

Effect of an Informative Leaflet on Knowledge Level of Mothers Regarding Traumatic Dental Injuries

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Objectives: The present study aimed to assess the level of knowledge regarding traumatic dental injuries (TDIs) among mothers and evaluate the efficacy of a simple educational leaflet, as an informative tool, to raise their awareness in this respect.

Methods: A total of 150 mothers with their children receiving dental care were included in this study and assigned to two groups of intervention and control. Before the intervention, a questionnaire was distributed among all the recruited mothers (time 0). After its completion, an informative leaflet with basic first aid information regarding what to do in case of TDIs was given to the mothers in the intervention group and their knowledge level was examined immediately after reading the leaflet (time 1). The knowledge of both groups was evaluated again after 3 months (time 2). The data were analyzed by SPSS version 21.

Results: The mean knowledge score was 6.53 out of 10 at baseline. A significant increase in knowledge score was noted in the intervention group (9.20) at time 1 ($P < 0.001$). The knowledge score improved in both the intervention (8.57) and control groups (7.61) after 3 months ($P < 0.001$). The intervention group had significantly higher score than the control group at time 2 ($P < 0.001$).

Conclusion: The informative leaflet enhanced the knowledge level of mothers regarding TDIs. Use of leaflets is suggested as an effective tool to inform mothers about the management of TDIs.

Keywords: Tooth Injuries; Knowledge; Pamphlets; Mothers; Education

Introduction

Traumatic dental injuries (TDIs) are among the main problems in oral health of children and adolescents, which can cause pain and distress. Children and adolescents usually encounter injuries and sport accidents during their daily life activities. In such events, the most common avulsed teeth are the central incisors. In these ages, teeth often have incompletely formed roots, and the periodontal ligament (PDL) lacks adequate resilience.¹ TDIs can thus have adverse effects on children and adolescents, irrespective of their gender, and poor knowledge of the parents in this regard can also lead to unfavorable long-term prognosis.²

The prognosis of avulsed teeth depends on prompt and adequate actions at the scene such as minimizing the extraoral time for the avulsed tooth, using an adequate storage and transportation medium, and protecting the root surface and the PDL from additional trauma.¹ Accordingly, it is important to know how parents, caregivers, teachers, and all those at the scene manage the situation.¹

Based on the related literature, numerous countries have so far reported insufficient knowledge level regarding the emergency management of TDIs.³ Besides, most dental injuries occur at home and mothers are the first who can take immediate and correct action in this respect. Inadequate knowledge regarding the management of TDIs was also reported in Jordanian mothers.⁴ In addition, working mothers in India were found to have better knowledge and awareness to prevent TDIs compared with their non-working counterparts.⁵ In Iraq⁶ and Brazil⁷,

mothers had insufficient knowledge regarding the prevention and management of TDIs. Scarce information also exists about the awareness and knowledge level of parents on the subject of TDIs in Iran. Ghaderi et al. reported that a simple educational leaflet could be a suitable tool to increase parental knowledge about dental avulsion.⁸ Therefore, the present study aimed to assess the effect of an informative leaflet on knowledge level of mothers regarding TDIs.

Methods and Materials

In this case-control study, a convenient sample of 150 mothers with children receiving dental care were included and assigned to two groups (namely the intervention and control groups) using a predefined random number table based on the date of referral to the school of dentistry in order to prevent information exchange between the groups. The inclusion criteria were all mothers referring to the Department of Orthodontics and Pediatric Dentistry of the School of Dentistry of Shahid Beheshti University of Medical Sciences with their children. After being informed about the objectives of the study, they voluntarily cooperated to complete the questionnaire in the next 3 months. The exclusion criteria were unwillingness for participation in the study, poor cooperation of mothers in filling out the questionnaire in the next 3 months, and illiteracy. The study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences (code: IR.SBMU.RIDS.REC.1394.74).
Questionnaire:

The questionnaire used in this study was researcher-made, and comprised of items extracted from several questionnaires used in the literature.^{6, 9, 10} It consisted of two parts: the first part was related to the demographic information, including maternal age, level of education, and occupation, and the second part included items on maternal knowledge about TDIs. Accordingly, 13 items were included in the questionnaire, of which three items were focused on mothers' general information including their experience in dealing with TDIs and routes of acquiring information on this topic. The next two items were related to crown fracture, one item was about a displaced tooth, and seven items evaluated the level of knowledge about dental avulsion. The questions were designed in the form of three different scenarios. For each scenario, a photograph of the related injury was also attached to the questionnaire.¹¹

Scenario 1: Crown fracture

In this scenario, the maternal knowledge about emergency management of crown fracture of a tooth and the suitable time for taking the child to dental office was evaluated.

Scenario 2: Displacement

In this scenario, one question explaining a case of dental luxation was presented to evaluate maternal knowledge about emergency management of such teeth.

Scenario 3: Avulsion in a 10-year-old child

This scenario included seven questions evaluating general knowledge about emergency management in avulsion, management and preservation of an avulsed tooth when found outside the mouth on the ground, how to clean and how to transfer the avulsed tooth, extraoral time of the tooth, and the preferred treatment setting.

First, the questionnaire items were scored and then each knowledge score was calculated separately. The possible total knowledge score in each domain for each respondent ranged from 0 to 10. In this study, each correct answer was scored 1.

The content validity of the questionnaire was evaluated by 10 relevant experts considering the importance and relevance of items. The written opinion of the experts was collected and the questions were modified accordingly. The face validity of the questionnaire was assessed by distributing the questionnaire among 10 mothers as a pilot. The reliability of the research instrument was further checked using the test-retest method on 10 mothers. They were asked to fill out the questionnaire again 2 weeks later. Accordingly, the reliability coefficient >0.7 was assumed acceptable.¹² Moreover, textbooks and reliable articles were used to design the informative leaflet.^{13, 14} The information in the leaflet was written in Persian, and full-color, clear, and expressive photographs were also attached. The content of the leaflet was approved by the committee of experts in Shahid Beheshti University of Medical Sciences.

Study procedure:

An informed consent form was signed by the study participants. Then, the questionnaire was distributed among all mothers in both groups (time 0). After receiving the completed questionnaires, the informative leaflet was given to the intervention group and then their knowledge level was evaluated again by filling out the same questionnaire once again after reading the leaflet (time 1). Three months later, all mothers in both groups were asked to complete the same questionnaire (time 2). The questionnaire was filled out by the intervention group three times (times 0, 1, and 2) and by the control group twice (times 0 and 2). Of note, the non-intervention group received another leaflet about oral health as placebo. The main leaflet was given to the intervention group after filling out the questionnaire for the first time and to the control group after 3 months. Based on the knowledge scores of 150 mothers at time 0, the knowledge level was divided into three categories of low, moderate, and high. Accordingly, scores below 5.5 were considered as low, those between 5.51 and 7.50 were regarded as moderate, and the scores above 7.51 were referred to as high based on a data-driven approach.¹⁵

Statistical analysis:

The Kolmogorov-Smirnov test was used to evaluate the normality of the data regarding the knowledge score. Since the data were not normally distributed, non-parametric tests were used. The Chi-square test was used to compare the study groups regarding demographic information. The Mann-Whitney U test was applied to assess the significance of the relationship between the experience of TDIs, history of receiving information regarding TDIs by the mothers, and their occupation (housewife, employed) with their initial knowledge level. In addition, the Kruskal-Wallis test was performed to analyze the difference in knowledge level of mothers based on their age and level of education (each comprised of three sub-groups). Besides, the relationship between the level of maternal knowledge and age was assessed by the Spearman's correlation coefficient. The Friedman test was applied in the intervention group to analyze the change in knowledge score over time (times 0, 1, and 2). In addition, the Wilcoxon test was used to compare the knowledge scores between two different time points in each group. The Spearman's correlation coefficient was also used to analyze the correlation between the maternal knowledge scores at two different time points. Data were analyzed using SPSS version 21.

Results

Table 1 presents the demographic information of the participations. Accordingly, there was no significant difference with regard to age ($P=0.97$), level of education ($P=0.73$), occupation ($P=0.66$), previous experience of

TDIs ($P=0.40$), and baseline information regarding TDIs ($P=0.62$) between the intervention and control groups.

		Intervention (N, %)	Non-intervention (N, %)	Total (N, %)	P-value
Age (year)	25-34	26 (35)	26 (35)	52 (34.6)	0.97
	35-44	40 (53)	39 (52)	79 (52.6)	
	45-55	9 (12)	10 (13)	19 (12.6)	
Level of education	Elementary education	7 (9)	10 (13)	17 (11.3)	0.73
	High school diploma	45 (60)	44 (59)	89 (59.3)	
	Higher education	23 (31)	21 (28)	44 (29.3)	
Occupation	Housewife	61 (81)	63 (84)	124 (83)	0.66
	Employee	14 (19)	12 (16)	26 (17)	
Previous encounter with TDIs	Yes	48 (64)	43 (57)	91 (61)	0.40
	No	27 (36)	32 (43)	59 (39)	
Baseline information	Yes	30 (40)	33 (44)	63 (42)	0.62
	No	45 (60)	42 (56)	87 (58)	
Total		75 (100)	75 (100)	150 (100)	

Working mothers had a significantly higher level of knowledge ($P=0.009$); whereas, no significant difference was found in dental trauma knowledge scores with respect to age and level of education ($P>0.05$). The mean baseline knowledge score in the intervention group was 6.25 ± 1.97 (time 0) which significantly increased to 9.20 ± 1.04 (time 1) ($P<0.001$), and then decreased to 8.57 ± 1.55 (time 2) ($P<0.001$). However, after 3 months, their level of knowledge was significantly higher than that before the intervention ($P<0.001$). In addition, the baseline knowledge score in the control group (Time 0) was 6.81 ± 1.83 which significantly improved to 7.61 ± 1.76 (time 2) ($P<0.001$). There was no significant difference in level of knowledge between the two groups at time 0, but significantly higher score was found in the intervention group at time 2 ($P=0.000$, Tables 2 and 3).

	Time 0 (\pm SD)	Time 1 (\pm SD)	Time 2 (\pm SD)
Intervention	6.25 (\pm 1.97)	9.20 (\pm 1.04)	8.57 (\pm 1.55)
Non-intervention	6.81 (\pm 1.83)	-	7.61 (\pm 1.76)
P-value	0.086	-	<0.001

SD: Standard deviation

In this study, a weak positive correlation was found in maternal knowledge in the intervention group between times 0-1 ($|r|=0.26$, $P<0.05$) and 0-2 ($|r|=0.24$, $P<0.05$),

Items (knowledge of)	Correct answers (%)			Increase or decrease in correct answers (%)		
	Time 0	Time 1	Time 2	Time 0 to 1	Time 0 to 2	Time 1 to 2
4.crown fracture management	41	89	61	48	20	-28
5.suitable time for taking a child to a dental office in case of crown fracture	89	96	97	7	8	1
6. Management of luxation	96	98	94	2	-2	-4
7.Management of avulsion	97	100	94	3	-3	-6
8.Avulsed tooth storage	34	94	86	60	52	-8
9.Avulsed tooth found on the ground	72	96	85	24	13	-11
10.How to clean an avulsed tooth	46	86	89	40	43	3
11. Suitable storage medium for an avulsed tooth	28	88	65	60	37	-23
12.Best time for taking a child to a dental office after avulsion	84	100	94	16	10	-6
13.Selected place for professional treatment of TDIs	99	100	100	1	1	0

Discussion

Considering the high prevalence of TDIs in children and

while a moderate positive correlation was noted between times 1 and 2 ($|r|=0.58$, $P<0.05$). In the non-intervention group, the correlation between times 0 and 2 was strong and positive ($|r|=0.74$, $P<0.001$).

Table 3- Median knowledge score (from 10) of participants (n=150)

	Time 0(IQR)	Time 1 (IQR)	Time 2 (IQR)
Intervention	6.50 (3.21)	9.50 (1.50)	9.00 (2.08)
Control	7.00 (2.75)	-	7.50 (2.50)

IQR: Interquartile range

According to the qualitative distribution of level of knowledge in the study participants (low, moderate, and high), almost half of the participants in the intervention group had "low" knowledge at baseline and at time 2, "high" knowledge level was observed among 80% of them. In the control group, about 30% of the respondents had "low" knowledge at time 0 and about half of them showed "high" knowledge level after 3 months.

According to Table 4, the highest increase in the mean score of knowledge in the intervention group was observed between time 0 and 1 in items no. 8 and 11 (namely, dental avulsion) and between time 0 and 2 in item no. 8. On the other hand, the greatest decrease was found in level of knowledge between times 1 to 2 in item no. 4 (crown fracture).

their impact on oral health, the need for further investigations in this respect is quite evident.¹⁶ For this reason, the present study aimed to investigate the effect of

an informative leaflet about TDIs on the level of knowledge of mothers referring to the Orthodontics and Pediatric Dentistry Departments of the School of Dentistry of Shahid Beheshti University of Medical Sciences (Tehran, Iran) in 2015. This study showed that the mean score of maternal knowledge at baseline was 6.53 out of 10. Comparing the results of this study with other investigations in this respect also demonstrated that the level of knowledge of mothers referring to the School of Dentistry regarding TDIs was higher than the mean score of the communities examined in other studies.^{4,6} The mean level of maternal knowledge was reported to be low in most studies.⁴ Nirwan et al. reported a significant association between knowledge level and age, suggesting that the age of respondents had an effect on their level of knowledge regarding TDIs.¹⁷ In two other reports, no significant difference was observed in total knowledge score in terms of mothers' level of education or age^{9,18}, which was in agreement with the findings of the present study.

Educational background also had a positive effect on the attitude and perceived importance of immediate management of TDIs, but it had no significant effect on the knowledge about management of such injuries. Even among the educated parents, only a few had received some information on what to do in case of dental avulsion.³ In the present study, there was no significant relationship between maternal level of education and knowledge about TDIs.

Besides, in this study, 60% of the mothers admitted that they had encountered TDIs during their lifetime, which was a considerable percentage. In the study by Nirwan et al, on schoolteachers, this rate was about 30%.¹⁷ This difference may indicate that mothers are more likely to encounter TDIs. In the present study, among those who acknowledged that they had information about such injuries, most of them had received this information through dentists, which was in line with the results of other investigations.¹⁷ The mean score of knowledge and management of TDIs in all mothers in Iraq was 5.2 out of 10⁶, but this rate in the present study was 6.53, which was slightly higher. In Iraq, 45% of the mothers would contact a dentist in case of TDIs while this rate was 68% and 93% in India⁵ and Brazil¹⁹, respectively, implying lack of awareness in mothers about the importance of optimal and early management of such injuries.

Only 66 (29%) mothers in Iraq knew that avulsed teeth should be replanted back in the socket or immediately transferred to a dentist in a storage medium. This percentage was 1% among mothers in Jordan⁴, 17% in the United Arab Emirates¹⁸, and 67% in India.⁵ In Iran, 98% of the mothers reported that it was better to put the fractured tooth back in the socket and take the child immediately to a dental office. In addition, 72% of them

reported they would immediately seek professional help from a dentist in case of tooth fracture.²⁰ Previous studies also revealed that mothers had higher level of knowledge about tooth fracture than avulsion.^{4,18}

Of note, the majority of parents have little knowledge about TDIs and emergency management of avulsed permanent teeth in children. As in the present study, the lowest percentage of correct answers at time 0 was related to item no. 8 regarding dental avulsion. Therefore, it seems that educational programs are necessary to improve parental knowledge.²¹ Most parents also realized the importance of follow-ups and the impact of an educational program on management of TDIs.²² Researchers in Yazd, Iran, also reported the knowledge of schoolteachers on emergency management of TDIs to be poor, confirming the absolute necessity of education of teachers regarding the management of such injuries.²⁰ By education of proper management of dental injuries and the actions that should be taken in dealing with injuries such as avulsion, tooth fracture and luxation, many oral and dental trauma complications can be mitigated in children. However, most of the available studies on public knowledge about TDIs only measured the participants' level of knowledge and awareness, and fewer studies examined the effect of an educational method for this purpose.^{8,9}

Substantial improvement in parental knowledge level following receiving leaflets regarding tooth avulsion was also reported by Al-Asfour and Andersson.⁹ In addition, routine dental visits have been suggested as an educational means to convey information about the management of TDIs.³ Loo et al. reported that most people were looking forward to attend educational programs regarding the management of TDIs.²³ Previous studies using leaflets showed that such interventions could be an adequate and desirable way to increase parental awareness.^{8,9} Although in the present study, during the three months after the intervention, a significant improvement in maternal information was observed in both groups, the knowledge enhancement in the intervention group was higher than that in the control group.

Item no. 8 also showed the highest increase in the mean knowledge score between times 0 and 2. Maternal knowledge about avulsion also remained higher than other items, which could be due to the attractiveness of this topic. Therefore, the present intervention in the field of avulsion could help people the most; however, knowledge retention was minimum in the field of crown fracture. It was not possible to directly compare the present results with similar previous investigations because some items or some answer choices were different.

One strength of the present study was that many studies had examined the effect of an educational method on the level of knowledge of individuals at intervals of one week or one month^{8,9}, but knowledge retention after 3 months

was also evaluated in this study.²⁴ The leaflets presented in the majority of previous studies had merely focused on the subject of avulsion, but due to the wide range of dental injuries, there was a need for a more complete leaflet in this regard. Therefore, in this study, an informative leaflet was designed in such a way that it increased awareness about two other common dental injuries in children, including displacement and crown fracture. The information obtained from the present study, with regard to the low cost of printing and distributing the leaflets, could provide useful results, help improve mothers' knowledge about TDIs in children, and thus promote oral health of Iranian children. Considering the limitations of this study, being restricted to only one district in the city of Tehran, Iran, the data may not fully represent the level of knowledge of all mothers in this megacity. Therefore, different cities should be selected

and nationwide investigations should be conducted to shed light on this important subject.

Conclusion

The study findings revealed that the informative leaflet enhanced the level of knowledge of mothers. Use of such leaflets is thus an effective tool to enhance the knowledge of mothers about the management of TDIs. Further studies are accordingly required to introduce and validate suitable educational programs regarding early management of TDIs by the parents.

Conflict of Interest

No Conflict of Interest Declared ■

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