.7)		20 (25.6)	64 (23.4)		20 (22.0)	20 (25.6)	
	Consequences	7 (7.7)	32 (11.4)		22 (28.2)	42 (15.3)		7 (7.7)	22 (28.2)	
	All of the above	35 (38.5)	13 (4.6)		6 (7.7)	5 (1.8)		35 (38.5)	6 (7.7)	

\*p≤0.05; <sup>^</sup> Chi Square

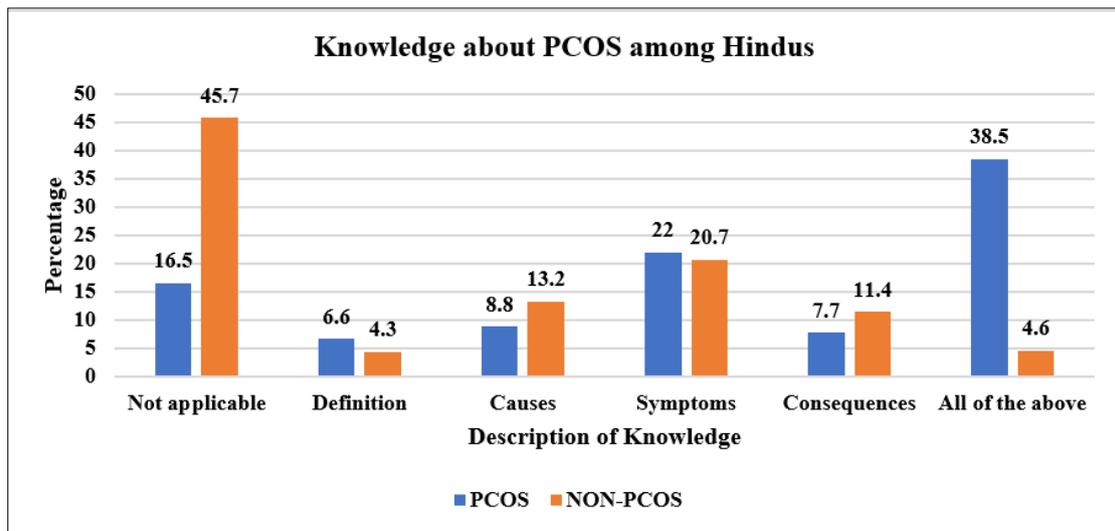


Figure 3 Knowledge about PCOS among Hindus (PCOS and Non-PCOS)

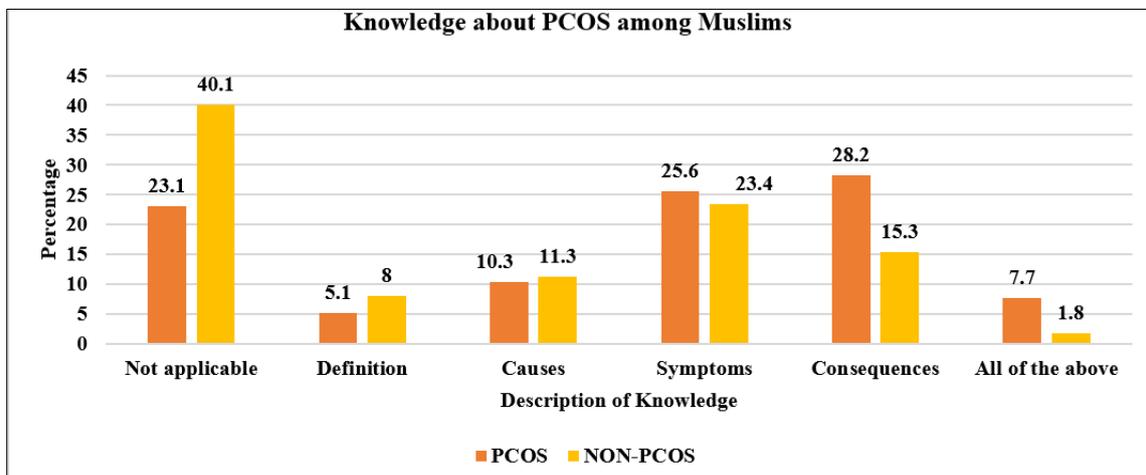


Figure 4 Knowledge about PCOS among Muslims (PCOS and Non-PCOS)

#### **4. Discussion**

In the present study, it was noted that Hirsutism and Acne were predominant among both the Hindu and Muslim PCOS participants had a strong relationship was observed with the existence of anorexia, candidiasis, and a mother's history of PCOS. Both clinical and biochemical hyperandrogenism are very useful in diagnosing Polycystic Ovary Syndrome (PCOS) [30-35]. Obesity may trigger hyperandrogenism from peripheral estrogen to androgen conversion, which leads to PCOS and anovulation which is very common among teenagers [36]. Women are disproportionately impacted by their fast-changing nutritional preferences, urbanization, fast-changing lifestyles, and stressful lives. These lead to the development of certain ailments that eventually threaten lifestyle.

In the present study, knowledge about PCOS shows a significant association among both the Hindu and Muslim PCOS participants and the source of knowledge among the majority of the participants were health professionals. It was shown that the most favored source of information for additional details regarding PCOS was health professionals [37]. There is an enormous variation in the amount of awareness of PCOS in India. In order to manage PCOS and enhance the patient's quality of life, awareness and accurate diagnosis are crucial [38]. Regretfully, most women are unaware of these hazards, despite the fact that PCOS has major negative effects on health [39, 40]. In India, there is a notable disparity in knowledge and awareness since the school curriculum does not provide sufficient material. Additionally, the majority of the women believed that menstruation discomfort and abnormalities were a natural byproduct of their physiology and didn't require medical attention because they had heard the word from friends and family [41]. Thus, there is a lack of understanding regarding PCOS due to cultural taboos and stigmas around discussing menstruation or female reproductive health concerns in an open manner. More similar kind of study also found that most of the participants had poor knowledge and health-related practices toward PCOS [22, 42-47].

Good educational intervention initiatives can raise awareness of PCOS and increase knowledge of the condition. Young adult single girls were found to be less cognizant of PCOS [48-54]. but after the intervention, the number augmented [55-58]. Intervention initiatives served as a catalyst to increase public understanding and awareness of PCOS. Comorbidities might arise as a result of delayed diagnosis. Therefore, it is desired to have adequate intervention programs to educate young girls and protect them from the long-term consequences of PCOS. Racial and ethnic differences can be used to evaluate the geo-epidemiology or pathophysiology of PCOS. Thus, PCOS is investigated while taking into account the cultural and social aspects from an anthropological standpoint. The genetic or cultural factors of PCOS may lead to comparative ethnic disparities. The occurrence of ethnic differences implies that cultural and lifestyle variables may contribute to the pathophysiology of PCOS.

---

#### **5. Conclusion**

The findings of the study indicate that a relatively small percentage of young women are aware of the nature of this disease and the early warning signs that should prompt them to seek medical attention. Through their conversations with the women, the authors learned that the majority of people view menstrual pain and irregularities as a natural part of their bodies and do not think it necessary to consult a physician.

---

#### **Compliance with ethical standards**

##### *Acknowledgements*

This paper is largely an outcome of doctoral work of Titas Ghosh, sponsored by ICSSR (Indian Council of Social Science Research). Authors are thankful to all participants.

##### *Disclosure of conflict of interest*

The authors declare that there is no conflict of interest.

##### *Statement of ethical approval*

The study was approved by the Institutional Human Ethical committee, University of Calcutta (Ref No- CUIEC/ 02/ 05/ 2022-23).

##### *Statement of informed consent*

The purpose of the research was explained to and written informed consent was taken from all the participants.

---

**References**

- [1] Capozzi A, Scambia G, Lello S. Polycystic ovary syndrome (PCOS) and adolescence: How can we manage it?. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 2020 Jul 1;250:235-40. DOI: <https://doi.org/10.1016/j.ejogrb.2020.04.024>
- [2] Rajkumar E, Ardra A, Prabhu G, Pandey V, Sundaramoorthy J, Manzoor R, Sooraj KV, Manikandaprabu M, Badiger T. Polycystic ovary syndrome: An exploration of unmarried women's knowledge and attitudes. *Heliyon*. 2022 Jul 1;8(7). DOI: <https://doi.org/10.1016/j.heliyon.2022.e09835>
- [3] Hemavathi P, Malathi S. Polycystic Ovary Syndrome and Risk of Polycystic Ovary Syndrome among Adolescent Girls in selected Colleges, Puducherry. *Cardiometry*. 2022 Nov 1(24):989-92. DOI:10.18137/cardiometry.2022.24.989992
- [4] Jahanfar S, Eden JA, Warren P, Seppälä M, Nguyen TV. A twin study of polycystic ovary syndrome. *Fertility and Sterility*. 1995 Mar 1;63(3):478-86. DOI: [https://doi.org/10.1016/S0015-0282\(16\)57412-3](https://doi.org/10.1016/S0015-0282(16)57412-3)
- [5] Legro RS, Driscoll D, Strauss III JF, Fox J, Dunaif A. Evidence for a genetic basis for hyperandrogenemia in polycystic ovary syndrome. *Proceedings of the National Academy of Sciences*. 1998 Dec 8;95(25):14956-60. DOI: <https://doi.org/10.1073/pnas.95.25.1495>
- [6] Battaglia C, Regnani G, Mancini F, Iughetti L, Flamigni C, Venturoli S. Polycystic ovaries in childhood: a common finding in daughters of PCOS patients. A pilot study. *Human Reproduction*. 2002 Mar 1;17(3):771-6.
- [7] Norman R, Wu R, Stankiewicz M. Polycystic ovary syndrome. *Medical Journal of Australia*. 2004 Feb 2;180(3):132-7. doi: 10.5694/j.1326-5377.2004.tb05838.x.
- [8] Vink JM, Sadrzadeh S, Lambalk CB, Boomsma DI. Heritability of polycystic ovary syndrome in a Dutch twin-family study. *The Journal of Clinical Endocrinology & Metabolism*. 2006 Jun 1;91(6):2100-4.
- [9] Escobar-Morreale HF, Luque-Ramírez M, San Millán JL. The molecular-genetic basis of functional hyperandrogenism and the polycystic ovary syndrome. *Endocrine reviews*. 2005 Apr 1;26(2):251-82.
- [10] Rosenfield RL. The polycystic ovary morphology-polycystic ovary syndrome spectrum. *Journal of pediatric and adolescent gynecology*. 2015 Dec 1;28(6):412-9.
- [11] Merkin SS, Phy JL, Sites CK, Yang D. Environmental determinants of polycystic ovary syndrome. *Fertility and sterility*. 2016 Jul 1;106(1):16-24.
- [12] Kaur J, Patil M, Kar S, Jirge PR, Mahajan N. Distribution of anthropometric, clinical, and metabolic profiles of women with polycystic ovary syndrome across the four regions of India. *Onco Fertil J*. 2019 Jan 1;2(1):20-6.
- [13] Yui MF, Lim CE, Luo X, Wong WS, Cheng NC, Zhan X. Polycystic ovarian syndrome in adolescence. *Gynecological Endocrinology*. 2009 Jan 1;25(10):634-9.
- [14] Ibáñez L, Díaz R, López-Bermejo A, Marcos MV. Clinical spectrum of premature pubarche: links to metabolic syndrome and ovarian hyperandrogenism. *Reviews in Endocrine and Metabolic Disorders*. 2009 Mar;10:63-76.
- [15] McPhee SJ, Papadakis M. Polycystic ovarian syndrome. *Current Medical Diagnosis and Treatment*. 49th ed. McGraw-Hill Medical. 2010;690.
- [16] Bronstein J, Tawdekar S, Liu Y, Pawelczak M, David R, Shah B. Age of onset of polycystic ovarian syndrome in girls may be earlier than previously thought. *Journal of pediatric and adolescent gynecology*. 2011 Feb 1;24(1):15-20.
- [17] Nazir F, Tasleem H, Tasleem S, Sher Z, Waheed K. Polycystic ovaries in adolescent girls from Rawalpindi. *JPMA. The Journal of the Pakistan Medical Association*. 2011 Oct 1;61(10):961-3.
- [18] Wang S, Alvero R. Racial and ethnic differences in physiology and clinical symptoms of polycystic ovary syndrome. In *Seminars in reproductive medicine* 2013 Sep (Vol. 31, No. 05, pp. 365-369). Thieme Medical Publishers.
- [19] Begum GS, Shariff A, Ayman G, Mohammad B, Housam R, Khaled N. Assessment of risk factors for development of polycystic ovarian syndrome. *diabetes*. 2017 Jan;1(2): 164-167.
- [20] Al-Fazari M, Sulaiman MAH, Al-Farsi YM, Al-Khaduri MM, Waly MI. Assessment of Risk Factors Related to Nutrition and Dietary Intake among Omani Women with Polycystic Ovarian Syndrome. *EC Nutrition*. 2017; 12(1): 18-28.

- [21] Sivayoganathan D, Maruthini D, Glanville JM, Balen AH. Full investigation of patients with polycystic ovary syndrome (PCOS) presenting to four different clinical specialties reveals significant differences and undiagnosed morbidity. *Hum Fertil (Camb)*. 2011 Dec;14(4):261-5. doi: 10.3109/14647273.2011.632058.
- [22] Al Souheil F, Chahine B. Knowledge of Polycystic Ovarian Syndrome, Its Complications, and Management among Lebanese Women: A Cross-Sectional Survey. *Journal of Health and Allied Sciences NU*. 2021 Dec 1;12(03):267-73.
- [23] El Sayed SL, El Sayed ML, Michael GC. Screening for Polycystic Ovarian Syndrome and Effect of Health Education on its Awareness among Adolescents: A Pre-Post Study. *International Journal of Nursing Education*. 2020 Oct 1;12(4).
- [24] Rotterdam ES. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. *Fertil Steril*. 2004 Jan ;81(1):19-25. DOI: 10.1016/j.fertnstert.2003.10.004
- [25] Legro RS, Arslanian SA, Ehrmann DA, Hoeger KM, Murad MH, Pasquali R, Welt CK. Diagnosis and treatment of polycystic ovary syndrome: an Endocrine Society clinical practice guideline. *The Journal of Clinical Endocrinology & Metabolism*. 2013 Dec 1;98(12):4565-92.
- [26] Williams T, Mortada R, Porter S. Diagnosis and treatment of polycystic ovary syndrome. *American family physician*. 2016 Jul 15;94(2):106-13.
- [27] Teede HJ, Misso ML, Costello MF, Dokras A, Laven J, Moran L, Piltonen T, Norman RJ. Recommendations from the international evidence-based guideline for the assessment and management of polycystic ovary syndrome. *Human reproduction*. 2018 Sep 1;33(9):1602-18.
- [28] Ferriman D, Gallwey JD. Clinical assessment of body hair growth in women. *The Journal of Clinical Endocrinology & Metabolism*. 1961 Nov 1;21(11):1440-7. DOI: <https://doi.org/10.1210/jcem-21-11-1440>
- [29] Zohra FT, Sultana T, Islam S, Nasreen T. Evaluation of Severity in Patients of Acne Vulgaris by Global Acne Grading System in Bangladesh. *Clinical Pathology & Research Journal*. 2017 June 15; 1(1): 1-5. DOI: 10.23880/cprj-16000105
- [30] Pusalkar M, Meherji P, Gokral J, Savardekar L, Chinnaraj S, Maitra A. Obesity and polycystic ovary syndrome: association with androgens, leptin and its genotypes. *Gynecological Endocrinology*. 2010 Dec 1;26(12):874-82. DOI: <https://doi.org/10.3109/09513590.2010.487586>
- [31] Preetha N, Ramaswamy L. Assessment of emerging adult women for poly cystic ovarian syndrome symptoms. *Indian Journal of Science and Technology*. 2016 Aug;9(30):1-5. DOI: 17485/ijst/2016/v9i30/88483
- [32] Priya PN, Shwetha MN. Knowledge regarding Polycystic Ovarian Syndrome among Young Female Adults. *Asian Journal of Nursing Education and Research*. 2019;9(1):84-6.
- [33] Upadhyia JP, Rai S, Acharya SV. Study of clinical characteristics of women with polycystic ovarian syndrome. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2020 Jun 1;9(6):2424-9.
- [34] Ashraf S, Nabi M, Rashid F, Amin S. Hyperandrogenism in polycystic ovarian syndrome and role of CYP gene variants: a review. *Egyptian Journal of Medical Human Genetics*. 2019 Dec;20(1):1-0. DOI: <https://doi.org/10.1186/s43042-019-0031-4>
- [35] Deswal R, Narwal V, Dang A, Pundir CS. The prevalence of polycystic ovary syndrome: a brief systematic review. *Journal of human reproductive sciences*. 2020 Oct;13(4):261. DOI: 10.4103/jhrs.JHRS\_95\_18
- [36] 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 Sep;6(11): 4971-5. DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20175010>
- [37] Aripin A, Jaber RM, Allias N, Omar S, Kamal NR, Dwekat O. Knowledge and attitudes towards polycystic ovary syndrome. *African Journal of Reproductive Health*. 2022 Apr 24;26(1):92-102.
- [38] Pitchai P, Sreeraj SR, Anil PR. Awareness of lifestyle modification in females diagnosed with polycystic ovarian syndrome in India: explorative study. *Int J Reprod Contracept Obstet Gynecol*. 2016 Feb 1;5(2):470-6. DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20160393>
- [39] Tsilchorozidou T, Overton C, Conway GS. The pathophysiology of polycystic ovary syndrome. *Clinical endocrinology*. 2004 Jan;60(1):1-7. doi: 10.1046/j.1365-2265.2003.01842.x

- [40] Sunanda B, Nayak S. A Study to Assess the Knowledge Regarding PCOS (Polycystic Ovarian Syndrome) among Nursing Students at NUINS. *Journal of Health and Allied Sciences NU*. 2016 Sep;6(03):24-6. DOI: 10.1055/s-0040-1708657
- [41] Patel J, Rai S. Polycystic ovarian syndrome (PCOS) awareness among young women of central India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2018 Oct 1;7(10): 3960-5. DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20183853>
- [42] Goh JE, Farrukh MJ, Keshavarzi F, Yap CS, Saleem Z, Salman M, Ramatillah DL, Goh KW, Ming LC. Assessment of prevalence, knowledge of polycystic ovary syndrome and health-related practices among women in Klang valley: A cross-sectional survey. *Frontiers in Endocrinology*. 2022 Aug 29; 13:985588.
- [43] Pramodh S. Exploration of Lifestyle Choices, Reproductive Health Knowledge, and Polycystic Ovary Syndrome (PCOS) Awareness Among Female Emirati University Students. *Int J Womens Health*. 2020 Oct 28; 12:927-938. doi: 10.2147/IJWH.S272867
- [44] Zaitoun B, Al Kubaisi A, AlQattan N, Alassouli Y, Mohammad A, Alameeri H, Mohammed G. Polycystic ovarian syndrome awareness among females in the UAE: a cross-sectional study. *BMC Women's Health*. 2023 Dec;23(1):1-2.
- [45] Ilyas N, Ghaffar A, Ahmad A. LEVEL OF AWARENESS OF POLYCYSTIC OVARIAN SYNDROME IN NON-MEDICAL FEMALE STUDENTS OF THE UNIVERSITY OF LAHORE. *Independent Journal of Allied Health Sciences*. 2019;2(04):186-91.
- [46] Haq N, Khan Z, Riaz S, Nasim A, Shahwani R, Tahir M. Prevalence and knowledge of polycystic ovary syndrome (PCOS) among female science students of different public Universities of Quetta, Pakistan. *Imperial Journal of Interdisciplinary Research*. 2017;35(6):385-92.
- [47] Ibrahim NA, Hamed Gad A, Salim HM. Phenotype Characteristics and Risk Factors of Polycystic Ovarian Syndrome among Nursing Students. *La Prensa Médica Argentina*. 2020 Aug:392.
- [48] Chainani EG. Awareness of polycystic ovarian syndrome among young women in Western India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2019 Dec 1;8(12):4716-21.
- [49] Jena SK, Mishra L, Naik SS, Khan S. Awareness and opinion about polycystic ovarian syndrome (PCOS) among young women: a developing country perspective. *International journal of adolescent medicine and health*. 2021 Jun 29;33(3):123-6. <https://doi.org/10.1515/ijamh-2018-0166>
- [50] Rajni SD, Deo S. Effectiveness of Informational Module regarding Polycystic Ovarian Syndrome on Knowledge among Young Women of Selected College at Lucknow. *International Journal of Science and Research (IJSR)*. 2020 September; 9 (9): 980-984. DOI: 10.21275/SR20915150549
- [51] Sehar S. Assessment of knowledge regarding polycystic ovary syndrome (PCOS) among nursing students. *International Journal of Nursing & Midwifery Research (E-ISSN: 2455-9318)*. 2020;7(3):42-5. DOI: <https://doi.org/10.24321/2455.9318.202025>
- [52] Jabeen A, Yamini V, Amberina AR, Eshwar MD, Vadakedath S, Begum GS, Kandi V. Polycystic Ovarian Syndrome: Prevalence, Predisposing Factors, and Awareness Among Adolescent and Young Girls of South India. *Cureus*. 2022 Aug 12;14(8). DOI: 10.7759/cureus.27943
- [53] Sharma P, Kaur M, Kumar S, Khetarpal P. A cross-sectional study on prevalence of menstrual problems, lifestyle, mental health, and PCOS awareness among rural and urban population of Punjab, India. *Journal of Psychosomatic Obstetrics & Gynecology*. 2022 Jul 3;43(3):349-58. DOI: <https://doi.org/10.1080/0167482X.2021.1965983>
- [54] Patil N, Jammalamadaka A, Hindodi A, Patel MI. Assessment of Knowledge and Prevalence of Risk Factors of Polycystic Ovarian Syndrome among Undergraduate Women: A Cross-Sectional Study. *Journal of Scientific Research in Medical and Biological Sciences*. 2023 May 19;4(2):10-8. DOI: <https://doi.org/10.47631/jsrmb.v4i2.571>
- [55] Soni KR, Agarwal S. To Evaluate the Knowledge and Awareness of PCOS among Women of Known Population: A Hospital Based Study. *Journal of Advanced Medical and Dental Sciences Research*. 2019 Oct;7(10). DOI: doi: 10.21276/jamdsr
- [56] Selvaraj V. Implementation of an awareness program and lifestyle intervention on polycystic ovarian syndrome among adolescent schoolgirls in India. *Acta Scientific Paediatrics*. 2020 May;3(5):24-30.

- [57] Donel J, Choudhary N, Sharma N, Garg N. The Effectiveness of a Structured Teaching Programme on Knowledge Regarding Polycystic Ovarian Syndrome (PCOS) among Adolescent Girls at a Selected School of Raipur. *International Journal of Nursing Care*. 2020 Jan 1;8(1). DOI: 10.37506/ijonc.v9i1.14002
- [58] Valarmathi ER, Metilda M. Effectiveness of Video Assisted Teaching Programme on Knowledge About Polycystic Ovarian Syndrome Among Adolescent Girls in a Selected School, Chennai. *International Journal of Midwifery Nursing*. 2022 Aug 9;5(2):30-4.

### Authors short Biography

	<p><b>Titas Ghosh</b> Titas Ghosh was born and educated in Kolkata. She has completed her Post-Graduation in Biological Anthropology from the University of Calcutta. Currently, she is pursuing a Ph.D. (final year) from the Department of Anthropology, University of Calcutta. She was a receiver of the ICSSR Doctoral Fellowship. She has published 2 articles in a peer-reviewed journal, 2 conference papers, and one article in an edited book chapter.</p>
	<p><b>Baidyanath Pal</b> Dr. Baidyanath Pal was born and completed his education in Burdwan. He was a former Associate Scientist-B in the Biological Sciences Division, Indian Statistical Institute. He has an experience of more than 25 years and his research area was Biostatistics especially biological and social anthropology. Additionally, he has been teaching Statistics and SPSS since 2017. He has published more than 20 research articles in peer-reviewed journals and more than 15 conference papers.</p>
	<p><b>Suwendu Maji</b> Sri Suwendu Maji was born and fulfilled his education in Kolkata. He has completed Post-Graduation from Delhi University. He is an Assistant Professor in the Department of Anthropology at, the University of Calcutta. His research interest is in Human Migration and Population Composition, Primate Behavior, and Anthropological Demography of public health. He has more than 15 publications in peer-reviewed journals and more than 10 conference papers.</p>
	<p><b>Monali Goswami</b> Dr Monali Goswami, born and educated in Odisha is a Biological Anthropologist of International Repute and presently working as an Associate Professor in the Department of Anthropology and Tribal Studies of the Maharaja Sriram Chandra Bhanjdeo University, Baripada, Odisha. Prior to that she was working as Assistant Professor of Department of Anthropology, University of Calcutta, Kolkata. She has published more than 55 publications in peer reviewed international and national journals, 86 conference papers and two books. She acts as a reviewer and does editorial jobs to various journals. She is listed in Who's Who in the World, USA.</p>