# An oral health promotion program for the prevention of complications following avulsion: the effect on knowledge of physical education teachers

Holan G, Cohenca N, Brin I, Sgan-Cohen H. An oral health promotion program for the prevention of complications following avulsion: the effect on knowledge of physical education teachers. © Blackwell Munksgaard, 2006.

Abstract - The aim was to assess the knowledge levels of physical education teachers before and after a seminar, presented by dental faculty as part of a community outreach program, in which the need for immediate treatment because of avulsion of permanent teeth has been emphasized, and to compare knowledge levels of teachers who attended the seminar with those who did not. Physical education teachers attended a seminar presented by senior faculty of the Hebrew University-Hadassah School of Dental Medicine as part of an educational campaign in the community. The seminar included clear instructions on the appropriate treatment of avulsed permanent teeth, which were appropriate for physical education teachers. The teachers completed two multiplechoice self-administered anonymous questionnaires related to immediate treatment they could provide in cases of permanent teeth avulsion. One hundred and twenty-six teachers completed the first questionnaire, 2 months before the seminar. One hundred teachers completed the second questionnaire 10 months after the seminar. Of these, 70 attended the seminar and 30 did not. Thirtytwo teachers who attended the seminar had completed both questionnaires. The percentage of teachers who provided expected 'correct' answers in the first questionnaire (11% and 16%) was significantly lower than that in the second questionnaire (23% and 68%). The percentage of teachers who provided correct answers in the second questionnaire among those who attended the seminar (24% and 69%) was not significantly different from those who did not attend the seminar (20% and 66%). An educational campaign in the community with a seminar targeted towards a cohort of physical education teachers can improve the knowledge of the teachers, even those who did not attend the seminar, probably by means of a contamination effect. Despite the improvement, which was found, the level of knowledge after the campaign remained low and more public health promotion efforts are indicated.

Dental trauma among children has been described in the literature in many countries. A wide range of prevalence levels has been demonstrated in surveys,

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which have not always employed similar epidemiological methodologies, but mostly have described young teenagers and trauma of anterior

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permanent teeth. Recent studies have shown prevalence levels ranging from 1.8% in Norway to 18.9% in Brazil (1–4). Epidemiological research on dental trauma has reported associations with gender, orthodontic factors and sport activities (5, 6). The most recent Israeli study has reported a prevalence of dental trauma (at least involving the dentine) of 13.5% among fifth and sixth grade Jerusalem schoolchildren (7). Another Israeli study has reported that 9% of young adults experienced dental injuries caused by sports (8).

All types of dental trauma should be treated as soon as possible after the event. This is most urgent for avulsed permanent incisors, when any delay in replantation dramatically reduces their long-term survival (9). Sport activity is one of the most common reasons for dental trauma among children (10–13) and physical education teachers are important agents in the prevention of dental trauma. They supervise children during sport activity at school and during breaks (14) and are more likely to witness children who are at risk of losing permanent teeth (15). Moreover, as they are close to the incident of injury they have the potential to immediately shorten the time interval between avulsion and replantation. Physical training teachers should therefore be cognizant of dental trauma and its appropriate treatment – insertion of an avulsed tooth back to its original location in the mouth as soon as possible. Unfortunately, previous research has indicated that teachers in general and physical education teachers specifically, have little or no knowledge on this subject. (14-18). The literature has repeatedly emphasized the need for an educational campaign to improve this knowledge (14–23). One attempt at modifying knowledge levels among teachers has been reported in the literature (24). This study evaluated the influence of mailed guidelines and seminars to schoolteachers concerning selfcare actions taken by children after trauma. The results showed that there was no improvement in the children's behavior.

The Hebrew University–Hadassah School of Dental Medicine recently celebrated its 50th jubilee. As part of the year's activities it was decided to adopt a community outreach program with the aim of educating the public about dental trauma. This 'case for action' was based upon the findings of an epidemiological survey conducted in the city (7). Senior faculty members presented seminars to groups of key people in the community: Jewish and Arab primary schoolteachers, physical education teachers, school nurses, family physicians, pediatric physicians, pediatric dentists, orthodontists, dental hygienists, and police personnel. Dental and dental hygiene students were delegated to educate schoolchildren. A range of educational materials was produced which included pamphlets, slides and a poster.

The purpose of the present study was to evaluate the effect of a seminar which was presented by the dental faculty to physical education teachers and which emphasized avulsion of permanent teeth and the need for immediate treatment. The specific objectives included assessing the knowledge levels of physical education teachers before and after the seminar and comparing knowledge levels of teachers who attended the seminar to those who did not.

## Methods

Physical education teachers of the Jerusalem district in Israel attend bi-annual compulsory meetings. At their meeting in July 2003, they were requested to anonymously complete a multiple-choice selfadministered questionnaire. Questions related to teachers' potential role regarding avulsion of permanent teeth among schoolchildren. The first section of the questionnaire included personal information: subject's gender, years of professional experience, hours per week spent with schoolchildren, previous experience with dental trauma (especially avulsion). The second section comprised of questions aimed to evaluate the level of knowledge regarding how to handle a situation of a permanent tooth avulsion. The correct expected answer was: looking for the avulsed tooth, gently rinsing under running tap water, replanting the tooth within 15 min and then immediately referring the child to a dentist or a hospital emergency room. For those who replied that they were unable or unwilling to replant the tooth the correct expected answer was: 'put the tooth in cold fresh milk (or saline, or in the child's oral vestibule) and refer the child (with the tooth) immediately to a dentist'.

At the physical education teachers' meeting in September 2003, a seminar was presented on dental trauma by five faculty members of the Hebrew University–Hadassah School of Dental Medicine in Jerusalem. The presentation included clear instructions on the appropriate treatment of avulsed permanent teeth, which were appropriate for physical education teachers.

In the following meeting in July 2004 physical education teachers were asked to complete a followup anonymous questionnaire. This was a shortened version of the previous questionnaire, handed out a year earlier, but included two additional questions: 'Did you complete a similar questionnaire last year?' and, 'Did you attend the seminar on dental trauma last year?'

The participation in the three aforementioned events is as follows: of 257 teachers who attended the meeting in July 2003, 126 (49% compliance) filled in the questionnaire; in September 2003, a total of 274 teachers attended the seminar; of 282 teachers who attended the meeting in July 2004, 100 (35% compliance) responded and returned the completed questionnaire. The distribution of respondents in the two consecutive years according to gender is presented in Table 1. Of the 100 teachers who completed the July 2004 questionnaire, only 70 attended the September 2003 seminar and 32 teachers took part in all three activities (Table 2).

#### Results

The distribution of physical education teachers by gender is presented in Table 1. There were twice as many females than males among the respondents at both meetings, when the questionnaires were applied. Table 2 shows that only 32 teachers of the 100 respondents in 2004 were involved in all three activities (i.e. completed the 2003 and 2004 questionnaires and participated in the seminar presentation. Seventy teachers did not complete the questionnaire in 2003 but did attend the meeting with the seminar presentation and completed the 2004 questionnaire.

When asked: 'What is the best immediate treatment for an avulsed tooth?' 16% (20 of 126 teachers) of the respondents in 2003 and 68% (68 of 100) of the respondents in 2004 provided the correct answer (Table 3). This difference was highly statistically significant (chi-square, P < 0.001). Sixty-nine percent (48 of 70) of the teachers who attended the seminar presentation replied correctly to this question in the 2004 questionnaire. This was

Table 1. Distribution of respondents in the 2003 and 2004 annual meetings by gender

Gender of participants	Questionnaire completion [n (%)]			
	2003	2004		
Male Female No response	39 (31) 82 (65) 5 (4)	34 (34) 62 (62) 4 (4)		
Total	126 (100)	100 (100)		

Table 2. Distribution of respondents who completed the 2004 questionnaire according to completion of the 2003 questionnaire and attendance at the seminar

	Completed the 2003 questionnaire					
Attended in the seminar	Yes	No	Did not reply	Total		
Yes	32	34	4	70		
No	4	26	0	30		
Total	36	60	4	100		

Table 3. Distribution of respondents by year of questionnaire completion, attendance to the seminar on dental trauma and reply to the question: 'What is the best immediate treatment for an avulsed tooth?'

	Questionnaire completion [ $n$ (%)]				
		2004 (teachers attended the seminar)			
Respondents' reply	2003	Yes	No	Total	
Correct answer* Wrong answer Did not reply to this question	20 <sup>†</sup> (16) 100 (79) 6 (5)	48 <sup>§</sup> (69) 19 (27) 3 (4)	20 <sup>§</sup> (66) 8 (27) 2 (7)	68 <sup>†</sup> (68) 27 (27) 5 (5)	
Total	126 (100)	70 (100)	30 (100)	100 (100)	

\*Find the tooth, rinse under tap water, replant or put in milk or child's mouth and hurry to the dentist.

Difference significant (chi-square, P < 0.001).

<sup>§</sup>Difference not significant (chi-square, P > 0.05).

similar to the 66% (20 of 30 teachers) who did not attend the seminar. No statistically significant difference was found between the two groups.

When asked whether they would replant an avulsed tooth themselves (if needed), 19% (24 of 126) of the respondents in 2003 and 53% (53 of 100) of the respondents in 2004 provided a positive answer (Table 4). This difference was highly statistically significant (chi-square, P < 0.001). Fifty-four percent (38 of 70) of the teachers who attended the seminar presentation gave a positive answer to this question in the 2004 questionnaire. This was similar to the 50% (15 of 30 teachers) who did not attend the seminar, with no statistically significant difference.

As shown in Table 5, a correct answer to the question: 'What is the best medium to transfer an avulsed tooth to the dentist?' was provided by 11% (14 of 126) and 23% (23 of 100 respondents) in 2003 and 2004 respectively. This difference was statistically significant (chi-square, P < 0.05). Twenty-four percent (17 of 70) of the teachers who attended the

Table 4. Distribution of respondents by year of questionnaire completion, attendance to the seminar on dental trauma and reply to the question: 'Would you replant an avulsed tooth yourself?'

	Questionnaire completion [n (%)]							
			2004 (teachers attended the seminar)				the	
Respondents' reply	2	003	١	/es	l	No	Т	otal
Yes	24*	(19)	38 <sup>†</sup>	(54)	15 <sup>†</sup>	(50)	53*	(53)
No	69*	(55)	17 <sup>†</sup>	(24)	10 <sup>†</sup>	(33)	27*	(27)
Do not know	31	(25)	13	(19)	5	(17)	18	(18)
Did not reply to this question	2	(1)	2	(3)	0	. ,	2	(2)
Total	126	(100)	70	(100)	30	(100)	100	(100)

\*Difference significant (chi-square, P < 0.001).

†Difference not significant (chi-square, P > 0.05).

Table 5. Distribution of respondents by year of questionnaire completion, attendance to the seminar on dental trauma and reply to the question: 'What is the best medium to transfer an avulsed tooth to the dentist?'

	Questionnaire completion $[n (\%)]$					
		2004 (teachers attended the seminar				
Respondents' reply	2003	Yes	No	Total		
Correct answer* Wrong answer <sup>§</sup> Did not reply to this question	14 <sup>†</sup> (11) 53 <sup>†</sup> (42) 59 (47)	17 <sup>‡</sup> (24) 24 <sup>‡</sup> (34) 29 (42)	6 <sup>‡</sup> (20) 12 <sup>‡</sup> (40) 12 (40)	23 <sup>†</sup> (23) 36 <sup>†</sup> (36) 41 (41)		
Total	126 (100)	70 (100)	30 (100)	100 (100)		

\*In the child's mouth or milk.

<sup>§</sup>In tap water, alcohol, disinfectant, plastic bag, handkerchief or napkin.

<sup>‡</sup>Difference not significant (chi-square, P > 0.05). †Difference significant (chi-square, P < 0.05).

Difference significant (chi-square, F < 0.03).

seminar presentation gave a correct answer to this question in the 2004 questionnaire. This was similar to the 20% (six of 30 teachers) who did not attend the seminar, with no statistically significant difference.

Seventy-two percent (91 of 126) of the teachers who completed the questionnaire in 2003 and 28% (28 of 100 teachers) in 2004 had witnessed at least one case of dental trauma at either the school or home. Sixteen percent (20 of 126) of the teachers who completed the 2003 questionnaire and 8% (eight of 100 teachers) in 2004 had evidenced cases of avulsion. Five of these eight teachers had attended the seminar presentation. Two of these five replied positively to the question: 'Would you replant an avulsed tooth yourself?', two others marked the option: 'There is no use in replanting an avulsed tooth' and one chose the option: 'Have no idea'.

### Discussion

The findings of this study show that a single seminar combined with extensive explanatory work in the community, can improve the know-ledge of physical education teachers regarding the appropriate immediate treatment of avulsed permanent teeth. The correct response to the question: 'What is the best immediate treatment for an avulsed tooth?' increased from 16% in 2003 to 68% in 2004. This is an encouraging result but not sufficient. Thirty-two percent of the physical education teachers still do not know what to do in a case of avulsion.

It is interesting to note that the percentages of correct answers provided by teachers who attended and those who did not attend the seminar were similar. This can be explained by a possible 'contamination effect' involving the sharing and spreading of information provided at the seminar presentation with teachers who had not attended. A similar effect was reported in a study evaluating the knowledge of physicians regarding appropriate emergency treatment (20). It was found that physicians were able to give significantly more correct answers when they had a spouse who was a dentist.

The fact that the second questionnaire was completed 10 months after the seminar presentation does not imply that the knowledge will persist for longer periods. The need for repetition of messages by oral presentations or other means is known to be necessary, in the health education literature, in order to maintain or increase knowledge levels. Especially disturbing are the findings that out of 70 teachers who attended the seminar, 27% did not know what is the best immediate treatment for an avulsed tooth, 24% did not know what is the best medium to transfer an avulsed tooth to the dentist and 24% replied they would not replant an avulsed tooth themselves. The reply of the latter may be attributed to a variety of reasons: psychological deterrents, avoidance of accepting additional responsibilities, fear of legal implications, etc. (14).

Surveys among teachers (14, 23) and physical education teachers (16–18) have been published in the dental literature. These have all reported inadequate levels of respondents' knowledge. Newman and Crawford (16) and Chan et al. (18) reported that the percentage of respondents who were able to indicate the appropriate management of avulsed teeth was 35% and 17.5%, respectively. The findings in the 2003 questionnaire of the present study are similar to those reported by Chan et al. (18), but lower than those reported by Newman and Crawford (16).

The present study has demonstrated an increase in knowledge of physical education teachers after a single seminar. This cannot and was not aimed at assessing a change in actual behavior. Furthermore, it should be remembered that the above reported seminar was an integral on-going component of a 1-year effort throughout the city regarding prevention of dental trauma. Posters had been placed in the schools, children had been visited by dental and dental hygiene students, the educational authorities and superintendents had been involved, circulars had been sent to all teachers, etc. All of this could certainly have had a cumulative and 'contaminating' influence beyond the independent effect of the single seminar presented by dental school faculty. This is not intended to diminish the importance of the seminar but to emphasize the importance of the combined efforts that were invested throughout the year and throughout the city. The results of this study clearly indicate a positive effect of

#### Knowledge of avulsion, education intervention

community efforts in this important field: the prevention of dental trauma.

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