Original Article

DOI: 10.7860/JCDR/2025/75765.20949

Dentistry Section

Assessment of Knowledge, Awareness and Attitudes about the Risk of Periodontal Disease among Polycystic Ovarian Disease Patients Residing in Chennai, India: A Questionnaire based Cross-sectional Study

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ABSTRACT

Introduction: Polycystic Ovarian Disease (PCOD) has become one of the most prevalent conditions among females of reproductive age. Women with PCOD are at an increased risk of developing Periodontal Disease (PD). As PD may potentially lead to tooth loss, it is essential to create active awareness. Understanding the current levels of awareness among the public would help in formulating appropriate awareness protocols.

Aim: To assess the knowledge, awareness and attitudes about the risk of PD among PCOD patients residing in Chennai.

Materials and Methods: A descriptive cross-sectional survey was conducted in the Department of Oral Pathology at Tagore Dental College, Chennai, Tamil Nadu, India, from December 2022 to March 2023 with 375 female participants diagnosed with PCOD and living in Chennai. Purposive sampling was employed to select participants. Data were collected using both online and offline questionnaires over a study duration of five months after obtaining informed consent. The questions assessed the knowledge, awareness and attitudes regarding the risk of PD among PCOD patients. Data were collected using Excel and transferred to the Statistical Package for the Social Sciences (SPSS) version 24.0 for analysis. Categorical data were expressed in frequencies and percentages.

Results: The study revealed that PCOD patients aged from 15 to 46 years, with a mean age of 22.25±5.03 years. Of the participants, 82.9% brushed their teeth once a day and 78.6% never flossed their teeth, indicating poor oral hygiene practices. Out of the 53 (14.1%) of participants who were aware that PCOD can affect oral health, about 29.3% received this information from their dentists and 26.8% received it from the internet. Approximately 93.6% of PCOD patients were not aware of the increased risk of PD due to PCOD and the majority (90.7%) did not believe they needed more frequent dental visits than non PCOD females, indicating relatively limited knowledge about the potential oral complications of PCOD. However, 97.1% of participants demonstrated a positive attitude toward adopting preventive measures to prevent PD/gum disease related to PCOD in the future.

Conclusion: The results of the present study highlight significant gaps in the knowledge, awareness and attitudes regarding the risk of PD among women with PCOD in Chennai. The key findings indicate that while there is a general lack of awareness about the association between PCOD and PD, there is a notable positive attitude toward adopting preventive measures for oral health. There is a critical need to create awareness among women with PCOD regarding the risk of PD to improve their quality of life.

Keywords: Endocrine diseases, Female, Health education, Insulin resistance, Oral hygiene, Periodontitis, Prevention and control, Risk factors

INTRODUCTION

The PCOD has become increasingly common among females of reproductive age, representing one of the most frequently diagnosed conditions in medical practice [1,2]. In India, the prevalence of PCOD ranges from 9.13% to 36% [3]. PCOD impacts various aspects of women's health, affecting oral microbiota and causing PD, obesity, hirsutism and increasing susceptibility to uterine pathology, diabetes, cardiovascular diseases and endometrial cancer [4-9]. Evidence suggests that women with PCOD are at a higher risk of developing PD compared to those without PCOD [10,11]. According to published literature, females with PCOD have a 28% increased risk of PD [5]. A meta-analysis and systematic review also indicate that PD in women may increase the onset of PCOD by about 46% [5]. Additionally, PCOD can exacerbate existing periodontal conditions, such as gingivitis caused by plaque, through various pathophysiological links, namely low-grade systemic inflammation, oxidative stress, insulin resistance, advanced glycation end products and systemic hormonal levels [3,12-14]. Studies have reported that PCOD patients with PD exhibit more severe gum bleeding, increased periodontal pocket depth and greater clinical attachment loss compared to non PCOD females with PD [5,14-16].

Given the preventable nature of PD through simple precautionary measures, it is crucial to raise awareness about its risks, especially in the context of PCOD. There are no studies revealing the levels of awareness about the risk of PD among the public and very few studies focus on awareness strategies [5,17]. As PCOD becomes a leading health concern in India, there is a pressing need to address its consequences to reduce associated co-morbidities and enhance the quality of life for affected individuals. Evaluating current knowledge and identifying gaps in awareness will be instrumental in developing targeted educational strategies to improve health outcomes for PCOD patients.

Hence, the present study aimed to assess the current levels of awareness about the risk of PD among PCOD patients living in Chennai, a metropolitan city in South India.

MATERIALS AND METHODS

The present cross-sectional descriptive study was conducted by the Department of Oral Pathology at Tagore Dental College, Chennai, Tamil Nadu, India, from December 2022 to March 2023. The study utilised a questionnaire survey to assess the knowledge, awareness and attitudes regarding the risk of PD associated with PCOD among patients living in Chennai. Purposive sampling was employed to ensure representative results. Ethical clearance was obtained from the Institutional Ethical Committee before proceeding with the study (Clearance No. 03092201).

Sample size calculation: The study included 375 females who were diagnosed with PCOD from 21 gynaecologist clinics and hospitals in Chennai, which were selected by convenience sampling. The sample size was determined through statistical calculations to ensure adequacy for the study objectives.

$$n=\frac{Z^2 * pq}{d^2}$$

Z=1.96 (level of confidence according to the standard distribution)

p=50%=0.50 (50%)

q=1-0.50=0.50

d=0.06 (margin of error)

$$n=\frac{1.96\times1.96\times0.5\times0.5}{0.0025}$$

The minimal sample size was approximately 369 (368.2426) and the maximal sample size was approximately 385 (385.1256); thus, a minimum of 375 responses were considered as the sample size for this survey.

Inclusion criteria: Females diagnosed with PCOD, residing in Chennai and those who consented to participate. The sample included both newly diagnosed patients (within one year of diagnosis) and patients diagnosed with PCOD for more than one year who were undermedication.

Exclusion criteria: Females not diagnosed with PCOD, those residing outside Chennai, individuals unwilling to participate and those with other systemic diseases, such as diabetes or cardiovascular disorders, were excluded from the study.

Diagnosis of Polycystic Ovary Syndrome (PCOS): The diagnosis of PCOS adhered to the Rotterdam 2003 criteria [18], which require the presence of at least two of the following:

- Polycystic ovaries: Presence of more than 12 follicles in each ovary (2-9 mm in diameter) and/or increased ovarian volume (>10 mL).
- Oligomenorrhea and/or anovulation.
- Hyperandrogenism: Clinical signs such as acne, hirsutism and acanthosis nigricans, or biochemical markers including total testosterone >70 ng/dL and rostenedione >245 ng/dL and DHEA-S >248 µg/dL [5].

Study Procedure

Participants were provided with a validated and prestructured questionnaire administered either in English or Tamil, either online (through Google Forms) or offline. The questionnaire contained a total of 18 items, including seven questions on knowledge (three questions regarding PCOD and its co-morbidities and four questions on oral hygiene practices), eight questions on awareness of the risk of PD associated with PCOD and its prevention and three questions on attitudes about the risk of PD in PCOD patients.

The questionnaire was validated for content validity by five experts using the Lawshe method, achieving a Content Validity Ratio (CVR) of 1. Reliability was assessed using Cronbach's alpha, which yielded a value of 0.81. A pilot study involving 20 participants was conducted to ensure clarity and understanding of the questionnaire items. Data from the pilot study were excluded from the final analysis.

STATISTICAL ANALYSIS

Data were collected using Excel and transferred to Statistical Package for the Social Sciences (SPSS) version 24.0. A Chi-square test was performed and a p-value of less than 0.05 was considered significant. Categorical data were expressed in frequencies and percentages.

RESULTS

The age of the participants ranged from 15 to 46 years, with a mean age of 22.25±5.03 years. The study revealed that [Table/Fig-1] the majority of participants (59.5%) were diagnosed with PCOD within the past year, while 40.5% were diagnosed more than a year ago. A significant proportion (84.8%) reported irregular periods and 15.7% had excessive facial or body hair as a symptom of PCOD. Severe acne was reported by 21.1% of participants, while none were aware of gum problems or periodontal diseases. Weight gain or difficulty

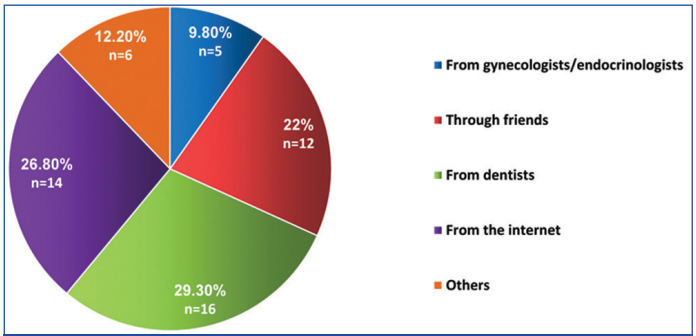
Questions		n (%)
Knowledge about PCOD		
1. Do you know the full form of PCOD?	Yes	363 (96.8%)
	No	12 (3.2%)
2. When were you diagnosed with PCOD?	<1 year ago	223 (59.5%)
	>1 year ago	152 (40.5%)
3. What are the symptoms of PCOD? Irregular periods	No	57 (15.2%)
	Yes	318 (84.8%)
Excessive facial and body hair	No	316 (84.3%)
	Yes	59 (15.7%)
Severe acne	No	296 (78.9%)
	Yes	79 (21.1%)
Gum problems/Periodontal Diseases (PD)	No	375 (100.0%)
	Yes	0 (0.0%)
Weight gain/difficulty in losing weight	No	289 (77.1%)
	Yes	86 (22.9%)
Knowledge about oral hygiene practices		
4. How often do you visit a dentist?	Once in 6 months	37 (9.9%)
	Once a year	171 (45.6%)
	Only when I cannot tolerate pain	113 (30.1%)
	Never	54 (14.4%)
5. How often do you brush your teeth?	Twice a day	60 (16.0%)
	Once a day	311 (82.9%)
	Sometimes	0 (0.0%)
	Never	4 (1.1%)
6. How often do you floss your teeth?	Once a day	37 (9.9%)
	After every meal	15 (4.0%)
	Sometimes	28 (7.5%)
	Never	294 (78.6%)
7. How often do you use mouthwash?	Twice a day	13 (3.5%)
	Once a day	83 (22.1%)
	Sometimes	43 (11.5%)
	Never	236 (62.9%)
Awareness about the risk of Periodontal Disease (PD)		
8a. Are you aware that PCOD can affect your oral health?	No	322 (85.9%)
	Yes	53 (14.1%)
9. Did you face any oral problems recently?	No	161 (42.9%)
	Yes	214 (57.1%)
10. Are you aware that there is increased chance of gum disease/PD associated with PCOD?	No	351 (93.6%)
	Yes	24 (6.4%)

11. Do you know that untreated gum disease/ PD can lead to tooth loss?	No	342 (91.2%)
	Yes	33 (8.8%)
12. Are you aware that it is difficult to treat gum disease in PCOD females?	No	353 (94.1%)
	Yes	22 (5.9%)
13. Are you aware that physical exercise is one of the important measures to improve oral health of patients with PCOD?	No	344 (91.7%)
	Yes	31 (8.3%)
14. Are you aware that PCOD medicines controls PCOD and inturn helps in preventing gum disease in PCOD patients?	yes	9 (2.4%)
	No	366 (97.6%)
15. Do you think PD/gum disease due to PCOD is preventable?	No	352 (93.9%)
	Yes	23 (6.1%)
Attitude towards preventive measures		
16. Do you believe that you should visit a dentist more frequently than a non PCOD female?	No	340 (90.7%)
	Yes	35 (9.3%)
17. Do you think you will be able to manage your oral diseases only by taking your PCOD medicines?	No	363 (96.8%)
	Yes	12 (3.2%)
18. Will you follow the preventive measures to prevent PD/gum disease due to PCOD in the future?	No	11 (2.9%)
	Yes	364 (97.1%)

[Table/Fig-1]: Descriptive statistics of each question in the questionnaire.

in losing weight was observed in 22.9% of participants. Regarding dental visits, only 9.9% visited a dentist every six months, 45.6% visited once a year, 30.1% visited only when in pain and 14.4% never visited a dentist. The majority (82.9%) brushed their teeth once a day, while 16% brushed twice daily and 1.1% reported never brushing. Flossing habits were poor, with 78.6% never flossing and only 9.9% flossing daily. Similarly, 62.9% never used mouthwash, while 22.1% used it once a day.

Awareness of the link between PCOD and oral health was low; 85.9% were unaware that PCOD could affect oral health. Among those who were aware, 29.3% had received the information from dentists and 26.8% received it through the internet [Table/Fig-2]. Furthermore, 57.1% reported recent oral problems. Awareness of the increased risk of gum disease due to PCOD was limited to 6.4% and 91.2% were unaware that untreated gum disease could lead to tooth loss. Only 5.9% knew that gum disease is harder to treat in PCOD patients and 8.3% recognised the importance of physical exercise in improving oral health. Preventive measures for gum disease were viewed as preventable by only 6.1% of respondents, while 93.9% were unaware of this fact. A majority (90.7%) did not believe they needed more frequent dental visits than non PCOD females. Only 3.2% thought oral diseases could be managed solely with PCOD medications and 97.1% expressed willingness to follow preventive measures for gum disease in the future.



[Table/Fig-2]: Question; 8(b); (n=53).

DISCUSSION

The results of the present study highlight significant gaps in knowledge, awareness and attitudes regarding the risk of PD among women with PCOD in Chennai. This study focuses on Chennai, a metropolitan city in South India, chosen for its high literacy rates and relatively advanced access to digital information. The assessment of awareness here may provide an approximate upper limit of overall awareness that could be expected from different parts of the country.

The key findings from the present study show that while there is a general lack of awareness about the association between PCOD and PD, there is a notable positive attitude toward adopting preventive measures for oral health. The findings of the current study revealed that 93.6% of PCOD patients were unaware of the increased risk of PD associated with PCOD. According to Nivedha K et al., this lack of awareness is consistent with the observation that many women with PCOD are not informed about the potential oral health implications of the condition [19]. PCOD, as an endocrine disorder, alters hormonal levels, including insulin resistance, which can exacerbate PD [20]. However, despite the significant connection between these two conditions, public health awareness on this topic appears to be minimal [19].

Furthermore, only 5.9% recognised that PD might be more difficult to treat in women with PCOD and only 8.3% acknowledged the role of physical exercise in improving oral health. These findings suggest a considerable gap in both the understanding of the relationship between PCOD and PD and the general knowledge of periodontal health [19]. According to Shah D and Patil M, this could be attributed to insufficient health education during routine medical consultations [21]. Gynaecologists, endocrinologists and healthcare professionals specialising in PCOD may not routinely address the potential oral health complications, leading to poor knowledge dissemination among patients [3,19,21-23].

The study also found that a significant portion of participants (57.1%) had recently experienced oral problems, such as gum bleeding, swollen gums, or bad breath, which could be indicative of PD. This is consistent with a study by Subbiah R et al., [16]. Despite these oral health issues, most participants (85.9%) were unaware that PCOD could affect their oral health. This suggests a disconnect between the patients' experiences of oral health problems and their understanding of the potential connection to their underlying condition, PCOD. It is also noteworthy that out of the 53 (14.1%) of participants who were aware of the link between PCOD and oral health, 29.3% received this information from a dentist, while 26.8% learned it from the internet [Table/Fig-2]. This indicates that the primary sources of information about the link between PCOD and PD are either healthcare professionals or non authoritative sources like the internet, highlighting the need for targeted, evidence-based health education on this issue.

While knowledge about the risks of PD in PCOD patients was limited, the study found that the majority of participants (97.1%) stated that they would follow preventive measures to prevent PD/gum disease due to PCOD in the future. This indicates that while patients may not be aware of the specific risks, they are open to taking steps to maintain better oral hygiene. The willingness of participants to engage in preventive practices is an encouraging finding, as it suggests that awareness programs focusing on oral health risks specific to PCOD may be well-received.

However, the study also highlighted a gap in dental care practices among the participants. Only 9.9% of respondents visited a dentist every six months and a large percentage (45.6%) only visited once a year, while 30.1% visited only when they were in pain. The low frequency of dental visits is concerning, especially given the known impact of PD on overall health. This finding aligns with research that has shown a general underutilisation of dental services among women with PCOD, possibly due to a lack of awareness about the connection between oral health and systemic conditions like PCOD [16,19]. Furthermore, a majority of participants (82.9%) reported brushing their teeth only once a day, with 78.6% never flossing their teeth and 62.9% never using mouthwash. This highlights the need for more education on proper oral hygiene practices, including the importance of regular dental check-ups and more frequent brushing and flossing.

The findings from the present study underline the urgent need for improved awareness among PCOD patients regarding their increased risk for PD. While patients are generally open to adopting preventive measures, they lack the necessary knowledge to connect their oral health with their systemic condition [19]. Therefore, there is a need for more targeted educational campaigns aimed at women with PCOD [19,24]. These campaigns should focus on informing patients about the link between PCOD and PD, as well as the importance of maintaining good oral hygiene practices [19,25].

Healthcare providers, especially gynaecologists, endocrinologists and dentists, play a critical role in bridging this knowledge gap [26]. Integrating oral health education into the routine management of PCOD could help patients better understand the importance of maintaining good oral hygiene and seeking regular dental check-ups [19,26]. Additionally, healthcare professionals should consider the role of interdisciplinary care, where gynaecologists and endocrinologists collaborate with dental professionals to ensure holistic care for PCOD patients.

Limitation(s)

The study was conducted in a specific geographic region (Chennai), which may limit the generalisability of the findings to other parts of India or internationally. Additionally, the cross-sectional nature of the study only provides a snapshot of awareness and attitudes at a single point in time and longitudinal studies are needed to assess the long-term impact of awareness campaigns on health behaviours and outcomes.

CONCLUSION(S)

The study reveals low awareness among women in Chennai about the link between PCOD and PD, despite a positive attitude toward oral health prevention. It calls for targeted education and the inclusion of oral health in routine care by gynaecologists and endocrinologists. Interdisciplinary collaboration can enhance comprehensive care for PCOD patients. While limited by its regional and cross-sectional nature, the study highlights opportunities to improve oral health outcomes through education and integrated healthcare efforts.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Sep 27, 2024
- Manual Googling: Dec 23, 2024
- iThenticate Software: Jan 04, 2025 (8%)

ETYMOLOGY: Author Origin

EMENDATIONS: 9

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Sep 25, 2024**
Date of Peer Review: **Nov 05, 2024**
Date of Acceptance: **Jan 06, 2025**
Date of Publishing: **May 01, 2025**