

The Effect of Using an Educational Poster on Mothers' Knowledge of Emergency Management of Dental Avulsion

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Abstract

INTRODUCTION: Mothers are commonly the first ones who encounter the dental avulsion in children. High knowledge of them could greatly affect the success rate of treatment. The purpose of this study was to evaluate the effect of educational poster on the mother's knowledge about management of dental avulsion.

MATERIALS AND METHODS: This study was conducted at the Department of Pediatric Dentistry, Guilan University of Medical Sciences from November 2020 to February 2021. After obtaining the informed consent, a questionnaire containing the mothers' socio-demographic information and 8 questions regarding knowledge about dental avulsion was responded alone by 262 mothers (131 in the study group and 131 in control group) before educational poster presentation in the study group. After three months, the participants of both groups were re-evaluated using the same questionnaire. McNemar's test and Generalized Estimating Equations (GEE) was used to analyze the data. Results with $P < 0.05$ were considered statistically significant.

RESULTS: Use of an educational poster improved the knowledge of participants of study group about dental avulsion, although this improvement was statistically significant in questions regarding immediate emergency action ($P=0.003$), appropriate time for replantation ($P<0.001$), cleaning before replantation of a dirty tooth ($P=0.022$) and suitable storage medium for transferring an avulsed tooth ($P<0.001$). It was found that variables like

age, level of education, employment status and previous training had no significant effect on participants knowledge ($P>0.05$).

CONCLUSION: Results showed that the use of posters as an educational method can effectively improve mothers' knowledge about management of children's dental avulsion.

KEYWORDS: Tooth Avulsion; Knowledge; Pediatric Dentistry

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Introduction

Traumatic dental injury (TDI) is an important global oral health concern in childhood that causes functional, psychological and esthetic problems [1]. TDIs affect teeth, their supporting structures, and adjacent soft tissue and range from minor enamel cracking to extensive maxillofacial injury [2-4].

Parents of the children are usually the first ones to report dental trauma to dentists; therefore, the parents' awareness of emergency management is important [5,6]. Unfortunately, the children are often referred to a dentist without any emergency management at the accident site that results in irreversible consequences such as

tooth loss and aesthetic problems in anterior region [7].

Frequency of tooth avulsion in permanent and in primary dentition is 0.5%–16% and 7–13%, respectively [3]. Avulsion of permanent anterior teeth with delayed reimplantation and unphysiological storage lead to dehydration of the root surface and decrease the survival rate of

reimplanted tooth [8,9]. With appropriate emergency treatment, the prognosis of the traumatic dental injury can be improved and ultimately preserve the smile of the child [10].

Educational programs and training are needed to improve proper management of dental avulsion by mothers. Educational posters and pamphlets can be used to inform parents about guidelines on management of dental trauma [10].

The purpose of this study was to evaluate the effectiveness of using an educational poster to increase parents' knowledge about management of dental avulsion. It is necessary to be aware of the knowledge level of parents to formulate a set of instructions to increase the parents' knowledge and help them to properly manage an emergency case of dental avulsion.

Material and Methods

Ethical Aspects

This cross-sectional descriptive analytical study was approved by Guilan University of Medical Sciences (IR.GUMS.REC.1399.311) in 2020/10/07.

Sample

This study was done on 262 mothers accompanying children between 4-12 years of age seeking dental treatment at the Department of Pediatric Dentistry, Guilan University of Medical Sciences from November

2020 to February 2021. Mothers between 20 and 60 years of age were included in the study. All participating subjects (n=262) were divided randomly into two groups (test-control), 131 mothers were allocated randomly to the test group and others to the control group.

Questionnaire

After explaining the nature and purpose of the study by a pedodontist to the mothers, subjects who agreed to participate, signed a statement of informed consent and filled out Questionnaire alone which assessed their socio-demographic information and knowledge about dental avulsion. A total of 8 questions regarding identification of tooth type, how to clean an avulsed tooth, how to transfer an avulsed tooth (suitable storage medium) and appropriate time for referring for the problem-based section were included, in which the level of knowledge of respondents were assessed and classified into three groups, which are low (0-3), moderate (4-6) and high (7-8). Validity of the questionnaire was checked by an expert panel of pediatric dentists and in a pilot study on 10 subjects, the reliability of the questionnaire was tested by a test-retest method.

After filling the questionnaire, an educational poster was distributed among subjects of the study group.

Three months later, the mothers' knowledge was evaluated again in

both groups using the same questionnaire.

Educational poster

The educational poster used in this study was designed at the Dental Research Center of Guilan University of Medical Sciences by a group of three pedodontists and included guidelines on emergency management of dental avulsion.

In cases of primary dental avulsion, replantation is contraindicated but in permanent dental avulsion:

- Hold the tooth by its crown, not by its root
- Wash the tooth under a slow stream of cold water
- Put the tooth in cold milk, saline or saliva
- Replant the tooth in its socket
- Visit a dentist immediately (within 30 min) [3] (Figure 1,2)



Figure 1. Avulsion of the tooth



Figure 2. Replantation of the teeth

Statistical Analysis

The data obtained on the questionnaires were analyzed with the aid of the Statistical Package for the Social Sciences (SPSS®, Version 26.0, Chicago, IL, USA). McNemar's test was used separately in both study and control groups for evaluating the changes of the percentage of correct answers after 3 months. Generalized Estimating Equations (GEE) was used to investigate the simultaneous effect of existing independent variables such as age, level of education, employment status and training history on participants knowledge. Results with P <0.05 were considered statistically significant.

Results

This cross-sectional descriptive study was conducted among 262 mothers. Socio-demographic characteristics of participants have been shown in Table 1.

Knowledge level of participants in the study and control groups before intervention and 3 months later has been shown in Table 2. The percentage of the participants with low knowledge decreased and the percentage of participants with high knowledge increased in two groups but this change was greater in the study group.

Table 3 shows the number and percentage of the participants who answered the questions

correctly. Results showed that the use of an educational poster improved the knowledge of mothers about dental avulsion, although this knowledge improvement was statistically significant in questions regarding immediate emergency action (P=0.003), appropriate time for replantation (P<0.001), cleaning before replantation of a dirty tooth (P=0.022) and suitable storage medium for transferring an avulsed tooth (P<0.001).

Table 1: Participant's socio-demographic characteristics

Variables	Study group(n=131) n(%)	Control group(n=131) n(%)
Age		
33 years or younger	68(51.9 %)	71 (54.1 %)
34 years or older	63(48.1 %)	60(45.9 %)
Educational level		
Diploma and associate's degree	13(9.9 %)	60(45.8 %)
Bachelor's and master's degree	105 (80.2 %)	71(54.2 %)
Doctorate degree	13(9.9 %)	0(0%)
Training history		
Yes	8(6.2 %)	4(3.1 %)
No	123(93.8 %)	127(96.9 %)
Employment status		
Yes	63(48.1 %)	51(38.9 %)
No	67(51.9 %)	80(61.1 %)

Variables	Low knowledge n(%)	Moderate knowledge n(%)	High knowledge n(%)
Study group			
Before intervention	17(12.9%)	63(48.4%)	51(38.7%)
After 3 months	0(0%)	9(6.9 %)	122(93.1%)
Control group			
Before intervention	38(29%)	72(54.9 %)	21(16.1 %)
After 3 months	17(12.9%)	84(64.1%)	30(23%)

Table 2: Knowledge level of participants in study and control groups before intervention and 3 months later

Table 3: Proportions of participating mothers who answered the questions correctly before intervention and three months later

	Study group(n=131)			Control group(n=131)		
	Before intervention n (%)	After 3 months n (%)	P-Value*	Before intervention n (%)	After 3 months n (%)	P-Value*
Identification of permanent tooth	110(83.9%)	127(96.8%)	0.219	55(41.9%)	97(74.2%)	0.002
Immediate emergency action	80(61.3%)	127(96.8%)	0.003	46(35.5%)	63(48.4%)	0.219
Knowledge of holding the avulsed tooth by its crown, not by its root	114(87.1%)	122(93.5%)	0.687	114(87.1%)	122(93.5%)	0.500
Appropriate time for replantation	67(51.6%)	118(90.3%)	<0.001	38(29%)	34(25.8%)	0.999
Cleaning before replantation of a dirty tooth	55(41.9%)	93(71%)	0.022	84(64.5%)	110(83.9%)	0.07
Suitable storage medium for transferring an avulsed tooth	21(16.1%)	101(77.4%)	<0.001	21(16.1%)	21(16.1%)	0.999
Identification of primary tooth	118(90.3%)	131(100%)	0.25	93(71%)	97(74.2%)	0.999
Contraindication of primary tooth replantation	89(67.7%)	110(83.9%)	0.125	67(51.6%)	80(61.3%)	0.375

*P-value was based on McNemar Test ($p < 0.05$)

Variables such as age ($P = 0.564$), level of education [diploma and associate's degree ($P = 0.091$) bachelor's and master's degree ($P = 0.330$), doctorate degree ($P = 0.357$)], training history ($P = 0.316$) and employment status ($P = 0.357$) had no significant effect on knowledge of participants.

Discussion

Tooth avulsion is considered as one of the most detrimental traumatic dental injuries among children [3]. Mother's high knowledge regarding the emergency management of tooth

avulsion injury will help to reduce the time interval between avulsion and replantation. Immediate action may greatly affect the prognosis of the avulsed tooth and enhance the success rate of treatment [11]. The purpose of this study was to investigate the knowledge of mothers about the emergency management of dental avulsion before and after distribution of an educational poster.

Present study revealed insufficient knowledge among mothers regarding emergency management of dental avulsion; the main reason is not having previous good training

regarding dental avulsion. Although most studies conducted in different countries indicated that the level of knowledge regarding the management of avulsed permanent teeth is low [12], this finding is in accordance with other studies of parental knowledge performed in Singapore [13] and Kuwait [14].

Similar to the study by Murali et al [15], more than half of the mothers were not aware of immediate emergency action and reimplantation of the avulsed permanent tooth in children. Their first action after tooth avulsion injury was to only calm the

child down and compress the bleeding without searching for the avulsed tooth. Most parents didn't pick up the avulsed tooth because they thought it is an infected material and needs to be thrown out [15].

Avulsed permanent teeth should be cleaned with saline solution before replantation [12]. 53.2% of participants selected saline solution whereas 41.5% of the participants of study by Jain A et al [12] chose saline as appropriate cleansing medium. Unfortunately in the studies by Abdellatif AM [8] and Al-Jame Q et al [16] lack of knowledge regarding cleansing medium was reported.

In our study, 16.1% of participants chose milk as storage medium. The suitable storage medium should be capable of preserving cell vitality, clonogenic capacity and easily accessible at the site of the accident. Although Hank's Balanced Salt Solution (HBSS, Save-A-Tooth®) has been proven to be the most effective storage media, low-fat milk is a good alternative to HBSS which is readily available and affordable [12]. In the study by Jain A et al [12] and Santos ME et al [17] as well, only 14.2% and 3% of parents selected milk as suitable storage medium respectively.

In the present study, most of the mothers were aware of not rubbing the root of tooth and holding the avulsed tooth by its crown. Whereas most of the participants of study by Oliveira TM et al [18] answered this question incorrectly. In the study by

Abdellatif AM et al [8] most of the parents preferred holding the avulsed tooth from the crown. They were aware that holding the tooth from the root will disturb the viability of the periodontal ligament.

In the study by Ozer S et al [19] more than half of the participants were aware of appropriate replantation time of an avulsed permanent tooth. In the present study, most mothers didn't know that for optimal healing, professional help should be sought within 30 min and knowledge of study group regarding appropriate time for replantation was significantly improved after education using poster.

Similar to our study, Abdellatif AM et al [8] reported that a few parents were willing to replantation of primary tooth which could be related to lack of knowledge about the hazards of replanting the primary teeth.

Similar to the present study, Resmy N et al [5] concluded that the educational status of mothers was not playing a role in their knowledge regarding the management of avulsed teeth in children.

Most studies [10,20,21] investigated the effect of educational poster on the knowledge of school teachers and students or fitness trainers but we studied the effect of educational poster on the knowledge of mothers. In the present study, educational poster effectively enhanced the

knowledge of study group participants compared to control group. Lieger O et al [10] showed positive effect of educational poster on the knowledge of school teachers. In the study by Young C et al [20] educational poster significantly improved the level of knowledge of secondary school students in Hong Kong. Ramezani GH et al [21] concluded that educational pamphlets enhanced the knowledge level of fitness trainers, but the magnitude of this effect was not significant in their study.

Conclusion

Educational poster statistically significantly improves mothers' knowledge about management of children's dental avulsion, so intervention program by different means should be developed targeting parents.

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