Distribution Statement

Distribution A: Public Release.

The views presented here are those of the author and are not to be construed as official or reflecting the views of the Uniformed Services University of the Health Sciences, the Department of Defense or the U.S. Government.

UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
POSTGRADUATE DENTAL COLLEGE
SOUTHERN REGION OFFICE
2787 WINFIELD SCOTT ROAD, SUITE 220
JBSA FORT SAM HOUSTON, TEXAS 78234-7510
https://www.usuhs.edu/pdc

THESIS APPROVAL PAGE FOR MASTER OF SCIENCE IN ORAL BIOLOGY

Title of Thesis: Identifying Risk Factors for Dental Emergency Visits in the US Army

Name of Candidate: MAJ Patrick Arbuckle
Degree: Master of Science
Date: June 30, 2023

THESIS/MANUSCRIPT APPROVED:	SIGNATURE/DATE:
Dr. Garrett Wood, LTC, DC Chief of Orthodontics, Fort Bragg, NC Research Advisor/Committee Member	WOOD.GARRETT.GRANT.1272982160 Digitally signed by WOOD.GARRETT.GRANT.1272982160 Date: 2023.05.25 14:41:13 -04'00'
Dr. Caroline Mikaloff, MAJ, DC Assistant Director, AEGD-2, Fort Bragg Committee Member	MIKALOFF.CAROLINE.LAUREN.1081225261 Digitally signed by MIKALOFF.CAROLINE.LAUREN.1081225261 Date: 2023.05.26 09:19:44 -04'00'
Dr. Erik Reifenstahl, LTC, DC Program Director, AEGD-2, Fort Bragg Committee Chairman	REIFENSTAHL.ERIK.FRANCIS.1249798440 Digitally signed by REIFENSTAHL.ERIK.FRANCIS.1249798440 Date: 2023.05.25 14:51:14 -04'00'

Identifying Risk Factors for Dental Emergency Visits in the US Army

MAJ Patrick J Arbuckle, DDS
Resident, AEGD 2-Yr Program
Fort Bragg, NC 28310
Mentor: LTC Erik Reifenstahl
Statistical Analysis: Thomas Beltran

Abstract

Purpose: The purpose of this study is to examine the relationship between subjects' oral health characteristics and the presence of an emergency dental care (EDC) visit over one year.

Materials and Methods: The Corporate Dental System (CDS) generated a limited data set for service members assigned for dental care at Fort Bragg, North Carolina. Data extracted included demographics and oral health characteristics (dental readiness classification, caries risk, periodontal screening and recording values (PSR), and tobacco use). Subjects were grouped based on the presence of an EDC visit code in the past year.

Results: 20,210 individuals were included in the sample. 8.5% of individuals sought emergency dental care during the period. Kruskal-Wallis tests found significant differences ($P < 0.05$) in EDC visits between age groups, gender, rank, dental readiness classification, and caries risk. Younger age, females, and low caries risk had the most significant increase in EDC visits. There was no significant difference in EDC visits between PSR or tobacco usage groups.

Conclusion: This study supports a relationship between demographics, oral health characteristics, and EDC visits. Age may be related to service members entering the military with untreated or managed dental needs, notably around the age of third molar eruption. Gender differences may be related to willingness to utilize non-emergency dental care or differences in oral hygiene habits. The inverse relationship between caries risk and EDC visits could be due to better identification and management of high caries risk patients or care avoidance. This project highlights the need for further study and increasingly discrete measurement of oral health care characteristics and coding for etiologies of dental emergencies.

Introduction

To maintain the medical readiness of deployed personnel, medical planners must account for injuries and diseases that are unrelated to combat. Disease and non-battle injuries are reported to outnumber combat injuries in every major US military operation.[1] Dental disease non-battle injuries (D-DNBI) or dental emergencies (DE) have exceeded other non-combat medical injuries in Iraq and Afghanistan operations over the last twenty years.[2] D-DNBI include emergency and essential dental care, as well as any issue for which a soldier seeks care from a dentist in theater. Historical reviews of D-DNBI annual incidence range from 111 to 437 per 1,000 personnel.[2] Annual D-DNBI incidence per 1,000 personnel in the Iraq and Afghanistan

operations were reported to be 136 for US Army Active Duty, 152 for US Army National Guard, and 184 for US Army Reserve.[3]

Dental and orofacial emergencies are often painful, directly decreasing individual soldier readiness by impacting sleep, ability to eat, and communication. Preoccupation with dental pain and disease interferes with concentration, decision-making, and the ability to complete tasks. While rare, some untreated dental conditions can lead to permanent disfigurement or death. Wojcik et al. found that 21.47% of dental emergencies in theater were of moderate severity, causing moderate-to-severe pain or loss of function, and 2.77% were of high severity, which included potentially life-threatening conditions.[2]

DE also impact unit readiness. Severe pain, loss of function, and a resulting evacuation can take a soldier out of the battlespace during crucial operations. Treating D-DNBI in far-forward environments can strain limited medical supply and medical provider attention. A group of previously deployed medical planners, dental officers, and dental noncommissioned officers estimated that a unit lost an average of three duty days for a dental evacuation.[4] According to a RAND Corporation study in 2012, evacuating a D-DNBI casualty to a dental provider could require up to nine personnel and three vehicles.[5] As suggested by Colthirst et al., the operational cost for other soldiers to replace the duties of a dental emergency evacuee and an escort impacts the unit's combat readiness, effectiveness, and morale.[4]

Lastly, D-DNBI incurs a financial cost for the US military. Colthirst et al. estimated theater dental emergencies cost the US Army $1.8 million a month between June 2009 and June 2011.[4] This cost included duty days lost and the cost of dental treatments; however, it did not include the significant cost of evacuations, due to the difficulty of estimating variable costs of transportation.

The main effort to reduce D-DNBI in theater is through identifying and completing dental treatment needs prior to deployment. The Department of Defense (DoD) classifies dental readiness to deploy into four categories.[6] Dental readiness class (DRC) 1 patients have a current dental examination and have no outstanding treatment needs. DRC 2 patients have a current dental examination and require treatment for conditions that are unlikely to cause a need for emergency dental treatment within 12 months. DRC 1 and 2 are considered deployable. DRC 3 patients require treatment for conditions that are urgent or are likely to require urgent care within 12 months. DRC 4 patients do not have a current dental examination, and their dental health status is unknown. DRC 3 and 4 are considered non-deployable. Patients in DRC 3 and 4 statuses have been shown to have higher rates of dental emergencies in both deployed and garrison environments.[7, 8]

The amount of D-DNBI that is preventable is unknown and disputed. Most claims on a baseline D-DNBI incidence are based on the ability to surgically eliminate active dental disease before deployments rather than implementing medical management of patients at risk for future orofacial conditions. This implies that once a DRC 3 condition

is treated and a patient is designated as DRC 1, he or she no longer has a higher risk for a dental emergency than any other DRC 1 patient. Mahoney and Coombs concluded that a dentally fit force would experience 150-200 D-DNBI per 1,000 personnel annually.[9]

As the field of dentistry moves from a primarily surgical endeavor to the medical management of oral disease, US Army dental teams can have a preventative impact on most D-DNBI. Studies examining dental emergency etiologies and severities show that a minority of emergencies are truly unpreventable, such as trauma or spontaneous oral health conditions. Simecek et al. found that approximately 20% of DE in initial entry US Marines in garrison were due to unpredictable trauma or oral medicine problems.[7] Eikenberg found that 2% of 24,641 DE in Iraq were primarily due to external trauma, and Colthirst found that 6% of DE in garrison were related to trauma.[10, 11] Dental providers can prevent or reduce DE due to the fifteen most frequent diagnosis categories found by Simecek et al. in Operation Iraqi Freedom and Operation Enduring Freedom prior to deployment.[3] Diagnoses included various caries disease presentations, defective restorations, undermined tooth structure, pulpal disease, gingival disease, and third molar conditions. Wojcik et al. found the top three most common high-severity diagnoses for deployed soldiers in Iraq and Afghanistan were necrotizing ulcerative gingivitis, anatomic space infection of endodontic origin, and fractured tooth.[2] Other than a traumatic tooth fracture, dental providers can play a role in preventing most severe dental diagnoses.

Preventing a greater amount of D-DNBI requires improved identification of soldiers most at risk for DE. While D-DNBI incidence in theater has been studied at regular intervals, identification of possible risk factors has been limited to demographic data including gender, age, and time in theater. Dental readiness is a static classification of current treatment needs. Only the guidelines for DRC3 involve a prediction of future dental issues, which is singularly based on the examining dentist's expert opinion. DRC 1, 2, and 4 guidelines do not infer risk stratification or predictive value of experiencing a D-DNBI. Simecek et al. found that of seven general categories of dental emergencies, only endodontic emergencies were predicted by a DRC 3/4 designation more than 50% of the time.[7]

The electronic Corporate Dental System (CDS) collects data input from dental providers that can be assessed for use as risk factors for seeking emergency dental services. Possible risk factors that are included with each dental examination include caries risk, periodontal screening and recording values (PSR), and tobacco status. The CDS caries risk assessment module is based on the American Dental Association caries risk assessment guidelines, which stratify different treatment management strategies across risk groups.[7, 12] PSR is a screening tool that is conducted at each exam to identify the need for full periodontal evaluation if found to be high risk.[13] CDS also maintains the patient's record of dental readiness classifications after each encounter.

This study examines the utilization of dental emergency visits and sick call in the garrison environment as a substitute for D-DNBI in theater. In garrison, service members typically have dental services available in their unit footprint and do not rely on dental services centered in medical treatment areas or rotating area support dental teams. Analyzing dental emergency services in garrison allows for estimating what theater D-DNBI could be given more ideal access to dental care. The objective of this project is to study the relationship between dental readiness classification at annual examination, caries risk, periodontal screening and recording values, tobacco use, demographic data, and emergency dental care (EDC) visits in service members assigned to Fort Bragg, North Carolina. The hypothesis is that the presence of EDC visits over one year is significantly correlated with higher dental readiness classification, higher caries risk, higher PSR, and tobacco use. The null hypothesis is that the presence of EDC visits over one year is not significantly correlated with higher dental readiness classification, higher caries risk, higher PSR, and tobacco use.

Methods and Materials

This study is a retrospective observational review of records studying possible risk factors for service members who sought emergency dental care in comparison to personnel who did not seek emergency dental care over twelve months. US Army dental providers document encounters electronically in CDS. Providers document tobacco status, caries risk assessment, and PSR values at the initial and subsequent annual oral examinations. Providers assign a dental readiness classification after each encounter. EDC visits can be identified using Code on Dental Procedures and Nomenclature (CDT) codes A0199/W0199 (Dental emergency visit), D9110 (Palliative treatment of dental pain), and D9440 (Visit after regularly scheduled hours). Table 1 explains the oral health characteristic variable groups.

Data was provided by data extraction from CDS Management. Participants were identified by a unit identification code assigning them to a dental treatment facility at the Fort Bragg Dental Health Activity. The limited data set extraction for assigned individuals included demographic data (gender, age, rank), oral health data (dental readiness classification, caries risk assessment, PSR, and tobacco use) at the most recent oral exam, and the presence or absence of dental emergency visit codes in the dental history from August 31st, 2021 to September 1st, 2022. Service members without any oral health examination history in CDS were excluded from the study. Completely edentulous service members without numeric PSR scores were also excluded from the study. PSR scores with an asterisk indicating mucogingival defect were considered only by the 0 to 4 score.

This study was conducted under a protocol reviewed by the Womack Army Medical Center Human Research Protections Programs Office (WAMC HRPPO) and was determined to meet exemption category 4 ((32 CFR 219.104(d)(4)(iii))). The WAMC HRPPO granted a waiver of the requirement to obtain HIPAA Authorization in accordance with DOD 6025.18-R. All records requested were de-identified and limited

in scope to the stated variables of interest. Datasets were held on protected Department of Defense computers and servers.

Statistical Analysis

Summary statistics are provided for categorical variables and include the number of participants as well as the prevalence (%) by EDC status. The sextant with the highest periodontal screening and recording value was captured to represent PSR data. Age data were pooled into age range categories (20-29, 30-39, 40-49, and 50-60) to facilitate analyses. Rank data were pooled into Officer and Enlisted categories for analyses. Demographic data (age, gender, rank) and oral health characteristics (smoking status, caries risk status, dental readiness classification, and periodontal screening and recording) were compared between groups using the Kruskal-Wallis test. Factors for which significant differences between groups exist were used as confounding or covariate variables in regression analyses.

The EDC status of individuals was analyzed using logistic regression. Collinearity and separation of data points were verified. A backward elimination approach was used to produce a reduced multivariable logistic model. Covariates in the reduced model included age, gender, and caries risk. Unadjusted regression models (the effect of a single independent variable on the dependent variable) as well as adjusted regression (the combined effects of multiple independent variables on the dependent variable) were conducted. Relative risk estimates were generated and are reported with associated 95% confidence intervals (CIs) for all variables. Adjusted odds ratios (aOR) are reported for components of the reduced model.

The receiver operating characteristic (ROC) analyses and area under the curve (AUC) were applied to predicted probabilities resulting from the final logistic regression analysis model. The AUC examined the discrimination validity of the logistic regression model on differentiating individuals who sought EDC and those who did not. For all tests, P-values less than 0.05 were considered statistically significant. Data analyses were conducted using the complex sample package for SPSS 25 (IBM, Armonk, NY, USA).

Results

Data from 20,210 individuals were included in the analyses. The sample primarily consisted of individuals under the age of 40 (n = 17,392) and was principally male (n=17,369, 85.9%). The rate of EDC visits in the sample was 8.5% (n = 1,721). No difference in the rate of EDC visits was noted with respect to tobacco usage or periodontal screening and recording ($P = 0.43$ and $P = 0.20$ respectively). Significant differences were noted between all remaining variables with respect to EDC visit status (all $P < 0.05$). Patient characteristics are summarized by EDC visit status in Table 2.

Logistic regression was used to analyze the relationship between age, gender, caries risk assessment, and EDC visits. Tobacco usage, rank, dental readiness

classification, and periodontal screening and recording values were not found to be independently associated with EDC visit status. Although variables in the model significantly predicted EDC visit status ($P < 0.001$), the resultant Nagelkerke R^2 only reached 0.03. ROC analysis showed that the three predictors could significantly differentiate individuals with a history of EDC (AUC = 0.61, $P < 0.001$) with a sensitivity of 62% and specificity of 55%.

Relative risks of characteristics are presented in Tables 2 and 3 for those who sought EDC. After controlling for differences in individual characteristics, multivariable analyses indicate that women had a 1.6X increased odds of seeking EDC (aOR 1.6; 95% CI 1.4-1.8). Additionally, compared to the service members aged 50+ years, those between the ages of 20-29 years were 3 times as likely to need EDC (aOR 3.0; 955 CI 2.3-3.9). Interestingly, increased caries risk was associated with lower odds of seeking EDC. Those assessed as low caries risk were 1.8X (95%CI 1.6-2.0) more likely to seek EDC as compared to individuals with high caries risk.

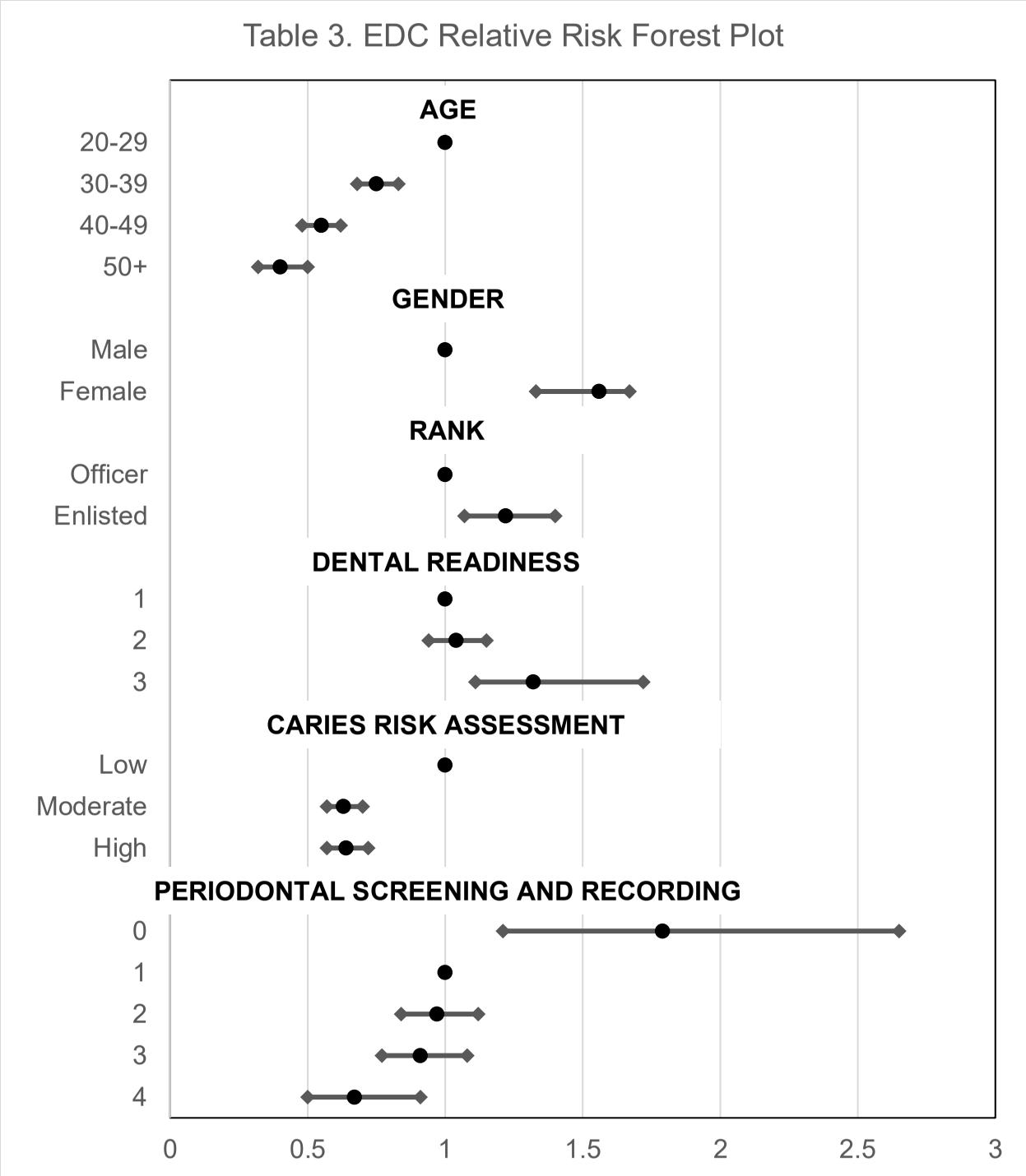
Table 1: Oral Health Characteristics

1. Dental readiness classification
    - DRC1: the individual has a current dental examination and has no outstanding treatment needs
    - DRC2: the individual has a current dental examination and requires treatment for conditions that are unlikely to cause a need for emergency or essential dental treatment within 12 months.
    - DRC3: individual requires treatment for conditions that are urgent or are likely to require urgent care within 12 months.
    - DRC4: the individual does not have a current dental examination, and the individual's dental health status is unknown.
2. Caries risk status
    - Low: the individual is at low risk for developing caries as determined by the dentist based on risk factors.
    - Moderate: the individual is at moderate risk for developing caries as determined by the dentist based on risk factors.
    - High: the individual is at high risk for developing caries as determined by the dentist based on risk factors.
3. Periodontal screening and recording values: a measure of gingival health which is recorded separately in sextants of the mouth. The addition of an asterisk "*" to the numeric score indicates a periodontal defect and will not be considered for this study. The greatest single sextant measurement will be recorded for analysis.
    - X: No teeth are present in the sextant.
    - 0: Probing depth less than 3.5 mm with no bleeding, calculus, or defective margins.
    - 1: Probing depth less than 3.5 mm with bleeding and no calculus or defective margins.
    - 2: Probing depth less than 3.5 mm with calculus or defective margins detected.
    - 3: Probing depth between 3.5 to 5.5 mm.
    - 4: Probing depth is greater than 5.5 mm.
4. Tobacco use
    - No Use
    - Use
5. Emergency dental visit
    - No: absence of A01999, W01999, D9110, or D9440 code
    - Yes: presence of A01999, W01999, D9110, or D9440 code

Table 2. Within Group Sample Characteristics, %

		Emergency Dental Visit			
Characteristics	n	Yes	No	RR (95% CI)	P
Age					
20-29	10094	40.0	50.9	ref	
30-39	7298	38.5	35.9	0.75 (0.68-0.83)	<0.001
40-49	2406	17.4	11.4	0.55 (0.48-0.62)	
50+	412	4.1	1.8	0.40 (0.32-0.50)	
Gender					
Male	17369	80.4	86.5	ref	<0.001
Female	2841	19.6	13.5	1.56 (1.33-1.67)	
Rank					
Officer	3603	15.3	18.1	ref	<0.01
Enlisted	20179	84.7	81.9	1.22 (1.07-1.40)	
Dental Readiness Classification					
1	5011	25.9	24.7	ref	
2	13851	69.0	68.5	1.04 (0.94-1.15)	0.04
3	1348	5.1	6.8	1.38 (1.11-1.72)	
Caries Risk					
Low	9609	36.5	48.6	ref	
Moderate	6789	40.7	32.9	0.63 (0.57-0.70)	<0.001
High	3810	22.7	18.5	0.64 (0.57-0.72)	
Periodontal Screening and Recording					
0	166	1.4	0.8	1.79 (1.21-2.65)	
1	2398	11.3	11.9	ref	
2	13905	67.3	68.9	0.97 (0.84-1.12)	0.20
3	3333	17.2	16.4	0.91 (0.77-1.08)	
4	408	2.8	1.9	0.67 (0.50-0.91)	

RR: Relative Risk for Emergency Dental Visit = Yes



Discussion

Age was found to have the strongest relationship with EDC visits. When age is controlled, there was no difference in EDC visits between Officers and Enlisted. The relationship between age and EDC visits is also apparent in the positive correlation between PSR and age and the negative correlation between age and DRC. Age along

with gender and caries risk assessment was able to significantly predict EDC visits, with sensitivity of 62% and specificity of 55%.

The relationship between age and EDC visits can be described by a few hypotheses. Most service members join military service before 30 years old. Initial dental needs are quickly controlled and subsequently monitored during required annual exams. The 20–29 age group coincides with the final eruption of third molars and their sequelae which can cause dental emergencies. Any unscheduled follow-ups after initial entry treatment or extractions would also be considered emergency dental visits. Attrition as service members age in the US Army tends to select individuals that are healthy, disciplined, and responsible. The military provides and typically requires professional education and assignments of increasing responsibility to be retained in service. Older service members may demonstrate better oral/general health habits, have higher oral health awareness, and/or better maintains dental conditions. They may be more proactive in scheduling regular appointments and accepting routine dental treatment. In the event of acute emergencies, they may be more likely to schedule an appointment for treatment or they may not be readily available during sick call times at military dental treatment facilities.

The difference in EDC visits between genders may be harder to identify. Wojcik et al. also found that female soldiers were at higher risk of D-DNBI compared to men during operations in Iraq and Afghanistan but noted that females had a lower risk of severe emergencies.[2] Explanations posited for this difference include tobacco use among males and the absence of females in combat arms units. While this study did find that tobacco use was higher among males in the population (25.0% of males vs. 6.4% of females), there was otherwise no association between tobacco use and EDC visits. In garrison, the distribution of gender between combat units and support roles may relate to unequal access to care for EDC visits or a preference for scheduled appointments.

The finding that low caries risk had greater odds of seeking emergency care in comparison with high caries risk seems counterintuitive at first but may also be explainable in this population. First, patients identified as high caries risk may be better managed by dental providers with frequently scheduled appointments and follow-ups until they are re-assessed as low or moderate caries risk. Patients identified as high risk in CDS are identified in the scheduler application to remind dental teams to continue high caries risk protocol at each appointment, such as in-office fluoride treatments, oral hygiene instructions, prescription fluoride products, and higher interval recall and radiographs. Conversely, high caries risk patients exhibit varying levels of dental treatment anxiety. These patients may elect to defer treatment for even symptomatic conditions until mandated for an annual periodic evaluation instead of present for EDC.

A unique aspect of this project is utilizing oral health care characteristics recorded at the previous annual exam instead of when presenting for a dental emergency. This allows analyses to be conducted with subjects who are identified as DRC 3 at the exam, even if their DRC 3 conditions are treated before their dental

emergency visit. Future projects can examine whether there is a differential risk between patients with treated DRC 3 conditions and untreated DRC 3 to experience dental emergencies.

The results of this study are limited by factors relating to dental care, data input quality, military considerations, and patient expectations. For dental considerations, the validity of these results requires accurate and standard determination of DRC, caries risk assessment, and PSR. Regarding data quality, results may be influenced by standardized dental coding of emergency dental visits. Additionally, the dental emergency code is typically used for any unscheduled appointment. It does not delineate between primary etiology (i.e. trauma, pericoronitis, pulpitis) or postoperative complications (i.e. infection, pain, alveolar osteitis). The code is also not specific to severity; presenting for an asymptomatic chipped restoration would be counted the same as a fascial space infection. The variable of EDC visits was measured nominally, whether a patient sought any emergency care or not. Results could be vastly different if EDC visits were analyzed as ordinal variables based on the severity of etiology or integer based on the number of EDC visits. While access to care is optimized in garrison, it is not perfect. Access to care may still be limited by dental resources or the availability of individuals in certain units or roles. Patient factors and decisions directly impact whether a dental condition is scheduled for a routine appointment or emergency dental care is sought.

Conclusion

Identification of dental emergency risk factors can be used in the future to implement targeted management of high-risk soldiers, resulting in improved individual and unit readiness, and reduced financial and operation burdens to the US Army. Risk factor identification can also be used to stage dental assets and equipment appropriately in theater or by medical planners to incorporate dental assets in operational plans. Lastly, established risk factors for dental emergencies can be used by dental providers to communicate the dental status of troops with combatant commanders in detail and justify the importance of dental healthcare in the environment of increasing readiness requirements, training requirements, and operational tempo.

This study utilized discrete entry fields that were required to be completed to update DoD mandatory exams in the CDS. The US Army is phasing out the CDS module for a new electronic dental health record in which the oral health data are not separately recorded, stored, or able to be independently extracted. Instead, caries risk assessment, PSR, and tobacco status are input by the provider in a narrative, non-searchable note. This project utilized data at the tail end of CDS utilization to examine the relationship between oral health characteristics, demographics, and emergency dental visits as reflected in a current population.

The hypotheses that the presence of EDC visits over one year is significantly correlated with higher dental readiness classification and higher caries risk are

accepted. The hypotheses that the presence of EDC visits over one year is not significantly correlated with higher PSR and tobacco use are rejected.

Future avenues of research in the deployed environment or stratifying dental emergency severity or frequency will help to build a predictive model of risk factors to address and prevent D-DNBI.

Acknowledgments

Patrick J Arbuckle developed the study concept, collected the data, and wrote the manuscript. Mr. Thomas Beltran completed the statistical analysis.

Disclaimer

The views expressed herein are those of the author and do not necessarily reflect the official policy of the Department of the Army, Department of Defense, or the US Government.

References

1. Wojcik BE, Humphrey RJ, Hosek BJ, Stein CR. Data-driven Casualty Estimation and Disease Nonbattle Injury/Battle Injury Rates in Recent Campaigns. US Army Med Dep J. 2016 Apr-Sep;(2-16):8-14. PMID: 27215860.

2. Wojcik BE, Szeszel-Fedorowicz W, Humphrey RJ, Colthirst P, Guerrero AC, Simecek JW, Fedorowicz A, Eikenberg S, Rogerse GC, DeNicolo, P: Risk of Dental Disease Non-Battle Injuries and Severity of Dental Disease in Deployed U.S. Army Personnel. Mil Med 2015; 180(5): 570–7.

3. Simecek JW, Colthirst P, Wojcik BE: The incidence of dental disease nonbattle injuries in deployed U.S. Army personnel. Mil Med 2014; 179(6): 666–73.

4. Colthirst P, Berg RG, DeNicolo, Simecek JW: Operational Cost Analysis of Dental Emergencies for Deployed U.S. Army Personnel During Operation Iraqi Freedom. Mil Med 2013; 178(4): 427–31.

5. Brauner MK, Jackson T, Gayton E: Medical Readiness of the Reserve Component. Santa Monica, CA, RAND Corporation, 2012. Available at http://www.rand.org/pubs/monographs/MG1105.html; accessed September 19, 2021.

6. U.S. Department of Defense, Individual Medical Readiness (IMR): DoD Instruction 6025.19, Washington, DC, Headquarters, 2006. Available at https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/602519p.pdf; accessed September 19, 2021.

7. Simecek JW, Diefenderfer KE: An evaluation of the US Navy Dental Corps classification guidelines. Mil Med 2010; 175(11): 895–900.

8. Chaffin J, Moss D: Review of current U.S. Army dental emergency rates. Mil Med 2008; 173(1 Suppl): 23–6.

9. Mahoney G, Coombs M: A literature review of dental casualty rates. Mil Med 2000; 165: 751 – 6.

10. Eikenberg S, Keeler R, Green T: Use of the Army Dental Command Corporate Dental Application as an electronic dental record in the Iraq theater of operations. US Army Med Dep J 2011; Jan–Mar: 51–7.

11. Colthirst P, DeNicolo P, Will R, Simecek JW: Use of Dental Disease Nonbattle Injury Encounter Module to Assess the Emergency Rate on an Army Military Installation Within the United States.Mil Med 2012; 177(9): 1100–4.

12. American Dental Association Council on Access, Prevention, and Interprofessional Relations: Caries diagnosis and risk assessment: a review of preventive strategies and management. J Am Dent Assoc 1995;126 (Suppl): 1S – 24S.

13. MK Jeffcoat, M McGuire, MG Newman “Evidence-based periodontal treatment. Highlights from the 1996 World Workshop in Periodontics” JADA 1997; 128;713-724.

Additional References

Teweles RB, King JE: Impact of troop dental health on combat readiness. Mil Med 1987; 152(5): 233 –5.

Richardson PS: Dental risk assessment for military personnel. Mil Med 2005; 170(6): 542–5.

Wojcik BE, Humphrey RJ, Czejdo B, Hassell LH: U.S. Army disease and nonbattle injury model, refined in Afghanistan and Iraq. Mil Med 2008; 173(9): 825–35.