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Original Article

Pattern of Cutaneous Manifestations in Polycystic ovarian Syndrome

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is the most common endocrine disease among women of reproductive age, characterized by hyperandrogenism, ovulatory dysfunction, and metabolic abnormalities. Cutaneous symptoms, such as hirsutism, acne, acanthosis nigricans, androgenic alopecia often accompany the condition, but the distribution of these diseases varies among populations. Information about the pattern of these disorders among Bangladeshi PCOS patients is limited. The objective of the present study was to assess the frequency and pattern of cutaneous manifestations in women with PCOS. **Methods & Materials:** A hospital based cross-sectional study was conducted from July 2025 to June 2026 among 200 PCOS women aged 18-38 years at Dhaka Medical College Hospital, Dhaka. The sociodemographic characteristics, clinical presentation, anthropometric measurements and various cutaneous manifestation were collected. The data were analyzed using statistical software package (SPSS). The Chi-square test was used to see the association between different variables. A p-value of less than 0.05 was considered as statistically significant. **Results:** Of the total of 200 women with PCOS, the mean age and BMI were 25.8 +/- 4.6 years and 25.7 +/- 4.2 kg/m^2, respectively. Menstrual irregularity was seen in 79.0% and hirsutism in 63.0%. The most common cutaneous manifestations were acne (64.0%), followed by hirsutism (63.0%) and acanthosis nigricans (36.0%). BMI was significantly associated with acne and acanthosis nigricans, while hirsutism was significantly associated with acne and acanthosis nigricans ($p<0.05$). **Conclusion:** Cutaneous manifestations were common among women with PCOS, with acne and hirsutism being predominant. Higher BMI was significantly associated with acne and acanthosis nigricans.

Keywords: *Polycystic ovary syndrome; Cutaneous manifestations; Acne vulgaris; Hirsutism; Acanthosis nigricans; Body mass index; Hyperandrogenism.*

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INTRODUCTION

Polycystic ovary syndrome (PCOS) ranks among the most prevalent endocrine disorders that affect women during their reproductive years. It is a heterogeneous condition marked by hyperandrogenism, ovulatory dysfunction, and variable ovarian morphology, carrying significant reproductive, metabolic, and psychological consequences [1,2]. Women with PCOS may additionally develop insulin resistance, obesity, dyslipidemia, and other metabolic abnormalities [1,3].

Skin manifestations are frequent clinical features of PCOS and can offer visible hints of underlying hormonal and metabolic disturbances. The principal dermatological manifestations comprise hirsutism, acne, androgenic alopecia, acanthosis nigricans, seborrhea, and acrochordons [3-6]. Hirsutism, acne, and androgenic alopecia are chiefly linked to androgen excess, while acanthosis nigricans and acrochordons are often associated with insulin resistance and hyperinsulinemia [4-6]. The frequency and severity of these manifestations can differ according to hormonal status, body mass index, metabolic abnormalities, ethnicity, and individual characteristics.

Earlier studies have documented considerable variation in the prevalence and pattern of cutaneous manifestations among women with PCOS, with hirsutism, acne, acanthosis nigricans, and androgenic alopecia being commonly reported [7-11]. A recent nationwide cross-sectional survey assessed women for PCOS using the International Evidence-Based Guidelines and found that PCOS was present in a notable proportion of participants. Irregular menstrual cycles and significant hirsutism were among the common clinical features. Women with PCOS also showed more frequent acanthosis nigricans, acne, and excessive facial or body hair growth compared with those without PCOS, while metabolic abnormalities were also more common among affected women [12].

Despite this recent nationwide evidence regarding the prevalence and clinical characteristics of PCOS in Bangladesh, specific data on the overall pattern and distribution of cutaneous manifestations remain scarce, especially in clinical populations. This constitutes an important research gap, since dermatological features may mirror underlying androgen excess and metabolic abnormalities and can also markedly impact psychosocial well-being. Accordingly, the present study sought to evaluate the pattern and frequency of cutaneous manifestations among women with polycystic ovarian syndrome, with particular focus on common dermatological features, in order to supply local evidence that may aid early recognition, appropriate evaluation, and comprehensive management of PCOS.

METHODS & MATERIALS

Study design and setting

A hospital-based cross-sectional study was conducted to assess the pattern of cutaneous manifestations among women with polycystic ovary syndrome (PCOS). The study was carried out from July 2025 to June 2026 at Dhaka College Hospital, Dhaka, Bangladesh. Participants were recruited from the relevant outpatient departments during the study period.

Study population

The study included women aged 18–38 years who had a diagnosis of PCOS and attended Chittagong Medical College Hospital during the study period. The diagnosis of PCOS was based on the clinical assessment and available medical records, following accepted diagnostic criteria. Women who fulfilled the eligibility criteria and provided informed consent were included in the study.

Sample size and sampling technique

A total of 200 women with PCOS were included in the study. Eligible participants were recruited using a consecutive

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sampling technique until the required sample size was achieved.

Data collection

Data were collected using a structured questionnaire through face-to-face interviews and clinical examination. Sociodemographic information including age, marital status, residence, and educational status was recorded. Relevant clinical information, including menstrual pattern, history of infertility or subfertility, and features of hyperandrogenism, was also documented.

Anthropometric assessment

Body weight and height were measured using standard procedures. Body mass index (BMI) was calculated as weight in kilograms divided by height in metres squared. For analysis, participants were categorized according to BMI as normal, overweight, or obese using the BMI classification applied in the study. The mean BMI of the study participants was also recorded.

Assessment of cutaneous manifestations

All participants underwent a clinical dermatological examination to identify cutaneous manifestations associated with PCOS. The assessment included examination for acne vulgaris, hirsutism, acanthosis nigricans, androgenetic alopecia, melasma, skin tags (acrochordons), and seborrhea. Hirsutism was assessed clinically based on the presence and distribution of terminal hair in androgen-dependent areas. Acanthosis nigricans was identified by the presence of characteristic hyperpigmented, velvety thickening of the skin, particularly in flexural areas. Other cutaneous manifestations were diagnosed based on their characteristic clinical features. Participants could have more than one cutaneous manifestation.

Study variables

The primary outcome variable was the presence and pattern of cutaneous manifestations among women with PCOS. The main explanatory variable was BMI category. Sociodemographic and clinical variables included age, marital status, residence, educational status, menstrual pattern, infertility/subfertility, and clinical hirsutism.

Statistical analysis

Data were checked for completeness, coded, and analyzed using IBM SPSS Statistics. Continuous variables were expressed as mean and standard deviation, while categorical variables were presented as frequencies and percentages. The prevalence of individual cutaneous manifestations was calculated. Associations between categorical variables, including BMI category and selected cutaneous manifestations, were assessed using the Chi-square test. A p-value of <0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the appropriate institutional ethical review committee before commencement of the study. Written informed consent was obtained from all participants after explaining the purpose and procedures of the study. Participation was voluntary, and confidentiality of all personal and clinical information was maintained throughout the study. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

RESULTS

Sociodemographic characteristics

Table I shows total of 200 women diagnosed with polycystic ovary syndrome (PCOS) were included in the study. The mean age of the participants was 25.8 ± 4.6 years, with an age range of 18–38 years. The majority of participants belonged to the 21–25-year age group (37.0%), followed by 26–30 years (31.0%). Most participants were married (58.5%), while 41.5% were unmarried. Regarding residence, 54.0% of the participants were from urban areas and 46.0% were from rural areas.

Table I

Sociodemographic characteristics of the study participants (*n*=200).

Variable	Frequency (n)	Percentage (%)
Age group (years)		
18–20	28	14.0
21–25	74	37.0
26–30	62	31.0
31–38	36	18.0
Marital status		
Married	117	58.5
Unmarried	83	41.5
Residence		
Urban	108	54.0
Rural	92	46.0
Educational status		
Up to secondary	42	21.0
Higher secondary	58	29.0
Graduate or above	100	50.0

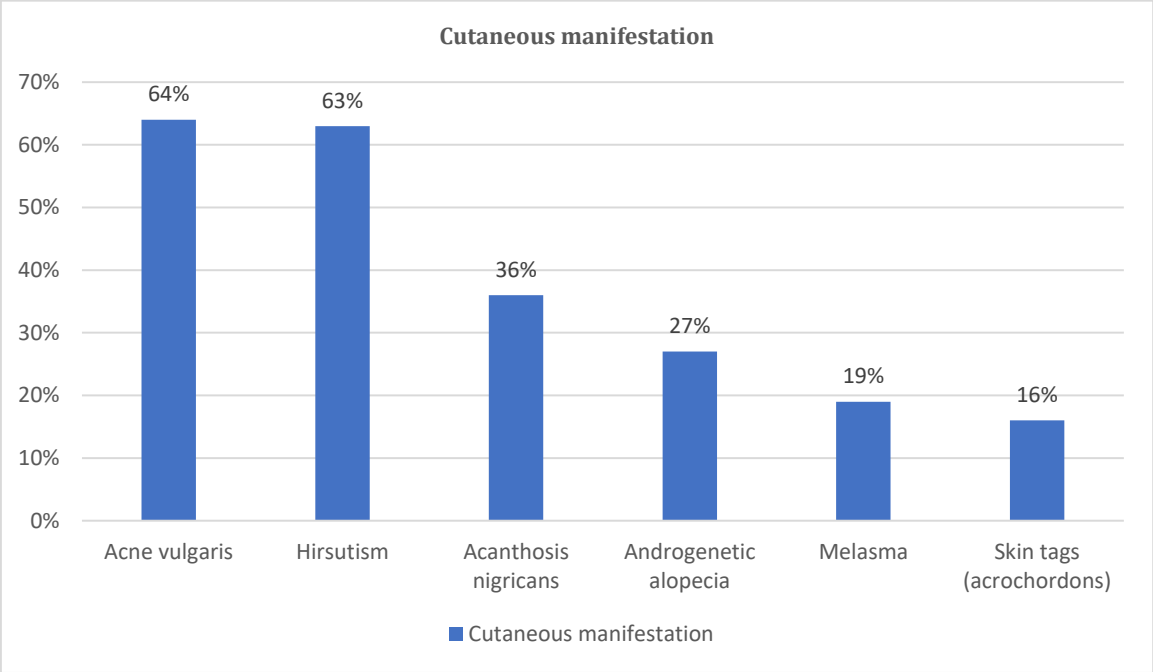
Clinical and anthropometric characteristics

Table II shows the mean BMI of the participants was 25.7 ± 4.2 kg/m². Based on BMI classification, 63 (31.5%) participants had normal BMI, 73 (36.5%) were overweight, and 64 (32.0%) were obese. Regarding common clinical features of PCOS, menstrual irregularity was reported by 158 (79.0%) participants, while infertility/subfertility was reported by 72 (36.0%). Clinical evidence of hirsutism was present in 126 (63.0%) participants.

Table II
Clinical and anthropometric characteristics of the participants (*n*=200).

Variable	Frequency (n)	Percentage (%)
BMI category (kg/m²)		
Normal (<23)	63	31.5
Overweight (23–27.4)	73	36.5
Obese (≥27.5)	64	32.0
Menstrual pattern		
Regular	42	21.0
Irregular	158	79.0
Infertility/subfertility		
Present	72	36.0
Absent	128	64.0
Clinical hirsutism		
Present	126	63.0
Absent	74	37.0

Pattern of cutaneous manifestations
Figure 1 show cutaneous manifestations were common among the study participants. Acne vulgaris was the most frequently observed manifestation, present in 128 (64.0%) participants, followed by hirsutism in 126 (63.0%), acanthosis nigricans in 72 (36.0%), androgenetic alopecia in 54 (27.0%), melasma in 38 (19.0%), and skin tags in 32 (16.0%). Since participants could have more than one cutaneous manifestation, the percentages do not add up to 100%.



Note: Multiple responses were recoded

Figure 1 Distribution of cutaneous manifestations among women with PCOS (*n*=200).

Association between BMI and selected cutaneous manifestations
Table III shows the prevalence of acne increased with increasing BMI, being observed in 55.6% of participants with normal BMI, 75.3% of overweight participants, and 62.5% of obese participants. The association between BMI category and acne was statistically significant (χ^2=6.78, p=0.034). Acanthosis nigricans showed a more pronounced association with BMI. It was present in 14.3% of participants with normal BMI, compared with 39.7% of overweight and 54.7% of obese participants (χ^2=24.44, p<0.001). Hirsutism was also more frequent among overweight and obese participants, although the association did not reach statistical significance (p=0.087).

Table III
Association between BMI category and selected cutaneous manifestations (*n*=200).

BMI category	Acne, n (%)	Hirsutism, n (%)	Acanthosis nigricans, n (%)
Normal (n=63)	35 (55.6)	35 (55.6)	9 (14.3)
Overweight (n=73)	55 (75.3)	49 (67.1)	29 (39.7)
Obese (n=64)	40 (62.5)	42 (65.6)	35 (54.7)
χ^2, p-value	6.78, 0.034	4.88, 0.087	24.44, <0.001

Association between clinical hirsutism and selected cutaneous manifestations

Table IV shows among participants with clinical hirsutism, acne vulgaris was present in 88 (69.8%), compared with 40 (54.1%) among those without clinical hirsutism. Acanthosis nigricans was observed in 52 (41.3%) participants with hirsutism compared with 20 (27.0%) without hirsutism. Both associations were statistically significant. Androgenetic alopecia was also more common among participants with hirsutism (31.0% vs. 20.3%), although the difference was not statistically significant (p=0.105).

Table IV

Association between clinical hirsutism and selected cutaneous manifestations (*n*=200).

Cutaneous manifestation	Hirsutism present (n=126), n (%)	Hirsutism absent (n=74), n (%)	χ^2	p-value
Acne vulgaris	88 (69.8)	40 (54.1)	5.04	0.025
Acanthosis nigricans	52 (41.3)	20 (27.0)	4.19	0.041
Androgenetic alopecia	39 (31.0)	15 (20.3)	2.62	0.105
Melasma	27 (21.4)	11 (14.9)	1.32	0.251

DISCUSSION

The present study enrolled 200 women diagnosed with PCOS, who had a mean age of 25.8±4.6 years. Most of them were aged between 21 and 25 years, were married, resided in urban areas, and were graduates or above. The current study is comparable to the previous study conducted in Bangladesh, which revealed that the majority of participants were aged between 15 and 25 years (60.15%), were married (52.81%), and were graduates (73.11%). However, in the present study, a higher percentage of participants were from rural areas (46.0%) than the previous study (21.03%) [13]. Therefore, it can be concluded that PCOS predominantly affects young, married, and educated females.

The present study showed that the mean BMI was 25.7±4.2 kg/m² with 36.5% overweight and 32.0% obese. The prevalence of menstrual irregularity, infertility/subfertility, and clinical hirsutism was 79.0%, 36.0%, and 63.0%, respectively. This study was similar to another study conducted in Bangladesh which showed a mean BMI of 26.3±5.6 kg/m² with 29.7% overweight and 39.4% obese. The prevalence of menstrual irregularity was 88.0%, while that of hirsutism was 94.9% [14]. It might be explained by differences in age and study population.

The present study revealed that the prevalence rates of cutaneous manifestations in women with PCOS were the highest for acne vulgaris, followed by hirsutism, acanthosis nigricans, androgenetic alopecia, melasma, and skin tags. The current results are consistent with previous studies which demonstrated that acne and hirsutism were the most frequently encountered dermatological abnormalities among females affected by PCOS [15]. Another study conducted among adult females with acne also revealed a significant association between acne and PCOS [16]. The aforesaid findings underline the high prevalence rates of cutaneous abnormalities among females diagnosed with PCOS as well as their potential usefulness for the identification of the disease.

The current research uncovered a significant link between BMI and acne and acanthosis nigricans, whereas hirsutism was more prevalent in overweight and obese patients, but the result was not statistically significant. The study is consistent with the previous research, which also revealed a relationship between BMI and several physical manifestations of PCOS [17,18]. Therefore, it can be concluded that increased BMI tends to be associated specifically with acne and acanthosis nigricans.

A recent study revealed that acne vulgaris and acanthosis nigricans were significantly more prevalent in patients with hirsutism. Interestingly, this study is consistent with previously published data, which demonstrated a high prevalence of concurrent acne, acanthosis nigricans, and hirsutism in patients with PCOS [5,6]. This might be explained by the fact that hyperandrogenism and metabolic abnormalities are frequently involved in the pathophysiology of PCOS.

In general, cutaneous manifestations were common among women with PCOS, with acne and hirsutism predominating, and higher BMI was particularly associated with acne and acanthosis nigricans.

CONCLUSION

The current study identified the presence of numerous skin manifestations among PCOS patients with acne vulgaris and hirsutism being the most commonly diagnosed signs followed by acanthosis nigricans and androgenetic alopecia. The study also found that higher BMI increases the likelihood of developing acne and acanthosis nigricans while hirsutism is significantly associated with acne and acanthosis nigricans. Overall, the current study provides a basis for the recognition of skin symptoms as a common presentation of PCOS and the need for their assessment during patient management.

REFERENCES

1. Stener-Victorin E, Teede H, Norman RJ, Legro R, Goodarzi MO, Dokras A, Laven J, Hoeger K, Piltonen TT. Polycystic ovary syndrome. Nature reviews Disease primers. 2024 Apr 18;10(1):27.
2. Joham AE, Norman RJ, Stener-Victorin E, Legro RS, Franks S, Moran LJ, Boyle J, Teede HJ. Polycystic ovary syndrome. The lancet Diabetes & endocrinology. 2022 Sep 1;10(9):668-80.
3. Escobar-Morreale HF. Polycystic ovary syndrome: definition, aetiology, diagnosis and treatment. Nature Reviews Endocrinology. 2018 May;14(5):270-84.
4. Farhan M, Seyfi A, Alnuaimi A, Alamour M, Alwarafi S, Elastal H, Nazir MH, Kamaraj B, Nagarajan HD, Delianne D, Ganesan S. A narrative review on cutaneous manifestations in polycystic ovary syndrome: pathophysiology, diagnosis, management, and psychosocial impact. Annals of Medicine and Surgery. 2025 Mar 28;87(5):2804.
5. Abusailik MA, Muhanna AM, Almuhisen AA, Alhasanat AM, Alshamaseen AM, Mustafa SM, Nawaiseh MB. Cutaneous manifestation of polycystic ovary syndrome. Dermatology reports. 2021 Sep 15;13(2):8799.
6. Carmina E. Cutaneous manifestations of polycystic ovary syndrome. Current Opinion in Endocrine and Metabolic Research. 2020 Jun 1;12:49-52.
7. Kaur S, Gupta SK, Juneja SK, Kaur S, Rani M. Study of cutaneous manifestations of polycystic ovarian syndrome. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2020 Apr 1;9(4):1627-32.
8. Aljefri YE, Alahmadi RA, Alajmi RS, Alkhamisi TA, Maaddawi HA, Alraddadi AA, Alamri AM, Alahmadi R, Alraddadi A, Alamri A. Cutaneous manifestations and hormonal changes among polycystic ovary syndrome patients at a tertiary care center. Cureus. 2021 Dec 22;13(12).
9. Feng JG, Guo Y, Ma LA, Xing J, Sun RF, Zhu W. Prevalence of dermatologic manifestations and metabolic biomarkers in women with polycystic ovary syndrome in north China. Journal of cosmetic dermatology. 2018 Jun;17(3):511-7.
10. Mukkamala S, Aruna C, Senthil AL, Kameti S. Cutaneous manifestations in polycystic ovarian syndrome: a clinico-epidemiological study. Journal of Pakistan Association of Dermatologists. 2018;28(4):410-4.

11. de Souza Martins G, de Almeida JA, Trigueiro AP, de Melo Alexandrino DB, de Queiroz Albuquerque F, Junqueira JF, Silva GA, de Souza TH, de Freitas Ribeiro G, Cavalcante TA, Sampaio KC. Dermatological manifestations of polycystic ovary syndrome. Brazilian Journal of Implantology and Health Sciences. 2024 Feb 26;6(2):2180-93.
12. Morshed MS, Hasan M, Tofail T, Banu H, Sultana N, Illiyas SB, Siddika MA, Islam R, Mahrukh H, Ferdousi T, Roy I. Prevalence and characteristics of women with polycystic ovary syndrome and isolated diagnostic feature using the International evidence-based guideline and antimüllerian hormone: A nationwide cross-sectional survey. medRxiv. 2025 Jul 31:2025-07.
13. Hasan M, Sultana S, Sohan M, Parvin S, Rahman MA, Hossain MJ, Rahman MS, Islam MR. Prevalence and associated risk factors for mental health problems among patients with polycystic ovary syndrome in Bangladesh: A nationwide cross—Sectional study. PloS one. 2022 Jun 22;17(6):e0270102.
14. Kamrul-Hasan AB, Aalpona FT, Selim S. Clinical, metabolic and hormonal profiles of Bangladeshi adolescents with polycystic ovary syndrome. touchREVIEWS in Endocrinology. 2021 Apr 28;17(1):54.
15. Khondker L, Nabila N. Comparison of lifestyle in women with Polycystic Ovary Syndrome (PCOS) and healthy women. The Gulf Journal of Dermatology and Venereology. 2022;29(1).
16. Chanyachailert P, Chularojanamontri L, Chantrapanichkul P, Tuchinda P, Wongwananuruk T, Sardod P, Kulthanan K. Adult female acne: Clinical characteristics and factors significantly associated with polycystic ovary syndrome. Australasian Journal of Dermatology. 2021 Nov;62(4):e532-8.
17. Rao VS, Cowan S, Armour M, Smith CA, Cheema BS, Moran L, Lim S, Gupta S, Manincor MD, Sreedhar V, Ee C. A Global Survey of ethnic Indian women living with polycystic ovary Syndrome: co-morbidities, concerns, diagnosis experiences, Quality of Life, and Use of Treatment methods. International journal of environmental research and public health. 2022 Nov 28;19(23):15850.
18. Kaur R, Kaur M, Suri V. Does body mass index have an effect on the prevalence of various symptoms of polycystic ovary syndrome and their associated risk factors?. Anthropological Review. 2021 Jun 30;84(2):101-16.