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Knowledge, Awareness and Practice of Periodontal Therapy during Pregnancy among Dental Professionals

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Authors' contributions

This work was carried out in collaboration among all authors. Author PS designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft manuscript. Authors MJ and SJ managed the analyses of the study and author MNK managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To assess the knowledge, awareness and practice of periodontal therapy during pregnancy among dental professionals
Materials and Methods: This cross-sectional study was conducted among 100 dental professionals in and around Chennai. A well-structured questionnaire consisted of 18 questions which were used to assess the awareness of periodontal therapy during pregnancy among dental professionals. Simple randomised sampling method was used to categories the sample population (online survey participants).The knowledge, awareness, scores were calculated for the correct answers to the questions. Based on their response data were statistically analysed.
Results: Based on statistical analysis results were tabulated. Around 74% of participants were undergraduates and 26% were postgraduates. Around 64% of the participants were aware of

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adverse pregnancy outcomes associated with periodontal disease. 80% of the participants were aware that pregnant patients must be turned to the left side on a dental chair for any dental examination and treatment.

Conclusion: The results of the present study showed that knowledge and awareness of periodontal therapy during pregnancy among dental professionals are appreciable among postgraduates than undergraduates. The attitude of the dental professionals, particularly undergraduates toward bringing the facts into clinical practice needs to be improved through integrated programs which can provide better and safe treatment to pregnant patients.

Keywords: Awareness; dental professionals; knowledge; periodontal disease; pregnancy.

1. INTRODUCTION

Oral health is an essential and integral part of general health, as the oral cavity should be considered as a “window” through which external microorganisms interact with the host [1]. In recent ages, it has been well documented that the impact of various systemic diseases exhibit their effect on the oral health of an individual [2]. There is a strong association between periodontal diseases and systemic conditions such as cardiovascular diseases, diabetes, and preterm low birth weight [3]. Periodontitis can be mentioned as an inflammatory disease of gingiva and its supporting structure, which is known to cause various systemic infections and those systemic infections were known to have adverse effects on pregnancy outcomes [4,5].

The relationship and awareness regarding the association between pregnancy outcomes and periodontitis should be well understood by dental professionals as they play an important role in the promotion of dental practices among pregnant women [6,7,8]. Knowledge about definitive and preventive aspects of periodontal treatment should be inculcated before pregnancy because intervention strategies given once the inflammatory cascade has started could not yield favorable results [9].

The American Academy of Periodontology recommended that periodontal examination and appropriate treatment should be given for pregnant women and women planning for pregnancy [10]. Meta-analysis of randomized controlled trials gave a report stating that periodontal treatment during pregnancy reduces the risk of PTLBW. For delivering standard prenatal care to pregnant women, dentists and medical practitioners should have adequate knowledge about the association and consider oral care as an integral part of the prenatal care program.

The systemic data and the studies were carried out to evaluate the knowledge, awareness, and association of pregnancy outcomes and periodontitis among health-care professionals are very few [11,12]. Many developed countries like USA, Canada have implemented several strategies to try to improve pregnant women's oral health, especially periodontal health, which have included utilizing prenatal care providers to improve maternal oral health (USA) and offering pregnant women free access to public dental services (UK and Greece) [13]. However, in developing countries like India, there is a lack of emphasis on perinatal oral health due to misconceptions, fear of lawsuits, or lack of evidence-based information among dentists. Long waiting time in the government clinic ranked the first perceived barrier against having a dental checkup during pregnancy [14]. Improving the oral health of pregnant women prevents complications of dental diseases especially periodontal disease during pregnancy and may reduce preterm and low birth weight deliveries [15]. Pregnant women's health significantly influences the future of a child's health. Only when pregnant women's health issues are given a higher priority by health-care providers (i.e., public and private insurers), there will be substantial improvement in the oral and general health of the next generation. This study focused to check Knowledge attitude and awareness level about periodontal therapy during pregnancy among dental professionals.

Our team has extensive knowledge and research experience that has been translated into high quality publications [16–35].

2. MATERIALS AND METHODS

2.1 Study Design and Study Setting

A cross sectional survey was conducted among the general public using a self- administered

questionnaire. The questionnaire was cross examined by experts in the field for validity and reliability.

2.2 Sampling

A total of 100 participants enrolled in this study. The sampling bias is minimized by including all available data with no sorting process. Simple randomised sampling method was used to categories the sample population (online survey participants).

2.3 Data Collection

A questionnaire based survey was conducted among 100 dental professionals in online platform. The questionnaire based survey was created on Google Forms platform. A total of 18 questions were asked related to periodontal therapy in pregnant women.

2.4 Statistical Analysis

The collected data was tabulated and analysed with Statistical Package for Social Sciences for Windows, version 26 and results were obtained. Categorical variables were expressed in percentage and Chi- square test was used to check association between categorical variables. Chi square tests were carried out using age, gender as independent variables and questions as dependent variables. P value < 0.05 were considered statistically significant.

3. RESULTS AND DISCUSSION

Based on statistical analysis results were obtained and tabulated. Around 74% of participants were BDS and 26% were MDS. Around 64% participants were aware of adverse pregnancy outcomes associated with periodontal disease (Fig. 1). 80% responded that the second trimester is safest for dental treatment in pregnant women (Fig. 2). 80% of participating dental professionals consult OB/GYN (Fig. 3). 46% prescribed aspirin (Fig. 4). 72% of prescribed penicillin (Fig. 5). 52% prescribed Chlorhexidine mouth wash for pregnant women (Fig. 6.). 84% of participants were not prescribing local anesthesia in pregnant women. 60% of the participating population were aware of Supine hypotension and 80% of participants were aware that pregnant patients must be turned to the left Side for dental treatment (Fig. 7).

Around 38% of undergraduates and all of the postgraduates were aware about the adverse pregnancy outcomes associated with periodontal disease. Majority of the BDS participants weren't aware about the supine hypotensive syndrome (40%) when compared to postgraduates where all the MDS participants were aware which is statistically significant. (Chi- square test, p value: 0.00) (Fig. 8). Around 54% of undergraduates were aware that the second trimester is the safest trimester for debridement in pregnant women with periodontal disease. 20% of the participants who were undergraduates weren't aware that second trimester is safest for pregnant women to undergo debridement procedure for periodontal disease whereas all the postgraduates (26%) were aware but the results were statistically not significant. (Chi-square test, p value:0.5) (Fig. 9). 60% of the undergraduates prefer consulting OB/GYN before periodontal management. 42% of the undergraduates prescribe aspirin to pregnant women. 56% of the undergraduates prescribe penicillin to pregnant women. 46% of the undergraduates preferred not to prescribe Chlorhexidine mouthwash for pregnant women. 58% of the undergraduates and all of the postgraduates preferred not to use local anesthetic with epinephrine in pregnant women and the results were statistically significant (Chi-square test, p value: 0.005) (Fig. 10). Around 34% of the undergraduates and all of the post graduates were aware about the supine hypotensive syndrome. Majority of the participants who were undergraduates weren't aware about the supine hypotensive syndrome (40%) whereas all of the MDS participants were aware which is statistically significant (Chi-square test, p value: 0.000) (Fig. 11).

Dental awareness among medical practitioners, particularly dentists, may not be sufficient about knowledge of pregnancy related conditions. There are few studies reported in literature assessing the awareness among these health practitioners. This questionnaire study was undertaken to assess the knowledge, attitude, and awareness of health-care professionals regarding the association of periodontal disease and adverse pregnancy outcomes in Chennai city.

In the present study, gynecologists had adequate knowledge of the effects of oral health on pregnancy outcomes. These findings were similar to the study conducted by Suri et al. [36] as 64% were aware of adverse pregnancy outcomes associated with periodontal disease. 80% responded that the second trimester 12% responded 1st trimester and 8% responded 3rd trimester is safest for dental treatment in pregnant women. The research showed that periodontal treatment can be provided for all

trimesters of pregnancy but due to morning sickness experienced during the first trimester and postural hypotension during the third trimester; the second trimester is considered as the ideal period for delivering effective dental care [37,38]. 38% of the BDS participants were aware that the periodontal treatment during pregnancy may have adverse effects. However, in a study performed by Offenbacher et al. 2006, he observed that the treatment was safe with improved periodontal health, and prevent periodontal disease progression. Preliminary data showed a 3.8-fold reduction in the rate of preterm delivery, a decrease in periodontal pathogen load, and a decrease in both GCF IL-1β and serum markers of IL-6 response [39]. 42% of the BDS participants preferred aspirin over other analgesic medication in the present study. However, Obstetricians discourage pregnant women from taking analgesic doses of aspirin due to the widespread availability of acetaminophen, which causes less gastric irritation. Use of nonsteroidal anti-inflammatory drugs (NSAIDs) such as Ibuprofen, Naproxen, and Ketoprofen drugs in early pregnancy has been strongly associated with an increased risk of cardiac septal defects. Like other NSAIDs, cyclooxygenase (COX)-2 inhibitors should be avoided in late pregnancy because they can cause premature closure of the ductus arteriosus [40].

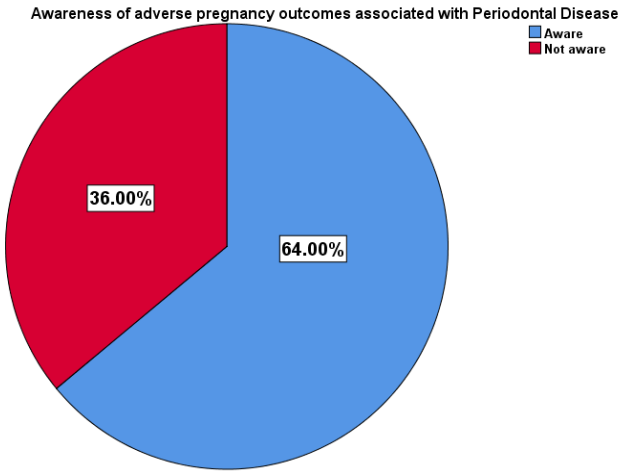

Fig. 1. Awareness on adverse pregnancy outcomes associated with periodontal disease. Blue colour denotes 'Yes' (64%), and Red colour denotes 'No' (36%).

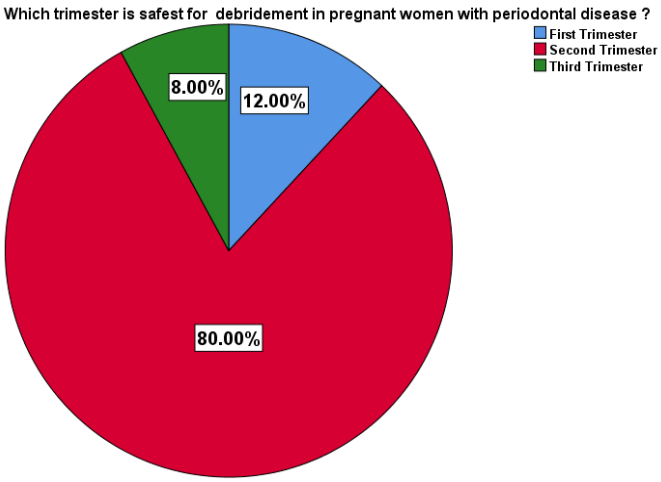

Fig. 2. Awareness on which trimester is safest for debridement in pregnant women with periodontal disease. Blue colour denotes 'First trimester' (12%), Red colour denotes 'Second trimester' (80%), and Green colour denotes 'Third trimester' (8%)

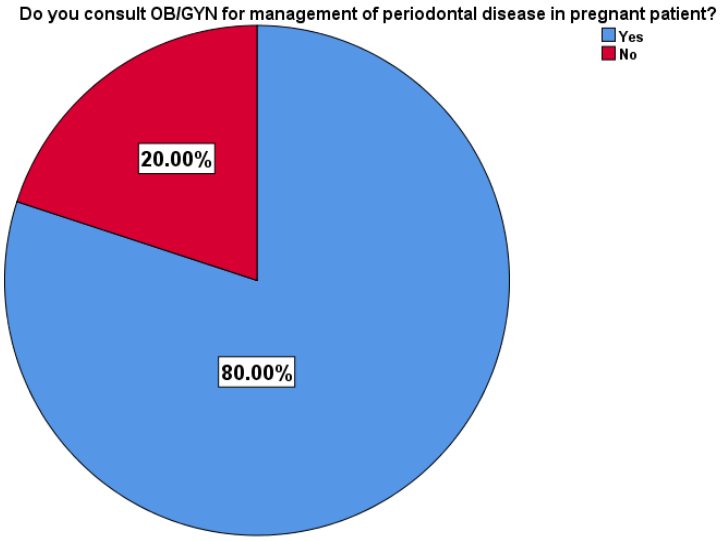

Fig. 3. Awareness on consulting OB/GYN for management of periodontal disease in pregnant women. Blue colour denotes 'Yes' (80%), and Red colour denotes 'No' (20%)

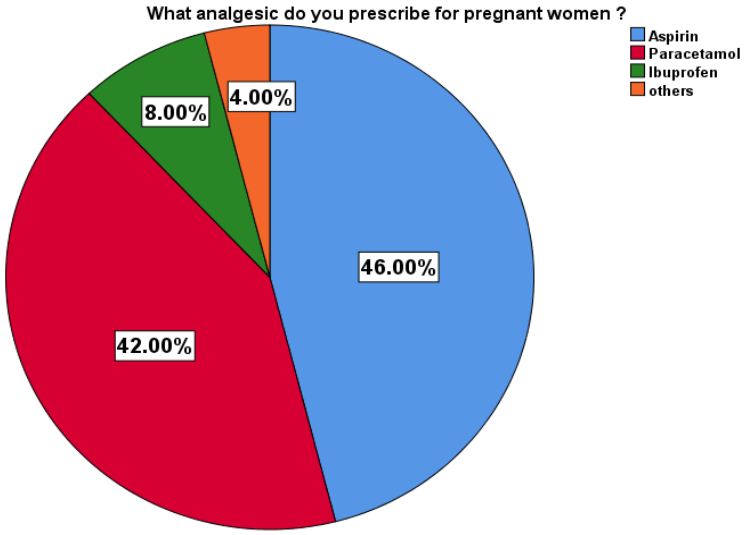

Fig. 4. Analgesic prescribed by the dental professionals for pregnant women. Blue colour denotes 'Aspirin' (46%), Red colour denotes 'Paracetamol' (8%), Green colour denotes 'Ibuprofen' (8%), and Orange colour denotes 'Other analgesics' (12%)

In the present study, 56% of the BDS participants preferred penicillin over other antibiotics for pregnant women. Most of the antibiotics can cross the placental barrier and can potentially affect the fetus. The macrolides, such as erythromycin, azithromycin, and clarithromycin, class of NSAIDs, COX-2 inhibitors such as celecoxib and rofecoxib do not cross the placenta to any significant extent and hence they do not cause any fetal anomalies. Tetracycline should be avoided in pregnant women and in children up to 12 years of age because of permanent teeth staining. Use of metronidazole is justified for significant oral and maxillofacial infections in pregnant women because of its less adverse effects [41].

Fatori Popovic et al. in his study stated that mouth rinsing solutions containing chlorhexidine should be preferred in pregnant women [42]. In the present study, 48% of the BDS participants would recommend chlorhexidine mouthwash for pregnant women who had undergone periodontal therapy Fig. 1).

The adverse effect of a local anesthetic on a fetus is usually determined by the amount of local anesthetic agent delivered across the placental barrier. The amount of local anesthetic agent delivered during local anesthesia is determined not only by the amount of local anesthetic administered, but also the method of administration, use of vasoconstrictors, the metabolic rate and half-life of the local anesthetic agent in the mother, the extent of the fetal and the maternal protein binding, and the acid dissociation constant (pKa) of the local anesthetic agent [43]. In the present study, 58% of the BDS students were aware that local anesthetic agents with epinephrine should not be administered in pregnant women with pre-eclampsia. It is because the protein binding of local anesthetic agents is highly reduced in

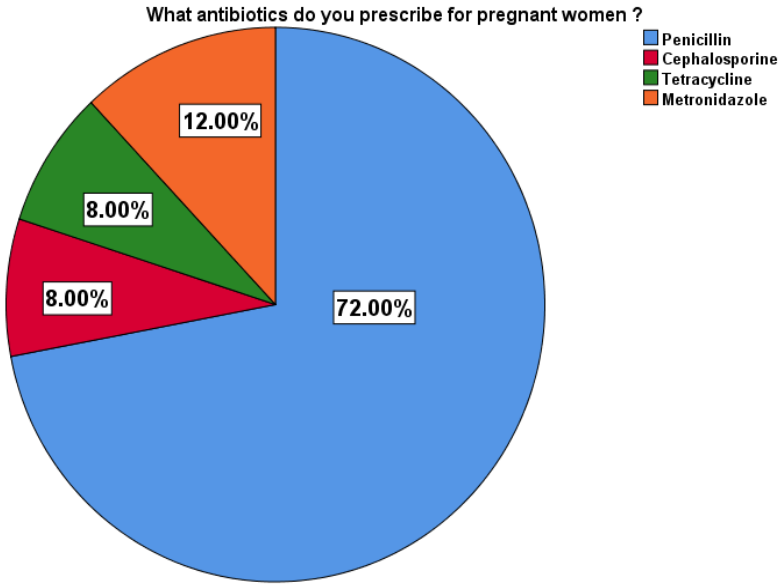

Fig. 5. Antibiotics prescribed by the dental professionals for pregnant women. Blue colour denotes 'Penicillin' (72%), Red colour denotes 'Cephalosporins' (8%), Green colour denotes 'Tetracycline' (8%), and Orange colour denotes 'Metronidazole' (12%)

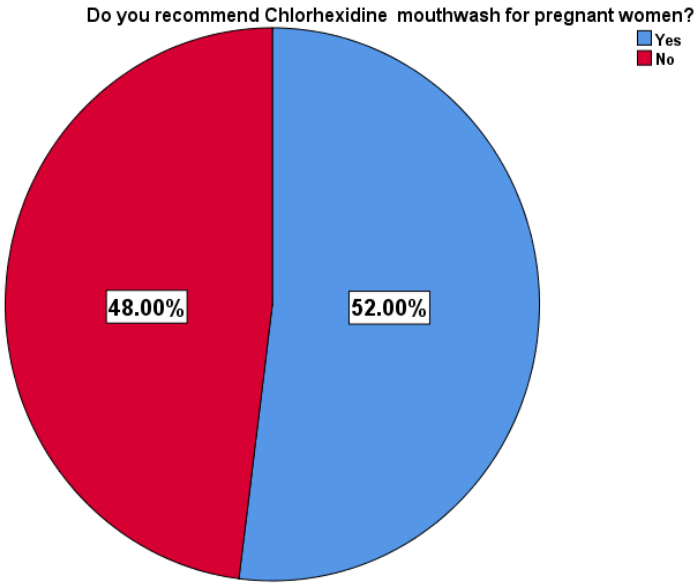

Fig. 6. Recommendation of chlorhexidine mouthwash for pregnant women. Blue colour denotes 'Yes' (52%), and Red colour denotes ' No' (48%)

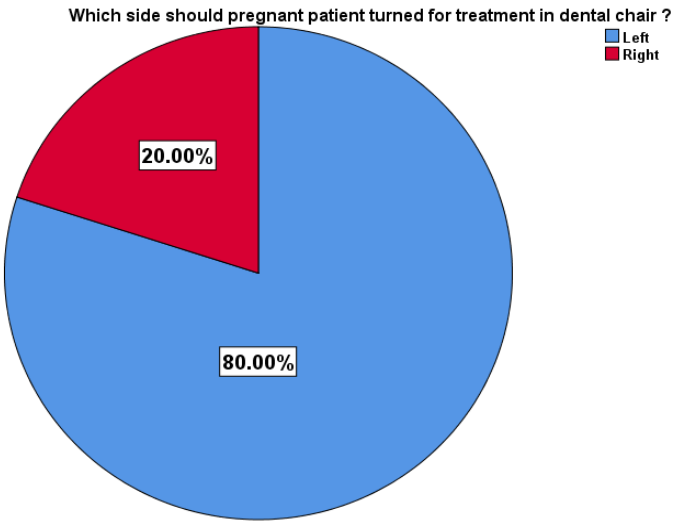

Fig. 7. Awareness on which side the pregnant patient will be turned for treatment in the dental chair. Blue colour denotes 'Left' (80%), and Red colour denotes 'Right' (20%)

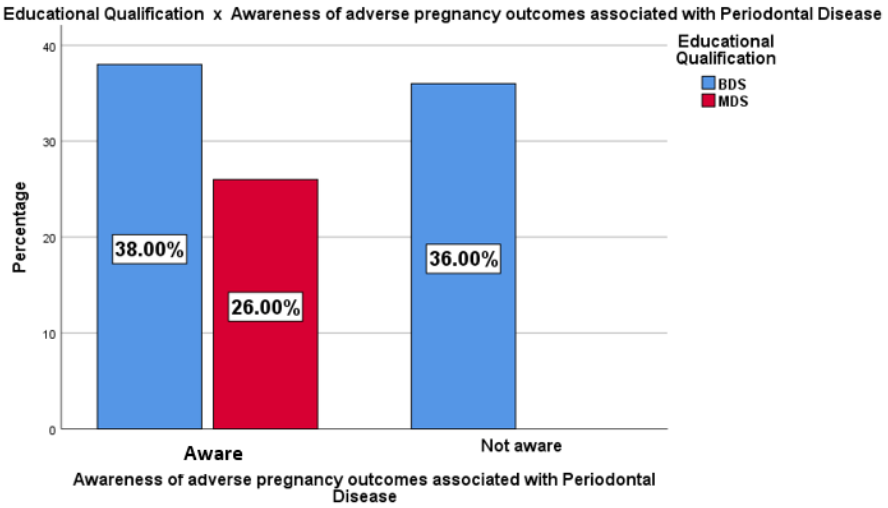

Fig. 8. Association between the educational qualification of the dental professionals and awareness on adverse pregnancy outcomes associated with periodontal disease. X-axis denotes the response and Y-axis denotes the percentage of responses for the question "Awareness of adverse pregnancy outcomes associated with periodontal disease" respectively. Blue colour denotes 'BDS', and red colour denotes 'MDS'. Majority of the BDS participants weren't aware about the supine hypotensive syndrome (40%) when compared to postgraduates where all the MDS participants were aware which is statistically significant. (Chi- square test, p value: 0.00)

pregnant women with pre- eclampsia or eclampsia. Hence, a large amount of local anesthetic agent can be transferred to the fetus. Moreover, epinephrine can potentially contract the blood vessels inside the uterus thereby reducing the blood flow to the placenta. Therefore, local anesthetic agents with epinephrine aren't advised in pregnant women with geriatric hypertensive diseases [44].

Interactive seminars and workshops conducted on a common platform would further enrich the knowledge and provide valuable insights in strengthening the association between periodontal disease and pregnancy outcomes. Further, long-term studies with larger sample size are needed to assess the impact of dental health education to health-care workers through various integrated programs.

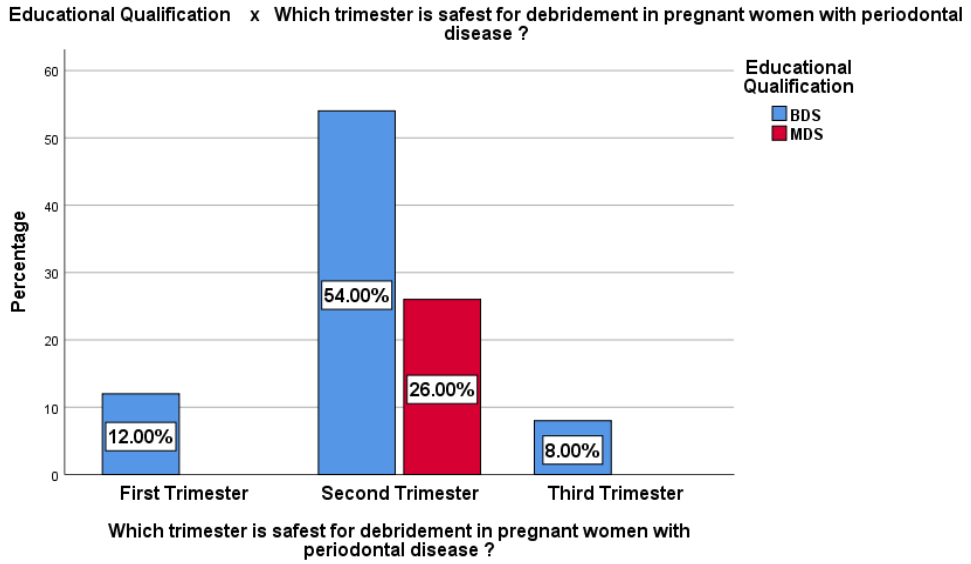

Fig. 9. Association between the educational qualification of the dental professionals and the awareness on which trimester is safest for debridement in pregnant women with periodontal disease. X-axis denotes the response and Y-axis denotes the percentage of responses for the question "Which trimester is safest for debridement in pregnant women with periodontal disease?" respectively. Blue colour denotes 'BDS', and red colour denotes 'MDS'. 20% of the participants who were undergraduates weren't aware that second trimester is safest for pregnant women to undergo debridement procedure for periodontal disease whereas all the postgraduates (26%) were aware but the results were statistically not significant. (Chi-square test, p value: 0.5)

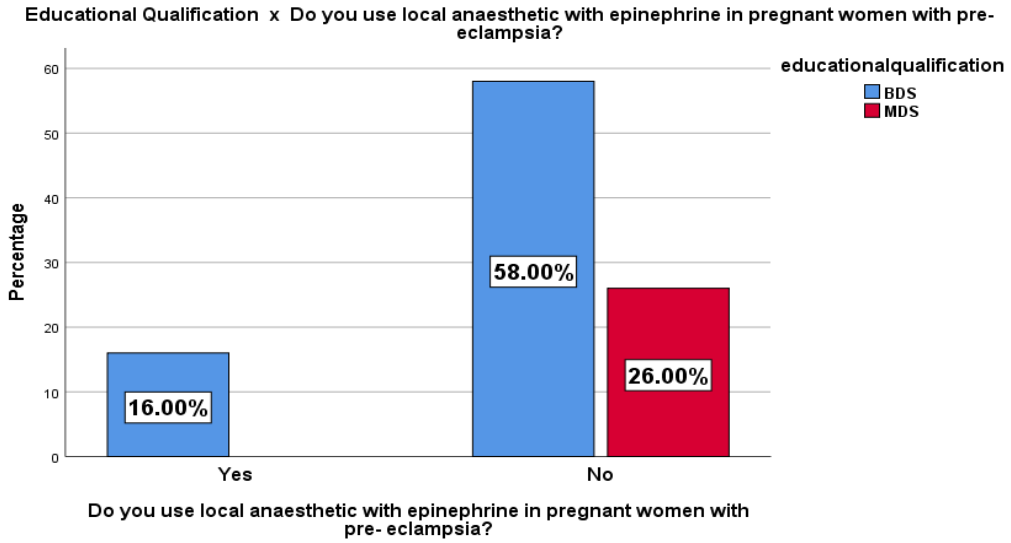

Fig. 10. Association between the educational qualification of the dental professionals and awareness on the use of local anesthetic with epinephrine in pregnant women with pre-eclampsia. X-axis denotes the response and Y-axis denotes the percentage of responses for the question "Do you use local anesthetic with epinephrine in pregnant women with pre-eclampsia?" respectively. Blue colour denotes 'BDS', and red colour denotes 'MDS'. 58% of the BDS participants and all the MDS participants responded 'No' and 16% of the BDS participants responded 'Yes' for the use of local anaesthetic with epinephrine in pregnant women with pre- eclampsia and the results were statistically significant. (Chi- square test, p value: 0.005)

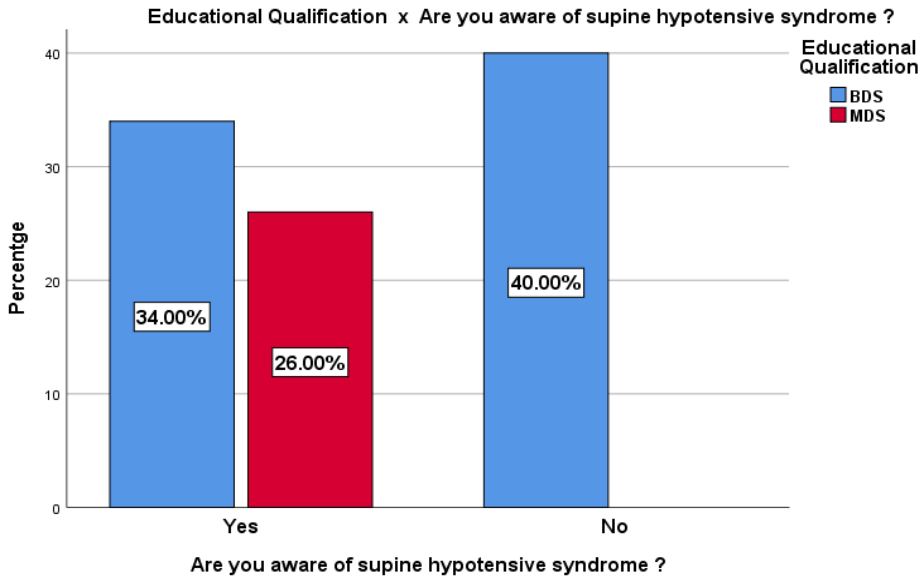

Fig. 11. Association between the educational qualification of the dental professionals and awareness on supine hypotensive syndrome. X-axis denotes the response and Y-axis denotes the percentage of responses for the question "Are you aware of supine hypotensive syndrome?" respectively. Blue colour denotes 'BDS', and red colour denotes 'MDS'. Majority of the participants who were undergraduates weren't aware about the supine hypotensive syndrome (40%) whereas all of the MDS participants were aware which is statistically significant (Chi- square test, p value: 0.000)

4. CONCLUSION

The knowledge of protocols to manage pregnant patients for periodontal therapy will reduce the incidence of maternal and neonatal complications. The results of the present study showed that most of the dental professionals are aware of periodontal therapy during pregnancy. Among the dental professionals, awareness is seen to be lesser in undergraduates when compared to postgraduates.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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