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Original Article

Effects of Educational Intervention on Level of Knowledge Regarding Polycystic Ovarian Syndrome Among Nursing Students

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ABSTRACT

Background: Polycystic ovarian syndrome is a common endocrine disorder among young women and is associated with reproductive, metabolic, and psychosocial complications. Nursing students require adequate knowledge and awareness of PCOS to support early recognition, counseling, and preventive health education. Objective: This study aimed to evaluate the effect of a structured educational intervention on knowledge and perceived educational impact regarding PCOS among nursing students. Methods: A quasi-experimental one-group pre-test and post-test study was conducted among 50 female BSN nursing students at Ali Fatima Hospital, Lahore. Participants were selected through non-probability purposive sampling. Data were collected using a structured questionnaire before and after the educational intervention. Descriptive statistics summarized demographic characteristics and response patterns, while a paired-samples t-test compared pre- and post-intervention scores using SPSS version 27. Results: Most participants were aged 15–20 years (60.0%), and all were female nursing students. Positive responses for improved knowledge and skills increased from 12.0% pre-intervention to 80.0% post-intervention. The paired-samples test showed a significant improvement in post-intervention scores, with a mean difference of −21.36, 95% CI −22.57 to −20.15, $t(49) = -35.37$, and $p < 0.001$. Conclusion: The educational intervention significantly improved post-intervention scores and perceived educational impact among nursing students. Future studies should use validated PCOS-specific knowledge tools and controlled designs. Keywords: Polycystic Ovarian Syndrome, Nursing Students, Educational Intervention, Knowledge, Health Education.

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders affecting females of reproductive age and is associated with reproductive, metabolic, dermatological, and psychological consequences. It commonly presents with menstrual irregularity, clinical or biochemical hyperandrogenism, acne, hirsutism, obesity, and subfertility, while its long-term implications may include insulin resistance, type 2 diabetes mellitus, dyslipidemia, cardiovascular risk, and reduced quality of life (1,2). Although PCOS is widely prevalent, delayed recognition remains common because early symptoms may be normalized by adolescents and young women or misunderstood as transient menstrual or cosmetic concerns. This delay can limit timely counseling, lifestyle modification, and referral for appropriate clinical evaluation (3,4).

Young women enrolled in nursing programs represent an important educational group because they are both personally vulnerable to PCOS-related health concerns and professionally positioned to provide health education, early recognition support, and counseling to peers, families, and future patients.

Previous studies have shown variable levels of PCOS awareness among college-going females, young women, and nursing students, with gaps reported in understanding of symptoms, risk factors, complications, diagnosis, and lifestyle-based management (5–7).

Evidence also suggests that structured educational programs can improve awareness of PCOS and encourage preventive health behaviors, particularly when delivered to adolescent girls, students, and healthcare trainees (8–10). However, knowledge gaps remain in many educational settings, especially where reproductive health topics are under-discussed due to stigma, hesitation, or limited curricular emphasis (11–13).

Despite the clinical and educational importance of PCOS, limited local evidence is available regarding the effect of structured educational interventions on PCOS-specific knowledge among nursing students. Existing studies highlight the need for focused awareness programs, but further evidence is required to determine whether targeted educational sessions can produce measurable improvement in knowledge among undergraduate nursing students in local institutional settings (14).

Therefore, this study was conducted to evaluate the effectiveness of a structured educational intervention in improving knowledge regarding PCOS among BSN nursing students. The study hypothesized that nursing students would demonstrate significantly higher PCOS knowledge scores after the educational intervention compared with their baseline pre-intervention scores.

MATERIALS AND METHODS

This quasi-experimental one-group pre-test and post-test study was conducted at Ali Fatima Hospital, Lahore, over a period of six months after synopsis approval. The study was designed to assess whether a structured educational intervention improved knowledge regarding polycystic ovarian syndrome among nursing students. The target population comprised BSN 8th-semester nursing students, and 50 participants were selected using a non-probability purposive sampling technique. The sample size was calculated using the formula $n = N / 1 + N(e^2)$, where n represents the required sample size, N represents the accessible population, and e represents the margin of error set at 5%.

Eligible participants were nursing students enrolled in a recognized nursing program who were willing to participate and available for both pre-test and post-test assessments. Students were excluded if they had received prior formal training specifically focused on PCOS, were unwilling to participate, or were absent during either phase of data collection. Participants were recruited from the eligible student cohort after explaining the purpose of the study, voluntary nature of participation, and confidentiality of responses. Informed consent was obtained before data collection.

Data were collected using a structured questionnaire consisting of demographic information and PCOS-related knowledge items. Demographic variables included age, gender, and educational level. The knowledge component assessed participants' understanding of PCOS, including basic definition, symptoms, risk factors, diagnostic awareness, possible complications, lifestyle modification, and management-related concepts.

Baseline knowledge was assessed before the educational intervention through a pre-test. After completion of the pre-test, participants received a structured educational session focused on PCOS pathophysiology, clinical presentation, risk factors, early identification, complications, lifestyle modification, and the role of nurses in counseling and health education. A post-test was then administered using the same knowledge assessment tool to evaluate change in knowledge after the intervention.

The primary outcome variable was change in PCOS knowledge score from pre-test to post-test. The independent variable was exposure to the structured educational intervention, while demographic characteristics were treated as descriptive variables. To reduce measurement bias, the same

questionnaire format was used for both assessments, and all participants received the same educational content. Data were checked for completeness before entry, and responses were coded consistently to minimize data-entry errors.

Data were analyzed using Statistical Package for the Social Sciences version 27. Descriptive statistics were used to summarize demographic characteristics as frequencies and percentages. Continuous knowledge scores were summarized using mean and standard deviation. The paired-samples t-test was applied to compare pre-intervention and post-intervention knowledge scores because the same participants were assessed at two time points. Statistical significance was set at $p < 0.05$. Results were reported using mean differences, standard deviation, standard error, 95% confidence intervals, t-values, degrees of freedom, and p-values to improve interpretability and reproducibility.

RESULTS

The data of 50 nursing students were analyzed to assess changes following the educational intervention. All participants were female BSN nursing students. Most participants were aged 15–20 years (n = 30, 60.0%), while 20 participants (40.0%) were aged 21–25 years. This reflects a young and academically homogenous group suitable for evaluating the immediate effect of an educational intervention among nursing students.

Table 1. Demographic Characteristics of Participants

Variable	Category	Frequency	Percentage
Age	15–20 years	30	60.0
Age	21–25 years	20	40.0
Gender	Female	50	100.0
Educational level	Nursing student	50	100.0

Because the item-level responses represent students' perceived impact of nurse-led educational activities rather than direct PCOS-specific knowledge domains, they were summarized as positive response rates by combining "Agree" and "Strongly Agree." This compact presentation shows a consistent shift toward favorable responses after the intervention across all measured perception items.

Table 2. Pre- and Post-Intervention Positive Response Distribution for Perceived Educational Impact

Item	Pre Agree/Strongly Agree n (%)	Post Agree/Strongly Agree n (%)	Absolute Increase
Improved knowledge and skills	6 (12.0)	40 (80.0)	+68.0%
Motivated to provide high-quality care	5 (10.0)	39 (78.0)	+68.0%
Nurse educators influenced work performance	5 (10.0)	34 (68.0)	+58.0%
Enhanced teamwork and collaboration	5 (10.0)	43 (86.0)	+76.0%
Increased job satisfaction	6 (12.0)	44 (88.0)	+76.0%
Empowered to implement innovative practices	7 (14.0)	41 (82.0)	+68.0%
Improved quality of patient care	4 (8.0)	40 (80.0)	+72.0%
Enabled new ways of thinking	6 (12.0)	41 (82.0)	+70.0%
Reward-linked guidance behavior	0 (0.0)	41 (82.0)	+82.0%
Intuition in decision-making	4 (8.0)	41 (82.0)	+74.0%

The strongest post-intervention positive responses were observed for increased job satisfaction (88.0%), enhanced teamwork and collaboration (86.0%), empowerment to implement innovative practices (82.0%), enabling new ways of thinking (82.0%), reward-linked guidance behavior (82.0%), and intuition in decision-making (82.0%). The largest absolute increase was observed for reward-linked guidance behavior, rising from 0.0% before the intervention to 82.0% after the intervention. Positive responses regarding knowledge and skills increased from 12.0% to 80.0%, indicating a marked perceived improvement after the educational activity.

The paired-samples t-test demonstrated a statistically significant increase in total pre- and post-intervention scores. The mean difference for pre-test minus post-test scores was −21.36, indicating

higher post-intervention scores. The 95% confidence interval ranged from −22.57 to −20.15 and did not cross zero. The difference was statistically significant, $t(49) = -35.37$, $p < 0.001$.

Table 3. Paired-Samples Test for Pre- and Post-Intervention Scores

Comparison	Mean Difference	SD	SE	95% CI	t	df	p-value
Pre-test – Post-test	−21.36	4.27	0.604	−22.57 to −20.15	−35.37	49	<0.001

Overall, the findings show a substantial post-intervention improvement in total scores and a consistent positive shift in students' perceptions of nurse-led educational activities. However, the item-level table should be interpreted as perceived educational impact, while the paired-score analysis should be used as the primary quantitative evidence for pre–post improvement.

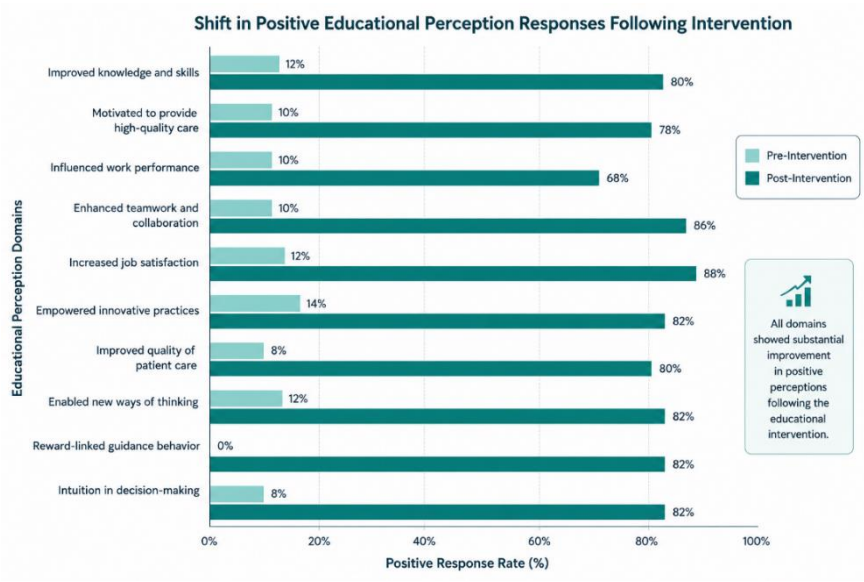

Figure 1 Shift in Positive Educational Perception Responses following Intervention

The figure demonstrates a substantial post-intervention increase in positive educational perception responses across all evaluated domains following the nurse-led educational intervention. Pre-intervention positive response rates ranged from 0.0% to 14.0%, whereas post-intervention responses increased markedly to between 68.0% and 88.0%. The greatest absolute improvement was observed in reward-linked guidance behavior, increasing from 0.0% pre-intervention to 82.0% post-intervention (+82.0%). Similarly, job satisfaction improved from 12.0% to 88.0% (+76.0%), teamwork and collaboration increased from 10.0% to 86.0% (+76.0%), and perceived improvement in patient-care quality rose from 8.0% to 80.0% (+72.0%). Knowledge and skill enhancement demonstrated a rise from 12.0% to 80.0% (+68.0%), while empowerment to implement innovative practices increased from 14.0% to 82.0% (+68.0%). Overall, the visual trend indicates a consistent and clinically meaningful positive shift in participant perceptions after exposure to the educational intervention.

DISCUSSION

This study evaluated the effect of a structured nurse-led educational intervention among nursing students and demonstrated a statistically significant improvement in post-intervention scores compared with baseline assessment. The paired-samples analysis showed a mean pre–post difference of −21.36, with a narrow 95% confidence interval from −22.57 to −20.15 and a highly significant t-value, $t(49) = -35.37$, $p < 0.001$. These findings indicate that exposure to the educational session was associated with a substantial improvement in measured post-intervention responses. The magnitude and consistency of the change suggest that structured educational activities can produce immediate measurable gains among nursing students when delivered in a focused academic setting.

The demographic profile showed that all participants were female nursing students, with most aged 15–20 years. This population is highly relevant for PCOS-related educational interventions because young female nursing students may personally benefit from improved reproductive health awareness while also serving as future healthcare providers involved in patient counseling, early symptom recognition, and preventive health education. Earlier studies have similarly emphasized that nursing students and young women often have insufficient knowledge regarding PCOS, particularly in relation to symptoms, risk factors, diagnostic awareness, complications, and lifestyle modification (1,2,5,6,11). The present findings are consistent with previous educational-intervention studies showing that structured teaching can improve awareness and knowledge regarding PCOS among students and young females (8,10,12,13).

The item-level findings further showed a marked positive shift in perceived educational impact. Positive responses for improved knowledge and skills increased from 12.0% before the intervention to 80.0% after the intervention. Similarly, motivation to provide high-quality care increased from 10.0% to 78.0%, teamwork and collaboration increased from 10.0% to 86.0%, and perceived job satisfaction increased from 12.0% to 88.0%. These findings suggest that educational exposure may not only improve knowledge-related responses but may also enhance students' confidence, motivation, and perceived readiness for professional nursing roles. However, these perception-based items should be interpreted cautiously because they reflect perceived educational benefit and professional attitude rather than direct PCOS-specific knowledge domains.

The findings support the educational value of integrating focused PCOS awareness sessions into nursing education. PCOS is associated with menstrual irregularity, infertility, metabolic complications, obesity, insulin resistance, and psychosocial burden, making early recognition and counseling clinically important (2,7,9). Nursing students who receive structured education on such conditions may be better prepared to identify warning signs, guide young women toward timely consultation, and support lifestyle modification. Similar literature has highlighted the importance of educational and awareness programs in improving recognition and management of PCOS among young women and healthcare trainees (3,4,8,12).

This study has limitations that should be considered while interpreting the findings. The study used a one-group pre-test and post-test quasi-experimental design without a control group; therefore, causal inference is limited. The sample was selected through purposive sampling from a single setting, which may restrict generalizability. The sample was also relatively small and included only female nursing students. The post-test appears to have assessed immediate response after intervention, so long-term retention of knowledge could not be determined. In addition, the item-level Likert responses included several perception-oriented domains related to nurse-led education, teamwork, job satisfaction, and professional confidence; therefore, these items should be presented as perceived educational impact rather than as direct PCOS knowledge measures. Future studies should use validated PCOS-specific knowledge instruments, include control groups, assess long-term retention, and involve larger multicenter samples.

CONCLUSION

The structured educational intervention produced a statistically significant improvement in post-intervention scores among nursing students, indicating that focused educational sessions can enhance awareness and perceived educational benefit in this population. Positive responses increased across all measured perception domains, including knowledge and skills, motivation, teamwork, professional confidence, and perceived quality of care. However, because several item-level responses measured perceived educational impact rather than direct PCOS-specific knowledge, future studies should apply validated PCOS knowledge tools, larger samples, control groups, and follow-up assessments to confirm sustained learning and clinical relevance.

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