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Oral care during pregnancy: Dentists knowledge, attitude and behaviour in treating pregnant patients at dental clinics of Bengaluru, India

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ABSTRACT

Introduction: Oral health of pregnant women is of utmost important to dental health practitioners. Even among healthy women the physiological changes that accompany pregnancy can lead to gingivitis, periodontitis and at times benign lesions. Preventive, emergency and routine dental procedures are all suitable during various phases of pregnancy, with some treatment modifications and initial planning.

Objectives: This study was undertaken to understand the dentist's knowledge, behaviour, attitude and beliefs towards treating pregnant patients.

Materials and methods: A self administered questionnaire study was conducted among dental health practitioners in Bengaluru city. Two hundred and fifty dental practitioners participated. Knowledge, behaviour, attitude and beliefs were recorded using thirty seven itemed questionnaire.

Results: Descriptive and chi square analysis was done. The *p*-value was set at 0.05. Second trimester was rated as the safest to provide all dental treatment. The type of the practice had effect on the treatment decision making of dentists and drug administration ($p < 0.05$). Participants believed that dental treatment should be part of prenatal care. Counselling pregnant patients is important and that continuous dental education program should be conducted.

Conclusion: The participating dentists exhibited limited knowledge about appropriate management of the pregnant patients.

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1. Introduction

Pregnant women are usually unaware of the oral problems that may arise during antenatal period and their consequences on the mother's and infant's oral and systemic health.[1] Understanding these otherwise normal adaptations is essential in providing dental care to pregnant patients.[2,3] Poor oral hygiene and suppressed immune system can lead to gingivitis, periodontitis, benign lesions like pregnancy tumours and increased susceptibility to oral infections.[4–7] Modifications in

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diet and frequency of eating can increase the risk of developing tooth decay. Poor oral hygiene also increases the risk of complications of pregnancy including preterm delivery or low birth weight, gestational diabetes, preeclampsia, small for gestational age infants and stillbirths.[6,8] Moreover, foetal exposure to oral pathogens may increase risk of subsequent neonatal intensive care admission. In all, the condition of pregnant woman's mouth can affect her health and that of foetus. Oral health care education, instructions and treatment when provided during pregnancy not only improve the oral health of pregnant women but also help in successful oral health management of the infant.[9]

Many believe poor oral health status during pregnancy is normal. Some believe that dental treatment is harmful to their unborn child. It prevents many women to approach dentists and to neglect their oral health.[10–12] Dentists often encounter pregnant patients in a dental set up and are reluctant to provide treatment due to fear and uncertainty about the risks posed to the pregnant patients and foetus by the dental care.[8,13–16] This reflects in the inadequate knowledge about the management of pregnant patients resulting in the undertreatment. Studies have shown that majority of the dentists were insufficiently informed and educated about the treatment of pregnant patients.[17–21] However, many dentists rate prenatal screening as important but when it comes to practice they believe that X-rays, periodontal surgery, amalgam fillings and pain medication are dangerous to pregnant women.[22]

Limited literature is available on the knowledge, behaviour and attitude of dentists in providing oral health care to pregnant patients in India. Hence the present study was undertaken to assess the knowledge, behaviour, attitude and beliefs of dentists towards treating pregnant patients.

2. Materials and methods

A self administered questionnaire study was conducted among dental health practitioners in Bengaluru city between March–June 2012. Bengaluru was divided into five zones (Bruhat Bengaluru Mahanagara Palike). The sampling frame included all licensed dental practitioners, registered in Karnataka State Dental Directory. Sample consisted of two hundred and fifty dental practitioners; fifty dental practitioners selected from each zone.

Ethical clearance was obtained from institutional ethical committee. The investigator approached the dentists, explained about the purpose of study and only those who gave informed consent constituted the study participants.

2.1. *Survey instrument*

The survey included thirty seven multiple choice questions to be completed by the dentists in English language. It consisted of four sections. Section one consisted of demographic details and information about the duration of dental practice, type of practice (solo/partnership), attending continuous dental education programs on periodontal disease of pregnant patients, their oral hygiene and early childhood caries, provisions of educational materials for pregnant patients by participating dentists. The responses were dichotomised into yes and no.

Section two consisted of a set of twelve questions assessing dentist's knowledge regarding the appropriateness of performing routine procedures, prescription of pharmaceuticals to pregnant women and management of pregnant patients in different trimesters of pregnancy.

Section three consisted of a set of seventeen questions assessing behaviour/practice of participating dentists. The response options provided were: recommended/as needed, sometimes/rarely, never, no response and often. Section four consisted of a set of eight questions assessing dentist's attitude and beliefs. The questions covered their beliefs regarding dental treatment and continuing dental education programs as a part of prenatal care. Likert-scale response format ranging from 1 to 5 with "strongly agree" to "strongly disagree" was used. Some questions were reversed to avoid response bias.

2.2. *Statistical analysis*

Statistical analysis was performed using SPSS version 17.0. Chi square test was used to analyse association of knowledge, behaviour and attitude in treating patients, to analyse the differences in responses of male and female dentists, private and solo practitioners and duration of practice.

3. Results

A total of 250 dentists completed the study. Out of which 48% (118) were males and 52% (131) were females. The mean age of the respondents was 30.97 ± 6.41 years. The overall mean duration of practice months was 74.61 months. Males however had long duration of practice months (98.99 months versus 52.47 months) compared to females. Males (57%) had more solo practice compared to females (43%) (Table 1).

3.1. *General questions*

Attending continuous educational programs: A total of 51% of the respondents had attended educational programs addressing periodontal diseases among pregnant patients, 44% on oral hygiene for pregnant patients and 42% on early childhood caries respectively.

Responses to the provisions provided by the practitioner: Only 23% provided oral hygiene instructions and information about periodontal diseases. A moderate 32% provided information regarding transmission of caries from care taker to children.

Providing educational brochures: 38% respondents provided brochures for early childhood caries in preschool children and 33% for oral hygiene for young children. 53% reported providing brochures regarding oral health and pregnancy and 49% about young children's dental development (Table 1).

3.2. *Knowledge about providing routine and emergency dental care to pregnant patients*

Routine dental procedures: Majority of the dentists felt that second trimester is safe to carry all routine and emergency

Table 1 – Characteristics of respondents.

Character	Number (%)
Age (in years)	30.97 (6.91)
<35 years	201 (80)
>35 years	49 (20)
Sex	
Male	119 (48)
Female	131 (52)
Duration of practice in months (average)	74.61
Up to 5 years	135 (54)
5- 10 years	80 (32)
>10 years	35 (14)
Practice type	
Solo	140 (56)
Partnership	110 (44)
Continuous dental education	
Periodontal disease of pregnant patients	127 (51)
Oral hygiene for pregnant patients	110 (44)
Early childhood caries	106 (42)
Provision of patient education regarding pregnancy related topics	
Oral hygiene instructions	57 (23)
About periodontal diseases	57 (23)
About caries transmission	84 (32)
Educational brochures	
About oral health care and pregnancy	133 (53)
About oral hygiene for young children	122 (49)
About young children's dental development	96 (38)
About early childhood caries in preschool children	83 (33)

procedures (Table 2). First trimester was also considered safe for many procedures. A high proportion (96%) of participants performed scaling and root planning as a routine procedure in pregnancy. 42% and 61% of the dentists respectively agreed not to take periapical and full mouth radiographs in pregnancy, be it any trimester. 69% considered it safe to perform routine extractions in the second trimester. Similar findings (56%) were seen for endodontic therapy and (59%) injecting local therapeutic agents during second trimester. 97% considered it safe to place resin composite restoration in pregnancy. Statistically significant association was observed in the responses of dentists in performing scaling and root planning, taking radiographs and administering local anaesthetic agent based on solo and partnership practice. No statistically significant difference ($p < 0.05$) was observed in the knowledge of male and female dentists. Solo practitioners believed to carry such procedures more in second trimester than other trimesters. Dentists working in partnership were more versatile in carrying above mentioned procedures in other trimesters as well (Table 2).

Emergency procedure: 69% agreed performing extraction in 2nd trimester. Almost 90% considered performing emergency access opening and incision and drainage during pregnancy. 22% considered third trimester safe for placing temporary restoration, if emergency arises. 44% will never administer long acting local anaesthesia even in emergency. Statistically significant difference ($p < 0.05$) was observed in giving long acting local anaesthetic agent between solo and partnership practitioners. The dentists working in partnership were more likely to administer the drug during emergency compared to solo practitioner (Table 2).

Table 3 provides detail description of behaviour questions of dentists. The knowledge of the dentists was reflected in their behaviour towards providing dental care to pregnant patients with majority considering second trimester to be safe for different procedures. However when it comes to taking radiographs, the behaviour differed from their knowledge. 26% and 46% will never take or sometimes or rarely take periapical and full mouth radiographs respectively of pregnant patients as routine procedures. 79% agreed performing extraction during pregnancy as a routine procedure in their clinics. Approximately 70% of the practitioners performed endodontic therapy, composite restoration and administered local therapeutic injection as routine procedures. Statistically significant association ($p < 0.05$) was observed in the responses of solo and partnership practioners for administering local therapeutic injection.

Table 2 – Knowledge of respondents about routine and emergency oral care of pregnant patients.

	Percentage distribution to responses (%)[a]				
	First trimester	Second trimester	Third trimester	Never	No response
Routine procedures					
Performing scaling and root planning[b]	25	57	14	3	1
Obtaining a single periapical radiograph[b]	11	34	10	42	3
Obtaining a full mouth radiograph[b]	8	21	7	61	4
Performing a single tooth extraction	10	69	5	14	2
Performing endodontic therapy	20	56	13	9	3
Placing resin based composite restoration	35	41	21	2	1
Administering a local therapeutic injection	14	59	8	18	3
Emergency often					
Extracting a tooth	14	69	9	7	2
Access opening to relieve pain	29	51	17	2	1
Incision and draining abscess	26	51	15	7	1
Planning a temporary restoration	31	45	22	1	0
Administering an injection of long acting anaesthetic[b]	9	32	5	44	9

[a] Respondents were instructed to indicate appropriate trimesters to provide treatment.
[b] Chi square test, statistically significant association between responses and type of practice (solo/partnership) at $p < 0.05$.

Table 3 – Respondents' behaviour towards providing routine and emergency treatment to pregnant patients.

	Percentage distribution to responses (%)				
	Recommendations	Sometimes	Never	No response	Often
Routine procedures					
Performing scaling and root planning	54	25	5	1	16
Obtaining a single periapical radiograph	37	25	26	2	11
Obtaining a full mouth radiograph	26	21	46	2	4
Performing a single tooth extraction	44	35	9	1	11
Performing endodontic therapy	50	31	5	1	13
Placing resin based composite restoration	51	23	8	1	17
Administering a local therapeutic injection[b]	44	26	19	3	8
Emergency often					
Extracting a tooth	52	32	8	1	7
Access opening to relieve pain	55	34	1	0	10
Incision and draining abscess	52	40	3	2	3
Planning a temporary restoration	57	26	2	0	15
Administering an injection of long acting anaesthetic	27	27	37	8	2
Drug recommendation					
Acetaminophen	47	21	24	3	5
NSAIDS[a]	25	32	35	1	7
Narcotic pain medication	11	15	65	8	11
Site specific antiseptic agent[a,b]	16	23	44	9	8
Doxycycline hyclate[a]	22	20	46	8	3

[a] Chi square test, statistically significant association between responses and gender at $p < 0.05$.
[b] Chi square test, statistically significant association between response and type of practice (solo/partnership) at $p < 0.05$.

The knowledge of dentists was reflected in their behaviour while providing emergency treatment to pregnant patients. More than 84% of the dentists performed extractions, access opening, incision and drainage and placement of temporary restorations on emergency basis. However 37% never administered long acting anaesthetic in emergency contrary to their higher knowledge.

Majority of the dentists do not prescribe drugs very often to pregnant patients. 47% will give acetaminophen if needed compare to 25% for NSAIDS. 65% will never give narcotic pain medication to pregnant patients. 44% and 46% of the dentists will never give site specific antiseptic agent and doxycycline respectively to their pregnant patients. Chi square test showed statistically significant association between responses and gender of dentists for recommending NSAIDS, site specific antiseptic agents and doxycycline hyclate. Male dentists were more likely to recommend the above said drugs to pregnant patients. Significant association was observed in the behaviour of solo and partnership practitioners for recommending site specific antiseptic agent.

3.3. *Attitude and belief*

Respondents' attitude and beliefs are summarised in Table 4. 89% of the respondents agreed that dental treatment should be the part of prenatal care. A total of 83% agreed that pregnant patients are more likely to seek dental care if their physicians recommended; however 67% disagreed that physicians are better able to counsel pregnant patients about oral health. 79% were confident of their skills to counsel pregnant patient. Nearly all (95%) believed it is important to counsel pregnant patients about periodontal disease and prematurity and about how dental decay can affect the baby. Also majority (73%) didn't agree that they are too busy to counsel pregnant patients. 89% of respondents showed interest in obtaining information through continuing dental education programs on pregnant patients. Statistically significant ($p < 0.05$, chi square) association was observed between responses and gender, regarding counselling pregnant patients about how decay can affect the baby. Significant association was also observed between responses and type of practice.

4. Discussion

Preventive, routine and emergency dental care procedures should be provided to pregnant patients. Beyond treatment there is need for pregnancy specific preventive care and oral health education.

This study investigates how far dentists' adopt knowledge, behaviour, attitude and beliefs towards treating pregnant patients. Approximately 50% of the respondents have received continuous education programs related to periodontal disease and oral hygiene for pregnant patients. 23% dentists educated pregnant patients regarding pregnancy related topics in their clinics. At least 33% provided educational brochures for the same. Similar results were reported in study done by Hubner et al.[21]

Majority of the dentists felt second trimester to be the safest for performing dental treatment. The finding is in agreement with other studies.[17–21] In the present study 96% of study subjects recommended scaling and root planning as needed on pregnant patients. Similar results (86%) were reported in other studies.[19,20] However only 50% agreed in Hubner et al study.[21] The results of the present study are encouraging and reflect good knowledge of the dentists. Initiating or continuing oral health preventive care program is

Table 4 – Respondents' attitude and belief toward behavioural counselling and treatment of pregnant patient.

	Percentage distribution to responses (%)				
	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Dental treatment should be a part of prenatal care	1	2	8	36	53
Pregnant patients are more likely to seek dental care if their physicians recommend it	2	6	10	51	32
Physicians are better able to counsel pregnant patients than dentist about oral health	21	46	13	12	8
My practice is too busy to add counselling for pregnant patients	20	53	16	8	3
Counselling pregnant patient about periodontal disease and prematurity is important for health	1	0	4	48	47
I have skills to counsel pregnant patients	1	5	15	59	20
It is worth in counselling pregnant patients about how decay can affect the baby[a]	2	3	5	54	36
Information about continuing dental education on pregnant patients interests me[b]	0	1	10	63	26

[a] Chi square test, statistically significant association between responses and gender at $p < 0.05$.
[b] Chi square test, statistically significant difference association between responses and type of practice (solo/partnership) at $p < 0.05$.

essential during pregnancy. Research has shown higher risk of preterm birth and low birth weight in pregnant women with periodontal disease and that periodontal therapy may reduce this risk.

In this study 42% and 61% of the dentists said, they will never take a single periapical and full mouth radiograph respectively. The findings are in agreement with 42.5% and 67% reported in other studies.[17,19] However our results are in contrast to study done by Pina and Douglas where 77% reported taking a radiograph for patient 10 weeks into pregnancy.[14] The concept of avoiding radiography during pregnancy generally applies to procedures in which the embryo or foetus would be in or near the primary beam. For dental radiography, the primary beam is limited to the head and neck region. Furthermore, the standard radiation hygiene practices such as use of high speed films, filtration, collimation and leaded aprons greatly reduced exposure. Full mouth radiography has been shown significantly less than 1 cGy, a dose far lower than uterine exposure from naturally occurring background radiation during the 9 months of pregnancy.[23] The maximum risk attributable to 1 cGy exposure to foetus has been estimated to be about 0.1%, a quantity thousands of times less than the baseline risks of spontaneous abortion, malformation or genetic disease.[24,25] However, it is prudent to avoid or minimize the use of diagnostic radiography during pregnancy, especially during the first trimester, the period of organogenesis.

There were mixed opinions regarding elective dental procedures. In the present study 14% will never extract painful teeth in routine; however during emergency they prefer doing extraction. 90% of the dentists agreed performing endodontic therapy or composite restorations in pregnant patients. However in other studies dentists preferred delaying such elective procedures.[18,19,21] The guidelines (Kumar J, Hiroko I, 2009) say that these procedures are relatively safe and pregnant patients should not be denied treatment solely on the basis of pregnancy status.[26]

44% in the present study will never administer anaesthetic agent even in emergency. However in the other studies a higher percentage preferred giving anaesthetic agents.[17–19] This reflects the poor knowledge of the dentists in the present study and their over conservative nature. Most of the anaesthetic complications are associated with the anxiety and not with the drug reaction. With adequate relaxation techniques such complications can be avoided.[27] However in case of emergencies the dentists in the present study were more willing to take risk. More than 90% of the respondents agreed to perform incision and drainage, access opening to relieve pain and temporary restoration.

The overall knowledge of the respondents was reflected in their behaviour towards treating pregnant patients. However despite knowing the fact that with adequate precautions radiographs are safe in pregnancy, less percentage of dentists performed it. For elective procedures like performing a single tooth extraction, dentists were more willing to do them in routine practice than reflected in their knowledge. Similarly a higher percentage of dentists performed emergency incision and drainage, administered anaesthetic agent, access opening and temporary restoration than that reflected by their knowledge. Clinical practice is usually competitive in nature. Denying treatment to the patient leads to loss of patient base and decrease in credibility of dentists. So this might be the reason for dentists providing such treatment despite their knowledge limiting them to do same. Results from our analysis confirm that dentists' knowledge have significant negative impacts on current practice.

Drugs are usually required in order to alleviate pain and control infection. Few drugs, however are not safe in pregnancy.[2,28] In the present study more than 90% of the dentists recommended analgesics (acetaminophen, NSAIDS) and possible antibiotic therapy (local) to the pregnant patients. Similar results were reported by other studies.[17,19] When acetaminophen is administered in therapeutic doses, it is generally considered to be the best choice in the management of oro-facial pain during pregnancy.[29,30]

89% of the dentists in the present study agreed that dental treatment should be the part of prenatal care. 83% believed that pregnant patients are more likely to seek dental care if

recommended by physicians. This finding is similar to that reported by Pina and Douglas et al.[14] 95% believed counselling pregnant patients about periodontal diseases and prematurity and how decay can affect the baby is important. However, only 79% of the dentists believe that they possess necessary skills to counsel pregnant patients. 67% of the dentists do not believe that physicians can counsel pregnant patients better than dentists about their oral health. Similar results were reported by Hubner et al.[21] Overall the dentists are confident about their counselling skills and believe it to be an important part of management of pregnant patients.

89% agreed that educational information regarding pregnant patients interests them. William et al, 2005 and Hubner et al, 2009 reported similar findings.[20,21] Continuous updating regarding management issues of pregnant patients is important. It not only helps in better patient management but also prevents any possibility of untoward event which may endanger mother and foetus.

Optimal oral health is very important for the pregnant patients and can be provided safely and effectively. Paying attention to the physiological changes associated with pregnancy, practising careful radiation hygiene measures, prescribing medications on the basis of drug safety categories, timing appointments appropriately and aggressive management of oral infections are important considerations. Given the possibility that periodontal diseases may affect pregnancy outcomes, dentists need to play a proactive role in the maintenance of the oral health of pregnant patients. It is recommended that the dentists should keep on updating their knowledge about the management of pregnant patients.

5. Conclusion

Despite current clinician recommendations to deliver all necessary care to pregnant patients during 1st, 2nd and 3rd trimesters, dentists' knowledge of the appropriateness of the procedures continues to lag state of art in dental science.

The survey showed that dentists have limited knowledge about appropriate management of the pregnant patients. It necessitates the continuous dental education and more emphasis in undergraduate dental curriculum on the management of the pregnant dental patient.

It is recommended to arrange training both dentists and obstetricians in the oral health needs, screening and care of pregnant patients, as a part of prenatal care. Findings suggest attitudes are significant determinants of accurate knowledge and current practice.

Conflicts of interest

All authors have none to declare.

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Prof. (Dr.) Mahesh Verma receives 'PADMA SHRI' award



Prof. (Dr.) Mahesh Verma has been honoured by prestigious *"Padma Shri"* award towards his outstanding contribution in the field of Dentistry in the year 2014.

Prof. Mahesh Verma is Director – Principal of Maulana Azad Institute of Dental Sciences is known for excellence in dental education and patient care in India and is ranked number one among the dental institutions across India with affiliations worldwide. Prof. Verma was born on 25th August 1957 at Punjab and he had his early education in Himachal and Punjab. He had his professional education at the Govt. Dental College Trivandrum and specialised in the field of Prosthodontics and Crown & Bridges as well as advanced training at State University of New York at Buffalo (USA). He is an MBA from Faculty of Management Studies, Delhi University and was awarded Gold Medal for excellent performance for academic excellence. He is also a PhD Scholar. Prof. Verma undoubtedly stands out as a professional of rare eminence, with the highest integrity as an administrator, an important constituent of most regulatory bodies of the profession in India, a Professor, a Motivator and a Leader in sensitizing and enlightening the society through multiple channels of communication, in the prevention of diseases and also providing medical care of the highest level to the poor and underprivileged.

His versatility, skills, devotion and diligence have been recognised in the past with the conferment of the "Dr B.C. Roy national award", in particular and other awards as well. Govt. of Delhi too has recognised his services by awarding him the "State Award". Prof. Verma is the Vice President of Dental Council of India, is chairman of Pierre Fauchard Academy, India section. He is also President elect of Indian Dental Association Head Office. He is Hon. Advisor to Armed forces Dental Services and Fellow of Royal College of Physicians and Surgeons of Glasgow.

Heartiest Congratulations Prof. (Dr.) Mahesh Verma for the Coveted Honor.

Wish you many more feathers in your Hat!