

Knowledge of Dental Caries, Oral Hygiene Practices, and Barriers to Accessing Dental Care among the Patients Attending Endodontic Treatment for Carious Permanent Molar Teeth at Restorative Unit, National Dental Hospital, Sri Lanka

Hettiarachchi Mathukandage Mayuri^{1*} and Sivaguru Vasantha¹

¹Restorative Dentistry Unit, National Dental Hospital (Teaching), Colombo, Sri Lanka

Abstract

Background: Dental caries is the most common dental health problem caused by bacteria interacting on the tooth surface. It is a public health burden in Sri Lanka, with a prevalence of 91.5% among 35–44-year-olds.

Objective: This study aims to assess the knowledge of dental caries, oral hygiene practices, and barriers to accessing dental care among the patients attending endodontic treatment for carious permanent molar teeth at the Restorative Unit, National Dental Hospital (NDH) Sri Lanka.

Methods: A Descriptive cross-sectional study was conducted on 300 patients aged 18 to 60 who attended Restorative Dental Unit A at NDH from March 2019 to March 2020. Data were collected through interviewer-administered questionnaires. SPSS version 24 was used for data analysis.

Results: According to the data, 48.2% of patients were aged between 20 and 35 years and 34.7% had completed their tertiary education. This study found that 58 % of patients had inadequate knowledge about preventing dental caries. Only 30.43% of patients identified that fluoride was useful in protecting teeth. Most patients (68.7%) brushed their teeth twice a day. 24.7% of patients used non-fluoridated toothpaste to clean their teeth and 49.2% reported going for routine dental check-ups at least once a year. Biscuits and sugar mixed with tea and coffee were the main sweet-containing foods used by the patients. The study revealed that 76.6% of patients knew they had tooth decay.

Conclusion: A significant percentage of the population did not have good knowledge about dental caries and oral hygiene practices.

Keywords: Knowledge, oral hygiene practices, diet, accessing dental care, dental caries.

INTRODUCTION

Dental caries is a disease of the calcified tissues of the teeth caused by the action of microorganisms on fermentable carbohydrates [1]. It is one of the most common diseases worldwide and is still a major cause of tooth loss [1]. According to the Sri Lankan National Oral Health Survey 2002/2003, the prevalence of caries in 35–44-year-olds has been reported to be 91.5% [2].

Several risk factors have contributed to the increased prevalence of dental caries, including the rise in the consumption of sugary foods, low fluoride exposure, inadequate teeth brushing habits, restricted dental care access, low family income, and low levels of knowledge [3, 4]. A good understanding of preventive dentistry is the key to reducing caries prevalence [5]. Studies have revealed that parents' knowledge of dental preventative measures can positively impact the oral health status of their children [6, 7].

Oral hygiene practices and seeking oral health care depend on several factors. Lack of information is one of the reasons for non-adherence to good oral

hygiene practices [8]. Although dentists recommend regular dental visits, many people fail to comply with this due to several barriers to using dental services [9]. Further oral health care utilization was mainly related to symptomatic reasons. Significant predictors of utilization of dental services by adolescents in Sri Lanka were gender, perceived need, and whether the adolescents had received information about oral health [10].

The disease of the pulpal origin affects the quality of life through physical pain and psychological discomfort [11]. Endodontic treatment removes bacteria from the root canal system and provides a seal to prevent their re-entry [12]. Dental treatments are quite costly for the average individual and compared to normal restoration, endodontic treatment is more expensive, time-consuming, and requires multiple visits to complete the procedure [13].

This research aimed to identify the knowledge of dental caries, oral hygiene practices, and barriers to accessing dental care among the patients attending endodontic treatment for carious permanent molar teeth at the Restorative Unit, National Dental Hospital (NDH) Sri Lanka. Identifying the above factors would enable healthcare professionals to advise and assist at-risk individuals in taking preventive measures. It would also

*Corresponding author: Hettiarachchi Mathukandage Mayuri, Restorative Dentistry Unit, National Dental Hospital (Teaching), Colombo, Sri Lanka, Email: maurihettiarachchi@gmail.com
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help the government minimize the costs of endodontic treatment in the long run.

METHODS

Study Design and Sample

Clinic-based descriptive cross-sectional study was conducted (March 2019 to March 2020) among patients 18 to 60 years of age, who attended the casualty clinic at the Restorative Dental Unit, National Dental Hospital. The inclusion criteria were the patients who had carious permanent molar teeth with a history of spontaneous bouts of pain, tenderness to percussion, and rapid exposure to dramatic temperature changes which elicited prolonged episodes of pain even after the thermal stimulus had been removed.

Pulp necrosis and irreversible pulpitis of permanent molars due to other reasons (tooth wear, cracks, and fractures, Molar incisor hypoplasia (MIH), developmental conditions (Amelogenesis imperfect), and trauma) than caries were excluded. Permanent molars having a periodontal pocket of 4mm were excluded.

The sample size was calculated with a z-value of 1.96, the anticipated population proportion of the patients seeking endodontic care in the specialized restorative dental unit as 50%, and the degree of precision as 5% and achieved 384 [14]. Due to the COVID-19 pandemic, there has been a reduction in the number of patients attending dental clinics in the last few months. Therefore, the total number of the sample was 300. A consecutive sample method was used.

Data Collection

Data were collected through interviewer-administered questionnaires. Five questions assessed the knowledge of dental caries. They included, (1) what is the main cause of tooth decay? (2) How do you identify the early stages of tooth decay? (3) If you have tooth decay, what would you do? (4) As you think how can we prevent tooth decay/dental caries? (5) What is the action of fluoridated toothpaste? Answers had multiple choices. When questions had multiple correct answers, partially correct answers were given 2 marks and the fully correct answers were given 3 marks. Patients who received 0-7 marks were categorized as patients having relatively poor knowledge. Patients who had 8-10 marks were categorized as average and patients who received 11-15 marks were categorized as patients having good knowledge.

We assessed oral hygiene practices by using five questions that covered the following areas; the ingredients used to clean the teeth, the frequency of

brushing, the use of dental floss, and the methods used to clean the teeth. Frequency and percentages were included in the results.

Barriers to attending dental treatments were recorded during the history taking of the patients. Patients who did not visit the dentist for restoration of pulp-exposed molar teeth were noted and barriers to attending dental treatment were recorded in those patients. Neglect of oral problems, reluctance to visit the dentist due to the effect on daily routine, fear of dental treatment, and no dental clinic near home were recorded. The frequency and percentages of the results were included in the result section.

Dietary habits were assessed by using the dietary analysis chart which contained six (6) sugary foods. (Chocolate, biscuits, cake, sweetened drink, tea/coffee mixed with sugar, Hardy candy/ toffee). The frequency of intake of sugar-containing food (daily, several times per week, and never/seldom) was recorded in the chart.

The ethical approval for the study was granted by the Ethical Review Committee of the Faculty of Medicine, University of Colombo, Sri Lanka (Reference no.: EC-17-113).

Statistical Analysis

Data were analyzed using SPSS (Version-24). Descriptive statistics (frequencies, standard deviations, means, ranges, and proportions) were used to summarize the data.

RESULTS

Socio-Demographic Characteristics of the Participants

The mean age of the respondents was 32.84 years (SD=13.14 years) and almost half of the participants (145) were 20-35 years old (Table 1).

Knowledge of Dental Caries

More than half (54.9%) of the patients had relatively Poor Knowledge regarding preventive measures against dental caries and only 16.1% had good knowledge. 75 patients had average knowledge regarding the prevention of dental caries. The mean, mode, and standard deviation of knowledge of dental caries questions were 7.193, 6.0, and 3.473 respectively. Only 75 patients believed that eating sugar caused tooth decay and 116 patients had identified that reduced frequency of sugar consumption prevents tooth decay. Ninety-one patients (30.33%) mentioned that fluoridated toothpaste protects the teeth from decay (Table 2).

Oral Hygiene Practices

Almost all the patients in the study sample used toothbrushes to clean their teeth. Most participants

Table 1: Socio-demographic characteristics of the study participants.

Socio-demographic factor	Number of Patients	(%)
Age		
>20 years	56	(18.7)
21- 30 years	99	(33.0)
31- 40 years	65	(21.7)
41-50 years	48	(16.0)
51- 60 years	32	(10.7)
Gender		
Female	170	(56.60)
Male	130	(43.30)
Levels of Education		
Elementary/middle school (up to ordinary level)	18	(6)
Secondary education (Advanced level completed)	177	(59.19)
Tertiary Education (graduate)	104	(34.78)
Occupation		
Managers	15	(5.01)
professionals	37	(12.37)
Technicians and associate professionals	42	(14.04)
Clerical support workers	17	(5.68)
Service workers and shop sales work	57	(19.06)
Unemployed	131	(43.66)

(68.66%) brushed their teeth twice a day. 75.3% of patients used fluoridated toothpaste. Almost half of the patients (49.2%) mentioned that they attended a dental clinic more than a year ago. Flossing was recognized as an interdental cleaning aid by only 9 patients (3%) (Table 3).

Dietary Habits

A high percentage of the patients consumed biscuits regularly (64%). Eighty-six patients (79.6%) in the sample revealed they ate chocolate several times a week (Fig. 1). Tea and coffee mixed with sugar were the most common beverages patients drank regularly.

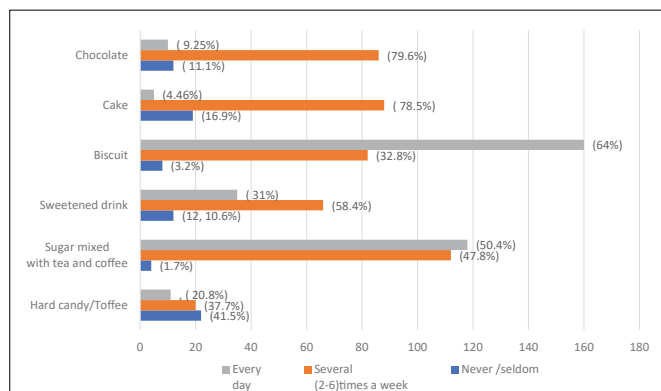


Fig. (1): The use of different sweets and the frequency of their usage by the patients.

Barriers to Accessing Dental Care

Although a majority of the participants (76.7%) were aware that they had tooth decay in their permanent molar teeth, only 119 participants (39.6%) went for dental treatment and 111 patients (37%) did not receive any treatment. Fig. (2) describes the barriers to not attending dental treatments of patients who were aware of their dental problems.

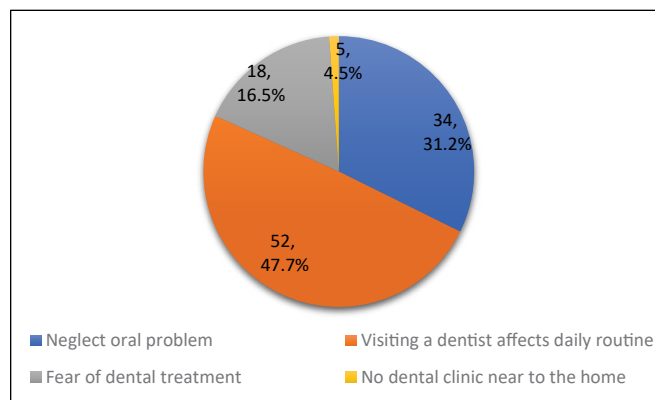


Fig. (2): Barriers to attending dental treatments.

DISCUSSION

Our study identified that 54.9% of patients did not have adequate knowledge regarding the prevention of dental caries and only 25% of patients believed that increased sugar consumption caused tooth decay. A Chinese study

Table 2: Patients' knowledge regarding the prevention of dental caries.

Knowledge	Number of Patients	(%)
What is the main cause of tooth decay?		
Increased frequency of sugar /sweet consumption	75	(25)
Reduced calcium in the body	16	(5.33)
Lack of vitamin	11	(3.66)
Do not know	190	(63.33)
Ageing	8	(2.66)
How do you identify the early stages of tooth decay?		
Change in the colour of the tooth (white spots/brown spots)	90	(31)
Sensitivity of the tooth while eating hot and cold food items	22	(7.33)
Cavity of tooth and Food packing	90	(30)
Pain of tooth	85	(28.33)
Do not know	13	(4.30)
If you have tooth decay, what would you do?		
See the dentist as soon as possible	252	(84)
Visit a dentist on developing pain	21	(7)
Take pills for pain relief	20	(6.66)
Do not bother if no pain is felt	7	(2.33)
As you think how can we prevent tooth decay/dental caries?		
Reduced frequency of sugar consumption	116	(38.66)
Brushing the teeth regularly	173	(57.66)
Tooth decay is not preventable as it is inherited	8	(2.60)
Do not know	3	(1)
What is the action of fluoridated toothpaste?		
Protect the teeth from decay	91	(30.33)
Do not know	208	(69.33)
Make the teeth white	1	(0.33)

Table 3: Oral hygiene practices of the patients who attended endodontic treatment.

Oral Hygiene Practices	Number of Patients	(%)
Ingredient used to clean teeth		
Fluoridated toothpaste	226	(75.33)
Non-fluoridated toothpaste	74	(24.77)
Frequency of cleaning teeth		
Once a day	59	(19.66)
Twice a day	206	(68.66)
>2 times a day	35	(11.66)
Use of dental floss		
Yes	9	(3)
No	291	(97)
Last dental visit		
Less than one month	27	(9.2)
1-6 months	67	(22.9)
6-12 months	51	(16.9)
>12 months	148	(49.2)

*Seven patients couldn't recall their last dental visit.

reported different results participants had a good level of knowledge regarding preventive measures against dental caries and most respondents believed sugar (89.2%) caused tooth decay [15]. These variations in findings could be due to the low levels of education of patients in this study.

The present study reported that 57.66% of patients identified that regular tooth brushing prevented tooth decay and 30.33% mentioned that fluoridated toothpaste could protect teeth from decay. A Malaysian study reported a similar finding where 74.1% of participants identified tooth brushing to prevent tooth decay and 38% cited that fluoridated toothpaste strengthens the tooth structure [16]. A lack of adequate knowledge about the benefits of fluoridated toothpaste was identified and the need for health education to improve their understanding was emphasized.

In our study, 3% of patients had used dental floss. Supporting our finding Maru and Narendran found that very few Indian adults used dental floss (0.5%) [17]. A similar finding described in a study done at the outpatient department of Saveetha Dental College, India found that 2.5% of patients used floss [18]. A Malaysian study also found that adults in rural villages hardly used floss (3.4%) [16]. On the contrary, a European study reported that 34.1% of the participants used dental floss daily [19]. The practice of floss is strongly influenced by an individual's lifestyle such as socioeconomic status, level of education, and other habits [20]. Approximately half of the participants (43.6%) were unemployed and (34.7%) were graduated. These findings suggested that in addition to educating patients about flossing, efforts should also be made to address the underlying lifestyle factors that impact their oral health practices [21]. Low socioeconomic status and lack of knowledge of the use and benefits of dental floss may cause fewer patients to practice dental floss. Introducing and demonstrating dental floss in routine dental checkups and oral health care programs is important.

A positive finding of the current study was that 75.3% of patients used fluoridated toothpaste and toothbrushes to clean their teeth and brushed their teeth twice or more than twice a day (80.4%). An Indian study reported that more than 80% of adult Indians brushed their teeth at least once daily [17]. A study done at Saveetha Dental College, India found that most participants (65%) brushed once daily, and 27.5% brushed twice daily [18]. The highest use of fluoridated toothpaste and brushing regularly may be attributed to regular dental visits where patients receive guidance from their dentists on good oral hygiene practices.

In the present study, 24.7% of patients used non-fluoridated toothpaste. A Saudi Arabian study reported similar results and described 27.6% of participants using non-fluoridated toothpaste [22]. However, a European study found a lower percentage (3.8%) of the use of nonfluorinated toothpaste [19]. A study in Ethiopia and China found that half of the respondents did not know whether they used fluoridated toothpaste [23, 24]. These findings could be due to variations in socioeconomic status and inadequate knowledge of oral health practices.

In the present study, 38.66% of patients mentioned that reducing sugar consumption could prevent tooth decay. However, the dietary analysis found that 64% of patients consumed sugar-containing foods and biscuits, and 50.4% consumed beverages; tea/coffee mixed with sugar daily. Maru and Narendran found that sweetened tea was the most popular beverage among Indian adults (75.1%) [17]. Tadin *et al.* reported that coffee was consumed daily by more than half of the participants (63.5%) in the adult general population in Croatia [19]. These variations in findings could be due to the cultural background of the population of the study conducted.

Periodic dental examinations are important in preventing oral diseases, educating patients, and encouraging the maintenance of good oral hygiene [25]. Almost half of the patients (49.2%) mentioned they attended a dental clinic more than one year ago. Although 84% of patients noted that it was important to visit the dentist soon when they suspect tooth decay, many participants had difficulties visiting immediately. In this study, 47.7% of patients revealed that their busy work schedule prevents them from seeking dental treatment. A similar finding was obtained by a systematic review done in India that found the most common barriers encountered by the adult population in India (as reported by 14 studies) include "lack of time" and "transportation difficulty" [26]. These findings emphasize the need for patient education on the importance of regular dental check-ups to identify oral health issues.

CONCLUSION

A clinic-based descriptive cross-sectional study was conducted among the patients attending the dental clinic to identify the knowledge of dental caries, oral hygiene practices, and barriers to attending the dental clinic. Our study results indicated that a significant percentage of the population did not have good knowledge about dental caries and oral hygiene practices. Very few patients had used dental floss and one-fourth had used nonfluorinated toothpaste. Therefore, dental health education programs should be implemented across all areas of Sri Lanka's healthcare system. Almost half of

the patients attended dental clinics more than one year ago and their busy work schedule prevents them from seeking dental treatment. It is important to encourage them to have routine dental checkups.

ETHICAL APPROVAL

Ethical approval was obtained from the Institutional Review Committee of the Faculty of Medicine, University of Colombo, Sri Lanka (Reference letter No. EC-17-113). All procedures performed in studies involving human participants followed the ethical standards of the institutional and/ or national research committee and the Helsinki Declaration.

CONSENT FOR PUBLICATION

This article did not contain any person's data, such as individual details, audio-video material, *etc.*

AVAILABILITY OF DATA

The authors confirm that data supporting the results of this study are available in the article.

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Declared none.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORS' CONTRIBUTION

Study concept, designing, result analysis and interpretation, manuscript drafting, critical review and revision of initial draft - Done by Dr. H.M. Mayuri and Dr. S. Vasantha.

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