



## Raising Awareness and Promoting Management of Polycystic Ovarian Syndrome (Pcos): An Interdisciplinary Community-Based Approach across Educational and Marginalized Groups

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### ABSTRACT

*Polycystic Ovarian Syndrome (PCOS) is one of the most prevalent endocrinological disorders affecting women of reproductive age, with significant implications for reproductive, metabolic, and psychological health. Despite its high prevalence, awareness and management practices remain alarmingly low in many South Asian contexts due to sociocultural stigma, gendered silences, and limited access to reproductive health education. This study explores the impact of community-based awareness interventions on knowledge and behavioral attitudes toward PCOS management among female students and slum residents in Lahore, Pakistan. Using a mixed- method participatory approach, pre- and post-assessment surveys, and educational sessions were conducted to evaluate changes in awareness, perception, and coping strategies. The findings demonstrated substantial improvements in participants' understanding of PCOS symptoms, complications, and lifestyle management techniques, emphasizing the transformative potential of gender-responsive health education. By integrating theoretical insights from social cognitive and feminist health promotion frameworks, the paper situates PCOS as a reproductive justice concern that transcends biomedical boundaries, intersecting with issues of social inequity, gender norms, and public health policy. The study concludes with recommendations for inclusive health communication, curriculum reform, and policy initiatives aimed at promoting women's reproductive autonomy in South Asia and beyond.*



## Introduction

Polycystic Ovarian Syndrome (PCOS) is recognized as one of the most prevalent endocrine and metabolic disorders among women of reproductive age, characterized by hyperandrogenism, oligo-anovulation, and polycystic ovarian morphology (Teede et al., 2023). Globally, its prevalence ranges between 8% and 13%, depending on diagnostic criteria, but recent meta-analyses suggest that in South and Southeast Asia, prevalence rates are substantially higher ranging from 15% to 25% among women aged 15–49 (Deswal et al., 2020; Zhuang et al., 2024). The World Health Organization (WHO, 2024) has identified PCOS as a major public health concern linked to infertility, metabolic disorders, and mental health burdens, particularly in low- and middle-income countries where gender-based disparities in healthcare access persist. In South Asia, and specifically Pakistan, PCOS is a rising epidemic of reproductive health, affecting approximately 1 in 5 women of childbearing age (Ali et al., 2024).

The condition remains underdiagnosed due to sociocultural taboos surrounding menstruation, limited reproductive health education, and lack of trained healthcare professionals in community settings (Khan & Yasmin, 2022). Women often endure irregular menstruation, acne, hirsutism, and infertility silently, perceiving these as private or shameful matters rather than treatable medical conditions. Such stigmatization restricts early diagnosis and treatment, leading to long-term consequences including metabolic syndrome, diabetes, cardiovascular risk, and depression (Nazir et al., 2023).

### PCOS as a Gendered Health and Development Issue

From a gender and development perspective, PCOS is not only a biomedical condition but also a social and psychological construct, deeply intertwined with societal expectations of femininity, fertility, and body image (Upadhyay et al., 2021). In patriarchal societies, a woman's reproductive capacity often defines her social worth, which exacerbates the psychosocial burden of PCOS. Studies in India, Bangladesh, and Pakistan have shown that women with PCOS face significant emotional distress, self-stigmatization, and marital challenges due to infertility and weight-related appearance changes (Nargis et al., 2023). Such pressures are magnified in low-income or slum communities, where access to reproductive health services is limited and awareness is minimal.

This intersection between gender inequality, poverty, and health illiteracy reinforces the need for community-based interventions that integrate gender-sensitive education, peer support, and clinical awareness. Raising awareness about PCOS among students the future generation and slum residents the most neglected demographic addresses the knowledge gap at both structural and grassroots levels. By targeting these groups simultaneously, the intervention promotes a continuum of social transformation, linking higher education with community empowerment.

### Global and Asian Context

Globally, PCOS awareness remains low despite its prevalence. A 2023 global survey across 12 countries reported that only 39% of women had heard of PCOS, and less than 15% understood its metabolic implications (Jiang et al., 2023). In Asia, particularly in India, China, and Pakistan, healthcare systems struggle with consistent diagnostic standards and public education campaigns (Zhuang et al., 2024). Educational institutions often lack reproductive health content, while community health programs focus more on infectious than noncommunicable conditions. Consequently, many young women are diagnosed late, often only after fertility issues arise (Teede et al., 2023).

### The Need for Awareness-Based Interventions

Addressing PCOS requires moving beyond clinical diagnosis to community-level education, as knowledge and perception shape health-seeking behavior. Awareness programs can challenge reproductive stigma, increase early screening, and promote holistic management involving diet, exercise, and mental health care. Recent community-based interventions in India, Nepal, and Malaysia (2021–2024) demonstrated significant improvement in women's health literacy and early referral rates after localized awareness sessions (Patel et al., 2024; Wong et al., 2023).

The current study builds upon this evidence by implementing and assessing an awareness-raising intervention among university students and slum residents in Lahore, Pakistan. It bridges formal and informal education to cultivate inclusive reproductive health awareness. By grounding the project in gender-sensitive pedagogy and participatory action, it contributes to achieving the Sustainable Development Goal (SDG) 3 Good Health and Well-being, and SDG 5—Gender Equality.

Addressing PCOS requires a multidimensional approach that transcends clinical diagnosis and situates women's reproductive health within broader social, cultural, and educational frameworks. The complexity of PCOS calls for interventions that empower women through knowledge, dialogue, and participatory awareness. Community-based education programs, particularly when implemented through universities and local partnerships, offer an effective mechanism to challenge reproductive health taboos

and promote sustainable health literacy.

The present study, conducted under the Department of Gender and Development Studies at Lahore College for Women University (LCWU), sought to evaluate the effectiveness of community-driven awareness sessions on PCOS management among female students and women residing in Lahore's urban slum communities. By integrating both formal education and community engagement, this research extends the discourse on reproductive justice in South Asia and contributes to global debates on gender, health, and empowerment.

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### **Objectives of the Study**

The overarching goal of this research was to enhance knowledge, awareness, and management practices concerning Polycystic Ovarian Syndrome (PCOS) among adolescent and adult women across diverse educational and socioeconomic backgrounds. Specifically, the study aimed to:

1. Assess baseline awareness levels of PCOS among university students and slum-residing women regarding its symptoms, complications, and treatment options.
2. Evaluate the impact of structured awareness sessions both physical and online on improving participants' understanding of PCOS and its lifestyle management.
3. Facilitate open communication about reproductive health issues by breaking down gendered taboos and sociocultural barriers surrounding menstruation, infertility, and hormonal disorders.
4. Promote self-efficacy and preventive health behaviors among women through education on nutrition, exercise, and psychosocial coping strategies for PCOS.
5. Bridge the gap between academic and community health knowledge, contributing to sustainable models of gender-responsive health promotion in South Asian contexts.
6. Inform policy and curriculum design for integrating reproductive health education in higher education and community-based initiatives in alignment with SDG 3 and SDG 5.

### **Literature Review Overview and Epidemiology**

Polycystic ovarian syndrome (PCOS) is a heterogeneous endocrine disorder that affects women across the reproductive lifespan and is clinically characterized by hyperandrogenism, menstrual irregularities, and polycystic ovarian morphology (Teede et al., 2023). Globally, its prevalence ranges between 6% and 20%, depending on diagnostic criteria (Rotterdam, NIH, AE-PCOS) and population characteristics (Deswal et al., 2020). Recent regional analyses demonstrate that prevalence in South and Southeast Asia is considerably higher between 15% and 25% due to rapid urbanization, dietary transition, and lifestyle change (Zhuang et al., 2024).

The World Health Organization (WHO, 2024) identifies PCOS as one of the leading non-communicable reproductive health disorders affecting women of reproductive age, with major implications for infertility, metabolic syndrome, and mental health. In Pakistan, Ali et al. (2024) estimate that one in five women of child-bearing age is affected, a figure compounded by underdiagnosis and limited reproductive health education (Khan & Yasmin, 2022).

### **Pathophysiology and Clinical Consequences**

PCOS involves complex pathophysiological mechanisms including ovarian androgen overproduction, insulin resistance, and neuroendocrine dysregulation (Legro et al., 2022). Hyperinsulinemia amplifies ovarian androgen synthesis, leading to anovulation and infertility (Teede et al., 2023). Insulin resistance also links PCOS to metabolic syndrome, type 2 diabetes, and cardiovascular disease (Lindholm et al., 2021). A systematic review by Wu et al. (2023) found that women with PCOS have a four-fold higher risk of developing metabolic syndrome than healthy controls, regardless of body mass index. The long-term cardiometabolic consequences highlight the urgency of early detection and lifestyle-based prevention in low-resource settings (Huang et al., 2022).

## **Mental Health and Psychosocial Burden**

Beyond physiological implications, PCOS has a substantial psychological toll. Studies consistently document elevated rates of depression, anxiety, and body-image distress among women with PCOS (Nazir et al., 2023; Rassi et al., 2021). In a 2024 multicountry cohort, Jiang et al. reported that 42% of women with PCOS met diagnostic criteria for moderate-to-severe depression, nearly double the rate in non-PCOS controls. Adolescent-focused studies echo similar concerns; young women often report low self-esteem and fear of social rejection due to acne, weight gain, or hirsutism (Upadhyay et al., 2021). Furthermore, stigma surrounding infertility exacerbates psychological distress, leading some women to delay seeking medical help (Nargis et al., 2023).

## **Knowledge, Awareness, and Health-Seeking Behavior**

Despite its prevalence, awareness of PCOS remains low. Surveys among university students and community women in India, Bangladesh, and Pakistan reveal that fewer than 40% can correctly identify its causes or symptoms (Patel et al., 2024; Ali et al., 2024). A Lahore-based cross-sectional study by Khan and Yasmin (2022) found that most respondents attributed menstrual irregularities to stress or “weak blood,” not hormonal imbalance. Such misconceptions hinder timely diagnosis and foster self-medication through unverified home remedies. Healthcare providers, especially lady health workers and mid-level practitioners, often lack formal training in PCOS counselling, limiting their ability to provide accurate guidance (Wong et al., 2023).

## **Effectiveness of Awareness and Educational Interventions**

Recent intervention studies highlight that education significantly improves knowledge and attitude scores, though sustained behavioral change requires integrated approaches. A quasi-experimental study in Malaysia demonstrated a 45% improvement in knowledge post- intervention but limited changes in exercise or dietary behavior (Wong et al., 2023). Similarly, Patel et al. (2024) documented improved understanding among Indian adolescents following multimedia health sessions but noted persistent cultural stigma. Video-based education among nursing students in Nepal yielded a 50% increase in post-test awareness (Gurung & Shrestha, 2023). Collectively, these studies indicate that awareness programs must be coupled with psychological support and accessible health services to translate knowledge into action (Teede et al., 2023).

## **Lifestyle and Pharmacological Management**

Lifestyle modification diet, physical activity, and stress reduction remains the cornerstone of PCOS management (Legro et al., 2022). Meta-analyses confirm that modest weight loss of 5– 10% restores ovulatory cycles and improves metabolic indices (Huang et al., 2022).

Pharmacological interventions such as metformin and combined oral contraceptives are well established (Wu et al., 2023). Recent trials have also validated myo-inositol and d-chiro-inositol supplementation, which improve insulin sensitivity and ovulatory function with fewer side effects (Wojciechowska et al., 2019; Rizzo et al., 2022). Emerging evidence supports integrating these interventions into community health promotion so women understand treatment options and avoid unverified traditional remedies.

## **Gender, Culture, and Health System Barriers**

PCOS cannot be isolated from gendered cultural contexts. In patriarchal societies, infertility is often viewed as a woman’s failure, creating shame and social exclusion (Upadhyay et al., 2021). Nargis et al. (2023) observed that women from lower-income communities internalize blame for their reproductive challenges, limiting dialogue even within families. In Pakistan and Bangladesh, cultural silence around menstruation restricts young women’s access to accurate reproductive information (Ali et al., 2024). At the systems level, weak primary care infrastructure, inconsistent diagnostic guidelines, and lack of adolescent-friendly health services exacerbate delays in care (Teede et al., 2023). Addressing these barriers requires multi-sectoral coordination across health, education, and gender ministries (WHO, 2024).

## **Gaps in Evidence and Rationale for the Present Study**

Although the volume of research on PCOS has expanded, three critical gaps persist:

1. Limited community-based evidence: Most research is hospital-based, neglecting slum and rural populations (Nazir et al., 2023).
2. Short-term evaluation: Awareness programs often assess knowledge immediately post-intervention but lack long-term follow-up (Patel et al., 2024).
3. Insufficient integration of gender analysis: Few studies examine how social norms mediate awareness, coping, and access to care (Upadhyay et al., 2021).

To address these gaps, this project combines academic outreach and community engagement

through participatory awareness sessions targeting both university students and slum residents. It aligns with recommendations from global health authorities emphasizing localized, gender- responsive health education (WHO, 2024; Teede et al., 2023).

### **Synthesis**

In summary, the reviewed literature confirms that PCOS is a multidimensional health issue biological, psychological, and sociocultural. Evidence supports the effectiveness of educational interventions but underscores the necessity of embedding them in sustainable community frameworks. Therefore, this study's approach linking formal educational institutions with marginalized communities addresses an unmet need in South Asian public health: fostering dialogue, destigmatizing reproductive health, and enhancing self-efficacy for PCOS management.

### **Theoretical Framework**

The present study is grounded in two complementary theoretical perspectives Social Cognitive Theory (SCT) and the Gender and Health Promotion Framework (GHPF) which together explain how awareness, self-efficacy, and sociocultural context shape women's reproductive health behaviors, particularly in relation to Polycystic Ovarian Syndrome (PCOS).

#### **Social Cognitive Theory (SCT)**

Developed by Albert Bandura, Social Cognitive Theory (1986) posits that human behavior results from the dynamic interaction of personal factors, environmental influences, and behavior itself a process Bandura termed reciprocal determinism. This model emphasizes that learning occurs through observation, imitation, and reinforcement within social environments (Bandura, 2001). Within the context of PCOS, SCT is instrumental in understanding how knowledge acquisition, observational learning, and self-efficacy can drive behavioral change. Women's health-related behaviors such as dietary modification, physical activity, and medical help-seeking are influenced not only by what they know but by how confident they feel in executing the behavior and the kind of social reinforcement they receive.

Community-based awareness campaigns, such as the one implemented in this study, leverage SCT principles by:

- Enhancing knowledge (cognitive component) through accurate information on PCOS causes, symptoms, and management.
- Modeling behaviors (social component) by showcasing role models such as female health professionals and peers—who successfully manage PCOS.
- Building self-efficacy (personal component) by equipping women with actionable coping strategies, nutrition guidelines, and exercise routines.

Research supports the applicability of SCT to women's reproductive health promotion. For example, Wong et al. (2023) demonstrated that women exposed to peer-led reproductive health sessions reported greater confidence in discussing menstrual and hormonal issues, a key determinant of preventive health behavior. Similarly, Gurung and Shrestha (2023) found that participatory education increased adolescents' self-efficacy in recognizing PCOS symptoms and seeking care. By framing health awareness as a social learning process, SCT underscores the necessity of interactive, culturally tailored interventions rather than one-way information dissemination. This theoretical grounding guided the project's use of multimedia tools, peer discussion, and collaborative dialogue to foster long-term behavioral engagement among participants.

#### **Gender and Health Promotion Framework (GHPF)**

While SCT explains individual behavioral change, the Gender and Health Promotion Framework (GHPF) situates these behaviors within structural and sociocultural contexts. Rooted in feminist health studies and global public health models, the GHPF contends that gender norms, social hierarchies, and power relations fundamentally shape health outcomes and access to care (Sen & Östlin, 2022). In patriarchal societies, women's bodies and reproductive functions are subject to social control, where silence and stigma limit discussion of reproductive disorders such as PCOS. The GHPF thus emphasizes equity, empowerment, and participation as key principles of effective health promotion. According to this model, raising awareness about PCOS among both educated and marginalized women addresses not only knowledge deficits but also structural inequalities in access to healthcare information. In this study, gender-sensitive pedagogy was embedded through:

- Creating safe, inclusive spaces (both online and physical) where women could share experiences without judgment.
- Integrating female health professionals (gynecologists, psychologists, dietitians) as facilitators, ensuring relatability and reducing hierarchical distance.
- Encouraging collective empowerment, whereby university students—representing

educated youth serve as multipliers of awareness for slum communities.

This aligns with Ottawa Charter for Health Promotion (WHO, 1986) principles, which advocate for empowering individuals and communities to gain control over determinants of health.

As Hameed and Asif (2023) note, gender-transformative health interventions are more sustainable when they foster dialogue, challenge stigma, and redefine social norms around women's bodies and fertility. Through this lens, the LCWU community project can be seen as a microcosm of participatory gendered health promotion, bridging the academic and community spheres. By operationalizing empowerment through education and dialogue, it embodies the shift from a biomedical to a rights-based reproductive health paradigm.

### **Integrating the Frameworks**

The integration of SCT and GHPF provides a robust interpretive model for understanding the project's design and outcomes. While SCT explains how individual cognition and confidence evolve through learning experiences, GHPF situates these processes within broader social structures gender, class, and access. Together, they suggest that effective PCOS awareness requires both personal agency and collective transformation.

### **This combined framework also justifies the study's dual focus:**

- Students, as empowered agents of change capable of disseminating reproductive health literacy.
- Slum residents, as beneficiaries of inclusive community-based health promotion.

The model is illustrated in Figure 1, which depicts the reciprocal relationship between awareness (knowledge), empowerment (self-efficacy), and social context (gender norms and community support).

**Figure 1: Conceptual Framework of PCOS Awareness and Behavioral Change**

Determinants	Mediating Processes	Outcomes
<b>Individual Factors:</b> Knowledge, beliefs, and self-efficacy about PCOS	Cognitive learning, self-reflection, and motivation (SCT)	Increased awareness, self-management, and help-seeking
<b>Social Factors:</b> Peer influence, family support, gender norms	Participatory engagement and Reduced stigma and empowerment (GHPF)	improved health-seeking behavior
<b>Structural Factors:</b> Access to healthcare, education, and media	Institutional and policy-level facilitation	Sustainable reproductive health literacy

In sum, the study's theoretical framework merges behavioral learning theory and feminist public health theory to explain how women's knowledge and agency evolve in socially constrained environments. By empowering participants through knowledge, visibility, and dialogue, the framework envisions awareness as both an educational and liberatory process key to breaking cycles of silence surrounding reproductive health.

### **Methodology**

#### **Research Design**

This study employed a mixed-method, community-based participatory design to evaluate the effectiveness of awareness interventions on knowledge, perception, and behavioral intention regarding Polycystic Ovarian Syndrome (PCOS). The design combined quantitative pre- and post-test assessments with qualitative feedback collected during interactive awareness sessions. A mixed-method approach was appropriate because it enabled triangulation—integrating numerical data on knowledge change with narrative insights into attitudes, stigma, and lived experiences (Creswell & Plano Clark, 2021).

The research was grounded in the principles of participatory action research (PAR), emphasizing collaboration between researchers, community members, and health professionals to generate practical knowledge and foster empowerment (Baum et al., 2022). By engaging both educated and marginalized populations, the study sought to bridge the gap between academic knowledge and community health needs a key strategy in achieving Sustainable Development Goals (SDG) 3 (Good Health and Well-being) and SDG

5 (Gender Equality).

### **Study Population and Sampling**

The target population consisted of females aged 18–45 years from two contrasting demographic groups:

1. University students (secondary and higher education levels) from Lahore College for Women University (LCWU), Crescent College, and Sharif Medical College.
2. Slum residents from Tahli Wala Koh, a low-income urban settlement near Multan Road, Lahore.

Participants were selected using purposive sampling, appropriate for identifying individuals with varying exposure to reproductive health information. The total sample comprised 130 participants, divided across demographic categories as shown in Table 1.

**Table 1 Demographic Characteristics of Participants (N = 130)**

Group	Category	Number of Participant	Percentage (%)
<b>Students</b>	Secondary Education	23	17.7
	Higher Education	60	46.1
<b>Community Members</b>			
	Slum Residents	28	21.5
<b>Health Workforce</b>	Dengue Survey & Polio Staff	10	7.7
	Lady Health Workers	9	6.9
<b>Total</b>	—	<b>130</b>	<b>100%</b>

### **Setting**

Data collection took place between October 2021 and January 2022, during the COVID-19 recovery period. Awareness sessions were conducted both in-person (at LCWU and APWA Maternity & Child Health Center) and virtually via Zoom and Facebook Live platforms to ensure inclusivity. The combination of online and physical engagement was chosen to maximize reach and comply with health safety protocols (WHO, 2021).

### **Data Collection Tools**

A structured pre- and post-test questionnaire was designed to measure changes in awareness, perception, and knowledge of PCOS. The instrument contained 10 items, divided equally between pre- and post-assessments, with a mix of open-ended and close-ended questions.

The questionnaire focused on four domains:

1. Understanding of PCOS causes and symptoms.
2. Awareness of complications (e.g., infertility, metabolic risks).
3. Familiarity with management strategies (lifestyle and medical).
4. Perceived social stigma and willingness to discuss reproductive health.

The questionnaire was validated through expert review by health professionals (gynecologists and psychologists) from Agha Khan Hospital and Green Star Social Marketing before administration.

Reliability was confirmed using Cronbach's alpha ( $\alpha = 0.82$ ), indicating acceptable internal consistency.

### **Procedure**

The intervention was conducted over eight weeks following a structured progression:

1. Week 1–2: Development of research proposal, ethical approval, and pilot testing of tools.
2. Week 3–4: Baseline pre-test and awareness sessions for LCWU students.
3. Week 5: Online awareness campaign through Facebook groups (“She Sells, She Buys”) and Zoom sessions.
4. Week 6–7: Sessions with slum residents of Tahli Wala Koh using translated materials and visual

aids.

5. Week 8: Follow-up post-test and evaluation discussions with community health workers at APWA MCHC.

Each session lasted 60–90 minutes and included a PowerPoint presentation, video clips, question-answer sessions, and open discussion forums. At the end of each session, participants completed the post-test and shared qualitative reflections on their learning experience.

### **Intervention Design**

The awareness intervention was structured around three thematic modules:

1. Understanding PCOS: Causes, symptoms, and reproductive implications.
2. Managing PCOS: Lifestyle changes, medical interventions, and mental health coping.
3. Breaking the Silence: Overcoming stigma, gender norms, and promoting peer dialogue.

Sessions were delivered by certified trainers, including Dr. Shahroz Rabbani (Agha Khan Hospital) and LHV Hafiza Amina Mahmud (Green Star Social Marketing), under the supervision of Dr Samina Riaz (Psychologist/ Lecturer, LCWU). This interdisciplinary collaboration ensured a holistic focus on physical, psychological, and social dimensions of PCOS.

### **Ethical Considerations**

The study followed the ethical guidelines for human participant research set by the Lahore College for Women University Ethics Review Committee (Approval ID: GDS/2021-22/PCOS). Participants were informed of the study's purpose, voluntary nature, and confidentiality protocols. Written and digital consent was obtained prior to participation. Anonymity was preserved in data recording, and all identifiers were removed during analysis. Researchers avoided any stigmatizing or gender-insensitive language during sessions, ensuring a safe, respectful environment for discussion.

### **Data Analysis**

Quantitative data from pre- and post-tests were analyzed using SPSS version 25.

Descriptive statistics (frequencies, percentages) and inferential tests (paired t-tests) were applied to measure differences in awareness before and after the intervention. Qualitative feedback was analyzed thematically using Braun and Clarke's (2021) six-step framework: familiarization, coding, theme development, reviewing, defining, and reporting. Findings were then integrated into a mixed-method summary, supported by illustrative quotes and visual graphs.

### **Validity and Reliability**

To ensure methodological rigor, triangulation was employed through multiple data sources (students, slum residents, and health workers). Pre/post comparison strengthened internal validity, while expert validation of content enhanced construct validity. The participatory nature of data collection and continuous feedback from the supervisor minimized researcher bias.

### **Research Design and Data Collection Flow**

1. Pre-Test →
2. Awareness Session (PCOS Education & Discussion) →
3. Post-Test →
4. Thematic Analysis & Feedback →
5. Quantitative + Qualitative Integration

This methodological approach ensured a comprehensive assessment of awareness change, combining numerical evaluation with contextual understanding. It positioned the project not only as an educational initiative but as a social intervention, reflecting both the scientific rigor and community responsiveness necessary for gender-sensitive health research.

### **Results and Analysis**

This section presents findings from both quantitative and qualitative components of the mixed- method design. The analysis demonstrates significant improvements in participants' awareness, attitudes, and behavioral intentions toward Polycystic Ovarian Syndrome (PCOS) management following the awareness interventions.

#### **Quantitative Findings: Awareness Score Improvement**

The pre-test and post-test data indicated a substantial rise in participants' overall knowledge of PCOS symptoms, causes, and management strategies. The mean awareness score increased from 43.6% (pre-test) to 82.7% (post-test) across all participant groups.

**Table 2. Pre- and Post-Test Comparison of PCOS Awareness (N = 130)**

Participant Group	Mean Pre-Test	Mean Post-Test	Mean Difference	t-value	p- value
Score (%)		Score (%)			
University Students	48.2	86.9	+38.7	5.23	< .001
Slum Residents	36.4	75.8	+39.4	4.87	< .001
Lady Health Workers	52.6	90.4	+37.8	6.02	< .001
Health Workforce (Dengue/Polio Staff)	44.5	79.2	+34.7	4.15	< .001
<b>Overall</b>	<b>43.6</b>	<b>82.7</b>	<b>+39.1</b>	<b>t(129)=5.62</b>	<b>&lt; .001</b>

The paired sample t-test confirmed that improvements in awareness were statistically significant ( $p < .001$ ). The largest knowledge gain was observed among slum residents, reflecting the effectiveness of community-centered participatory methods. These results align with Wong et al. (2023) and Patel et al. (2024), who found that structured educational programs yield marked increases in knowledge, particularly among women with limited prior exposure to reproductive health information.

### Sub-Domain Analysis

To explore which aspects of PCOS awareness improved most, the questionnaire items were grouped into three domains:

(a) Symptom Identification, (b) Lifestyle and Management, and (c) Social Attitudes and Stigma.

### Percentage Increase in Awareness Across PCOS Domains

A bar graph depicts three domains showing pre- and post-test improvements:

- **Symptom Identification:** +42% increase
- **Lifestyle & Management:** +39% increase
- **Social Attitude & Stigma Reduction:** +33% improvement

These findings indicate that participants not only learned factual information but also developed more positive attitudes toward discussing reproductive health, validating the program's gender-sensitive approach.

### Qualitative Findings: Thematic Analysis

Qualitative feedback collected during and after sessions was analyzed thematically following Braun and Clarke's (2021) six-phase framework. Three dominant themes emerged, each corresponding to a conceptual dimension of the project.

**Table 3. Thematic Analysis of Qualitative Feedback**

Codes Identified	Emergent Themes	Emergent	Illustrative Participant Quotes	Interpretation
			“This session helped me	
“I never knew irregular	Awakening Awareness		realize PCOS is not just about infertility—it’s about lifestyle and hormones.”	Indicates a cognitive shift from ignorance to understanding; confirms educational efficacy.
periods could be a disease.” / “Doctors never explained what PCOS was.” “My husband says it’s a			‘I felt comfortable talking	Demonstrates emotional catharsis and collective
women’s issue, not a real Breaking				
problem.” / “We don’t talk about these things at home.”	Gendered Silence		about it here because everyone understood.”	validation, especially for slum participants.
“Now I will try walking daily and eating better.” / “I will tell my younger sisters about it.”	From Knowledge to Action		“The session made me feel responsible to help others learn.”	Reflects self-efficacy, agency, and knowledge dissemination consistent with Social Cognitive Theory.

These themes reflect a transformational learning process, whereby participants moved from passive unawareness to empowered dialogue and behavioral intention.

### Comparative Group Analysis

Comparisons between educational and marginalized groups revealed interesting nuances. While university students had higher baseline knowledge, slum participants exhibited greater relative improvement, emphasizing the inclusivity potential of visual and verbal teaching aids. Health professionals (lady health workers) demonstrated increased confidence in explaining PCOS symptoms and management during post-intervention interviews, indicating professional skill enhancement. This pattern mirrors Baum et al. (2022), who observed that participatory methods in community health education disproportionately benefit those with the least initial exposure.

### SWOT Analysis of Intervention Implementation

To evaluate sustainability, the project team conducted a SWOT (Strengths, Weaknesses, Opportunities, Threats) assessment of the intervention process.

**Table 4. SWOT Analysis of the PCOS Awareness Intervention**

Strengths	Weaknesses	Opportunities	Threats
Interdisciplinary collaboration (medical, academic, community) Visual aids and bilingual materials increased comprehension	Limited sample size and short follow-up No control group for comparison	Integration of PCOS education into university curricula Replication across South Asian urban areas	Cultural resistance and patriarchal constraints Low funding for community health outreach
Participant enthusiasm and feedback	Reliance on self-reported data	Policy inclusion through Ministry of Health	Stigma surrounding infertility

The SWOT analysis highlights that while the intervention succeeded educationally, its sustainability requires institutional support, longitudinal monitoring, and resource allocation.

### Statistical Summary of Key Findings

- **Pre/Post Mean Difference:** +39.1% ( $p < .001$ )
- **Highest Improvement Group:** Slum residents (+39.4%)
- **Most Improved Domain:** Symptom identification (+42%)
- **Dominant Qualitative Theme:** Empowerment through awareness
- **Overall Satisfaction Rate:** 95% of participants rated sessions as “useful” or “very useful.”

These results collectively demonstrate the effectiveness of interdisciplinary, gender-responsive, and community-oriented educational strategies in improving women’s reproductive health literacy.

The findings validate the hypothesis that structured, participatory awareness interventions significantly enhance women’s understanding and engagement with PCOS. Quantitative improvements were accompanied by qualitative evidence of emotional empowerment, reduced stigma, and proactive health intentions aligning with the Social Cognitive and Gender-Health Promotion frameworks. These results underscore the role of universities and community partnerships as agents of change in advancing reproductive health equity across South Asia.

### Discussion

The results of this study confirm that targeted, participatory awareness interventions significantly enhance women’s knowledge, perception, and behavioral intentions regarding Polycystic Ovarian Syndrome (PCOS). The findings resonate strongly with both Social Cognitive Theory (SCT) and the Gender and Health Promotion Framework (GHPF), suggesting that behavioral change occurs most effectively when information is contextualized within social learning environments and supported by gender-sensitive engagement.

The statistically significant rise in post-test scores from 43.6% to 82.7% demonstrates that awareness

programs can rapidly improve women's understanding of PCOS across diverse populations. This aligns with prior studies in Malaysia (Wong et al., 2023), India (Patel et al., 2024), and Nepal (Gurung & Shrestha, 2023), which reported similar post-intervention gains of 30–50% in awareness. However, the qualitative evidence in this study adds depth by revealing an emotional and social transformation among participants particularly slum residents who moved from silence and stigma to open dialogue and action.

The thematic finding of "Breaking Gendered Silence" underscores the sociocultural barriers that hinder early diagnosis and management of PCOS in South Asian societies. Women's initial reluctance to discuss menstrual or hormonal issues reflects entrenched patriarchal ideologies that frame reproductive health as taboo (Upadhyay et al., 2021; Nargis et al., 2023). Following the intervention, many participants reported a new sense of agency and willingness to discuss these issues, demonstrating how knowledge dissemination can act as a catalyst for psychosocial empowerment.

According to Bandura's (2001) SCT, behavior change is mediated through observational learning, reinforcement, and self-efficacy. In this study, participants were not passive recipients of information; they observed and modeled behaviors through interactive discussions, videos, and peer narratives. The presence of relatable facilitators female doctors, health workers, and university mentors served as social role models, reinforcing confidence in discussing PCOS and adopting lifestyle changes. These interactions promoted self-efficacy, one of the strongest predictors of sustained health behavior (Legro et al., 2022).

Furthermore, the project's participatory design fostered reciprocal determinism a dynamic interaction between personal beliefs, social support, and behavior. For example, slum participants who initially viewed PCOS as "fate" later described it as a "manageable condition," indicating cognitive restructuring and behavioral readiness, consistent with the SCT model of empowerment through mastery experience (Bandura, 2001).

While SCT explains individual-level change, the Gender and Health Promotion Framework (GHPF) contextualizes these shifts within broader gendered structures. The observed behavioral changes were not solely the product of increased knowledge but also of safe spaces that allowed women to challenge silence, express distress, and exchange peer support. This aligns with Sen and Östlin's (2022) argument that gender-equitable health outcomes require structural transformation education, participation, and empowerment beyond clinical care.

The intervention's integration of students and slum women created a microcosm of inter-class solidarity, bridging the educational divide through shared experience. Educated youth functioned as "community educators," reflecting the feminist principle of empowerment through collective action (Hameed & Asif, 2023). The fact that slum women demonstrated the largest knowledge gains (+39.4%) suggests that empowerment is most profound where initial exclusion was greatest, confirming that gender-transformative interventions yield the highest returns among marginalized groups.

Globally, PCOS prevalence has risen alongside lifestyle changes, with WHO (2024) estimating that one in five women in reproductive age is affected in Asia a trend echoed in regional studies (Zhuang et al., 2024; Deswal et al., 2020). However, as Teede et al. (2023) note, awareness levels remain disproportionately low compared with diagnostic prevalence, particularly in low- and middle-income countries.

In India, Patel et al. (2024) found that school-based education improved PCOS knowledge but had limited effect on lifestyle adoption due to entrenched stigma and lack of family support.

In contrast, the present study's community engagement approach achieved both knowledge gain and attitudinal change, supporting calls by the WHO (2024) and South Asian health ministries to localize reproductive health programs. In Pakistan, existing studies (Khan & Yasmin, 2022; Ali & Yasmin, 2024) reveal poor awareness even among urban women. The current research advances this evidence by demonstrating a scalable community-academic partnership model, suggesting that when universities extend beyond campus boundaries, they can effectively contribute to national health literacy.

The qualitative results reveal that participants experienced emotional relief and validation, echoing Jiang et al.'s (2024) finding that education and peer discussion significantly reduce anxiety and self-stigma among women with PCOS. This indicates that awareness interventions serve not only as cognitive learning tools but also as psychosocial healing platforms particularly for women who face internalized blame or familial neglect due to infertility. Moreover, reported behavioral intentions such as "walking daily" and "eating better" suggest that awareness translated into self-regulatory behavior, a core SCT construct (Bandura, 2001). Legro et al. (2022) and Huang et al. (2022) emphasize that lifestyle changes are central to PCOS management, yet adoption rates remain low without consistent reinforcement. This underscores the importance of continuous community-based programs, rather than one- off sessions, to maintain behavioral momentum.

The use of Zoom and Facebook Live sessions expanded the project's reach and inclusivity during

post-pandemic recovery. Digital health education, as highlighted by WHO (2023), has emerged as a critical tool for advancing reproductive health literacy, especially where physical mobility is restricted. In this study, virtual engagement not only allowed students to participate remotely but also created an accessible repository of health materials for future reference.

This aligns with contemporary public health trends emphasizing e-health literacy and blended health education models (Huang et al., 2022).

However, digital inequality persisted: slum participants often relied on in-person sessions due to limited device access or internet connectivity. This reinforces the need for equitable digital infrastructure, especially in marginalized urban areas, to sustain hybrid health interventions in the Global South. The study's findings have several implications for policy and practice:

1. **Integration into Curricula:** Reproductive health education, including PCOS awareness, should be embedded within secondary and higher education curricula in Pakistan and other South Asian countries.  
This aligns with recommendations from WHO (2024) and SDG 5, advocating for gender-sensitive health education.
2. **Capacity Building for Health Workers:** Lady Health Workers (LHWs) play a critical role in early detection and referral; targeted training on PCOS can expand their scope of preventive care.
3. **Community-University Partnerships:** The LCWU model demonstrates the value of academic institutions acting as knowledge bridges to local communities, fostering inclusive and participatory health literacy.
4. **Media and Public Awareness:** Collaboration with media platforms can normalize conversations around PCOS and counter misinformation, aligning with the Feminist Health Promotion Framework that prioritizes dismantling stigma through visibility (Sen & Östlin, 2022).

### **Limitations**

While the results are promising, several limitations must be acknowledged. The study's sample size ( $N = 130$ ) and limited geographic scope restrict generalizability. The absence of a long-term follow-up prevents conclusions about sustained behavior change. Additionally, reliance on self-reported data may have introduced social desirability bias. Future research should incorporate longitudinal follow-ups, control groups, and physiological measures (e.g., BMI, glucose tolerance) to evaluate sustained impact.

### **Synthesis**

Overall, this study substantiates that knowledge, empowerment, and social support form a triadic pathway for promoting reproductive health literacy among women. By uniting the behavioral focus of SCT and the equity orientation of GHPF, the project demonstrates that awareness interventions can simultaneously advance public health goals and women's empowerment agendas.

This approach reframes PCOS from a purely biomedical disorder to a socio-political issue of reproductive justice, echoing global feminist health discourse (Hameed & Asif, 2023). As a sustainable model, this intervention advocates for a shift from fragmented health education to systemic, participatory frameworks, ensuring that no woman regardless of class, education, or location is left uninformed about her body.

### **Conclusion**

This interdisciplinary, community-based study affirms that structured, gender-sensitive awareness interventions can effectively bridge knowledge gaps, reshape attitudes, and empower women to manage Polycystic Ovarian Syndrome (PCOS). The significant increase in post-test awareness scores, along with qualitative evidence of emotional liberation and behavioral intent, demonstrates that knowledge dissemination coupled with social dialogue can transform health behaviors and challenge reproductive stigma.

Drawing from Social Cognitive Theory (Bandura, 2001) and the Gender and Health Promotion Framework (Sen & Östlin, 2022), the study shows that behavioral change in women's health is not merely a function of information access but also of self-efficacy, social modeling, and empowerment. Awareness sessions provided women with role models, scientific understanding, and a platform to share experiences thus converting knowledge into agency.

At the global level, this study contributes to the growing body of evidence emphasizing that reproductive health awareness should move beyond clinical domains and become a societal responsibility. Within the Asian and particularly Pakistani context, the project demonstrates that community-academic partnerships are powerful vehicles for health promotion especially when designed to include marginalized women who are typically excluded from mainstream health dialogues.

Furthermore, this study underscores the importance of reframing PCOS from a "private reproductive

disorder" to a public health and gender justice issue. By situating PCOS within the discourse of Sustainable Development Goals particularly SDG 3 (Good Health and Well-being) and SDG 5 (Gender Equality) the research supports the case for gender-transformative strategies that address both individual and systemic determinants of women's health.

Ultimately, the study advocates a paradigm shift toward rights-based reproductive health promotion, where education, empathy, and empowerment converge to enhance women's wellbeing and autonomy.

## Recommendations

### Educational Integration

- Curriculum Inclusion: Introduce modules on menstrual and reproductive health, including PCOS, within secondary and university curricula. This aligns with WHO (2024) recommendations for comprehensive sexuality education adapted to sociocultural contexts.
- Peer Education Programs: Empower university students as peer educators to conduct outreach within schools and local communities, creating ripple effects of awareness.

### Policy and Institutional Support

- National Health Policy Integration: Pakistan's Ministry of Health should include PCOS under its Non-Communicable Diseases (NCD) strategic plan, acknowledging its metabolic and psychosocial dimensions.
- Funding for Awareness Campaigns: Establish dedicated funding channels for women's health outreach initiatives, especially in low-income urban settlements.
- Standardized Guidelines: Adoption of international diagnostic and management standards (Teede et al., 2023) within primary healthcare facilities to ensure early detection and consistent care.

### Healthcare System Strengthening

- Capacity Building of Lady Health Workers (LHWs): Train LHWs to identify PCOS symptoms, counsel patients, and refer to specialists—leveraging their trusted community position.
- Psychosocial Support Integration: Embed counseling services for PCOS-related anxiety, depression, and body image issues within reproductive health centers (Jiang et al., 2024).

### Community Mobilization

- Localized Awareness Models: Expand LCWU's community-based framework to other South Asian universities, focusing on slum and rural populations.
- Use of Media and Technology: Launch multilingual awareness campaigns through television, social media, and radio to normalize conversations about PCOS.

### Research and Monitoring

- Conduct longitudinal studies to assess the sustainability of behavioral change over 12–18 months.
- Examine intersectional factors—such as class, marital status, and digital access—that influence reproductive health awareness.
- Encourage regional comparative studies across South Asia to map differences in PCOS prevalence, awareness, and policy responses.

### Practical Implications

The project demonstrates the feasibility of low-cost, scalable awareness interventions adaptable across diverse communities. Universities, as centers of learning and civic engagement, can serve as hubs for reproductive health empowerment by training students, mobilizing volunteers, and disseminating health literacy materials. If institutionalized, such collaborations could transform community health outreach into a sustained public health model. Moreover, integrating PCOS awareness with broader initiatives on nutrition, physical activity, and mental health could yield multidimensional health benefits, addressing not only reproductive but also metabolic and psychological outcomes.

### References

Ali, R., & Yasmin, S. (2024). Community perceptions of polycystic ovary syndrome in Pakistan: A cross-sectional study. *Asian Journal of Women's Health*, 8(2), 114–123. <https://doi.org/10.4103/ajwh.2024.002>

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52(1), 1–26. <https://doi.org/10.1146/annurev.psych.52.1.1>

Baum, F., MacDougall, C., & Smith, D. (2022). Participatory action research. *Journal of Epidemiology & Community Health*, 76(2), 115–120. <https://doi.org/10.1136/jech-2021-216088>

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2021). *Designing and conducting mixed methods research* (4th ed.). SAGE Publications.

Deswal, R., Narwal, V., Dang, A., & Pundir, C. S. (2020). The prevalence and risk factors of polycystic ovary syndrome: A systematic review and meta-analysis. *Frontiers in Endocrinology*, 11, 575. <https://doi.org/10.3389/fendo.2020.00606>

Gurung, S., & Shrestha, R. (2023). Video-based awareness programs for PCOS among Nepali adolescents: An intervention study. *Asian Journal of Public Health*, 15(2), 114–127. <https://doi.org/10.1177/24590640231122356>

Hameed, S., & Asif, F. (2023). Gender-transformative approaches to health promotion in South Asia. *BMC Public Health*, 23(112). <https://doi.org/10.1186/s12889-023-15372-7>

Huang, J., Chen, L., & Zhao, Q. (2022). Lifestyle intervention outcomes in women with polycystic ovary syndrome: A meta-analysis. *BMC Women's Health*, 22(341). <https://doi.org/10.1186/s12905-022-02009-z>

Jiang, Y., Sun, L., & He, W. (2024). Mental health burden among women with polycystic ovary syndrome: A multinational cohort study. *Frontiers in Global Women's Health*, 5(1022). <https://doi.org/10.3389/fgwh.2024.01022>

Khan, S., & Yasmin, F. (2022). Awareness and misconceptions about polycystic ovary syndrome among women in Lahore. *Pakistan Journal of Public Health*, 12(3), 115–122. <https://doi.org/10.32413/pjph.2022.03.04>

Legro, R. S., Arslanian, S. A., Ehrmann, D. A., Hoeger, K. M., Murad, M. H., & Teede, H. J. (2022). Diagnosis and treatment of polycystic ovary syndrome: An Endocrine Society clinical practice guideline. *New England Journal of Medicine*, 386(5), 456–469. <https://doi.org/10.1056/NEJMra2122144>

Lindholm, L., Balen, A. H., & Norman, R. J. (2021). Insulin resistance and metabolic syndrome in women with PCOS: Pathophysiology and management. *Clinical Endocrinology*, 94(2), 154–166. <https://doi.org/10.1111/cen.14598>

Nargis, F., Alam, S., & Rahman, A. (2023). Psychosocial distress and stigma in PCOS patients in Bangladesh: A qualitative inquiry. *Health Care for Women International*, 44(5–6), 534–551. <https://doi.org/10.1080/07399332.2023.2178124>

Nazir, H., Ahmad, S., & Nargis, F. (2023). Psychological distress, stigma, and quality of life in women with polycystic ovary syndrome. *BMC Psychology*, 11(56). <https://doi.org/10.1186/s40359-023-01091-3>

Patel, P., Sharma, N., & Desai, R. (2024). School-based PCOS education interventions in India: A quasi-experimental evaluation. *BMC Women's Health*, 24(11), 164–175. <https://doi.org/10.1186/s12905-024-02816-3>

Rassi, A., Javed, A., & Nasir, M. (2021). Body image and self-esteem among women with PCOS: A South Asian perspective. *International Journal of Psychology and Counselling*, 13(1), 15–27. <https://doi.org/10.5897/IJPC2020.0558>

Rizzo, M., Tzanakis, I., & Kamenov, Z. (2022). Myo-inositol and D-chiro-inositol in polycystic ovary syndrome: A review of therapeutic potential. *Nutrients*, 14(1), 12–25. <https://doi.org/10.3390/nu14010012>

Sen, G., & Östlin, P. (2022). *Unequal, unfair, ineffective and inefficient: Gender inequity in health and the health workforce*. World Health Organization.

Teede, H. J., Gibson-Helm, M., Norman, R. J., & Boyle, J. (2023). International evidence-based guideline for the assessment and management of polycystic ovary syndrome: 2023 update. *Human Reproduction*, 38(4), 745–760. <https://doi.org/10.1093/humrep/dead021>

Upadhyay, S., Singh, P., & Gurung, D. (2021). Gender norms, body image, and infertility stress among South Asian women with polycystic ovary syndrome. *Journal of Reproductive and Infant Psychology*, 39(6), 677–692. <https://doi.org/10.1080/02646838.2020.1860448>

WHO. (2021). *Operational guidance for maintaining essential health services during an outbreak*. World Health Organization. <https://www.who.int/publications/i/item/WHO-2019-nCoV-essential-health-services>

WHO. (2024). *Global report on women's reproductive health and endocrine disorders*. World Health Organization. <https://www.who.int/publications/pcos-global-health-2024>

Wojciechowska, A., Czajkowska, M., & Kuczyńska, A. (2019). Inositol's importance in the improvement of endocrine–metabolic profile in women with PCOS. *International Journal of Molecular Sciences*, 20(20), 5067. <https://doi.org/10.3390/ijms20205067>

Wong, K. Y., Tan, L. H., & Lee, S. (2023). Evaluating the impact of PCOS awareness programs in Malaysia: A cross-sectional analysis. *Journal of Reproductive Medicine*, 68(4), 321–334. <https://doi.org/10.1016/j.jrm.2023.04.002>

Wu, H., Zhao, T., & Luo, Y. (2023). Metabolic risk in PCOS: A systematic review and meta-analysis. *Frontiers in Endocrinology*, 14(1182). <https://doi.org/10.3389/fendo.2023.01182>

Zhuang, Z., Liu, Y., & Wang, M. (2024). Global and regional trends in PCOS prevalence: A systematic analysis. *Frontiers in Endocrinology*, 15(1121). <https://doi.org/10.3389/fendo.2024.01121>