

# Comparative Analyses of the Computer Aided Presentation and Brochure Based Information on the Knowledge of Mothers Regarding the Oral Health Status of Their 0-3 Years Old Children

*Bilgisayar Destekli Sunum Şeklindeki Ağız Sağlığı Eğitimi ve Yüz Yüze Broşür Bazlı Bilgilendirmenin 0-3 Yaş Arası Çocuğu Bulunan Annelerin Çocuklarının Ağız ve Diş Sağlığı Hakkında Bilgi Düzeyine Etkisinin Değerlendirilmesi*

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## Keywords

Brochure-based information, computer aided presentation, dental health education, preventive dentistry, early childhood caries

## Anahtar Kelimeler

Broşür bazlı bilgilendirme, bilgisayar destekli sunum, dental sağlık eğitimi, koruyucu diş hekimliği, erken çocukluk çağı çürüğü

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## Abstract

**Objective:** The healthy habits that are created by parents during infancy play an important role in preventing oral and dental health problems, which cause decreased quality of life in children. In this study, the purpose was to evaluate the effectiveness of two different educational methods by providing oral and dental health training with computer-aided presentation (CAP) and Brochure-Based Information (BBI) methods for mothers who have 0-3 age group of children.

**Materials and Methods:** A total of 90 mothers who had children between the ages of 0-3 participated in this study. Before the training, the participants were asked to fill in the questionnaire forms that contained information on their demographic characteristics and oral hygiene practice knowledge, and the Pre-test (PreT) questionnaire forms that consisted of 12 questions to measure the information levels on oral and dental health of the participants. The participants were asked the same questions again immediately after the training (PostT1), and 3 months later (PostT2). Comparisons were made between the two types of training in terms of PreT, Post, T1 and Post-T2 follow-up periods. Additionally, time-dependent changes were calculated for each group. The chi-square, Mann-Whitney U, and McNemar test's were used during the statistical analyses. The p<0.05 level was considered significant in all analyses.

**Results:** In the PreT, no differences were found between the groups (p>0.05). The CAP group participants were found to be more successful in Q3 and Q4 in the PostT2 (p<0.05). Moreover, BBI group participants were found to be more successful in the PostT1 for Q12 (p<0.05) and for Q2, Q5, Q11, and Q12 in the PostT2. In some questions, the time dependent responses also significantly altered the CAP and BBI results.

**Conclusion:** It can be predicted that mothers have a lack of knowledge about the topics of the first dentist visit, early childhood caries and the use of fluoride toothpaste in children. The usage of the BBI method could have more successful outcomes in increasing the knowledge and awareness status of mothers compared to the CAP.

## Öz

**Amaç:** Çocuklarda yaşam kalitesinin düşmesine neden olan ağız ve diş sağlığı problemlerinin önlenmesinde ebeveynlerin bebeklik döneminde oluşturdukları sağlıklı alışkanlıkların önemli rolleri vardır. Bu araştırmada, 0-3 yaş grubu çocuğu

olan annelere bilgisayar destekli sunum (BDS) ve broŒr bazlı bilgilendirme (BBB) yntemleriyle ađız ve diŒ sađlıđı eđitimi verilerek iki farklı eđitim ynteminin etkinliđinin karŒılaŒtırmalı olarak deđerlendirilmesi amalandı.

**Gere ve Yntemler:** AraŒtırmaya 0-3 yaŒ arası ocuđu bulunan 90 anne katıldı. Eđitim ncesinde katılımcılardan ierisinde demografik zellikler ile oral hijyen uygulama bilgilerinin yer aldıđı anket formları ve katılımcıların ađız ve diŒ sađlıđı ile ilgili bilgi dzeylerini lmeyi amalayan 12 sorudan oluŒan n test (T) anket formlarını doldurmaları istendi. Katılımcılara eđitimden hemen sonra (ST1) ve 3 ay sonra (ST2) aynı sorular tekrar soruldu. Her iki eđitim tipi arasında n test, son test 1 ve son test 2 takip dnemleri aısından gruplar arasında karŒılaŒtırmalar yapıldı. Ayrıca her bir grupta zamana bađlı deđiŒimler hesaplandı. İstatistiksel analizler sırasında ki-kare, Mann-Whitney U ve McNemar testleri kullanıldı. Tm analizlerde  $p < 0,05$  dzeyi anlamlı olarak kabul edildi.

**Bulgular:** T'de gruplar arasında fark bulunmadı ( $p > 0,05$ ). BDS grubu katılımcılarının ST2 anketindeki 3. ve 4. sorularda daha baŒarılı oldukları grld ( $p < 0,05$ ). Ayrıca BBB grubu katılımcılarının ise ST1'de 12. soruda ( $p < 0,05$ ) ve ST2'de 2, 5, 11 ve 12. sorularda daha baŒarılı oldukları grld.

**Sonu:** Annelerin ilk diŒ hekimi ziyareti, erken ocukluk rkleri ve ocuklarda florlu diŒ macunu kullanımı konularında bilgi eksikliđine sahip oldukları tahmin edilebilir. BDS'ye gre BBB ynteminin kullanılması, annelerin bilgi ve farkındalık durumlarını artırmak iin daha baŒarılı sonulara sahip olabilir.

## Introduction

The dental caries during the primary teething period is a preventable and reversible process. However, if left untreated, pain, bacteremia risk, growth and developmental disorders, speech disorders, lack of self-confidence and damage to permanent teeth may occur (1).

Researchers reported that the main reason of the poor oral health of children might be inadequate knowledge and attitudes about oral and dental health of parents (especially mothers) and caregivers (2). Programs that promote health in early childhood are needed to be implemented to prevent the formation of dental caries (3). It has been shown in previous studies that there have been significant decreases in the incidence of dental caries among children groups who benefit from preventive programs (4-6). Although it is known that mothers have important roles in the care of her children, and that the main risk factors for many diseases are related with the lifestyle habits, it is considered that the trainings that will be provided especially for parents or caregivers with children between the ages of 0-3 may also reduce the risk of future dental problems (7-10). For this reason, parents and caregivers must have the right knowledge and attitude about oral health from as early periods as possible to give their children healthy oral habits.

When evaluated in terms of educational strategies, it was reported in previous studies that computer or web-assisted implementations (11), brochure-based trainings, face-to-face training and motivational interviews are necessary especially for pediatric age groups to protect and sustain oral health (12).

Researchers evaluate and analyze various training techniques in a comparative manner (12-14). In general, the trainings that are given and repeated may increase oral health, the level of knowledge and the motivation in a much more comfortable way especially in non-hospital settings (13-15).

### The hypotheses to be tested in this study are;

- 1- There may be differences between computer-aided presentation (CAP) and brochure-based information (BBI) training methods in terms of each question,
- 2- The educational methods can be different for each question in the tests to be applied in the pretests and post-tests (PostT) that will be applied in the CAP and BBI groups.

## Materials and Methods

### Study Design

The present study was conducted in a comparative manner with "Pre-test (PreT) - PostT model". CAP and BBI training types were evaluated comparatively.

In the present study, the CAP and face-to-face brochure-based oral health trainings were provided to the mothers with children between the ages of 0-3 in an isolated non-clinical/non-hospital setting. The trainings were carried out from August to November 2018. The approval of the Ethics Committee that was required for the study was obtained from the Directorate of the Ethics Committee of Clinical Research of the Faculty of Medicine of the Black Sea Technical University (protocol no: 2018/22; date: 02.03.2018).

### Oral Health Training

Before the mothers were provided with oral dental health training, informed consent forms was read and signed by the participants in the scope of the study. The questions were compiled from previous studies on this subject in the questionnaire (7,16,17). The form including demographic variables, oral hygiene habits were recorded. Also, the questionnaires consisted of 12 questions was applied on the oral dental health of children (Attachment 1). The timeline training events were given in Figure 1. The oral-dental health training in the form of CAP was carried out with 7-8 people in groups in 6 sessions in the form of a collective presentation with the help of projector, the BBI about oral and dental health was completed with sessions held in 5 different days by interviewing the participants face-to-face with the brochures. After the questionnaires were completed, the mothers were given toothbrushes and fluoride-free toothpastes for their children.

### Sample size calculation and randomization

The sampling size was calculated by using G Power 3.1.9.2 (Universitäre Kiel, Germany) programme. The confidence interval =95% and the beta error =0.01 were used for the calculation based on the study of Hallas et al. (7) and the total number of sampling was determined as 80. However by considering the potential data losses, the averaged final number was set as 100. Each group was divided into groups with computer-assisted randomization programme for 50 mothers.

Attachment 1. Oral and dental health survey questions	
Q1	The results of oral health problems in children
Q2	Whether the cause of tooth caries bacterial origin
Q3	Primary teeth eruption time
Q4	The first dentist examination time
Q5	Dentist examination frequency
Q6	How healthy milk teeth look
Q7	Early childhood caries risk factors related to nutrition
Q8	Baby's tooth cleaning
Q9	Time of the children alone tooth brushing time
Q10	Fluoride toothpaste use age
Q11	Choosing snacks for kids
Q12	Relationship between nutrition and caries in children

### Statistical Analysis

The SPSS (Statistical Package for Social Sciences, SPSS Inc. Chicago, IL, USA) 17.0 Statistical Package Program was used to analyze the data that were obtained in the study. The Kolmogorov-Smirnov, Mann-Whitney U, chi-square and McNemar tests were used for data analysis. The  $p < 0.05$  was considered to be significant in all analyses.

### Results

A total of 100 participants who were identified as the targets were reached by telephone and informed about the study in the scope of our study. Ninety of those invited to the study participated in the study and 47 mothers were included in the CAP Group and 43 mothers in the BBI Group. The flowing diagram of the study was given in Figure 2.

The distributions of the socio demographic data of the mothers who participated in the study are shown in Table 1. In this context, there was only a statistically significant difference between the educational and occupational status of the mothers between CAP and BBI group ( $p < 0.001$ ), and no significant differences were detected in terms of the number of children between 0-3 years of age, the number of children in other age groups, the genders of the children between 0-3 years of age monthly income of the family, and the ages of the mothers ( $p > 0.05$ ). It was determined that 87.2% of the mothers in the CAP group were university graduates, 8.5% were high school graduates; and 44.2% of the mothers in the BBI group were university graduates and 25.6% were high school graduates. In the CAP group, 72.3% of the participants were employed as teachers, and housewives were the most common occupation group in the BBI group 60.5% (Table 1). When the oral hygiene habits of the mothers and their children were evaluated, no significant differences were detected between CAP and BBI groups ( $p > 0.05$ ) (Table 2).

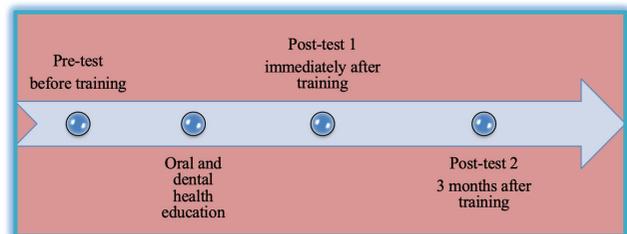
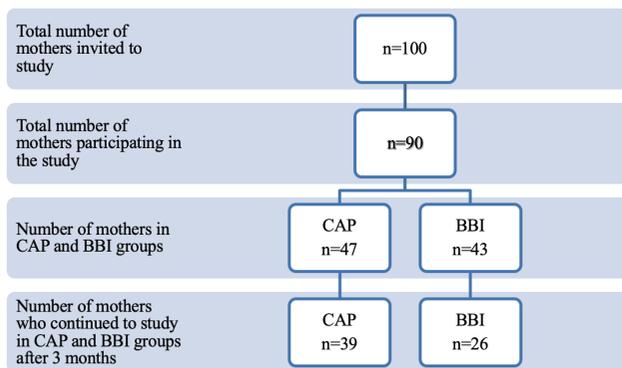


Figure 1. Timeline of study events

<b>Table 1. Socio-demographic distribution of participants by groups</b>				
	<b>CAP (n=47)</b>	<b>BBI (n=43)</b>	<b>Total (n=90)</b>	<b><sup>1</sup>p,<sup>2</sup>p,<sup>3</sup>p</b>
	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	
<b>Mother education</b>				
Primary	2 (4.3%)	9 (20.9%)	11 (12.2%)	<sup>1</sup> p<0,001
High school	4 (8.5%)	11 (25.6%)	15 (16.7%)	
University	41 (87.2%)	19 (44.2%)	60 (66.7%)	
Master's degree	0 (0%)	4 (9.3%)	4 (4.4%)	
<b>Number of children 0-3 years</b>				
1 child	43 (91.5%)	38 (88.4%)	81 (90%)	<sup>2</sup> p=0.443; p>0.05
2 child	4 (8.5%)	5 (11.6%)	9 (10%)	
<b>Number of children in other age</b>				
0	23 (48.9%)	22 (51.2%)	45 (50%)	<sup>2</sup> p=0.790; p>0.05
1 child	15 (31.9%)	11 (25.6%)	26 (28.9%)	
2 child	7 (14.9%)	9 (20.9%)	16 (17.89%)	
3 child	2 (4.3%)	1 (2.3%)	3 (3.3%)	
<b>Child gender</b>				
1 girl	21 (44.7%)	18 (41.9%)	39 (43.3%)	<sup>2</sup> p=0.469; p>0.05
1 boy	22 (46.8%)	20 (46.5%)	42 (46.7%)	
2 girls	2 (4.3%)	1 (2.3%)	3 (3.3%)	
2 boys	0 (0%)	1 (2.3%)	1 (1.1%)	
1 boy ande 1 girl	0 (0%)	2 (4.7%)	2 (2.2%)	
Unknown answer	2 (4.3%)	1 (2.3%)	3 (3.3%)	
<b>Average family monthly income</b>				
0-2000 TL	3 (6.4%)	3 (7.0%)	6 (6.7%)	<sup>2</sup> p=0.060; p>0.05
2000-5000 TL	14 (29.8%)	23 (53.5%)	37 (41.1%)	
≥5000 TL	30 (63.8%)	17 (39.5%)	47 (52.2%)	
<b>Mother occupation</b>				
Teacher	34 (72.3%)	4 (9.3%)	38 (42.2%)	<sup>1</sup> p<0.001
Computer programmer	1 (2.1%)	0 (0%)	1 (1.1%)	
Doctor	1 (2.1%)	2 (4.7%)	3 (3.3%)	
Banker	1 (2.1%)	1 (2.3%)	2 (2.2%)	
Medical secretary	1 (2.1%)	1 (2.3%)	2 (2.2%)	
Lawyer	1 (2.1%)	0 (0%)	1 (1.1%)	
Teknician	0 (0%)	1 (2.3%)	1 (1.1%)	
Nurse	0 (0%)	2 (4.7%)	2 (2.2%)	
Housewife	8 (17%)	26 (60.5%)	34 (37.8%)	
Student	0 (0%)	1 (2.3%)	1 (1.1%)	
Architect	0 (0%)	1 (2.3%)	1 (1.1%)	
Business	0 (0%)	1 (2.3%)	1 (1.1%)	
Chemist	0 (0%)	1 (2.3%)	1 (1.1%)	
Operation responsible	0 (0%)	1 (2.3%)	1 (1.1%)	
Akademician	0 (0%)	1 (2.3%)	1 (1.1%)	
Mean age (minimum - maximum)	33.06±4.204 (25-46)	32.23±4.529 (25-43)		

<sup>1</sup>p: Pearson chi-square, <sup>2</sup>p: Fisher's Exact test, <sup>3</sup>p: Mann-Whitney U tests were performed. Values of p<0.05 were considered statistically significant. CAP: Computer aided presentation, BBI: Brochure based information, TL: Turkish lira

The comparison between the groups based on the correct answers given by the participants in both groups to the questions in the questionnaire in the PreT, PostT1 and PostT2 is shown in Table 3. In this respect, no statistically significant differences were detected between the CAP and BBI groups in 12 questions answered in the PreT questionnaire ( $p>0.05$ ), and it was determined that the BBI group was more successful in the Q12 ( $p=0.030$ ) in the PostT1, and the BBI group was more successful in the in the Q2 ( $p=0.021$ ), Q5 ( $p=0.044$ ), Q11 ( $p=0.042$ ) and Q12 ( $p=0.048$ ) in the PostT2 questionnaire; and the



**Figure 2.** Distribution of the number of participants at baseline and follow-up periods

CAP: Computer aided presentation, BBI: Brochure based informatio

CAP group was more successful in the Q3 ( $p=0.035$ ) and in the Q4 ( $p=0.048$ ) in the PostT2 questionnaire.

The correct answer numbers and rates of the mothers who participated in the study in CAP and BBI Groups are shown in Table 4. In this respect, in the CAP Group, “dental caries are bacterial (Q2)” and “the time when children started to brush their teeth (Q9)” was the questions that were most correctly answered (83%), and it was determined that the rate of the correct answers given to the question was the least with a rate of 17% in the question “the age of using fluoride toothpaste (Q10)”; however, it was also determined that the rate of this question increased at a significant level after the training. When the question-based intra-group changes were examined in the CAP Group, it was determined that there were statistically significant increases in the PreT and PostT1 in the Q1 ( $p<0.001$ ), Q3 ( $p=0.008$ ), Q4 ( $p<0.001$ ), Q5 ( $p=0.027$ ), Q6 ( $p=0.006$ ), Q7 ( $p<0.001$ ), Q10 ( $p<0.001$ ) and Q11 ( $p=0.003$ ); and between the PreT and PostT2 in the Q7 ( $p=0.012$ ), Q10 ( $p=0.021$ ) and Q12 ( $p=0.039$ ); and there was a decrease at a statistically significant level in the Q1 ( $p=0.016$ ) and Q4 ( $p=0.022$ ) between the PostT1 and PostT2 questionnaires.

In the BBI group, “dental caries are bacterial (Q2)” was the most correctly answered question with a rate

	CAP (n=47)	BBI (n=43)	Total (n=90)	2p
Oral hygiene habits of the mothers	Yes (percent)	Yes (percent)	Yes (percent)	
Would you go to the regular dentist twice a year?	16 (34%)	10 (23.3%)	26 (28.9%)	<sup>2</sup> p=0.186; p>0.05
Do you brush your teeth regularly twice a day?	41 (87.2%)	38 (88.4%)	79 (87.8%)	<sup>2</sup> p=0.564; p>0.05
Do you use additional products such as floss, mouthwash?	27 (57.4%)	23 (53.5%)	50 (55.6%)	<sup>2</sup> p=0.434; p>0.05
Do you consume more than one snack per day between the main meals?	34 (72.3%)	29 (67.4%)	63 (70%)	<sup>2</sup> p=0.391; p>0.05
Oral hygiene practices for your child				
Do you clean your child’s teeth?	40 (85.1%)	30 (69.8%)	70 (77.8%)	<sup>2</sup> p=0.067; p>0.05
Do you add sugar-containing foods to the food you give to your child?	17 (36.2%)	16 (37.2%)	33 (36.7%)	<sup>2</sup> p=0.546; p>0.05
Have you ever taken your child to a dentist?	15 (31.9%)	9 (20.9%)	24 (26.7%)	<sup>2</sup> p=0.174; p>0.05

<sup>2</sup>p: Fisher’s Exact test was performed. Values of p<0.05 were considered statistically significant. CAP: Computer aided presentation, BBI: Brochure based information

**Table 3. Comparison of oral health information questionnaire between the groups in the beginning and follow-up periods**

	PreT	PostT1	PostT2
Q1.'The results of oral health problems in children'	p>0.05	p>0.05	p>0.05
Q2.'Whether the cause of tooth caries bacterial origin'	p>0.05	p>0.05	<sup>2</sup> p=0.021; p<0.05
Q3.'Primary teeth eruption time'	p>0.05	p>0.05	<sup>2</sup> p=0.035; p<0.05
Q4.'The first dentist examination time'	p>0.05	p>0.05	<sup>2</sup> p=0.048; p<0.05
Q5.'Dentist examination frequency'	p>0.05	p>0.05	<sup>2</sup> p=0.044; p<0.05
Q6.'How healthy milk teeth look'	p>0.05	p>0.05	p>0.05
Q7. 'Early childhood caries risk factors related to nutrition'	p>0.05	p>0.05	p>0.05
Q8.'Baby's tooth cleaning'	p>0.05	p>0.05	p>0.05
Q9. 'Time of the children alone tooth brushing time'	p>0.05	p>0.05	p>0.05
Q10.'Fluoride toothpaste use age'	p>0.05	p>0.05	p>0.05
Q11.'Choosing snacks for kids'	p>0.05	p>0.05	<sup>2</sup> p=0.042; p<0.05
Q12.'Relationship between nutrition and caries in children'	p>0.05	<sup>2</sup> p=0.030; p<0.05	<sup>2</sup> p=0.048; p<0.05

<sup>2</sup>p: Fisher's Exact test was performed. Values of p<0.05 were considered statistically significant. PreT: Pre-test, PostT1: Post-test 1, PostT2: Post-test 2

of 88%. The least correctly answered question was the "early childhood caries (ECC) risk factors (Q7)" with a rate of 16%; however, it was also determined that it increased at a significant level right after the training. It was determined that the number of the correct answers given to all questions increased in the PostT1 questionnaire compared to the PreT questionnaire. When the PreT and PostT1 questionnaire answers were compared, it was determined that there were significant improvements in 8 questions. When the time-dependent variations were compared between the questionnaires in the BBI group, statistically significant increases were detected between the PreT and PostT1 in the Q1 (p<0.001), Q4 (p<0.001), Q5 (p<0.001), Q6 (p=0.013), Q7 (p<0.001), Q10 (p<0.001), Q11 (p<0.001) and Q12 (p=0.002); and between the PreT and PostT2 in the Q1 (p=0.016), Q6 (p=0.006), Q7 (p=0.012) and Q12 (p=0.006); and there were decreases at significant levels between the PostT1 and PostT2 in the Q4 (p=0.008), Q7 (p=0.039) and Q10 (p<0.001) (Table 4).

Sixty-five of the 90 mothers who participated in the study completed the study by also filling out the PostT2 questionnaire, 39 of these participants were CAP group and 26 were BBI group participants. To determine whether the attendance in our study had an effect on the outcomes of the study, intra-group and intergroup comparisons were made for the data

of continuing (n=65) and non-continuing (n=25) mothers. No significant differences were detected between the participants who continued and who did not continue (missing) in any of the items in which the demographic data and oral hygiene habits were questioned in the intra-group comparisons. When the questions in the questionnaires were evaluated, it was determined that there were significant differences in terms of the continuing mothers only in the 5<sup>th</sup> question in the PreT questionnaire in the CAP group (p=0,028), and in the 6<sup>th</sup> question (p=0.029) in the PostT1 questionnaire in the BBI group.

As a result of the sensitivity analysis made by substituting the missing data in the responses of the participants who did not continue (missing) the study in the pre-training questionnaires with the answers given in the PostT2 questionnaire, which was carried out 3 months after the training, it was determined that there were no statistically significant in any of the 12 questions in the PostT2 questionnaire between the CAP and BBI groups (p>0.05)

## Discussion

As a result of our study, it was determined in the inter-group and intra-group comparisons that there were no significant differences in all the questions; for this reason, the two hypotheses that were tested were not

**Table 4. Intra-group comparison of oral health information questionnaire at baseline and two follow-up periods**

Questions	PreT		PostT1		PostT2		PreT-postT1		PreT-postT2		PostT1-PostT2	
	CAP	BBI	CAP	BBI	CAP	BBI	CAP	BBI	CAP	BBI	CAP	BBI
	n=47	n=43	n=47	n=43	n=39	n=26	<sup>4</sup> p	<sup>4</sup> p	<sup>4</sup> p	<sup>4</sup> p	<sup>4</sup> p	<sup>4</sup> p
Q1. The results of oral health problems in children	31 (66%)	24 (56%)	46 (98%)	39 (91%)	31 (79%)	22 (85%)	<sup>4</sup> p<0.001	<sup>4</sup> p<0.001	<sup>4</sup> p=0.065 p>0.05	<sup>4</sup> p=0.016 p<0.05	<sup>4</sup> p=0.016 p<0.05	<sup>4</sup> p=0.625 p>0.05
Q2. Whether the cause of tooth caries bacterial origin	39 (83%)	38 (88%)	44 (94%)	40 (93%)	33 (85%)	25 (96%)	<sup>4</sup> p=0.18 p>0.05	<sup>4</sup> p=0.727 p>0.05	<sup>4</sup> p=0.754 p>0.05	<sup>4</sup> p=0.625 p>0.05	<sup>4</sup> p=0.219 p>0.05	<sup>4</sup> p=1.00 p>0.05
Q3. Primary teeth eruption time	38 (81%)	34 (79%)	46 (98%)	39 (91%)	35 (90%)	21 (81%)	<sup>4</sup> p=0.008 p<0.05	<sup>4</sup> p=0.180 p>0.05	<sup>4</sup> p=0.453 p>0.05	<sup>4</sup> p=1.00 p>0.05	<sup>4</sup> p=0.375 p>0.05	<sup>4</sup> p=0.375 p>0.05
Q4. The first dentist examination time	21 (45%)	17 (40%)	43 (91%)	39 (91%)	27 (69%)	16 (61%)	<sup>4</sup> p<0.001	<sup>4</sup> p<0.001	<sup>4</sup> p=0.134 p>0.05	<sup>4</sup> p=0.227 p>0.05	<sup>4</sup> p=0.022 p<0.05	<sup>4</sup> p=0.008 p<0.05
Q5. Dentist examination frequency	31 (66%)	24 (56%)	42 (89%)	41 (95%)	30 (77%)	22 (85%)	<sup>4</sup> p=0.027 p<0.05	<sup>4</sup> p <0.001	<sup>4</sup> p=1.00 p>0.05	<sup>4</sup> p=0.109 p>0.05	<sup>4</sup> p=0.227 p>0.05	<sup>4</sup> p=0.125 p>0.05
Q6. How healthy milk teeth look	31 (66%)	24 (56%)	41 (87%)	34 (81%) n=42	31 (79%)	22 (85%)	<sup>4</sup> p=0.006 p<0.05	<sup>4</sup> p=0.013 p<0.05	<sup>4</sup> p=0.146 p>0.05	<sup>4</sup> p =0.006 p<0.05	<sup>4</sup> p=0.375 p>0.05	<sup>4</sup> p=0.688 p>0.05
Q7. ECC risk factors related to nutrition'	13 (28%)	7 (16%)	36 (76%)	35 (81%)	23 (59%)	14 (54%)	<sup>4</sup> p<0.001	<sup>4</sup> p<0.001	<sup>4</sup> p=0.012 p<0.05	<sup>4</sup> p =0.012 p<0.05	<sup>4</sup> p=0.302 p>0.05	<sup>4</sup> p=0.039 p<0.05
Q8. Baby's tooth cleaning	31 (66%)	27 (63%)	29 (62%)	32 (74%)	28 (72%)	19 (73%)	<sup>4</sup> p=0.791 p>0.05	<sup>4</sup> p=0.302 p>0.05	<sup>4</sup> p=0.508 p>0.05	<sup>4</sup> p=0.388 p>0.05	<sup>4</sup> p=0.549 p>0.05	<sup>4</sup> p=0.688 p>0.05
Q9. Time of the children alone tooth brushing time	40 (83%)	32 (74%)	41 (87%)	34 (79%)	31 (79%)	22 (85%)	<sup>4</sup> p=0.727 p>0.05	<sup>4</sup> p=0.774 p>0.05	<sup>4</sup> p=1.00 p>0.05	<sup>4</sup> p=0.344 p>0.05	<sup>4</sup> p=0.688 p>0.05	<sup>4</sup> p=1.00 p>0.05
Q10. Fluoride toothpaste use age	8 (17%)	8 (19%)	29 (62%)	34 (79%)	16 (41%)	9 (35%)	<sup>4</sup> p<0.001	<sup>4</sup> p<0.001	<sup>4</sup> p=0.021 p<0.05	<sup>4</sup> p=0.388 p>0.05	<sup>4</sup> p=0.146 p>0.05	p<0.001
Q11. Choosing snacks for kids	30 (64%)	24 (56%)	41 (87%)	41 (93%)	28 (72%)	21 (81%)	<sup>4</sup> p=0.003 p<0.05	<sup>4</sup> p<0.001	<sup>4</sup> p=0.344 p>0.05	<sup>4</sup> p=0.039 p>0.05	<sup>4</sup> p=0.109 p>0.05	<sup>4</sup> p=0.375 p>0.05
Q12. Relationship between nutrition and caries in children	33 (68%)	28 (65%)	36 (76%)	40 (93%)	34 (87%)	24 (92%)	<sup>4</sup> p=0.481 p>0.05	<sup>4</sup> p=0.002 p<0.05	<sup>4</sup> p=0.039 p<0.05	<sup>4</sup> p=0.006 p<0.05	<sup>4</sup> p=0.267 p>0.05	<sup>4</sup> p=1.00 p>0.05

<sup>4</sup>p: McNemar test was performed. Values of p<0.05 were considered statistically significant. CAP: Computer aided presentation, BBI: Brochure based information, PreT: Pre-test, PostT1: Post-test 1, PostT2: Post-test 2, ECC: Early childhood caries

accepted for all questions, and were partially accepted.

Our study was conducted with a 72% participation rate in the 3-month follow-up period with a total of 90 mothers in two groups. Although the number of the participants was determined to be 100 in the sampling size calculation (7), 90 mothers were able to participate in the study, and in addition to the insufficient interest

in the training through mass media, the fact that the society does not pay adequate attention for this issue may suggest that it is effective for mothers to engage in the caretaking of their children, and not be able to devote time to train them because of the criteria of having children between the ages of 0-3. A total of 65 of the 90 mothers who participated in

the study completed the study by filling in the PostT2 questionnaire in the 3<sup>rd</sup> month after the training.

In a similar study that was conducted in Iran, it was determined that the rate of participants who completed the study at the end of 3-month follow-up period was 80% (18), and in a study that was conducted by Hoeft et al. (19), they reached a follow-up rate of 75% at the end of 3 months. In the study that was conducted by Hallas et al. (7), only 10 of the 94 mothers participated in the continuation of the study. For this reason, it may be considered that the 72% participation rate in the study is acceptable. When the socio-demographic characteristics of the two groups were compared, it was determined that there is only a statistically significant difference between the mothers' educational status ( $p < 0.001$ ) and their professions ( $p < 0.001$ ); this and the lack of significant differences between the oral hygiene practices of the parents and their children and the answers given by them to initial questionnaires show that the participants of the two groups have very similar characteristics.

In the present study, the purpose was to compare only the effectiveness of the methods by using the same information and the same visuals in the trainings given to both groups. The participants in the BBI group in which the face-to-face training model was applied were trained with brochures during the training; however, these brochures were not given to the participants considering that the 3<sup>rd</sup> month check-ups would be carried out by e-mail and telephone, and not to create bias when comparing the sustainability of the information acquired in education. In a study that evaluated the oral health training conducted by Makvandi et al. (18), the mothers in the intervention group were informed by a booklet, and this booklet was given to the mothers to re-read them at an appropriate time and remember the messages given. In this study, different from the present study of ours, it was observed that there was only one intervention group. In the scope of our study, the values in the three periods were compared by conducting a questionnaire before, immediately after the training and 3 months after the training to determine whether the changes in the level of knowledge were sustainable. However, there are also researchers who recommend longer-term studies (7,20).

According to the answers given to the questionnaires by CAP and BBI group participants, no statistically significant differences were detected in any question in the PreT questionnaire ( $p > 0.05$ ), and both groups were similar in terms of the answers to the questions and in terms of the initial knowledge levels. It was determined that BBI group participants gave more accurate answers at significant levels to the in the Q12 ( $p = 0.030$ ) in the PostT1 questionnaire, and in the Q2 ( $p = 0.021$ ), Q5 ( $p = 0.044$ ), Q11 ( $p = 0.042$ ) and Q12 ( $p = 0.048$ ;  $p < 0.05$ ) in the PostT2 questionnaire; and CAP group participants gave more accurate answers at significant levels in the Q3 ( $p = 0.035$ ) and Q4 ( $p = 0.048$ ) in the PostT2 questionnaire. In the light of these results, it may be considered that there was a significant increase in the knowledge levels of the participants in the BBI group than of the participants of the CAP group; and that the training with BBI was more successful. Meanwhile, considering the higher educational status of the CAP group participants ( $p < 0.001$ ), it can be predicted that the participants' educational status was not effective as a result of our study.

In a study conducted by Hallas et al. (7), before the oral health training, the mothers were asked "do you think fluoride is safe and it helps prevent dental caries as your baby grows?", and 71.6% of the mothers said "yes"; and they were also asked "Do you think that dentist examination is important when your baby reached the age of 1, and 89.2% of the mothers said "yes" at a rate of 89.2%. When Weber and Gasparoni (21) questioned whether mothers who had children between 12-49 months used fluoride toothpaste for their children, it was observed that this rate increased after the training, and 30% of the participants initially answered "yes".

It was reported in another study that was conducted in Latin population that the correct answer rate was initially lower when the relationship between the development of caries and nutrition was questioned (21). In our study, the questions that were asked to the participants before the training were given a lower percentage about the question when the first dentist examination should be (Q4), ECC risk factors (Q7), and fluoride toothpaste use (Q10). It is observed that the correct answer rates given to these questions increased at significant levels compared to the initial values after the training in both the CAP and BBI groups.

The absence of a control group in the study might be considered as a limitation; however, the evaluation of the time-dependent changes in each group, in other words, the Quasi-experimental design of the study eliminated the need for a control group. Although the loss of participants in the follow-up periods appeared before us as another limitation, when we compared the continuing and non-continuing (missing) participants, no differences that could change the results of the study could be detected for each group. However, increasing the continuing participant rates in future studies will be useful.

### Conclusion

It can be foreseen that both methods will increase the level of knowledge, but awareness may be higher due to the use of BBI in oral and dental health training that will be given to mothers. In addition, it was determined that missing knowledge was less in the time of the first dentist examination in children (Q4), the nutritional risk factors of the ECC (Q7), fluoride toothpaste use (Q10) compared to the other questions, and the long-term persistence of the knowledge learnt was less compared to the other questions. For this reason, it may be considered useful to allocate more time to these topics in the studies and social education programs that will be planned in the future.

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### Ethics

**Ethics Committee Approval:** The approval of the Ethics Committee that was required for the study was obtained from the Directorate of the Ethics Committee of Clinical Research of the Faculty of Medicine of the Karadeniz Technical University (protocol no: 2018/22; date: 02.03.2018).

**Informed Consent:** Before the mothers were provided with oral dental health training, informed consent forms was read and signed by the participants in the scope of the study.

**Peer-review:** Externally and internally peer-reviewed.

### Authorship Contributions

Surgical and Medical Practices: Ö.F.G., T.T., Concept: Ö.F.G., T.T., F.K., Design: Ö.F.G., T.T., Ö.B., F.K., Data Collection or Processing: Ö.F.G., A.K., Analysis or Interpretation: Ö.F.G., T.T., Ö.B., Literature Search: Ö.F.G., T.T., A.K., Writing: Ö.F.G., T.T.

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