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Pediatric oral and dental health knowledge in child development students

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ABSTRACT. Oral and dental problems can also affect general health. The aim of this study is to evaluate the senior child development undergraduate students' knowledge on pediatric oral and dental health and to examine the changes in their knowledge levels after the training. A 24-item questionnaire was sent to the participating students, in which their demographic characteristics and their knowledge about children's oral health were questioned. Afterwards, 3-hour training was given and the same questionnaire was sent again at the end of the training. One-way Anova and Mann-Whitney-U tests were used to compare quantitative variables. Fortysix students participated in this study. The students' knowledge score was 7.65±1.95 before the training; it was calculated as 9.78±2.06 after training. The difference was statistically significant ($p < 0.05$). The majority of the incorrect answers before the training were given for fluoride toothpaste use (78.3%), tooth brushing start period (60.9%), first permanent tooth eruption time (43.5%), and treatment option of caries in primary teeth(41.3%). A significant decrease was observed in these rates after the training ($p < 0.05$). Child development students have a moderate knowledge on oral and dental health and their knowledge levels increase with training. In order to raise children with better oral health habits, the undergraduate education of the Child Development Department needs to be rearranged.

Keywords: child development; oral dental health; education; knowledge level; Turkey.

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Introduction

Child development can be defined as the emotional, cognitive, and physical acquisitions the child acquires from birth to adolescence (Aral, Findik Tanrıbuyurdu, Yurteri Tiryaki, Saglam, & Aysu, 2015). In this context, the main goal of the child development department of universities is to support the mental, language, motor, social, emotional development, and self-care skills of children aged 0–18 with normal development, special needs, hospitalized, in need of protection, refugees and at risk. This department aims to train child development specialists who can evaluate the development of the child and provide services to the child, family, educator, and society to support development and skill fields (Dogan & Baykoc, 2015; Oktay, Yıldız-Celtek, Kuyucu, Kuzdan, & Tetikcok, 2016).

In this program, theoretical lectures and practical trainings are provided in all fields of child development for individuals under the age of 18 (Bagci & Aslan Bagci, 2018; Gulen & Donmez, 2020). Child development professionals work in the fields of health, education, social services and other sectors after graduation (Dogan & Baykoc, 2015). Pre-school education services, institutions that provide education to special need children, academics in universities, and child development specialists in hospitals are the most important business areas of child development graduates.

In the undergraduate program of the child development department, basic courses such as anatomy, physiology, first aid, child health and diseases, language development, special need education, and family counseling are given. Oral and dental health information is also explained in these courses and is not a separate course. It is important for child development specialists, who frequently associate with children, to have a certain knowledge about children's oral health as well as education activities, and general health information (Oktay et al., 2016). Oral cavity is the first gateway to our body, so oral and dental health is closely related to the general health. For this reason, oral and dental health should also be checked while monitoring child development.

Children may have problems due to caries and periodontal problems affecting the general health, and accurate detection of oral and dental findings can help in the early diagnosis of some diseases or syndromes (Colak, Dulgerdil, & Serdaroglu, 2010). For this reason, it is very important for pediatricians, nurses, teachers, and child development specialists who follow the development of children at an early stage to have knowledge about the development of teeth, optimum oral health, and directing to the dentist when necessary. Recently, the impact of oral and dental health on general health has been emphasized, and studies aimed at providing training for health workers on this subject (Kilinc, Yurt, Manisaligil, & Kızildag, 2020). As far as we know, there is no study in literature evaluating the knowledge of child development students on children's oral and dental health. Therefore, we aimed at evaluating the knowledge of senior child development undergraduate students on children's oral and dental health and to increase their knowledge using the training given.

Material and methods

This cross-sectional study was approved by the Ethics Committee of Biruni University (2021/50-03). Participation was completely voluntary and anonymous. It was assumed that the participants who responded to the anonymous questionnaire had given their consent to participate in the study. This study was conducted in compliance with the 2013 Helsinki declaration. The 24-item questionnaire was prepared by taking the opinions of 2 child development experts and 2 pediatric dentists and was organized using Google Forms. The questionnaire was directed to 60 senior students studying in Child Development Department of Health Sciences Faculty of Biruni and İstanbul Bilgi University during the academic year 2020–2021 through an online link via e-mail and social media platforms such as WhatsApp and Zoom. Subsequently, a 3-hour children's oral and dental health training was given on Zoom and students were asked to fill the same questionnaire after the training. During the training program, the basic information about children's oral and dental health was given, and it was aimed to keep the information in mind with interactive speeches and images. Incomplete or blank questionnaires were excluded from the study. The minimum sample size was 45 according to the power calculation (80%) for this study.

In May 2021, senior child development students responded the questionnaire before and after the training. The survey consisted of two parts: the first part was on the personal characteristics of the participants (3 questions) and the second part was on their knowledge on children’s oral dental health (21 questions). A 12-point scoring system was developed to assess the knowledge levels of the students (Table 1).The total knowledge level was calculated based on each student’s response. Each correct response was given a score of “1” and each incorrect response a score of “0”. The total score was calculated by collecting the scores ranging from 0 to 12, on a Likert Scale. According to this, the knowledge levels were categorized as uninformed (0), low knowledgeable (1–4), moderately knowledgeable (5–8), and high knowledgeable (9–12). The study data were obtained by internet e-survey results established by Google Forms. By directing the same questionnaire to the students before and after the training, the differences between their knowledge levels and awareness were evaluated.

Table 1. Scoring of the knowledge level.

Scoring item	Answer	Score
When does the first primary tooth erupt	6-12 months	1
When are primary teeth (dentition) completed	3 years	1
When does the first permanent tooth erupt	6-7 years	1
How many primary teeth are there in total	20	1
How many permanent teeth are there in total	32	1
Is the child's physical development important in terms of dental treatment	Yes	1
Is the child's mental development important in terms of dental treatment	Yes	1
When should be the first dental visit	With the eruption of first primary tooth	1
When should brushing/cleaning start	With the eruption of first primary tooth	1
Can fluoride toothpaste be used by children	Yes	1
Should decmonthsed primary teeth be treated	Yes	1
Is there a relationship between oral and dental health and the general development of the child	Yes	1
Total		12

0 - Uninformed / 1-4 low knowledgeable / 5-8 moderately knowledgeable / 9-12 high knowledgeable

Statistical analysis

Statistical analyses were performed using IBM SPSS 22nd version (SPSS IBM, Turkey). In the statistical analysis of the study data, in addition to descriptive statistical methods (mean, standard deviation, frequency), one-way ANOVA and Mann-Whitney U tests were used to compare the quantitative variables. Wilcoxon Signed Ranks test and McNemar test was used to compare the pre-training and post-training data. Significance was assessed at a level of $p < 0.05$.

Ethical approval statement

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Results

The students were aged between 21 and 44 years, and the study was conducted with 46 students, 2 (4.3%) men and 44 (95.7%) women. The average age of the students was 23.5 ± 4.61 years. All students agree that there was a change in their knowledge levels after the training, 73.9% of them strongly agree that there is a change in their level of knowledge after the training and 26.1% agree.

The knowledge level of the students was evaluated over 12 questions, and the distribution of answers to these questions is shown in Table 2. While 63% of the students answered "no" to the use of fluoride toothpaste in children before the training, they gave a "yes" response at the rate of 62.3% after the education. Regarding the treatment of caries in primary teeth, 23.9% answered "No, the primary teeth should be extracted immediately to prevent infection" before the training, while the rate of those who gave this answer after the training decreased to 8.7%. Before the training, students gave the answer of "10–11 years" at a rate of 17.4% (n = 8) for the time of first permanent tooth eruption and 23.9% (n = 11) for the time of first dental check-up after the completion of the primary teeth. These rates decreased significantly after the training ($p < 0.05$).

Table 2. Distribution of the answers given to the knowledge level scoring questions before and after the training.

		Before training	After training
		n (%)	n (%)
Q1-First primary tooth eruption time	0-3 months	4 (8.7%)	3 (6.5%)
	6-12 months	34 (73.9%)	39 (84.8%)
	12-18 months	7 (15.2%)	2 (4.3%)
	18-24 months	1 (2.2%)	2 (4.3%)
Q2-Completion time of primary dentition	2,5-3 years	33 (71.7%)	33 (71. 7%)
	4-5 years	8 (17.4%)	8 (17.4%)
	6-7 years	4 (8.7%)	4 (8.7%)
	8-9 years	1 (2.2%)	1 (2.2%)
Q3-First permanent tooth eruption time	3-4 years	7 (15.2%)	4 (8.7%)
	6-7 years	26 (56.5%)	35 (76.1%)
	10-11 years	8 (17.4%)	2 (4.3%)
	12-13 years	3 (6.5%)	5 (10.9%)
	Other	2 (4.3%)	-
Q4-Total number of primary teeth	15	10 (21.7%)	4 (8.7%)
	20	26 (56.5%)	37 (80.4%)
	24	8 (17.4%)	2 (4.3%)
	30	1 (2.2%)	-
	32	-	3 (6.5%)
	Other	1 (2.2%)	-
Q5-Total number of permanent teeth	15	7 (15.2%)	4 (8.7%)
	20	5 (10.9%)	3 (6.5%)
	24	3 (6.5%)	-
	30	1 (2.2%)	-
	32	30 (65.2%)	39 (84.8%)
Q6-The state of importance of the child's physical development in terms of dental treatment	Yes	42 (91.3%)	42 (91.3%)
	No	1 (2.2%)	2 (4.3%)
	Don't know	3 (6.5%)	2 (4.3%)
Q7-The state of importance of the child's	Yes	32 (69.6%)	43 (93.5%)

mental development in terms of dental treatment	No	6 (13%)	2 (4.3%)
	Don't know	8 (17.4%)	1 (2.2%)
Q10-Time for first dental visit	With the first primary tooth eruption /no later than the first year of age	30 (65.2%)	38 (82.6%)
	3 years old	5 (10.9%)	4 (8.7%)
	When primary dentition is completed	11 (23.9%)	3 (6.5%)
	When there is a pain	-	1 (2.2%)
Q11-Time to start brushing/cleaning teeth	With the first primary tooth eruption	18 (39.1%)	31 (67.4%)
	1 years old	10 (21.7%)	6 (13%)
	3 years old	8 (17.4%)	8 (17.4%)
	When primary dentition is completed	7 (15.2%)	-
	When permanent teeth begin to erupt	2 (4.3%)	1 (2.2%)
	Other	1 (2.2%)	-
Q12-The use of fluoride toothpaste by children	Yes	10 (21.7%)	30 (65. 2%)
	No	29 (63%)	14 (30.4%)
	Don't know	7 (15.2%)	2 (4.3%)
Q15-Treatment of decayed primary teeth	Yes	27 (58.7%)	37 (80.4%)
	No, it can wait, it will replaced by a new one anyway	8 (17.4%)	5 (10.9%)
	No, the teeth should be extracted immediately to prevent infection	11 (23.9%)	4 (8.7%)
Q17-Existence of a relationship between oral and dental health and the general development of the child	Yes	44 (95.7%)	46 (100%)
	No	1 (2.2%)	-
	Don't know	1 (2.2%)	-

Table 3 shows the evaluation of the relationship between the correct answers given by the students to the knowledge level scoring questions before and after the training. According to this, the correct response rates of the students about eruption time, number of primary and permanent teeth, tooth brushing, and dental treatment start times were statistically significantly higher after the training than before.

Table 3. The relationship of the correct answers to the knowledge level scoring questions before and after the training.

		Before training	After training	p
		n (%)	n (%)	
Q1-First primary tooth eruption time	Wrong	12 (26.1%)	7 (15.2%)	0.267
	Correct	34 (73.9%)	39 (84.8%)	
Q2-Completion time of primary dentition	Wrong	13 (28.3%)	13 (28.3%)	1.000
	Correct	33 (71.7%)	33 (71.7%)	
Q3-First permanent tooth eruption time	Wrong	20 (43.5%)	11 (23.9%)	0.049*
	Correct	26 (56.5%)	35 (76.1%)	
Q4-Total number of primary teeth	Wrong	20 (43.5%)	9 (19.6%)	0.043*
	Correct	26 (56.5%)	37 (80.4%)	
Q5-Total number of permanent teeth	Wrong	16 (34.8%)	7 (15.2%)	0.049*
	Correct	30 (65.2%)	39 (84.8%)	
Q6-The state of importance of the child's physical development in terms of dental treatment	Wrong	4 (8.7%)	4 (8.7%)	1.000
	Correct	42 (91.3%)	42 (91.3%)	
Q7-The state of importance of the child's mental development in terms of dental treatment	Wrong	14 (30.4%)	3 (6.5%)	0.001*
	Correct	32 (69.6%)	43 (93.5%)	
Q10-Time for first dental visit	Wrong	16 (34.8%)	8 (17.4%)	0.096
	Correct	30 (65.2%)	38 (82.6%)	
Q11-Time to start brushing/cleaning teeth	Wrong	28 (60.9%)	15 (32.6%)	0.007*
	Correct	18 (39.1%)	31 (67.4%)	
Q12-The use of fluoride toothpaste by children	Wrong	36 (78.3%)	16 (34.8%)	0.000*
	Correct	10 (21.7%)	30 (65.2%)	
Q15-Treatment of decayed primary teeth	Wrong	19 (41.3%)	9 (19.6%)	0.041*
	Correct	27 (58.7%)	37 (80.4%)	
Q17-Existence of a relationship between oral and dental health and the general development of the child	Wrong	2 (4.3%)		_
	Correct	44 (95.7%)	46 (100%)	

McNemar Test*$p < 0.05$.

Table 4 shows the answers given by the students to the multiple-choice questions before and after the training. The students' knowledge about the possibility of diarrhea and dermatitis during tooth eruption increased. After the training, more students reported that they could use finger massage and hyaluronic acid

gel to relax the child ($p < 0.05$). Again, after the training, there was an increase in the knowledge levels of the students about the use of fluoride in children, the treatment of bad oral habits and the emergency interventions that should be done in case of dental trauma.

Table 4. Evaluation of the answers to the multiple-choice questions before and after the training.

		Before training	After training	p
		n (%)	n (%)	
Q8-Symptoms that can be seen during teething	Fever	42 (91. 3%)	43 (93.5%)	1.000
	Hypersalivation	39 (84.8%)	41 (89.1%)	0.727
	Diarrhea	14 (30.4%)	29 (63%)	0.001*
	Insomnia	41 (89.1%)	44 (95.7%)	0.453
	Bad temper	38 (82.6%)	39 (84.8%)	1.000
	Itchy gums	44 (95.7%)	43 (93.5%)	1.000
	Putting finger in to mouth	42 (91.3%)	42 (91.3%)	1.000
	Dermatitis on the cheeks	14 (30.4%)	28 (60.9%)	0.009*
	Loss of appetite	34 (73.9%)	34 (73.9%)	1.000
Q9-Recommendations for relaxing the child during teething	Teethers	42 (91.3%)	41 (89. 1%)	1.000
	Finger massage	27 (58.7%)	38 (82.6%)	0.035*
	Antipyretic drugs	21 (45.7%)	24 (52.2%)	0.678
	Anesthetic gels	14 (30.4%)	25 (54.3%)	0.013*
	Hyaluronic acid gel	2 (4.3%)	14 (30.4%)	0.004*
	Other	-	2 (4.3%)	-
Q13-Time to start using fluoride toothpaste in children	At 6 months (with first tooth eruption)	5 (10.9%)	12 (26.1%)	0.118
	3 years old	6 (13%)	15 (32.6%)	0.064
	6 years old	6 (13%)	7 (15.2%)	1.000
	When the child acquires the ability to spit	12 (26.1%)	8 (17.4%)	0.388
	When the dentist recommends according to the caries risk	6 (13 %)	9 (19.6%)	0.581
	Fluoride is harmful, toothpastes with natural ingredients should be used in children	17 (37%)	4 (8.7%)	0.004*
Q14-What to do if the baby is born with teeth	Breast protector can be used	20 (43.5%)	30 (65.2%)	0.052
	Teeth can be grind by the dentist	8 (17.4%)	16 (34. 8%)	0.077
	It should be extracted immediately	6 (13%)	3 (6.5%)	0.375
	If it is not shakes it should be followed, if it is shakes it should be extracted	23 (50%)	28 (60.9%)	0.359
	Other	4 (8.7%)	3 (6.5%)	1.000
Q16-Recommendations for oral bad habits such as bottle/pacifier use, thumb sucking	Suggestions are given	12 (26.1%)	19 (41.3%)	0.210
	Finger nail polish / gloves are used	9 (19.6%)	28 (60.9%)	0.000*
	Bandages are used to prevent movement of the arm	3 (6.5%)	11 (23.9%)	0.057
	Oral appliances are used	8 (17.4%)	26 (56.5%)	0.000*
	Benefit from the reward system	29 (63%)	25 (54.3%)	0.557
	Other	3 (6.5%)	-	-
Q18-The relationship between oral and dental health and the child's general development	Nutrition	44 (95.7%)	42 (91.3%)	0.687
	Psychological development	21 (45.7%)	30 (65.2%)	0.078
	Social development	18 (39.1%)	32 (69.6%)	0.003*
	Speech problems	33 (71.7%)	41 (89.1%)	0.057
	Other	-	1 (2.2%)	-
Q19-In case of trauma, the storage media of broken tooth fragment or displaced tooth until going to the dentist	Wrap in napkin	15 (32.6%)	11 (23.9%)	0.481
	In water	21 (45.7%)	28 (60. 9%)	0.23
	In milk	11 (23.9%)	26 (56.5%)	0.006*
	In its own saliva	5 (10.9%)	24 (52.2%)	0.000*
	In bleacher	1 (2.2%)	-	-
	Other	2 (4.3%)	-	
Q20-Knowledge of behavioral management techniques that can be used in dental treatments of pediatric patients	Yes	12 (26.1%)	37 (80.4%)	0.000*
	No	16 (34.8%)	6 (13%)	
	Don't know	18 (39.1%)	3 (6.5%)	
Q21-Behavior management techniques that can be used in the dental treatment of pediatric patients (B.T. n=12, A.T. n=38)	Tell-Show-Do	9 (75%)	34 (89.5%)	0.250
	Modelling	8 (66.7%)	30 (78.9%)	1.000
	Positive behavior guidance	9 (75%)	31 (81.6%)	1.000
	Reinforcement	6 (50%)	20 (52.6%)	1.000
	Voice control	6 (50%)	20 (52.6%)	1.000

McNemar Test*$p < 0.05$.

When comparing the students' knowledge level scores before and after the training, the increase of scores observed after the training was found to be statistically significant ($p < 0.05$) (Table 5). The rate of being high knowledgeable before the education (45.7%) was found to be statistically significantly lower than after the education (80.4%) ($p < 0.05$) (Table 5). There was no statistically significant relationship between age/gender and knowledge level scores before and after training ($p>0.05$).

Table 5. Evaluation of the relationship between knowledge score and knowledge level before and after training.

		Before training	After training	p
		(Min-Max)-(Ort±SS (median))	(Min-Max)-(Ort±SS (median))	
Knowledge score		(4-12)-(7,65±1,95 (8))	(4-12)-(9,78±2,06 (10))	[1]0,000*
		n (%)	n (%)	
Knowledge level	Low	3 (6,5%)	2 (4,3%)	[2]0,018*
	Moderate	22 (47,8%)	7 (15,2%)	
	High	21 (45,7%)	37 (80,4%)	

[1]Wilcoxon Sign Test[2]McNemar Test*$p < 0.05$.

Discussion

Oral and dental health problems in children can be prevented by appropriate intervention and guidance of people who can observe children from an early age, such as primary healthcare providers and child development specialists (Fernando, Kanthi, & Johnson, 2013). In this study, the knowledge levels of child development senior students who can work in fields such as health, education, and social services were evaluated before and after training about child oral and dental health, and a significant increase was determinate in the knowledge level after the training.

Oral health is an important component of general health (Fernando et al., 2013). The development of babies is followed from birth, but they are not usually directed to dental care at an early age. In addition, since many mothers work in today's socio-economic conditions, primary care providers and pre-school teachers play an important role in assisting children access dental care (Mani, Aziz, John, & Ismail, 2010; Baltaci, Baygin, Tuzuner, & Korkmaz, 2019). Many oral health problems, such as dental caries, malocclusion, and fluorosis, begin in early childhood. In addition, many habits (tooth brushing, general/oral hygiene, thumb sucking, etc.) are acquired at the early school age. For this reason, monitoring oral and dental health at an early age by conscious personnel allows problems to be noticed and prevented in the early period (dela Cruz, Rozier, & Slade, 2004; Mani et al., 2010). In this study, the knowledge level of child development students about good oral hygiene habits and the effects and treatment methods of bad oral habits such as thumb sucking and tongue thrusting also increased. Oral and dental health education is not given as a separate course in health-related branches such as medical faculty, nursing, and child development departments, and a small place is allocated to oral health in education programs (Kilinc & Gunay, 2010; Kilinc et al., 2020). Having a high knowledge level about oral health by primary health care personnel and pre-school educators will help them to educate children and families correctly, to acquire the wright habits and to establish good oral health. They will also be able to help detect dental diseases at an early stage, advise children about the need for dental care, and refer them to a specialist (dela Cruz et al., 2004; Alshunaiber, Alzaid, Meaigel, Aldeeri, & Adlan, 2019)

Begzati, Meqa, Siegenthaler, Berisha, and Mautsch, (2011) showed that pre-school teachers do not have basic knowledge about oral health. On the contrary, in this study, the knowledge level of child development students about oral health was found to be moderate before training. Similar findings were seen in studies conducted in health services vocational school students, medical school students, and primary health care providers (dela Cruz et al., 2004; Ocek, Ertugrul, & Eden , 2008; Kilinc et al., 2020). In studies where preschool teachers (Khurana et al., 2020) and pediatricians (Jiang, Savageau, Riedy, & Silk, (2023) were trained about oral health in pediatric patients, it was observed that there was a significant increase in knowledge levels after the training. Similarlyin the present study, an increase was observed in the knowledge level after the training, and the students were found to be highly knowledgeable (80.4%). There was no significant difference between the knowledge level and age/gender. This is consistent with other studies examining the effects of oral training (dela Cruz et al., 2004; Douglass, Douglass, & Silk, 2005; Fernando et al., 2013).

Most students gave wrong answers on the use of fluoridated toothpaste, the time of the first dental visit, the time to start brushing, and the need for treatment of primary tooth decay. The European Academy of

Pediatric Dentistry (EAPD) recommends that the first dental visit should be done with the eruption of the first tooth (Kühnish et al., 2016). Vast majority of the pediatricians who participated in a multicenter study conducted in the USA, Saudi Arabia and Greece showed that they had accurate information about the first dental visit and the tooth brushing start time (Alrashdi, Limaki, & Alrashdi, 2021). One-third of the child development students in this study referred children for the first dental visit when their primary teeth were completed or at the age of 3, and more than half of them stated that they would refer children to the first dental visit until the age of 1 year. However, in a study conducted on pediatricians in Europe, only 7% of physicians stated that they referred children under 1 year old to the dentist (Hadjipanayis et al., 2018). In this respect, it is possible to say that the knowledge of students participating in this study is more up-to-date. Studies conducted in Turkey and Nigeria had similar results (Sezer, Paketci, & Bozaykut, 2013; Eke et al., 2015). Aburahima, Hussein, Kowash, Alsalami, and Al Halabi, (2020) reported that although most of the primary health care providers have correct knowledge about the time of the first dental visit, nearly half of them believe that the time to start brushing is 2-3 years old. Ayik, Özçelik, Akyüz, and Bahçecik, (2017) and Kilinc et al. (2020) also reported similar results in their study. In accordance with these studies more than half of the students in this study gave the wrong answer to the time to start brushing before the training. However, there was a significant increase in the level of knowledge after the training in this study.

Dental caries affects the social, psychological, dental, and general development of children. For this reason, interventions to prevent dental caries should be started from the first years of life and necessary treatments should be performed (Hadjipanayis et al., 2018). Although before training, the majority of the students stated that primary tooth treatments should be performed, 23.9% thought that the decayed primary teeth should be extracted immediately. The findings of this study are consistent with that by Ocek et al. (2008). However, Mani et al. (2010) found that the majority of participants reported that decayed primary tooth should not be treated (61.8%).

In the present study, more than half of the students think that fluoride is harmful for children and those who recommend fluoride do so after the age of 3 or when the child is able to spit. This result is similar to that conducted in Turkey, Europe, and America (Indira, Dhull, & Nandlal, 2015; Hadjipanayis et al., 2018; Kilinc et al. 2020). According to the latest guideline published by EAPD, daily use of fluoridated toothpaste is recommended at the first tooth eruption in children (Toumba et al., 2019). Alshunaiber et al. (2019) reported that only 22.8% of primary health care workers were aware of the use of fluoridated toothpaste could be recommended from the 6th month of age. In a study conducted in the USA, pediatricians and general practitioners had lower knowledge about infant oral health before training (Douglass et al., 2005). After the training, the recommendation rate of fluoridated toothpaste and first dental visit for 1 year old and younger increased. Similarly, Jiang et al. (2023) reported that the importance given to fluoride applications by pediatricians increased after the oral health training. In this study, most of the students after the training learned that fluoride is not harmful. Although the awareness about the time to use the first fluoridated paste increased, one-third of the participants reported that they would not recommend fluoride to children even after the training. It is seen that it is very difficult to break the prejudices of even healthcare professionals due to the many speculative news about fluoride around the world. For this reason, we still need to raise awareness about the relationship between fluoride and dental health.

Children's oral health knowledge includes knowledge of tooth development, dental trauma and caries prevention, diagnosis, and treatment (Sezer at al., 2013). In this study, most students correctly answered the eruption time of the first primary tooth and the total number of primary teeth. This result is compatible with that in the literature (Mani et al., 2010; Alshunaiber et al., 2019). On the other hand, in a study conducted in students of health faculties in India, less than half of the students answered correctly to questions such as the total number of teeth and the number of primary teeth (Sharda & Shetty, 2010). As in other studies in the literature, the eruption time of the first permanent tooth is among the most incorrectly answered questions in this study (Kilinc & Gunay, 2010; Kosan et al., 2017).However, the rate of correct answers in this study is higher than that in other studies. This may be due to the differences in the content of undergraduate education. Examining the percentages of correct answers after the training helps confirm that the oral and dental health knowledge of child development students in their undergraduate education is not fully sufficient to evaluate the child dental development.

Fall-related traumas are among the most common accidents in childhood (Bolukbas, Kahraman, Karaman, & Kalayci, 2007). In our study, the knowledge of students on what to do in case of trauma before training and the correct storage conditions of the tooth was insufficient (23.9%). After the training, this rate increased to

56.5%. Similarly, in the study of Sezer et al. (2013), the knowledge of physicians about what to do in case of dental trauma was found to be insufficient (25.6%). In addition, studies conducted with pre-school teachers in the literature reported that teachers do not know how to intervene in case of dental trauma, and they observed that theacher's knowledge level increased significantly with the training provided. (Baltaci et al. 2019; Khurana et al. 2020). Students studying in the department of child development; especially those who will work in pre-school institutions; should get adequate training on dental traumas, so they will enable them to intervene in a timely and correct manner.

The knowledge of primary healthcare providers and pre-school teachers about oral health was found to be moderate in many studies (dela Cruz et al., 2004; Douglass et al., 2005; Sezer et al., 2013; Aburahima et al., 2020; Alrashdi et al., 2021). Informing the society about oral health should not be the duty of dentists alone. Increasing the level of knowledge about oral and dental health of health professionals, child development specialists and educators who communicate with children in early age, and making necessary arrangements in undergraduate education about oral and dental health will help create healthier futures with better oral hygiene and oral hygiene habits.

Limitations

There are some limitations in this study. First of all, this study includes students in only two universities. Conducting the study across our country can help us achieve better results. In addition, we evaluated the knowledge of students immediately after the training, after a certain period of time, there may be changes in the students' answers. Longer-term studies are needed in the literature.

Conclusion

The knowledge levels of the child development students participating in this study on oral and dental health were moderate and their knowledge increased with the training provided. It has been concluded that there is a need for more detailed training on oral and dental health during undergraduate education of the child development department, which will be beneficial for public health. For this purpose, the undergraduate education of the department of child development should be rearranged and pediatric dentists, primary healthcare personnel, and pre-school educators should be in contact.

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