OPEN ACCESS Freely available online

Annals and Essences of Dentistry

Research Article

Perceived Barriers to Preventive Dental Care among Practicing Dentists of Central India

Sudhanshu Saxena[1*], Mohit Pal Singh[2], N. D. Shashikiran[3]

[1]Department of Oral Medicine and Radiology, Pacific Academy of Higher Education and Research University, Udaipur, Rajasthan, India;[2]Department of Oral Medicine and Radiology, Pacific Dental College and Hospital, Pacific Academy of Higher Education and Research University, Udaipur, Rajasthan, India;[3]Department of Pedodontics and Preventive Dentistry, Krishna Institute of Medical Sciences Deemed University, Karad, Maharashtra, India

ABSTRACT

Aim: The present research aimed to assess barriers to provide preventive dental care among practicing dentists of Central India.

Materials and methods: This cross-sectional questionnaire-based study was conducted among practicing dentists of Madhya Pradesh state, India. A Web-based questionnaire was designed to collect demographic information and responses on a Likert scale for 12 barriers. The barriers were subcategorized as patient-, dentist and practice-related barriers. Data collected were statistically analysed using Pearson's chi-square test and multivariate logistic regression analysis. P values <0.05 were considered statistically significant.

Results: The ignorance of patients for regular dental visits, considering preventive care as non-profitable, and the traditional curative nature of dentistry was considered as barriers by all the dentists. A significant difference was observed between dentists with different years of dental practice for patient's unwilling to pay for preventive care, no respect in preventive care practice and scarcity of printed materials for dental health education. Low priority of preventive dentistry in the dental curriculum had 10.585 times higher odds among postgraduate than graduate dental professionals.

Conclusion: The findings of the study revealed that dentists in central India consider patient's attitude, respect in preventive care, monetary benefits, existing curriculum and curative nature of dental practice as potential barriers to providing preventive care.

Keywords: Prevention; Barriers; Oral problems; Dental care

INTRODUCTION

Oral diseases are highly prevalent throughout the life course and have considerable negative effects on individuals, communities, and the wider society. While there has been a noticeable improvement in oral health in many developed countries, [1] the prevalence of oral diseases is rising in many low-income and middle-income countries including India, linked to wider social, economic, and commercial changes [2]. The utmost common oral problems, dental caries and periodontal disease, are caused by microbes and aggravated by dietary sugars, ineffectual plaque removal, and less than optimum fluoride accessibility [3]. Additionally, higher proportions of oral diseases are witnessed among the underprivileged sections of society [4].

The association between oral and general health is well established by evidence [2]. For instance, severe periodontal disease is linked to diabetes. There is a sturdy relationship between non-communicable chronic diseases and numerous oral diseases, predominantly a consequence of common risk factors [5]. Many general illnesses also have oral manifestations that surge the risk of oral disease which, sequentially, is a risk factor for several general health conditions [2]. This further highlights that good oral health is quintessential for overall well-being.

Dental caries and periodontal disease are the two ubiquitous oral diseases in India. According to a national survey prevalence of dental caries is 50%,52.5%,61.4%,79.2%, and 84.7% in 5,12,15,35-44, and 65-74 year old, respectively. The frequency of

Correspondence to: Sudhanshu Saxena, Department of Oral Medicine and Radiology, PhD scholar, Pacific Academy of Higher Education and Research University, Udaipur, Rajasthan, India, E-mail: drrspath@gmail.com

Received: 06-Jun-2022, Manuscript No. AEDJ-22-18239; **Editor assigned:** 08-Jun-2022, Pre-QC No. AEDJ-22-18239 (PQ); **Reviewed:** 22-Jun-2022, QC No. AEDJ-22-18239; **Revised:** 29-Jun-2022, Manuscript No. AEDJ-22-18239 (R); **Published:** 07-Jul-2022, DOI: 10.35248/0976-156X.22.14.224.

Citation: Saxena S, Singh M P, Shashikiran N.D (2022) Perceived Barriers to Preventive Dental Care among Practicing Dentists of Central India. Ann Essence Dent. 14:224.

periodontal disease was reported as 55.4%,89.2%, and 79.4% in 12,35-44, and 65-74 years old, respectively. In that survey load of oral cancer was detected as 0.2 to 0.4 per 100 across the various age groups [6]. Also, there is enough evidence to support the fact that in recent years there is an increase in oral disease-related morbidly in the nation [7].

As per the Dental Council of India's database, currently, more than 300 dental colleges are offering dental education in India and every year on average approximately 25,000 graduate and 5000 postgraduate dental students are passing out [8,9]. This data is providing a very optimistic sign as far as the availability of the dental workforce is concerned. To make dental education contemporary, from time to time necessary changes have been made in the curriculum by the regulatory body [9].

There is well-established evidence on the preventable nature of oral diseases [10,11]. The challenge is to generate opportunities and conditions to empower individuals and communities to appreciate good oral health [1]. The need to encourage the practice of preventive dental care in India is critical because the available resources in India as in most developing countries are deficient to support the customary curative care of oral diseases [12]. Dental professionals are cultivated to promote better oral hygiene in the community. They are also accountable to assimilate preventive procedures, educating and motivating patients about preventive oral health manners [13].

It is, therefore, important to explore the barriers to providing preventive dental care among Indian dentists. However, the literature search has revealed that no comprehensive study has been conducted in Central India on this aspect. Hence present research aimed to assess barriers to provide preventive dental care among practicing dentists of Central India.

MATERIALS AND METHODS

Study population and study design

This cross-sectional questionnaire-based study was conducted among practicing dentists of Madhya Pradesh state, India.

Data collection tool (Questionnaire)

A Web-based questionnaire was designed to collect personal data, such as age, gender, educational background, years of the dental practice, and type of patients treated. Another section was on barriers to provide preventive dental care. A total of 12 barriers were subcategorized as patient, dentist and practice-related barriers. Participants were asked to respond on a Likert scale for each of the 12 barriers (not at all, very little, little, much and very much). The questionnaire was in English and included a cover note explaining the voluntary, anonymous and confidential nature of participation in the survey. Information that could identify the participant's identity was not requested so that participants were encouraged to provide truthful information.

Pilot study

The English versions of the web-based questionnaires were piloted for clearance and understanding among twenty-five dentists of different ages and working experience of Madhya Pradesh state and discussed with them. Based on the feedback, the questionnaire was revised to obtain the final version. Dentists who participated in the pilot study were excluded from the final data collection.

Sample size

Based on the response rate in the pilot study that is 68%, confidence interval of 95% and 5% absolute precision sample size calculated was 313 dentists. The minimum sample size was adjusted by 10% to compensate for non-responses, bringing the total sample size to 344 practicing dentists.

Sampling technique

A systematic random sampling technique was followed for data collection. The list of dentists for the same was obtained from Madhya Pradesh state dental council.

Data collection

The web-based questionnaire was sent by e-mail to the practicing dentists. They were requested to submit the consent and responses within a week. Those who did not submit were contacted after one week and fortnight consequently. After the second reminder, no further attempt was made to collect data.

Informed consent and ethical clearance: Participation in the study was voluntary. The consent was obtained through the web-based questionnaire. Ethical clearance for the study was obtained from the ethics committee of the institution (ethics number HDCH/2014/115).

Statistical methods

Validity and reliability testing: (a): Face validity: In pilot testing after completion of the questionnaire, participants were interviewed regarding the overall acceptability, length, language, clarity and feasibility of the tool. Over 90% of practicing dental professionals found the questionnaire easy to understand and fill; (b): Content validity: The contents of the questionnaire were scrutinized by a panel of three academicians. The mean content validity ratio was 0.83, as per the opinion expressed by the panel. Cronbach's alpha (α) was between 0.71 to 0.86 for different sections of questionnaires which showed acceptable to good internal consistency; (c): Reliability of responses: The data using the questionnaire was recollected from 10% of participants. Kappa values for reliability was between 0.68 to 0.84, which indicated substantial to almost perfect agreement.

Data collected was entered in Microsoft Excel 2013 for Windows. Mean Standard Deviation (MSD), frequency and percentages of responses were calculated. For further analysis, the Likert scale responses of participants were dichotomized; not at all, very little, little was considered as 'no' and much and very much was considered as 'yes'. The data were analyzed by application of Pearson's chi-square test and multivariate logistic regression analysis. P values <0.05 were considered statistically significant. All analyses were performed using version 21.0 of the Statistical Package for Social Sciences (IBM Corporation, Armonk, New York, USA) (Table 1).

A total of 249 dentists responded to the questionnaire. Table 1 shows the sociodemographic characteristic of the study subjects. Most of the dentists were males, having an undergraduate degree, having experience of dental practice up to five years and treating pediatric as well as adult age group (Figure 1).

Table 1: Sociodemographic characteristic of the dentists.

Sociodemographic characteristic		Value (n=249)
Age (Years)	Mean ± SD	30.12 ± 6.14
Gender	Male {n (%)}	156 (62.65)
	Female {n (%)}	93 (37.35)

Professional degree	BDS {n (%)}	194 (77.91)
	MDS {n (%)}	55 (22.09)
Years of dental practice	0-5 years	148 (59.44)
	6-10 years	50 (20.08)
	>10 years	51 (20.48)
Patient group	Children {n (%)}	02 (0.80)
	Adult {n (%)}	00 (0.00)
	Mixed {n (%)}	247 (99.20)

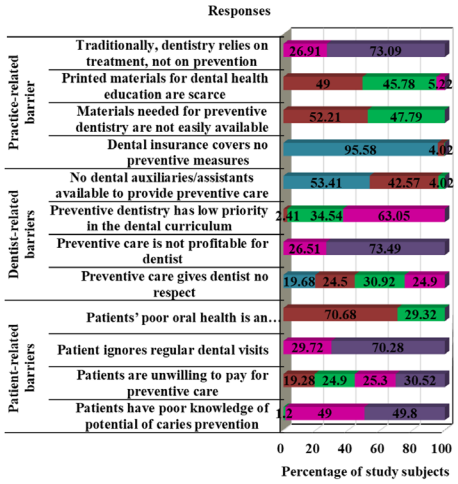

Figure 1: Responses of study subjects on Likert scale for barriers. **Note:** ( ) Not at all, ( ) Very little, ( ) Little, ( ) Much, ( ) Very much.

Among patient-related barriers, ignorance of patients for regular dental visits was a 'very much' barrier to provide preventive care for 70.28% of dentists. Among dentist related barriers, non-profitable preventive care was a 'very much' barrier to provide preventive care for 73.49% of dentists. Nearly 73% of study subjects, responded 'very much' for the traditional curative nature of dentistry among practice-related barriers (Table 2).

The ignorance of patients for regular dental visits, considering preventive care as non-profitable, and the traditional curative nature of dentistry was considered as barriers by all the dentists. Significantly a greater number of postgraduate than undergraduate dental professionals considered the low priority of preventive dentistry in the dental curriculum as a barrier (χ^2=26.684, df=1, P<0.001). Patients' poor oral health, non-availability of dental auxiliaries or assistants for preventive care, lack of Dental insurance coverage for preventive measures and not easy availability of materials needed for preventive dentistry were not considered as barriers by any of the dentists who participated in the present study (Table 3).

Table 3 shows barriers to preventive care among study subjects according to years of dental practice. Significant difference was observed between dentists with different years of dental practice for patient's unwilling to pay for preventive care (χ^2=9.189, df=2, P<0.05), no respect in preventive care practice (χ^2=15.011, df=2, P<0.01) and scarcity of printed materials for dental health education (Yates χ^2=6.764, df=2, P<0.05).

Table 2: Barriers to preventive care among study subjects according to professional degree.

Barriers		Professional degree		Chi-square test
		BDS n (%)	MDS n (%)	
Patient-related barrier	Patients have poor knowledge of potential of caries prevention	192 (98.97)	54 (98.18)	Yates' χ^2=0.052, df=1, P=0.820 (>0.05)
	Patients are unwilling to pay for preventive care	107 (55.15)	32 (58.18)	χ^2=0.159, df=1, P=0.690 (>0.05)
	Patient ignores regular dental visits	194 (100.00)	55 (100.00)	Test not applicable
	Patients' poor oral health is an obstacle to preventive care	00 (0.00)	00 (0.00)	Test not applicable
Dentist-related barrier	Preventive care gives dentist no respect	48 (24.74)	14 (25.45)	χ^2=0.012, df=1, P=0.913 (>0.05)
	Preventive care is not profitable for dentist	194 (100.00)	55 (100.00)	Test not applicable
	Preventive dentistry has low priority in the dental curriculum	106 (54.64)	51 (92.73)	χ^2=26.684, df=1, P=0.000 (<0.001)
	No dental auxiliaries/assistants available to provide preventive care	00 (0.00)	00 (0.00)	Test not applicable
Practice-related barrier	Dental insurance covers no preventive measures	00 (0.00)	00 (0.00)	Test not applicable
	Materials needed for preventive dentistry are not easily available	00 (0.00)	00 (0.00)	Test not applicable
	Printed materials for dental health education are scarce	10 (5.15)	03 (5.45)	Yates' χ^2=0.065, df=1, P=0.799 (>0.05)
	Traditionally, dentistry relies on treatment, not on prevention	194 (100.00)	55 (100.00)	Test not applicable

Table 3: Barriers to preventive care among study subjects according to years of dental practice.

	Barriers	Years of dental practice			Chi-square test
		0-5 years	6-10 years	>10 years	
		n (%)	n (%)	n (%)	
Patient-related barrier	Patients have poor knowledge of potential of caries prevention	146 (98.65)	50 (100.00)	50 (98.04)	Yates' χ^2=0.085, df=2, P=0.958
	Patients are unwilling to pay for preventive care	71 (47.97)	33 (66.00)	35 (68.63)	χ^2=9.189, df=2, P=0.010
	Patient ignores regular dental visits	148 (100.00)	50 (100.00)	51 (100.00)	Test not applicable
	Patients' poor oral health is an obstacle to preventive care	00 (0.00)	00 (0.00)	00 (0.00)	Test not applicable
Dentist-related barrier	Preventive care gives dentist no respect	24 (16.22)	20 (40.00)	18 (35.29)	χ^2=15.011, df=2, P=0.001
	Preventive care is not profitable for dentist	148 (100.00)	50 (100.00)	51 (100.00)	Test not applicable
	Preventive dentistry has low priority in the dental curriculum	90 (60.81)	36 (72.00)	31 (60.78)	χ^2=2.150, df=2, P=0.341
	No dental auxiliaries/assistants available to provide preventive care	00 (0.00)	00 (0.00)	00 (0.00)	Test not applicable
Practice-related barrier	Dental insurance covers no preventive measures	00 (0.00)	00 (0.00)	00 (0.00)	Test not applicable
	Materials needed for preventive dentistry are not easily available	00 (0.00)	00 (0.00)	00 (0.00)	Test not applicable
	Printed materials for dental health education are scarce	13 (8.78)	00 (0.00)	00 (0.00)	Yates' χ^2=6.764, df=2, P=0.034 (<0.05)
	Traditionally, dentistry relies on treatment, not on prevention	148 (100.00)	50 (100.00)	51 (100.00)	Test not applicable

Variables that showed significant association in univariate analysis were further analysed by multivariate logistic regression analysis (adjusted odds ratio) to evaluate the strength of association. The logistic regression model showed that the low priority of preventive dentistry in the dental curriculum had 10.585 times higher odds among postgraduate than graduate dental professionals (95% CI: 3.681-30.436, P<0.001). Patients' unwillingness to pay for preventive care had 2.105 times higher odds among dental professionals with 6-10 years of experience (95% CI: 1.079-4.106, P<0.05) and 2.372 times higher odds among dental professionals with more than 10 years of experience (95% CI: 1.210-4.653, P<0.05) than the dental professionals with 0-5 years of experience. The odds of considering "no respect in preventive care" as a barrier was 3.444 times higher among dental professionals with 6-10 years of experience (95% CI: 1.685-7.041, P<0.01) than the dental professionals with 0-5 years of experience. For the same variable odds were 2.818 times higher among dental professionals with more than 10 years of experience (95% CI: 1.369-5.800, P<0.01) than the reference category (0-5 years of experience). Logistic regression analysis could not establish a significant association between scarcity of printed materials for dental health education and dental professionals with different levels of experience (P>0.05).

RESULTS AND DISCUSSION

Preventive dentistry is acknowledged as an integral part of contemporary dental services and an essential element of the dental curriculum [14]. The World Health Organization (WHO) suggested orienting dental services towards prevention and health promotion as one of the primary action areas for developing countries when initiating or strengthening oral health programmes [15]. Dental workforce is one of the essential resources to instrument preventive approaches [16].

In the present study, patient-related barriers were rated high by dentists of central India. Nagarajappa et al. have stated that Indian dentists judged themselves as being the least responsible and patients being most accountable for limited preventive care practice [17].

In the present study among patient-related barriers poor knowledge, unwillingness to pay for preventive care and ignorance for regular dental visits were rated high by practicing dental professionals. Poor oral health was not considered an impediment by the dentists. The unwillingness of the patient to pay and lack of knowledge to use fissure sealants were the major concerns of Greek dentists. Dental services in Greece are largely private; hence, patients or their parents have to pay for dental treatment. Patients will not accept fissure sealants if not well informed about their usefulness [18]. In a study among Peshawar dentists, the low socio-economic status of patients and their unwillingness to pay was the predominant reason for the low coverage of fissure sealants [19]. Most of the dentists (55%) from Saudi Arabia responded that on priority attitude of parents for preventive dentistry need to be changed [20]. In another study by Nagarajappa et al., patient-related barriers (poor knowledge, unwillingness to pay, ignorance for regular dental visits, poor oral health) were the strongest obstacles for Indian dentists. Similar observation was reported by Rosing et al., [10] Ghasemi et al., [21] and Tseng et al., [22]. In a study Libyan dentists have rated poor knowledge of patients of the potential of caries prevention with the highest score among patient-related barrier. No significant difference was observed for the rating of barriers for age, sex and years of practice [23].

The attitude of dental practitioners concerning preventive dentistry is a key factor that can impact their decision to practice prevention-oriented care and may affect their capability to persuade patients to obtain preventive measures [21]. In the present study, low monetary benefits of preventive care and low priority on prevention in the curriculum were the major dentist-related barriers. In a study, more than 50% of Indian dentists conveyed that unsatisfactory remuneration discouraged them from providing

preventive care [17]. In another study, the majority of Libyan dental graduates (interns) appreciated the merits of preventive dentistry at the community level but it was not considered attractive, reputable and beneficial for dentists. Iranian and British dentists did not find the practice of preventive dentistry to be reputable and financially beneficial [24,25].

Several studies have reported that the current undergraduate dental education curriculum does not adequately prepare dentists for preventive dental care [22,26,27]. The lack of importance on evidence-based prevention strategies can adversely influence student perception and views to the significance of incorporation into everyday dental practice [28]. The process of merely repairing the carious disease process and not adequately teaching prevention directly to our students and indirectly to our patients is falling short of educational obligations [14]. Iranian dentists have considered it as one of the major barriers [21]. The consistent findings were reported by Leggett et al. in qualitative research [25].

In a study by Nagarajappa et al., the absence of dental auxiliaries to deliver preventive care was not considered a major barrier by most Indian dentists. Traditional Indian dentistry does not rely on dental auxiliaries since they are very few [17]. These findings are consistent with the present study. However, in a study among Libyan dentists, the lack of dental auxiliaries to provide dental care was the highest-rated dentist related barrier [23].

In the present study, the curative nature of traditional dental practice was the much stressed practice-related barrier. Today, dental care has focused on restoration and surgical management of oral diseases even though most oral diseases are largely preventable [11,25,29].

In a study by Yokoyama et al. positive patient perception for preventive dentistry was reflected as higher use of caries-preventive measures in Japan. Economic reasons may be a probable answer for this observation as dental insurance systems in Japan mainly cover treatment procedures [30]. Non-coverage of preventive care by dental insurance was reported as a major practice related barrier by Iranian dentists. Dental attendance and dental insurance are positively related. Studies in the USA and Australia have shown that insured patients have received more preventive dental care than non-insured [21]. In the present study, dental professionals have not considered it a barrier. In India, dental insurance is in its infancy, which could be a probable reason for the observation.

In a nationwide study among fifth-year dental students (interns) of India, Balappanavar et al. had reported that lack of resources and referral centres and; lack of training were the major barriers faced by interns in practicing tobacco cessation [31]. Similar observations for the practice of tobacco cessation were reported by other studies [17].

In the present study, significantly a greater number of postgraduate than undergraduate dental professionals considered the low priority of preventive dentistry in the dental curriculum as a barrier. Also, a significant difference was observed between dentists with different years of dental practice for patient's unwilling to pay for preventive, no respect in preventive care practice, and scarcity of printed materials for dental health education. In a study, Mongolian dentists with more years of work experience were having greater barriers to oral health education [32]. Indian dentists from Udaipur city with higher professional qualification and experience were having significantly more practice-related barriers [17]. However there was no such difference among Iranian dentists [21].

CONCLUSION

The findings of the study revealed that dentists in central India consider patient's attitude, respect in preventive care, monetary benefits, existing curriculum and curative nature of dental practice as potential barriers to providing preventive care. An appropriate plan of action is needed to address multipronged barriers and promote preventive dentistry in India. Further qualitative studies among different stack holders would provide a more in-depth understanding of barriers.

LIMITATIONS

A self-administered questionnaire was used as a data collection tool in the present study. The self-administered questionnaires have the advantage of being free from interviewer's bias but there is a chance of bias from the respondents concerning the degree of truthfulness of their responses. This problem was addressed in the present study by keeping the anonymous nature of the questionnaire, explaining the purpose of the study and making it very clear to the participants that there are no accurate or incorrect answers and was asked to respond to the best of their knowledge. To address the reliability issues questionnaire was re-administered to 10% of study subjects.

REFERENCES

1. Wagle M, Trovik TA, Basnet P, Acharya G. Do dentists have better oral health compared to general population: A study on oral health status and oral health behavior in Kathmandu, Nepal. BMC Oral Health 2014 [cited 2021; 14:23.
2. Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: A global public health challenge. Lancet 2019; 394(10194):249-60.
3. Saxena S, Shashikiran ND. Oral self-care behaviors among future dental professionals in Central India. Int J Curr Res Aca Rev 2016;4(3):189-96.
4. World Health Organization: Oral health. [cited 2021 Jul 1].
5. Petersen PE. Global policy for improvement of oral health in the 21st century-implications to oral health research of World Health Assembly 2007, World Health Organization. Community Dent Oral Epidemiol 2009;37(1):1–8.
6. Bali RK, Mathur VB, Talwar PP, Chanana HB. National oral health survey and fluoride mapping, 2002-2003, India. New Delhi: Dental Council of India; 2004.
7. Reddy KV, Moon NJ, Reddy KE, Chandrakala S. Time to implement national oral health policy in India. Indian J Public Health 2014;58(4):267-269.
8. Jaiswal AK, Srinivas P, Suresh S. Dental manpower in India: Changing trends since 1920. Int Dent J 2014;64(4):213-218.
9. Dental Council of India. [cited 2021 Jul 1].
10. Rosing K, Leggett H, Csikar J, Vinall-Collier K, Christensen LB, Whelton H, et al. Barriers and facilitators for prevention in Danish dental care. Acta Odontol Scand 2019;77(6):439-451.
11. Bracksley-O'Grady S, Anderson K, Masood M. Oral health academic's conceptualisation of health promotion and perceived barriers and opportunities in dental practice: a qualitative study. BMC Oral Health 2021 [cited 2021 Jul 1];21:165.
12. Treerutkuarkul A, Gruber K. Prevention is better than treatment. Bull World Health Organ 2015;93(9):594–-595.
13. Saxena S, Shashikiran ND. Practice of preventive dentistry by dental professionals in Central India. Int J Adv Res 2016;4(3):1167-1170.

14. Garcia RI, Sohn W. The paradigm shift to prevention and its relationship to dental education. J Dent Educ 2012;76(1):36-45.

15. Petersen PE, Estupinan-Day S, Ndiaye C. WHO's action for continuous improvement in oral health. Bull World Heal Organ. Int J Public Heal 2005 [cited 2021;83(9):642.

16. Arheiam A, Bankia I, Ingafou M. Perceived competency towards preventive dentistry among dental graduates: The need for curriculum change. Libyan J Med 2015;10:26666.

17. Nagarajappa R, Sanadhya S, Batra M, Daryani H, Ramesh G, Aapaliya P. Perceived barriers to the provision of preventive care among dentists of Udaipur, India. J Clin Exp Dent 2015;7(1):e74-9.

18. Michalaki M, Sifakaki M, Oulis CJ, Lygidakis NA. Attitudes, knowledge and utilization of fissure sealants among Greek dentists: a national survey. Eur Arch Paediatr Dent 2010;11(6):287-93.

19. Arbab KN, Khan SS, Hameed A, Khan AA. Dentist's perception and practices regarding primary prevention of dental caries. Proceeding SZPGMI 2015;29(1):5-9.

20. Togoo RA, Al-Rafee MA, Kandyala R, Luqam M, Al-Bulowey MA. Dentists' opinion and knowledge about preventive dental care in Saudi Arabia: A nationwide cross-sectional study. J Contemp Dent Pract 2012;13(3):261-265.

21. Ghasemi H, Murtomaa H, Torabzadeh H, Vehkalahti MM. Perceived barriers to the provision of preventive care among Iranian dentists. Oral Health Prev Dent 2009;7(4):339-346.

22. Tseng W, Pleasants E, Ivey SL, Sokal-Gutierrez K, Kumar J, Hoeft KS, et al. Barriers and facilitators to promoting oral health literacy and patient communication among dental providers in California. Int J Environ Res Public Health. 2021;18(1):216.

23. Arheiam A, Masoud I, Bernabe E. Perceived barriers to preventive dental care among Libyan dentists. Libyan J Med 2014;9:24340.

24. Ghasemi H, Murtomaa H, Torabzadeh H, Vehkalahti MM. Knowledge of and attitudes towards preventive dental care among Iranian dentists. Eur J Dent 2007;1(4):222-229.

25. Leggett H, Csikar J, Vinall-Collier K, Douglas GVA. Whose responsibility is it anyway? Exploring barriers to prevention of oral diseases across Europe. JDR Clin Transl Res 2021;6(1):96-108.

26. Macy Study Team, Formicola AJ, Bailit HL, Beazoglou TJ, Tedesco LA. Introduction to the Macy study report. J Dent Educ 2008;72(2 Suppl):5-9.

27. Melbye ML, Armfield JM. The dentist's role in promoting community water fluoridation: A call to action for dentists and educators. J Am Dent Assoc 2013;144(1):65-75.

28. Metz MJ, Miller CJ, Lin WS, Abdel-Azim T, Zandinejad A, Crim GA. Dental student perception and assessment of their clinical knowledge in educating patients about preventive dentistry. Eur J Dent Educ 2015;19(2):81-86.

29. Murthy GA, Mohandas U. The knowledge, attitude and practice in prevention of dental caries amongst pediatricians in Bangalore: A cross-sectional study. J Indian Soc Pedod Prev Dent 2010;28(2):100-103.

30. Yokoyama Y, Kakudate N, Sumida F, Matsumoto Y, Gilbert GH, Gordan VV. Dentists' practice patterns regarding caries prevention: results from a dental practice-based research network. BMJ Open. 2013;3:e003227.

31. Balappanavar AY, Sardana V, Gupta P. Nationwide survey of fifth-year dental students' perceptions about tobacco prevention, control, and curriculum in India. J Dent Educ 2013;77(10):1384-1393.

32. Tseveenjav B, Vehkalahti MM, Murtomaa H. Barriers to the provision of oral health education among Mongolian dentists. Oral Health Prev Dent 2005;3(3):183-188.