



Original Research Article

“A study to assess the effectiveness of structured teaching programme on knowledge regarding life style modification in PCOS among Engineering students in selected colleges of Navi Mumbai.”

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Abstract: Background: Polycystic Ovarian Syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age and is associated with hormonal imbalance, menstrual irregularities, infertility, obesity, and metabolic complications. Lifestyle modification, including dietary regulation, regular physical activity, and weight management, is considered the first-line management strategy. However, awareness regarding PCOS and its lifestyle management remains inadequate among young women. **Aim:** To assess the effectiveness of a structured teaching programme on knowledge regarding lifestyle modification in PCOS among engineering students in selected colleges of Navi Mumbai.

Methods: A quantitative research approach with a quasi-experimental one-group pre-test post-test design was adopted. The study was conducted among 135 female engineering students selected through non-probability convenience sampling. Data were collected using a self-structured questionnaire consisting of demographic variables and 20 multiple-choice questions related to PCOS and lifestyle modification. The reliability coefficient of the tool was 0.9. Descriptive and inferential statistics were used for data analysis. The effectiveness of the intervention was assessed by comparing pre-test and post-test knowledge scores. **Results:** In the pre-test, 111 (82.2%) students had average knowledge and 24 (17.8%) had good knowledge, with a mean score of 9.45 ± 1.31 (47.25%). After the structured teaching programme, 105 (77.8%) achieved good knowledge, 28 (20.7%) had average knowledge, and 2 (1.5%) attained excellent knowledge. The post-test mean score increased to 11.97 ± 1.65 (59.85%), with a mean percentage gain of 12.6%. The calculated paired t-value was 14.03 ($p < 0.05$), indicating a statistically significant improvement. No significant association was found between pre-test knowledge and selected demographic variables. **Conclusion:** The structured teaching programme was effective in significantly enhancing knowledge regarding lifestyle modification in PCOS among engineering students.

Keywords: Polycystic Ovarian Syndrome, Lifestyle Modification, Structured Teaching Programme, Knowledge, Engineering Students.

INTRODUCTION

Polycystic Ovarian Syndrome (PCOS) is a heterogeneous endocrine disorder and one of the most common hormonal disorders affecting women

of reproductive age [1]. It was first described in 1935 by Stein and Leventhal and was initially known as Stein–Leventhal syndrome.

PCOS affects approximately 8–13% of women of reproductive age worldwide, with prevalence ranging from 2.2% to 26% depending on the population studied and diagnostic criteria used [1]. It commonly begins during adolescence, although symptoms may vary over time.

PCOS is characterized by hormonal imbalance, hyperandrogenism, menstrual irregularities, and polycystic ovaries [1]. Oligo-ovulation or anovulation may lead to infertility, making PCOS one of the leading causes of infertility among women [1]. The disorder is also associated with obesity, insulin resistance, hyperinsulinemia, and increased risk of type 2 diabetes and cardiovascular diseases [2].

The morphology of polycystic ovaries is defined as the presence of 12 or more follicles measuring 2–9 mm in diameter and/or increased ovarian volume on ultrasonography [3]. According to the Rotterdam criteria (2003), PCOS is diagnosed when any two of the following three features are present:

1. Oligo-ovulation and/or anovulation
2. Clinical and/or biochemical signs of hyperandrogenism
3. Polycystic ovaries on ultrasound [1]

Although PCOS is a chronic condition with no definitive cure, symptoms can be effectively managed through lifestyle modification, pharmacological treatment, and fertility management [4]. Lifestyle modification remains the first-line management, especially for overweight and obese women [4,5].

NEED OF THE STUDY

Polycystic Ovarian Syndrome (PCOS) is a multifactorial clinical condition associated with metabolic, endocrine, and reproductive disturbances [1]. It presents with hyperandrogenism, menstrual dysfunction, infertility, obesity, and increased risk of long-term complications such as impaired glucose tolerance and cardiovascular disease [2]. The pathogenesis of PCOS is complex and involves hormonal imbalance resulting from increased androgen levels and insulin resistance, influenced by genetic and environmental factors [1].

Given the rising incidence of PCOS and its long-term metabolic and psychological consequences, preventive strategies are essential. Lifestyle modification—including regular physical activity, weight management, and dietary changes—plays a significant role in improving metabolic parameters and reproductive outcomes [4,6].

A cross-sectional study conducted by Pitchai et al. (2016) assessed awareness of lifestyle modification among women with PCOS in Mumbai and Navi Mumbai [7]. The study revealed that only 21% of respondents were very well aware of PCOS. About

51% reported doctors as their primary source of information. While 81% believed PCOS is manageable, only 62% were aware that exercise helps in its management, and only 39% practiced regular exercise. Furthermore, 64% were aware that dietary modification influences PCOS, and 32% reported anxiety after diagnosis. However, 95% expressed willingness to adopt lifestyle changes [7].

These findings highlight a significant gap between awareness and actual implementation of lifestyle practices. Therefore, structured educational interventions are necessary to enhance knowledge and promote healthy behavioral changes among young women.

Hence, the present study aims to assess the effectiveness of a structured teaching programme on knowledge regarding lifestyle modification in PCOS among engineering students in selected colleges of Navi Mumbai.

AIM OF THE STUDY

To assess the effectiveness of a structured teaching programme on knowledge regarding lifestyle modification in Polycystic Ovarian Syndrome (PCOS) among engineering students in selected colleges of Navi Mumbai.

OBJECTIVES

1. To assess the knowledge regarding lifestyle modification in PCOS among college students.
2. To evaluate effectiveness of structure teaching programme on knowledge.
3. To find out an association between pre-test knowledge with selected demographic variables

METHODOLOGY

Research Approach

A quantitative research approach was adopted for the present study to evaluate the effectiveness of a structured teaching programme on knowledge regarding Polycystic Ovarian Syndrome (PCOS) among engineering students.

Research Design

A quasi-experimental one-group pre-test post-test design was used for the study. This design was considered appropriate to assess the effectiveness of the structured teaching programme by comparing knowledge scores before and after the intervention. It is simple, practical, and suitable for conducting research in natural educational settings.

Variables

- Independent Variable: Structured teaching programme on Polycystic Ovarian Syndrome (PCOS).

- Dependent Variable: Knowledge regarding lifestyle modification in PCOS among engineering students.

Setting of the Study

The study was conducted in selected engineering colleges of Navi Mumbai. The setting was chosen based on feasibility, accessibility, and relevance to the study objectives.

Population

Target Population

The target population comprised all female engineering students studying in selected colleges of Navi Mumbai.

Accessible Population

The accessible population included female engineering students who were available during the period of data collection in the selected colleges.

Sample Size

The sample size consisted of 135 female engineering students from selected colleges of Navi Mumbai.

Sampling Technique

A non-probability convenience sampling technique was used to select the participants who met the inclusion criteria and were available at the time of data collection.

Sampling Criteria

Inclusion Criteria

- Female engineering students who were available during the time of data collection.
- Students who were willing to participate in the study.

Exclusion Criteria

- Students who were absent during data collection.
- Data Collection Technique and Tool
- Data were collected using a self-structured questionnaire developed by the investigator based on the objectives of the study.

The tool consisted of two sections:

1. **Section I: Demographic data (age, year of study, etc.)**
2. **Section II: Structured questionnaire on PCOS consisting of 20 multiple-choice questions.**

The questionnaire covered areas such as definition, causes, types, diagnostic evaluation, lifestyle modification, management, and treatment of PCOS. Each correct answer was awarded one mark. The maximum possible score was 20. The grading of knowledge levels was formulated by the investigator in consultation with a statistician and an educationist.

Validity of the Tool

The research tool was submitted to experts in the field of nursing and related disciplines for content validation. Necessary corrections and suggestions were incorporated, and the final tool was prepared accordingly.

Reliability of the Tool

After establishing validity, the reliability of the tool was tested. The reliability study was conducted among 13 engineering students at Bharati Vidyapeeth College of Engineering, Navi Mumbai. The reliability coefficient was found to be 0.9, indicating that the tool was highly reliable.

Ethical Considerations

- Ethical clearance was obtained from the Institutional Ethics Committee of Bharati Vidyapeeth (Deemed to be University), College of Nursing, Navi Mumbai.
- Permission was obtained from the concerned authorities of the selected engineering colleges.
- Informed consent was obtained from the participants.
- Confidentiality and anonymity of the participants were maintained throughout the study.
- Participants were informed about the purpose of the study before data collection.

RESULTS

Procedure for Data Collection

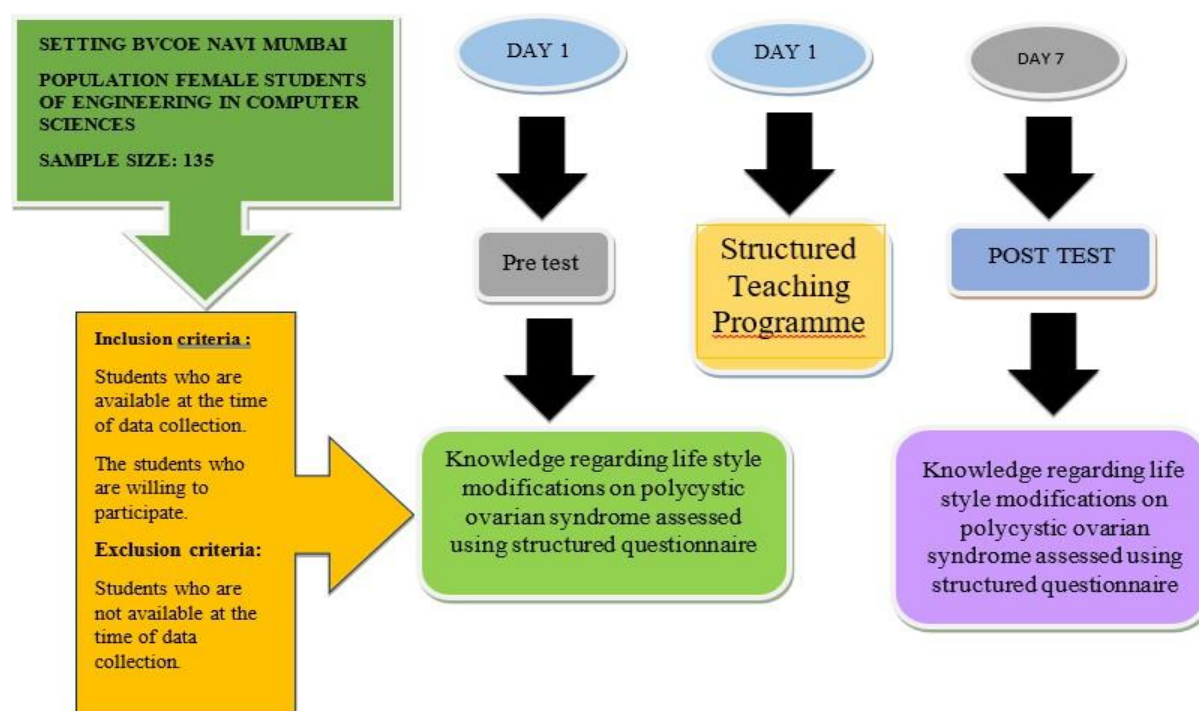


Figure 1: Schematic Representation of Procedure for Data Collection

Plan for Data Analysis

Data analysis was carried out based on the objectives and hypotheses of the study using descriptive and inferential statistics.

Descriptive statistics: Frequency and percentage distribution were used to describe demographic variables and knowledge scores.

Inferential statistics: The Chi-square test was used to determine the association between pre-test knowledge scores and selected demographic variables.

The effectiveness of the structured teaching programme was assessed by comparing pre-test and post-test knowledge scores.

Pilot Study

A pilot study was conducted at Bharati Vidyapeeth College of Engineering (Mumbai University), Navi Mumbai, to assess the feasibility of the main study.

Pre-test and post-test were conducted among a small group of engineering students. The purpose and confidentiality of the study were explained to the participants. The pilot study helped in refining the tool and confirming the feasibility of the main study.

Plan for Dissemination

The findings of the study will be presented using frequency and percentage distributions for baseline characteristics. Knowledge scores will be analyzed using descriptive and inferential statistics. The association between selected demographic variables and pre-test knowledge will be determined using the Chi-square test. The results will be disseminated through academic presentations and submission to the concerned institution.

RESULT

Frequency and Percentage Distribution of selected Demographic Characteristics

The demographic profile of 135 engineering students who participated in the study showed:

1. Age (in years): The majority of the participants, 107 (79.3%), were in the age group of 18–20 years. About 27 (20.0%) students were aged 21–23 years, while only 1 (0.7%) student was in the age group of 23–25 years. None of the participants were above 25 years of age. This indicates that most of the respondents were in late adolescence and early adulthood.

2. Monthly Income of the Family (in rupees): More than half of the participants, 72 (53.3%), belonged to families with a monthly income above ₹50,001. About 27 (20.0%) had a family income between ₹25,001–50,000, 22 (16.3%) between ₹15,001–25,000, and 14 (10.4%) below ₹15,000. This shows that a majority of students belonged

to higher-income families.

3. Religion: Most of the participants, 126 (93.3%), were Hindus. Muslims and individuals belonging to other religions each constituted 4 (3%) participants, while only 1 (0.7%) participant was Christian. This indicates that the sample predominantly consisted of Hindu students.

4. Education of Parents: A majority of parents, 97 (71.9%), were graduates. About 23 (17.0%) had secondary education, 13 (9.6%) had other forms of education, and only 2 (1.5%) had primary education. This reflects that most participants came from relatively well-educated family backgrounds.

5. Area of Residence: Most of the participants, 125 (92.6%), resided in urban areas, while only 10 (7.4%) were from rural areas. This indicates that the study sample largely represented urban students.

6. Family History of PCOS: Only 7 (5.2%) participants reported a family history of PCOS, whereas 128 (94.8%) reported no family history. This suggests that the majority did not have a known familial predisposition.

7. Previous Source of Information Regarding PCOS: Out of 135 participants, 47 (34.8%) had prior information regarding PCOS, while 88 (65.2%) reported having no previous information. This indicates that a considerable proportion of students lacked prior awareness about PCOS.

8. Dietary Pattern: The majority of participants, 95 (70.4%), followed a non-vegetarian diet, while 40 (29.6%) were vegetarians. This shows that most students consumed a mixed (non-vegetarian) diet.

The findings reveal that most participants were young (18–20 years), from urban areas, belonging to higher-income families, and had well-educated parents. However, despite this background, a significant proportion (65.2%) lacked prior information regarding PCOS, highlighting the need for structured educational interventions among engineering students.

Frequency and Percentage Distribution Pre-test & Post-test Knowledge

Table 1: Distribution category of knowledge score.

Category of knowledge	Score
Poor	0-5
Average	6-10
Good	11-15
Excellent	16-20

Table 1 shows the classification of knowledge scores regarding Polycystic Ovarian Syndrome (PCOS). The total score ranged from 0 to 20. Knowledge levels were categorized into four groups: Poor (0–5), Average (6–10), Good (11–15), and Excellent (16–20). This categorization was used to assess and compare the pre-test and post-test knowledge levels of the participants.

Table 2: Frequency and percentage distribution of knowledge of Engineering students

Level of knowledge	Pre-test		Post-test	
	F	%	F	%
Poor	00	00%	00	00%
Average	111	82.2%	28	20.7%
Good	24	17.8%	105	77.8%
Excellent	00	00%	02	1.5%

The table 2 shows the distribution of knowledge scores of engineering students before and after the structured teaching programme.

- Pre-test: Most students, 111 (82.2%), had average knowledge, while 24 (17.8%) had good knowledge. No student scored in the poor or excellent categories. This indicates a moderate level of baseline knowledge about PCOS among the participants.
- Post-test: After the structured teaching programme, the knowledge levels improved significantly. 105 (77.8%) students achieved good knowledge, 28 (20.7%) were in the average category, and 2 (1.5%) attained excellent knowledge. No students were in the poor category post-intervention.

Overall Interpretation: The structured teaching programme was effective in improving the knowledge of engineering students regarding PCOS, as seen by the shift from predominantly average knowledge in the pre-test to predominantly good knowledge in the post-test.

Effectiveness of Structured Teaching Programme on Knowledge Regarding PCOS Among Engineering Students

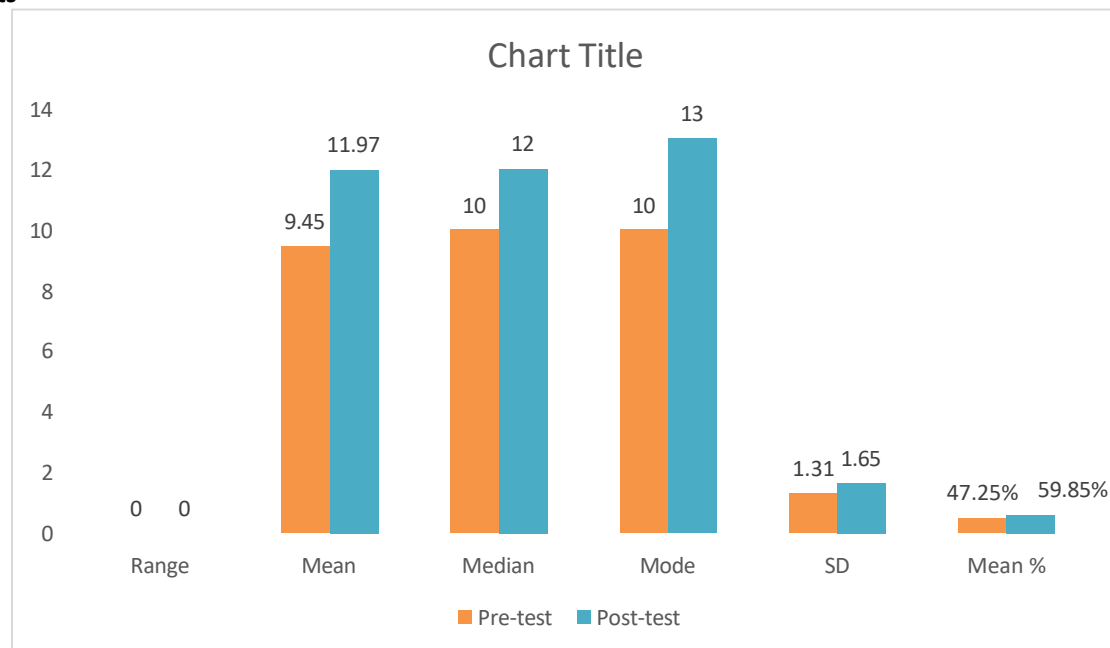


Figure 2: Comparison of Pre-test and Post-test Knowledge Scores of Engineering Students Regarding PCOS

The figure 2 represents a comparison of pre-test and post-test knowledge scores of engineering students regarding Polycystic Ovarian Syndrome (PCOS). In the pre-test, the knowledge scores ranged from 7 to 13, with a mean score of 9.45, a median of 10, and a mode of 10. The standard deviation was 1.31, and the mean percentage score was 47.25%. These results indicate that, prior to the structured teaching programme, the students' knowledge about PCOS was moderate, with most scores clustering around the central value and low variability among participants.

Following the structured teaching programme, the post-test scores showed marked improvement. The range increased slightly from 7 to 16, and the mean score rose to 11.97. The median and mode also increased to 12 and 13, respectively, while the standard deviation slightly increased to 1.65. The mean percentage score improved to 59.85%, representing a mean percentage increase of 12.6% from the pre-test. This upward shift in mean, median, and mode demonstrates that the majority of students gained substantial knowledge after the intervention.

Overall, the comparison clearly reflects the effectiveness of the structured teaching programme. The increase in knowledge scores across all descriptive measures indicates that the programme successfully enhanced the understanding of engineering students regarding PCOS, and the results suggest that educational interventions can significantly improve awareness and knowledge in this population.

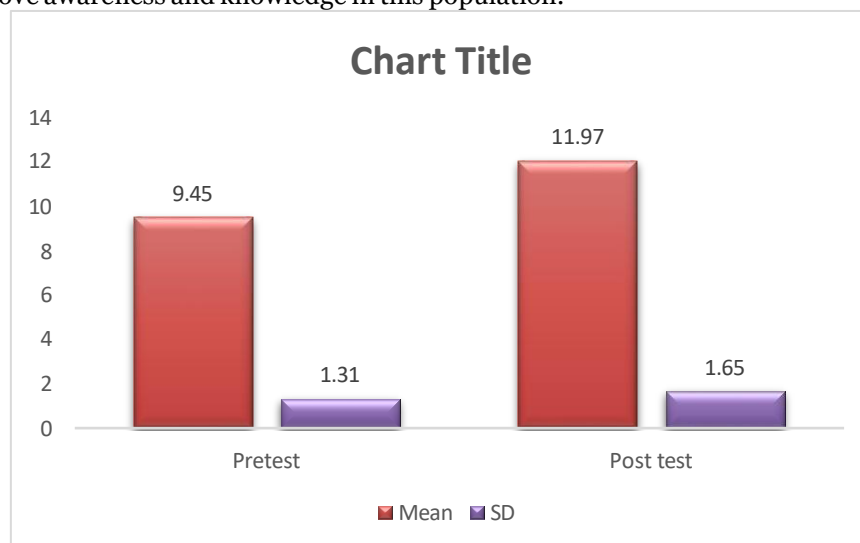


Figure 3: Effectiveness of Structured Teaching Programme on Knowledge Regarding Lifestyle Modification in PCOS

The figure 3 illustrates the comparison of mean knowledge scores and standard deviations of engineering students before and after the structured teaching programme on PCOS. In the pre-test, the mean knowledge score was 9.45 with a standard deviation of 1.31, indicating a moderate level of knowledge and relatively low variability among the students. Following the intervention, the post-test mean score increased to 11.97 with a standard deviation of 1.65, showing a notable improvement in knowledge levels.

The paired 't' test was conducted to determine the statistical significance of the difference between pre-test and post-test scores. The calculated paired 't' value was 14.03 with $df = 59$, which indicates that the increase in knowledge after the structured teaching programme was highly significant ($p < 0.05$).

Overall, the figure demonstrates that the structured teaching programme was effective in enhancing the knowledge of engineering students regarding lifestyle modification in PCOS. The increase in mean score and the significant paired 't' value confirm that the educational intervention had a positive impact on students' understanding of PCOS and its management through lifestyle changes.

Association between Pre-test Knowledge Score and Demographic Variables

The association between the pre-test knowledge scores of engineering students regarding PCOS and their demographic variables was analyzed using the Chi-square test. The results indicate that there was no statistically significant association ($p > 0.05$) between pre-test knowledge and any of the selected demographic variables, including age, monthly family income, religion, parental education, area of residence, family history of PCOS, previous source of information, and dietary pattern.

This suggests that the students' baseline knowledge about PCOS was independent of their demographic characteristics, indicating that factors such as age, income, and parental education did not influence their initial level of knowledge.

DISCUSSION

The findings of the present study are consistent with earlier evidence showing that structured educational interventions significantly improve knowledge regarding Polycystic Ovarian Syndrome (PCOS) among adolescents and young adults. In the present study, engineering students demonstrated moderate baseline knowledge in the pre-test, but their post-test scores increased substantially following the Structured Teaching Programme (STP), indicating that planned teaching can effectively bridge knowledge gaps even in educated populations. This improvement supports the broader clinical view presented by Escobar-Morreale (2016), who emphasized that PCOS is a common endocrine-metabolic disorder requiring clear diagnostic understanding and long-term management, particularly through lifestyle and evidence-based clinical guidance. Similarly, the need for accurate information is reinforced by Kaur et al. (2021), who found that women with PCOS often experience treatment delays, consult multiple agencies, and express dissatisfaction due to poor-quality information—highlighting the importance of early awareness and structured health education.

The present study's results also align strongly with STP-based studies among adolescents. Dahiya et al. (2024) reported a marked rise in mean knowledge scores after STP, and their findings, like the present study, showed no significant association between pre-test knowledge and demographic variables.

Comparable outcomes were noted by Varughese and Tauro (2018) and Shukla and Verma (2021), who observed statistically significant improvements in post-test knowledge following structured teaching, confirming that educational programmes are effective in improving PCOS-related awareness across student groups. Likewise, Mala and John (2019) concluded that structured teaching enhanced knowledge regarding PCOS and prevention of complications, supporting the effectiveness of teaching interventions similar to the present study.

Further, the teaching focus on lifestyle modification is supported by evidence that lifestyle change plays a central role in PCOS management. Shahid et al. (2019) and Sharma and Srivastava (2020) emphasized that diet, exercise, and sustainable lifestyle modification improve PCOS symptoms and quality of life, while Ibrahim et al. (2021) demonstrated significant improvement in health-related quality of life after lifestyle education sessions. Overall, the present study adds to the existing literature by confirming that STP is an effective strategy for improving PCOS knowledge among engineering students, and that baseline knowledge deficits occur irrespective of socio-demographic characteristics.

CONCLUSION

The present study concluded that the structured teaching programme was effective in improving knowledge regarding lifestyle modification in Polycystic Ovarian Syndrome (PCOS) among

engineering students in selected colleges of Navi Mumbai. The findings revealed that although the majority of students belonged to urban, educated, and relatively higher socioeconomic backgrounds, baseline knowledge regarding PCOS and its lifestyle management was only moderate. This indicates that general educational status does not necessarily ensure adequate awareness about reproductive health conditions.

Following the implementation of the structured teaching programme, a significant improvement was observed in post-test knowledge scores compared to pre-test scores. The statistical analysis confirmed that the intervention had a positive and meaningful impact on students' understanding of PCOS, its causes, risk factors, complications, and the importance of lifestyle modification. Furthermore, no significant association was found between pre-test knowledge scores and selected demographic variables, suggesting that knowledge deficits were uniformly distributed across different groups.

Overall, the study highlights the importance of structured educational interventions in promoting awareness and preventive health behavior among young women. Early education regarding lifestyle modification can play a vital role in reducing long-term metabolic and reproductive complications associated with PCOS.

Conflict of Interest: The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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