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Dental practitioners' knowledge and implementation of the 2007 International Association of Dental Traumatology guidelines for management of dental trauma

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Abstract – *Aim*: To evaluate the knowledge, adoption, and diffusion rate of the 2007 International Association of Dental Traumatology guidelines among practicing military dental professionals, 1 year after publication. *Methods*: Fifty-four military dental professionals in the Medical Corps of the Israel Defense Forces participated in the study and completed a questionnaire, consisting of demographic questions, and multiple choice questions that presented critical points that a military dentist should know when treating a tooth injury. *Results*: Seven dentists (13%) graduated in the summer of 2007 after publication of the current guidelines. Military instructions (37%) and the official guidelines published in *Dental Traumatology* (25.9%) were the most common sources of updating the current guidelines. Twenty-six percentage of the participants were not updated with the new guidelines at all. Based on the current guidelines, the overall correct answer response rate for the 10 questions was 71.7%. Tetracycline, as an antimicrobial agent of choice in avulsion, yielded the lowest percentage of correct answers (20.4%), with duration of splinting after root fracture, the next most incorrectly answered question (50.0%). *Conclusions*: High level of knowledge regarding the 2007 guidelines was found among Israeli military dentists, 1 year after publication. However, knowledge regarding several issues (e.g., medication, splinting) should be reinforced.

One of the higher risk groups for dental (1–3) and maxillofacial (4, 5) trauma is the military population. However, in this population, there are reports of inadequate preventive measures (6) and first-aid management (7–9) of dental trauma, and in most military first aid manuals, there is a lack of information regarding dental trauma (10).

In 2007, the International Association of Dental Traumatology (IADT) updated the guidelines for the management of traumatic dental injuries, published in *Dental Traumatology* in three parts: management of fractures and luxations of permanent teeth (11), avulsion of permanent teeth (12), and primary teeth injuries (13). Shortly after publication of these new guidelines, the Medical Corps' Headquarters published compatible instructions regarding management of dental trauma to all military dental clinics in the Israel Defense Forces (IDF).

To date, there is no information regarding diffusion of the new 2007 IADT guidelines. The purpose of this study was to evaluate the knowledge, adoption, and diffusion rate of the 2007 IADT guidelines among practicing military dental professionals, 1 year after publication.

Methods

Before an obligatory continuing education convention, held in 2008, military dental professionals in the Medical Corps were requested to participate in the study and to complete a questionnaire, consisting of two parts. The first part included demographic questions regarding gender, age, year of dental school graduation, and type of dental specialty (if any). Participants were also asked to note their sources of knowledge regarding the current IADT guidelines (more than one answer was allowed): international literature (*Dental Traumatology*), National literature, the internal military instructions, undergraduate education, continuous (postgraduate) education (CE), personal-verbal communication, or none.

The second part consisted of multiple choice questions, prepared by dentists from different disciplines of dental care (endodontics, prevention and health administration, oral medicine, periodontics, and prosthodontics). This section was used to collect information regarding the most critical points that military dental professionals should know when treating dental injuries.

Disagreements were settled by discussion. Questions included first aid of dental avulsion, evaluation of the dental wound (first attendance), late treatment of avulsion (after prompt replantation), management of dried (> 60 min) extra-oral avulsed tooth, antibiotic of choice in avulsion, management of lateral luxation, type and duration of dental splinting after root fracture, prognosis of various dental injuries, and postinjury self-care instructions to the patient. Situations of primary teeth trauma were not presented to the participants.

Data were collected and analyzed using MS Excel (Microsoft Inc., Redmond, WA, USA). The Ethics Committee of the Medical Corps, IDF, approved the study design.

Results

All 54 dental officers participating in the obligatory CE convention answered the questionnaire. Most questions were fully answered (0.2% missing data). Table 1 presents the demographic characteristics of the participants. Seven dentists (13%) graduated in the summer of 2007 subsequent to publication of the current guidelines.

Table 2 details the participants' sources of updating the current guidelines. Military instructions (37%) and the official IADT guidelines published in *Dental Traumatology* (25.9%) were the most common. More than one-fourth of the participants did not update the new guidelines at all.

Overall, the correct answer response rate for the 10 questions was 71.7% (Table 3). Specifically, correct answering rate for the four questions regarding avulsion was 60.2%, and for the two root fracture questions was 61.1%. Tetracycline, as an antimicrobial agent of choice in avulsion, yielded the lowest percentage of correct answers, with 20.4% of the participants who knew the current relevant guidelines. Twenty seven (50.0%) participants knew the recommended duration of dental splinting after root fracture.

Discussion

The Diffusion of Innovations Theory suggests that adoption of an innovation involves interaction between the individual and the innovation itself. Five steps are presented: obtaining knowledge of an innovation; forming an attitude about the innovation; making a decision to adopt or reject an innovation; implementing the new idea; and confirming this decision and continuing changed behavior (14).

Table 1. Demographic details of the study participants

Characteristic	*n*
Sex	
Male	29
Female	25
Practice	
Dental specialist	10
General practitioner	44
Age, mean (±SD)	32.5 (±4.6)
Time from graduation, years (±SD)	7.1 (±4.6)

Table 2. Participants' sources of updating the 2007 guidelines

Source	*n* (%)*
Education	
Undergraduate (dental school)	4 (7.4)
Postgraduation	4 (7.4)
Instruction	
Military	20 (37.0)
Verbal	12 (22.2)
Literature	
International (*Dental Traumatology*)	14 (25.9)
National (Hebrew)	11 (20.4)
None	14 (25.9)

*Sum exceeds 100% as some participants have more than one updating source.

Rogers (15, 16) describes five factors that influence the rate of adopting the innovation: the adopter's perception of the relative advantage of the innovation; the compatibility of the innovation with existing structures; the perceived degree of difficulty involved in adopting the innovation; the testability of the innovation in the absence of significant resources; and the visibility of outcomes resulting from adoption of the innovation.

According to Roger's adoption/innovation curve, one-sixth of a population consists of innovators and/or early adopters, one-third early majority adopters, one-third late majority adopters, and one-sixth laggards (14). This study showed that 12 months after publication of the new IADT guidelines, the adequate knowledge level was above 70% for all presented dental trauma situations. Thus, it can be postulated that according to Roger's curve, the diffusion level in the studied population was within the late majority adopters when the study was conducted. However, the lower rate of correct response about the specific questions regarding avulsion and root fracture (60% and 61%, respectively), indicates a need for further education and diffusion efforts.

Military instructions and articles published in *Dental Traumatology* were the most prevalent sources of updating the new guidelines (11, 12). Although the highly diffused method of military instructions is a unique military media, it can be used even in a civilian setting, e.g., updated practice protocols sent by the Ministry of Health to all registered (civilian) clinics.

More than one-fifth reported verbal informal personal communication as their updating source. However, this method is less comprehensive and could lead to incorrect results and serious outcomes (17).

Studies regarding the knowledge of civilian healthcare providers, with respect to management of dental trauma, show adequate (18, 19) to poor (20, 21) knowledge among dental practitioners and poor knowledge among physicians (22, 23). In this study, greater knowledge was found among military dental professionals. This can be explained by the official military instructions, in which 37 % of the participants reported as their updating source. Another possible explanation is the high dental trauma incidence among military population (1–3). A military dental practitioner is more exposed to dental trauma than their civilian counterpart, thus searching for

Table 3. Distribution of the correct answers to the different questions asked in the questionnaire

Issue	Question	Correct answer according to IADT 2007	*n* (%)
General	Evaluation of the dental wounded (first attendance)	Vitality tests and three peri-apical radiographs	46 (85.2)
	Dental injury with lowest prognosis	Intrusion	45 (83.3)
	Postinjury self-care instruction to the patient	Brushing with soft toothbrush and chlorhexidine mouthwash	52 (96.3)
Avulsion	First aid of dental avulsion	Immediate replantation	51 (94.4)
	Late treatment (after prompt replantation)	Endodontic treatment should be initiated within 7–10 days	37 (68.5)
	Management of dried (>60 min) extra-oral avulsed tooth (14-year-old patient)	20 min of treatment with fluoride and replantation (for maintaining of alveolar bone)	31 (57.4)
	Antibiotic of choice in avulsion (in a non- allergic patient)	Tetracycline	11 (20.4)
Root fracture	Type of dental splinting after root fracture	Semi-rigid	39 (72.2)
	Duration of dental splinting after root fracture	1 month	27 (50)
Lateral luxation	Late management of lateral luxation	Endodontic treatment should be initiated only if pulp necrotic is evident	48 (88.9)
Average correct answers			38.7 (71.7)

IADT, International association of dental trauma.

relevant knowledge in scientific literature as well as verbal communication.

Good prognosis of injured teeth largely depends on prompt and appropriate management (24, 25). Thus, it is important for healthcare-givers, especially dental practitioners, to maintain an adequate level of updated knowledge.

Official guidelines and consensus protocols are significant in an appropriate clinical decision making process (26). Although relatively high level of knowledge was found in this study, the results can be used in planning future educational interventions (27). The results point to issues of possible lack of knowledge of medications and splinting.

Conclusions

High level of knowledge regarding 2007 IADT guidelines was found among Israeli military dental professionals, 1 year after publication. However, knowledge regarding several issues (e.g., medication, splinting) should be reinforced.

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