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RESEARCH ARTICLE

Depression, anxiety and stress assessment in women with polycystic ovary syndrome attending a tertiary care hospital in Bangladesh

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Abstract

Background: This study evaluated depression, anxiety, and stress in women with polycystic ovary syndrome (PCOS) using the depression, anxiety, and stress scale-21 (DASS-21) and examined their live experiences with this endocrine disorder.

Methods: A mixed-methods study, combining an analytical cross-sectional study and qualitative grounded theory, was conducted from February to June 2022 at Bangabandhu Sheikh Mujib Medical University. The study involved 266 pre-diagnosed women with PCOS. Psychological symptoms were assessed using the DASS-21. Additionally, 10 in-depth patient interviews and 6 key-informant interviews with mothers explored the personal and societal dynamics of PCOS.

Results: The survey revealed significant psychological distress among participants, with 32% as "moderate" for depression, 68% as "extremely severe" for anxiety, and 45% as "severe" for stress. Participants had a mean age of 24.2 years (standard deviation 5.4) and were pre-diagnosed cases of PCOS. Married women had higher odds of anxiety (OR 2.0; 95% CI 1.1–3.2), while menstrual problems predicted both anxiety (OR 2.0; 95% CI 1.0–3.4) and stress (OR 2.0; 95% CI 1.0–3.4). Insomnia significantly predicted anxiety (OR 3.0; 95% CI 1.4–6.2) and stress (OR 2.3; 95% CI 1.1–5.1). Societal stigma compounded these challenges, with unmarried girls concerned about acne and hirsutism, and their mothers focusing on menstrual irregularities and fertility. Married women delayed care-seeking by 2–3 years, driven by infertility concerns, highlighting societal pressures around marriage and childbearing as more significant stressors than PCOS itself.

Conclusion: Women with PCOS face significant mental health challenges which are exacerbated by marital status, insomnia, menstrual issues, and societal stigma. Family support plays a role in coping with the condition.

Key messages

Women with polycystic ovary experience significant psychological distress, with high anxiety, stress, and moderate depression levels. Insomnia, marital status, and menstrual issues are key predictors. The societal stigma surrounding acne, hirsutism, and infertility intensifies the emotional burden and delays healthcare-seeking. Enhancing awareness, reducing stigma, and strengthening mental health support are crucial for improving well-being and timely intervention.

Introduction

Polycystic ovarian syndrome (PCOS) is a multifaceted endocrine condition [1]. While traditionally recognized for its reproductive and metabolic aspects. Recent research highlights its connection with psychological well-being, notably depression and anxiety [2]. With an estimated 8-13% prevalence among reproductive-aged women and a high rate of underdiagnosis, PCOS poses a substantial public health concern [3, 4]. Recent research indicates that women with PCOS are up to six times more [5] likely to experience moderate to severe anxiety and up to four times more [6] likely to exhibit symptoms of depression [7, 8]. In a narrative review conducted in Bangladesh, the prevalence of PCOS ranged from 6.11% (among the subjects visiting the gynecology OPDs) to 92.16% (in subjects consulted for hirsutism) [9], yet research on its psychological effects in this context is limited, especially in tertiary care settings [10]. Understanding these effects is crucial for effective disease management, quality of life improvement, and treatment adherence [11]. This study aimed to highlight the psychosocial aspects of PCOS, helping healthcare providers create interventions for both the physical and emotional needs of affected women.

Methods

Study design, sampling methodology

A mixed-methods study was conducted from February to June 2022 at the Endocrinology and Obstetrics and Gynaecology outpatient departments (OPDs) of Bangabandhu Sheikh Mujib Medical University (BSMMU). The sample size, calculated using the formula $Z^2p(1-p)/d^2$, was based on a 52% prevalence of depression among women with PCOS (Sulaiman et al., 2017). With a 95% confidence level (Z=1.96) and a 5% margin of error, the required sample size was 384. Due to practical constraints, 266 participants were purposively enrolled, achieving 40% statistical power. Grounded theory served as the basis of the qualitative component. Purposive sampling selected participants with diverse perspectives on PCOS. 16 in-depth interviews (IDI) were conducted in Bangla using IDI guidelines, with informed written consent from adolescent girls, their mothers, and women. The sample size was determined by data saturation.

Data collection tool

The severity of depression, anxiety, and stress was measured using a Bangla-validated version of the depression anxiety and stress scale (DASS)-21[12]. Each subscale has 7 items, with participants rating items on a 4-point scale (0–3). Participants rated each item on a 4-point scale reflecting their experiences during the previous week. Scores are normal, mild, moderate, severe, and extremely severe. Depression ranges from 0–9 (normal) to 28+ (extremely severe), anxiety from 0–7 (normal) to 20+ (extremely severe), and stress from 0–14 (normal) to 34+ (extremely severe) [12]. Other questions were translated into Bangla and pre-tested with 10 PCOS patients to ensure clarity and cultural relevance.

Data collection procedure

Participants were recruited from the PCOS clinic at BSMMU. Women aged 18–40 years with PCOS were selected. Those with severe psychiatric conditions, unrelated chronic illnesses, or unwilling to participate were excluded. Two female research officers underwent five-day training. Survey tools were designed in English and translated into Bangla. Respondents were briefed on research objectives and ice-breaking questions. Qualitative interviews, lasting 45–60 minutes, were conducted face-to-face in Bangla and audio recorded. Surveys ensured privacy and confidentiality.

Quantitative statistical analysis

Quantitative statistical analysis involves both descriptive and inferential statistics. Descriptive statistics were used for age and other demographic variables. Depression, anxiety, and stress were quantified using the DAS scale, with mean scores. Logistic regression explored relationships between predictor and dependent variables. The statistical analysis was performed using the SPSS version 25.

Qualitative thematic analysis

For qualitative data analysis, recordings were downloaded and transcribed, with field notes cross-referenced with transcripts. A-priori codes were developed with additional inductive codes generated through repeated transcript review. These codes were further broken down into subcodes, resulting in 15 a-priori codes and 5 themes. Transcripts were organised according to predefined codebooks for data clustering, comparison, and theme identification. Thematic analysis was manually conducted to explore emerging patterns and insights.

Ethical consideration

This study received ethical approval from the Institutional Review Board (IRB) of Bangabandhu Sheikh Mujib Medical University and was conducted following the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants, outlining the study objectives, participation rights, and the option to withdraw at any stage. For participants under 18 years of age, written assent was required, accompanied by informed consent from a parent or legal guardian.

Results

Among the 266 participants, the majority of them were in their mid-twenties. The participants had a nearly equal distribution of married and unmarried individuals. Most resided in urban areas, and most participants attained at least higher secondary education (Table 1).

Psychological impact of PCOS

Quantitative findings

The DASS-21 showed that anxiety was the most prevalent distress among participants, with 68.0% classified as "extremely severe." Stress followed at 44.7% "Severe." Depression was lower, with 23.3% "extremely severe." Table 2.

Table 1 Background characteristics of the respondents (n=266)

Variables	n (%)
Marital status	
Married	134 (50.4)
Unmarried	132 (49.6)
Residence	
Urban	187 (70.3)
Rural	79 (29.7)
Education	
Upto secondary	81 (30.5)
Higher secondary and above	185 (69.5)
Occupation	
Students	128 (48.0)
govt. employee and non-govt. employee	21 (8.0)
Homemakers	117 (44.0)
Number of children of the married respondent (n=134)	
Yes	61 (45.5)
No	73 (54.5)
Menstrual problems (menorrhagia, amenorrhea, and dysmenorrhea)	
Yes	151 (56.8)
No	115 (43.2)
Hirsutism	
Yes	241 (90.6)
No	25 (9.4)
Acne	
Yes	154 (57.9)
No	112 (42.1)
Insomnia	
Yes	200 (75.2)
No	66 (24.8)
Hormonal problems (hyperthyroidism, and hypothyroidism)	
Yes	41 (15.4)
No	225 (84.6)
Increased appetite	
Yes	130 (48.9)
No	136 (51.1)
Infertility	
Yes	50 (18.8)
No	216 (81.2)

Qualitative insights into psychological stress

In-depth interviews revealed the emotional burden of PCOS, with participants expressing sadness, frustration, and hopelessness over their condition's unpredictability. "Why am I not recovering from this disease? I wonder if this disease will ever get better! Or will it get worse? There have been other problems as well. I am always stressed. I find it difficult to stay relaxed" (Unmarried woman, 24 years)

Table 2 Scores of depression, anxiety and stress among participants with polycystic ovarian syndrome (n=266)

Psychological condition	Depression, anxiety and stress 21 scale				
	Normal	Mild	Moderate	Severe	Extremely severe
Depression range	0-9	10–12	13–20	1–27	28–42
Depression n (%)	39 (14.7)	0 (0.0)	86 (32.2)	79 (29.7)	62 (23.3)
Anxiety range	0–7	8–9	10–14	15-19	20–42
Anxiety n (%)	3 (1.1)	5 (1.9)	37 (13.9)	40 (15.0)	181 (68.0)
Stress range	0–14	15–18	19–25	26–33	34–42
Stress n (%)	2 (0.8)	25 (9.4)	107 (40.2)	119 (44.7)	13 (4.9)

Stigma and social support

Experience of stigma

Participants reported stigma related to PCOS. Unmarried girls were especially concerned about appearance, with acne and hirsutism often overshadowing the PCOS diagnosis. Mothers of these unmarried girls, however, were more focused on menstrual irregularities and the potential impact on fertility after marriage. "I came here today because my daughter's periods have been irregular since she started menstruating. She bleeds once every 2 to 3 months. This can be problematic in the future for having children" (Mother of unmarried female, 52 years)

Role of social support

Despite facing stigma, participants also highlighted the importance of social support networks in navigating the challenges of PCOS. Participants expressed gratitude for supportive family members and friends who offered empathy and encouragement throughout their PCOS journey. "My family supports me immensely. They say no matter how long it takes they will bear my treatment cost. Though we have financial issues, my brother and mother have always been very helpful towards me" (Unmarried female, 21 years old)

Psychological burden and societal pressures associated with PCOS

Concerns over body image and marriage

Qualitative interviews further illuminate the emotional and social consequences of PCOS, with participants expressing significant concerns regarding body image and societal expectations. Physical symptoms of PCOS, such as weight gain, acne, and hirsutism, often result in dissatisfaction with appearance, reduced social confidence, and feelings of inadequacy, exacerbated by societal comparisons and stigmatization. "My daughter always feels upset. She doesn't like to go outside because of her physical appearance. She is always irritable and sometimes feels too tired from dealing with all of this" (mother, 48 years old).

PCOS symptoms like facial hair and acne, significantly impact self-esteem, causing internalized stigma and negative self-perceptions. Unmarried participants reported distress over societal beauty standards, fear of marital rejection, and narratives linking PCOS to infertility. "People behave oddly when they see this facial hair, perhaps it is just me who feels odd coming in front of people. People pass remarks on facial hair, and some people may forget these hurtful words, but for me, it is quite difficult to get these words out of my head" (Unmarried female, 19 years)

Fertility related anxiety and marital pressure

In qualitative interviews, participants expressed distress over potential infertility, with irregular menstrual cycles and anovulation contributing to feelings of uncertainty and frustration. Societal pressures to conceive amplify this anxiety, leading to feelings of inadequacy. "Everyone thinks that women with PCOS have difficulty conceiving. One of my

cousins had PCOS, and after marriage, she couldn't conceive. She eventually got divorced because of it" (unmarried female, 18 years old).

"I am trying for a baby, and the doctor said it might take 7 to 8 months. But my in-laws think it's all my fault" (married female, 28 years old).

Quantitative association with psychological distress

Multivariate Logistic regression (Table 3) revealed marriage as a significant predictor of anxiety, with married women showing a twofold increase in anxiety (95% CI 1.1–3.2). Menstrual problems were associated with elevated stress, with affected participants being twice as likely to experience higher stress levels (95% CI 1.0–3.4). Women with insomnia had three times the odds of anxiety (95% CI 1.4–6.3) and over twice the odds of stress (95% CI 1.1–5.1) compared to those without insomnia.

Table 3 Multivariate logistic regression model for the dependent variables' depression, anxiety, and stress (n=266)

Predictor value	Dependent variables		
	Depression Odds ratio (95% CI)[c]	Anxiety Odds ratio (95% CI)[c]	Stress Odds ratio (95% CI)[c]
Marriage	2.2 (1.0–5.3)	2.0 (1.1–3.2) [a]	2.0 (1.0–3.0)
Menstrual problem	1.0 (0.2–1.3)	2.0 (1.0–3.2) [a]	2.0 (1.0–3.4) [a]
Hirsutism	0.4 (0.1–1.5)	2.2 (1.0–7.0)	1.0 (0.2–2.0)
Acne	1.1 (1.0–3.0)	1.0 (0.4–1.3)	1.0 (0.4–2.0)
Insomnia	1.0 (0.3–2.0)	3.0 (1.4–6.2) [b]	2.3 (1.1–5.1) [a]
Hormonal problem	1.1 (0.1–11.0)	1.0 (0.2–3.4)	1.0 (0.2–3.0)
Increased appetite	1.0 (0.3–2.0)	1.3 (1.0–2.3)	1.2 (1.0–2.2)
Infertility	0.3 (0.3–2.0)	0.2 (0.0–1.0) [a]	1.0 (0.2–2.0)

[a]$P<0.05$, [b]$P<0.01$, [c]CI indicates confidence interval

Healthcare experiences and access to treatment

Unmarried participants sought medical help 3 to 5 years after experiencing symptoms. Married individuals sought help when facing conception challenges. Access to healthcare varied due to socioeconomic status, location, and healthcare infrastructure, affecting the availability of PCOS-specific resources and expertise. "I stopped taking tablets between because we have financial problems. I am just a student and my brother is the only earning member. I am now thinking of starting again because my symptoms have reappeared". (Unmarried female, 18 years old).

Most patients were satisfied with the care for depression and anxiety among women with PCOS at a tertiary hospital in Bangladesh. Participants praised the competence, compassion, and attentiveness of healthcare providers.

Family and societal roles in PCOS management

Participants highlighted the importance of understanding and support from loved ones and society, advocating for a stigma-free environment. They emphasised the need for awareness, positive attitudes, and support systems that foster empowerment and well-being, underscoring the transformative impact of acceptance in promoting resilience and holistic management of PCOS. 'I just want to say that every family has to create a positive mind about PCOS. For that they should be informed about the disease and support the woman to overcome the disease' (Married female, 28 years old).

Discussion

This study sheds light on the psychological impact, stigma, and healthcare experiences of women with PCOS at a tertiary hospital in Bangladesh. High levels of anxiety (68% "extremely severe") and stress (45% "severe") were found, with insomnia as a significant predictor. The stigma around acne, hirsutism, and infertility was a dominant stressor, exacerbated by societal expectations. Delays in healthcare-seeking due to financial and social barriers were noted, despite overall satisfaction with care. Family support, while protective, did not fully mitigate psychological distress.

The psychological burden observed, characterized by elevated anxiety and moderate depression, aligns with findings from global research. Talbott *et al.* similarly note higher anxiety levels in PCOS patients compared to depression. Compared to western studies, the higher anxiety levels found in this study suggested that the culture of Bangladesh may amplify anxiety [13, 14].

Stigma was a pervasive issue, with participants expressing shame over symptoms like acne and hirsutism, as seen in studies from the US and India. Stigma worsened psychological distress, highlighting the need for targeted interventions. Family support, crucial for coping, aligns with global studies showing its benefits [15-17].

The association between insomnia and psychological distress aligns with global research linking sleep disturbances to anxiety and stress. The relationship is likely bidirectional, with insomnia predicting anxiety and stress, and psychological distress contributing to sleep disturbances. Participants' concerns about body image and fertility reflect broader issues also found in UK and Australian studies [18, 19].

Regarding healthcare experiences, our findings reveal delays in seeking treatment, mirroring barriers of timely diagnosis in resource-limited settings. Socioeconomic challenges, such as financial constraints, significantly impact healthcare access. Despite these barriers, participants reported satisfaction with care, contrasting with findings in some western studies where dissatisfaction is more prevalent [19, 20].

The study provides valuable insights but has limitations. The small sample size resulted in a statistical power of only 40% for detecting true associations. Therefore, the findings may have limited generalisability and sensitivity to subtle associations.

Conclusion

This study highlights the psychological burden of PCOS, worsened by the stigma around symptoms like acne and hirsutism. Familial support aids coping, emphasizing the need for context-specific interventions in Bangladesh to reduce stigma, enhance mental health support, and improve healthcare access.

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Author contributions

Conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: FH, NA, UH, H. *Drafting the work or reviewing it critically for important intellectual content:* FH, SS, RKK, MSA, NA, UH, H, BN, SSI. *Final approval of the version to be published:* FH, SS, RKK, MSA, NA, UH, H, BN, SSI. *Accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved:* FH.

Conflict of interest

We do not have any conflict of interest.

Data availability statement

We confirm that the data supporting the findings of the study will be shared upon reasonable request.

Supplementary file

None

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