



T.C.

YEDITEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

DEPARTMENT OF PEDIATRIC DENTISTRY

**ASSESSMENT OF PARENTS' ATTITUDES AND
PRACTICES OF ORAL HYGIENE IN A GROUP OF
PRESCHOOL CHILDREN ATTENDING TO
PEDIATRIC OUTPATIENT DEPARTMENTS IN
ISTANBUL, TÜRKİYE**

DOCTOR OF PHILOSOPHY THESIS

MELİS ÜNSAL ÇALIŞKANER, DDS

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APPROVAL

This thesis has been deemed by the jury in accordance with the relevant articles of Yeditepe University Graduate Education and Examinations Regulation and has been approved by Administrative Board of Institute with decision dated and numbered

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DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgment has been made in the text.

29.09.2023

Melis ÜNSAL ÇALIŞKANER

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ABBREVIATION AND SYMBOLS

pH	:Potential of hydrogen
ECC	:Early childhood caries
S – ECC	:Severe early childhood caries
MS	: <i>Streptococcus mutans</i>
F	:Fluoride
ppm	:parts per million
APF	:Acidulated phosphate fluoride
NaF	:Sodium fluoride
DFS	:Difluorosilane
SMFP	:Sodium monofluorophosphate
CaF ₂	:Calcium fluoride
FA	:Fluorapatite
HF	:Hydrogen fluoride
SnF	:Stannous fluoride
dfs	:Decayed/filled surfaces of primary teeth
dft	:Decayed/filled primary teeth
CPP – ACP	:Casein phosphopeptides-amorphous calcium phosphate
nHA	:Nanohydroxyapatite
mg	:milligram
g	:gram
kg	:kilogram
SLS	:Sodium lauryl sulphate
TSPD	:Turkish Society of Paediatric Dentistry
EAPD	:European Academy of Pediatric Dentistry
AAPD	:American Academy of Pediatric Dentistry
IAPD	:International Association of Paediatric Dentistry
SD	:Standard Deviation
N	:Number

ABSTRACT

Ünsal Çalışkaner M. 2023. Assessment of parents' attitudes and practices of oral hygiene in a group of preschool children attending to pediatric outpatient departments in Istanbul, Türkiye. Yeditepe University Institute of Health Sciences, PhD Thesis, Istanbul.

This cross-sectional study aimed to assess parents' attitudes and practices of oral hygiene in a group of preschool children attending two different paediatric outpatient departments in Istanbul, Türkiye. Parents of children under six attending the Paediatric Outpatient Departments of, Istanbul, were included. A self-administered questionnaire was designed in two parts: parents' demographic information and attitudes and practices of oral hygiene for their children. Statistical analyses were done using the chi-square test, and multiple comparisons were examined using the Z test with Bonferroni correction. The results were evaluated at a significance level of $p < 0.05$. Two hundred three parents with a mean age of 36.15 ± 5.57 participated in the study. Most parents reported their children brushed their teeth once daily and started toothbrushing within a few months to a year after the eruption. The majority of parents supervised their children during toothbrushing by giving verbal instructions. Paediatricians and dentists were reported as the primary sources of information regarding oral hygiene. Most children were using toothpaste and started toothbrushing between the ages of 1 to 3 years. The reasons for using toothpaste were reported primarily as preventing dental caries. Most parents selected their children's toothpaste by considering the contents of the toothpaste organic or herbal ingredients were the main consideration. It was concluded that it would be beneficial for parents to have more information about their children's correct oral hygiene behaviours and the importance of using fluoridated toothpaste at an early age and receiving education at the earliest possible period to improve and develop children's oral and dental health.

Keywords: oral hygiene, preschool children, parental attitudes, parental practices

ÖZET

Ünsal Çalışkaner M. 2023. İstanbul'da Çocuk Sağlığı ve Hastalıkları Polikliniklerine Başvuran Bir Grup Okul Öncesi Çocuğun Ebeveynlerinin Ağız Hijyeni Konusundaki Tutum ve Uygulamalarının Değerlendirilmesi. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Doktora Tezi, İstanbul.

Bu kesitsel çalışmanın amacı, İstanbul'da iki farklı çocuk sağlığı ve hastalıkları polikliniğine başvuran okul öncesi çocukların ebeveynlerinin ağız hijyeni tutum ve uygulamalarının belirlenmesidir. Ebeveynlerin yanıtlaması için hazırlanan bu anket ebeveynlerin demografik bilgileri ve çocukların ağız sağlığına yönelik tutum ve uygulamaları olarak iki bölüm olarak tasarlandı. İstatistiksel analiz ki kare testi ve çoklu karşılaştırmalar Bonferroni düzeltmeli z testi kullanılarak tamamlandı. Sonuçlar, anlamlılık $p<0,05$ düzeyinde değerlendirildi. Çalışmaya yaş ortalaması $36,15\pm5,57$ olan 203 ebeveyn katıldı. Anketler ile toplanan bilgiler analiz edildiğinde, çocukların çoğunluğunun günde 1 kere dişlerin fırçalandığı ve diş fırçalamaya ilk süt dişi sürdükten birkaç ay ile 1 yıl arasında başladığı, ebeveynlerin çoğunun çocuklarına diş fırçalama sırasında yardım ettiği ve genellikle sözlü komutlarla çocuklarını yönlendirdiği, belirlendi. Ebeveynler çoğunlukla ağız hijyeni konusunda çocuk doktorlarını ve diş hekimlerini bilgi kaynağı olarak gösterdiler. Çocukların çoğunluğunun diş macunu kullanmaya 1 ile 3 yaşları arasında başladıkları belirlendi. Katılımcıların diş macununu öncelikli olarak diş çürüklerini önlemek için kullandıkları görüldü. Katılımcıların neredeyse tamamında çocukların çocuk diş macunu kullandığı, ebeveynlerin çocuklarına diş macunu seçerken en çok içeriğini göz önüne alarak, organik/bitkisel diş macun markalarını tercih ettikleri belirlendi. Genç ebeveynler daha çok sosyal medyadan etkilenmekte ve çocuklarına daha aktif olarak yardım etmekte iken, iki çocuk sahibi olanlar ve daha yüksek eğitim düzeyindeki ebeveynlerin daha iyi ağız hijyen tutumlarına sahip oldukları saptandı. Ebeveynlerin çocuklarının doğru ağız hijyen davranışları ve erken yaşta floridli diş macunu kullanımının önemi konusunda daha fazla bilgiye sahip olmaları ve mümkün olan en erken dönemde eğitim almalarının çocukların ağız ve diş sağlığının iyileştirilmesinde ve geliştirilmesinde yararlı olacağı sonucuna varıldı.

Anahtar kelimeler: ağız hijyeni, okul öncesi çocuklar, ebeveynlerin tutumları, ebeveynlerin davranışları

1. INTRODUCTION AND PURPOSE

Oral health is an integral component of general health and can affect the functional, psychological and social dimensions of well-being (1). According to the World Health Organization, it indicates "being free of chronic oro-facial pain, oral and pharyngeal (throat) cancer, oral tissue lesions, congenital disabilities such as cleft lip and palate, and other disease and disorders that affect the oral, dental, and craniofacial tissues, collectively known as the craniofacial complex" (2).

Among different oral health problems, dental caries is a significant public health problem in both developing and industrialised countries. It is the most common chronic infectious disease in childhood, with the prevalence of an estimated 621 million children with untreated caries in primary dentition (3,4). The prevalence of dental caries shows elevation in preschool children against the other age groups (5). A nationwide oral health survey reported that dental caries prevalence was 69.8% for five-year-old children, a costly public health problem in Türkiye(6).

Dental caries affecting the primary dentition of preschool children are referred to as early childhood caries (ECC) (7). ECC is defined as "the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of six" (8). Consequences of chronic pain from dental caries have significant impacts on children's general health and quality of life by causing insufficient nutrition intake, disturbing sleeping pattern, weight loss, and behavioural problems (9,10). Despite ECC showing rapid progression due to the morphology and structure of primary teeth, the impact of dental caries can be reduced by primary prevention and early identification (11).

According to the International Association of Paediatric Dentistry Bangkok declaration, primary prevention of ECC should involve both interventions at the community level and prevention at an individual level (8). Promoting twice-daily brushing with fluoridated toothpaste is the primary oral hygiene strategy for reducing the risk of ECC for all children (12). Parents have an essential role in maintaining oral hygiene and developing toothbrushing habits during the first six years of children. Since parents provide their children's oral hygiene in preschool, low parental knowledge and

poor attitudes towards oral health are associated with higher caries experience in infants and children (13).

Parental oral health behaviour may be influenced by socioeconomic status, cultural background, and educational level (14). Developing an effective oral health promotion strategy must be based on an in-depth understanding of the knowledge and attitudes of the population. For the success of any intervention for parents at the community level, the first step is to understand their culture, attitudes, and oral hygiene (15), followed by identifying deficiencies in parents' knowledge and awareness (16).

Since it is known that parents and children visit hospitals and family health centres earlier than dental clinics (17), this study will be carried out in paediatric outpatient clinics to collect data from different target groups. To our knowledge, there are no existing reports on the attitudes and practices of parents regarding their children's oral hygiene attending paediatric outpatient departments in Türkiye. By understanding the approaches, identifying the deficiencies, and investigating the sources of information about the oral hygiene practices of parents, these data will help to improve oral health promotion strategies at the community level.

Therefore, the aim of this study was to assess parents' attitudes and practices of oral hygiene in a group of preschool children attending two different paediatric outpatient departments in Istanbul, Türkiye.

The null hypothesis (H_0) was that parents' attitudes and practices of oral hygiene in preschool children are not affected by the age of the parents, parents' educational background, relationship with the children (mother, father, or other relatives), parents' number of the children, and the age of the children.

The alternative hypothesis (H_1) was parents' attitudes and practices of oral hygiene in preschool children are affected by the age of the parents, parents' educational background, relationship with the children (mother, father, or other relatives), parents' number of the children, and the age of the children.

2. GENERAL INFORMATION

2.1. Early Childhood Caries (ECC)

Dental caries is a multifactorial transmissible infectious disease controlled by cariogenic microorganisms and behavioural, genetic, and sociological factors. It occurs due to prolonged acid formation from bacteria in dental biofilm through anaerobic metabolism of dietary sugars, reducing biofilm pH and mineral loss of the tooth surface. Dental caries is one of the significant public health problems in the world and one of the most common chronic diseases of early childhood (18,19).

2.1.1. Definition of ECC

Dental caries affecting the primary dentition of preschool children are referred to as early childhood caries (ECC). ECC is defined as "the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of six." The definition of severe early childhood caries (S-ECC) is any sign of smooth-surface caries in a child younger than three years of age, from ages three through five, one or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth, or a decayed, missing, or filled score of greater than or equal to four (age three), greater than or equal to five (age four), or greater than or equal to six (age five) (8,20).

ECC is a multifactorial disease of the hard tissue of the teeth. The manifestation of ECC can range from demineralisation to loss of tooth structure or complete destruction of the crown. The first clinical signs of ECC usually appear in the first two years of life and show rapid development and progression from the enamel into dentine in 6 months or less. It is seen initially on the maxillary incisors as white lesions on the labial surfaces and progresses brownish-black cavitation along the gingival margin. When it remains untreated, it begins to affect the mandibular primary molars as well. In severe cases, the crowns of the maxillary incisors may be destroyed completely (11,21,22).

The consequences of untreated ECC significantly affect preschool children and their families short- and long-term lives. It may cause chronic pain and discomfort and lead to problems in everyday activities, including eating, sleeping, learning, and speech development. Further progression without treatment leads to premature loss of a primary tooth, followed by malocclusion in permanent dentition. It also negatively impacts the

quality of life, socialising, self-esteem, and growth and weight gain of children. Children with a history of ECC are at increased risk for new dental caries in both primary and permanent dentition. In addition, ECC requires extensive restorative treatment, which is often performed under general anaesthesia. Sleepless nights, lost workdays of caregivers, and the substantial cost of dental care may cause distress for the parent and a financial burden on the family (21,23–26).

2.1.2. Epidemiology of ECC

ECC is a serious public health problem in both developed and developing countries. It has been considered not only as an oral disease but also as a social, cultural, demographic, behavioural and economic problem. The prevalence of ECC varies according to several factors, such as culture, ethnicity, socioeconomic status, dietary and oral hygiene practices, parental knowledge, values, and attitudes. The incidence of ECC among young children with primary teeth is 1.76 billion. ECC prevalence increases with age and generally remain untreated under three-year-old (11,26).

The prevalence of ECC varies between countries and continents. The prevalence of dental caries declined over the two decades in developed countries; it is estimated to range from 1 to 12% in young children from these countries. The prevalence of ECC is higher, up to 70%, in developing countries and within disadvantaged populations of developed countries, such as immigrants and ethnic minorities. In many low-income countries, the prevalence of ECC is relatively high, such as 36-85% in Asia, 38-45% in Africa and 22-61% in the Middle East (11,18,27,28).

A nationwide oral health survey in Türkiye reported that dental caries prevalence was 69.8% for five-year-old children in 2004. The mean number of decayed, missing, and filled primary teeth in 5-year-old was 3.7 and seen more frequently among boys than girls. Only 30.2% of these children were caries-free (6).

2.1.3. Aetiology of ECC

ECC is a multifactorial disease. The aetiology of ECC includes the interaction between the susceptible tooth surface/host, fermentable carbohydrates, and cariogenic microorganisms, which are influenced by various behavioural, sociological, and environmental factors (26,29).

Streptococcus mutans (MS) and *Streptococcus sobrinus* are the most common microorganisms in dental plaque associated with ECC. Lactobacilli also play a role in caries progression, but not its initiation. The colonisation of the oral cavity in children by microorganisms resulted via both vertical and horizontal transmission. The primary source of MS is transmitted from the mother or caregiver via vertical transmission through salivary contact. Horizontal transmission of MS occurs between siblings or peers at a playgroup or childcare centre. The window for infectivity of MS in children is between 19 and 31 months of age, and the age of colonisation is important in determining children's caries risk status. Preschool children with higher MS levels are more prone to new dental caries (24,29,30).

There are many dietary factors especially feeding practices, associated with ECC. Improper feeding practices such as frequent sugar consumption, sugar introduction at an early age, bottle feeding with sugar-containing liquids and prolonged nighttime breastfeeding may increase the risk of developing ECC by prolonging the exposure of tooth structures to carbohydrates. Introducing sugar in the first year of age and consuming highly sweetened foods and drinks is related to the incidence of childhood caries in the following years. Breastfeeding beyond 12 months is associated with dental caries in maxillary anterior teeth, and bottle feeding is associated with dental caries in molars. Nighttime bottle feeding and sleeping with a bottle also have a central role in the severity of ECC (11,29,31).

Poor oral hygiene practices promote the risk of developing dental caries. There is an association between the delayed introduction of toothbrushing and ECC. Parents should begin children's oral hygiene care upon the eruption of the first primary tooth. Inadequate brushing, the presence of visible dental plaque and toothbrushing less than once daily are the essential oral hygiene factors related to ECC. The other factors that increase the risk of developing ECC are irregular toothbrushing, using non-fluoridated toothpaste, and lack of parental supervision during toothbrushing (31,32).

ECC has also been associated with environmental and sociological factors such as family income, socioeconomic status, parental attitudes and health beliefs, parenting practice, parental education level, family size, child temperament, and psychosocial issues. Low family income may affect the parental education level and access to health care information, resulting in poor oral health knowledge and practices. Children with a

low socioeconomic background are more prone to develop dental caries than those with a high socioeconomic level. Since ECC is not limited to children with low socioeconomic status, the presence of enamel hypoplasia and high levels of MS were shown as the risk factors of ECC in high- or upper-middle-income families (23,26,29,31).

2.1.4. Prevention of ECC

The ECC is a preventable and controllable disease through a combination of community, professional and individual measures. Caries risk assessment is essential to effective ECC prevention and management strategies. Caries experience, dietary habits, oral hygiene practices, fluoride use, and socioeconomic status should be considered during caries risk assessment in young children. Early assessment of children's caries risk by their first year is important for planning personalised preventive measures. Preventive approaches of ECC are structured in three phases; primary, secondary, and tertiary prevention. (8,11,33)

Primary prevention for ECC starts before the initiation of the disease. ECC prevention should begin during the prenatal and perinatal periods. Educating pregnant women and mothers in minimising risk behaviours positively influences children's oral health. The best practices for preventing ECC are daily exposure to fluoride and dietary control, which include limiting free sugar intake in foods and drinks for children under two years, eliminating nighttime bottle feeding with milk or drinks containing free sugars, and breastfeeding beyond 12 months. Toothbrushing should be performed twice daily with fluoridated toothpaste containing 1000 – 1450 parts per million fluoride (ppm F), starting from the eruption of the first primary tooth. Parents should assist or supervise their children during brushing, using an age-appropriate amount of toothpaste on the brush (11,24,29).

Secondary prevention for ECC is early detection of dental caries and effective control of initial caries prior to cavitation. Following the primary prevention approaches, more frequent fluoride varnish applications are recommended for non-cavitated caries. Applying pit and fissure sealants to susceptible molars are effective non-invasive measures for preventing caries progression (11,29).

Tertiary prevention involves both non-invasive and invasive preventive management. Conservative caries removal and tooth restoration may be necessary to

preserve the tooth structure and prevent negative consequences such as pain and infection. Tertiary prevention aims to reduce the negative impact of dental caries and improve the quality of life for children with ECC (11,29).

2.1.5. Topical Fluoride Application

Fluoride (F) is a crucial element for preventing dental caries and maintaining good oral health in both children and adults. Fluoride promotes the remineralisation of early caries lesion and inhibits sound enamel demineralisation (34). The mechanism of action of fluoride is to interfere with the re-demineralisation balance of hard tissue after the eruption of the teeth. The effectiveness of fluoride is enhanced when a low level of fluoride is constantly present in the oral cavity (35).

The methods of fluoride application can be divided into systemic (water, supplements, milk, and salt) and topical (toothpaste, gels, varnishes, and mouth rinses). The most cariostatic effect of fluoride is primarily topical activity rather than systemic effect (36). The topical application of fluoride provides elevated concentrations of fluoride only to the dental surfaces, not intended for ingestion (37). The efficacy of topical fluoride depends on the concentration of fluoride used, the frequency and duration of application, and the fluoride compound used (38).

The topical fluoride applications are categorised as professionally applied or self-applied fluorides. Fluoride gels and varnishes are typical professional topical fluoride application methods delivered by healthcare professionals in dental offices or other settings such as schools. Toothpaste and mouth rinses are the primary forms of self-applied fluoride methods for individual use at home (37).

2.1.5.1. Professional Fluoride Application

Professionally applied topical fluorides are used by dental professionals, and they could be in different forms, such as gels, varnishes, solutions, or foams. These products have a much higher fluoride concentration than self-applied fluorides. Professional fluoride application is easy to apply to children and non-cooperative patients. The frequency of professional topical fluoride application should be determined based on caries risk assessment of children between 3, 4, and 6 months intervals. (39,40).

Professionally applied fluoride gels and foams contain high concentrations of fluoride (5000–12300 ppm F). Fluoride gels are available in acidulated phosphate fluoride (APF) formulations containing 1.23% F (12,300 ppm F) and as 2% neutral sodium fluoride (NaF) products containing 9,000 ppm F. These fluoride gels are easily applied in mouth trays due to viscosity. Fluoride foams are available as 1.23% APF or 2% neutral NaF formulations. Since fluoride foams have reduced density than gels during the application, foams can consider safer to prevent excessive fluoride intake (40,41). Research showed that fluoride foams are more effective in permanent dentition (39).

Fluoride varnishes have been used for the prevention and control of dental caries. The most commonly used fluoride varnishes contain NaF with 2.26% F (22,600 ppm), 0.9% containing difluorosilane (DFS) with 0.1% F (1000 ppm) and containing NaF with 5.6% F (39). These varnishes prolong the contact time between fluoride and the tooth surfaces by the formation of deposits of calcium fluoride (CaF_2). Calcium fluoride acts as a reservoir for the slow release of fluoride (42). The application of fluoride varnishes is simple, with small brushes and sets relatively quickly. Although varnishes contain high concentrations of fluoride, they are considered to be safe due to the small amount used during application. Even if it is ingested, the amount is generally too little to induce any toxic effect of fluoride intake (43). Studies showed that professionally applied fluoride varnishes are effective in both primary and permanent dentition (35,37).

2.1.5.2. Self- Applied Topical Fluoride Agents

Fluoridated toothpastes represent the most prevalent form for fluoride delivery and are globally used by exceeding 500 million individuals. Regarding the multifactorial aetiology of dental caries, toothbrushing with a fluoridated toothpaste could be considered as the best method of fluoride utilization, as it combines the mechanical removal or disruption of dental plaque with the caries-protective effect of fluoride (41). Toothpastes containing F had been introduced commercially in the 1970s and are the major source of F in the lack of fluoridated drinking water. F in toothpastes is mostly formulated as sodium fluoride (NaF), sodium monofluorophosphate (SMFP), amine fluoride, and stannous fluoride. Multiple factors may influence the benefits and therapeutic effectiveness of fluoridated toothpaste, such as the fluoride concentrations, the amount of toothpaste used, and individual variations, including the duration and frequency of brushing and rinsing behaviour. The ingestion of fluoridated toothpaste can produce

serious toxic effects, and appropriate adult supervision is essential for children using toothpaste (43).

Fluoride mouth rinses have been successfully used in dentistry for nearly six decades, whether self-application or community-based methods. While NaF solutions are the most commonly used, formulations containing different fluoride compounds are also available (41).

Mouth rinses can be used complement with fluoridated toothpaste and are recommended for individuals with a high susceptibility to dental caries. Sodium fluoride (NaF) is the primary active compound for delivering fluoride in mouth rinses. Over-the-counter mouth rinses commonly contain 0.05% NaF (equivalent to 226 ppm F). Fluoride-containing mouth rinses have a lower viscosity than toothpastes, allowing the F to reach the interproximal regions, narrow pits, and fissures. The use of fluoride mouth rinses is recommended for children over six years with active dental caries (43). The recent systematic review of topical fluoride for caries prevention presents recommendations in favour of using 0.09 per cent fluoride (900 ppm F) mouth rinse at least weekly for children aged 6 to 18 years (44).

2.1.5.3. Mechanism of Action of Topical Fluoride Application

When fluoride is available in the saliva at higher concentrations from the topical fluoride application, fluoride reacts with calcium on the tooth surface and in the dental biofilm to form calcium fluoride. Calcium fluoride (CaF_2) is an important source of fluoride in oral fluids. It is known as pH-controlled fluoride and calcium reservoir (34). The primary caries-preventive mechanisms of action of fluoride are post-eruptive by topical effects, including inhibition of demineralisation, enhancement of remineralisation, and inhibition of bacterial activity in the dental plaque (36).

Topical fluoride inhibits demineralisation by adsorbing negative fluoride ions to the enamel surface and acts as a physical barrier against acid attacks. Dissolution of hydroxyapatite occurs when the pH drops below 5.5. However, if the pH is higher than about 4.5 when fluoride is available at low concentrations during the remineralisation process, the newly forming crystal will incorporate fluoride instead of hydroxyl. By incorporating the more electro-negative fluoride ion at the hydroxyl position, a more

perfect crystal is formed with a highly acid-resistant surface called fluorapatite (FA) (34,45).

Fluoride present in the saliva by topical application enhances remineralisation. The pH rises higher than 5.5 when the buffering components of the saliva neutralise the acid in the dental plaque. The remineralisation process naturally begins since the saliva is supersaturated with calcium and phosphate. Fluoride enhances this remineralisation process by diffusing to the surface of the partially demineralised enamel and attracting calcium ions, then phosphate ions. This fluoride-rich remineralisation process forms a new surface called fluorhydroxyapatite crystals with a lower solubility surface and more resistant to future acid attacks than the original enamel (34,36,45).

Fluoride can also affect the physiology of oral bacteria, including cariogenic streptococci, which may indirectly affect demineralisation. Bacterial metabolism can be affected by fluoride through a variety of complex mechanisms, such as direct inhibition of cellular enzymes or increased proton permeability of cell membranes in the form of hydrogen fluoride (HF). Fluoride diffuses into the bacterial cell wall as a neutral HF molecule and dissociates in the cytoplasm releasing HF and fluoride ions. These intracellular fluoride ions inhibit glycolytic enzymes, which leads a decrease in acid production from glycolysis. Fluoride ions in the cytoplasm also lower cytoplasmatic pH, affecting both the acid production and acid- tolerance of MS (34,45).

2.1.6. Fluoride Toxicity

Fluoride is consumed mainly through the oral cavity and absorbed through the gastrointestinal tract. The mineralised tissues uptake more fluoride in growing children, and it progressively declines with age. Excessive fluoride ingestion may cause long-term side effects or acute toxicities depending on doses, duration, and exposure methods. The primary source of fluoride toxicity reported by oral hygiene products, mainly toothpastes. The toxicity of fluoride is classified into acute toxic effects and chronic effects (46).

2.1.6.1. Acute Toxicity

The excessive use of fluoride can cause acute toxicity, especially with the ingestion of one or more doses during a short-time period, which may lead to adverse poisoning effects. Even immediate intoxication is rare; the acute toxic dose is 5 mg/kg

body weight. This represents the minimal dose that may cause serious signs and symptoms and requires immediate hospitalisation and treatment. In the case of acute fluoride toxicity, the first symptoms and signs are nausea, abdominal pain, bloody vomiting, and diarrhoea, followed by generalised or localised muscle tetany, especially of hands and feet. In addition, hypotension, bronchospasm, fixed and dilated pupils, and hyperkalemia are also observed in acute fluoride toxicity, which may result in ventricular arrhythmias and cardiac arrest within 2 - 4 hour. Only a few fatal cases related to the topical fluoride application have been reported. Therefore, it is important to minimise fluoride ingestion during professional topical treatment and calculate the amount of fluoride ingested to prevent toxic effects. The optimum dose of fluoride and the fluoride minimal risk levels are summarised in Table 2.1. (39,46,47).

Table 2.1. Important doses of fluoride

The optimal dose of fluoride (children & adults)	0.05 -0.07 mg F/kg body weight
The toxic dose of fluoride (children & adults)	5 mg F/kg body weight
The lethal dose of fluoride (children)	16 mg F/kg body weight
The lethal dose of fluoride (adults)	32 g F/kg body weight

2.1.6.2. Chronic Toxicity

Chronic toxicity of fluoride is more common than acute toxicity. It is defined as the ingestion of variant doses of fluoride over a prolonged time. There are two types of chronic toxicity; dental fluorosis and skeletal fluorosis.

2.1.6.2.1. Dental Fluorosis

Dental fluorosis is a developmental disturbance of enamel caused by exposure to high concentrations of fluoride during tooth development. The occurrence and severity of dental fluorosis depend on the parameters of fluoride exposure during enamel formation. Clinical manifestations of dental fluorosis range from faint white horizontal lines, more irregular cloudy white areas, or yellow to light brown larger opaque areas. In the most severe cases, brown staining or pitting of the enamel may be present, and qualitatively visible enamel loss can be seen. Although the mild form of dental fluorosis is not considered a public health problem, more severe forms may cause aesthetic problems, especially when the anterior permanent teeth are involved. The balance

between the caries-preventive benefit of fluoride and the risk of developing dental fluorosis is important to promote oral health during childhood (39,47,48).

2.1.6.2.2. Skeletal Fluorosis

Chronic fluoride exposure at more than the optimal levels by ingestion or inhalation results in skeletal fluorosis. It is characterised by an increase in bone mass and density because of the deposition of excess fluoride within the bone matrix. Most common signs and symptoms of skeletal fluorosis are generalised bone and joint pain, muscle weakness and the development of osteosclerosis. The severity of skeletal fluorosis depends on the fluoride concentration in the drinking water. The severity of skeletal fluorosis depends on the amount of water intake, quality of water, renal disease, and dietary factors such as excessive tea consumption (46,47).

2.2. Toothpastes

Toothpaste is an essential element of oral hygiene and has a history of nearly 4000 years. In ancient times, people used toothpaste for only cosmetic purposes to clean tooth staining, and it contained harsh abrasives, even toxic ingredients. By the 19th century, modern toothpaste was invented to remove microbial dental plaque and aid in the maintenance of oral health. Toothpastes are available in many forms, like powder, gel, or paste (43,49,50).

Although toothpastes are extraordinarily complex products with plenty of different formulations, they generally contain the same basic ingredients; abrasives, water, humectants, foaming agent, binding agent, flavouring agents, sweetening agents, colouring or preservatives, and therapeutic agents. New toothpastes are constantly being developed for different purposes for different age groups by therapeutic agents (active ingredients) added to the structure of toothpastes (51,52).

Toothpastes contain several or all of the ingredients listed in Table 2.2.

Table 2.2. Ingredients of Toothpastes

Ingredient	Percentage
Abrasive	20-40
Water	20-40
Humectants	20-40
Foaming agent (soap or detergent)	1-2
Binding agent	Up to 2
Flavouring agent	Up to 2
Sweetening agent	Up to 2
Therapeutic agent	Up to 5
Colouring or preservative	<1

Abrasives are the most traditional toothpaste ingredients to remove dental plaque and stains without damaging the tooth surface. The abrasives commonly used in toothpastes are calcium carbonate, dicalcium phosphate dihydrate, alumina, hydrated silica, calcium pyrophosphate, and sodium bicarbonate. The degree of abrasiveness of toothpaste depends on the hardness, size, and concentration of the abrasives.

The water in the toothpastes tends to evaporate over time; therefore, humectants were added to avoid separation and to provide homogeneity. Sorbitol, mannitol, glycerol, and propylene glycol are the most commonly used humectants in toothpaste. Binding agents are added to the formulation during a prolonged storage period to maintain stability and viscosity.

Foaming agents facilitate the intraoral flow of toothpaste. The most widely used detergent in toothpastes is sodium lauryl sulphate (SLS) functions as a foaming agent. Flavouring is essential to mask the unpleasant taste of humectants, provide an immediate breath freshening and is preferred to be relatively long-lasting such as peppermint, spearmint, and menthol. Saccharin, cyclamate, sorbitol, and mannitol are the primary noncariogenic sweetening agents added to improve the taste of toothpaste (53–55).

2.2.1. Active Ingredients

The active ingredients in the toothpaste, called therapeutic agents, contribute to an increase in the performance of the toothpaste. Different therapeutic agents provide additional properties to toothpastes and offer preference options to individuals in the market. The therapeutic agents added to toothpastes are mainly anti-caries, antibacterial,

anti-plaque, and anti-calculus; also, there are agents for relieving dentin hypersensitivity and whitening agents (52,55).

Fluoride is the most effective anti-caries agent and is the gold standard in toothpastes. Fluoride is present in toothpastes as sodium fluoride (NaF), but sodium monofluorophosphate (SMFP) and stannous fluoride (SnF). Other agents like xylitol, calcium, phosphate, and sodium bicarbonate are also used in toothpastes to prevent dental caries. Toothpastes containing calcium phosphate help prevent dental caries by improving remineralisation and increasing fluoride uptake. Xylitol cannot be fermented by oral microorganisms. Since it inhibits carbohydrate metabolism, xylitol is considered a cariostatic agent. Toothpastes containing sodium bicarbonate reduce the number of oral microorganisms by elevation the salivary pH level (55–57).

Toothpastes containing anti-plaque agents inhibit plaque accumulation and reduce the effects of the bacterial toxin on the surrounding dental tissues. The most commonly used anti-plaque agents in toothpastes are triclosan, stannous fluoride and zinc ions. Antimicrobial agents such as sodium fluoride and triclosan have as their mechanism of action the inhibition of the activity of different bacterial enzymes. Triclosan is a broad-spectrum antibacterial and antifungal agent widely used in toothpastes. Triclosan-included toothpastes inhibit plaque regrowth, thereby reducing gingival inflammation. Toothpastes containing stannous fluoride demonstrated an anti-plaque effect by altering the plaque ecology to affect the levels of gingivitis. Zinc compounds, especially zinc citrate and zinc chloride, are added to toothpastes as an anti-plaque agent as it reduces bacterial proliferation and plaque formation (52,55,56).

Anti-calculus agents in toothpastes interrupt the mineralisation process of plaque to calculus. They are effective against supragingival calculus formation. Toothpastes containing pyrophosphate and zinc have an anti-calculus effect by inhibiting crystal growth (56).

The sensitivity of dentine is caused by changes in the fluid within dentinal tubules that stimulate odontoblasts and nerves to stimulate pain. Potassium salts, such as citrate and nitrate can accomplish nerve desensitisation. Potassium nitrate is a commonly used desensitisation agent; it reduces nerve reactions by penetrating through the length of the dentinal tubules and depolarising sensory nerve endings located at the dentin–pulpal

interface. The occluding or sclerosing of exposed dentinal tubules was used to control hypersensitivity. Strontium salts, stannous fluoride, potassium, and arginine are agents used in toothpastes for dentinal tubule occlusion (55,56).

2.2.1.1. Fluoridated Toothpaste

Fluoridated toothpastes have been commercially available since the 1970s, especially in developed countries. Nearly all toothpaste formulations contain fluoride. The formulation and fluoride concentration of toothpaste is diverse, with various fluoride compounds, mainly sodium fluoride (NaF), sodium monofluorophosphate (SMFP), amine fluoride, and stannous fluoride. The other toothpaste ingredients must be compatible with fluoride to maintain its efficiency. Calcium-containing abrasives have the potential to inactivate the fluoride in the oral cavity. Similarly, fluoride may react with silica to form fluorosilicates in the presence of insufficient detergent (50,51).

The importance of fluoridated toothpaste in the control of dental caries is well established with dozens of clinical studies, which have shown that there is strong evidence that fluoridated toothpastes are more effective than non-fluoridated toothpastes. However, the efficacy of fluoridated toothpastes may depend on multiple factors such as the concentration of fluoride, the amount of toothpaste used, the duration and frequency of brushing and after-rinsing behaviour (43,50).

A meta-analysis by Marinho et al. showed strong evidence of fluoridated toothpastes' clinical effectiveness in preventing dental caries compared with non-fluoridated toothpastes or no toothpaste at all. It was also reported that fluoridated toothpastes with 1000–1500 ppm reduce approximately 24–29% of the incidence of dental caries in children's permanent teeth (37).

Twetman et al. reported that fluoridated toothpaste reduced dental caries' prevalence significantly in young permanent teeth compared with a placebo. It was noted that toothpastes with 1,500 ppm fluoride had a more significant effect on the young permanent dentition than those with lower fluoride concentrations (58).

The meta-analysis by Santos et al. provided evidence of the effectiveness of fluoridated toothpastes on dental caries in the primary dentition of preschool children. Preschool children who used standard fluoridated toothpastes (1000–1500 ppm) experienced a significant reduction in the mean number of primary decayed, filled

surfaces (dfs) and teeth (dft); they also had a significantly lower risk of developing new dental caries (5).

Walsh et al. reported that toothbrushing with 1500 ppm fluoridated toothpaste reduces decayed, filled surfaces (dfs) for the primary dentition of young children. Compared to toothpastes with 440 ppm fluoride, toothbrushing with 1450 ppm fluoride slightly reduces new dental caries' development (59). Therefore, as a result of the anti-carries effect, children's use of standard F toothpastes (1000–1500 ppm) should be supported regardless of age.

2.2.1.2. Non-fluoridated Toothpaste

2.2.2. Choice of Toothpaste for Children

There are many toothpastes with different properties and active ingredients in the markets which are specially designed for children. Parents may prioritise different criteria when choosing toothpaste in this wide range. Generally, the type of toothpastes children use is based purely on parental preference. The choice of toothpaste is affected by factors such as socioeconomic status, the recommendation of the product, television and internet advertisements, and social media. Other factors considered necessary in choosing toothpaste include the packaging, taste, and smell. Packaging influences children's decision-making, displaying familiar animated characters and pictures of fruit with attractive flavourings. In addition, factors such as brand awareness and the content of product information are among the other factors that affect preferences. Some parents are concerned with the herbal contents, while others are concerned about the fluoride content in children's toothpastes (64–66).

Bennadi et al. reported that most of the mothers selected toothpastes which were based on suggestions from friends, family members, advertisements, etc. A few mothers emphasised fluoride concentrations and dentists' recommendations while choosing toothpastes for their children (67).

According to Shirke and Katre, only a few parents used recommended toothpaste by dentists/ health professionals. The majority of parents selected toothpastes based on information from the media, magazines, etc. (68). Sultan et al. stated that most of the mothers selected toothpastes for their children based on their taste and from television advertisements, and only 16% of mothers used as recommended by their dentist (69).

Köseoğlu et al. reported a study that investigated the factors affecting the choice of toothpaste with the participation of 251 adults in Türkiye. According to the results, the advice of the dentist, television and internet advertisements, and packaging are almost ineffective in selecting toothpaste. However, toothpaste's whitening or desensitising properties are the most critical factors in toothpaste selection. The smell of toothpaste, the price, and friends/family recommendations are less effective in choosing toothpaste (70).

Egil et al. evaluated the parent's reasons for the choice of children's toothpaste with 653 participants in 3 different cities in Türkiye. The anti-caries effect is the most crucial reason for the toothpaste preference of parents. As the parents' education level increases, the rate of using fluoridated toothpaste decreases in Türkiye (71).

2.3. Oral Hygiene Practices

2.3.1. Toothbrushing

Toothbrushing is a fundamental self-care behaviour for the maintenance of oral hygiene. Effective brushing with toothpastes helps to remove dental plaque that prevents oral diseases, especially caries, gingivitis, and periodontitis. It is recognised that optimal control of biofilm cannot be achieved with toothbrushing alone, and the use of fluoridated toothpaste is considered a golden standard in caries prevention. Using a manual or powered toothbrush with fluoridated toothpaste for a minimum of two minutes is recommended (72,73)

Performing toothbrushing requires motor skills and the cognitive aspect of understanding the process. Children under five lack fine manual skills, motivation, knowledge for brushing effectively, and the inability to expectorate. Therefore, it is recommended that parents perform or assist toothbrushing for children to avoid over-ingestion of toothpaste and to ensure effective cleansing (67,74,75).

The timing seems important; oral hygiene care for infants should be started before the eruption of the first primary tooth. Cleansing the infant's teeth should be carried with a wet cloth, gauze or a soft fingertip toothbrushing aid with a smear layer of fluoridated toothpaste. For preschool children, a parent should perform toothbrushing twice daily, using a soft toothbrush of age-appropriate size (30,67,72).

The recommendation for toothbrushing frequency with fluoridated toothpaste is well established; even appearing on toothpaste packaging should be at least twice daily, morning and at bedtime. Brushing children's teeth twice a day mechanically removes food debris, hence helping to reduce bacteria in the oral cavity. In addition, to benefit from the topical action mechanism of fluoride, the most convenient instrument for bringing fluoride into the oral cavity is considered to be a toothbrush. Brushing twice daily with fluoridated toothpaste increases the caries-preventive effect by exposing dental biofilm to fluoride ions more often, even without effective plaque removal (73,76,77).

However, epidemiological studies show that public adherence to toothbrushing recommendations could be better. Bennadi et al. (67) conducted a study on toothpaste utilisation profiles among 248 mothers of preschool children. It is reported that most mothers started brushing their children's teeth with toothpaste more than one year after the eruption of the first primary tooth. However, the majority of mothers supervised and helped their children during toothbrushing with toothpaste twice daily. Kapur et al. (12) evaluated the routine oral health practices and use of fluoridated toothpaste among 173 children aged 4 to 6 years in two different socioeconomic groups. According to this study, the majority of children brushed their teeth only once daily. Also, most of the parents in the city claimed to supervise their children during toothbrushing versus only half of mothers in peri-urban areas.

2.3.2. Amount of Toothpaste Usage

Fluoridated toothpaste is the source of 80% of the optimal total daily fluoride intake, accepted as safe for the development of dental fluorosis. Improper use of fluoridated toothpaste has been documented as a risk factor for dental fluorosis in both fluoridated and non-fluoridated areas, especially in the first two years of life. Children under six years of age have inadequate swallowing and expectorating reflex; they may ingest 25-65% of the toothpaste put on their toothbrush. It is known that the dose of fluoride ingestion during toothbrushing is related to the amount of toothpaste used, its fluoride concentration and the age of the children. To avoid the risk of dental fluorosis, an age-related amount of fluoridated toothpaste should be applied during brushing while maximising the anti-caries effect of fluoride. Furthermore, in addition to supervised toothbrushing, parents are advised to dispense toothpaste in every use to minimise fluoride consumption in children younger than six years (48,78–80).

Using either a smear or a small amount of toothpaste for children is recommended. Different guidelines have a considerable variation of terminology regarding the small amount, such as smear, rice grain, pea-size, and lentil size. These differences in terminology can lead to misinterpretations by parents. The amount of smear of toothpaste may vary depending on the size of the toothbrush. The concept of pea size needs to be clarified and may have different meanings in different cultures. To prevent over-ingestion of fluoride due to the differences and ambiguities in the terminology, recommendations about the amount of toothpaste usage should be provided with clear visual instructions on toothpaste packaging (80–82).

2.3.3. After Brushing Behaviours

The benefits to the oral health of toothbrushing with fluoridated toothpaste are well-known. The methods used for rinsing behaviour after brushing are now recognised to significantly influence the anti-caries effect of fluoride. Rinsing with water after brushing is such an automatic part of the oral hygiene routine that most people are unaware of their rinsing behaviour and underestimate its importance. Experimental studies have determined that the highest levels of fluoride in saliva are found when rinsing, spitting, or swallowing is not allowed but when the toothpaste/saliva mixture is used as a mouthwash. Also, higher rinsing volume with water, rinse frequency and rinse time after brushing result in lower intraoral fluoride levels. To increase the effectiveness of fluoridated toothpaste, it is recommended to rinse the toothpaste saliva slurry around the mouth and then spit out the excess slurry to maintain the salivary fluoride levels for as long as possible, rather than rinsing with water. Although removing excess toothpaste slurry from young children's mouths is important to minimise toothpaste ingestion, vigorous rinsing with water is not recommended (73,76,77).

2.3.4. Global Recommendations on the Use of Fluoridated Toothpastes

There are several guidelines for recommendations of toothbrushing with fluoridated toothpaste for children under six years.

The Turkish Society of Paediatric Dentistry (TSPD) published a fluoride status report in 2016 and updated it in 2019. In this report, it is recommended that toothbrushing twice a day with fluoridated toothpaste (minimum 1000 ppm) for all children, regardless of age, using an age-appropriate concentration and amount of paste. It is suggested the

use smear size of 1000 ppm fluoridated toothpaste (0.125g F) in children from the eruption of the first primary tooth until two years; pea size of 1000 ppm fluoridated toothpaste (0.25g F) in children aged 2 to 6 years(83).

The European Academy of Pediatric Dentistry (EAPD) recommended using fluoridated toothpaste twice a day as soon as the eruption of the first primary tooth. Parents are advised to maintain supervision of toothbrushing children under six years. It is suggested the use grain of rice size of 1000 ppm fluoridated toothpaste (0.125g F) in children aged six months to 2 years; pea size of 1000 or 1450 ppm fluoridated toothpaste (0.25g F) in children aged 2 to 6 years. Fluoride concentration for children between 2 to 6 years should be considered based on the individual caries risk (84).

The American Academy of Pediatric Dentistry (AAPD) suggests toothbrushing twice daily with fluoridated toothpaste for all children, no later than the eruption of the first primary tooth. It is recommended to use only a smear or rice-sized fluoridated toothpaste (0.125 g F) dispensed each time in children under three years of age to reduce the risk of fluorosis. A pea-size fluoridated toothpaste (0.25 g F) is appropriate for children aged 3 to 6 years. Toothbrushing for preschool children should always be under the supervision or assistance of the parents, and rinsing after brushing should be with minimum water or eliminated (7).

According to the International Association of Paediatric Dentistry (IAPD) recommendation, brushing children's teeth should be performed twice daily with fluoridated toothpaste, between 1,000 – 1,500 ppm fluoride, using smear size of toothpaste for children under age 3, pea-size of toothpaste for children between 3-6 years (85).

2.4. Oral Health Knowledge and Attitudes

2.4.1. Oral Health Maintenance in Preschool Children

Five factors influence the oral health of children: genetics and biology, social environment, physical environment, health behaviours and practices, and use of dental care. Oral health in childhood is a significant predictor of adult oral health. Prevention of oral disease among children can be achieved through adopting positive behaviours such as good oral hygiene practices and less consumption of fermentable carbohydrates. Early establishment of favourable oral health behaviour is considered a goal in the prevention

of early childhood caries. Oral health behaviours established early in childhood are related to children's current oral health and are associated with oral health conditions later into adulthood (1,86,87).

Childhood, particularly early childhood, is an influential period of life for establishing lifelong health behaviours, including oral hygiene behaviours. Children below the age of 5 years typically spend majority of their time in company of parents, especially with mothers, even while attending preschools or nurseries. These early years involve "primary socialisation", during which the earliest childhood routines and habits are gained. During this primary socialisation period, children develop daily living skills and knowledge primarily from their parents and caregivers. including the adoption of dietary and oral hygiene practices. Therefore, the establishment of routine nutritional and health behaviours in children depends on the knowledge, attitudes and practices of their parents, caregivers, and elder siblings (88–90).

Children are dependent on their environment to establish and maintain oral health behaviour. During the early childhood years, the role of parents is crucial in maintaining children's good oral health because they are the primary caregivers of oral health. Parents are also responsible for developing good oral-health behaviours in their children. The parents' oral health behaviour influences children's oral health, especially the mothers, who are the primary role model for developing behaviour. Children generally imitate their parents' practices, and any conduct, appropriate or inappropriate, may be learned by observing the parents at home by a child. Parents' knowledge and positive attitude toward dental care are essential in improving children's oral health. Low parental knowledge and poor attitudes towards oral health are associated with higher caries experience in childhood (91–94).

2.4.2. Family Influences on Children's Oral Health

Parents influence their children's oral health directly and indirectly by providing support and role modelling. They significantly impact oral health behaviour more in preschool children than older children. Parents' habits and knowledge about oral health directly influence children's oral health status. Oral health behaviours of families are derived from the family's social norms, beliefs, and cultural background. During primary socialisation, children learn these behaviours usually from parents. Parental

characteristics such as beliefs, attitudes, and socioeconomic status also influence children's oral health behaviours. Parents of parents who control their children's toothbrushing and sugar intake have positive oral health practices, demonstrating that parental attitudes positively impact their children's oral health status. Even in similar social and economic circumstances, family status and number of children are associated with the preschool child's oral health (87,93,95).

Socioeconomic status is related to oral health-related behaviours in early childhood. The association between children's poor oral health and the family's low socioeconomic status is evident. Education level is an essential socioeconomic indicator that reflects knowledge and attitudes toward oral health behaviours. Socioeconomic characteristics affect the oral health knowledge and attitudes of parents with a lower level of education and negatively affect their oral health practices. Parents with higher education levels have more control over children's oral health behaviour compared to low-educated parents. Highly educated parents report more positive attitudes and stronger motivations to control children's sugar intake than low-educated parents. The higher the parents' education level, the more favourable the oral hygiene behaviours of their children (93,96,97).

Parents' age and family size are important social background factors that directly influence their children's dental health. Parental age is associated with oral hygiene; young parents need to be more experienced and more negligent about children's oral hygiene practices. The number of children in the family positively and negatively affects children's oral health. Only child parents have more energy and time to pay attention to children's health, which tends to result in improved oral health. However, parenting skills improve with later children, and older children may be positive role models for their younger siblings. Also, poor dental experiences with older children motivate parents to improve oral hygiene practices for younger siblings and increase parental awareness about oral health (98–100).

Suresh et al. (89) conducted a study to assess the mother's knowledge about the oral health of preschool children. 406 mothers of children aged between 1 - 4 years, who attended the hospital's paediatric department in Moradabad, participated in this study. As a result, higher-education mothers were found to have better knowledge of oral hygiene

practices. In addition, mothers who lived in urban areas had a better knowledge of oral hygiene practices than rural mothers.

Jain et al. (90) reported a study to assess mothers' knowledge, attitude, and practices toward their children's oral health and compare them between age, educational level, and socioeconomic status of mothers. This study was conducted among 422 mothers of 3–5 years old preschool children. According to this study, mothers aged 30–45 years showed significantly more positive oral health attitudes than other age groups. Mothers with high education levels have substantially better knowledge, attitude and practice compared with lower education levels. Also, mothers who had higher socioeconomic status showed better knowledge, attitude, and practices than those of lower socioeconomic status.

2.4.3. Promotion of Oral Health

Prevention of oral disease and the promotion of oral health begins with implementing effective public health measures. Developing an effective oral health promotion strategy in any given individual must be based on an in-depth understanding of the knowledge and attitudes of the population. A better understanding of social, economic, belief, behavioural, and attitudinal factors is crucial to the goal of oral health promotion. For the success of any intervention for parents at the community level, the first step is to understand their culture, attitudes, and oral hygiene practices, followed by identifying deficiencies in dental awareness and parents' knowledge. Therefore, assessing the attitudes and practices of parents toward ECC would be beneficial and would also increase our understanding of actions and interventional approaches to prevent this public health problem (86,101,102).

Oral health education is fundamental in preventing ECC in children, intending to change the children's and parents' knowledge, attitudes, and behaviours. Health education is beneficial in raising the level of knowledge and in changing both attitudes and beliefs. For the effectiveness of health education, it should be tailored to the specific needs of a population by assessing the current level of parental knowledge and oral health behaviour. Providing information to parents about their children's oral health may lead to increased knowledge, but an increase in knowledge may not cause enough behavioural change to promote oral health. Therefore, oral health education planning and design also requires

identifying beliefs and attitudes to result in behaviour change. Periodic reinforcement of educational programs is also essential to maintain oral health promotions in the long term (93,97,101,102).

Oral health promotion is highly dependent on the excellent health behaviours of children. Adopting behavioural habits in childhood starts in their home, with the parents, especially the mothers. Parents play an essential role in reinforcing positive oral health behaviours, such as eating healthy foods with less sugar and adopting practices to improve children's oral hygiene. In addition, children tend to assimilate and mimic the good as well as bad habits of their parents and siblings. Parents should be informed that their oral hygiene habits also influence their children's oral health and, therefore, their quality of life. It is essential for parents to understand the factors that affect children's oral health to prevent oral diseases and promote oral health. Therefore, future public health measures should include all family members, focusing on children and parental behaviours to provide parents with adequate guidance on maintaining their child's oral health (86,93,101).

2.5. Studies on Parents' Attitudes and Practices about Oral Hygiene of Preschool Children

Pullishery et al. (2013) reported a cross-sectional study to evaluate parental attitudes and tooth brushing habits in preschool children. The study was conducted among 130 mothers of 8 to 68-month-old preschool children in Mangalore, Karnataka. Preschool children started toothbrushing at a mean age of 22.4 months but used toothpaste after 20 months. Younger mothers and mothers with higher levels of education had better knowledge about oral hygiene practices (103).

Bennadi et al. (2014) studied toothpaste utilization profiles in 50 preschool children in Mysore, India. About 62% of mothers started brushing their children's teeth more than one year after the eruption of their first deciduous teeth. The majority of children used adult toothpaste and were supervised by their parents while tooth brushing. Majority of the mothers selected toothpaste for their children based on suggestions from friends, family members, and advertisements (67).

Kapur et al. (2019) evaluated the use of fluoridated toothpaste among a total of 173 preschool children aged 4 to 6 years in two different geographical areas of

Chandigarh. About 85% of children were using fluoridated toothpaste, and children in urban areas brushed their teeth more regularly with paediatric-size toothbrushes. Also, more parents in urban areas reported supervising their children while tooth brushing (12).

Shirke and Katre (2019) reported a cross-sectional study to assess the knowledge and perception of 75 parents about toothpaste used in 2 – 12 years old children. More than half of the parents used more than pea-sized toothpaste for their children. Parental education level was not correlated with the knowledge and perception of toothpaste. The majority of parents selected toothpaste based on their personal choices, and only a few parents chose toothpaste according to dentists'/ health professionals' recommendations (68).

Pranno et al. (2022) reported a study to evaluate the relationship between behaviours, habits, and knowledge of parents about their children's oral health. The study was conducted among 204 parents and children were aged between 3 and 12 years. About 80% of parents were using fluoridated toothpaste for their children, and 57% of them chose toothpaste to prevent dental caries (104).

3. MATERIALS AND METHODS

3.1. Study Design and Sampling

This was a cross-sectional questionnaire study, and the size of the sample was determined according to a power analysis. In the power analysis of the study performed with the G*power 3.1 program, the effect size for type of toothpaste used in the study group was found to be 0.09 (67) (alpha error probability=0.05). In the sample size analysis performed with a power value of 0.8, the total number of samples required to be taken was found to be 192. In the power analysis performed with the G*power 3.1 program related to our study, the effect size for frequency of toothbrushing was found to be 0.1 in the study group (60) (alpha error probability=0.05). In the sample size analysis performed with a power value of 0.8, the total number of samples required to be taken was found to be 158. Therefore, it was planned to include a minimum of 195 people.

This study had been conducted among 203 parents of children aged under 6-year-old, attending the Paediatric Outpatient Departments of Koç University Hospital and Yeditepe University Hospital, Istanbul. Ethical approval was obtained from Non-Interventional Clinical Research Ethics Board of Yeditepe University, Istanbul, Türkiye (Registration number: 202202162) (APPENDIX 1). The study had been performed in agreement with the Declaration of Helsinki principles. Permissions to conduct this study were taken from the heads of Pediatrics Departments in Koç University and Yeditepe University. The selection of the participants had been done using random sampling technique, and based on these inclusion criteria:

- Parents who had children under 6-year-old.
- Children with at least one erupted deciduous tooth.
- Children who had not any mental or systemic conditions.

Exclusion criteria of this study were parents with:

- Children older than 72 months old.
- Children without any erupted deciduous teeth.
- Children with systemic or mental conditions.

Also, questionnaires with unanswered all questions or with more than one option marked other than the specified questions were excluded from the study.

Prior to data collection, parents have been informed about the details of the study, and the written consent (APPENDIX 2) has been obtained. Parents' participation was voluntary and free of constraint. Questionnaires were administered by a single person (M.Ü.Ç.) according to the method of conducting surveys under observation. After the necessary explanations were given about how to apply questionnaires, parents were allowed to fill in the questionnaires. The study has been conducted in the waiting area of paediatric forementioned outpatient departments in between June 2022 to February 2023. (Figure 3.1 and Figure 3.2)



Figure 3.1. Waiting area of Pediatrics Department in Koç University



Figure 3.2. Waiting area of Pediatrics Department in Yeditepe University

3.2. Development of the Questionnaire

The questionnaire of this study was developed using validated instruments from several previous studies (16,60,68). The initial translations from original language of questionnaires were made by two independent translators. One of translators was member of Mersin University, School of Foreign Languages and was unaware of the objective of the questions to reflect the language used by the target population. The other translator was one of the faculty members of Yeditepe University Faculty of Dentistry, Department of Paediatric Dentistry who is familiar with the terminology of the translated questionnaire and who has experience in interviewing and data collection. Two translated questions were compared and synthesized to create single questionnaire. The formed single questionnaire was back translated to the original language and compared with the initial questions, to ensure the preserve content integrity.

The final version of the questionnaire was cross-examined by content evaluation panel (105), which was composed of a committee of 7 experts from Yeditepe University Faculty of Dentistry, Department of Paediatric Dentistry, to maximize the likelihood of content-valid, well-constructed data collection questionnaire. Experts were presented with an expert opinion form and were asked to evaluate the questions as 'essential', 'essential but modify, and 'not essential'. After calculating the content validity index and the content validity ratio, all 15 questions were approved, and the final questionnaire (APPENDIX 3) was developed. Since this questionnaire was not a scale instrument, no pilot study was required for validation.

3.3. Data sources:

A self-administered questionnaire for parents was designed in Turkish and developed in two parts:

General information: Information on demographic details of the parents, as ages of parents (year), education level, number of children, and relationship with child (mother-father-other), children's age (day/month/year) and gender were gathered.

Parents' Attitudes and Practices of Oral Hygiene for Their Children: This part of the questionnaire consisted of one open-ended question and 14 close-ended, multiple-choice questions related to parents' attitudes and practices towards children's oral health as detailed below:

- Toothpaste usage and tooth brushing frequency.
- Amount of toothpaste on the toothbrush.
- Age of starting tooth brushing/using toothpaste.
- Supervised/monitored toothbrushing.
- Method of helping child while brushing.
- Brand of the toothpaste preferred.
- Source of information on oral hygiene (Dentist, paediatrician, pharmacist, media, etc.)

3.4. Statistical Analysis:

All collected data were recorded with Microsoft Excel. Data were analysed using IBM SPSS software version 23. Descriptive statistics was used to summarize the sample and responses of the questionnaires. The relationship between the age of parents, education level of parents, number of the child that parents have, relationship with children or children's age and parents' attitudes and practices of oral hygiene for their children was explored using chi-square test and multiple comparisons were examined using Z test with Bonferroni correction. Analysis results were presented as frequency and percentage. A p value of < 0.050 was considered as statistically significant.



4. RESULTS

From June 2022 to February 2023, a total of 210 questionnaires were collected from parents of children aged under 6 years old, attending the Pediatric Outpatient Departments of Koç University Hospital and Yeditepe University Hospital, Istanbul. 7 of 210 questionnaires were excluded due to missing data or unanswered questions. 104 (51.23%) completed questionnaires originated from Koç University Hospital, while 99 (48.77%) were from Yeditepe University Hospital.

4.1. Demographic Characteristics of The Study Population

The frequency and percentage of demographic characteristics of participants in this study are presented in Tablo 4.1.

Table 4.1. The frequency and percentage of general characteristics of the participants

Variables	Categories	Mean± Standard Deviation (SD) / Number (N=203)	Median (min – max) / Percentage %
Participants' Age		36.15±5.57	36 (21 – 65)
Participants' Age Group (in years)	<25 25 – 29 30 – 34 35 – 39 > 40	2 16 63 67 55	1 7.9 31 33 27.1
Education level	Primary school Middle school High school Pre-University University/Collage Master's degree Doctorate Degree	2 2 32 23 91 39 14	1 1 15.8 11.3 44.8 19.2 6.9
Relationship with child	Mother Father Others	164 30 9	80.8 14.8 4.4
Number of children in the family	None 1 2 3 or more	3 104 79 16	1.5 51.5 39.1 7.9
Age of child		3.66±1.52	3.92 (0.5 – 5.92)
Age group of child	< 2 2 – 6	36 167	17.7 82.3
Gender of child	Female Male	108 95	53.2 46.8

The majority of the participants were in the age group of 35-39 years (33%), the mean age (+SD) of participants was found to be 36.15 ± 5.57 years. The minimum age and maximum age of parents were determined as 25 years old and 46 years old. Almost half of the participants had university/college graduates (44.8 %), and most of the participants were mothers (80.8%). The participants other than mother or father were reported as siblings (N=2), aunt (N=1), caregiver (N=1) and grandmothers (N=3). Parents reported that 52.3% of the participants had only 1 child, and 53.2% had girls. The mean age (+SD) of children was 3.66 ± 1.52 years, most of the children were in the age group of 2 – 6 years (82.3%).

4.2. Parents Attitudes and Practices of Oral Hygiene for Their Children

Table 4.2 presents the frequency and percentage of participants responses to questions related parents' attitudes and practices towards their children's oral hygiene. Parents reported that most of the children (39.9%) brushes his/her teeth once a day, and only 34.5% of children brushes their teeth twice a day. About 4.4% of parents had not started brushing their children's teeth. According to the responses of parents, 42.9% of children started toothbrushing a few months to a year after eruption of the first deciduous teeth, 34% started immediately after the first deciduous tooth begin to erupt, and 18.7% started toothbrushing more than a year after first deciduous teeth. The majority of parents (67.5%) reported helping their children while brushing with various methods; 26.9% of parents perform brushing their children's teeth, 37.3% hold toothbrush and make brushing movements together with their children and 45.5% only give verbal instruction while children brush themselves. About 26.9% of parents checked their child teeth after brushing themselves, and 36.6% of parents brushed at the same time with their children. As regard to learning the information about oral hygiene of their children, parents reported different sources; pediatricians (45.4%), dentists (44.3%), their families (27.8%) and social media (20.1%).

The majority of children (84.2%) reported using toothpaste when brushing their teeth, only 71.4% of them use toothpaste every time. Almost all children (99.4%) had their own toothpaste apart from their parents. It was stated by parents that the reasons for using toothpaste while brushing their children's teeth are preventing dental caries (71.9%), preventing colouring/staining of the teeth (52%), as part of the daily routine (39.8%), preventing gum diseases (36.3%) and providing a fresh breath (28.7%),

respectively. One of the parents stated that they use toothpaste because it is necessary to use it. About 70.2% of children started to use toothpaste between 1 – 3 years old. More than half of the parents (59.1%) put toothpaste on their children's toothbrush, and 64.9% of children use toothpaste less than 1/3 length of the toothbrush. Only one parent reported that they put a bit of toothpaste on toothbrush. The distribution of responses of parents to the question about after brushing behavior were 65.3% of rinsing with plenty of water and spit out, 22.4% of swallowing toothpaste while brushing, and 12.4% of spitting out without rinsing (Table 4.2).

With regard to selecting their children's toothpaste, most of the parents considered the contents of the toothpaste (87.1%). About 6.5% of the parents stated that they consider age appropriateness when choosing toothpaste for their children. Nearly half of the parents (47.6%) said that they choose the brand of toothpaste for their children due to being organic/herbal. Other reasons were the recommendation of their dentists (30%), information on the package (24.1%), accessibility (15.3%), recommendation of friends (14.7%), and their aroma/tastes (14.1%). Only 8.8% of parents reported preferring toothpaste for containing fluoride. Some of the parents reported in writing their reasons for choosing their toothpaste brand for their children. The written responses were images on the toothpaste packages, being safe to swallow, brand credibility and not containing SLS, fluoride, paraben, titanium dioxide, and glucose. (Table 4.2)

Table 4.2. Distribution of responses related parents' attitudes and practices towards children's oral hygiene

Questions	N	%
Does your child brush his/her teeth?		
Brushes more than twice a day	6	3
Brushes twice a day	70	34.5
Brushes once a day	81	39.9
Brushes sometimes	34	16.7
Brushes almost never	3	1.5
Has not started brushing yet	9	4.4
When did your child start brushing his/her teeth?		
Immediately after eruption of the first deciduous tooth	69	34
A few months to a year after eruption of the first deciduous tooth	87	42.9
More than a year after eruption of the first deciduous tooth	38	18.7
Has not started brushing yet	9	4.4
Does your child get help from a parent while brushing his/her teeth?		
Yes	137	67.5
No	57	28.1
Has not started brushing yet	9	4.4

Method of helping while your child brushes his/her teeth.*		
I perform brushing my child's teeth.	36	26.9
I hold the toothbrush with my child and make brushing movements together	50	37.3
I give verbal instruction to my child while brushing himself/herself	61	45.5
I check my child teeth after brushing himself/herself.	36	26.9
I brush my own teeth at the same time with my child.	49	36.6
From which sources did you learn the necessary information for your child's oral hygiene?*		
Dentist	86	44.3
Pediatrician	88	45.4
Pharmacy	5	2.6
Family, relatives, and social environment	54	27.8
Television, radio, newspaper, etc.	18	9.3
Social media	39	20.1
Does your child use toothpaste when brushing his/her teeth?		
Uses toothpaste every time	145	71.4
Uses toothpaste, but not every time	26	12.8
Doesn't use toothpaste	23	11.3
Has not started brushing yet	9	4.4
What are your reasons for using toothpaste to brush your child's teeth?*		
To prevent dental caries	123	71.9
To prevent coloring/staining of the teeth	89	52
To prevent gum diseases	62	36.3
To provide a fresh breath	49	28.7
As part of the daily routine	68	39.8
Other	2	1.7
Does your child have his/her own separate toothpaste?		
Yes	171	99.4
No	1	1.7
When did you start using toothpaste for your child?		
As soon as eruption of the first deciduous teeth	21	12.3
Between ages 1 – 3	120	70.2
After age 3	30	17.5
Who puts toothpaste on your child's toothbrush?		
The child himself/herself	63	36.8
Mother or another adult	101	59.1
Sometimes child sometimes mother	7	4.1
The amount of toothpaste on the toothbrush ...		
Less than 1/3 of the brush	111	64.9
Less than 2/3 of the brush	48	28.1
The length of the toothbrush	11	6.4
Other	1	0.6
What does your child do immediately after toothbrushing with toothpaste?		
Rinse with plenty of water and spit out	111	65.3
Spit out without rinsing	21	12.4
Swallow toothpaste while brushing	38	22.4
What do you consider when choosing your child's toothpaste?*		
The content of the toothpaste	148	87.1
The taste/aroma of toothpaste	28	16.5
Images on the package of toothpaste	6	3.5
The price of the toothpaste	6	3.5
Other	11	6.5

What is your reason for choosing the brand of your child's toothpaste?*		
Dentist's recommendation	51	30
Recommended by friend/acquaintances.	25	14.7
Price	4	2.4
Accessibility	26	15.3
Information on the package	41	24.1
Aroma/taste	24	14.1
Organic/Herbal toothpaste	81	47.6
Containing fluoride	15	8.8
Other	12	7.1

*Multiple response

Parents were requested to write their current toothpaste brand for their children in an open-ended question, and the distribution of their responses is shown in Table 4.3. The majority of parents reported using the brand ROCS toothpaste for their children, and about 13% of parents could not remember the brand name.

Table 4.3. Frequency and percentage of responses about children's toothpaste brands

Brands of toothpastes	Number	Percentage
ROCS	55	29.9
Colgate	28	15.2
Jack'n Jill	21	11.4
Oral-B	21	11.4
Eyüp Sabri Tuncer	6	3.3
Sensodyne	5	2.7
The Humble co	4	2.2
Farmasi Eurofresh	4	2.2
Ipana	3	1.6
Signal	2	1.1
Dermokil DK Dent	2	1.1
Splat	2	1.1
Banat	1	0.5
Chicco	1	0.5
Ersağ	1	0.5
Hip	1	0.5
Nenedent	1	0.5
Opalescence	1	0.5
Sanitral	1	0.5
Not remembered	24	13.0

Table 4.4. The comparison of parents' attitudes and practices of oral hygiene in their children between their age groups

	<29 years		30-34 years		35-39 years		>40 years		Test stat.	p
	n	%	n	%	n	%	n	%		
When did your child start brushing his/her teeth?										
Immediately after eruption of the first deciduous tooth	2	12.5	18	29.5	25	37.3	19	38	12.064	0.210
A few months to a year after eruption of the first deciduous tooth	12	75	28	45.9	29	43.3	15	30		
More than a year after eruption of the first deciduous tooth	2	12.5	12	19.7	10	14.9	13	26		
Has not started brushing yet	0	0	3	4.9	3	4.5	3	6		
Does your child brush his/her teeth?										
Brushes more than twice a day	0	0	2	3.3	3	4.5	0	0	7.572	0.818
Brushes twice a day	5	31.3	17	27.9	24	35.8	20	40		
Brushes once a day	6	37.5	25	41	26	38.8	21	42		
Brushes sometimes	3	18.8	14	23	10	14.9	6	12		
Brushes almost never	2	12.5	3	4.9	4	6	3	6		
Does your child get help from a parent while brushing his/her teeth?										
Yes	13	81.3	45	73.8	41	61.2	33	66	4.602	0.596
No	3	18.8	13	21.3	23	34.3	14	28		
Has not started brushing yet	0	0	3	4.9	3	4.5	3	6		
Method of helping while your child brushes his/her teeth.*										
I perform brushing my child's teeth.	4	33.3	14	31.8	12	29.3	6	18.8	28.505	0.019
I hold the toothbrush and make brushing movements together	4	33.3ab	25	56.8a	10	24.4b	10	31.3ab		
I give verbal instruction to my child while brushing himself/herself	5	41.7	16	36.4	19	46.3	20	62.5		
I check my child teeth after brushing himself/herself.	1	8.3	13	29.5	8	19.5	13	40.6		
I brush my own teeth at the same time with my child.	4	33.3	20	45.5	10	24.4	13	40.6		
From which sources did you learn the necessary information for your child's oral hygiene?*										
Dentist	3	18.8	31	53.4	26	40.6	24	51.1	37.666	0.004
Pediatrician	9	56.3	32	55.2	26	40.6	18	38.3		
Pharmacy	1	6.3	1	1.7	1	1.6	2	4.3		
Family, relatives, and social environment	3	18.8	12	20.7	23	35.9	14	29.8		
Television, radio, newspaper, etc.	2	12.5ab	7	12.1ab	1	1.6a	7	14.9b		
Social media	7	43.8a	16	27.6ab	7	10.9b	6	12.8b		

Table 4.4. Continued

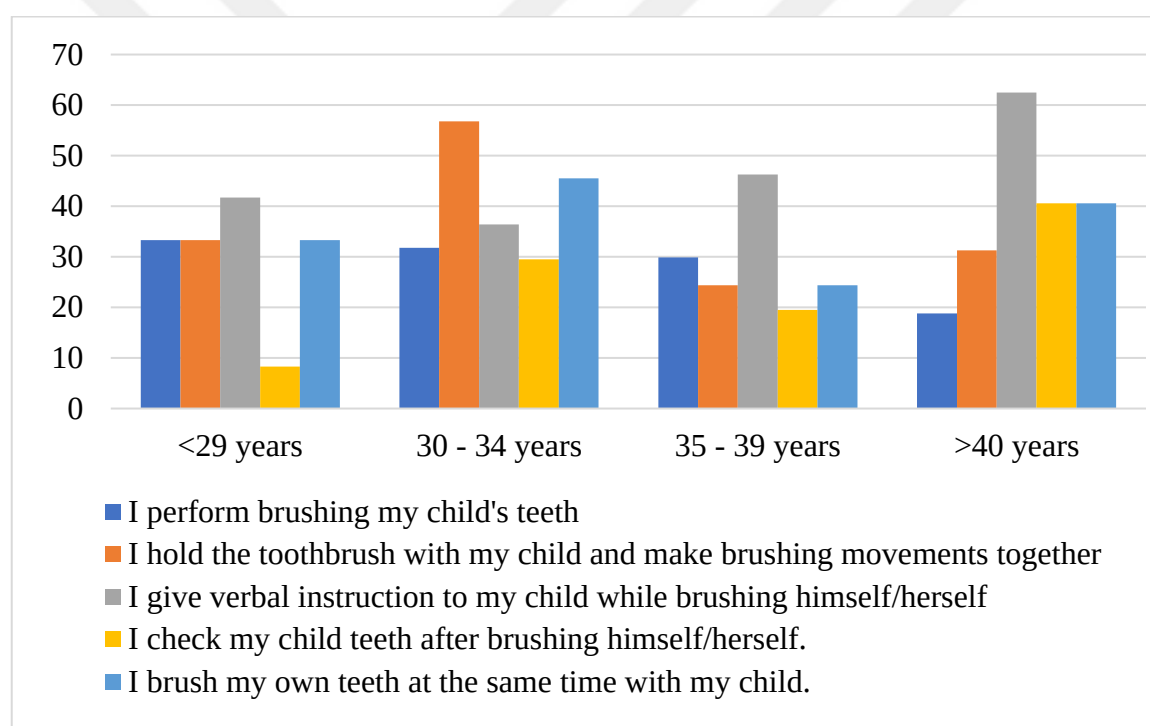
Does your child use toothpaste when brushing his/her teeth?										
Uses toothpaste every time	4	25a	44	72.1b	52	77.6b	37	74b	30.358	<0.001
Uses toothpaste, but not every time	5	31.3	6	9.8	10	14.9	5	10		
Doesn't use toothpaste	7	43.8a	8	13.1b	2	3b	5	10b		
Has not started brushing yet	0	0	3	4.9	3	4.5	3	6		
What are your reasons for using toothpaste to brush your child's teeth*										
To prevent dental caries	4	44.4	37	74	41	66.1	34	81	18.518	0.422
To prevent coloring/staining of the teeth	6	66.7	30	60	33	53.2	17	40.5		
To prevent gum diseases	2	22.2	19	38	23	37.1	14	33.3		
To provide a fresh breath	0	0	17	34	17	27.4	12	28.6		
As part of the daily routine	3	33.3	19	38	25	40.3	20	47.6		
Other	0	0	1	2	2	3.2	0	0		
Does your child have his/her own separate toothpaste?										
Yes	9	100	50	100	61	98.4	41	97.6	1.271	0.736
No	0	0	0	0	1	1.6	1	2.4		
When did you start using toothpaste for your child?										
As soon as eruption of the first deciduous teeth	2	22.2	5	10	7	11.3	5	11.9	3.804	0.703
Between ages 1 – 3	4	44.4	37	74	46	74.2	29	69		
After age 3	3	33.3	8	16	9	14.5	8	19		
Who puts toothpaste on your child's toothbrush?										
The child himself/herself	3	33.3	15	30	19	30.6	22	52.4	8.054	0.234
Mother or another adult	6	66.7	34	68	40	64.5	18	42.9		
Sometimes child sometimes mother	0	0	1	2	3	4.8	2	4.8		
The amount of toothpaste on the toothbrush.										
Less than 1/3 of the brush	7	77.8	30	60	43	69.4	27	64.3	6.361	0.703
Less than 2/3 of the brush	1	11.1	18	36	15	24.2	11	26.2		
The length of the toothbrush	1	11.1	2	4	3	4.8	4	9.5		
Other	0	0	0	0	1	1.6	0	0		
What does your child do immediately after toothbrushing with toothpaste?										
Rinse with plenty of water and spit out	6	66.7	31	62	38	62.3	29	69	3.384	0.759
Spit out without rinsing	2	22.2	5	10	7	11.5	6	14.3		
Swallow toothpaste while brushing	1	11.1	14	28	16	26.2	7	16.7		

Table 4.4. Continued

What do you consider when choosing your child's toothpaste?*										
The content of the toothpaste	9	100	45	90	53	86.9	36	85.7		
The taste/aroma of toothpaste	1	11.1	9	18	8	13.1	8	19		
Images on the package of toothpaste	1	11.1	2	4	1	1.6	1	2.4	20.809	0.143
The price of the toothpaste	2	22.2	0	0	4	6.6	0	0		
Other	0	0	2	4	5	8.2	4	9.5		
What is your reason for choosing the brand of your child's toothpaste?*										
Dentist's recommendation	1	11.1	15	30	21	33.9	13	31.7		
Recommended by friend/acquaintances.	2	22.2	8	16	8	12.9	4	9.8		
Price	1	11.1	0	0	2	3.2	1	2.4		
Accessibility	2	22.2	10	20	6	9.7	8	19.5		
Information on the package	1	11.1	10	20	14	22.6	14	34.1	25.943	0.522
Aroma/taste	1	11.1	10	20	5	8.1	8	19.5		
Organic/Herbal toothpaste	6	66.7	30	60	26	41.9	16	39		
Containing fluoride	1	11.1	4	8	7	11.3	3	7.3		
Other	1	11.1	4	8	4	6.5	2	4.9		

Chi-square test, a-b: There is no difference between groups with the same letter in each line, *multiple response

The comparison of oral hygiene attitudes and behaviours of parents in different age groups is shown in Table 4.4. There was a statistically significant difference between the distribution of the answers given to the method of helping their children brush their teeth according to age groups of parents ($p=0.019$). According to parents' responses, performing brushing their children's teeth are more common in parents in the age group of under 29 years (33.3%), and the frequency of this method decreased as the age of the parents increased. More than half of the parents in the age group of 30 – 34 years (56.8%) helped their children by holding the toothbrush and brushing together, while almost half of the parents in the age group of 35 – 39 years (46.3%) helped giving verbal instructions. The majority of parents in the group of over 40 years (62.5%) stated that they help their children with verbal instructions during toothbrushing. (Graph 4.1)

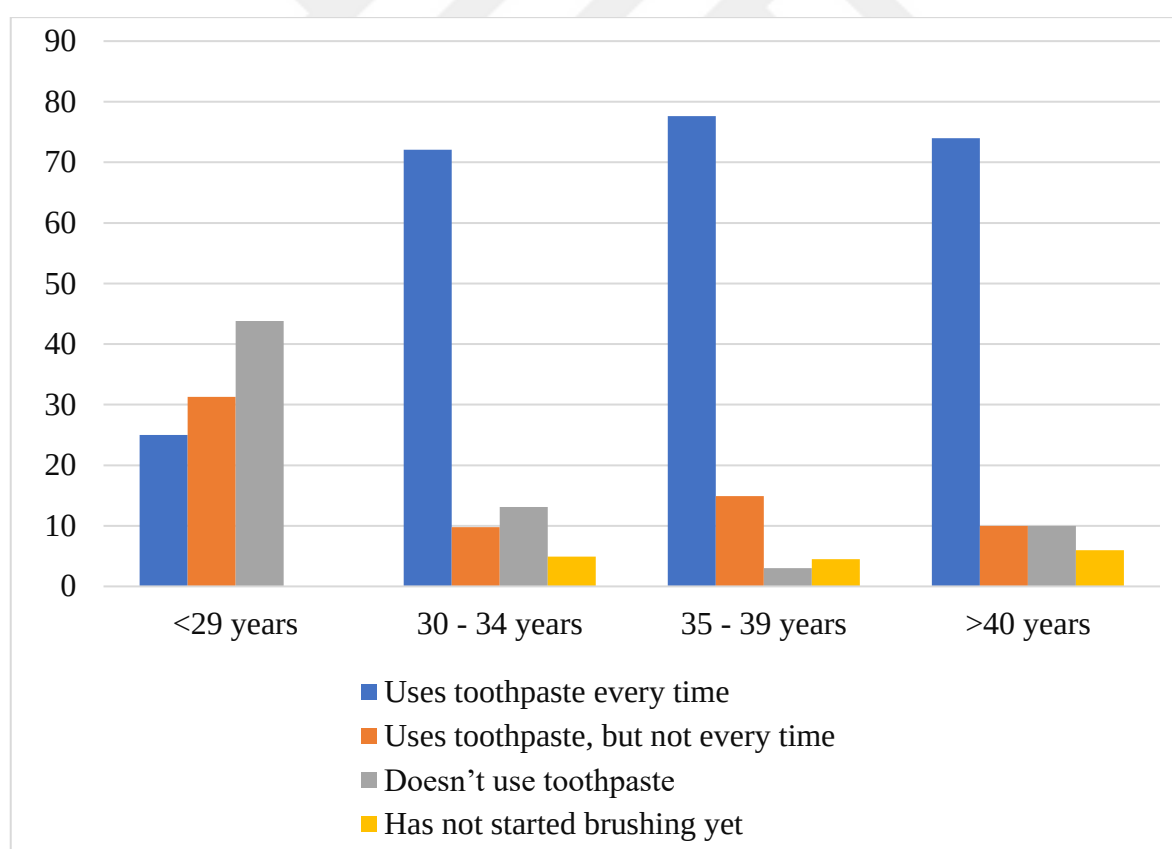


Graph 4.1. Distribution of the methods of helping their children brush their teeth according to age groups of parents.

Information sources of parents for their children's oral hygiene showed a statistically significant difference according to the age groups of the parents ($p=0.004$). About 18.8% of parents in the age group of under 29 years reported their information source as dentist, 53.4% of parents in the age group of 30 – 34 years, 40.6% of parents in the age group of 35 – 39 years 40.6%, and 51.1% of parents in the age group of over 40 years, respectively. Parents in the age group of under 29 years gave the answer as a pediatrician with the ratio of 56.3%, parents in the age group of 30 – 34 years with 55.2%, parents in the age group of 35 – 39 years with

40.6%, and parents in the age group of over 40 years with 38.3% respectively. About 43.8% of parents in the age group of under 29 years reported social media as a source of information for oral hygiene practices, responses as social media were only 10.9% of parents in the age group of 35 – 39 years and 12.8% of parents in the age group of over 40 years. (Table 4.4.)

There was a statistically significant difference between the age groups of parents in responses to the question “does your child use toothpaste when brushing his/her teeth” ($p < 0.001$). Most of the parents in the age group of 30 – 34 years (72.1%), parents in the age group of 35 – 39 years (77.6%) and parents in the age group of over 40 years (74%) reported that their children used toothpaste every time while toothbrushing. However, parents in the age group of under 29 years reported significantly fewer responses to using toothpaste in every brushing (25%) and higher responses to not using toothpaste (43.8%) than any other age group of parents. There was no statistically significant difference between the distributions of the responses given to the other questions in comparison of the age groups of the parents. (Table 4.4. and Graph 4.2)



Graph 4.2. Distribution to responses about using toothpaste for their children according to age groups of parents.

Table 4.5. The comparison of parents' attitudes and practices of oral hygiene in their children between parents' education levels

	High school or less		Pre-University		University/College		Master's Degree		Doctorate Degree		Test stat.	p
	n	%	n	%	n	%	n	%	n	%		
When did your child start brushing his/her teeth?												
Immediately after eruption of the first deciduous tooth	10	27.8	8	34.8	29	31.9	16	41	6	42.9	22.601	0.031
A few months to a year after eruption of the first deciduous tooth	12	33.3	10	43.5	39	42.9	19	48.7	7	50		
More than a year after eruption of the first deciduous tooth	8	22.2	5	21.7	21	23.1	3	7.7	1	7.1		
Has not started brushing yet	6	16.7a	0	0ab	2	2.2b	1	2.6ab	0	0ab		
Does your child brush his/her teeth?												
Brushes more than twice a day	1	2.8	1	4.3	3	3.3	0	0	1	7.1	21.183	0.172
Brushes twice a day	11	30.6	10	43.5	31	34.1	14	35.9	4	28.6		
Brushes once a day	10	27.8	9	39.1	37	40.7	17	43.6	8	57.1		
Brushes sometimes	7	19.4	3	13	16	17.6	7	17.9	1	7.1		
Brushes almost never	7	19.4	0	0	4	4.4	1	2.6	0	0		
Does your child get help from a parent while brushing his/her teeth?												
Yes	22	61.1	14	60.9	60	65.9	30	76.9	11	78.6	19.215	0.014
No	8	22.2	9	39.1	29	31.9	8	20.5	3	21.4		
Has not started brushing yet	6	16.7a	0	0ab	2	2.2b	1	2.6ab	0	0ab		
Method of helping while your child brushes his/her teeth.*												
I perform brushing my child's teeth.	6	28.6	3	21.4	16	27.6	7	23.3	4	36.4	13.285	0.865
I hold the toothbrush and make brushing movements together	9	42.9	4	28.6	24	41.4	10	33.3	3	27.3		
I give verbal instruction to my child while brushing himself/herself	7	33.3	7	50	28	48.3	17	56.7	2	18.2		
I check my child teeth after brushing himself/herself.	5	23.8	3	21.4	17	29.3	8	26.7	3	27.3		
I brush my own teeth at the same time with my child.	8	38.1	2	14.3	22	37.9	13	43.3	4	36.4		
From which sources did you learn the necessary information for your child's oral hygiene?*												
Dentist	13	43.3	11	47.8	39	43.8	17	44.7	6	42.9	18.044	0.801
Pediatrician	13	43.3	10	43.5	39	43.8	20	52.6	6	42.9		
Pharmacy	2	6.7	0	0	3	3.4	0	0	0	0		
Family, relatives, and social environment	4	13.3	7	30.4	29	32.6	8	21.1	6	42.9		
Television, radio, newspaper, etc.	1	3.3	3	13	12	13.5	1	2.6	1	7.1		
Social media	5	16.7	5	21.7	19	21.3	7	18.4	3	21.4		

Table 4.5. Continued

Does your child use toothpaste when brushing his/her teeth?												
Uses toothpaste every time	21	58.3	17	73.9	67	73.6	30	76.9	10	71.4	24.166	0.019
Uses toothpaste, but not every time	8	22.2	3	13	8	8.8	5	12.8	2	14.3		
Doesn't use toothpaste	1	2.8	3	13	14	15.4	3	7.7	2	14.3		
Has not started brushing yet	6	16.7a	0	0ab	2	2.2b	1	2.6ab	0	0ab		
What are your reasons for using toothpaste to brush your child's teeth?*												
To prevent dental caries	21	72.4	16	80	52	69.3	25	71.4	9	75	25.099	0.400
To prevent coloring/staining of the teeth	11	37.9	9	45	41	54.7	22	62.9	6	50		
To prevent gum diseases	11	37.9	8	40	21	28	17	48.6	5	41.7		
To provide a fresh breath	8	27.6	8	40	19	25.3	11	31.4	3	25		
As part of the daily routine	6	20.7	6	30	32	42.7	18	51.4	6	50		
Other	0	0	0	0	2	2.7	0	0	1	8.3		
When did you start using toothpaste for your child?												
As soon as eruption of the first deciduous teeth	3	10.3	4	20	9	12	4	11.4	1	8.3	4.233	0.836
Between ages 1 – 3	21	72.4	12	60	50	66.7	27	77.1	10	83.3		
After age 3	5	17.2	4	20	16	21.3	4	11.4	1	8.3		
Who puts toothpaste on your child's toothbrush?												
The child himself/herself	9	31	10	50	29	38.7	11	31.4	4	33.3	4.692	0.790
Mother or another adult	18	62.1	10	50	42	56	23	65.7	8	66.7		
Sometimes child sometimes mother	2	6.9	0	0	4	5.3	1	2.9	0	0		
The amount of toothpaste on the toothbrush ...												
Less than 1/3 of the brush	21	72.4	11	55	53	70.7	19	54.3	7	58.3	21.334	0.051
Less than 2/3 of the brush	5	17.2	8	40	17	22.7	14	40	4	33.3		
The length of the toothbrush	3	10.3	1	5	5	6.7	2	5.7	0	0		
Other	0	0	0	0	0	0	0	0	1	8.3		
What does your child do immediately after toothbrushing with toothpaste?												
Rinse with plenty of water and spit out	20	69	16	80	49	66.2	20	57.1	6	50	8.549	0.382
Spit out without rinsing	6	20.7	1	5	7	9.5	5	14.3	2	16.7		
Swallow toothpaste while brushing	3	10.3	3	15	18	24.3	10	28.6	4	33.3		

Table 4.5. Continued

What do you consider when choosing your child's toothpaste?*

The content of the toothpaste	25	86.2	16	80	68	91.9	28	80	11	91.7		
The taste/aroma of toothpaste	3	10.3	6	30	9	12.2	9	25.7	1	8.3		
Images on the package of toothpaste	1	3.4	1	5	4	5.4	0	0	0	0	27.366	0.125
The price of the toothpaste	0	0	0	0	3	4.1	2	5.7	1	8.3		
Other	0	0	0	0	4	5.4	6	17.1	1	8.3		

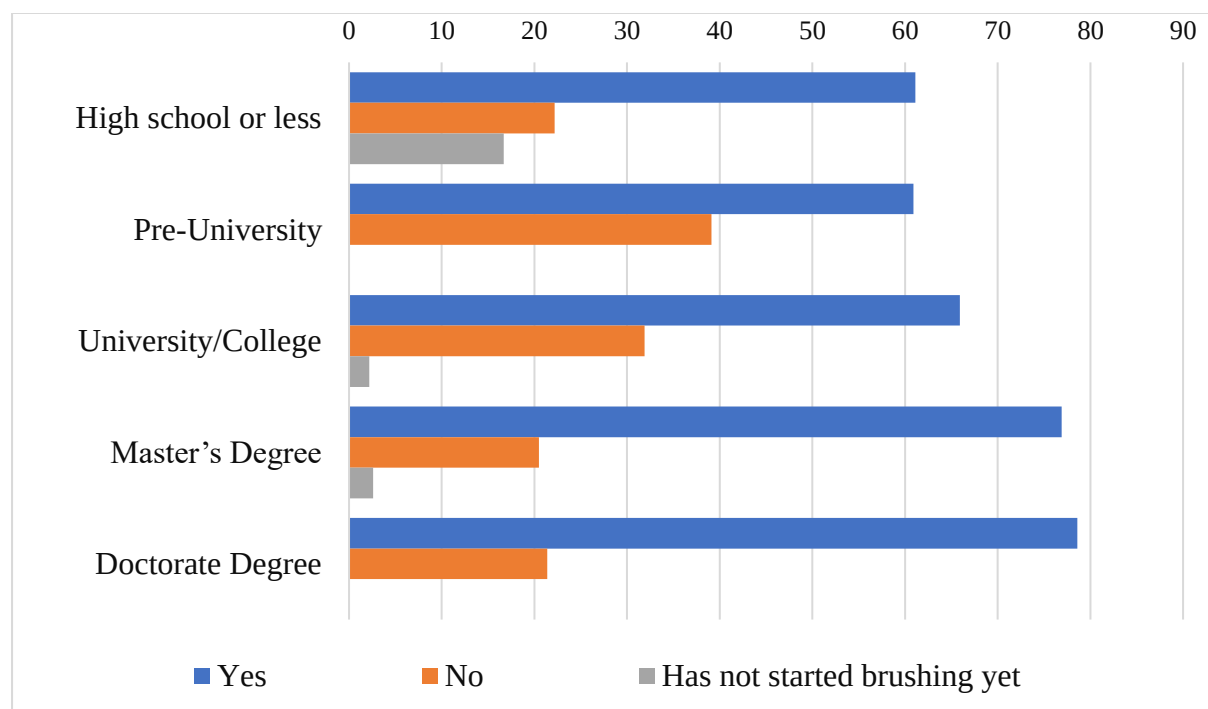
What is your reason for choosing the brand of your child's toothpaste?*

Dentist's recommendation	9	31	3	15	23	31.1	11	31.4	5	41.7		
Recommended by friends/acquaintances	1	3.4	2	10	14	18.9	7	20	1	8.3		
Price	0	0	0	0	2	2.7	2	5.7	0	0		
Accessibility	3	10.3	5	25	9	12.2	7	20	2	16.7		
Information on the package	4	13.8	7	35	19	25.7	6	17.1	5	41.7	39.690	0.309
Aroma/taste	4	13.8	4	20	7	9.5	9	25.7	0	0		
Organic/Herbal toothpaste	15	51.7	7	35	38	51.4	16	45.7	5	41.7		
Containing fluoride	1	3.4	1	5	5	6.8	6	17.1	2	16.7		
Other	4	13.8	1	5	5	6.8	2	5.7	0	0		

Chi-square test, a-b: There is no difference between groups with the same letter in each line, *multiple response

The comparison of oral hygiene attitudes and behaviours of parents according to their education levels is shown in Table 4.5. There was a statistically significant relationship between the educational status of parents and the time to start toothbrushing, supervised toothbrushing, and using toothpaste during brushing. 16.7% of parents who had high school or less graduation reported that their children had not started toothbrushing yet, while only 2.2% of parents who had university graduation gave the same information ($p=0.031$). Parents with a higher level of education started brushing their children's teeth earlier than parents with a lower educational level. (Table 4.5)

According to the education level of the parents, there was a statistically significant difference between the distributions of the answers given to the question of whether they help their children while brushing their teeth ($p=0.014$). According to the responses, 61.1% of parents graduated from high school or below, 60.9% of parents with a pre-university degree, 65.9% of parents with a university degree, 76.9% of parents with a master's degree, 78.6% of parents with a doctorate supervised their children's toothbrushing. Using toothpaste for brushing their children's teeth was reported significantly higher by parents with pre-university degrees (73.9%) and higher educational levels than parents who graduated from high school or below (58.3%) ($p=0.019$). (Table 4.5 and Graph 4.3)



Graph 4.3. Distribution of whether or not parents help their children while toothbrushing according to parents' education level.

Table 4.6. The comparison of parents' attitudes and practices of oral hygiene in their children between mothers and fathers

	Mother		Father		Test stat.	p
	n	%	n	%		
When did your child start brushing his/her teeth?						
Immediately after eruption of the first deciduous tooth	59	36	5	16.7	4.799	0.187
A few months to a year after eruption of the first deciduous tooth	67	40.9	17	56.7		
More than a year after eruption of the first deciduous tooth	30	18.3	7	23.3		
Has not started brushing yet	8	4.9	1	3.3		
Does your child brush his/her teeth?						
Brushes more than twice a day	5	3	0	0	2.105	0.716
Brushes twice a day	57	34.8	9	30		
Brushes once a day	64	39	14	46.7		
Brushes sometimes	27	16.5	6	20		
Brushes almost never	11	6.7	1	3.3		
Does your child get help from a parent while brushing his/her teeth?						
Yes	112	68.3	20	66.7	0.234	0.890
No	44	26.8	9	30		
Has not started brushing yet	8	4.9	1	3.3		
Method of helping while your child brushes his/her teeth.*						
I perform brushing my child's teeth.	28	25.5	8	42.1	9.800	0.081
I hold the toothbrush with my child and make brushing movements together	40	36.4	9	47.4		
I give verbal instruction to my child while brushing himself/herself	47	42.7	13	68.4		
I check my child teeth after brushing himself/herself.	32	29.1	3	15.8		
I brush my own teeth at the same time with my child.	42	38.2	5	26.3		
From which sources did you learn the necessary information for your child's oral hygiene?*						
Dentist	73	46.8	11	37.9	4.810	0.568
Pediatrician	68	43.6	17	58.6		
Pharmacy	5	3.2	0	0		
Family, relatives, and social environment	42	26.9	10	34.5		
Television, radio, newspaper, etc.	14	9	3	10.3		
Social media	31	19.9	5	17.2		

Table 4.6. Continued

Does your child use toothpaste when brushing his/her teeth?						
Uses toothpaste every time	115	70.1	22	73.3		
Uses toothpaste, but not every time	21	12.8	5	16.7	1.133	0.769
Doesn't use toothpaste	20	12.2	2	6.7		
Has not started brushing yet	8	4.9	1	3.3		
What are your reasons for using toothpaste to brush your child's teeth?*						
To prevent dental caries	93	68.4	23	85.2		
To prevent coloring/staining of the teeth	69	50.7	17	63		
To prevent gum diseases	42	30.9a	16	59.3b	14.600	0.024
To provide a fresh breath	39	28.7	7	25.9		
As part of the daily routine	53	39	14	51.9		
Other	3	2.2	0	0		
Does your child have his/her own separate toothpaste?						
Yes	135	99.3	26	96.3	1.638	0.201
No	1	0.7	1	3.7		
When did you start using toothpaste for your child?						
As soon as eruption of the first deciduous teeth	17	12.5	2	7.4		
Between ages 1 – 3	96	70.6	20	74.1	0.574	0.751
After age 3	23	16.9	5	18.5		
Who puts toothpaste on your child's toothbrush?						
The child himself/herself	51	37.5	8	29.6		
Mother or another adult	82	60.3	16	59.3	5.243	0.073
Sometimes child sometimes mother	3	2.2	3	11.1		
The amount of toothpaste on the toothbrush						
Less than 1/3 of the brush	91	66.9	16	59.3		
Less than 2/3 of the brush	37	27.2	8	29.6	5.371	0.147
The length of the toothbrush	8	5.9	2	7.4		
Other	0	0	1	3.7		
What does your child do immediately after toothbrushing with toothpaste?						
Rinse with plenty of water and spit out	87	64.4	17	63		
Spit out without rinsing	18	13.3	2	7.4	1.174	0.556
Swallow toothpaste while brushing	30	22.2	8	29.6		

Table 4.6. Continued

What do you consider when choosing your child's toothpaste?*	120	88.9	23	85.2		
The content of the toothpaste	22	16.3	4	14.8		
The taste/aroma of toothpaste	4	3	1	3.7	1.332	0.932
Images on the package of toothpaste	5	3.7	1	3.7		
The price of the toothpaste	8	5.9	3	11.1		
Other						
What is your reason for choosing the brand of your child's toothpaste?*						
Dentist's recommendation	40	29.4	10	38.5		
Recommended by friends/acquaintances	13	9.6a	9	34.6b		
Price	2	1.5	2	7.7		
Accessibility	22	16.2	4	15.4		
Information on the package	32	23.5	7	26.9	21.301	0.011
Aroma/taste	21	15.4	3	11.5		
Organic/Herbal toothpaste	70	51.5	8	30.8		
Containing fluoride	14	10.3	1	3.8		
Other	9	6.6	2	7.7		

Chi-square test, a-b: There is no difference between groups with the same letter in each line, *multiple response

The comparison of oral hygiene attitudes and behaviours of parents according to their relationship with children is shown in Table 4.6. Participants other than mothers and fathers were not included in this comparison. There was a statistically significant difference between mothers and fathers regarding reasons for using toothpaste for their children ($p=0.024$). The majority of both mothers (68.4%) and fathers (85.2%) reported using toothpaste to prevent dental caries for their children. While 59.3% of fathers stated that they use toothpaste to prevent gum disease, significantly fewer mothers (30.9%) reported using toothpaste to prevent gum disease for their children. (Table 4.6)

There was a statistically significant difference between mothers and fathers according to the reasons for choosing their children's toothpaste brands ($p=0.011$). The most popular reason for choosing a toothpaste brand among mothers was reported as being organic/herbal (51.5%), followed by dentists' recommendations (29.4%). Compared to the responses of fathers (34.6%), a significantly smaller number of mothers (9.6%) stated the reason for choosing toothpaste brand for their children as "recommended by friends/acquaintances." (Table 4.6)

Table 4.7. The comparison of parents' attitudes and practices of oral hygiene in their children between numbers of children in families

	1		2		3 or more		Test stat.	p
	n	%	n	%	n	%		
When did your child start brushing his/her teeth?								
Immediately after eruption of the first deciduous tooth	32	31.7	28	36.4	3	20	14.335	0.026
A few months to a year after eruption of the first deciduous tooth	53	52.5a	25	32.5b	6	40ab		
More than a year after eruption of the first deciduous tooth	15	14.9	17	22.1	5	33.3		
Has not started brushing yet	1	1a	7	9.1b	1	6.7ab		
Does your child brush his/her teeth?								
Brushes more than twice a day	5	5	0	0	0	0	12.112	0.146
Brushes twice a day	35	34.7	28	36.4	3	20		
Brushes once a day	38	37.6	32	41.6	8	53.3		
Brushes sometimes	20	19.8	9	11.7	3	20		
Brushes almost never	3	3	8	10.4	1	6.7		
Does your child get help from a parent while brushing his/her teeth?								
Yes	76	75.2a	44	57.1b	11	73.3ab	10.392	0.034
No	24	23.8	26	33.8	3	20		
Has not started brushing yet	1	1a	7	9.1b	1	6.7ab		
Method of helping while your child brushes his/her teeth.*								
I perform brushing my child's teeth.	23	31.1	11	25.6	2	18.2	12.923	0.228
I hold the toothbrush and make brushing movements together	30	40.5	16	37.2	2	18.2		
I give verbal instruction to my child while brushing himself/herself	29	39.2	22	51.2	8	72.7		
I check my child teeth after brushing himself/herself.	16	21.6	15	34.9	4	36.4		
I brush my own teeth at the same time with my child.	29	39.2	12	27.9	5	45.5		
From which sources did you learn the necessary information for your child's oral hygiene?*								
Dentist	37	37	38	54.3	8	57.1	15.874	0.197
Pediatrician	51	51	30	42.9	4	28.6		
Pharmacy	3	3	1	1.4	1	7.1		
Family, relatives, and social environment	30	30	18	25.7	4	28.6		
Television, radio, newspaper, etc.	8	8	8	11.4	1	7.1		
Social media	25	25	10	14.3	1	7.1		

Table 4.7. Continued

Does your child use toothpaste when brushing his/her teeth?								
Uses toothpaste every time	75	74.3	51	66.2	11	73.3	10.573	0.103
Uses toothpaste, but not every time	10	9.9	13	16.9	2	13.3		
Doesn't use toothpaste	15	14.9	6	7.8	1	6.7		
Has not started brushing yet	1	1	7	9.1	1	6.7		
What are your reasons for using toothpaste to brush your child's teeth?*								
To prevent dental caries	59	69.4	46	71.9	10	76.9	4.090	0.982
To prevent coloring/staining of the teeth	43	50.6	35	54.7	8	61.5		
To prevent gum diseases	30	35.3	23	35.9	5	38.5		
To provide a fresh breath	24	28.2	19	29.7	3	23.1		
As part of the daily routine	35	41.2	26	40.6	5	38.5		
Other	3	3.5	0	0	0	0		
Does your child have his/her own separate toothpaste?								
Yes	85	100	63	98.4	12	92.3	5.565	0.062
No	0	0	1	1.6	1	7.7		
When did you start using toothpaste for your child?								
As soon as eruption of the first deciduous teeth	6	7.1	12	18.8	0	0	10.247	0.036
Between ages 1 – 3	68	80a	38	59.4b	10	76.9ab		
After age 3	11	12.9	14	21.9	3	23.1		
Who puts toothpaste on your child's toothbrush?								
The child himself/herself	27	31.8	27	42.2	5	38.5	2.585	0.629
Mother or another adult	55	64.7	34	53.1	8	61.5		
Sometimes child sometimes mother	3	3.5	3	4.7	0	0		
The amount of toothpaste on the toothbrush								
Less than 1/3 of the brush	53	62.4	45	70.3	8	61.5	8.638	0.195
Less than 2/3 of the brush	28	32.9	12	18.8	5	38.5		
The length of the toothbrush	3	3.5	7	10.9	0	0		
Other	1	1.2	0	0	0	0		
What does your child do immediately after toothbrushing with toothpaste?								
Rinse with plenty of water and spit out	50	58.8	44	69.8	9	69.2	11.715	0.020
Spit out without rinsing	7	8.2	12	19	1	7.7		
Swallow toothpaste while brushing	28	32.9a	7	11.1b	3	23.1ab		

Table 4.7. Continued

What do you consider when choosing your child's toothpaste?*								
The content of the toothpaste	76	89.4	54	85.7	12	92.3	3.936	0.950
The taste/aroma of toothpaste	13	15.3	12	19	1	7.7		
Images on the package of toothpaste	2	2.4	3	4.8	0	0		
The price of the toothpaste	3	3.5	3	4.8	0	0		
Other	5	5.9	5	7.9	1	7.7		
What is your reason for choosing the brand of your child's toothpaste?*								
Dentist's recommendation	28	32.9	17	27	5	38.5	19.729	0.348
Recommended by friend/acquaintances.	14	16.5	6	9.5	2	15.4		
Price	2	2.4	1	1.6	1	7.7		
Accessibility	13	15.3	11	17.5	2	15.4		
Information on the package	13	15.3	20	31.7	5	38.5		
Aroma/taste	10	11.8	11	17.5	3	23.1		
Organic/Herbal toothpaste	39	45.9	35	55.6	4	30.8		
Containing fluoride	10	11.8	3	4.8	1	7.7		
Other	7	8.2	4	6.3	0	0		

Chi-square test, a-b: There is no difference between groups with the same letter in each line, *multiple response

The comparison of oral hygiene attitudes and behaviours of parents according to the number of their children is presented in Table 4.7. There was a statistically significant difference in commencing time of toothbrushing between the number of children in families ($p=0.026$). Most of the parents who had two children (36.4%) started brushing their children's teeth immediately after the eruption of the first deciduous teeth, while most of the parents who had one child (52.5%) and had three or more children (40%) started toothbrushing a few months to a year after the eruption of the first deciduous teeth. There was also a statistically significant difference between the number of children in families and the time to start using toothpaste ($p=0.036$). Compared to the parents with two children (59.4%), significantly more parents who had one child (80%) started using toothpaste for their children between 1 – 3 years.

There was a statistically significant difference between the number of children in the family and helping children during toothbrushing ($p=0.034$). More single-child parents (75.2%) reported helping their children brush their teeth than parents with two children (57.1%). In addition, parents with two children (9.1%) stated that significantly more of their children had not started toothbrushing yet. (Table 4.7)

There was a statistically significant difference between the after-brushing behaviours regarding the number of children in the family ($p=0.02$). To the question "What does your child do immediately after toothbrushing with toothpaste?" about 32.9% of parents with one child reported that their children swallow toothpaste while brushing, the significantly smaller number of parents with two children (11.1%) responded with the same answer. (Table 4.7)

Table 4.8. The comparison of parents' attitudes and practices of oral hygiene in their children between age groups of children

	<2 year		2-6 years		Test stat.	P
	n	%	n	%		
Does your child brush his/her teeth?						
Brushes more than twice a day	0	0	6	3.6	51.379	<0.001
Brushes twice a day	8	22.2	62	37.1		
Brushes once a day	9	25a	72	43.1b		
Brushes sometimes	8	22.2	26	15.6		
Brushes almost never	11	30.6a	1	0.6b		
Does your child get help from a parent while brushing his/her teeth?						
Yes	18	50a	119	71.3b	43.881	<0.001
No	9	25	48	28.7		
Has not started brushing yet	9	25a	0	0b		
Method of helping while your child brushes his/her teeth.*						
I perform brushing my child's teeth.	6	33.3	30	25.9	4.604	0.466
I hold the toothbrush with my child and make brushing movements together	9	50	41	35.3		
I give verbal instruction to my child while brushing himself/herself	8	44.4	53	45.7		
I check my child teeth after brushing himself/herself.	2	11.1	34	29.3		
I brush my own teeth at the same time with my child.	6	33.3	43	37.1		
From which sources did you learn the necessary information to ensure your child's oral hygiene?*						
Dentist	10	37	76	45.5	22.037	0.001
Pediatrician	20	74.1a	68	40.7b		
Pharmacy	0	0	5	3		
Family, relatives, and social environment	3	11.1a	51	30.5b		
Television, radio, newspaper, etc.	2	7.4	16	9.6		
Social media	10	37a	29	17.4b		
Does your child use toothpaste when brushing his/her teeth?						
Uses toothpaste every time	8	22.2a	137	82b	85.958	<0.001
Uses toothpaste. but not every time	5	13.9	21	12.6		
Doesn't use toothpaste	14	38.9a	9	5.4b		
Has not started brushing yet	9	25a	0	0b		

Table 4.8. Continued

What are your reasons for using toothpaste to brush your child's teeth? *						
To prevent dental caries	9	69.2	114	72.2	1.683	0.946
To prevent coloring/staining of the teeth	8	61.5	81	51.3		
To prevent gum diseases	4	30.8	58	36.7		
To provide a fresh breath	3	23.1	46	29.1		
As part of the daily routine	4	30.8	64	40.5		
Other	0	0	3	1.9		
Who puts toothpaste on your child's toothbrush?						
The child himself/herself	2	15.4	61	38.6	3.889	0.143
Mother or another adult	11	84.6	90	57		
Sometimes child sometimes mother	0	0	7	4.4		
What does your child do immediately after toothbrushing with toothpaste?						
Rinse with plenty of water and spit out	5	38.5a	106	67.5b	12.961	0.002
Spit out without rinsing	0	0	21	13.4		
Swallow toothpaste while brushing	8	61.5a	30	19.1b		
What do you consider when choosing your child's toothpaste?*						
The content of the toothpaste	11	84.6	137	87.3	5.930	0.313
The taste/aroma of toothpaste	0	0	28	17.8		
Images on the package of toothpaste	0	0	6	3.8		
The price of the toothpaste	1	7.7	5	3.2		
Other	2	15.4	9	5.7		
What is your reason for choosing the brand of your child's toothpaste?*						
Dentist's recommendation	4	30.8	47	29.9	10.751	0.293
Recommended by friend/acquaintances.	4	30.8	21	13.4		
Price	0	0	4	2.5		
Accessibility	0	0	26	16.6		
Information on the package	3	23.1	38	24.2		
Aroma/taste	0	0	24	15.3		
Organic/Herbal toothpaste	7	53.8	74	47.1		
Containing fluoride	0	0	15	9.6		
Other	0	0	12	7.6		

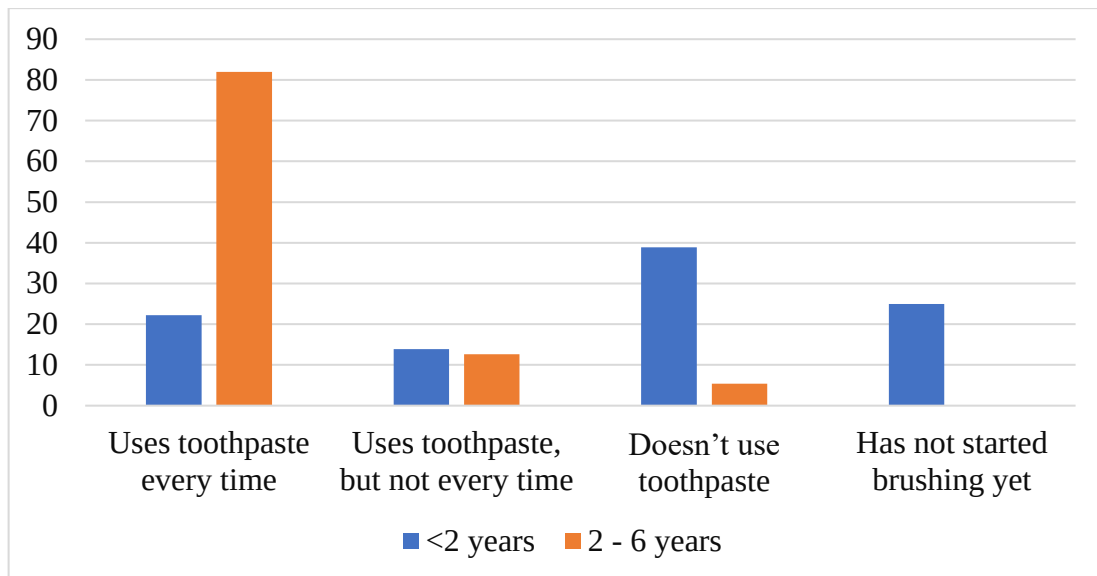
Chi-square test, a-b: There is no difference between groups with the same letter in each line, *multiple response

The comparison of oral hygiene attitudes and behaviours of parents according to ages of their children is presented in Table 4.8. There was a statistically significant difference between the age groups of children and frequency of toothbrushing ($p < 0.001$). Majority of children in the group of age between 2 – 6 years (43.1%) were reported brushing their teeth once a day. In the group of age under 2 years, about 30.6% of children reported almost never brushing their teeth, only 25% brushing once daily.

According to the responses to question “Does your child get help from a parent while brushing his/her teeth?” there was a statistically significant difference between the age groups of the children ($p < 0.001$). While half of the children under the age of 2 were helped by their families while brushing their teeth, 25% of these children had not yet started brushing their teeth. Parents stated that 71.3% of children between the ages of 2 and 6 received help from their parents while brushing their teeth. (Table 4.8)

When parents' information sources on oral hygiene were compared, there was a statistically significant difference between the age groups of the children ($p = 0.001$). Parents with children younger than two years learned information to maintain their children's oral hygiene mostly from pediatricians (74.1%), followed by dentists (37%) and social media (37%), versus parents with children in the age group of 2 to 6 years learned from dentists (45.5%), pediatricians (40.7%) and their families/relatives (30.5%). (Table 4.8)

There was a statistically significant difference in using toothpaste while toothbrushing between the age groups of the children ($p < 0.001$). Most of the children in the age group of 2 to 6 years (82%) used toothpaste every time while toothbrushing. However, significantly less children in the age group of under 2 years used toothpaste in every brushing (22.2%) and significantly more children not using toothpaste (38.9%) than children in the age group of 2 to 6 years (5.4%). In addition, about 25% of children in the age group of under 2 years had not started brushing their teeth yet. (Table 4.8 and Graph 4.4)



Graph 4.4. Distribution of using toothpaste while brushing according to children's age groups.

There was a statistically significant difference between the after-brushing behaviours and the age groups of the children ($p=0.002$). Regarding after brushing behavior, the majority of children in the age group between 2 to 6 years (67.5%) were reported as rinsing with plenty of water and spitting out. On the contrary, the majority of children younger than 2 years (61.5%) were swallowing toothpaste while brushing. There was no statistically significant difference between the distributions of the responses given to the other questions in comparison to the age groups of the children. (Table 4.8)

5. DISCUSSION

The cross-sectional questionnaire study was conducted among 203 parents of children aged under 6-year-old, attending the Pediatric Outpatient Departments of Koç University Hospital and Yeditepe University Hospital, Istanbul. Attitudes and practices of oral hygiene in a group of parents of preschool children attending paediatric outpatient departments were evaluated in this cross-sectional study. There was difference among the parents' attitudes and practices when compared according to the age groups of the parents, educational level of parents, relationship with the children (mother and father), number of the children in families, and the age group of the children. Therefore the null hypothesis was rejected.

In this study, children under 6 years were selected as the target group. This preschool period is important in developing and shaping the oral hygiene habits of children. In addition, the oral health of preschool has a significant impact on their future oral health. Therefore, understanding the oral hygiene practices of children and identifying the deficiencies is considered as an important step for the promotion of future oral health interventions.

Parents have an essential role in maintaining oral hygiene and developing toothbrushing habits during the first six years of children. Low parental knowledge towards oral health is associated with higher dental caries in younger children. Providing oral health education improves parents' ability and positively affects children's oral hygiene. The first step to developing oral health strategies should be understanding parents' culture, attitudes, and beliefs regarding oral hygiene, followed by identifying knowledge and deficiencies about oral health behaviours. Since there was not enough studies regarding parental perspectives on oral hygiene practices among preschool children, this study aimed to assess parents' attitudes and practices of oral hygiene in a group of preschool children attending two different paediatric outpatient departments in Istanbul.

Preschool children do not have literacy skills and cannot answer the questions adequately; therefore, this questionnaire was applied to the parents. While early visits to the dentist are important for promoting oral health, parents often visit the dentist after their children experienced important oral health problems, such as dental pain or

traumatic dental injuries. Young children contact with a family physician or pediatrician typically earlier than a child's first dental visit. Also, most of the previous epidemiological studies about oral health were performed in the dental departments at universities; this study was conducted in paediatric outpatient clinics to target a distinct demographic group. Since systemic diseases are known to affect children's oral hygiene practices, only parents of healthy children were included in the study to preserve the homogeneity of the data.

A questionnaire is a systematic data collection method used in epidemiological and sociological research to obtain information about people's thoughts, knowledge levels, attitudes, and behaviours on the relevant subject by asking some questions to a predetermined group of people. Close-ended questions are structured for standardized data, which enables to categorize responses, facilitate statistical analysis and compare systematically. Therefore, the questionnaire method with close-ended questions was used to obtain data in this study.

Questions about the frequency of toothbrushing evaluated the efficiency of toothbrushing practices, the timing of commencing toothbrushing and parents' method of supervising children. Criteria of parents' selection of toothpaste, amount of toothpaste usage and after-brushing behaviour were used to understand parents' attitudes toward the toothpaste utilization of children. In addition, the information sources of parents about oral hygiene were important in determining the pathways of oral health education for community-level interventions. Since, better knowledge about oral health might not always indicate better oral hygiene practices, the questionnaire of this study was prepared only to assess parents' attitudes and practices about oral hygiene among their children without evaluating as true or false.

Toothbrushing is fundamental for maintaining oral hygiene and promoting optimal oral health. It is well known that parents should commence toothbrushing immediately after the eruption of the first deciduous teeth (72,106). This study revealed that only 34% of parents started toothbrushing immediately after the eruption of the first deciduous teeth, whereas 42.9% began toothbrushing within a few months to a year after the eruption. However, it's concerning that 18.7% of parents had not started toothbrushing until more than a year after the eruption of the first deciduous teeth. The results of this study were similar to the results of studies conducted by Jain et al. (90), and Pranno et al.

(104), which reported preschool children started to brush their teeth mostly after the eruption of 4 to 6 deciduous teeth, indicating a few months to a year later than the eruption of the first teeth. Contrary to our results, Buckeridge et al. (107), Jahandideh and Tüloğlu (108) reported that most children started toothbrushing immediately after the eruption of the first deciduous teeth.

According to the data from the sample population evaluated in this study, a statistically significant relationship was determined between parental education levels and the time to commence toothbrushing for their children. Parents with higher levels of education were more likely to start toothbrushing for their children earlier than parents with lower education levels. Especially parents with university degrees were found to begin brushing their children's teeth earlier than those with a high school education or less. The differences in the timing of starting toothbrushing based on the number of children in families were also found statistically significant in our study. Parents with two children predominantly started toothbrushing immediately after the eruption of the first deciduous teeth (36.4%). In contrast, parents with one child tend to start toothbrushing later (52.5%), a few months to a year after the eruption of the first deciduous teeth. This difference may have resulted due to the possibility of parents with multiple children being more experienced and informed about oral hygiene practices.

In this study, parents reported varying frequencies of toothbrushing for their children. While most parents expressed their children brushing their teeth once daily (39.9%), fewer children brushed their teeth twice daily (34.5%). These findings showed similar results to the studies by Pullishery et al. (103) and Jain et al. (90) Since many children were reported to brush their teeth only once a day, we may highlight the need for interventions to promote toothbrushing twice daily. Also, the finding that 4.4% of parents had yet to start brushing their children's teeth reveals the importance of early oral hygiene education. According to the results of this study, toothbrushing frequency also varies between the age groups of children. While 43.1% of children in the age group of 2 to 6 years reported brushing their teeth once a day, 30.6% of children under two stated that they almost never brushed their teeth.

Preschool children do not have enough fine dexterity for effective brushing. For better oral hygiene, it is recommended that parents perform brushing their children's teeth or help their children while toothbrushing (67,74). In our study, the majority of parents

(67.5%) stated that they supervise their children during brushing, which was in accordance with previous studies (67,69). The relevant findings of this study showed that a significant proportion of parents (61.1% to 78.6%) across different educational levels actively supervise their children's toothbrushing. Parents with only one child were more likely to supervise and assist during toothbrushing (75.2%) than parents with two children (57.1%). This difference might indicate that parents with one child have more time to dedicate their child's oral hygiene practices.

In this study, parents' methods of helping their children were also investigated. These methods include directly brushing their children's teeth, holding the toothbrush, brushing together, and providing verbal instructions. Most parents (45.5%) stated that, they only give verbal instruction while children brush themselves; 37.3% hold toothbrushes and make brushing movements together with their children. Also, about 36.6% of parents said that they brushed their teeth simultaneously with their children. Bennadi et al. (67) also investigated the methods of helping, and almost half of the mothers reported helping by holding the brush together or brushing their children's teeth, as recommended. It was shown that the helping methods of toothbrushing vary based on factors such as the parent's and child's ages. Parents of younger children tend to help their children more hands-on, while parents of older children prefer verbal guidance during toothbrushing. While younger parents (between 30 to 34 years) (56.8%) reported helping by making brushing movements together, parents over 35 predominantly supervised their children by verbal instructions (62.5%). This significant difference in the helping methods might have resulted from parenting styles in different generations.

This study emphasized different sources for parents to obtain information about oral hygiene for their children. Paediatricians (45.4%) and dentists (44.3%) were identified as the primary sources of information. This finding demonstrates the importance of healthcare professionals in informing parents about oral hygiene practices. Approximately 27.8% of parents obtained information about oral hygiene practices from their families. This finding indicates that familial experiences and traditions shape parents' perceptions of oral health. While the percentage of parents using social media (20.1%) is relatively lower, it still highlights the potential impact of digital platforms on parents. Therefore, evaluating the reliability of information obtained through social media is essential. Jain et al. reported that mothers mainly got information about oral health

through newspapers and television (90). In the study by Salama et al., parents especially consider dentists, mass media and relatives as information sources about oral health (109).

For parents with children younger than two years, paediatricians were found as the primary source of information (74.1%) regarding oral hygiene practices in the present study. As children grow into the age group of 2 to 6 years, the effect of paediatricians as a source of information declined slightly (40.7%), while the influence of dentists increased (45.5%). Also, significantly more parents with children younger than two years around to be were influenced by social media (37%) for information. However, as children grow older, the influence of family members as information sources increased (30.5%), and social media reduced (17.4%). These findings suggest that parents prioritize health professionals as guidance as their children grow while considering their family's experiences and advice. The relevant result of this study also highlights the influence of social media among younger parents (43.8%) compared to older age groups, which shows younger generations' familiarity with digital platforms.

According to the data obtained in this study, the prevalence of toothpaste use among children was high, with 84.2% of parents reporting that their children used toothpaste during toothbrushing, similar to the findings of the study by Jain et al. (90). While a significant portion of parents stated that their children used toothpaste every time (71.4%), there were differences according to the age of children, age, and educational level of parents. Children aged 2 to 6 years showed significantly higher rates of toothpaste use (82%), while those under two years had a lower rate of toothpaste use (22.2%). Also, 38.9% of children under two years had not started using toothpaste. This finding highlights the importance of age-appropriate oral health education for parents with children in different age groups. This study showed a relation between parents' educational levels and the use of toothpaste. Parents with higher educational levels were more likely to ensure their children use toothpaste every toothbrush. Parents aged 30-39 exhibited a significantly higher prevalence of consistent toothpaste use for their children than those under 29. Also, most parents under 29 had not started brushing their children with toothpaste. This data may result from generational differences or a need for knowledge of younger parents about oral hygiene practices.

In the present study, most parents reported that the primary reason for using toothpaste while brushing their children was preventing dental caries, similar to the

previous studies by Pranno et al. (104) and Shirke and Katre (68). Half of the parents (52%) reported using toothpaste to prevent teeth colouring or staining. This result might reflect parents' concern for the aesthetic aspects of their children's oral health. Relatively more fathers chose the reason as "preventing gum disease" than mothers. Considering that the prevalence of gingivitis in preschool children is very low (60), parents are unlikely to choose anti-gingivitis toothpaste for their children. Therefore, fathers may have unconsciously stated their reasons for their own toothpaste.

Almost all children in this study (98.8%) were reported to use children's toothpaste, separated from their parents. In the other study in Eskişehir, Türkiye, by Jahandideh and Tüloğlu (108), conducted on children aged between 0 – 13 years, 67.4% of children used children's toothpaste. In another study (67,68,110), most mothers used adult toothpaste to brush their children's teeth. This difference may result due to socio-demographic differences between the studies.

Using toothpaste for young children immediately after the eruption of deciduous teeth in the oral cavity helps prevent early childhood caries (7,77). In our study, only 12.3% of children started using toothpaste immediately after the eruption of their first deciduous teeth. Most children began to use toothbrushing between the ages of 1 to 3 years. Pullishery et al. (103) reported that toothpaste was used only for children older than 20 months of age. Also, Bennadi et al. (67) determined that children started toothbrushing with toothpaste more than a year after the eruption of the first deciduous teeth, which showed similar results to our study. In this study, parents of single children and those with three or more children started using toothpaste for their children later than parents with two children. This finding might have resulted from differences in the parents' oral health knowledge and beliefs.

Younger children, particularly those under five have inadequate swallowing and expectorating reflexes and are likelier to ingest toothpaste while toothbrushing (48,79). Thus, using a minimal amount of toothpaste (a smear or rice-sized amount) is recommended to minimize fluoride ingestion while still protecting against dental caries. Furthermore, parents are advised to dispense toothpaste themselves in every use to minimize toothpaste consumption in children younger than six years (7,83,84). In our study, more than half of parents (59.1%) reported putting toothpaste on their children's toothbrushes themselves. Also, most parents reported using toothpaste less than 1/3 the

length of the toothbrush (64.9%) as recommended. Similar findings were also observed in the previous studies (108,111).

Children under six years should be encouraged to either rinse for a short time with a small amount of water or to spit out the toothpaste without rinsing to increase the effectiveness of fluoridated toothpaste (7,73). In our study, only a small number of children were reported to spitting out without rinsing (12.4%). In addition, a notable proportion of children were reported to swallow toothpaste while brushing (22.4%), similar to the results of Bennadi et al.(67), Sultan et al. (69) and Agboola et al. (110). This finding emphasizes the need to educate parents about the importance of after-brushing behaviours.

According to this study, a higher percentage of younger children under two years old were likelier to swallow toothpaste while brushing (61.5%). Among children aged between 2 to 6 years, a larger proportion (67.5%) reported rinsing with water and spitting out after brushing. These results are correlated with the developmental stages of motor skills and cognitive understanding of younger children. More parents of children with only one child (32.9%) reported their children swallowing toothpaste while brushing, compared to parents of children with two children (11.1%). This difference may be seen because parents with more than one child are more likely to be experienced in the oral health of their children.

There are many different commercial brands of toothpaste for children in Türkiye. This study determined the additional criteria of parents when choosing toothpaste for their children and the reasons for selecting the toothpaste brands. While 87.1% of parents considered the contents of toothpaste when choosing, only 8.8% specifically mentioned fluoride. However, in the other studies, most children were reported using fluoridated toothpaste (104,107,109).

Almost half of the parents (47.6%), the main criteria for selecting toothpaste based on their organic or herbal ingredients, the majority of the sample chose the brand ROCS (29.9%) for their children. Dental professional recommendations played a significant role in guiding parents' toothpaste choices, with 30% of parents reporting that they consider dentists' advice. Social influence with recommendations from friends and acquaintances also influenced the decisions of approximately 14.7% of parents. In this study, fathers

more frequently consider recommendations from friends/acquaintances (34.6%) than mothers. This result might be attributed to the differences in the reliability of the information from the social environment between the two genders. The main criteria for choosing children's toothpaste differed in previous studies. According to Bennadi et al., mothers selected toothpaste based on the suggestions of family and friends (67). In the study of Sultan et al., mothers were influenced mainly by television advertisements to choose toothpaste for their children (69). The main criterion of toothpaste reported by Agboola et al. was the brand of the toothpaste. Only in the study by Jahandideh and Tüloğlu most parents consider dentist recommendations for selecting their children's toothpaste (108).

Limitations of this study:

- The questionnaire of this study was self-reported, which might be subject to recall error and reporting bias. Additionally, the questionnaire contained a majority of close-ended questions that might not give a complete description of preferences. Open-ended questions might be more suitable to understand the behaviour or attitudes of participants in detail.
- The limited sample size might influence the findings of this study. Only parents who gave written consent and volunteered were included in the study. Since the questionnaires were conducted in two localized hospitals, and the socioeconomic level of parents was relatively high, these results cannot be reflected in the general population. Further quantitative and qualitative research studies on more extensive and diverse populations and for a more extended period are fundamental for a better understanding of the attitudes and practices of parents about their children's oral hygiene.

6. CONCLUSIONS

1. Only 34% of parents had initiated toothbrushing in their children immediately after the eruption of the first deciduous teeth, while 18.7% delayed toothbrushing for more than a year. Parents with higher education levels were likely to start toothbrushing earlier. Parents with a high school education (16.7%) had not begun toothbrushing yet ($p=0.031$). Also, parents with one child had started toothbrushing later (52.5%), a few months to a year after the eruption of the first deciduous teeth, than parents with two children (32.5%) ($p=0.026$).

2. Most parents reported their children brushed their teeth once daily (39.9%), whereas fewer brushed their teeth twice daily (34.5%). Almost half of the parents of children in the age group of 2 to 6 years (43.1%) reported brushing their teeth once a day, contrary to children under two years who rarely brushed their teeth (30.6%) ($p<0.001$).

3. Most parents (67.5%) reported they supervised their children during toothbrushing. Parents with one child appeared to be more involved in leading and assisting during toothbrushing (75.2%) than parents with two children (57.1%) ($p=0.034$). The majority of parents (45.5%) only gave verbal instructions while their children were brushing; only 26.9% of parents directly performed brushing their children's teeth. Parents aged between 30 and 34 reported predominantly helping their children by holding the toothbrush together and making brushing movements (56.8%). In contrast, parents over 35 were less actively involved in toothbrushing ($p=0.019$).

4. Regarding oral hygiene information, paediatricians (45.4%) and dentists (44.3%) were reported as primary sources for parents. Social media more influenced younger parents (43.8%) than parents older than 35 ($p=0.004$). For parents with children younger than two years, paediatricians were found to be the primary source of information (74.1%). For parents with children aged 2 to 6 years, the level of paediatricians' influence significantly decreased (40.7%). More parents with children younger than two reported social media (37%) as information sources compared to parents of children older than 2. Additionally, it was determined that, as children grow older, the influence of family members as information sources significantly increased (30.5%) ($p=0.001$).

5. Most parents (84.2%) reported their children used toothpaste during toothbrushing, and 71.4% used it regularly. Parents of children aged 2 to 6 years showed

significantly higher rates of toothpaste use (82%), while 38.9% of children under two years had not started using toothpaste ($p<0.001$). Parents older than 30 reported a significantly higher prevalence of regular toothpaste use for their children. Also, more parents under 29 (43.8%) had not started brushing their children with toothpaste ($p<0.001$).

6. The reason for using toothpaste while brushing their children was primarily reported as preventing dental caries (71.9%). Significantly more fathers stated their reason as "preventing gum disease" than mothers ($p=0.024$). Almost all children (98.8%) had a separate toothpaste from their parents, using children's toothpaste.

7. Only a minority of parents (12.3%) reported their children started using toothpaste immediately after the eruption of their first deciduous teeth. Parents with two children began using toothpaste for their children earlier than parents of single children and those with three or more children ($p=0.036$).

8. Regarding toothpaste application, parents generally stated they dispensed toothpaste on their children's toothbrushes themselves (59.1%). As for the amount of toothpaste, most parents reported using toothpaste less than 1/3 the length of the toothbrush (64.9%) during brushing.

9. Only a few parents reported children spitting out toothpaste without rinsing (12.4%) after brushing. Children younger than two years old were determined to be more prone to swallowing toothpaste (61.5%). In comparison, in children between 2 and 6 years, a more extensive proportion (67.5%) reported rinsing with water and spitting out after brushing ($p=0.002$). More parents of children with a single child (32.9%) said their children swallowed toothpaste while brushing, compared to parents of children with two children (11.1%) ($p=0.020$).

10. Regarding the selection of toothpaste, most parents (87.1%) reported they mainly considered the contents of toothpaste for their children. The most popular brand was ROCS (29.9%) for children's toothpaste. Organic or herbal ingredients (47.6%) were reported as the main criteria for selecting children's toothpaste brands, followed by dentist recommendations (30%). Fathers more frequently considered recommendations from friends/acquaintances (34.6%) than mothers ($p=0.011$).

Within the limitations and in line with the findings of this study, it was concluded that it would be beneficial for parents to have more information about their children's correct oral hygiene behaviours and the importance of using fluoridated toothpaste at an early age and receiving education at the earliest possible period to improve and develop children's oral and dental health.

Dental professionals should help and motivate parents to properly supervise and assist their children's brushing habits. The findings of this study highlighted areas for targeted oral health interventions and the importance of healthcare professionals in promoting optimal oral health in young children.



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8. APPENDICES

8.1. Ethical Approval

	YEDİTEPE ÜNİVERSİTESİ GİRİŞİMSEL OLMAYAN KLİNİK ARAŞTIRMALAR ETİK KURULU	Versiyon No 2.0 13.02.2022 Sayfa 1 / 2
KARAR FORMU		
15.03.2022		
ETİK KURUL BİLGİLERİ	Etik Kurulun Adı	Yeditepe Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu
	Açık Adres	Yeditepe Üniversitesi Kayışdağı Kampüsü, Tıp-Mühendislik Binası, Sağlık Bilimleri Enstitüsü, İnönü Mah. Kayışdağı Cad. 326A, 26 Ağustos Yerleşimi 34755 Ataşehir, İstanbul
	İnternet Sayfası	http://goetik.yeditepe.edu.tr/
	Telefon	0216 578 00 00
	E-posta	goetik@yeditepe.edu.tr
DEĞERLENDİRİLEN BELGELER	Islak imzalı başvuru dosyası, CD'si ve elektronik başvuru	☒
	Araştırma başlığı ve araştırmacıların isimleri	☒
	Başvuru dilekçesi	☒
	Başvuru Formu- Araştırmanın;	☒
	• Niteliği	☒
	• Önemi ve özgün değeri	☒
	• Amaç ve hedefleri	☒
	• Yöntemi	☒
	• Yönetimi	☒
	• Yaygın etkisi	☒
	• Araştırma bütçesi (Mevcutsa)	☒
	• Süresi ve uygunluğu (Zaman cetveli)	☒
	• Kaynakları	☒
	Bilgilendirilmiş Gönüllü Olur Formu (yapılan araştırmaya özel olarak hazırlanmış)	☒
	Taahhütname-1	☒
	Araştırmanın yapılacağı kurumdan izin alma sorumluluğunun araştırmacılara ait olduğuna dair taahhüt	☒
	Taahhütname-2	☒
	Dünya Tıp Birliği Helsinki Bildirgesinin son versiyonunun ve Sağlık Bakanlığı'nın ilgili tüm kılavuzlarının okunmasına dair taahhüt	☒
	Taahhütname-3	☒
	Daha önce yapılmış etik kurul başvuruları mevcut olup olmadığına dair taahhüt	☒
Taahhütname-4	☒	
Araştırma sırasında araştırma bütçesinde yer almayan ve gönüllünün kendisine veya Sosyal Güvenlik Kurumuna ek yük getirecek hiçbir işlem uygulanmayacağına dair taahhüt	☒	
Taahhütname-5	☒	
COVID-19 hastalarında tedavi yaklaşımları ve bilimsel araştırmalar genelgesi okunmasına dair taahhüt	☒	
Taahhütname-6	☒	
Milli Eğitim Bakanlığı Araştırma Uygulama İzinleri konulu yazının okunmasına dair taahhüt	☒	
Araştırmacıların her birisine ait özgeçmiş formu	☒	
Ek belgeler (Varsa kullanılan ölçek izinleri vb.)	☒	
KARAR BİLGİLERİ	Başvuru Numarası	202202162
	Toplantı Tarihi	11.03.2022
	Toplantı Yeri	Çevirim içi (Google Meet)
	Karar No	7
Araştırmanın Başlığı	İstanbul'da Çocuk Sağlığı ve Hastalıkları Polikliniklerine Başvuran Bir Grup Okul Öncesi Çocuğun Ebeveynlerinin Ağız Hijyeni Konusundaki Tutum ve Uygulamalarının Değerlendirilmesi	
Araştırmacılar	Dt. Melis Ünsal, Prof. Dr. Senem Selvi Kuvvetli	



BAŞVURU NUMARASI: 202202162

KARAR

15.03.2022

☒ KABUL	☐ RET ☐ KAPSAM DIŞI (GİRİŞİMSEL) ☐ BİLİMSEL VE/VEYA ETİK KURALLARA AYKIRI ☐ BİR SORUMLU ARAŞTIRMACININ (TEZ İŞE TEZ DANIŞMANI), BİR TOPLANTIYA iki (2) ADETTE FAZLA ÇALIŞMA BAŞVURUSUNDA BULUNMASI ☐ KURUM İÇİ BAŞVURULARINDA KURUMSAL E-POSTA HESABI İLE GİRİŞ YAPILMAMIŞ OLMASI ☐ ŞARTLI KABULDE BELİRTİLEN REVİZYONLARIN ZAMANINDA VE/VEYA İSTENİLDİĞİ ŞEKİLDE YAPILMAMIŞ OLMASI
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Araştırmanın Başlığı

İstanbul'da Çocuk Sağlığı ve Hastalıkları Polikliniklerine Başvuran Bir Grup Okul Öncesi
Çocuğun Ebeveynlerinin Ağız Hijyeni Konusundaki Tutum ve Uygulamalarının
Değerlendirilmesi

Araştırmacılar

Dt. Melis Ünsal, Prof. Dr. Senem Selvi Kuvvetli

8.2. Informed Consent Form



İstanbul'da Çocuk Sağlığı ve Hastalıkları Polikliniklerine Başvuran Bir Grup Okul Öncesi Çocuğun Ebeveynlerinin Ağız Hijyeni Konusundaki Tutum ve Uygulamalarının Değerlendirilmesi

Bilgilendirme:

Sayın Gönüllü,

“İstanbul'da Çocuk Sağlığı ve Hastalıkları polikliniklerine başvuran, bir grup okul öncesi çocuğun ebeveynlerinin ağız hijyeni konusundaki tutum ve uygulamalarının değerlendirilmesi” isimli bu araştırma Yeditepe Üniversitesi Dış Hekimliği Fakültesi Çocuk Dış Hekimliği Anabilim dalı doktora öğrencisi Dt. Melis Ünsal Çalışkaner'in doktora tezi kapsamında yapılmaktadır. Birinci kısımda 6, ikinci kısımda 15 soru olmak üzere toplam 21 sorudan oluşan bu anket çalışması için ayırmanız gereken süre yaklaşık olarak 15 dakikadır. Yaklaşık 195 gönüllü ile gerçekleştirilecek olan bu çalışma, elde edilecek verilerin istatistiksel yöntemlerle incelenmesi ile ebeveynlerin ağız hijyeni konusundaki tutum ve uygulamalarını göstermeyi amaçlamaktadır. Toplanan veriler doğru ya da yanlış uygulamalar olarak değerlendirilmeyecek olup, yalnızca mevcut durumu ortaya koyacaktır.

Bu araştırmaya katılmak gönüllülere hiçbir maddi ya da manevi yük oluşturmaz. Veriler değerlendirilirken kişisel bilgiler değerlendirmeye katılmayacak, yalnızca anket sorularına verilen cevaplar değerlendirilecektir. Bu çalışmaya katılmak gönüllülük esasına dayanmaktadır. Araştırma süresince herhangi bir zamanda gönüllü çalışmaya sağladığı verilerin değerlendirme dışında tutulmasını talep etmekte özgürdür. Çalışmaya sağlanan verilerin geri çekilmesinin gönüllülere karşı hiçbir yaptırımı, maddi ve/veya manevi hiçbir zararı olmayacaktır. Çalışmadan ayrılmak gönüllülerin, çalışmaya katıldıkları sağlık kuruluşundan aldıkları hizmetlerde aksamaya neden olmayacaktır.

Çalışmaya katılmayı kabul eden gönüllülerin kimlik ve iletişim bilgileri, çalışma sürecinde gönüllülere ulaşılması gereken hallerde kullanılmak üzere alınacaktır. Bu bilgilere çalışmanın yürütücüleri ve etik kurul tarafından doğrudan erişim sağlanabilir. Gönüllü bu bilgilendirilmiş gönüllü olur formunu imzalayarak bilgilerini paylaşmayı kabul etmiş sayılacaktır. Araştırmanın planı ve işleyişinde olacak değişiklikler, katılım sırasında alınan iletişim bilgileri kullanılarak gönüllülere bildirilecektir.

Ankete katılımınız için teşekkür ederiz.

Gönüllü Oluru:

Bilgilendirilmiş gönüllü olur formundaki tüm açıklamaları okudum ve bu çalışmanın kapsamı, amacı ve şekli ile ilgili tüm bilgiler bana aşağıda açık bilgileri yer alan hekim tarafından anlatıldı. Bu araştırmaya gönüllü olarak, hiçbir baskı ve zorlama olmaksızın kendi rızamla katılıyorum; bu araştırma sonucunda elde edilecek veriler ile oluşturulacak sonuçların bilimsel yayın, rapor ve benzeri dokümanlarda kullanılmasına izin veriyorum. Bu çalışma sonuçlarının kullanılmasını kısıtlamayacağımı beyan ediyorum.

Gönüllü (Vasisi):

Adı Soyadı:
E-posta Adresi:
Telefon Numarası:
İmza:

Tanık:

Adı Soyadı:
E-posta Adresi:
Telefon Numarası:
İmza:

Araştırma Yürütücüsü:

Adı Soyadı:
E-posta Adresi:
Telefon Numarası:
İmza:

Tarih ve Saat:

Tarih ve Saat:

Tarih ve Saat:

8.3. Questionnaire of The Study



İstanbul'da Çocuk Sağlığı ve Hastalıkları Polikliniklerine Başvuran
Bir Grup Okul Öncesi Çocuğun Ebeveynlerinin Ağız Hijyeni Konusundaki
Tutum ve Uygulamalarının Değerlendirilmesi

Bölüm 1:

1. Yaşınızı belirtiniz.

.....

2. Eğitim durumunuzu işaretleyiniz.

- a. İlkokul
- b. Ortaokul
- c. Lise
- d. Yüksekokul (Önlisans)
- e. Üniversite (Lisans)
- f. Yüksek Lisans
- g. Doktora

3. Çocuğa yakınlık derecenizi belirtiniz.

- a. Annesi
- b. Babası
- c. Diğer...

4. Kaç çocuğunuz var, belirtiniz.

.....

5. Pediatri muayenesine getirdiğiniz çocuğunuzun doğum tarihini belirtiniz.

...../...../.....

6. Çocuğunuzun cinsiyetini işaretleyiniz.

- a. Kız
- b. Erkek

Bölüm 2:

1. Çocuğunuz dişlerini fırçalıyor mu? (Lütfen sadece bir şık işaretleyiniz)
 - a) Günde ikiden fazla kez fırçalar
 - b) Günde iki kez fırçalar
 - c) Günde bir kez fırçalar
 - d) Bazen fırçalar
 - e) Neredeyse hiç fırçalamaz
2. Çocuğunuzun dişleri ne zaman fırçalanmaya başladı?
 - a) İlk süt diş sürdükten/çıktıktan hemen sonra
 - b) İlk süt dişi sürdükten/çıktıktan birkaç ay ila bir yıl sonra
 - c) İlk süt dişi sürdükten/çıktıktan bir yıldan fazla zaman geçtikten sonra
3. Çocuğunuz dişlerini fırçalarken bir ebeveyninden yardım alıyor mu?
 - a) Evet
 - b) Hayır
4. Eğer yanıtınız evet ise, çocuğunuz dişlerini fırçalarken nasıl yardım ediyorsunuz?
(Birden fazla şık işaretleyebilirsiniz.)
 - a) Çocuğumun dişlerini ben fırçalıyorum.
 - b) Diş fırçasını çocuğum ile tutarak fırçalama hareketleri yapıyorum.
 - c) Çocuğumu diş fırçalaması sırasında sözel olarak ile yönlendiriyorum.
 - d) Çocuğum dişlerini kendisi fırçaladıktan sonra kontrol ediyorum.
 - e) Çocuğum ile aynı anda kendi dişlerimi fırçalıyorum.
5. Çocuğunuzun ağız hijyenini sağlamak için gereken bilgileri hangi kaynaklardan öğrendiniz?
(Birden fazla şık işaretleyebilirsiniz.)
 - a) Diş hekimi
 - b) Çocuk doktoru
 - c) Eczane
 - d) Aile, akraba ve sosyal çevre
 - e) Televizyon, radyo, gazete, vb.
 - f) Sosyal medya

6. Evinizde çocuğunuzun dişlerinin fırçalanması sırasında diş macunu kullanılıyor mu?
- a) Her seferinde
 - b) Kullanılıyor ama her seferinde değil
 - c) Diş macunu kullanılmıyor

Eğer cevabınız a veya b şıkkı ise, aşağıdaki sorulara devam ediniz.

7. Çocuğunuzun dişlerini fırçalarken diş macununu hangi amaçla kullanıyorsunuz?
(Birden fazla seçenek işaretleyebilirsiniz)
- a) Diş çürüklerini önlemek
 - b) Dişin sararmasını/lekelenmesini önlemek
 - c) Diş eti hastalıklarını önlemek
 - d) Ferah bir nefes sağlamak/ağız kokusunu önlemek
 - e) Günlük rutinin bir parçası olarak
 - f) Diğer, belirtiniz.....
8. Çocuğunuzun kendine ait, ebeveynlerinden ayrı bir diş macunu var mı?
- a) Evet
 - b) Hayır
9. Çocuğunuz için diş macunu kullanmaya ne zaman başladınız?
- a) İlk süt dişi sürer sürmez/çıkar çıkmaz
 - b) 1-3 yaş arasında
 - c) 3 yaşından sonra
10. Diş macununu çocuğunuzun diş fırçasının üzerine kim koyuyor?
- a) Çocuğun kendisi
 - b) Annesi veya başka bir yetişkin
11. Çocuğunuzun dişlerinin fırçalanması sırasında kullanılan diş macunu miktarı aşağıdakilerden hangisi ile uyumludur? Lütfen işaretleyiniz.
- a) Fırçanın 1/3'ünden az.....
 - b) Fırçanın 2/3'ünden az.....
 - c) Fırçanın uzunluğu kadar.....
 - d) Diğer, belirtiniz...

12. Çocuğunuz dişlerini diş macunu ile fırçaladıktan hemen sonra ne yapıyor?

- a) Bol su ile çalkalayıp tükürtüyor.
- b) Su ile çalkalamadan sadece tükürtüyor.
- c) Fırçalama sırasında diş macununu yutuyor.

13. Çocuğunuza diş macunu seçerken nelere dikkat ediyorsunuz?

- a) Diş macununun içeriğine
- b) Diş macununun tadına/aromasına
- c) Diş macununun paketinin üzerindeki görsellere
- d) Diş macununun fiyatına
- e) Diğer, belirtiniz...

14. Şu anda çocuğunuz için kullandığınız diş macunu markasını belirtiniz.

.....

15. Bu markayı seçme nedeniniz? Birden fazla şık işaretleyebilirsiniz.

- a) Diş hekiminin önerisi
- b) Arkadaş/tanıdık önerisi
- c) Fiyatı
- d) Erişilebilirlik
- e) Paketin üstündeki bilgilendirme
- f) Aroması/tadı
- g) Organik/Bitkisel olması
- h) Flor içermesi
- i) Diğer, belirtiniz.

9. CURRICULUM VITAE

Personal Informations

Name	Melis	Surname	Ünsal Çalışkaner
Place of Birth		Date of Birth	
Nationality	T.C.	TR ID Number	
E-mail		Phone number	

Education

Degree	Department	The name of the Institution Graduated From	Graduation year
Master	Dentistry	Yeditepe University	2018
University	Dentistry	Yeditepe University	2018
High school	-	Bolu Fen Lisesi	2010

Languages	Grades
English	YDS 73.75

Computer Skills

Program	Level
Microsoft Office	Excellent

Scientific works

The articles published in the journals indexed by SCI, SSCI, AHCI

Tonguc Altin K, Topcuoglu N, Duman G, et al. Antibacterial effects of saliva substitutes containing lysozyme or lactoferrin against Streptococcus mutans. Arch Oral Biol. 2021;129.
Gurdogan Guler EB, Bayrak GD, Unsal M, Selvi Kuvvetli S. Effect of pediatric multivitamin syrups and effervescent tablets on the surface microhardness and roughness of restorative materials: An in vitro study. J Dent Sci. 2021;16(1).