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The effect of a leaflet given to parents for first aid measures after tooth avulsion

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Abstract – The aims of this study were to evaluate knowledge level among parents regarding tooth avulsion and replantation and to evaluate a simple leaflet as an information tool to enhance this knowledge. One Hundred and fifty parents in a primary school in Kuwait City participated in the study. Half of the parents received a leaflet with basic first aid message regarding what to do in case of tooth avulsion. One week after reading the leaflet, the parents who had received the leaflet were evaluated by using a questionnaire. The other half of the parents who had not seen the leaflet served as control. The level of knowledge was measured in the following categories: General knowledge of tooth avulsion, knowledge of replantation and primary vs permanent teeth, knowledge of how to clean an avulsed tooth, knowledge of extra-oral time, knowledge of storage methods and storage media. By scoring the knowledge, the level of knowledge was calculated. The results showed that knowledge level was low among Kuwaiti parents. Improvement was seen in all categories of knowledge as a result of reading the leaflet. A simple leaflet can be a valuable tool to convey important basic information and enhance knowledge of tooth avulsion and how parents should act in such a situation, although there are limitations in conveying the message for a complete understanding. Measuring the knowledge by scoring can give valuable feedback in developing various educational tools.

Avulsion of a permanent tooth is the most serious dental injury and is mostly seen among children (1–5). Losing a tooth at an early age results in a difficult treatment situation, especially for a growing child in whom the growth and development of the area may be inhibited (1, 6, 7). Moreover, a lost tooth may also result in psychological and financial consequences for the child and his/her parents (1, 2, 8). However, if the tooth can be replanted within the first 10–15 min after avulsion, there is a chance for successful healing and the tooth can be saved for the future (3, 9–11). If a tooth cannot be replanted within 10–15 min, it can be temporarily stored in a suitable storage medium during the transport to the clinic (12–14).

Replantation is a well supported treatment method in the literature. Unfortunately all advances in treating an avulsed tooth has no value in terms of prognosis, if the avulsed tooth is not managed in a correct way at the place of accident or if treatment is delayed beyond the recommended first 15 min or longer (1, 3, 15, 16). Therefore, it is very important to involve people (children, parents, and teachers) who might be present at the site of injury and have them well informed of how to manage a situation with tooth avulsion and replantation.

The average knowledge level of dental emergency among lay people and care givers world wide is unsatisfactorily low (8, 17–31). Increasing the awareness of dental trauma management among the public including children may be one way to improve the prognosis of avulsed teeth. Visiting schools, giving lectures, distributing leaflets, TV commercials or making posters are all possible forms to help increase awareness of dental trauma management. The authors have not found any studies in the literature on educating people on how to act in the very best way which is important, both from a knowledge point of view and from a cost/benefit point of view.

The authors recently found that a 30-min lecture significantly increased the knowledge level among school teachers (32). However, giving lectures is resource demanding in that a professional must personally visit an audience. A less resource demanding way to spread information is by giving out leaflets, which are not too expensive to print and can be easily distributed to many people.

The aims of this study were (i) to evaluate knowledge level among parents regarding tooth avulsion and replantation and (ii) to evaluate the effectiveness of a simple leaflet as an information tool.

Materials and methods

Approval for the study was obtained from the Ministry of Education to assess knowledge and distribute leaflets to parents of pupils in one primary school (school children's age ranged from 6–11 years) in Kuwait city district. Eighty-five parents of school children were randomly selected (group A) and were given an informative leaflet about tooth avulsion and immediate and appropriate steps in dental first aid with regard to tooth

avulsion and replantation. The leaflet was prepared by staff of Kuwait University, Faculty of Dentistry (authors), written in simple Arabic language with colourful schematic demonstrations and drawings on front and back (Fig 1, 2). The leaflet was printed in four colours. One week after reading the leaflet, the parents were asked to fill in a questionnaire written in a simple style in their mother tongue, i.e. Arabic.

The questionnaire aimed at assessing the knowledge level of dental first aid with particular focus on the following five categories:

I. General knowledge of tooth avulsion
II. Knowledge of replantation and primary/permanent teeth
III. Knowledge of how to clean an avulsed tooth
IV. Knowledge of extra-oral time
V. Knowledge of storage methods and media

For each category, a score ranging from 0–3 was used, where 0 = no knowledge, 1 = minor knowledge demonstrated, 2 = adequate but not complete and 3 = complete knowledge demonstrated. The questions had been selected so that reaching a score 0 or 1 indicated insufficient knowledge to manage an emergency situation of tooth avulsion. Scores 2 and 3 indicated knowledge of sufficient level to manage a situation of tooth avulsion. This scoring has been used in a recently published study and found to be suitable for studies like ours (31). A translated version of the questionnaire with the ideal answers and principles of scoring are shown in Appendix.

Another group of 75 randomly selected parents (group B) who had not been given the leaflet served as control and were given the same questionnaire and the same scoring criteria were used.

Fig. 1. Photograph of the front of the leaflet used in this study.

Fig. 2. Photograph of the back of the leaflet in this study.

Results

Of 85 parents in group A, 75 had completed the questionnaire properly and were included in the study. There were 52 females and 23 males and the mean age 41 years (S.D. 9.3) in group A. All 75 parents in group B answered the questionnaire properly and were included in the study. There were 64 females and 11 males, with mean age of 40 years (S.D. 8.0) in group B.

The scoring for each of the five categories of knowledge areas is shown in Table 1. A comparison between parents having adequate knowledge (scores 2 and 3) of how to act correctly in an emergency situation without having seen the leaflet (group B) compared to parents who had seen the leaflet (group A) is seen in Fig 3.

Score of general knowledge of tooth avulsion

There were no parents in group A lacking knowledge (score = 0) compared to 16% of parents lacking knowledge in group B. Minor knowledge (score = 1) was seen in 24% of the parents in group A compared to 37% in the control group B. Sixty-seven percent of parents in group A demonstrated adequate knowledge (score = 2) compared to 40% in group B. Complete knowledge (score = 3) was seen in 9% in group A and 7% in the control group B (Table 1).

Adequate to full knowledge (score 2 and 3) of general knowledge of tooth avulsion was seen in 47% of the parents who were not given the leaflet (group B) and in 76% of parents who were given the leaflet (group A), Fig 3.

Table 1. Distribution of parents' knowledge according to scores (%) over the five categories of knowledge areas

	0	1	2	3	Score 2 + 3
I General knowledge					
With brochure	0	24	67	9	76
No brochure	16	37	40	7	47
II Primary/Permanent teeth					
With brochure	8	24	67	1	68
No brochure	17	55	28	0	28
III Cleaning					
With brochure	5	20	11	64	75
No brochure	31	45	20	4	24
IV Time					
With brochure	5	49	31	15	46
No brochure	25	57	12	5	17
V Media					
With brochure	16	8	24	52	76
No brochure	88	7	4	1	5

For details see Material and methods.

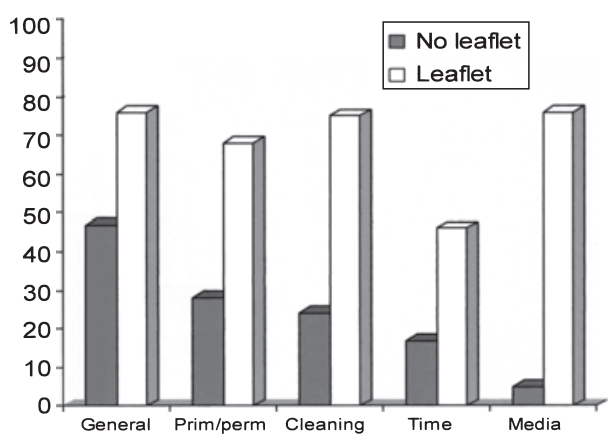

Fig. 3. Distribution of acceptable knowledge (scores 2 and 3) (%) for being able to manage a situation of tooth avulsion for parents presented with leaflets and parents not presented with leaflets. For definition of scores, see Materials and methods and Appendix.

Score of knowledge of replantation and primary/permanent teeth

Eight percent of the parents in group A and 17% in group B demonstrated no knowledge (score = 0). Minor knowledge (score = 1) was seen in 24% in group A, compared to 55% in the control group B. Adequate knowledge level (score = 2) was seen in 67% in group A, compared to 28% in B group. Complete knowledge was seen in one patient 1% in group A and in none of the parents in group B (Table 1).

Adequate to full knowledge (score 2 and 3) of avulsed primary and permanent teeth was seen in 28% of the parents who were not given the leaflet (group B) and in 68% where leaflet had been given to the parents (group A) (Fig 3).

Score of knowledge of how to clean an avulsed tooth

Five percent of the parents in group A demonstrated lack of knowledge (score = 0) of how to clean an avulsed tooth compared to 31% in group B. In group A, 20% demonstrated minor knowledge (score = 1) compared to 45% in group B. Adequate knowledge(score 2) was demonstrated in 11% in group A, compared to 20% in the control group B. Complete knowledge (score = 3) was seen in 64% of parents in group A, compared to 4% in group B (Table 1).

Adequate to full knowledge (score 2 and 3) of how to clean the avulsed tooth was seen in 24% of the parents who were not given the leaflet (group B) and in 75% where leaflet had been given to the parents (group A) (Fig 3).

Score of knowledge of extra-oral time

Five percent of the parents in group A demonstrated no knowledge (score = 0) of extra-oral time compared to 25% of parents in group B. Forty nine percent of the parents in group A showed minor knowledge (score = 1) compared to 57% in group B. Adequate knowledge (score = 2) was demonstrated in 31% in group A, compared to 12% in group B. Complete knowledge (score = 3) was seen in 15% of the parents in group, A compared to 5% (score = 3) in the control group B (Table 1).

Adequate to full knowledge (score 2 and 3) of extra-oral time was seen in 17% of the parents who were not given the leaflet (group B) and in 46% where leaflet had been given to the parents (group A) (Fig 3).

Score of knowledge of storage methods and media

Sixteen percent of the parents in group A demonstrated no knowledge of storage methods and media compared to 88% of parents in group B. Minor knowledge (score = 1) was seen in 8% in group A and 7% in group B. Adequate knowledge (score = 2) was seen in 24% in group A compared to 4% in group B. Complete knowledge (score = 3) was seen in 52% of the parents in group A compared to one parent with full knowledge in group B (Table 1).

Adequate to full knowledge (score 2 and 3) of storage methods and media was seen in 5% of the parents who were not given the leaflet (group B) and in 76% where leaflet had been given to the parents (group A) (Fig 3).

Discussion

Numerous studies in the literature from various countries have shown that the knowledge level of children, parents, teachers and even professionals is low regarding correct first aid measures of tooth avulsion and replantation (8, 18–32). However, there seems to be no studies on how knowledge should best be raised to a higher level in the society, which is of paramount importance to save avulsed teeth by replantation. Distributing a simple leaflet with the key message on tooth avulsion and replantation is one way to do this.

This study showed that parents who were not given the leaflet, had in general too low knowledge level in the various categories of knowledge to be able to act correctly in an emergency situation. This is in accordance with a previous pilot study in parents in Kuwait (31). This study showed that a simple leaflet was sufficient to increase the levels of sufficient knowledge considerably, over the same knowledge areas, up to a higher level, 46–74% of the parents. Although a variation between different categories of knowledge was seen, information given by a simple leaflet apparently increased the level considerably in all categories of knowledge.

Ten parents dropped out of the study as they failed to deliver a completed questionnaire after 1 week, and after analysing the dropouts, we found out that there was no reason that this drop out should have any major influence on the results.

Although there are limitations in a study like this, the results clearly show the power of information given to the public by using a simple leaflet. Information given in a leaflet must be eye-catching, very short and contain only the most essential. The leaflet as information tool does not give the parents any possibility to gain knowledge deeper than the most basic necessary. To enhance the knowledge level further, other tools of information must be used. In a recent study using a similar evaluation method in teachers, as in the present study, a 30-min lecture raised the knowledge levels of the same five categories of knowledge in school teachers (32). This is not surprising as a lecture can contain more information and also give opportunities for questions and answers. One may argue that the teachers in that study may have had a higher knowledge than parents before the lecture; but, this was not the case. In that study, the knowledge level of the teachers, before the lecture was given, was lower than the knowledge level of parents who had not received the information leaflet. The reasons for this are not clear, but may be related to parents being more apprehensive of their own children's health compared with many teachers, who were a younger group than the parents and a majority of the teachers were not parents.

The leaflet apparently fulfilled its value as a valuable information tool when it comes to teaching the parents on how to clean an avulsed tooth, storage methods and storage media for the avulsed tooth. We conclude that these areas were well understood and the same message in the leaflet can be used also in future versions of the leaflet.

With regard to changing the general knowledge of tooth avulsion and special knowledge of replantation and primary/permanent teeth, the leaflet was successful in raising the knowledge for acting correctly in an emergency situation. However, there were very few who demonstrated complete knowledge. This was because of the fact that one figure in the leaflet, which was supposed to explain how a tooth was attached, was not detailed enough for this purpose and needs modification in its next version. However, this knowledge is basic about teeth and has little impact on how to act correctly in case of emergency. Furthermore, although majority of parents had understood that primary teeth should not be replanted, the next version of the leaflet has to be modified as regards the reason why primary teeth should not be replanted namely, the risk of injury to the underlying permanent germ. This important information was apparently not fully understood by all and contributed to the lower number with complete knowledge. This illustrates the limitations of a leaflet for conveying deeper knowledge. Furthermore, our method of evaluating the knowledge level after implementation of a teaching method is of value to improve and develop an information tool further.

However, one must bear in mind that this study does not evaluate the long term effects of the gained knowledge. It would be interesting to study the knowledge level over a longer period of time. Kahabuka et al. evaluated the influence of guidelines mailed to school teachers and seminars on self-care actions taken by children after trauma. Data were collected 6 months before and 5 months after provision of the guidelines and it was found that single educational input to schoolteachers was not enough to promote children's self-care after injury (33) and concluded that educational campaigns should aim to include lay people, especially parents, to increase their knowledge of how to handle dental emergency. This study focused on delivering the appropriate dental first aid to parents who are the key lay people involved in child care. Furthermore, studies like this do not tell if the parents will be psychologically ready to perform tooth replantation when facing such a situation. For this reason, it is important to educate the parents in alternatives to replantation, such as storage media. Another aspect is the possible outcome regarding interest in prevention of tooth avulsion, which may be a desirable secondary

outcome of information. These are all examples of future areas of research.

The leaflet failed to enhance the knowledge level regarding extra-oral time. Although people were aware of the importance of a short extra-oral time before replantation, many of them gave priority to the alternative to replant after the bleeding had been stopped first. The leaflet could not explain that the best way to stop bleeding is actually to replant the tooth. It goes without saying that a simple leaflet has a limited space to give complete information; however, a change should be considered in developing the leaflet in future.

The leaflet, although, can be of a value, apparently cannot be as effective as a lecture, and this is because of the fact that a reader of a leaflet may face some difficulties in understanding all its content if it is not written well and it does not have the advantage of a lecturer present who can explain aspects that may be unclear. The disadvantage of the lecture, however, is that it is resource demanding and therefore costly. We suggest that a leaflet can be distributed to parents in schools so as to reach many parents. However, the leaflet should be ideally followed up by an informative lecture and discussion. This, of course, involves a question of resources in a society. Perhaps other media tools such as CDs and DVDs distributed to parents can give deeper knowledge than a lecture. It is very common nowadays that the general public is searching information on the Internet. Such information for the public may be found on the website of International Association of Dental Traumatology (IADT) (http://www.iadt-dentaltrauma.org).

In conclusion, knowledge level is low among parents in Kuwait as regards how to act when facing a situation with an avulsed tooth. However, a simple leaflet can convey important basic information to parents and substantially raise the knowledge level, although it has its limitations in conveying the message for a complete understanding. Measurement of knowledge by means of scoring is a valuable method to compare knowledge before and after use of educational tools. This will give an opportunity for feedback that can be used for modifying the education tool and developing new information tools. Further research is needed to elucidate the long term effects of various tools of information.

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Appendix: A translated version of the questionnaire (in bold) with ideal answers and principles of scoring (*in italic*)

General knowledge of teeth and tooth avulsion

Do you know how the tooth is normally kept in its position in the jaw so that it will not fall when you chew?

Do you think a tooth can be completely knocked out?

If the tooth is knocked out by accident, do you think it can be put back so that you can chew and smile with it as you did before the accident?

To achieve a full score of 3, knowledge about each of the three principles below has to be demonstrated.

- Know that a tooth is attached to the bone by fibres.
- Know that a tooth can be knocked out completely.
- Know that an avulsed tooth can be replanted, heal successfully and function again normally.

To achieve a score of 2, knowledge of two of the above principles has to be demonstrated.

To achieve a score of 1, one of the above principles has to be demonstrated.

Knowledge of replantation of primary vs permanent teeth

Do you think primary (baby, temporary) teeth should be put back in after they were knocked out?

If the answer is no, give the reason why?

Do you think permanent (the teeth you have for the rest of your life) teeth should be put back in after they were knocked out?

To achieve a full score of 3, the parent has to know all of the following information:

- Primary teeth should not be replanted.
- The reason for not replanting a primary tooth is the risk of injury to the underlying permanent tooth germ.
- Permanent teeth should be replanted, whenever possible.

To achieve a score of 2, knowledge of two of the above principles has to be demonstrated.

To achieve a score of 1, one of the above principles has to be demonstrated.

Knowledge of how to clean the tooth

If the tooth has fallen on the ground and is dirty, what would you do?

If you have to clean the tooth first, how do you clean it?

Do you clean the tooth even if it is not dirty?

How do you hold the tooth while cleaning it?

Is it important to rub away all the dirt?

To achieve a full score of 3, the parent has to know all of the following information:

- A dirty tooth should be rinsed in water (not in an antiseptic solution).
- A tooth should be held by its crown and touching of the root surface should be avoided.
- Rubbing the root should be avoided.

To achieve a score of 2, knowledge of two of the above principles has to be demonstrated.

To achieve a score of 1, one of the above principles has to be demonstrated.

Knowledge of Extra-oral time

When should the tooth be put back in, if it was knocked out of the mouth? (Choose the best alternative)

- Immediately
- As soon as the bleeding has stopped
- During the first hour
- Within the first 6 h
- When visiting the dentist

Why?

Do you think a tooth can be out of a person's mouth for a longer time if stored in another way than dry storage?

To achieve a full score of 3, the parent has to know all the following information:

- A tooth should be replanted as soon as possible.
- The reason is that the root cells (periodontal membrane) will be injured by dry storage.
- A tooth can be stored for longer periods if stored in a suitable storage medium.

To achieve a score of 2, knowledge of two of the above principles has to be demonstrated.

To achieve a score of 1, one of the above principles has to be demonstrated.

Knowledge of Storage method and media

1. What should you do if you cannot (or choose not to) put the tooth back in your mouth?
2. How should you transport the tooth on the way to the dentist?
3. Have you heard about any other way of storing a tooth that has been knocked out before it is put back in its socket?
4. Mark desirable and undesirable ways of storing a tooth that has been knocked out while you are on your way to the dentist (show a list of suggestions below).

Wrap the tooth in paper	Yes	No
Wrap the tooth in a handkerchief	Yes	No
Wrap the tooth in gauze or cotton	Yes	No
Wrap the tooth in cellophane	Yes	No
Put the tooth in water	Yes	No
Put the tooth in ice water	Yes	No
Place the tooth in a disinfecting solution	Yes	No
Place the tooth in the child's mouth	Yes	No
Place the tooth in the child's hand	Yes	No
Put the tooth in milk	Yes	No
Put the tooth in fruit juice	Yes	No
Put the tooth in saline solution	Yes	No
Put the tooth in Coca-Cola	Yes	No

To achieve a full score of 3, the parent has to know all of the following information:

- The tooth can be stored if it cannot be replanted.
- The tooth must not be stored in water.
- The tooth must not be stored dry.
- The correct answer to at least 12 of the 13 statements listed above.

To achieve a score of 2, knowledge of at least two of questions 1–3 have to be demonstrated. In addition, at least 10 of the 13 statements listed in question 4 have to be correctly marked.

To achieve a score of 1, some knowledge has to be demonstrated.