Knowledge, attitudes and practices of emergency care practitioners in the management of common dental emergencies in the eThekwini District, KwaZulu-Natal.

ABSTRACT

Introduction

It is essential to provide timeous and appropriate treatment in cases of dental emergencies. First responders such as Emergency Care Practitioners (ECPs) usually provide this prehospital care. The successful management of casualties experiencing common dental emergencies is dependent on two fundamental factors; the first responder’s knowledge and ability to render the appropriate level and standard of medical care, and; secondly, the time that expires between the onset of the incident and the initiation of definitive emergency medical treatment. Delayed or inappropriate management can have long term physiological and psychological effects.

Objectives

This was an exploratory and descriptive study, using quantitative and qualitative methods to determine the knowledge and attitudes of Emergency Care Practitioners of the eThekwini District of KwaZulu-Natal, South Africa, in the management of dental emergencies.

Results

The results revealed that Emergency Care Practitioners had inadequate knowledge, training, and understanding of the management of common dental emergencies by ECPs. There was limited initial training, with a significant portion of the participants (44.9%, p 0.233) having not received any training at all in the management of orofacial traumas, and with a significant majority (78.3%, < 0.001) having no further education and training. Most ECPs indicated a desire to receive such training.

Conclusion

This study indicated that ECPs lacked confidence in managing dental emergencies, which highlighted a need for specific dental awareness and training programs to further empower ECPs in the management of such emergencies.

Keywords: Common dental emergencies, Emergency Care Practitioners, Emergency Medical Management, Knowledge, attitudes and practices

INTRODUCTION

Dental emergencies are fast becoming an oral health issue due to its increased prevalence. Dental emergencies, including dentoalveolar fractures, maxillary and mandibular fractures, and complications of untreated tooth infections require immediate management. Any delay or improper management thereof can have long-term and adverse health outcomes. Moreover, orofacial trauma including anterior tooth avulsion, may lead to various psychological effects such as the loss of confidence and, possible loss of a job or inability to obtain work, especially in fields where physical appearance is regarded as being important (such as frontline sales and retail jobs). In addition, there may be a negative aesthetic consequence of these injuries, as they occur on the part of the body that is almost always exposed and visible. Effects such as facial scarring, disfigurement and deformation, loss of function, and paralysis may occur and often cannot be disguised or hidden. Additionally, casualties may require extensive and expensive plastic and reconstructive surgery to restore some aesthetics and function. There may also be significant social interaction difficulties and even social avoidance, which could be ascribed to embarrassment and a fear of rejection. This delay may be related to access to...
The SADJ is licensed under Creative Commons Licence CC-BY-NC-4.0.

http://dx.doi.org/10.17159/2519-0105/2022/v77no7a2

In private, during their break times. The questionnaire questionnaires were distributed to them to complete.

After obtaining informed consent from participants, the study. At the same time, those engaged in the private sector and student ECPs were excluded.

This prehospital care is usually provided by first responders such as emergency care providers attending an accident scene. Several studies show that management of orofacial trauma is often not included in medical courses and first aid training nor in first-aid textbooks and training manuals of first responders to trauma such as ECPs.

While research on an international level regarding orofacial trauma and the knowledge of ECPs in managing such trauma is substantial, in South Africa, there is a lack of epidemiological studies on the understanding of emergency care providers in managing these conditions.

OBJECTIVES OF THE STUDY
The study aimed to determine the knowledge, attitudes, and practices among emergency care providers’ in managing dental emergencies.

METHODOLOGY
This was an exploratory, descriptive study employing quantitative and qualitative methods to achieve the objectives. The researcher obtained ethical approval from the Social Sciences and Humanities Research Ethics Committee (SSHREC Reference number: 068/16) and the KZN Department of Health (Reference number: 26/16 KZ-2015RP12-306). This study was completed in 2018.

The quantitative aspect involved participants (ECPs), employed by the local public sector Emergency Medical Services in the eThekwini Health District of KwaZulu-Natal, to complete a self-administered questionnaire on their knowledge, attitudes, and practices in the management of casualties presenting with orofacial trauma. A random sampling method, through the Surveymaker® software, was used to obtain the sample size. The sample size was calculated using a power calculation method with the following parameters: Sample size of 1138, Coefficient Index of 95% and, Standard Deviation of 0.96%, yielding a final sample size of 288. Using convenience sampling, participants were recruited at the start of their shifts in their workplaces and were informed about the study. All qualified ECPs registered with the Health Professional Council of South Africa (HPCSA), both male and female, employed by the provincial Department of Health Emergency Medical Services in the eThekwini District were included in the study. At the same time, those engaged in the private sector and student ECPs were excluded.

After obtaining informed consent from participants, the questionnaires were distributed to them to complete, in private, during their break times. The questionnaire included open and closed-ended questions and comprised four sections (demographics, knowledge, attitudes, practices, and further training needs). Sample questions included: Demographics (How many years of operational experience do you have in your profession?); Knowledge (Would you consider re-implantation of a primary (deciduous) avulsed tooth?); Attitudes (I am confident and comfortable treating common traumatic orofacial injuries and orofacial medical emergencies?); Practices (I know how to manage a tooth that is completely knocked out). The responses on attitudes and practices were rated on a Likert scale ranging from strongly agree to strongly disagree. Construct validity was used in the construction of the questionnaires to maintain validity of the quantitative data. The researcher collected the questionnaires at the end of their shifts, and all completed questionnaires were coded to maintain participant anonymity.

The qualitative part of the study involved conducting semi-structured interviews with a purposively selected sample of ECPs, the managers from 7 bases (Tongaat, Phoenix, KwaMashu, Marianhill, R K Khan, Wentworth, and Umlazi) in the eThekwini Health District. The interviews were conducted using an interview schedule to gain an in-depth understanding of training and curriculum content regarding the emergency management of common orofacial trauma and dental emergencies. Sample questions include: Do you think there is adequate education and training offered to ECPs to manage common orofacial traumatic injuries and medical emergencies? and in your opinion, is further training required for ECPs in training to manage common orofacial trauma and medical emergencies efficiently? The interviews were conducted at the participants’ convenience, in their offices, and lasted approximately 30 minutes. The researcher recorded the interviews with the participants’ consent.

The qualitative data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 24® IBM 2016. Data analysis included descriptive statistics such as frequency and mean distribution and were presented as graphs and tables. Inferential statistical techniques, the Chi-Squared test, and the ANOVA Statistical test were used to determine associated relationships between the independent and dependent variables (knowledge, attitudes, and practices). The qualitative data obtained from the digital voice recordings were transcribed verbatim onto a Microsoft Word® document. In ensuring credibility, the researcher sent the data transcripts to the participants for verification to maintain dependability. Confirmability was established by quoting the participants’ actual dialogue. The researcher analyzed the primary data manually to search for common patterns, which later emerged as themes and sub-themes according to Braun and Clark, 2010.

RESULTS
Of the 237 questionnaires distributed, only 138 were returned, yielding a 57.5% response rate. The majority of the study population were male (n=104, 75.4%) with most being within the age categories of 40-50 years (n= 54, 39.1%) and 30-40 years (n=50, 36.2%). Most (n=104, 75%) of the ECPs had a secondary medical
qualification, such as a rescue qualification, in addition to their basic paramedical qualification. The basic ambulance assistants had an average of 9.5 years of operational experience, in contrast to the higher qualified Critical Care Assistant, who had, on average, 20 years of experience. Those ECPs with a basic rescue qualification had over 21 years, while the more advanced medical rescue qualification holders had 10.8 years of experience, as reflected in Figure 1 below.

The differences observed in determining the ECPs training in the management of common orofacial injuries and medical emergencies during initial training was not significantly different (55% vs 45%), but significantly more respondents (78%) indicated that they did not receive any further training post-qualification, as shown in Figure 2.

Knowledge of Oro-facial Trauma
A large number of respondents reported dealing with patients who presented with some type of dental injury (soft-tissue lacerations; 63.8%, Mandible fractures; 50%), yet just about half (n= 73, 53%) were able to identify the different teeth in the oral cavity. A significant number (n= 88, 64%) of the participants did not know when to re-implant an avulsed tooth, and 41% (n=57) did not know the proper process to preserve and implant an avulsed tooth.

When asked about the management of the potentially life-threatening orofacial condition of Ludwig’s Angina, more than half of the study population (n=77, 55.5%) were unaware of this condition. Only14% (n= 19) of the participants recognized that the most critical sequel of Ludwig’s angina is airway obstruction. Only 8% (n= 11) realized that Ludwig’s angina is a bilateral swelling submandibular, sublingual and submental spaces.

Attitudes and Practices in Management of Oro-facial trauma
Just over 50% of participants agree (n=61, 44%) and (n= 13, 9.4%) strongly agree that they feel confident and comfortable when treating common traumatic orofacial injuries and medical emergencies (Table 1). Less than 50% (n=29, 21%) of the study population agreed that they could recognize severe complications from a dental abscess such as Ludwig’s angina, and n=65 (47%) were confident in the management of post-op bleeding. Moreover, only 61 participants (44%) agreed that they were confident in assessing dental trauma, 58 (42%) were confident in the initial management of dental fractures. Only 41 participants (29.7%) agreed that they were confident in managing an avulsed tooth. Most of the respondents believed that they needed further training in the management of dental emergencies (n= 79, 57.2% agreed and n=23, 16.7% strongly agreed).

When asked about their need for further training, a significant two-thirds (74%, p < 0.001) of the respondents agreed with the need for additional training. Interestingly, 80% of the respondents wanted this training to be offered by a dental practitioner, and 67.3% wanted training to be delivered at a formal lecture or workshop rather than online. Most (69%) of the participants wanted this training regularly (between 6 months to annually), and a significant number (n=91, 66%) wanted this training to be of a day’s duration.

The emergent themes obtained from the analysis of the qualitative data pertained to mainly the training of ECPs as noted in an interview with an EMS base manager:

"We are trained to deal with life-threatening emergencies, and unfortunately this does not include orofacial emergencies like an avulsed tooth. We tend to patch people up, and not really manage the emergency with a focus on the long-term effects and consequences. Our basic training has not equipped us to deal with things like bleeding following a dental extraction."

[ Interview with EMS Base manager A]

This could lead to the lack of confidence in the management of orofacial injuries as noted by participant B:

"I was not confident when treating orofacial injuries as this was the role of the dental practitioner, but if I had received more training in both my basic training at college, and in further training after qualifying then perhaps, we would be more confident in dealing with these emergencies"

[ Interview with EMS Base manager B]

DISCUSSION
In a country like South Africa, plagued with high levels of criminal and interpersonal violence and high rates of motor vehicle and pedestrian accidents, there is an increased likelihood that ECPs will respond to several incidents wherein casualties present with orofacial traumas and injuries. With a warm climate, many South Africans are active sports participants. This presents an additional risk to participants sustaining orofacial traumas, especially in aggressive contact sports such as rugby, boxing, and martial arts. An adequate understanding
and knowledge of dealing with these types of injuries are essential for ECPs and first responders. Inadequate knowledge of the management of orofacial injuries can have devastating and expensive consequences and lead to poor prognosis and outcomes.

This study demonstrated that ECPs have insufficient knowledge, skills, and confidence to render appropriate emergency management to casualties presenting with dental trauma and other dental emergencies. Just over 50% of participants agree (n=61, 44%) and (n=13, 9.4%) strongly agree that they feel confident and comfortable when treating common traumatic orofacial injuries. ECPs who indicated that they had higher levels of knowledge were more optimistic in treating orofacial trauma. While noting the effect of seniority, both in terms of qualification and experience, it is of concern that the younger and often lower-qualified ECPs, have minimal confidence in managing such orofacial injuries. Yet, it is most likely that the younger ECPs would respond to a more significant number of incidents involving casualties with orofacial trauma, as they often work longer hours and have many years left in their careers. The prevalence of dental trauma worldwide ranges from 10% to 51%. Dental professionals are not the first responders for dental trauma, nor do they work in emergency rooms in healthcare facilities. Therefore it is inevitable that emergency care workers and medical professionals in emergency rooms will be required to provide emergency dental treatment before professional dental contact. These first responders need to be as confident in managing dental injuries as they would be in managing other injuries sustained elsewhere in the body. However, the literature indicates that even medical professionals are not confident or comfortable managing traumatic dental injuries, further widening the medical-dental divide. A study by Trivedy et al. (2012), conducted in the United Kingdom, found that most (88%) of the physicians were not confident in managing dentofacial emergencies.

This lack of confidence stems from insufficient training or knowledge regarding the management of dental trauma. The study findings indicate that only 57 participants (41, 3%) agreed that they had sufficient knowledge of managing dental trauma and other dental emergencies. These findings were consistent with a recent report by Cruz-da-Silva et al. (2016), which showed that first responders had inadequate knowledge when dealing with cases of dental trauma, and Ulusoy et al. (2016), who reported that 41% of the respondents assessed their knowledge and management of dental trauma as insufficient.

The prognosis of an avulsed tooth is dependent on the preservation of the tooth and the re-implantation time. In this study, 64% of the participants did not know when to re-implant an avulsed tooth, and 41% did not know the proper process to preserve and implant teeth.

| Table 1: ECP’s knowledge, attitudes and confidence to deal with medical emergencies |
|----------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|
| I am confident and comfortable treating common traumatic orofacial injuries and medical emergencies. | C1 | 12 | 8.7% | 8 | 5.8% | 44 | 31.9% | 61 | 44.2% | 13 | 9.4% | < 0.001 |
| I have adequate knowledge on how to manage common traumatic orofacial injuries and medical emergencies. | C2 | 14 | 10.1% | 19 | 13.8% | 39 | 28.3% | 57 | 41.3% | 9 | 6.5% | < 0.001 |
| I feel that I do require further training in the management of common traumatic orofacial injuries and medical emergencies. | C3 | 14 | 10.1% | 4 | 2.9% | 18 | 13.0% | 79 | 57.2% | 23 | 16.7% | < 0.001 |
| I am confident in identifying a significant complication of a dental abscess such as Ludwig’s Angina. | C4 | 21 | 15.2% | 24 | 17.4% | 52 | 37.7% | 29 | 21.0% | 12 | 8.7% | < 0.001 |
| I am confident in the management of post-extraction bleeding. | C5 | 19 | 13.8% | 15 | 10.9% | 30 | 21.7% | 65 | 47.1% | 9 | 6.5% | < 0.001 |
| I am confident in the assessment of dental trauma. | C6 | 14 | 10.1% | 16 | 11.6% | 41 | 29.7% | 61 | 44.2% | 6 | 4.3% | < 0.001 |
| I am confident in the initial management of dental fractures. | C7 | 18 | 13.0% | 14 | 10.1% | 41 | 29.7% | 58 | 42.0% | 7 | 5.1% | < 0.001 |
| I am confident in the initial management of a partially dislodged tooth. | C8 | 17 | 12.3% | 25 | 18.1% | 37 | 26.8% | 49 | 35.5% | 10 | 7.2% | < 0.001 |
| I am not confident in the initial management of a completely dislodged (avulsed) tooth. | C9 | 15 | 10.9% | 34 | 24.6% | 38 | 27.5% | 41 | 27.5% | 7.2% | < 0.001 |
an avulsed tooth. These findings were consistent with other studies by Joybell et al., 2019 conducted among emergency care workers in India. The authors found that more than three-quarters of the 100 emergency care workers interviewed did not know the re-implantation procedures of avulsed teeth. Lack of knowledge can negatively affect the primary care of avulsed teeth and the management of other dental trauma or dental emergencies.

This lack of knowledge stems from not receiving adequate training in managing dental emergencies as medical and dental training occur separately. In this study, more than half the respondents (55 %) indicated that they did not receive any formal training on dental trauma, while 78% stated that they did not receive any further training. This finding is similar to another study by Aren et al., 2018, in which 72.22% of the participants (first responders to trauma) did not receive any training on oral and dental health, and 97.62% did not attend any further dental trauma management training; however, over 80% were willing to participate in training on this subject. In this study, almost three quarter (73.9%) of the respondents expressed the need and desire for more education on managing dental emergencies. This was also reiterated by the managers interviewed. Continuing education, knowledge sharing by dental professionals, postgraduate programs, and interdiscipliinary seminars will further enhance knowledge on the emergency management of dentoalveolar tooth injuries and other dental emergencies.

Limitations of the Study
The study was only conducted in the eThekwini district, which may affect the generalizability of the study findings. Another possible limitation is that the study population included only ECPs employed by the public sector; however, this decision was taken in the light that many private EMS have comparatively smaller work caseloads than public EMS. Further research is required to determine the knowledge, attitudes, and practices of ECPs in the private sector and other provinces in South Africa.

CONCLUSION
The findings of this study indicate that ECPs lack confidence in managing dental emergencies and suggest a need for specific dental awareness and continuing training programs to empower ECPs in the management of casualties better presenting with such emergencies.

Acknowledgments
The researchers would like to acknowledge the University of KwaZulu-Natal for funding to conduct this study. Conflict of Interest: All authors declare there are no conflicts of interest.

REFERENCES
1. Skapetsis T, Gerzina, T, Hu W. Review Article: Management of dental emergencies by medical practitioners: Recommendations for Australian education and training', Emergency Medicine Australasia 2011; 23: 142-52.
2. Samaei H, Weiland T J, Dilley S, Jelinek GA. Knowledge and Confidence of a Convenience Sample of Australasian Emergency Doctors in Managing Dental Emergencies: Results of a Survey, Canadian Dental Journal 2015. Available at: http://europepmc.org/abstract/med/12513934. [Accessed 15 June 2017].
3. Robinson E, Rumsey N, Partridge J. An Evaluation of the Impact of Social Interaction Skills Training for Facially Disfigured People, British Journal of Plastic Surgery 1996; 49:281-89.
4. Zaleckiene V, Peciuliene V, Brukiene V, Drukeitis S. Traumatic dental injuries: etiology, prevalence and possible outcomes. Stomatologija 2014; 16(1):7-14.
5. Traeber J, Luiza M, Trano R et al. Knowledge of lay people and dentists in emergency management of dental trauma. Dental Traumatology 2009; 25: 277-83.
6. Laloo R. Risk factors for major injuries to the face and teeth, Dent Traumatology 2003; 19:12–4.
7. Pozner CN, Zare R, Nelson SJ, Levine M. International EMS Systems: The United States; past, present, future. Resusitation 2004; 60: 239-44.
8. Levine L, Zadi K. Education on and Prevention of Dental Trauma: It’s time to act! Dental Traumatology 2012; 28: 49-54.
9. Zadik, Y. Oral trauma and dental emergency management recommendations of first-aid textbooks and manual. Dental Traumatology 2007; 22: 304-6.
10. Road Traffic Management Corporation (RTMC). (2016). Statement by Transport Minister Diplo Peters on the occasion to release the preliminary festive season report for December 2015 and January 2016. Available at https://www.arrivealive.co.za/news.aspx?5=1&1=22624&page=Statement_by_Transport_Minister_Diplo_Peters_on_the_occasion_to_release_the_preliminary_festive_season_report_for_December_2015_and_January_2016_Accessed_30_December_2016. [Accessed 14 June 2017].
11. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol 2010;3(2):77-101. https://doi.org/10.1191/1478088706qp063oa
12. MacFarlane C, van Loggenberg C, Kloeck W. International EMS systems in South Africa: past, present, and future. Resusitation 2005; 64(2):145-48.
13. Gassner R, Bösch R, Tuli T, Emshoff R. Prevalence of dental trauma in 6000 patients with facial injuries: implications for prevention. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1999; 87:27–33.
14. Trivedy C, Kodate N, Ross A, Al-Rawi H, Jaiganesh T, Harris T, et al. The attitudes and awareness of emergency department (ED) physicians towards the management of common dentofacial emergencies. Dent Traumatol 2012; 28:121–6.
15. Cruz-da-Silva, B. R., Perazzo, M., Neves, É. T., Firmino, R. T., & Granville-Garcia, A. F. Effect of an Educational Programme on the Knowledge Level Among an Emergency Service Medical Team Regarding Tooth Avulsion. Oral health & preventive dentistry, 2016; 14(3), 259–266.
16. Ulusoy AT, Onder H, Cetin B, Kayan S. Knowledge of medical hospital emergency physicians about the first-aid management of traumatic tooth avulsion. Int J Paediatr Dent 2012; 22:211–6.
17. Andersson L, Bodin I. Avulsed human teeth
replanted within 15 minutes—a long term clinical follow up study. Endod Dent Traumatol. 1990; 6:37–42.

18. Joybell CC, Kumar MK, Ramraj B. Knowledge, awareness, and attitude among the employees in emergency ambulance services towards traumatic dental injuries. J Family Med Prim Care 2019; 8:1043-8.

19. Aren A, Erdem AP, Aren G, Zähin ZD, Güney Tolgay C, Çayırcı M, et al. Importance of knowledge of the management of traumatic dental injuries in emergency departments. Ulus Travma Acil Cerrahi Derg 2018; 24:136–144.