International Journal of Enhanced Research in Medicines & Dental Care (IJERMDC),
ISSN: 2349-1590, Vol. 13 Issue 2, February 2026

Assessment of Socio-demographic Factors and Dental Anxiety among Pregnant Women Attending Tertiary Care Hospital in Karad, Maharashtra

Kumud Anil Patil[1], Dr. Shivakumar K.M.

[1]Department of Public Health Dentistry, School of Dental Sciences, Krishna Vishwa Vidyapeeth Deemed to be University, Karad, Maharashtra, India.
[2]Professor and Head of the Department of Public Health Dentistry, School of Dental Sciences, Krishna Vishwa Vidyapeeth Deemed to be University, Karad, Maharashtra, India

Corresponding Author: Dr. Shivakumar K.M. (MDS)

ABSTRACT

Background: This study aims to assess the socio-demographic factors influencing dental anxiety among pregnant women attending a tertiary care hospital in Karad, Maharashtra. Understanding these factors will help healthcare providers develop targeted interventions to alleviate dental anxiety, thereby improving oral health outcomes for this vulnerable population.

Materials and methods: A cross-sectional study was conducted among 300 pregnant women who visited the dental department of a tertiary care hospital. Data were collected using structured questionnaires to assess socio-demographic characteristics and dental anxiety levels, measured using the Modified Dental Anxiety Scale (MDAS). Statistical analyses were performed using SPSS software to identify correlations and significant differences.

Results: The study revealed a high prevalence of dental anxiety (62%) among the participants. Significant associations were found between dental anxiety and socio-demographic factors such as age, education level, and previous dental experiences. Younger women and those with lower educational attainment exhibited higher anxiety levels.

Conclusion: The findings underscore the necessity of addressing dental anxiety among pregnant women, particularly focusing on demographic variables. Enhanced communication strategies and psychological support within dental care settings are recommended to mitigate anxiety and improve care compliance among this population.

Keywords: Dental anxiety, pregnant women, socio-demographic factors, tertiary care hospital, Karad, Maharashtra

INTRODUCTION

There's still a lot we don't know about how dental services are utilized during pregnancy(1). Because physiological changes during pregnancy, such as increased levels of oestrogen and progesterone, predispose women to gingivitis, periodontitis, and dental caries, all of which can have serious consequences for Oral health is crucial for both the mother's and the fetus's wellbeing. Despite established guidelines recommending safe dental care at any stage of gestation, misconceptions persist among patients and healthcare providers regarding safety, often leading to avoidance or delays in treatment. Dental anxiety or phobia, which is characterized by concern or avoidance of dental treatment because of fear of pain, loss of control, bad experiences in the past, or false information, is one of the main obstacles to receiving dental care during pregnancy. Access to dental treatment during pregnancy helps to reduce potential adverse oral outcomes, including those associated with periodontal disease, early birth, low birth weight, and preeclampsia(2). Getting dental care is not only to keep the mother's oral health in check but also for the infants, since cariogenic bacteria can be passed to the infant if a pregnant woman has dental caries. Pregnant women's neglect of their teeth has been linked to a number of variables, including inadequate oral health knowledge, a negative dental experience, or the dentist's ignorance that pregnant women shouldn't receive dental care(3). Though a high burden of oral diseases affects pregnant women, dental phobia, a widespread obstacle to dental treatment and often an unnoticed ailment, is the least researched. As a result, it was required to examine the prevalence of dental phobia and the underlying causes in

pregnant women(4). Pregnant women in semi-urban and rural areas often experience compounded barriers due to limited awareness, financial constraints, cultural beliefs, and healthcare infrastructure limitation.

Designing focused treatments that might enhance maternal oral health behaviors and outcomes requires a knowledge of how sociodemographic variables affect dental anxiety in areas like Karad, Maharashtra. Environmental factors have a big impact on dental anxiety. A dental clinic's sights, sounds, and scents can all significantly increase a patient's sense of fear and anxiety(5).

This study aims to identify psychological and socioeconomic factors affecting pregnant women's dental care use in Karad, a Karad tertiary care hospital. It aims to identify how age, gender, education level, and frequency of visits affect patients' mental health and anxiety levels, aiming to bridge gaps in prenatal dental care and develop successful public health initiatives. Higher dental anxiety levels are typically associated with a greater demand for dental care. Additionally, this concern appears to contribute to lower self-rated oral health and a larger societal effect from oral health problems(6).

In light of this, the current study is to evaluate the degree of dental anxiety among expectant mothers who are visiting a tertiary care facility in Karad, Maharashtra, and investigate the relationship between this anxiety and different sociodemographic characteristics. The study aims to give evidence-based insights that can improve the integration of oral healthcare into standard prenatal treatments and influence public health policy by identifying these relationships. Improving pregnant women's dental health is the main objective as it will enhance their entire pregnancy experience as well as the health of their unborn children.

MATERIALS AND METHODS

A. Study Design and Setting

This cross-sectional study was conducted in the Obstetrics and Gynaecology (OBGY) outpatient department of Krishna Hospital and Research Centre, Karad, Maharashtra, India. The study was approved by the Institutional Ethics Committee of Krishna Vishwa Vidyapeeth, Karad (Protocol No. 690/2022-2023).

B. Participants and Sampling

A total of 300 pregnant women (100 from each trimester) were selected through simple random sampling from women attending the OBGY department. Inclusion criteria were willingness to participate and ability to provide informed consent. Illiterate participants were enrolled with witnessed verbal consent.

C. Data Collection Tool

A pretested, structured questionnaire was administered in English or the local language. The first section recorded sociodemographic data (age, education, annual family income, trimester of pregnancy, parity, dental visit history, and place of residence). The second section assessed awareness and attitudes toward oral health during pregnancy.

D. Assessment of Dental Anxiety

Dental anxiety was measured using the Modified Dental Anxiety Scale (MDAS), a validated five-item psychometric tool. Each item described a dental situation (e.g., visiting the dentist, waiting in the clinic, tooth drilling, scaling/polishing, receiving a local anaesthetic injection) and was rated on a 5-point Likert scale (1 = not anxious to 5 = extremely anxious). Total scores ranged from 5 to 25 and were categorized as:

Mild anxiety: 5–11
Moderate anxiety: 12–18
High anxiety: 19–25

E. Data Collection Procedure

Eligible participants were approached in the waiting area, informed about the study purpose, and provided written or verbal consent. The questionnaire was self-administered, with assistance provided for illiterate participants.

F. Data Management and Analysis

Completed questionnaires were coded and entered into Microsoft Excel, then analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics (mean, standard deviation, frequencies, percentages) were calculated. Associations between anxiety levels and sociodemographic factors were tested using the Chi-square test, with $p<0.05$ considered statistically significant.

RESULTS

Table I. Pregnancy trimester-wise and Age-wise distribution among the pregnant women

No.	Pregnancy trimester	Frequency	Percentage %
1	1st trimester	100	33.33%
2	2nd trimester	100	33.33%
3	3rd trimester	100	33.33%
	AGE (in years)		
1	Mean $\pm \leq$ D	26.53 $\pm$ 3.89	8.84 $\pm$ 1.30%
2	19 – 25	139	46.33%
3	$\geq$ 26	161	53.66%

Table 1 shows that there were 300 answers in all. The three trimesters of pregnancy were equally represented among the research participants. One hundred women, or 33.33% of the sample, were in the first trimester. One hundred women, or 33.33% of the total, were in the second trimester. Likewise, one hundred women, or 33.33% of the participants, were in the third trimester. The sample's mean age was 26.53 years (SD; ± 3.89 years), with 46.33% of participants being between the ages of 19 and 25 and 53.66% being 26 or older.

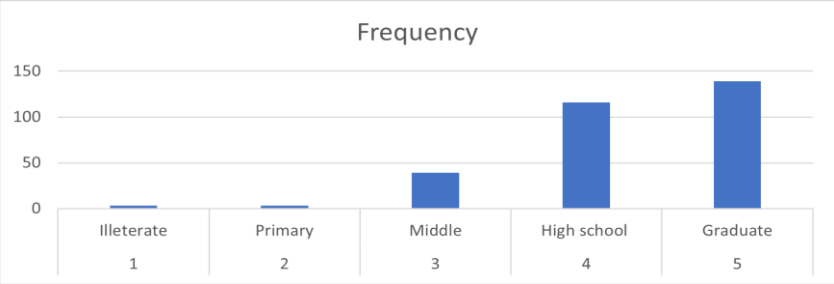

Fig. 1. Education-wise distribution among the pregnant women.

Figure 1 shows 300 pregnant women in all were asked about their educational background. 3 of these women, or 1% of the study group, were illiterate. 3 women, who made up 1% of the participants, had only completed primary school. 13% of the participants, or 39 women, had completed middle school. The research found that 116 women, or 38.6% of the total population, had finished high school. 139 women, or 46.3% of the total participants, were graduates, who had the largest percentage.

Table II Family income per annum-wise distribution among the pregnant women

No.	Family income per annum	Frequency	Percentage %
1	Mean $\pm\leq$ D	3.69$\pm$2.01	1.23 $\pm$ 0.67
2	< 1L	31	10%
3	1L - 5L	204	68%
4	> 5L	65	22%

Table 2 According to income categories, 31 women, or 10% of the sample as a whole, had a household income of less than one lakh per year. 68% of the participants, or two hundred and four women, had a household income between one and five lakhs per year. 22% of the research group, or 65 women, reported having a household income of more than five lakhs each year. All three hundred pregnant women who participated in the study reported using dentifrice to clean their teeth, making up 100% of the population. Of these, 127 women (or 42.3% of the study group) brushed twice a day, whereas 173 women (or 57.6% of the group) brushed once a day.

Table III. Distribution of the pregnant women's family histories

No.	Family history	Frequency	Percentage %
1	Hypertension	45	15%
2	Diabetes mellitus	4	1.30%
3	Hypertension, Diabetes Mellitus	12	4.30%
4	Tuberculosis	2	0.66%
5	None	236	78.66%
6	COPD	1	0.33%

According to Table 3, determining the possible risk factors that might affect the mother's and her unborn child's health during pregnancy requires careful consideration of family medical history. The study found that certain hereditary or lifestyle-related conditions, such as hypertension and diabetes mellitus, can contribute to adverse pregnancy outcomes. Out of the participants, 15 percent had a family history of hypertension, 3% had diabetes mellitus, 4.3% had both, and 78.66% had no relevant family medical history.

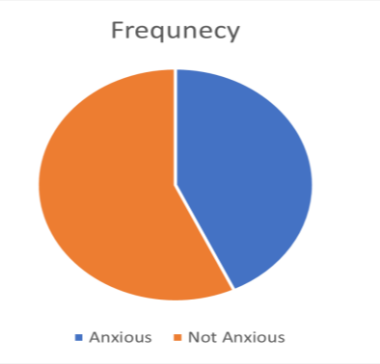

Fig. 2. Dental anxiety observed among pregnant women

Figure 2 depicts that Dental anxiety is a common psychological response that can significantly impact oral health-seeking behaviour, especially among pregnant women. Pregnant women often experience heightened emotional and physical sensitivity, leading to increased anxiety towards dental procedures. A study found 43% of pregnant women experienced dental anxiety, while 57% did not experience anxiety.

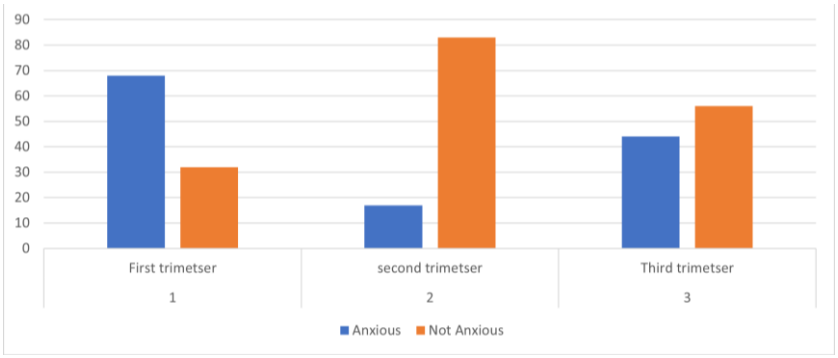

Fig. 3. Dental anxiety in pregnant women by trimester

Figure 3 shows that Dental anxiety during pregnancy may vary across different trimesters due to physiological and emotional changes that occur as the pregnancy progresses. The study examines trimester-wise variations in dental anxiety in pregnant women, revealing that the most vulnerable women are in the first trimester. The second trimester saw a higher number of anxious women, while the third trimester saw a lower number of anxious women. This information can help tailor oral health interventions for pregnant women.

Table IV. Dental anxiety in pregnant women as assessed by the Modified Dental Anxiety Scale (MDAS) questionnaire

MDAS questionnaire items	Not anxious, no. (%)	Slightly anxious, no. (%)	Fairly anxious, No. (%)	Very anxious, No. (%)	Extremely anxious, No. (%)	Mean ± SD
A. Feelings regarding the dental procedure tomorrow (Visit Tomorrow)	57 (19%)	78 (26%)	80 (26.6%)	68 (22.6%)	17 (5.6%)	2.7 ± 1.7

B. Feelings while sitting in (Waiting Room)	35 (11.6%)	69 (23%)	83 (27.6%)	86 (28.6%)	27 (9%)	3 ± 1.16
C. Feelings about tooth drilling (Use of Drills)	15 (5%)	48 (16%)	77 (25.6%)	91 (30.3%)	69 (23%)	3.5 ± 1.15
D. Feelings about scaling and polishing (Scale and Polish)	24 (8%)	45 (15%)	61 (20.3%)	101 (33.6%)	69 (23%)	3.48 ± 1.22
E. Feelings about local anaesthetic injection (Injection)	13 (4.3%)	28 (9.3%)	41 (13.6%)	91 (30.3%)	127 (42.3%)	3.97 ± 1.15

Table 4 explains

A. Feelings regarding the Dental Procedure Tomorrow (Visit Tomorrow):

19% of the participants said they were not nervous about getting dental work done soon. 26.6% reported feeling fairly worried, while 26% reported feeling slightly apprehensive. 5.6% of participants were extremely nervous about the appointment, while another 22.6% were very apprehensive.

B. Feelings while Sitting in the Waiting Room (Waiting Room):

11.6% of the participants felt not anxious while sitting in the waiting room. 23% reported being slightly anxious, and 27.6% were fairly anxious. 28.6% indicated they were very anxious, and 9% of participants were extremely anxious in the waiting area.

C. Feelings about Tooth Drilling (Use of Drills):

Figure 4 illustrates that a sizable percentage, Just 5% of respondents said they were not nervous about using dental drills. 25.7% reported feeling fairly worried, while 16% reported feeling slightly apprehensive. 30.3%, were very worried and 23.0% were extremely concerned while considering tooth drilling.

D. Feelings about Scaling and Polishing (Scale and Polish):

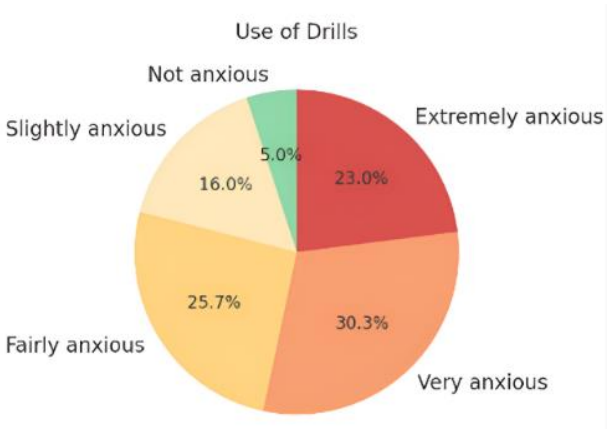

Fig. 4. Using drills

8% of participants reported feeling not anxious about scaling and polishing. 15% were slightly anxious, while 20.3% were fairly anxious. 33.6% felt very anxious, and 23% were extremely anxious during the procedure .

E. Feelings about Local Anaesthetic Injection (Injection):

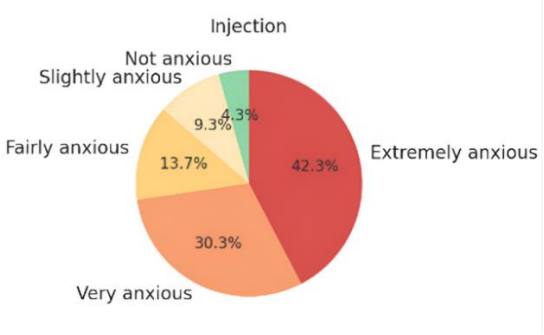

Fig. 5. Injection

Figure 5 shows that just 4.3% of participants reported not being nervous about getting an injection of a local anesthetic. 13.7% said they were fairly nervous, and 9.3% said they were little anxious. The greatest percentage, 42.3%, felt extremely apprehensive about receiving an injection, while 30.3% were very anxious.

DISCUSSION

Patients and their dental care providers may face serious difficulties as a result of dental anxiety and dread(7). We must implement a number of measures to increase access to dental care and protect pregnant women's oral health. In women who are not pregnant, anxiety and depression can negatively impact dental health; however, the relationship between these two conditions during pregnancy, when anxiety and depression tend to increase, has not been well examined. The current study sought to ascertain the prevalence and severity of dental anxiety in expectant mothers as well as its relationship to various economic factors(8). The Modified Dental Anxiety Scale (MDAS) revealed that over 43% of respondents had mild to severe anxiety, highlighting dental anxiety as a significant issue in this population. Although the exact relationships between Dental fear and anxiety/Dental behavior management problems and internalizing and externalizing behavioral issues as well as general fear were unclear, they were linked(9).

With a mean MDAS score of 18.91 (±4.85) and 68% of women categorized as worried, dental anxiety was most common among women in their first trimester, according to trimester-wise analysis. This increased worry might be caused by early pregnancy hormone changes, uncertainty about the outcome of the pregnancy, and common misconceptions about the safety of dental procedures at this critical time.

However, anxiety significantly decreased in the second trimester, with just 17% of respondents reporting feeling apprehensive and an average anxiety level of 14.19 (±4.68). The lower anxiety levels may be explained by the fact that the second trimester is frequently thought to be the most emotionally and physically stable phase of pregnancy. Women's confidence in receiving dental care may have also been bolstered by increased exposure to prenatal care and assurances from medical professionals during this time.

Interestingly, anxiety levels increased once more in the third trimester; 44% of women had high dental anxiety, with a mean MDAS score of 16.87 (±4.58). This rebound effect may be a result of collected physical pain, anxieties about approaching labor, or long-term avoidance of dental care throughout pregnancy, hence strengthening dental fear. The high-low-moderate anxiety pattern across trimesters fits with prior studies showing shifting psychological reactions at various phases of pregnancy. Individuals with high levels of dental anxiety are more likely to put off getting treatment, which can result in more serious dental issues and symptomatic visiting habits that reinforce or exacerbate preexisting dental anxiety.

Sociodemographic studies revealed striking trends as well. According to the poll, a patient's age, gender, education level, procedure, and frequency of visits all have a substantial impact on their mental health and anxiety(10). With more education linked to reduced anxiety, education seemed to be a major driving influence. To effectively manage anxious dental patients, it's crucial to evaluate their levels of dental anxiety prior to treatment(11). Approximately 85% of women had at least a high school education, despite the fact that just 2% were illiterate; this might help to improve oral health and reduce anxiety related to dental procedures. This supports earlier studies stressing the role of health literacy in lowering dental anxiety and boosting health-seeking behaviour.

Income level also showed up as a contributing element. The bulk of respondents 68% reported an annual family income between ₹1 lakh and ₹5 lakhs, however 10% earned less than ₹1 lakh. Financial limitations and low socioeconomic status have previously been identified as barriers to receiving timely dental care, which may exacerbate anxiety due to long-term neglect and the decline of oral health.

Looking at oral hygiene habits, it was inspiring to discover that more than 42% of respondents brushed twice daily and 100% used dentifrice. This indicates that people's knowledge of oral hygiene is rather great. Still, the presence of high anxiety stresses the psychological rather than behavioural nature of the impediment despite excellent personal hygiene habits, hence underlining the requirement of focused therapy and patient education. Older age, lower Body mass index, greater Physical fitness, and meeting Physical activity requirements were all associated with increased Mediterranean diet adherence. These aspects should be taken into consideration while designing educational programs and recommendations to improve the health condition of both the mother and the fetus during pregnancy(12).

A study found that women with a family history of systemic illnesses, such as diabetes and hypertension, may experience increased dental anxiety. However, 78.66% of the subjects had no significant family history of systemic diseases, suggesting that dental anxiety may be more influenced by psychological and informative factors. Local anaesthetic injections (42.3%) had the highest levels of extreme anxiety, followed by tooth drilling (23%) and scaling (23%). This highlights the importance of desensitizing communication and using behavioral management techniques for dentists, especially when caring for pregnant patients. Pregnancy-related physical and mental factors, as well as sociodemographic factors like income, education, and attitudes towards oral health, also play a significant role. Addressing these concerns through patient-centered communication, tailored counseling, and increased knowledge among dentists could significantly increase dental services during pregnancy(13). Few studies explicitly examine the frequency of cavities and other oral health disorders in pregnant women, despite some evidence associating pregnancy-related gum disease to unfavorable pregnancy outcomes(14). You may improve prenatal health and lower the risk of cavities in your unborn child by practicing good oral hygiene and taking care of your teeth throughout pregnancy(15).

CONCLUSION

This study demonstrates that dental anxiety is common among pregnant women in Karad, Maharashtra, with the highest prevalence during the first trimester and a moderate resurgence in the third trimester. Education and income emerged as important sociodemographic determinants of anxiety, whereas age showed no significant association. Despite generally good oral hygiene practices, psychological barriers—particularly fear of invasive procedures—remain a major obstacle to seeking dental care. Integrating trimester-specific oral health counselling into routine antenatal care, alongside culturally tailored educational campaigns, may help reduce dental anxiety and improve maternal and infant oral health outcomes. These findings provide evidence to guide policy and clinical strategies for enhancing prenatal dental care in similar semi-urban and rural settings.

AUTHORS' CONTRIBUTIONS

- *Kumud Anil Patil*: Conceptualization, Data Collection, Analysis, Drafting of Manuscript.
- *Dr. Shivakumar K.M.*: Study Design, Supervision, Critical Review, Final Approval of Manuscript.

Both authors have read and approved the final manuscript.

CONSENT FOR PUBLICATION

Not applicable, as no identifying participant data or images are included in this manuscript.

ACKNOWLEDGMENTS

The authors express their sincere gratitude to the staff and participants of Krishna Hospital and Research Centre, Karad, for their cooperation and support during the study.

FUNDING

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

COMPETING INTERESTS

The authors declare that they have no competing interests.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Institutional Ethics Committee of Krishna Vishwa Vidyapeeth, Karad, Maharashtra, India (Protocol No. 690/2022-2023). Written informed consent was obtained from all participants prior to enrollment. For illiterate participants, the study purpose and procedures were explained in the local language, and verbal consent was obtained in the presence of an impartial witness. Confidentiality and anonymity of participants were maintained throughout the study.

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