Prevalence, Clinical Assessment, Clinical Evaluation of Polycystic Ovary Syndrome (Pcos), and Health-Related Practices Among Nursing Students in Selected Colleges, Dharmapuri

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Abstract

Introduction: *Polycystic ovarian syndrome (PCOS) is a common endocrine disorder among women of reproductive age, negatively impacting metabolism, reproductive health, the endocrine system, and mental well-being.. The symptoms associated with excess androgen and irregular menstrual cycles greatly affect the quality of life for women who have PCOS.*

Objective: *There is a lack of information regarding the clinical evaluation and assessment of PCOS and health-related practices among female nursing students. This research sought to estimate the prevalence, clinical evaluation, assessment, and health-related practices of nursing students concerning PCOS.*

Methods: *Using a self-administered questionnaire in English languages, a descriptive cross-sectional study was carried out among Dharmapuri female nursing students. All the data were reported using descriptive statistics.*

Results: *The results of this study show that less than 10% of female nursing students have been diagnosed with PCOS; however, data suggests a rising prevalence of its symptoms, with more than half exhibiting poor health-related behaviors.*

Conclusion: *The findings from this study reveal that fewer than 10% of female nursing students have received a diagnosis of PCOS, yet data indicates a growing occurrence of its symptoms, with over half displaying inadequate health-related behaviors. As a result, it is important to develop educational initiatives that inform nursing students about the symptoms and consequences of PCOS. Furthermore, it is advisable for these students to have an annual check-up with a gynecologist to improve their health.*

Keywords: *Polycystic ovarian syndrome, Health related practice, Nursing student, Prevalence.*

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is an endocrine and hormonal disorder characterized by polycystic ovaries, failure to ovulate, and/or heightened levels of testosterone. PCOS poses significant health risks for women. This medical issue can lead to severe long-term health consequences, including diabetes, cardiovascular illnesses, mental health problems, challenges with fertility and pregnancy, and an increased risk of endometrial cancer. According to the AE-PCOS society, a diagnosis of PCOS requires evidence of ovarian dysfunction and either clinical or biological signs of hyper-androgenism. Clinical manifestations of PCOS include infertility, heavy menstrual bleeding during puberty, irregular menstrual cycles, ovulatory dysfunction, and signs of hyper-androgenism such as excessive hair growth and acne. Women with PCOS are more likely to experience female pattern hair loss, also known as androgenetic alopecia, although its relationship with androgen excess or signaling is not fully understood1.Hirsutism is defined by an unusual pattern of terminal hair growth that resembles that seen in males. Acne is another common sign of hyper-androgenism in women with PCOS. Due to heightened androgen effects on the pilosebaceous unit, there is a noted prevalence of acne among this group. Acne lesions are frequently found on the forehead, chin, chest, and upper back and can present as nodules, cysts, pustules, or papules[2].

Individuals diagnosed with PCOS frequently report a history of significant acne and mention the use of one or several over-the-counter medications. Physicians may look for signs of hyper-androgenism and irregular menstrual cycles in patients; however, many individuals also express concerns regarding their fertility, which should be acknowledged. Infertility may eventually emerge as an issue since most individuals seek treatment throughout their reproductive lives, with ovulatory dysfunction being the primary factor behind menstrual irregularities. PCOS is the most common underlying cause of ovulatory

infertility and may affect a significant number of individuals experiencing anovulatory infertility. Polycystic ovary syndrome (PCOS) does not present with a unique, identifiable sign or symptom[3].

Given that obesity exacerbates all aspects of PCOS, the condition is notably linked to insulin resistance that arises from obesity. The short- and long-term complications connected to PCOS include impaired glucose tolerance, type 2 diabetes, coronary artery disease, cerebrovascular issues, obstructive sleep apnea, anxiety, depression, psychosexual problems, and eating disorders. During pregnancy, these individuals are at an increased risk of having babies who are small for gestational age (SGA), as well as facing preeclampsia, gestational diabetes, and perinatal mortality. Providing educational support, addressing psychological factors, promoting a healthy lifestyle, and accessing specialized healthcare services should be prioritized in management. Aspiring nurses are integral as they will be key members of the healthcare team in the future[4].

This subject was chosen to help nursing students recognize polycystic ovarian syndrome.
Polycystic ovarian syndrome (PCOS) is a complex and varied condition that presents with multiple clinical indications, including ovulatory irregularities, polycystic ovaries, and hyperandrogenism. Research indicates that women with PCOS are at a heightened risk of developing metabolic syndrome, which is characterized by obesity, abnormal lipid levels, and insulin resistance, leading to serious long-term consequences such as type 2 diabetes, cardiovascular problems, and infertility. The financial burden and emotional difficulties linked to PCOS are significant, notably affecting individuals' quality of life and reproductive health[5].

Approximately 4% to 10% of the global population is affected by PCOS, with higher prevalence rates observed in India, where estimates range from 20% to 26%. Despite its alarming prevalence worldwide, the syndrome's causes remain unclear, and its diagnosis is complicated by a variety of symptoms rather than a single hallmark sign. The symptoms of PCOS develop gradually and align with the changes typically seen during puberty, making it difficult to identify the condition in young females. Consequently, PCOS frequently remains unrecognized and undiagnosed in adolescents, often only appearing as irregular menstrual cycles around the time they start menstruating[6].

The diverse symptoms of PCOS emerge at a young age, including anovulation, infrequent menstruation (oligomenorrhea), weight gain, hirsutism, and acne, which can lead to obesity, insulin resistance, and hyperandrogenism in late adolescence. This syndrome may increase a woman's likelihood of developing cardiovascular problems, hypertension, type 2 diabetes, and infertility issues[7].

Recently, the rate of this condition has increased due to environmental changes and lifestyle-related diseases stemming from modernization. Considering the importance and implications of PCOS, it is essential to assess its prevalence among young girls. College students represent a cohesive demographic that is easily accessible and will also eventually become the mothers of future generations. Surprisingly, these individuals may appear healthy and remain unaware of their PCOS until they encounter challenges with conception after marriage. Given this, conducting a risk assessment through a survey seems to be the most effective approach to early recognition of the condition and enhancing awareness among young women about the necessity of receiving appropriate care to avert long-term consequences. Therefore, the aims of this study were to assess the prevalence of PCOS and to examine the clinical evaluations related to it among nursing students[8].

OBJECTIVES:
1. To determine the prevalence of Polycystic Ovary Syndrome (PCOS) among nursing students in selected colleges of Dharmapuri.
2. To assess the clinical signs, symptoms, and diagnostic evaluations related to PCOS among the study participants.
3. To evaluate the health-related practices adopted by nursing students in the prevention and management of PCOS.

II. METERIAL AND METHODOLIGY:

A quantitative evaluative method was employed for this research.. Descriptive research design was used for this study to find the prevalence, clinical assessment, clinical evaluation of polycystic ovary syndrome and health related practices among nursing students in selected colleges. This study was conducted at Dharmapuri district nursing college students. This study was conducted among 253 Nursing students those who are studying Bsc(N) in Dharmapuri district based on their inclusion criteria. This study employed a non-randomized purposive sampling technique.

Exclusion criteria included individuals who opted out of participation, those who did not completely fill out the questionnaire, individuals who self-identified as having PCOS, or those not studying in the nursing profession. Participants were recruited via WhatsApp. Data was gathered using a validated, self-administered, closed-ended, structured questionnaire that was adapted from two earlier studies.

The questionnaire was organized into four sections: the first recorded the demographic variable of the respondents, the second contained 9 questions related to clinical assessment of PCOS, the third included 3 questions focusing on clinical evaluation and the fourth had 9 questions regarding the health related practices of participants.

III.RESULT

This survey collected a total of 253 responses. Table 1 details the frequency and percentage distribution of demographic variables, Table 2 covers clinical assessment, Table 3 pertains to clinical evaluation, and Table 4 addresses health-related practices of the participants.

Table:1 Frequency And Percentage Distribution Of Nursing College Students According To Their Demographic Variables (N=253)

S.No	Demographic variables	Frequency	Percentage
1.	**Age in years**		
	a) 18	49	19.4
	b) 19	71	28.1
	c) 20	91	36
	d) >20	42	16.6
2	**BMI value (kg/m²)**		
	a) < 18.5	62	24.5
	b) 18.5-24.9	124	49
	c) 25-29.9	38	15
	d) >30	29	11.5
3	**Educational status**		
	a) I year	74	29.2
	b) II year	86	34
	c) III year	48	19
	d) IV year	45	17.8
4	**Religion**		
	a) Hindu	194	76.7
	b) Christian	50	19.8
	c) Muslim	9	3.6
5	**Type of the family**		
	a) Nuclear family	199	78.7
	b) Joint family	52	20.6
	c) Extended family	2	0.8
6	**Parent's educational status**		
	a) Mother only educated	29	11.5
	b) Father only educated	35	13.8

	c) Both are educated	110	43.5
	d) Both are uneducated	79	31.2
7	**Father's occupation**		
	a) Employee in private organization	24	9.5
	b) Employee in Government	9	3.6
	c) Daily wager	144	56.9
	d) Self employed	63	24.9
	e) Unemployed	13	5.1
8	**Mother's occupation**		
	b) Employee in private organization	23	9.1
	b) Employee in Government	6	2.4
	c) Daily wager	70	27.7
	d) Self employed	34	13.4
	e) Unemployed	120	47.4
9	**Family monthly income (in rupees)**		
	a) <Rs.15, 000/-	138	54.5
	b) Rs.15, 001-20,000/-	53	20.9
	c) Rs.20, 001-30,000/-	19	7.5
	d) >Rs.30,000/-	43	17
10	**Residential area**		
	a) Urban	74	29.2
	b) Rural	149	58.9
	c) Semi urban	30	11.9

According to their ages, 49 nursing students (19.4%) are 18, 71 students (28.1%) are 19, 91 students (36%) are 20, and 42 students (16.6%) are 21 years old.

In terms of BMI classifications, 62 nursing students (24.5%) are categorized as having a BMI lower than 18.5. A total of 124 students (49%) fall within the 18.5-24.9 range. Additionally, 38 students, which represents 15%, possess a BMI that falls between 25 and 29.9, while 29 students, accounting for 11.5%, have a BMI that is greater than 30.

Regarding their educational levels, 74 nursing students (29.2%) are in their first year, 86 (34%) are in their second year, 48 (19%) are in their third year, and 45 (17.8%) are in their fourth year or beyond.

As for their religious identities, 194 nursing students (76.7%) identify as Hindu, 50 students (19.8%) as Christian, and 9 students (3.6%) as Muslim. In relation to family type, 199 nursing students (78.7%) come from nuclear families, 52 students (20.6%) from joint families, and 2 students (0.8%) from extended families.

When looking at their parents' educational background, 29 nursing students (11.5%) have mothers who are educated only, 35 (13.8%) have fathers who are educated only, 110 (43.5%) have both parents educated, and 79 (31.2%) have parents who are both uneducated.

Regarding fathers' occupations, 4 nursing students (9.5%) have fathers working in private organizations, 9 (3.6%) have fathers employed by the government, 144 (56.9%) come from families with fathers who are daily wage earners, 63 (24.9%) have self-employed fathers, and 13 (5.1%) have fathers who are unemployed.

In terms of the mothers' occupations, 23 (or 9.1%) of them work for private companies, 4% have jobs in government, 70 (27.7%) are engaged as daily laborers, 34 (13.4%) are self-employed, while 120 (47.4%) are currently unemployed.

In terms of monthly family income, 138 nursing students (54.5%) report earnings below Rs. 15,000/-, while 53 students (20.9%) fall into the income bracket of Rs. 15,001-20,000/-. Additionally, 19 students (7.5%) earn between Rs. 20,001 and Rs. 30,000/-, and 43 students (17%) have incomes that exceed Rs. 30,000/-.

In terms of living areas, 74 (29.2%) of nursing students live in urban locations, 149 (58.9%) reside in rural areas, and 30 (11.9%) live in semi-urban areas.

Table:2 Clinical Assessment Of Pcos

S.No	Clinical variables	Frequency	Percentage
1.	**Family history of PCOS**		
	a) Yes	20	7.9
	b) No	233	92.1
2	**Presence of menorrhagia (unusually heavy or prolonged period)**		
	a) Yes	23	9.1
	b) No	230	90.9
3	**Presence of amenorrhea (absence of menstruation)**		
	a) Yes	27	10.7
	b) No	226	89.3
4	**Irregular menstruation**		
	a) Yes	71	28.1
	b) No	182	71.9
5	**Presence of acne during menstrual cycle**		
	a) Yes	106	41.9
	b) No	147	58.1
6	**Presence of hirsutism (unwanted male pattern hair growth on female face, chest, back, etc.)**		
	a) Yes	24	9.5
	b) No	229	90.5
7	**Presence of alopecia (unusual amount of hair loss from the scalp)**		
	a) Yes	90	35.6
	b) No	163	64.4
8	**Presence of acanthosis nigricans (thick, and dark velvety patches of skin)**		
	a) Yes	24	9.5
	b) No	229	90.5
9	**Presence of continuous abnormal weight gain**		
	a) Yes	37	14.6
	b) No	216	85.4

Table 2 presents the clinical assessment of PCOS: family history of PCOS, Majority of the students 233 (92.1%) indicated they do not have any family history of the disorder. Among the students, 230 (90.9%) students did not face this issue. Additionally, 27 (10.77%) students experienced irregular menstruation, and 182 (71.9%) did not show any signs of irregular periods. During their menstrual cycle, 106 (41.9%) students exhibited symptoms of acne, while 147 (58.1%) did not have such symptoms. There were 24 (9.5%) students with hirsutism (characterized by unwanted male pattern hair growth on the face, chest, back, etc.), and 229 (90.5%) students did not experience hirsutism. In terms of hair loss, 90 (35.6%) students reported having alopecia (an unusually high degree of hair loss from the scalp), while 163 (64.44%) did not face this condition. A total of 24 students (9.5%) were identified as having acanthosis nigricans, which is characterized by the presence of thick, dark, velvety patches of skin, while 229 students (90.5%) did not show any signs of this condition. Finally, 37 (14.66%) students reported ongoing abnormal weight gain, whereas 216 (85.44%) did not experience any abnormal weight increase.

Table :3 Clinical Evaluation Of Participants

S.NO	Clinival evaluation	Frequency	Percentage
1	Diagnosed with PCOS		
	a) Yes	27	10.7
	b) No	226	89.3
2	Taking treatment for PCOS		
	a) Yes	14	5.5
	b) No	239	94.5
3	Currently not diagnosed with PCOS		
	a) Yes	51	20.2
	b) No	202	79.8

Table 3 displays the clinical evaluation of participants: 27 students (10.7%) were identified as having PCOS, while 226 students (89.3%) reported that they do not have the condition. Within this group, 14 students (5.5%) are undergoing treatment for PCOS, and 51 students (20.2%) are not currently diagnosed with the condition.

SECTION D: HEALTH- RELATED PRACTICES OF PARTICIPANTS
TABLE:4

S.No	Description	Frequency	Percentage
1	I take low fat food		
	a)Always	28	11.1
	b)Usually	33	13
	c)Sometimes	120	47.4
	d)Rarely	42	16.6
	e)Never	30	11.9
2	I take low-carbs food		
	a)Always	29	11.5
	b)Usually	32	12.6
	c)Sometimes	113	44.7
	d)Rarely	38	15
	e)Never	41	16.2
3	I take fruits and vegetables (5 servings/ day)		
	a)Always	54	21.3
	b)Usually	33	13
	c)Sometimes	94	37.2
	d)Rarely	49	19.4
	e)Never	23	9.1
4	I take high-fibre foods		
	a)Always	37	14.6
	b)Usually	30	11.9
	c)Sometimes	121	47.8
	d)Rarely	47	18.6
	e)Never	18	7.1
5	Healthy diet eating is easy for me		
	a)Always	55	21.7
	b)Usually	45	17.8

	c)Sometimes	86	34
	d)Rarely	39	15.4
	e)Never	28	11.1
6	I do exercise at least 5 days per week for half an hour		
	a)Always	21	8.3
	b)Usually	16	6.3
	c)Sometimes	69	27.3
	d)Rarely	73	28.9
	e)Never	74	29.2
7	I do meditation at least 5 days per week for 1/2 an hour		
	a)Always	16	6.3
	b)Usually	18	7.1
	c)Sometimes	54	21.3
	d)Rarely	51	20.2
	e)Never	114	45
8	I do yoga asana at least 5 days per week for half an hour		
	a)Always	11	4.3
	b)Usually	15	5.9
	c)Sometimes	65	25.7
	d)Rarely	55	21.7
	e)Never	107	42.3
9	I follow diversion techniques at least one day per week for a minimum of 1-3 hours		
	a)Always	10	4
	b)Usually	18	7.1
	c)Sometimes	85	33.6
	d)Rarely	59	23.3
	e)Never	81	32

The table 4 provided a detailed account of the health-related behaviors of the participants. Among the 253 participants, 28 (11.1%) nursing students consistently consume low-fat foods, 33 (13%) do so occasionally, 120 (47.4%) nursing students less often consume. Out of the 253 individuals, 113 (44.7%) occasionally eat low-carb meals. 94 nursing students (32.2%) consistently eat five servings of fruits and vegetables each day.
 Of the 253 participants, 121 (47.8%) nursing students occasionally consume high-fiber foods. Among the nursing students maintain a healthy diet only sometimes. Of the 253 individuals surveyed, 69 (27.3%) engage in exercise occasionally, 73 (28.9%) exercise infrequently, and 74 (29.2%) do not exercise at all. Majority of the nursing students 114 (54%) do not engage in meditation at all and 107 students (42.3%) do not practice yoga asanas. Furthermore, out of the 253 participants, 10 nursing students (4%) employ diversion techniques at least once a week for 1-3 hours, 18 (7.1%) use them regularly, 85 (33.6%) do so from time to time, 59 (23.3%) practice them infrequently, and 81 (32%) do not engage in diversion techniques at all.

IV. DISCUSSION
In 2024, the prevalence of PCOS ranged from 2.2% to 48% in various countries. Our findings showed that the prevalence rate in Dharmapuri was 10.7%. Similar studies found similar prevalence rates in South

India (9.13%), among women in Oman (7%), and in Bhopal, India (8.2%).9 however, there has been no similar prevalence study conducted specifically on nursing students in Dharmapuri. The differences in prevalence rates were linked to variations in the populations studied and the use of different diagnostic criteria, such as the Rotterdam criteria, the National Institutes of Health (NIH) criteria, and the Androgen Excess and PCOS (AE-PCOS) criteria.

Our clinical study on manifestations showed that 7.9% of students reported a family history of PCOS. Regarding the presence of menorrhagia (unusually heavy or prolonged periods), 9.1% of students are experiencing this issue. Concerning amenorrhea (the lack of menstruation), 10.7% of nursing students face this problem. Additionally, 28.1% of students are dealing with irregular menstruation, 41.9% experience acne during their menstrual cycle, and 9.5% suffer from hirsutism. Furthermore, 35.6% experience alopecia, 9.5% show signs of acanthosis nigricans, and 14.6% are struggling with ongoing abnormal weight gain. This suggests that a significant number of nursing students do not seek consultations with gynecologists.

According to age distribution, the majority of nursing students, 91 individuals (36%), are 20 years old. In terms of BMI classifications, the largest group consists of 62 nursing students (24.5%) who have a BMI under 18.5. Regarding educational levels, most of them, 86 students (34%), are in their second year. With respect to religious affiliations, a significant number of nursing students, 194 (76.7%), identified as Hindu. When examining their parents' educational backgrounds, the majority, 110 students (43.5%), have both parents who are educated. Focusing on fathers' occupations, a large portion, 144 students (56.9%), come from families where the fathers are daily wage earners. For mothers' occupations, the majority, 70 students (27.7%), also work as daily wage earners. Regarding family monthly income, most nursing students, 138 individuals (54.5%), report incomes below Rs. 15,000/-. Lastly, concerning living environments, the majority, 149 students (58.9%), live in rural areas.

Our clinical study on manifestations indicated that 7.9% of students have a family history of PCOS. Concerning menorrhagia (heavy or prolonged menstrual bleeding), 9.1% of students report encountering this issue. With respect to amenorrhea (the absence of menstruation), 10.7% of nursing students experience this condition. Moreover, 28.1% of students are managing irregular menstrual cycles, 41.9% deal with acne associated with their menstrual periods, and 9.5% endure hirsutism. In addition, 35.6% are affected by alopecia, 9.5% have acanthosis nigricans, and 14.6% are facing continuous abnormal weight gain.

Based on the clinical evaluation, 27 students (10.7%) were recognized as having PCOS, 14 students (5.5%) are receiving treatment for PCOS, and 51 students (20.2%) have not been diagnosed with the condition at this time.

Based on the health-related behaviors observed among the participants, a significant portion, 120 (47.4%), reported that they occasionally consume low-fat foods. A majority of 113 (44.7%) indicated that they sometimes consume low-carbohydrate foods. In addition, 94 participants (37.2%) mentioned that they sometimes eat fruits and vegetables, totaling around five servings per day. Furthermore, 121 participants (47.8%) noted that they occasionally incorporate high-fiber foods into their diet. When it comes to healthy eating, 86 participants (34%) find it easy sometimes. On the other hand, 74 participants (29%) reported that they never engage in daily exercise, while 114 participants (45%) stated they never practice meditation daily. Similarly, 107 participants (42.3%) never perform Yog asana each day, and 85 participants (33.6%) reported using diversion techniques sometimes.

V. CONCLUSION

The results of this research indicate that less than 10% of female nursing students have been diagnosed with PCOS, while the data show an increasing presence of its symptoms, with more than half exhibiting insufficient health-related behaviors. As a result, it is essential to develop educational initiatives that inform nursing students about the indicators and manifestations of PCOS. Furthermore, it is advisable for these students to consult a gynecologist at least once a year to improve their health.

LIMITATIONS

This study focused exclusively on female nursing students in Dharmapuri. Furthermore, a major limitation of our study is the absence of exploration into the knowledge of nursing students about PCOS. While the current research aimed to thoroughly assess different facets of nursing students' health practices related to PCOS, we did not specifically investigate how nursing students are impacted by PCOS and the associated

factors.

AUTHORS' CONTRIBUTION
 All authors have taken responsibility for the entire manuscript and have provided their consent for its submission.

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CONFLICT OF INTEREST
The writers assert that there are no financial conflicts of interest.

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