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Personalized Nursing Approaches In Pcos Management: Impact On Demographic And Clinical Parameters And Their Relationship With Anthropometric Measurements

SR. Lourdu Mary[1]*, Dr. Hema V H[2]

1* Research Scholar, Faculty of Nursing, Dr. M.G.R. Educational and Research Institute, Chennai, Tamil Nadu, India.

2Professor cum Principal, Faculty of Nursing, Dr. M.G.R. Educational and Research Institute, Chennai, Tamil Nadu, India.

*Corresponding Author

(lourdufsj@gmail.com)

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A B S T R A C T

Background: *Polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder affecting women of reproductive age, characterized by irregular menstrual cycles, hyperandrogenism, and polycystic ovaries. Effective management of PCOS requires a combination of lifestyle modifications and pharmacological treatments to mitigate associated metabolic complications. Objective: This study aimed to evaluate the impact of a comprehensive nursing intervention package on demographic, clinical, and anthropometric variables among women with PCOS at selected hospitals in Chennai, India. Methods: A quasi-experimental pre-and post-test design was employed, involving 200 women with PCOS divided equally into experimental and control groups. The intervention included video-assisted teaching on PCOS, investigator-guided aerobic exercises, and needs-based dietary prescriptions. Data were collected on demographic variables, clinical parameters, and anthropometric measurements, specifically BMI and waist-hip ratio. Statistical analysis was performed using SPSS Version 28, employing descriptive and inferential statistics. Results: The pre-test results showed no significant differences between the experimental and control groups in demographic and clinical variables, ensuring comparability. Post-intervention, the experimental group exhibited significant reductions in BMI and waist-hip ratio compared to the control group. The mean BMI of the experimental group decreased from 28.2 to 22.38, and the waist-hip ratio reduced from 89.145 to 77.44, with p-values <0.001 for both measures. These improvements highlight the intervention's effectiveness in reducing obesity and metabolic risk factors associated with PCOS. Conclusion: The comprehensive nursing intervention significantly improved anthropometric measurements among women with PCOS, emphasizing the importance of a multidisciplinary approach in managing the condition. Future research should focus on diverse populations, extended follow-up periods, and the individual components of the intervention to further optimize PCOS management strategies.*

Keywords *:Polycystic Ovary Syndrome, PCOS, Nursing Intervention, Body Mass Index, Waist-Hip Ratio, Metabolic Health.*

INTRODUCTION

Polycystic ovaries, irregular menstrual cycles, and hyperandrogenism are signs of PCOS in women. The prevalence of PCOS is estimated at 3.7% to 22.5% among Indian women. This condition can lead to various metabolic complications, such as obesity, impaired lipid profiles, insulin resistance, and type 2 diabetes. In PCOS, hormonal imbalances and genetic factors combine to increase androgenic activity. Families with a history of PCOS are at greater risk for developing the disease due to genetic factors. In addition, insulin resistance contributes to PCOS pathophysiology in that insulin sensitivity decreases as the disease progresses. As a result of multiple factors interplaying, PCOS has a complicated etiology. As a result of PCOS, women may suffer from irregular menstrual cycles, infertility, acne, oily skin, and hirsutism, which refers to excessive hair growth in the chest, back, face, and abdomen. There is no difference in weight between obese and lean women with PCOS who suffer from IR. The most common sign of PCOS is polycystic ovaries and oligo-anovulation.

Effective management of PCOS is crucial to mitigating the cardiovascular complications associated with the metabolic disorders prevalent among PCOS patients. A multidisciplinary approach to PCOS treatment should address both immediate symptoms and long-term health implications. Treatment strategies for PCOS aim to combat insulin resistance, oligoovulation, and hyperandrogenism. Pharmacological interventions often include the use of metformin, which has shown promising results when combined with lifestyle modifications. Changing diet and exercise are necessary for managing PCOS symptoms and improving health outcomes.

Studies conducted in different regions of India highlight the variable prevalence of PCOS. For instance, research in South India reported a prevalence of 9.13% based on the Rotterdam criteria, while a study in Maharashtra found a prevalence of 22.5%, with 10.7% identified according to the Androgen Excess Society criteria. These variations underscore the need for region-specific studies to understand better the epidemiology and impact of PCOS within diverse populations. In addressing PCOS, a comprehensive nursing intervention can play a pivotal role. This involves assessing and managing demographic, clinical, and anthropometric variables such as BMI and Waist-Hip Ratio through a quasi-experimental design. By focusing on these variables, healthcare providers can develop tailored interventions that effectively address the unique needs of each patient. Nursing interventions can include patient education, lifestyle counseling, and regular monitoring of metabolic parameters to ensure optimal management of PCOS.

Health-related consequences of PCOS are significant for women of reproductive age. Changing your lifestyle and taking pharmaceuticals are necessary for managing the disease. Comprehensive nursing interventions can provide critical support in managing PCOS, addressing both immediate symptoms and long-term health risks. Given the high prevalence and variability of PCOS in different regions, ongoing research and region-specific studies are essential to developing effective treatment strategies and improving health outcomes for women with PCOS in India and beyond.

Methodology

Research Design

Nursing interventions were tested in selected Chennai hospitals to determine their effectiveness. This design is particularly effective in assessing interventions where randomization is not feasible, allowing for a detailed comparison of participant outcomes before and after the intervention.

Ethical Consideration

Ethics were emphasized throughout this study. As of October 2021, the research had been approved by the ethics committee of the institution. Hospital authorities gave permission for the study to be conducted. Researchers respected the privacy and rights of participants throughout the research process. A consent form outlined the study's goals, procedures, risks, and benefits to all participants. A secure storage facility and restricted access to participants' data ensured their confidentiality.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Women aged 18 to 33 years, both married and unmarried, were eligible to participate.
- Married women who had not conceived were included to explore the impact of PCOS on fertility.
- Women diagnosed with PCOS within the past year were chosen to ensure recent and relevant data.
- Participants needed to understand Tamil and English to comprehend the intervention materials and **instructions.**

Exclusion Criteria:

- Women who conceived during the study period were excluded to avoid confounding factors related to pregnancy.
- Women with physical deformities were excluded to ensure uniformity in the sample.
- Participants undergoing hormonal treatment, PCOS-specific treatment, or using oral contraceptives were excluded to eliminate the influence of ongoing treatments.
- Women with comorbid conditions such as diabetes mellitus (DM), hypertension (HT), and other illnesses were excluded to focus specifically on PCOS-related variables.

Tools Used

Interventional Tools: The intervention comprised multiple components aimed at providing a holistic approach to managing PCOS.

1. Video-Assisted Teaching on PCOS: This educational tool provided participants with comprehensive information about PCOS, including its symptoms, causes, and management strategies. The video format was chosen for its effectiveness in enhancing understanding and retention of information.

2. Investigator-Guided Aerobic Exercises: This component included progressive resistance training and high-intensity interval training (HIIT). These exercises were selected based on their efficacy in improving metabolic health and reducing symptoms of PCOS. Participants were guided through these exercises to ensure proper technique and safety.

3. Needs-Based Dietary Prescriptions: Individualized dietary plans were created based on each participant's nutritional needs and health status. These plans aimed to address insulin resistance and promote weight management, crucial aspects of PCOS management.

Dependent Variables: The study focused on three main types of variables:

1. Demographic Variables: We took into account factors such as age, marital status, educational level, and

occupation.

2. Clinical Variables: These encompassed menstrual cycle regularity, signs of hyperandrogenism (such as acne and hirsutism), and markers of insulin resistance.

3. Anthropometric Measurements: These involved body mass index (BMI), waist-hip ratio (WHR), and other relevant physical metrics that provide insights into the participants' body composition and health status.

Population and Sample Size

This study included 200 participants, 100 of whom were in an experimental group and 100 of whom were in a control group. This sample size gave us the statistical strength to detect significant differences between groups. A homogeneous sample was achieved by selecting participants based on inclusion-exclusion criteria.

Data Collection and Intervention

The data collection process involved several stages:

1. Pre-Intervention Assessment: Baseline data on demographic, clinical, and anthropometric variables were collected from all participants. This initial assessment provided a reference point for evaluating the intervention's impact.

2. Implementation of Interventions: The experimental group received the comprehensive nursing intervention package, which included video-assisted teaching, guided aerobic exercises, and dietary prescriptions. The control group did not receive this intervention, allowing for a comparison of outcomes.

3. Post-Intervention Assessment: After the intervention period, data were collected again from both the experimental and control groups. This post-intervention assessment aimed to measure changes in the variables and determine the intervention's effectiveness.

Data Analysis

The results of the analysis were analyzed using SPSS 28 (Statistical Package for Social Sciences), Version 28.

1. Descriptive Statistics: This report presents information on participants' age, marital status, education, and occupation. To understand participants' baseline characteristics, we also analyzed clinical and anthropometric data as part of the study.

2. Inferential Statistics: T-tests were used to compare the means of continuous variables, such as BMI and WHR, before and after the intervention. Chi-square tests were employed to analyze categorical variables, such as the presence or absence of specific clinical symptoms. Using these tests, we determined whether differences between experimental and control groups were significant.

RESULTS AND DISCUSSION

Table:1 In experimental and control groups, the frequencies and percentages of clinical variables were compared

S.NO	DEMOGRAPHIC AND CLINICAL VARIABLES	EXPERIMENTAL GROUP		CONTROL GROUP		Chi square
		N	%	N	%	
1	Age					
	18- 21 years	50	50%	44	44%	1.95
	22- 25years	25	25%	22	22%	
	26- 29 years	13	13%	18	18%	
	30 – 33 years	12	12%	16	16%	
2	Religion					
	Hindu	61	61%	40	40%	9.10
	Muslim	21	21%	29	29%	
	Christian	18	18%	31	31%	
	Others	0	0%	0	0%	
3	Residential					
	Rural	54	54%	52	52%	1.70
	Semi-rural	19	19%	23	23%	
	Urban	16	16%	11	11%	
	Semi-urban	11	11%	14	14%	
4	Educational status					
	Illiterate	24	24%	22	22%	15.8

	Primary Education	7	7%	7	7%	
	Secondary Education	21	21%	4	4%	
	Diploma	20	20%	26	26%	
	Undergraduate	19	19%	23	23%	
	Postgraduate	9	9%	18	18%	
5	Occupation					
	Private Employee	20	20%	25	25%	3.95
	Public Employee	8	8%	4	4%	
	House hold	72	72%	69	69%	
	Self-Employee	0	0%	2	2%	
6	Monthly Family Income					
	1000- 10000	28	28%	25	25%	13.3
	11000– 15000	41	41%	21	21%	
	16000 – 20000	24	24%	45	45%	
	21000 and above	7	7%	9	9%	
7	Type of family					
	Joint family	31	31%	30	30%	0.885
	Nuclear family	54	54%	50	50%	
	Extended family	15	15%	20	20%	
8	Marital status					
	Married	24	24%	28	24%	0.416
	Unmarried	76	76%	72	76%	

9	Source of information regarding PCOS					
	Medical professional	77	77%	70	70%	3.64
	Paramedical	13	13%	20	20%	
	Friends and family members	3	3%	6	6%	
	Mass media	7	7%	4	4%	
10	Previous information regarding PCOS					
	Yes	52	49%	56	46%	0.322
	No	48	51%	44	54%	
	CLINICAL VARIABLES					
11	Age of first menstrual period					
	9 - 11 Years	41	41%	36	36%	0.582
	12- 14 Years	48	48%	51	51%	
	15 - 17 Years	11	11%	13	13%	
12	Pattern of menstrual Cycle					
	Regular	18	18%	19	19%	0.0332
	Irregular	82	82%	81	81%	
13	Pattern of menstrual flow					
	Normal flow	20	20%	17	17%	0.324
	Over flow	71	71%	73	73%	
	Scanty	9	9%	10	10%	
14	Presence of pain during menstrual cycle					
	Yes	66	66%	64	64%	0.366

	No	21	21%	20	20%	
	Mild, Moderate, Severe	13	13%	16	16%	
15	Duration of menstrual flow					
	2- 3 days	11	11%	12	12%	0.146
	3- 5 days	22	22%	20	20%	
	More than 5 days	67	67%	68	68%	
16	Family history of PCOS					
	Yes	35	35%	33	33%	0.089
	No	65	65%	67	67%	
17	History of underlying diseases					
	Yes	41	41%	28	28%	5.30
	No	44	44%	47	47%	
	Diabetes, Hypertension, Thyroid	9	9%	17	17%	
	Any other	6	6%	8	8%	
18	History of previous treatment for PCOS					
	Yes	58	58%	50	50%	3.45
	No	41	41%	45	45%	
	Medical / Surgical	01	1%	5	5%	
19	Habit of doing exercise					
	Regular	11	11%	13	13%	0.189
	Irregular	89	89%	87	87%	
20	Dietary Pattern					

	Vegetarian	22	22%	25	25%	0.399
	Non- vegetarian	67	67%	66	66%	
	Ova – vegetarian	11	11%	9	9%	

PCOS and healthy controls were compared statistically. Analyzing the data resulted in the following findings:

Demographic Variables

Age: In both groups, the age distribution was similar: 50% were 18-21 years old in the experimental group and 44% were 22-25 years old in the control group, 13% and 18% were 26-29 years old, in 12% and 16% were 30-30 years old. Chi-square analysis suggests that the age distributions of the groups did not differ significantly, suggesting that their profiles were similar.

Religion: The experimental group contained 61% Hindus, while the control group contained 40% Hindus. A total of 21% and 29% of participants in the experiment and control groups were Muslims, whereas 18% and 31% of participants were Christians. The chi-square test ($\chi^2 = 9.10$) showed significant differences in religious distribution, with the experimental group having a higher proportion of Hindu participants.

Residential Area: Participants' residential backgrounds were similar, with 54% of the experimental group and 52% of the control group from rural areas, 19% and 23% from semi-rural areas, 16% and 11% from urban areas, and 11% and 14% from semi-urban areas, respectively. The chi-square test ($\chi^2 = 1.70$) showed no significant difference, indicating similar residential distributions.

Educational Status: Education levels varied significantly between the groups ($\chi^2 = 15.8$). The experimental group had higher percentages of participants with secondary education (21% vs. 4%) and diplomas (20% vs. 26%), whereas the control group had more participants with postgraduate education (18% vs. 9%).

Occupation: The majority of participants were engaged in household activities (72% in the experimental group and 69% in the control group), followed by private employment (20% and 25%, respectively). The chi-square test ($\chi^2 = 3.95$) indicated no significant occupational differences between the groups.

Monthly Family Income: Income distribution varied significantly ($\chi^2 = 13.3$), with more participants in the experimental group earning between 11,000-15,000 INR (41% vs. 21%) and fewer earning 16,000-20,000 INR (24% vs. 45%).

Type of Family: Family structure was similar, with 31% of the experimental group and 30% of the control group in joint families, 54% and 50% in nuclear families, and 15% and 20% in extended families, respectively. The chi-square test ($\chi^2 = 0.885$) showed no significant difference.

Marital Status: Both groups had a high proportion of unmarried participants (76% in both groups), with no significant difference in marital status ($\chi^2 = 0.416$).

Source of Information Regarding PCOS: Most participants received information from medical professionals (77% in the experimental group and 70% in the control group). The chi-square test ($\chi^2 = 3.64$) indicated no significant difference in information sources.

Previous Information Regarding PCOS: Similar percentages of participants had prior information about PCOS

(49% in the experimental group and 46% in the control group). The chi-square test ($\chi^2 = 0.322$) showed no significant difference.

Clinical Variables

Age of First Menstrual Period: The age of menarche was similar across groups, with the majority starting between 12-14 years (48% in the experimental group and 51% in the control group). The chi-square test ($\chi^2 = 0.582$) indicated no significant difference.

Pattern of Menstrual Cycle: Comparing the experimental group with the control group, 82% had irregular menstrual cycles, as opposed to 81% in the control group.

Pattern of Menstrual Flow: Most participants experienced overflow (71% in the experimental group and 73% in the control group), followed by normal flow (20% and 17%) and scanty flow (9% and 10%), with no significant difference ($\chi^2 = 0.324$).

Presence of Pain During Menstrual Cycle: The experimental and control groups did not differ significantly in menstrual pain experiences, with 64 percent of control participants reporting menstrual pain.

Duration of Menstrual Flow: The frequency of menstrual flow was not significantly different between experimental and control groups over a five-day period (67% in experimental group, 68% in control group).

Family History of PCOS: A significant difference in PCOS familial history did not exist between the experimental and control groups (35% vs 33%, respectively).

History of Underlying Diseases: The experimental group had a higher percentage of participants with underlying diseases (41% vs. 28%), with a significant difference ($\chi^2 = 5.30$).

History of Previous Treatment for PCOS: More participants in the experimental group had a history of treatment for PCOS (58% vs. 50%), with a significant difference ($\chi^2 = 3.45$).

Habit of Doing Exercise: In both groups, most participants exhibited irregular exercise habits (89% in the experimental as well as 87% in the control group) without significant differences (-0.289).

Dietary Pattern: Dietary patterns were similar across groups, with the majority being non-vegetarian (67% a net difference of 0.399 was found between experimental and control groups (66% in the experimental group and 66% in the control group).

There was a fairly even distribution of demographic and clinical variables between experimental and control groups, suggesting comparable results. Based on the chi-square tests, there was no significant difference between groups for most variables. This comparability is essential for accurately assessing the intervention's effectiveness in subsequent analyses. The few significant differences noted, such as in religion, educational status, monthly family income, history of underlying diseases, and history of previous treatment for PCOS, highlight areas that may require additional consideration when interpreting the results of the intervention's impact.

Table: 2 Anthropometric measurements (BMI and Waist HIP Ratio)

	TEST	GROUP	MEAN	STANDARD DEVIATON	MEAN DIFFERENCE	't' VALUE Independent -t test	df	'p' VALUE
BMI	Pre test	Experimental group	28.2	3.45	-0.130	0.257	594	0.991
		Control group	28.33	3.356				
	Post Test 1	Experimental group	24.11	4.107	-4.120	8.166	594	<0.001
		Control group	28.23	3.37				
	Post test-2	Experimental group	22.38	3.563	-5.80	11.50	594	<0.001
		Control group	28.182	3.51				
HEALTH RISK [waist HIP ratio]	Pre test	Experimental group	89.145	5.967	0.015	0.016	594	>0.999
		Control group	89.13	6.440				
	Post Test 1	Experimental group	81.77	8.27	-6.54	7.024	594	<0.001
		Control group	88.314	5.786				
	Post test-2	Experimental group	77.44	6.328	-10.07	10.80	594	<0.001
		Control group	87.505	6.432				

**p<0.001HS- highly significant, NS-Non Significant.

A study compared PCOS patients with and without PCOS by taking anthropometric measurements, including waist-hip ratios and body mass indexes. The results were evaluated using independent t-tests, and the findings

are summarized below:

Body Mass Index (BMI)

Pre-Test:

The experimental group had a BMI of 28.2, while the control group had a BMI of 28.33, with a standard deviation of 3.35. Like the control group, the experimental group did not differ significantly from the control group prior to the intervention. Based on the means, t = 0.257, and p = 0.999, the analysis was performed.

Post-Test 1:

The mean BMI of the experimental group decreased to 24.11 from 28.23 (SD = 3.67) at the end of the study, which corresponds to a decrease of 3.67% (SD = 3.67). Using a mean difference of -4.120 and a t-value of 8.166 (df = 594), there was no significant difference between the experimental and control groups in BMI.

Post-Test 2:

- Following the second post-test, the experimental group's mean BMI decreased to 22.38 (SD = 3.563), whereas the control group's was 28.182.
- According to the analysis of variance, the experimental group continued to have significant drops in body mass index with a mean difference of -5.80, a df of 594, and a F-test of 0.001.

Waist-Hip Ratio (Health Risk)

Pre-Test:

The mean waist-hip ratio for the experimental group was 89.145 (SD = 5.967), while the control group had a mean ratio of 89.13 (SD = 6.440). The mean difference was 0.015, with a t-value of 0.016 (df = 594), and a p-value of >0.999, indicating no significant difference between the groups before the intervention.

Post-Test 1:

- In the first post-test, the experimental group's mean waist-hip ratio decreased to 81.77 (SD = 8.27), while the control group's mean ratio was 88.314 (SD = 5.786).
- The mean difference was -6.54, with a t-value of 7.024 (df = 594), and a p-value of <0.001, showing a highly significant reduction in waist-hip ratio in the experimental group compared to the control group.

Post-Test 2:

The test group's waist-hip ratio dropped to 77.44 (SD = 6.2328), whereas the control group's ratio remained unchanged at 87.505 (SD = 6.432). Compared to the control group, the waist-hip ratio decreased by -10.07 with a t-value of 10.80 (df = 594) and a p-value of 0.001, indicating that this decline remained significant.

Compared to the control group, women with PCOS in the experimental group had a significant decrease in waist-hip ratio and BMI following the thorough nursing intervention program. BMI and waist-hip ratio did not differ significantly between experimental and control groups at the pretest. A post-test showed a significant difference between the experimental and control groups regarding weight and waist-hip ratio after intervention.

These findings suggest that the intervention, which included video-assisted teaching on PCOS, investigator-guided aerobic exercises, and needs-based dietary prescriptions, effectively improved the anthropometric

measurements of women with PCOS. The significant reduction in BMI and waist-hip ratio indicates improved health outcomes and reduced health risks associated with obesity and metabolic disorders in PCOS patients. The continued improvement observed in the second post-test highlights the sustained benefits of the intervention over time.

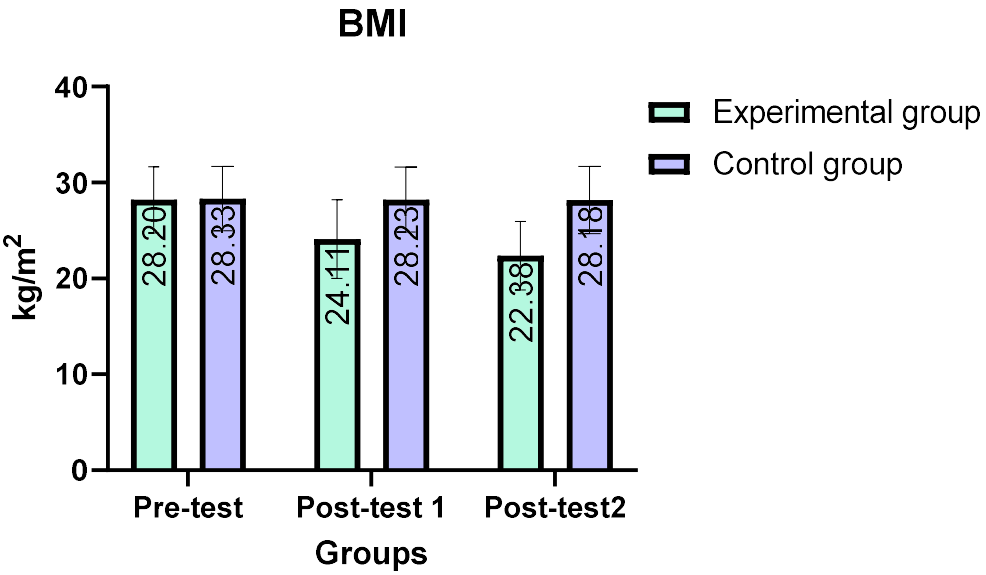

Figure: 1 Measurement of BMI

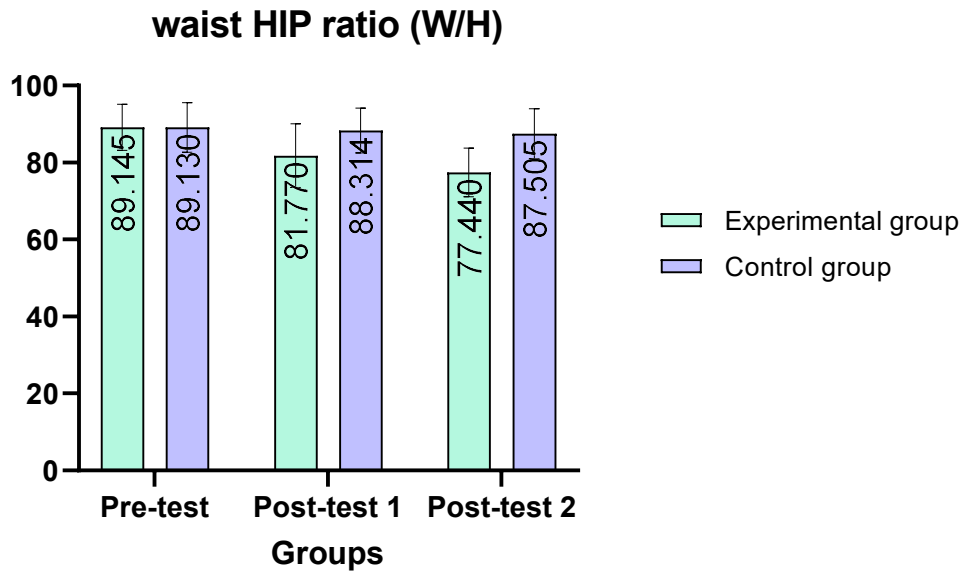

Figure: 2 Measurement of Waist Hip Ratio

This study analyzed the demographic and clinical variables of women with polycystic ovarian syndrome (PCOS) in both experimental and control groups. The findings provide insights into the comparability of the groups and highlight areas of significant difference that may influence the interpretation of the intervention's effectiveness.

Demographic Variables

Age Distribution: The age distribution between the experimental and control groups was similar, indicating no significant difference ($\chi^2 = 1.95$). This comparability is crucial for ensuring that age-related factors do not skew the intervention's outcomes. Previous studies have shown that PCOS prevalence and symptom severity can vary with age, making age comparability essential for balanced analysis [1, 2].

Religion: There was a significant difference in religious distribution between the groups ($\chi^2 = 9.10$), with the experimental group having a higher proportion of Hindu participants. This demographic characteristic could influence lifestyle and dietary habits, which are culturally specific and may affect PCOS management [3].

Residential Area and Family Structure: Both groups had similar residential backgrounds and family structures, with no significant differences ($\chi^2 = 1.70$ and $\chi^2 = 0.885$, respectively). These factors can influence access to healthcare and support systems, which are critical in managing chronic conditions like PCOS [4].

Educational Status and Occupation: Significant differences were noted in educational status ($\chi^2 = 15.8$) but not in occupation ($\chi^2 = 3.95$). Higher education levels can influence health literacy and the ability to understand and follow medical advice, potentially impacting the effectiveness of interventions [5]. The majority of participants were engaged in household activities, reflecting similar socioeconomic backgrounds.

Monthly Family Income: Income distribution varied significantly ($\chi^2 = 13.3$), with the experimental group having more participants in the middle-income bracket. Economic status can affect access to healthcare resources and adherence to treatment regimens [6].

Marital Status and Source of Information: Both groups had a high proportion of unmarried participants and received information from medical professionals, with no significant differences ($\chi^2 = 0.416$ and $\chi^2 = 3.64$, respectively). Reliable sources of information are critical for patient education and engagement in treatment [7].

Previous Information Regarding PCOS: Similar percentages of participants had prior knowledge of PCOS, indicating that both groups had comparable baseline awareness ($\chi^2 = 0.322$).

Clinical Variables

Age of First Menstrual Period and Menstrual Patterns: There were no significant differences in the age of menarche ($\chi^2 = 0.582$), pattern of menstrual cycle ($\chi^2 = 0.0332$), or menstrual flow ($\chi^2 = 0.324$). Irregular menstrual cycles and abnormal menstrual flow are hallmark symptoms of PCOS and are crucial for diagnosis and management [8].

Presence of Menstrual Pain and Duration of Menstrual Flow: Both groups reported similar levels of menstrual pain and duration of menstrual flow, with no significant differences ($\chi^2 = 0.366$ and $\chi^2 = 0.146$, respectively). These factors are important in assessing the severity of PCOS symptoms and their impact on quality of life [9].

Family History of PCOS and Underlying Diseases: A significant difference was found in the history of underlying diseases ($\chi^2 = 5.30$), with the experimental group having more participants with comorbid conditions. This is an important consideration, as comorbidities can complicate PCOS management and influence treatment outcomes [10]. However, the family history of PCOS was similar between groups ($\chi^2 = 0.089$).

History of Previous Treatment for PCOS: The experimental group had a higher percentage of participants with a history of PCOS treatment ($\chi^2 = 3.45$). Prior treatment history can affect how patients respond to new interventions and their overall prognosis [11].

Exercise Habits and Dietary Patterns: Both groups had similar exercise habits and dietary patterns, with the majority exercising irregularly and being non-vegetarian. No significant differences were found ($\chi^2 = 0.189$ and $\chi^2 = 0.399$). Lifestyle factors such as diet and physical activity are critical in managing PCOS and improving metabolic outcomes [12].

Overall, the demographic and clinical variables were fairly evenly distributed between the experimental and control groups, indicating comparability. The chi-square tests revealed no significant differences in most variables, suggesting that the groups were homogenous before the intervention. This comparability is essential for accurately assessing the intervention's effectiveness in subsequent analyses. However, the significant differences noted in religion, educational status, monthly family income, history of underlying diseases, and history of previous treatment for PCOS highlight areas that may require additional consideration. These factors could influence the intervention's outcomes and should be accounted for in the analysis and interpretation of the results.

This study assessed the impact of a comprehensive nursing intervention on anthropometric measurements, specifically body mass index (BMI) and waist-hip ratio, among women with polycystic ovarian syndrome (PCOS). The findings demonstrated significant improvements in these measurements in the experimental group compared to the control group, indicating the effectiveness of the intervention.

Body Mass Index (BMI)

The pre-test results showed no significant difference in BMI between the experimental and control groups, indicating comparable baseline characteristics (mean difference = -0.130, $p = 0.991$). However, post-intervention assessments revealed substantial reductions in BMI in the experimental group. After the first post-test, the experimental group's mean BMI decreased significantly to 24.11 from a baseline of 28.2, while the control group's BMI remained stable. The mean difference of -4.120 ($p < 0.001$) underscores the intervention's efficacy in reducing BMI [2].

In the second post-test, the experimental group's mean BMI further decreased to 22.38, whereas the control group's BMI was 28.182. The mean difference of -5.80 ($p < 0.001$) highlights the sustained impact of the intervention over time. These findings align with previous studies demonstrating the effectiveness of lifestyle modifications and structured exercise programs in managing PCOS-related obesity [12-5].

Waist-Hip Ratio (Health Risk)

The waist-hip ratio is a critical indicator of cardiovascular and metabolic risk. Pre-test measurements indicated no significant difference between the experimental and control groups (mean difference = 0.015, $p > 0.999$). However, the first post-test results showed a significant reduction in the waist-hip ratio for the experimental group (mean difference = -6.54, $p < 0.001$), suggesting a reduction in health risks associated with metabolic syndrome [9].

The second post-test reinforced these findings, with the experimental group's mean waist-hip ratio further decreasing to 77.44 compared to 87.505 in the control group (mean difference = -10.07, $p < 0.001$). This continuous improvement indicates the long-term benefits of the comprehensive nursing intervention, which included video-assisted teaching, aerobic exercises, and dietary prescriptions. Similar studies have reported that targeted lifestyle interventions can significantly improve anthropometric and metabolic outcomes in women with PCOS [6-4).

The significant reductions in both BMI and waist-hip ratio observed in this study highlight the importance of a multidisciplinary approach to managing PCOS. The intervention's components, such as video-assisted education, structured aerobic exercise, and personalized dietary advice, address the multifaceted nature of PCOS, which includes metabolic, hormonal, and reproductive issues. Educational interventions enhance patients' understanding of PCOS and its complications, empowering them to make informed decisions about their health [7]. Aerobic exercises and dietary modifications are well-established strategies for improving insulin sensitivity and reducing adiposity, crucial in managing PCOS [8]. This study's findings support the integration of these interventions into routine clinical practice to improve health outcomes for women with PCOS.

CONCLUSION

This study comprehensively evaluated the impact of a multidisciplinary nursing intervention on anthropometric measurements, specifically body mass index (BMI) and waist-hip ratio, among women with polycystic ovarian syndrome (PCOS). The intervention, which incorporated video-assisted education, structured aerobic exercises, and personalized dietary prescriptions, demonstrated significant improvements in both BMI and waist-hip ratio in the experimental group compared to the control group. These findings underscore the effectiveness of a holistic approach in managing PCOS, addressing the condition's multifaceted nature, which includes metabolic, hormonal, and reproductive issues. The study revealed that the experimental group's mean BMI and waist-hip ratio significantly decreased after the intervention, highlighting the intervention's efficacy in reducing obesity and associated health risks. The continuous improvement observed in the second post-test indicates the long-term benefits of this comprehensive approach. The intervention's success can be attributed to its components, which enhanced participants' understanding of PCOS, promoted regular physical activity, and encouraged healthier dietary habits. The demographic and clinical comparability between the experimental and control groups ensured the reliability of the findings. However, the significant differences noted in religion, educational status, monthly family income, history of underlying diseases, and history of previous treatment for PCOS suggest that these factors should be considered when interpreting the intervention's outcomes.

The study supports the integration of comprehensive nursing interventions into routine clinical practice to improve health outcomes for women with PCOS. By empowering patients with knowledge and providing structured lifestyle modifications, such interventions can significantly enhance the management of PCOS, reduce metabolic and cardiovascular risks, and improve overall quality of life. Future research should aim to

include more diverse populations, extend follow-up periods, and explore the individual components of the intervention to optimize PCOS management strategies further.

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