

Knowledge, value, opinion and practice about usage of pit and fissure sealant among dental professionals in Chennai, Tamil Nadu, India

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Abstract

Aim: A study was aimed to assess the knowledge, value, opinion, and practice regarding the use of dental sealants among private dental practitioners in Chennai, Tamil Nadu, India. **Materials and Methods:** A self-administrated questionnaire were distributed to 192 private dental practitioners in Chennai, Tamil Nadu, India by using simple random sampling. A convenience sampling technique was employed. The questionnaire consisted of 28 items, which included information about knowledge, value, opinion, and practice regarding dental sealants. The questionnaire was obtained from the study by San Martin *et al.* 2013 and Kailash Asawa *et al.* 2014. Frequency distribution was tabulated. For frequency distribution strongly, strongly agree, and agree were combined as “agree” and strongly disagree and disagree were combined as “disagree.” There were no changes in “neutral.” **Results:** Among the 196 study subjects 56.2% were males and 43.8% were females with their clinical experience of 52.1% for <5 years, 35.4% for 5–10 years, and 13.5% for >15 years. The mean scores for knowledge, value, opinion, and practice were 41.8 ± 3.7 , 18.7 ± 2.8 , 18.1 ± 1.4 , and 12.9 ± 2.3 , respectively. **Conclusion:** The results suggest that dental practitioners had satisfactory knowledge about pit and fissure sealant and had neutral attitudes about sealants being effective. Dental practitioners adequately used the pit and fissure sealants but they did not follow the standardized procedures and specific guidelines.

Key words: Dental caries, dental sealants, knowledge, pit and fissure sealants, practice, preventive dentistry

INTRODUCTION

Successful attempts were made to combat the high incidence of dental caries in developed countries but the increased incidence of dental caries is still a great burden in the developing countries.^[1] Though dental caries is not a life-threatening disease,^[2] it still has great biological, physical, social, and economic implications.^[3] Effective methods to control caries, hence, receive great attention.

A survey conducted among 12-year-old children in seven states of India (Uttar Pradesh, Rajasthan, Orissa, Puducherry, Maharashtra, Arunachal Pradesh, and Delhi) showed that caries prevalence was high in Puducherry and low in Orissa.^[4] Similarly, a survey conducted in Ludhiana among 12-year-olds and 15-year-olds, caries prevalence was found to be 81.4% and 86.2%, respectively.^[5]

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Truman *et al.*^[6] and Ahovuo-Saloranta *et al.*^[7] proved that sealants were effective in preventing pit and fissure caries. The use of pit and fissure sealants in high caries risk population is recommended by some systematic reviews.^[8] Even after 30 years of inception of pit and fissure sealants in the dental market, they are not used to the extent scientific data would recommend.^[9] Studies from the USA,^[10] Greece,^[11] Sweden,^[12] and Scotland^[13] all indicate that sealants are underutilized.

The composition of pit and fissure sealants is bisphenol A-glycidyl methacrylate (BISGMA), urethane dimethacrylate, and triethylene glycol dimethacrylate. However, there is no sufficient data about the knowledge and usage of pit and fissure sealant among private dental practitioners. Hence, the present study was aimed to assess the knowledge, value, opinion, and practice regarding dental sealants among the private dental practitioners in Chennai, Tamil Nadu, India.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted among 192 dental graduates working in the private sector in Chennai, Tamil Nadu, India and they were interviewed by the questionnaire method. India is a nation of extraordinary diversity, the second largest in Asia and the seventh largest and the second most populous country with a population of 1.21 billion.^[14] It covers an area of 328,263 sq. km. There are 28 states and seven union territories in India. Sample size required for the study was calculated to be $N = 192$, with 80% power at 5% α - error. Questions were divided into four sections to assess the knowledge, value, opinion, and practice regarding the use of dental sealants among private dental practitioners. All participants' data were coded to ensure the confidentiality of information.

Ethical approval from the college authorities was obtained. Informed consent was obtained from the study participants.

The questionnaire was obtained from the study by San Martin *et al.* 2013^[15] and Kailash Asawa *et al.* 2014.^[16] The knowledge, value, opinion, and practice about dental sealants among the dental professionals in Chennai, Tamil Nadu, India were assessed using a pretested self-administered questionnaire. Based on the patient's feedback, the questionnaire did not require any alteration. Kappa statistics was performed to check the internal reliability of the questionnaire and it was found

to be 0.8. The study was conducted by using simple random sampling on the private dental practitioners in Chennai, Tamil Nadu, India.

The questionnaire contained Part A and Part B. Part A included demographic data such as age, gender, levels of education, and years of experience in clinical practice. Part B included the dentist's knowledge, which consisted of 11 questions; value consisted of 5 questions, opinion consisted of 6 questions, and practice consisted of 8 questions.

The ranking of the participants responses for Part B (knowledge, value, opinion, and practice) was based on the agreement with each statement, which was based on the 5-point Likert scale: Strongly agree, agree, neutral, disagree, and strongly disagree.

Study participants with dental degrees such as Bachelor of Dental Surgery (BDS), Master of Dental Surgery (MDS), Doctor of Philosophy (Ph.D.) who were willing to participate were included. Study participants who were not willing to participate and were unable to give informed consent were excluded.

Statistical analysis

Only completely filled questionnaires were considered for analysis. Questions were coded as 1–5. The responses were coded in Microsoft Excel and data were transferred to the computer for analysis by using Statistical Package for the Social Sciences (SPSS) 17 (SPSS Inc., Chicago, IL, USA). Frequency distributions were computed. For frequency distribution strongly, strongly agree, and agree were combined as "agree" and strongly disagree and disagree were combined as "disagree." There are no changes in "neutral."

RESULTS

Table 1 depicts the frequency of the responses regarding knowledge. About 184 (95.8%) of the study subjects had agreed that there was scientific evidence for the restorative use of pit and fissure sealant. About 8 (4.2%) of the study subjects had not understood about the instruction for placing dental sealant. Only 16 (8.3%) study subjects had disagreed that the important factor in sealant placement was proper acid etching. About 132 (68.8%) of the study subjects had believed that caries risk assessment was to prevent overtreatment. About 60 (31.2%) of the study subjects had disagreed that pit and fissure sealants had adverse effects.

Table 2 depicts the frequency of responses regarding value. About 120 (62.5%) of the study subjects had disagreed that the sealant technique takes time to be performed correctly. Only 24 (12.5%) of the study subjects had agreed that dental sealant materials were very expensive. Table 3 depicts the frequency of responses regarding opinion. About 120 (62.5%) of the study subjects agreed that they had difficulty in

justifying about the sealants' cost. About 12 (6.2%) of the study subjects had disagreed with the statements about there being a necessity to use and promote sealants among dental educators and dentists. Only 76 (39.6%) of the study subjects had agreed that they applied dental sealants because the oral public health community instructed them to do so.

Table 1: Frequency of responses regarding knowledge

Statements	Disagree (%)	Neutral (%)	Agree (%)
There is scientific evidence for the restorative use of dental sealants	0 (0)	8 (4.2)	184 (95.8)
I understand the instructions for placing sealants	8 (4.2)	12 (6.2)	172 (89.6)
I am familiar with the technique of placing dental sealants	20 (10.4)	12 (6.2)	160 (83.4)
I think that sealants should only be used on newly erupted teeth	96 (50)	40 (20.8)	56 (29.2)
I believe that fissure sealants should be reviewed after placement	4 (2.2)	36 (18.8)	152 (79.2)
I agree that resin sealants are more effective than glass ionomer sealant	12 (6.2)	40 (20.8)	140 (73)
I believe the technique of applying a sealant is the most important aspect to the success of the treatment	12 (6.2)	24 (12.6)	156 (81.2)
The most important factor for adhesion to occur in sealant placement is proper acid etching	16 (8.4)	40 (20.8)	136 (70.8)
I believe that you must perform a caries risk assessment to prevent overtreatment	8 (4.2)	52 (27)	132 (68.8)
Pit and fissure sealants have adverse effects	60 (31.2)	68 (35.4)	64 (33.4)
I agree that resin sealants are more effective than glass ionomer sealant	24 (12.5)	64 (33.3)	104 (54.2)

Table 2: Frequency of responses regarding value

Statements	Disagree (%)	Neutral (%)	Agree (%)
I think this technique takes time to do correctly	120 (62.4)	36 (18.8)	36 (18.8)
The materials that are used for the placement of sealants are very expensive	144 (75)	24 (12.5)	24 (12.5)
I do not use sealants very often as a preventive method because its effect is short lived	128 (66.7)	48 (25)	16 (8.3)
Fissure sealants are used less than they should be	8 (4.2)	68 (35.4)	116 (60.4)
The dental staff at my clinic/work place communicates importance of using sealants to the patients	36 (18.8)	24 (12.4)	132 (68.8)

Table 4 depicts the frequency of responses regarding practice. About 120 (62.5%) of the study subjects had disagreed with the belief in the effectiveness of sealants. Only 16 (8.3%) of the study subjects had agreed that they recommended the reapplication of dental sealant when there was complete or partial loss of sealant material in the teeth. None of them followed the guidelines for the placement of dental sealant.

DISCUSSION

Pit and fissures on permanent molars and premolars are vulnerable sites for carious lesions due to their morphology and plaque accumulation. Sealants applied to pits and fissures act as mechanical barriers between the enamel surface and the biofilm, and if retained completely, have been shown to be very effective in restricting the entry of bacteria.^[17] The studies of Handelman *et al.* in 1976 from over 35 years ago^[18] and some later studies by Mertz-Fairhurst *et al.* (1998) have shown that when caries lesions are sealed, the lesion does not progress.^[19]

Until the middle of the 1980s, sealants were generally applied in a preventive manner solely to intact, unstained fissures with no suspected enamel caries lesions. The present recommendations for sealant application relate back to several international consensus reports from the 1980s and 1990 where sealing over enamel lesions and questionable fissures was suggested. Twelve school-based pit and fissure programs have been proven to be beneficial in preventing caries, especially in schools that serve children from low income group families.^[20]

The present study was planned to assess the knowledge, value, opinion, and practice among private dental practitioners in Chennai, Tamil Nadu, India. A total of 192 study participants constituted the study population. The knowledge, value, opinion, and practice and demographic details such as age, gender, highest level of education, and years of experience were measured using a pretested self-administered questionnaire.

In the present study, males were found to be more when compared to females. The data were a contrast to the study by Kailash Asawa *et al.* (2014),^[16] whereas

Table 3: Frequency of responses regarding opinion

Statements	Disagree (%)	Neutral (%)	Agree (%)
It is difficult to explain to patients what dental sealants are	48 (25)	28 (14.6)	116 (60.4)
It is difficult to justify the cost of sealants to parents	8 (4.2)	64 (33.3)	120 (62.5)
I think my patients understand the benefits of using sealants	16 (8.3)	36 (18.8)	140 (72.9)
It is necessary to promote the use of sealants amongst dentists and dental educators	12 (6.2)	28 (14.6)	152 (79.2)
I apply sealants because the oral public health community instructs me to	84 (43.8)	32 (16.6)	76 (39.6)
I use dental sealant because it is easy to apply and patients find it comfortable	24 (12.5)	76 (39.6)	92 (47.9)

Table 4: Frequency of responses regarding practice

Statements	Disagree (%)	Neutral (%)	Agree (%)
Since working in the oral health public community, I have greater belief in the effectiveness of sealants	120 (62.5)	40 (20.8)	32 (16.7)
I sometimes avoid dental sealants for the possibility of sealing over caries	124 (64.6)	44 (22.9)	24 (12.5)
I think sealants, besides being a preventive method, can also have a restorative effect and can be used on incipient caries	108 (56.2)	48 (25)	36 (18.8)
This sealing technique, when used alongside fluoride application, may reduce the rate of decay more significantly	120 (62.5)	56 (29.2)	16 (8.3)
In the case of partial or total loss of sealant, I would recommend reapplication	176 (91.7)	0 (0)	16 (8.3)
The most important factor for adherence to occur in sealant placement is proper isolation	0 (0)	8 (4.2)	184 (95.8)
The most important factor for adherence to occur in sealant placement is proper acid etching	0 (0)	24 (12.5)	168 (87.5)
The benefits of using sealants should be considered with regard to the patient's risk of caries and clinicians should follow specific guidelines	192 (100)	0 (0)	0 (0)

the study by San Martin *et al.* (2013)^[15] revealed females to be more when compared to males. This was due to difference in sample selection, inclusion/exclusion criteria, and the nature of the data obtained.

In the present study, 58.3%, 29.2%, and 12.5% of the study subjects belonged to the age groups of 25–34 years, 35–44 years, and >45 years, respectively. A study by Kailash Asawa *et al.* (2014)^[16] revealed that 64.7%, 27.6%, and 7.7% of the study subjects belonged to the age groups of 25–34 years, 35–44 years, and >45 years, respectively.

In the present study, 52.1%, 35.4%, and 13.5% of the study subjects had <5 years, 5–10 years, and >10 years of professional experience, respectively, whereas the study by Kailash Asawa *et al.* (2014)^[16] revealed that 53.2%, 23.1%, and 23.7% had <5 years, 5–10 years, and >10 years of experience, respectively. The study conducted by San Martin *et al.* (2014)^[15] revealed that knowledge was inversely proportional to the years of experience. The above finding was in line with the findings of the present study. This was due to the fact that the usage of preventive method was more common in the present decades when compared to the past decades.

A study by Rafi Ahmed Togoo *et al.* 2012^[21] revealed 38.4% of dentist practice pit and fissure sealant, whereas in the study of Hadi Ghasemi *et al.* (2007)^[22] among Iranian dentists and the current study among Indian dentists revealed that the majority of dentists had usage of dental sealant. This was due to the fact that awareness was more in these countries; hence, accurate knowledge about preventive dental care will enable dentists to make appropriate decisions about their patients' health.

About 8 (4.2%) of the study participants disagreed with the statement that they did not understand the instruction for placing dental sealant. This result was similar to the study by Kailash Asawa *et al.* (2013)^[16] and San Martin *et al.* (2014).^[15] The reason might be due to the fact that study participants who had >10 years of experience had less awareness about the pit and fissure sealant method.

The technique for placing dental sealants was familiar among 160 (83.3%) study subjects. About 140 (72.9%) of the study subjects agreed that resin sealants were more effective than GIC. These findings were similar to the findings of the study by Kailash Asawa *et al.* (2013)^[16] and San Martin *et al.* (2014).^[15] This was because teaching about the dental preventive method in Indian and Spanish curricula was found to be more favorable. The reason may be attributed to the fact that resin-based sealants are superior in retention and prevent dental caries than glass ionomer sealants.

About 156 (81.2%) of the study subjects believed that the appropriate technique of application was essential for the success of pit and fissure sealants. This finding was similar to the study conducted by Kailash Asawa *et al.* (2013)^[16] and the findings were less compared to the study conducted by San Martin *et al.* (2014).^[15]

In the present study, 62.5% of the study participants agreed that they found it difficult to justify the cost of sealants to patients. The agreement of the study participants was comparatively more in the study by Kailash Asawa *et al.* (2014)^[16] and comparatively less in the study by San Martin *et al.* (2013).^[15] Moreover, in the present study around 12.5% of study participants responded that pit and fissure sealant material was very expensive. This might be due to the fact that the National Health System in Spain provides a care to children based on parent's income. But in Tamil Nadu (India), the state government provides dental treatments such as restoration and extraction free of cost rather than preventive dental procedures.

In the present study, 79.2% of the study participants agreed to promote the use of dental sealants, which is similar in the study by Kailash Asawa *et al.* (2014).^[16] Contrary to this only 16.7% of study participants agreed with greater belief in the effectiveness of sealants for the community, whereas in a study by Hadi Ghasemi *et al.* (2007)^[22] revealed that there were positive attitudes toward preventive dental care, especially regarding its benefits for the community. The reason behind this fact is economically beneficial and personally reputable.

In the current study, 60.4% of the study participants agreed that they had difficulty in explaining the to the patients as to what dental sealants were. The present study finding was in line with the study conducted by Kailash Asawa *et al.* (2014).^[16] This might be due to the fact that there is a lower literacy rate about the oral health awareness in the Indian population.

CONCLUSION

This study concluded that knowledge, value, opinion, and practice regarding use of dental sealants among the private dental practitioners in Chennai, Tamil Nadu, India revealed sufficient knowledge, value, and opinion about dental sealants but inadequate practice of dental sealants. In view of the high likelihood of oral diseases such as caries occurring in pit and fissures and the inadequate use of sealants by the dental profession, this study demonstrated a clear and present need for the dentists to receive further formal training at the

level of undergraduate, postgraduate, and continuing professional dental education in India.

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Conflicts of interest

There are no conflicts of interest.

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