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Original Article

Evaluation of the Effectiveness of Parental Oral Health Education

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ABSTRACT

Aim: Oral and dental health problems are significant global public health challenges. Maintaining optimal oral health requires the adoption of proper oral hygiene practices, regulating cariogenic food intake, and routine dental check-ups. Parents play a crucial role in enhancing their children's knowledge, attitudes, and practices related to oral health, making their involvement critical in promoting healthy behaviors. This study aimed to assess parents' knowledge of oral health and to evaluate the effectiveness of parental oral health education.

Materials and Methods: This study involved the parents of 227 children, aged 7-13 years, who attended the Department of Pediatric Dentistry at Ege University Faculty of Dentistry for routine dental examinations. After ethical approval, a pre-test consisting of 20 questions was administered to the participants in order to assess their baseline knowledge of oral health. Following the completion of the educational session, a post-test with the same questions was administered to all participants. Additionally, the parents were asked to complete a satisfaction survey in order to assess their perception of the educational intervention. The total scores of the pre- and post-tests were assessed based on the number of correct responses. Statistical analysis was performed using the SPSS 25.0 program, by chi-square test, t-test, and Fisher's exact test.

Results: The mean age of the parents included in this study was 38.72±13.46 years. Of the 227 parents, 54% were female and 46% were male. No significant differences were observed in the distribution of parents' gender, age, and education levels ($p>0.05$). The mean total score in the pre-test was 7.13±1.91, which increased to 12.21±2.08 in the post-test, indicating a significant improvement in knowledge following the educational intervention. Notably, 56% of the parents demonstrated an increase in their total score in the post-test compared to the pre-test. According to the satisfaction survey, 74% of parents expressed satisfaction with the educational session provided.

Conclusion: These findings indicate that providing parents with structured educational programs on oral and dental health can greatly improve their knowledge and facilitate the development of improved oral health practices among children. Expanding these programs throughout the population could significantly enhance children's oral health in the long term.

Keywords: Oral health education, pediatric dentistry, oral hygiene, parental involvement, preventive dentistry

Introduction

Oral health is a critical component of overall health, with its maintenance from an early age being essential (1). Effective oral health management relies on factors such as establishing proper oral hygiene practices, reducing the intake of cariogenic foods, and ensuring routine dental check-ups (2-4).

Oral health education is a fundamental aspect of preventive dentistry, playing a pivotal role in reducing the incidence of dental diseases through early intervention and

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proactive care (5). By providing individuals with essential knowledge regarding effective oral hygiene practices, such as proper brushing and dental flossing techniques, the role of diet in oral health, and the importance of regular dental visits, education facilitates informed decision-making and enables individuals to take responsibility for their oral health. This approach not only reduces the prevalence of dental caries and periodontal diseases but also lowers the need for more complex and costly dental treatments in the future (5-7). Furthermore, oral health education promotes a preventive health paradigm, highlighting the interrelationship between oral health and general health outcomes. Incorporating comprehensive oral health education into preventive dentistry models contributes to long-term oral health maintenance, fostering healthier communities and enhancing the overall well-being of individuals, thereby supporting the sustainability of dental care systems (7,8).

Children acquire a substantial portion of their daily life skills and knowledge from their parents, relying on them to develop habits during early childhood (9). Parents play a crucial role in enhancing their children's knowledge, attitudes, and practices related to oral health, making their involvement critical in promoting healthy behaviors (10,11). It has been reported that mothers' oral care routines positively impacted their children's oral health practices (12). Similarly, another piece of research indicated that inadequate parental knowledge and negative attitudes toward oral health are associated with higher caries rates in infants and young children, highlighting the critical importance of the caregivers' knowledge levels (13).

Parental supervision and guidance are thus essential for establishing and maintaining good oral health habits in children. However, evidence suggests that parents often lack sufficient knowledge regarding their children's oral and dental health (14,15). Effective parental education programs can bridge gaps in knowledge, address misconceptions, and empower caregivers to model and promote positive oral health behaviors, ultimately enhancing the overall oral health status of the future generation. This study aimed to examine the knowledge levels of parents regarding their children's oral health and to evaluate the effectiveness of parental oral health education.

Materials and Methods

This study involved the parents of 227 children, aged 7-13 years, who attended the Department of Pedodontics at Ege University Faculty of Dentistry for routine dental examinations. A total of 227 participants were enrolled, comprising 122 females aged 24-43 years and 105 males aged 28-46 years. Ethical approval for this study was obtained from the Ethics Committee of Medical Research at the Ege University Faculty of Medicine (approval no.: 23-6.1T/59, date: June 22, 2023). Informed consent was obtained from the parents who voluntarily participated in this study. This study utilized a single-group pre-test/post-test design. Before initiating the educational intervention, the participants were informed about the confidentiality of their responses to the pre-test and post-test administered as part of this research. The measurement tools used in this study were designed by two experts and consisted of forms with 20 questions (yes/no) to assess the parents' knowledge about children's oral and dental health. Both the pre-test and post-test included the same topics, such as children's dental development, oral hygiene habits, diet, fluoride usage, and dental visits. Following the completion of the pre-test, the participants attended an educational session designed to provide comprehensive information on the oral and dental health of children. The session was conducted via a 30-slide PowerPoint presentation. After the educational session concluded, a post-test comprising the same set of questions was conducted with all of the participants. Additionally, the parents were asked to complete a satisfaction survey to assess their perception of the educational intervention. The total scores of the pre- and post-tests were assessed based on the number of correct responses.

Statistical Analysis

Statistical analyses were conducted using SPSS version 25.0. Descriptive statistics were used to analyze the demographic characteristics and baseline knowledge levels of the participants. The effectiveness of the educational intervention was evaluated using the Paired Samples t-test, while the chi-square test and Fisher's exact test were employed to analyze categorical data.

Results

The mean age of the participants was 38.72±13.46 years. Among the 227 parents included in this study, 54% were female, and 46% were male. Detailed demographic characteristics of the participants are presented in Table I. No significant differences were observed in the distribution of the parents' gender, age, or education levels ($p>0.05$).

The distribution of responses to the pre-test and post-test questions is summarized in Table II. In the post-test conducted after the educational intervention, the

proportion of the correct responses significantly increased for the questions numbered 5, 14, 15, 16, 18, and 19 compared to the pre-test ($p<0.05$). Additionally, those participants with higher education levels were more likely to answer these six questions correctly in the pre-test ($p<0.05$).

In the pre-test, only 3.5% of the parents (n=8) answered all of the questions correctly. This proportion increased to 25% (n=56) in the post-test. The mean total score, determined by summing the number of correct responses, was 7.13±1.91 in the pre-test and 12.21±2.08 in the post-test. No statistically significant associations were found between gender, age, or educational levels and the pre/post-test scores ($p>0.05$). 56% of the participants demonstrated an improvement in their total scores following the educational intervention. Results from the satisfaction survey indicated that 74% of the parents were satisfied with the educational intervention.

Table I. Demographic characteristics of parents

		n	%	p
Gender	Female	122	54	0.08
	Male	105	46	
Age (years)	<25	18	8	0.06
	25-40	101	44.5	
	>40	108	47.5	
Education level	Illiterate	25	11	0.06
	Primary/secondary school	54	24	
	High School	116	51	
	University or higher	32	14	

p<0.05 statistically significant

Table II. Distribution of responses in pre-test and post-test among parents

	Pre-test		Post-test		p
Questions	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**	
1. Children's first primary tooth erupts around 6 months of age.	16	84	24	76	>0.05
2. A child's first dental visit should occur as soon as the first primary tooth appears.	11	89	16	84	>0.05
3. The first permanent tooth usually erupts around the age of 6 years.	33	67	39	61	>0.05
4. Children should brush their teeth regularly.	52	48	56	44	>0.05
5. Parents should supervise children's toothbrushing until about the age of 7-8 years.	14	86	68	32	**0.02***
6. Teeth should be brushed with non-fluoride toothpaste in children.	54	46	41	59	>0.05
7. Children should brush their teeth at least twice a day.	24	76	28	72	>0.05
8. Each toothbrushing session should last for 2 minutes.	21	79	29	71	>0.05
9. Children should not avoid using dental floss.	19	81	22	78	>0.05
10. Preventive applications like fissure sealants and fluoride varnishes are beneficial for children's dental health.	49	51	53	47	>0.05
11. Treatment of the primary teeth is not necessary.	66	34	61	39	>0.05
12. Habits such as mouth breathing during sleep, thumb sucking, and the prolonged use of pacifiers or bottles can impact jaw and tooth development.	43	57	49	51	>0.05
13. Immediate care is required in cases of dental trauma in children.	37	63	42	58	>0.05
14. The first sign of dental caries is the appearance of white spots on teeth.	19	81	56	44	**0.01***
15. Sweet foods and drinks should be consumed at times apart from main meals.	71	29	38	62	**0.02***
16. Teeth should be cleaned after taking syrups or other medications.	28	72	73	27	**0.01***
17. Natural foods such as molasses and honey can contribute to dental caries.	81	19	77	23	>0.05
18. The first primary teeth should be cleaned after every meal once they erupt.	24	76	81	19	**0.01***
19. Dental caries do not occur due to breastfeeding.	82	18	33	67	**0.03***
20. Regular dental check-ups every 6 months are essential for children.	62	38	70	30	>0.05

*p<0.05 Statistically significant

Discussion

Oral and dental health issues represent a significant and widespread public health challenge globally (1). In many countries, including our own, the rising prevalence of oral health problems underscores the urgent need for the development and implementation of protective and preventive strategies. A critical factor influencing the oral health of a population is oral health literacy, which plays a central role in shaping health behaviors and outcomes (2-4). For instance, a study conducted in Tehran explored the relationship between parents' oral health literacy and the caries indices of both the parents and their children. The findings of that study emphasized the direct correlation between increased oral health literacy in parents and improvements in both their own oral health and that of their children, including reductions in caries indices and enhanced oral health behaviors (13).

This evidence underscores the crucial role of improving oral health literacy, particularly among parents, in enhancing oral health outcomes for both individuals and their families. This improvement not only fosters better decision-making but also strengthens the foundation for healthier communities. The importance of targeted educational interventions cannot be overstated as increasing both awareness and understanding of oral health can lead to substantial long-term health benefits, and so reduce the prevalence and burden of oral diseases across populations (5-7).

Education plays a pivotal role in promoting oral and dental health and preventing associated issues. Parents, as primary role models in the early development of children, significantly influence the establishment of healthy habits, including those related to oral hygiene. Thus, parents need to possess accurate and comprehensive knowledge of oral health to ensure that they can pass this knowledge on to their children. Increasing parents' awareness of the importance of oral health is particularly effective in preventing dental problems in children. Furthermore, involving parents in preventive dental programs, especially those targeting dental caries, can lead to improved oral health outcomes at the community level (7,8).

Educational programs focused on oral health play a critical role in fostering long-term positive health behaviors in both parents and their children. By equipping parents with the knowledge and skills necessary to educate their children about good oral hygiene practices, these programs ensure that foundational habits are established early. Furthermore, they empower parents to actively monitor their children's oral health practices and provide ongoing reinforcement, which is essential for maintaining healthy habits over time. As highlighted by Mutluay et al. (16), these programs offer a dual benefit: they not only serve as a conduit for disseminating vital oral health information directly to children but also encourage sustained engagement with oral health behaviors beyond the immediate educational session. This ongoing involvement of the parents helps solidify the integration of these practices into daily routines, ultimately improving long-term oral health outcomes. Moreover, by fostering a collaborative approach where both parents and children are actively engaged in learning and practicing proper oral hygiene, such educational initiatives contribute to a more holistic approach to health promotion, emphasizing the importance of prevention and self-care in oral health management. These programs, therefore, represent a key strategy in reducing oral health disparities, especially when combined with other community-level interventions which target both individual and systemic barriers to oral health education (16).

This study was designed to assess the level of parental knowledge regarding their children's oral health and to evaluate the effectiveness of an oral health education program. This study involved the parents of 227 children, aged 7-13 years, who attended a university dental clinic for routine dental examinations. The initial phase of this study involved assessing the parents' baseline knowledge via a pre-test, followed by a targeted educational session covering key topics such as oral hygiene, diet, fluoride usage, dental development, and the importance of regular dental visits. The post-test results revealed a statistically significant improvement in the number of correct responses ($p<0.05$), confirming that educational interventions can substantially enhance parents' understanding of essential oral health practices. The findings emphasize the critical need to identify knowledge gaps regarding oral and dental health and to develop targeted educational programs which address these deficiencies. Such interventions are essential in preventing oral health issues, benefiting not only parents but also their children.

Research indicates that parents should assist their children with tooth brushing until the age of 7-8 years, as children below this age are often unable to perform this task effectively on their own (17,18). In the present study, the percentage of correct responses regarding this practice increased significantly, from 14% in the pre-test to 68% in the post-test.

Research has demonstrated that primary teeth should be cleaned promptly upon eruption, as early implementation of oral hygiene practices is critical for the prevention of dental complications (19). Early childhood caries have also been associated with breastfeeding, particularly in cases where proper oral hygiene practices are not adequately maintained (19,20). In the present study, the percentage of parents who reported cleaning their children's teeth after every meal increased from 24% in the pre-test to 81% in the post-test, illustrating the substantial positive impact of education on behavioral change.

In the present study, it is noteworthy that the percentage of correct responses regarding the usage of fluoride toothpaste in children increased from 46% in the pre-test to 59% in the post-test. According to clinical guidelines, fluoride toothpaste must be used in children to effectively prevent early childhood caries and promote optimal oral health (21,22). However, despite the provision of targeted education, the increase in knowledge on this matter was relatively modest. The limited improvement observed may be attributed to widespread misinformation and misconceptions regarding fluoride usage, exacerbated by misleading claims frequently disseminated by social media influencers. These sources often share conflicting or oversimplified information, which can weaken the effectiveness of educational efforts and reinforce misconceptions about the safety and benefits of fluoride. A focused approach is needed to counter unreliable information and promote evidence-based guidelines effectively. Addressing this issue requires a multifaceted approach which includes integrating evidence-based messaging into social media channels, leveraging the influence of credible healthcare professionals online, and actively debunking common myths about fluoride. By adopting these targeted strategies, public health initiatives can effectively combat misinformation, enhance knowledge, and promote informed decision-making regarding fluoride use and oral health practices. This underscores the importance of utilizing social media not only as a platform to identify misinformation but also as a powerful tool to disseminate accurate, evidence-based information to a broader audience.

The association between the frequency of sugary food intake and the development of dental caries is well-established in contemporary dental research. Excessive consumption of sugar, particularly in frequent or prolonged exposure, provides an ideal environment for harmful bacteria in the mouth to produce acids which demineralize tooth enamel. This process significantly increases the risk of caries formation, especially when oral hygiene practices are inadequate. Cariogenic food negatively affects oral health not only by directly damaging enamel but also by altering the oral microbiota, which further accelerates the development of dental caries. Given this understanding, it is essential to emphasize dietary modifications as a fundamental component of caries prevention strategies, particularly in educational programs targeting both children and their caregivers (23,24). In the present study, the percentage of parents who understood the importance of consuming cariogenic foods and drinks during main meals rather than as snacks increased from 29% in the pre-test to 62% in the post-test, further emphasizing the effectiveness of education in altering dietary habits.

In the present study, according to the satisfaction survey, 74% of the parents expressed satisfaction with the educational session provided. The observed satisfaction rate is favorable; however, it is believed that the level of satisfaction with the educational program could have been higher had the knowledge assessments not been administered to the families. The application of such tests may have influenced the participants' perceptions of the program, potentially leading to a less favorable evaluation due to test-related stress or discomfort. Consequently, future educational initiatives might benefit from focusing on the delivery of content without incorporating formal assessments, which could enhance overall satisfaction and engagement.

Providing oral and dental health education to parents not only enhances their knowledge but also ensures the transmission of improved oral health practices to their children. This is essential for the long-term prevention of dental issues. However, to fully understand the lasting impact of these interventions, further longitudinal studies are required in order to assess how parental education affects the incidence of oral health problems in children over time. Pediatricians also play a pivotal role in promoting and maintaining oral health in children, serving as a vital link between general health care and dental care.

Study Limitations

There are several limitations of this study. Firstly, the data was limited to the variables measured by the pre-designed forms and relied on the subjective responses of parents. Additionally, since the study participants were drawn from those seeking treatment at a university clinic, the findings may not be fully representative of the broader population. Future research could benefit from a more diverse sample in order to enhance the generalizability

of the results and provide a clearer understanding of the impact of educational interventions across different demographic groups.

Conclusion

Oral and dental health education is most effective when provided by qualified professionals. In order to enhance their effectiveness and accessibility, these programs should be systematically planned and expanded. We recommend implementing nationwide programs to improve parents' understanding of oral health, focusing on turning this knowledge into lasting behavioral changes. Regularly scheduled educational sessions would reinforce healthy practices and address evolving oral health challenges as children develop. Professionally administered, continuous interventions are vital in preventing early oral health issues, ultimately fostering improved long-term health outcomes for future generations.

Ethics

Ethics Committee Approval: Ethical approval for this study was obtained from the Ethics Committee of Medical Research at the Ege University Faculty of Medicine (approval no.: 23-6.1T/59, date: June 22, 2023).

Informed Consent: Informed consent was obtained from the parents who voluntarily participated in this study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: C.S., N.M., E.M.A., B.Ş.Ç., N.E., F.E., D.Ç., Concept: C.S., N.M., E.M.A., B.Ş.Ç., N.E., F.E., D.Ç., Design: C.S., N.M., E.M.A., B.Ş.Ç., N.E., F.E., D.Ç., Data Collection or Processing: C.S., N.M., E.M.A., B.Ş.Ç., N.E., F.E., D.Ç., Analysis or Interpretation: C.S., N.M., E.M.A., B.Ş.Ç., N.E., F.E., D.Ç., Literature Search: C.S., N.M., E.M.A., B.Ş.Ç., N.E., F.E., D.Ç., Writing: C.S., N.M., E.M.A., B.Ş.Ç., N.E., F.E., D.Ç.

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