

Psychosocial risk factors and bruxism in the United States military population

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By

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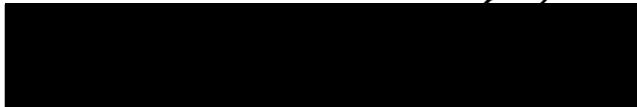
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Psychosocial risk factors and bruxism in the United States military population

A REPORT ON

Research project investigating the association between the psychosocial factors such as perceived stress, sleep quality, and dental anxiety and bruxism. Assess the differences in the reported psychosocial factors between the population of bruxers and non-bruxers in the United States military

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ABSTRACT

Purpose: The purpose of this study is to assess the association between the three psychosocial factors and bruxism; and compare the differences between the military population of bruxers and non-bruxers in their reported perceived stress (PSS), sleep quality (PSQI), and dental anxiety (DAS).

Methods: Paper questionnaires were distributed to four dental treatment facilities on Fort Hood. Active Duty servicemembers receiving their routine dental care were given the option to participate in the questionnaire study about their habits and sleep. The questionnaires intended to assess the individuals' experience with bruxism, perceived stress (PSS), sleep quality (PSQI), and dental anxiety (DAS). The scores from the questionnaires were electronically computed and interpreted on SPSS software.

Results: Total of 274 servicemembers participated in the questionnaire study throughout the 4 months period. 251 of the responses were used in the assessment because 23 of them were incomplete. Positive correlations were found between PSS and Bruxism ($r = 0.250, p < 0.001$); PSQI and Bruxism ($r = 0.325, p < 0.001$); and DAS and Bruxism ($r = 0.144, p < 0.01$). Additionally, positive correlations were found between PSS and PSQI, PSS and DAS, and PSQI and DAS. Sleep Bruxism also had positive correlation with Awake Bruxism. Overall, there were significant positive correlations between the psychosocial factors (PSS, PSQI, and DAS) and Bruxism, and among the psychosocial factors themselves. Furthermore, independent samples t-test comparing the three psychosocial factors in the population of bruxers and non-bruxers showed that there were significant differences in the reported PSS scores of bruxers ($M = 14.83, SD = 7.7$) and non-bruxers ($M = 10.66, SD = 6.046$); $t(249) = -4.07, p < 0.001$; the PSQI scores of bruxers ($M = 7.02, SD = 3.70$) and non-bruxers ($M = 4.29, SD = 3.00$); $t(249) = -5.42, p < 0.001$; and DAS of bruxers ($M = 6.65, SD = 2.88$) and non-bruxers ($M = 5.82, SD = 2.06$); $t(249) = -2.29, p < 0.05$, hence on average, the population of bruxers reported higher on Perceived Stress Scale, higher PSQI (poorer sleep), and higher Dental Anxiety Score.

Conclusions: Based on the results of this questionnaire study, there was an association between bruxism and the three psychosocial risk factors; as military population who experienced bruxism tend to report higher perceived stress, poorer sleep quality, and higher dental anxiety. Compared to the population of bruxers and that of non-bruxers, there were significant differences in the reported perceived stress, sleep quality, and dental anxiety.

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Disclaimer

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INTRODUCTION

Approximately 8-16% of the general adult population of equal gender distribution have experienced bruxism, and such prevalence is greater among younger population [18, 27]. Bruxism, unlike mastication, swallowing, or speaking, is a parafunctional oral movement characterizes by jaw clenching, teeth grinding, etc. The Glossary of Prosthodontic Terms (GPT-8) defines bruxism as a “parafunctional grinding of teeth or an oral habit consisting of involuntary rhythmic or spasmodic non-functional gnashing, grinding, or clenching of teeth in other than chewing movements of the mandible which may lead to occlusal trauma.” Bruxism pertains to dental professionals because of potential compromise of dental restorations, tooth damage, orofacial pain, and temporomandibular disorders [25, 27].

Bruxism can occur either awake or during sleep. Awake/diurnal/daytime bruxism is defined as parafunctional clenching that is commonly semi-voluntary. On the contrary, sleep bruxism is defined as an involuntary abnormal oral movement characterized by tooth clenching and/or grinding that occurs during sleep; it is classified as sleep related movement disorder [3, 25, 27]. The etiology of bruxism remains unclear and the risk factors vary. Previously, it was hypothesized that malocclusion or occlusal interferences trigger bruxism, but studies found no differences in the reported sleep bruxism between population with malocclusion and the control population, and that occlusal therapy did not reduce its likelihood [27, 31].

Recent studies demonstrate that central factors may be responsible for triggering bruxism, which can further be divided into pathophysiological and psychosocial factors [25, 27, 31]. According to numerous studies, emotional stress and dental anxiety play potential role in moderating bruxism [6, 30]. In Winocur’s study for instance, the examiners looked at associations among self-reported bruxism (questionnaires used by the American Academy of

Sleep Medicine's diagnostic criteria of Sleep and Awake Bruxism), emotional stress (PSS- Perceived Stress Scale), desirability of control (DC- Desire of Control scale), dental anxiety (DAS- Dental Anxiety Scale), and gagging (GAS- Gag Assessment Scale).

In Winocur's study, the investigating team distributed questionnaires to the general adult population living at an urban area in central Israel. From the responses generated from the questionnaire study, the results revealed high positive correlation between dental anxiety and gagging ($r = 0.604, p < 0.001$); negative correlation between perceived stress and desirability of control ($r = 0.292, p < 0.001$); and positive correlation between perceived stress and dental anxiety ($r = 0.217, p < 0.001$). No significant differences was noted between bruxers and non-bruxers with desirability of control. Furthermore, the study also showed significant differences in the mean scores in perceived stress and dental anxiety between the population of bruxers (awake and sleep) and that of non-bruxers. The outcomes of this study suggested that dental anxiety, gagging, and perceived stress have strong association with self-reported bruxism; no association was observed in desirability of control [30].

Similarly, the Montero's study investigated the correlation between personality traits and self-reported bruxism. The questionnaire study was distributed to 526 subjects over 18 years of age. The questionnaire contents consisted of 1) 6-item questionnaire aimed to solicit self-reporting bruxism-related symptoms identical to the ones implemented by the Winocur's study, 2) Modified Dental Anxiety Scale used to determine the level of anxiety in dental setting, and 3) NEO-Five Factors Inventory used to measure an individual's personality associated with five different traits (neuroticism, extroversion, openness, agreeableness, and conscientiousness.). The results revealed positive correlations between bruxism and personality traits, such as neuroticism ($r = 0.25, p < 0.001$), bruxism and the Global Modified Dental Anxiety Score ($r = 0.09, p < 0.05$)

and ($r = 0.12, p < 0.01$). From this study, we can imply association among certain personality traits (i.e. neuroticism) and dental anxiety (MDAS scores) with self-reported bruxism [20].

Meanwhile, Karakoulaki's study reported association between sleep bruxism and perceived stress through the measure of stress-related biomarkers (salivary cortisol and α -amylase). Forty-five volunteers who participated in this study were screened for bruxism using the 6-item questionnaire outlined by the American Academy of Sleep Medicine, identical to the ones implemented by the Winocur's and Montero's studies, and then further confirmed clinically via electromyography. The investigators assessed the participants' perceived stress using the Perceived Stress Scale questionnaire. Researchers collected each participant's unstimulated saliva and measured the levels of salivary cortisol and α -amylase via enzyme-linked immunosorbent assay test and enzyme kinetic reaction. The results showed the positive correlation between the bruxism and salivary cortisol levels (Spearman rank correlation = 0.401, $p = 0.047$), and that bruxers possessed higher level of salivary cortisol than do non-bruxers ($p < 0.001$). Furthermore, bruxers reported higher levels of perceived stress than did non-bruxers ($p < 0.001$). In contrast, based on the result, there were no significant differences in salivary α -amylase levels between bruxers and non-bruxers ($p = 0.414$). Such findings suggested association between bruxism and higher level of perceived psychological stress and stress-related biomarkers [1, 12].

Sleep quality is a potential pathophysiological factor contributing to bruxism. Sleep-related microarousals, for instance, have been examined for their role in regulating bruxism [25, 27, 31]. Polysomnographic studies showed the link between sleep bruxism and sleep microarousals. Microarousal occurs during sleep disturbance when a person transitions from a deep sleep to a lighter sleep stage. This occurrence is accompanied by gross body movements

(including jaw's motor activity in bruxers), increasing heart rate, changes in respiratory rate, and increasing muscle activities. Studies have shown that bruxism episodes occur concurrently with involuntary leg movements during this arousal response. [2, 27, 31].

In general, individuals with sleep bruxism report more interrupted sleep, moderate daytime sleepiness, perception of sleep deprivation, not getting enough refreshing sleep, nocturnal arousal, and more frequent body movement during sleep [2, 27]. Studies have investigated the correlation of sleep quality and symptoms of bruxism.

The Sierra-Negra's study, for example, examined the quality of sleep, sleep bruxism and awake bruxism among dental students at different times during the academic years. The research team distributed the questionnaire to the students at the beginning, the middle, and the end of their courses. The questionnaire included the Pittsburg Sleep Quality Index to evaluate the sleep quality of an individual based on different subcomponents such as sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime dysfunction. The components are totaled to yield a global PSQI score. Scores greater than five indicate poorer quality of sleep [28].

Similar to the studies discussed, the students were asked to self-report their experience with sleep and awake bruxism by answering questions regarding to sleep bruxism - "In the last 30 days, has anyone told you that you grind your teeth while sleeping? (Yes / No)"; and awake bruxism - "In the last 30 days have you noticed clenching your teeth? (Yes / No)". The outcomes of this section of the questionnaire were dichotomized as "Yes" (individuals who reported that they had ground their teeth while asleep or clenched their teeth while awake in the last 30 days) and "No" (individuals who reported that they had not ground their teeth while asleep or clenched their teeth while awake in the last 30 days) [28].

The result showed that students in the first semester scored higher on the PSQI (poorer quality of sleep) than students in other semesters, possibly due to academic and professional pressures and stress of entering a new environment affecting the quality of sleep. When factoring in the presence of sleep bruxism (21.5% of the students) and awake bruxism (36.5% of the students) with PSQI, there were higher prevalence of sleep bruxism (PR = 1.540; 95% CI: 1.00–2.37) and awake bruxism (PR = 1.344; 95% CI: 1,008-1,790) with poorer sleep duration throughout the academic years. Similar results were observed with habitual sleep efficiency (PR = 1.323; 95% CI: 1.03–1.70) and sleep disturbance components (PR = 1.533; 95% CI: 1.03–2.27) [28]. From this present study, the prevalence of awake and sleep bruxism is higher in population of dental students with poorer sleep quality.

Sleep deprivation is common in the military as servicemembers report sleep duration of 5.74 hour per night on average; whereas the American Academy of Sleep Medicine suggests that most adults need about seven to eight hours of sleep per night to feel alert and well-rested during the day [21, 29]. The military is also known for its high stress work environment. In contrast with the civilian workforce, the military personnel report significantly more work stress: deployments, combat exposures, threats of physical harm, permanent change of stations are some of the examples of potential stressors in the military life [15, 23].

A study conducted with the Israeli military, for example, assessed 57 healthy male Israeli Air Force officers (17 were jet pilots, 18 helicopter pilots, and 22 non-pilot officers) for tooth wear at their routine dental exam during a 4-week period. Tooth wear was screened using a 6-point scale: 0 = no apparent wear, 1 = slight wear, 2 = wear of enamel only, 3 = wear into the dentin in single spots, 4 = exposure of dentin in an area of more than 2 mm, and 5 = wear of more than one-third of the clinical crown. Subjects who scored “3” in at least one tooth were

defined as suffering from bruxism. Moreover, these Air Force officers completed a Psychological questionnaire that assesses the magnitude of their workplace stress and their coping methods. The outcomes demonstrated that all the officers experienced similar level of stress, with 69% of the piloting reported bruxism, and only 27% of the non-pilot group reporting likewise [17]. Thereby, among bruxers, pilots tend to show coping strategies that were significantly more emotional and less task-oriented than non-pilots, whereas non-bruxers showed no significant differences in coping behaviors. This study may suggest the importance of integrating dental and psychological preventative intervention with the military personnel.

Like in the civilian sector, dental anxiety exists among servicemembers. Approximately 10-20% of the general adult population experience dental anxiety, which may contribute to their poor dental attendance, compliance to care, and ultimately oral health. Those with high level of dental anxiety catastrophize their phobias, causing them to avoid seeking routine dental care and later to develop dental problems that often require invasive and extensive treatments, including emergency care [19].

The present study may help us understand servicemembers' psychosocial experiences and how they influence their parafunctional oral habits; doing so will allow us to educate them on various risk factors to bruxism, hence improving their medical and dental readiness.

The present study intends to reinforce the existing literature as discussed above by looking at the correlation of psychosocial risk factors (Perceived Stress Scale, Sleep Quality, and Dental Anxiety) and Bruxism in the United States military using the questionnaire study. The method is practical and cost-effective as means to study a large sample population. The limitation of using questionnaire study is that it is subjective, thus over- or underreporting is likely. And the outcome of this study may only suggest "possible" sleep and / or awake bruxism

[18], so further investigation is recommended in the future. Additional diagnostic tools such as clinical examination, electromyography, and polysomnography are necessary to more accurately diagnose bruxism. However, such technique would pose a challenge in this study due to high cost and limited time and resources. Although bruxism cannot be accurately diagnosed without instrumental means as described above, recent literature suggested that self-report of muscle fatigue, temporal headaches, and questionnaires that correspond to AASM criteria were associated with highest sensitivity (78%, 67%, 58%, respectively) and also with highest diagnostic odds ratio (OR = 9.63, 9.25, 6.33, respectively). Hence, the use of questionnaires to solicit self-reporting bruxism is a valuable screening tool to identify sleep bruxism [22], despite of the limitation. Nonetheless, the present study may benefit dental clinicians by enabling them to better screen bruxism by taking account of servicemembers' psychosocial risk factors and refer them to proper care if necessary.

HYPOTHESES

The purpose of this study is to assess the association between the three psychosocial factors and bruxism; and compare the differences between the military population of bruxers and non-bruxers in their reported perceived stress (PSS), sleep quality (PSQI), and dental anxiety (DAS). The questionnaires will be collected from four dental clinics at Fort Hood, Texas.

Null Hypothesis #1: There are no significant correlations between the three psychosocial factors (PSS, PSQI, and DAS) and bruxism.

Study Hypothesis #1: There are significant correlations between the three psychosocial factors (PSS, PSQI, and DAS) and bruxism.

Null Hypothesis #2: There are no significant differences between the military population of bruxers and non-bruxers in their reported psychosocial factors.

Study Hypothesis #2: There are significant differences between the military population of bruxers and non-bruxers in their reported psychosocial factors.

MATERIALS AND METHODS

Questionnaires Preparation

The study involved a sample population of servicemembers stationed at Fort Hood. The author distributed paper questionnaires throughout four designated Dental Treatment Facilities located at Fort Hood, Texas and made them available at the front desk of the reception areas. With the support and approval from the four clinics' Officers-in-Charge (see APPENDIX B), the investigator delegated the reception staffs to give the servicemembers the option to participate in the questionnaire when the servicemembers come for their routine dental care; the participation is voluntary and anonymous. The study protocol was IRB approved by the Clinical Investigation and Research Office at CRDAMC (see APPENDIX A). Included in the questionnaire study was an introduction stating that the purpose is to study the Soldiers' lifestyles and dental habits; it added a disclaimer that the participation is voluntary and anonymous. The instruction asked the participants to answer to the best of their ability (see APPENDIX C). The investigator monthly inspected the clinics and redistribute copies of the questionnaires if necessary.

Calculating the sample size using the estimated effect size ($r \cong 0.20$, $\alpha = 0.05$, and $\beta = 0.20$) and referencing from the Winocur's study ($r = 0.214$, $p < 0.001$), the author consulted with the statistician and projected that the necessary number of participants needed to achieve a statistically significant results is $N = 194$; in account of 20% dropout rate, the author estimated that the recommended sample size is $N = 250$ to yield results that are statistically significant [14].

The questionnaire began by asking the participants to report their age range, gender, branch, and rank as means to gather the demographics. Section 1 of the questionnaire was adopted from the American Academy of Sleep Medicine's diagnostic criteria of Sleep and

Awake Bruxism [3] asking the participants to report their experiences of bruxism during the past 6 months. Section 2 included 10 questions measuring the subjects' emotional stress that were directly derived from Cohen's Perceived Stress Scale. Section 3 derived its sleep quality assessment from Pittsburg Sleep Quality Index. And Section 4 measures the subjects' reported dental anxiety based on Corah's Dental Anxiety Scale (see APPENDIX C). After completion, the participants submitted their responses to box labeled "Survey" located at the front desk of the reception area. The investigator periodically collected the responses and securely stored them in a brown paper envelope labeled "Chen 18-04."

Questionnaire Assessment (see index C for Sample Questionnaire)

Section 1 assessed for self-reported bruxism, similar to the previous studies, the questionnaire was adopted from the American Academy of Sleep Medicine's diagnostic criteria of Sleep and Awake Bruxism [3]. This section included four questions asking participants to report their signs of bruxism; question #3 was divided into 6 subcategories, subjects who answered "Yes" to one or more of the 6 subcategories would score a "Yes" on #3 (see APPENDIX C). Question #3 asks "Are you aware of any of the following symptoms upon awakening?" Which was then divided into 6 sub-categories, labeled by lower cased Roman numerals; each of the 6 sub-categories asks for different symptoms that the subject may have or have not experienced (e.g. sensation of fatigue, tightness or soreness of your jaw upon awakening? Headaches upon awaking? Etc.). If the subjects answered "Yes" to at least one of these six sub-categories, they would be considered a "Yes" for question #3. Question #1, #2, and #3 pertained to signs of Sleep Bruxism, and #4 to signs of Awake Bruxism. Subjects who answered "Yes" to two or more on the first three questions were scored as positive for Sleep

Bruxism. Otherwise, subjects who only answered “Yes” to one or none on the first three questions were scored as negative for Sleep Bruxism. Overall, subjects who answered “Yes” on #4 will score positive for Awake Bruxism and those who answered “No” will score negative for Awake Bruxism. Subjects who scored positive on either Sleep Bruxism, Awake Bruxism, or both will be defined as suffering from Bruxism.

Section 2 measured the subjects’ perceived stress via the Cohen’s Perceived Stress Scale (PSS). The sum of numerical scores from the 10 questions yielded one global score ranges from 0 to 40. Higher scores represented higher perceived stress. Specifically, scores ranging from 0-13 were categorized as low stress, 14-26 as moderate stress, and 27-40 as high perceived stress. Cohen’s PSS demonstrated test-retest reliability of between 0.84-0.86 and validity ranges between 0.52-0.76 [7].

Next, Section 3 assessed the subjects’ self-reported sleep quality and disturbance over a 1-month time interval through the use of the Pittsburg Sleep Quality Index (PSQI). The sum of scores from the seven questionnaire components yielded one numerical score which determines the quality of the subjects’ sleep. Higher PSQI scores were defined as poorer quality of sleep. Any score of 5 or higher was defined as poor sleep quality. PSQI has demonstrated internal consistency and a reliability coefficient (Cronbach’s alpha) of 0.83 for its seven components [5].

Lastly, section 4 assessed the subjects’ dental anxiety using the Corah’s Dental Anxiety Scale. The scores from the four questions were summed to yield a global numerical sum. Higher scores represent higher dental anxiety. Participants who answered 0-8 were classified as low anxiety, 9-12 as moderate anxiety, 13-14 as high anxiety, and 15-20 as severe anxiety [8].

Questionnaire Collection

After collecting the questionnaire responses, the author assigned each individual response a number in order to keep track of them. The author input the numerical data into Microsoft Excel spreadsheet. Each responses will get one score for each of the 4 sections. In Section 1. Bruxism, “Yes” were scored as numerical “1” and “No” were scored as “0.” Individuals who scored positive on either Sleep Bruxism, Awake Bruxism, or both will be defined as suffering from Bruxism, hence categorized as “1”; otherwise “0” for Non-bruxers. Section 2. PSS, the numerical responses (“0” to “4”) from the ten questions yielded a global score range from “0” to “40”. In Section 3. PSQI, each subject’s responses summed and yielded a score ranging from “0” to “∞”. And Section 4. DAS, the subject’s four responses (“1” to “5”) summed and yielded one numerical score ranging from “1” to “20.” The author then transferred these scores into the SPSS software for data analysis.

Statistical Analysis

Data were collected and analyzed using the IBM SPSS Statistics 25. The demographics were analyzed via Frequency Statistics (age range, gender, military branch, and rank). The author used Pearson Correlations to assess for the association of the various psychosocial factors and forms of bruxism. Furthermore, the psychosocial factors reported by the population of bruxers and non-bruxers were compared using the independent samples t-test. This was done in order to assess whether the differences in the reported psychosocial factors were significant between the population of bruxers and non-bruxers.

RESULTS

The questionnaire study took 4 months to complete, from 1 October 2018 to 1 February 2019. 274 Fort Hood servicemembers participated in the questionnaire study. However, 23 of them were incomplete, hence were omitted from the study. Hence, the sample population used in the study included 251 responses.

See Table 1 for Demographics. Of the 251 participants, 43.8% ($n = 110$) were 17-21 years old, 23.1% ($n = 58$) were 22-26 years old, 12.7% ($n = 32$) were 27-31 years old, 12.4% ($n = 31$) were 32-36 years old, and 8.0% ($n = 20$) were 37 years or older. The majority (82.5%; $n = 207$) were males, 16.7% ($n = 42$) were females, and 0.8% ($n = 2$) were others. Furthermore, 98.8% ($n = 248$) were Army personnel and 1.2% ($n = 3$) were Air Force personnel. Of the participants, most were Enlisted Soldiers consisted (86.7%; $n = 218$), Warrant Officers were (3.3%; $n = 8$), and Officers (10%; $n = 25$).

Table 2 for bivariate correlation between the Psychosocial Factors (PSS, PSQI, and DAS) and Bruxism. Pearson correlation coefficients were computed to assess the relationship between the Psychosocial Factors and Bruxism. There was a positive correlation between the Perceived Stress Scale and Bruxism ($r = 0.250$, $p < 0.001$), between Pittsburg Sleep Quality Index and Bruxism ($r = 0.325$, $p < 0.001$), and between Dental Anxiety Scale and Bruxism ($r = 0.144$, $p < 0.01$). Overall, from this correlation data, it can be implied that Soldiers who score higher PSS (higher stress), PSQI (poorer sleep quality), and DAS (higher dental anxiety) correspond to increases in number of Soldiers who experience Bruxism. It can be suggested that Soldiers who experience higher stress, poorer sleep quality, and higher dental anxiety may also be susceptible to experiencing bruxism.

Similar outcomes were observed between the Psychosocial Factors and Sleep Bruxism, as well as Psychosocial Factors and Awake Bruxism (see Table 2). Additionally, there was a significant positive correlation between Sleep Bruxism and Awake Bruxism ($r = 0.630$, $p < 0.001$), suggesting that subjects who experience Sleep Bruxism may also have the tendency to experience Awake Bruxism as well.

Furthermore, there were positive correlations between PSS and PSQI ($r = 0.384$, $p < 0.001$), PSS and DAS ($r = 0.295$, $p < 0.001$), and PSQI and DAS ($r = 0.234$, $p < 0.001$). From this, not only did we observe the positive association between the Psychosocial Factors and Bruxism, we can also observe the association among the psychosocial factors. We may imply that individuals who experience higher gradient of one of the three psychosocial factors, such as emotional stress, may also suffer higher gradient of another psychosocial factors such as poorer sleep quality and/or higher dental anxiety.

See Table 3a for results from the independent samples t-test comparing the three Psychosocial Factors in population of Bruxers and Non-bruxers. There were significant differences in the PSS scores of Bruxers ($M = 14.83$, $SD = 7.7$) and Non-bruxers ($M = 10.66$, $SD = 6.05$); $t(249) = -4.07$, $p < 0.001$). According to Cohen's Perceived Stress Scale, the cutoff score that differentiates between low stress and moderate stress is 13, as 0-13 is considered low stress and 14-26 is moderate stress. Hence applying the PSS cutoff score, Bruxers on average scored moderate stress and the Non-bruxers scored low on the PSS. These results suggest that Bruxers in general reported higher perceived stress than Non-bruxers. Cohen's $d = 0.60$ suggests that there was a medium effect size, hence the differences was both statistically significant and moderately sized.

There were significant differences in the PSQI scores of Bruxers ($M = 7.02$, $SD = 3.70$) and Non-bruxers ($M = 4.29$, $SD = 3.00$); $t(249) = -5.42$, $p < 0.001$). PSQI categorizes any score of 5 and higher as poor quality sleeper, and anything below to be normal quality sleeper. Therefore, based on the score cutoff, it is evident that Bruxers on average scored Poor on the sleep quality ($M = 7.02$) as opposed to that of Non-bruxers ($M = 4.29$). These results suggest that bruxers experience poorer sleep quality than do non-bruxers. Cohen's $d = 0.81$ suggests that there was a large effect size, hence the differences in scores between the two population groups are statistically significant and large.

Furthermore, there were significant differences in the DAS of Bruxers ($M = 6.65$, $SD = 2.88$) and Non-bruxers ($M = 5.82$, $SD = 2.06$); $t(249) = -2.29$, $p < 0.05$). Corah's Dental Anxiety Scale grades 0-8 as low anxiety, 9-12 as moderate anxiety, 13-14 as high anxiety, and 15-20 as severe anxiety. Both Bruxers and Non-bruxers scored within the means of less than 8 ($M = 6.65$ and $M = 5.82$, respectively), we can suggest that both populations experience mild form of dental anxiety, despite the slight discrepancy in their mean scores. Cohen's $d = 0.33$ suggests that there was a small effect size, hence the differences in scores between the two population groups was small albeit statistically significant. Similar outcome differences were seen in populations who reported Sleep Bruxism vs the Control population (see Table 3b and 3c).

Table 1. Demographics

Age Range

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	17-21	110	43.8	43.8	43.8
	22-26	58	23.1	23.1	66.9
	27-31	32	12.7	12.7	79.7
	32-26	31	12.4	12.4	92.0
	37+	20	8.0	8.0	100.0
	Total	251	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	207	82.5	82.5	82.5
	Female	42	16.7	16.7	99.2
	Other	2	.8	.8	100.0
	Total	251	100.0	100.0	

Military Branch

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Army	248	98.8	98.8	98.8
	Air Force	3	1.2	1.2	100.0
	Total	251	100.0	100.0	

Table 2. Pearson Correlations between Psychosocial Factors and Bruxism
Pearson Correlations Between Psychosocial Factors and Bruxisms

		Correlations					
		Perceived Stress Scale	Pittsburg Sleep Quality Index	Dental Anxiety Scale	Bruxism	Sleep Bruxism	Awake Bruxism
Perceived Stress Scale	Pearson Correlation	1	.384**	.295**	.250**	.229**	.161*
	Sig. (2-tailed)		.000	.000	.000	.000	.011
	N	251	251	251	251	251	251
Pittsburg Sleep Quality Index	Pearson Correlation	.384**	1	.234**	.325**	.317**	.216**
	Sig. (2-tailed)	.000		.000	.000	.000	.001
	N	251	251	251	251	251	251
Dental Anxiety Scale	Pearson Correlation	.295**	.234**	1	.144*	.126*	.153*
	Sig. (2-tailed)	.000	.000		.023	.046	.016
	N	251	251	251	251	251	251
Bruxism	Pearson Correlation	.250**	.325**	.144*	1	.935**	.743**
	Sig. (2-tailed)	.000	.000	.023		.000	.000
	N	251	251	251	251	251	251
Sleep Bruxism	Pearson Correlation	.229**	.317**	.126*	.935**	1	.630**
	Sig. (2-tailed)	.000	.000	.046	.000		.000
	N	251	251	251	251	251	251
Awake Bruxism	Pearson Correlation	.161*	.216**	.153*	.743**	.630**	1
	Sig. (2-tailed)	.011	.001	.016	.000	.000	
	N	251	251	251	251	251	251

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

Table 3a. Independent Sample t-Test between Population of Bruxers and Non-bruxers

Independent Sample t-Test between Population of Bruxers and Non-bruxers

Group Statistics					
	Bruxism	N	Mean	Std. Deviation	Std. Error Mean
Perceived Stress Scale	Non-Bruxer	203	10.66	6.046	.424
	Bruxer	48	14.83	7.700	1.111
Pittsburg Sleep Quality Index	Non-Bruxer	203	4.29	2.995	.210
	Bruxer	48	7.02	3.699	.534
Dental Anxiety Scale	Non-Bruxer	203	5.82	2.060	.145
	Bruxer	48	6.65	2.877	.415

Independent Samples Test										
		Levene's Test for Equality of Variances			t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceived Stress Scale	Equal variances assumed	6.082	.014	-4.069	249	.000	-4.173	1.026	-6.193	-2.153
	Equal variances not assumed			-3.508	61.398	.001	-4.173	1.190	-6.552	-1.795
Pittsburg Sleep Quality Index	Equal variances assumed	7.742	.006	-5.418	249	.000	-2.730	.504	-3.723	-1.738
	Equal variances not assumed			-4.758	62.354	.000	-2.730	.574	-3.877	-1.583
Dental Anxiety Scale	Equal variances assumed	9.412	.002	-2.292	249	.023	-.823	.359	-1.530	-.116
	Equal variances not assumed			-1.872	58.892	.066	-.823	.440	-1.703	.057

Table 3b. Independent Sample t-Test between Population of Sleep Bruxers and Non-bruxers

Independent Sample t-Test between Population of Sleep Bruxers and Non-bruxers

Group Statistics										
	Sleep Bruxism	N	Mean	Std. Deviation	Std. Error Mean					
Perceived Stress Scale	Non-Bruxer	208	10.77	6.117	.424					
	Sleep Bruxer	43	14.77	7.764	1.184					
Pittsburg Sleep Quality Index	Non-Bruxer	208	4.34	2.996	.208					
	Sleep Bruxer	43	7.12	3.812	.581					
Dental Anxiety Scale	Non-Bruxer	208	5.85	2.072	.144					
	Sleep Bruxer	43	6.60	2.945	.449					

Independent Samples Test										
		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceived Stress Scale	Equal variances assumed	5.408	.021	-3.710	249	.000	-3.993	1.076	-6.113	-1.874
	Equal variances not assumed			-3.175	53.295	.002	-3.993	1.258	-6.516	-1.471
Pittsburg Sleep Quality Index	Equal variances assumed	8.656	.004	-5.270	249	.000	-2.780	.527	-3.819	-1.741
	Equal variances not assumed			-4.502	53.236	.000	-2.780	.617	-4.018	-1.542
Dental Anxiety Scale	Equal variances assumed	8.346	.004	-2.006	249	.046	-.754	.376	-1.494	-.014
	Equal variances not assumed			-1.598	50.924	.116	-.754	.472	-1.700	.193

Table 3c. Independent Sample t-Test between Population of Awake Bruxers and Non-bruxers

Independent Sample t-Test between Population of Awake Bruxers and Non-bruxers

Group Statistics										
	Awake Bruxism	N	Mean	Std. Deviation	Std. Error Mean					
Perceived Stress Scale	Non-Bruxer	222	11.08	6.563	.440					
	Awake Bruxer	29	14.38	6.120	1.137					
Pittsburg Sleep Quality Index	Non-Bruxer	222	4.55	3.214	.216					
	Awake Bruxer	29	6.79	3.447	.640					
Dental Anxiety Scale	Non-Bruxer	222	5.86	2.101	.141					
	Awake Bruxer	29	6.93	3.093	.574					

Independent Samples Test										
		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceived Stress Scale	Equal variances assumed	.120	.730	-2.568	249	.011	-3.303	1.286	-5.836	-.769
	Equal variances not assumed			-2.710	36.937	.010	-3.303	1.219	-5.773	-.833
Pittsburg Sleep Quality Index	Equal variances assumed	1.361	.244	-3.499	249	.001	-2.239	.640	-3.499	-.979
	Equal variances not assumed			-3.315	34.663	.002	-2.239	.676	-3.611	-.867
Dental Anxiety Scale	Equal variances assumed	8.386	.004	-2.437	249	.016	-1.075	.441	-1.944	-.206
	Equal variances not assumed			-1.818	31.462	.079	-1.075	.591	-2.281	.130

DISCUSSION

The purpose of this study was to assess the association between the three Psychosocial Factors and Bruxism; and compare the differences in the reported perceived stress (PSS), sleep quality (PSQI), and dental anxiety (DAS) between the population of bruxers and non-bruxers. The results demonstrated association between the Psychosocial Factors and Bruxism as there were significant positive correlations between PSS and Bruxism ($r = 0.250, p < 0.001$); PSQI and Bruxism ($r = 0.325, p < 0.001$); and DAS and Bruxism ($r = 0.144, p < 0.01$). It can be implied that personnel who experience higher stress, poorer sleep quality, and higher dental anxiety may also be susceptible to experiencing bruxism.

In addition, there was a significant positive correlation between Sleep Bruxism and Awake Bruxism ($r = 0.630, p < 0.001$), suggesting an association between subjects who experience sleep bruxism and those who experience awake bruxism. Furthermore, significant correlations were also noted between PSS and PSQI ($r = 0.384, p < 0.001$), PSS and DAS ($r = 0.295, p < 0.001$), and PSQI and DAS ($r = 0.234, p < 0.001$), showing evident associations among the Psychosocial Factors themselves. Inferring from this, we may predict that personnel who experience one of the three psychosocial factors, such as emotional stress, may also suffer higher gradient of another psychosocial factors such as poorer sleep quality and/or higher dental anxiety.

Overall, there were significant positive correlations among the Psychosocial Factors (PSS, PSQI, and DAS) and Bruxism, thus rejecting the first null hypothesis. The findings suggest that perceived stress, quality sleep, and dental anxiety can be useful predictors for military personnel who experience bruxism.

The independent sample t-test further showed that the population reported positive on Bruxism, on average, scored higher on the PSS, PSQI, and DAS than did the population that reported otherwise, and the differences were statistically different. This outcome hence rejects the second null hypothesis.

Earlier investigations discussed positive correlation between the Psychosocial Factors and Bruxism. Cavallo's study found positive correlation between PSS and Awake / Sleep Bruxism [6], nonetheless presented limited correlation results. Meanwhile, the Winocur's study showed a positive correlation between perceived stress and dental anxiety ($r = 0.217$, $P < 0.001$). The study, however, did not conduct correlation tests between the Psychosocial Factors and Bruxism. Instead, it compared the differences in the means scores on the different psychological variables between the population with bruxism and the population without [30]. The respondents reported positive in Awake Bruxism, for instance, showed higher mean scores on PSS ($M = 25.76 \pm 6.61$ (126), $p < 0.05$) than those who reported negative ($M = 24.49 \pm 6.85$ (275), $p < 0.05$); and those who responded positive to Awake Bruxism showed higher mean scores on DAS ($M = 11.45 \pm 4.54$ (126), $p < 0.05$) than those who reported negative ($M = 9.95 \pm 3.74$ (275), $p < 0.05$). This is also similar with subjects who responded positive to Sleep Bruxism scoring higher on PSS ($M = 27.16 \pm 6.81$ (55), $p < 0.005$) than did those who responded negative ($M = 24.49 \pm 6.82$ (347), $p < 0.005$); and those who responded positive to Sleep Bruxism scored higher on DAS ($M = 13.47 \pm 4.49$ (55), $p < 0.001$) than did those who responded negative ($M = 9.93 \pm 3.78$ (347), $p < 0.001$) [31].

Adding to the previous studies, the present study too demonstrated significant mean differences in the three psychosocial factors between the population of bruxers and non-bruxers. The independent sample t-test showed that there were significant differences in the reported PSS

scores of Bruxers ($M = 14.83$, $SD = 7.7$) and Non-bruxers ($M = 10.66$, $SD = 6.046$); $t(249) = -4.07$, $p < 0.001$; and DAS of Bruxers ($M = 6.65$, $SD = 2.88$) and Non-bruxers ($M = 5.82$, $SD = 2.06$); $t(249) = -2.29$, $p < 0.05$). These significant findings enable us to imply that individuals who suffer from bruxism tend to experience higher emotional stress and dental anxiety than individuals who do not.

The present study also looked into the correlation between the sleep quality and bruxism, similar to the Brazilian study involving dental students' sleep quality and their reported awake and sleep bruxism. The Brazilian study, for example, showed higher prevalence of sleep bruxism (PR = 1.540; 95% CI: 1.00–2.37) and awake bruxism (PR = 1.344; 95% CI: 1,008–1,790) with poorer sleep duration. Similar results were observed with habitual sleep efficiency (PR = 1.323; 95% CI: 1.03–1.70) and sleep disturbance components (PR = 1.533; 95% CI: 1.03–2.27). Inferring from this study, the prevalence awake and sleep bruxism were higher with the dental students who reported poorer sleep quality [28]. Adding to this study, we noted significant positive Pearson correlation between PSQI and Bruxism ($r = 0.325$, $p < 0.001$). In addition, the present study also found that the military personnel who reported positive for Bruxism on average, scored higher on PSQI scores ($M = 7.02$, $SD = 3.70$) than did Non-bruxers ($M = 4.29$, $SD = 3.00$); $t(249) = -5.42$, $p < 0.001$). These findings suggest that not only is sleep quality a predictor of bruxism, we generally observe poorer sleep quality among population of bruxers than the control population.

The results from the present study not only reject the null hypothesis, they also enable us to strengthen our inquiry regarding the Psychosocial Factors and their association with Bruxism. Such may indicate the importance of integrating psychosocial preventative intervention with our dental practices in the military population.

One can acknowledge that the limitation of the study is primarily the use of questionnaires for the military personnel to self-report their psychosocial dispositions and their oral habits. The definition of bruxism in the present study relied on self-reporting and was not clinically verified; hence, self-reported signs and symptoms of bruxism may only enable the author to screen for possible presence of disease, but not accurately diagnose it. As result, questionnaires may be susceptible to biases, such as subjects' recollection, or lack of, regarding bruxism, as well as their emotional stress, or sleep quality [16]. Additional diagnostic tools such as clinical examination, electromyography, and polysomnography are necessary to more accurately diagnose bruxism [30]. Such methods would pose a challenge due to high cost, limited time, and resources on moderately sized sample population.

Another limitation of this study is that it only studied a small range of psychosocial factors, excluding other potential risk factors such as use of psychoactive stimulants. Past studies have examined the roles of psychoactive stimulants and bruxism (24, 27). One study, for example, showed association between sleep bruxism and psychoactive stimulants such as coffee, tobacco, and alcohol [5]. Furthermore, a similar study has shown positive correlation with the increase or excess use of psychoactive stimulants and the risk of sleep bruxism [26]. This may be an important to consider in the current study of interest since the prevalence of tobacco uses in the U.S. is higher among the military than the civilian population [9]. In addition, daily consumption of caffeine product in the military is higher than civilian counterpart [12]. To accurately assess a subject's habitual use of psychoactive stimulant, nonetheless, would require personal interviews that would be challenging with a sample of 251 participants.

Furthermore, other potential limitation of the study is the size of the sample population. Due to the fact that the author only obtained 251 valid responses and that there were large

discrepancies among the demographics (i.e. age range, genders, ranks, and military branch), we may not be able to statistically assess our sample population without introducing errors. To confirm the past literature that the prevalence of bruxism is equally distributed across genders, for instance, we would recommend to collect equal number of responses from males and females in order to achieve a more accurate representation of each gender group. In our current study, there were 207 males and only 42 female personnel. Similarly, we would be interested in examining the differences in psychosocial factors and bruxism among the different military branches, but our study obtained 248 Army personnel, but only 3 Air Force personnel. In addition, when conducting independent sample t-test, there was a large discrepancy in the number of sample population of bruxers ($N = 48$) and non-bruxers ($N = 203$), thus producing different variances that could've affected the outcomes' accuracy. Overall, future studies following the current may benefit from a larger sample population.

Subjects participating in the questionnaire study may be susceptible to cognitive biases. Cognitive bias is a psychological phenomenon characterizes by erroneous thinking that occurs when people process and interpret the information presented to them; such can pose a limitation to this study. One potential limitation with the use of questionnaires, for example, is the subjects' *confirmation bias*, which is defined as the tendency of an individual to interpret new information as confirmation of one's existing beliefs or theories [4, 10, 11]. The participants reading the contents of the questionnaires may overreport the aspects that they recall experiencing more and underreport the otherwise, thus affecting the outcomes of the study. Meanwhile, *hindsight bias* may be another possibility; this occurs when the individuals' pre-existing notion about an outcome influences their perceptions of their own behavior. The personnel participating the questionnaire study at the waiting area of the Dental Treatment

Facilities, for instance, may expect that the author of the questionnaire is a dental provider whose intent is to solicit more signs and symptoms of bruxism; this may lead them to overreport bruxism. *Negativity bias* may also contribute to the limitation of the study, as the participants may also express more dental anxiety since they are waiting for their dental appointment, hence they may score higher on the Dental Anxiety Scale than if they were to respond to the questionnaire in a different setting [10]. Thus, one must not discount the effects of human cognitive biases when conducting questionnaire studies in the future.

CONCLUSION

The aim of this study was to assess the association between the three Psychosocial Factors and Bruxism and to compare the differences between the military population of bruxers and non-bruxers in their reported perceived stress (PSS), sleep quality (PSQI), and dental anxiety (DAS). The results of the present study demonstrated that there were positive correlations between Bruxism and the three Psychosocial Factors; as military population who experience bruxism tend to report higher perceived stress, poorer sleep quality, and higher dental anxiety. Compared to the population of bruxers and that of non-bruxers, there were significant differences in the reported perceived stress, sleep quality, and dental anxiety.

Future studies building upon this topic can further be strengthened by obtaining a larger sample population, incorporating additional diagnostic tools such as clinical examination, electromyography, and polysomnography in order to more accurately diagnose bruxism. Moreover, personal interviews can be conducted to assess the participants' psychosocial status better and inquire a broader range of psychosocial aspects aside from the three from this study.

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APPENDIX A



DEPARTMENT OF THE ARMY
HEADQUARTERS, CARL R. DARNALL ARMY MEDICAL CENTER
36065 SANTA FE AVE
FORT HOOD, TEXAS 76544-5060

MCXI-QCD

DATE: 05 September 2018

MEMORANDUM FOR: Keng-Yu Chen, DMD, Principal Investigator (PI)

SUBJECT: Exempt Status Determination

PROJECT TITLE: Psychosocial Risk Factors and Bruxism in the United States Military Population

REFERENCE #: CRDAMC 18-04

ACTION: ACKNOWLEDGEMENT OF MODIFICATION 2

1. This letter is in response to your request to Carl R. Darnall Army Medical Center (CRDAMC) for review of a modification to the above-referenced project, which was previously determined to be exempt from the regulatory requirements of 32 CFR 219 based on criteria under 32 CFR §219.101(b)(2).
2. The proposed modification involves improvements to the literature review, hypotheses, study title, and questionnaires, additional clinic sites for data collection, and replacing a subcomponent of the "Psychoactive Stimulant Use" questionnaire with a "Dental Anxiety" subsection. These questionnaires will not contain any direct or indirect subject identifiers.
3. The CRDAMC Human Protections Administrator (HPA) has reviewed the requested modification and has determined that this modification does not change the status previously determined to be exempt.
4. There are no additional changes to the information provided on your original start letter.
5. POC for this action is the undersigned at rachell.l.jones.civ@mail.mil or (254) 553-9779.

9/5/2018

X Rachell L. Jones

Rachell L. Jones, PhD
CRDAMC Human Protections Administrator
Signed by: JONES, RACHELLEANNE.1461470919

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APPENDIX B

Carl R. Army Medical Center
Human Research Protection Program

IMPACT STATEMENT FOR EXEMPT RESEARCH

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PROTOCOL TITLE: Psychosocial risk factors and bruxism in the United States military population

PRINCIPAL INVESTIGATOR: CPT Gary Chen

SERVICE/DEPARTMENT: *BJDC (AEGD 2 Residency Program)*

ASSISTANCE REQUESTED: CPT Chen is requesting the command team representative from the respective dental clinic (**BILLY JOHNSON DENTAL CLINIC**), to acknowledge and give permission to pursue his research study titled "Psychosocial risk factors and bruxism in the United States military population." Bruxism is parafunctional activity consisting of involuntary grinding or clenching of teeth that may be triggered by various risk factors. The risk factors that have been explored in past literatures include perceived stress, dental anxiety, and self-reported sleep quality. The primary purpose of this study using a questionnaire is to examine the risk factors of bruxism in the United States active duty Army personnels.

The following activities will be performed at your respective dental clinic in regards to the above research project:

- 1) All front-end reception staff at the dental clinics will be briefed and explained as to the purpose of the questionnaires and their primary role in distributing and collecting the questionnaires by CPT Chen.
- 2) Only front-end reception staff will hand out the questionnaires to dental patients prior to their appointment while in the waiting room.
- 3) The subjects are informed the following instructions:
 - a. Their participation in the questionnaires is voluntary.
 - b. The questionnaires will be anonymous and that they are not personally identifiable.
 - c. Each questionnaire will take about 5 minutes to fill.
 - d. All questionnaires will be filled in the waiting room and upon completion, the participants will return them to the reception staff, who will store them in a brown envelop labeled "18-04".
 - e. All participants can stop participating in the questionnaire at any point.
- 4) CPT Chen will collect the envelop with the questionnaires at the end of the questionnaire collection period and store/dispose them appropriately.

TOTAL NUMBER OF PATIENTS TO BE STUDIED: Approximately 250 participants

NUMBER OF PATIENTS PER MONTH: 100 participants per month

LENGTH OF STUDY: *4 months*

Version: 3 August 2018

Page 1 of 3

Principal Investigator

I hereby request approval of the aforementioned activity to be conducted in accordance with a research proposal pending approval. Any changes to the above described activities which might influence the approval of this work in your area will be submitted for approval prior to implementation, unless they are immediately required to ensure the safety of subjects or others.

X 

CPT Gary Chen

Signature block of Principal Investigator

Date *14 Sept 2018*

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Approving Official

I have read the description of the above activity and have made the following determination:

- Approved - No Additional Comments
- Approved - See Additional Comments Below
- Disapproved - See Additional Comments

Additional Comments:

Signature block of Approving Official

Date 14 Sept 18

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Carl R. Army Medical Center
Human Research Protection Program

IMPACT STATEMENT FOR EXEMPT RESEARCH

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PROTOCOL TITLE: Psychosocial risk factors and bruxism in the United States military population

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- 2) Only front-end reception staff will hand out the questionnaires to dental patients prior to their appointment while in the waiting room.
- 3) The subjects are informed the following instructions:
 - a. Their participation in the questionnaires is voluntary.
 - b. The questionnaires will be anonymous and that they are not personally identifiable.
 - c. Each questionnaire will take about 5 minutes to fill.
 - d. All questionnaires will be filled in the waiting room and upon completion, the participants will return them to the reception staff, who will store them in a brown envelop labeled "18-04".
 - e. All participants can stop participating in the questionnaire at any point.
- 4) CPT Chen will collect the envelop with the questionnaires at the end of the questionnaire collection period and store/dispose them appropriately.

TOTAL NUMBER OF PATIENTS TO BE STUDIED: Approximately 250 participants

NUMBER OF PATIENTS PER MONTH: 100 participants per month

LENGTH OF STUDY: 4 months

Principal Investigator

I hereby request approval of the aforementioned activity to be conducted in accordance with a research proposal pending approval. Any changes to the above described activities which might influence the approval of this work in your area will be submitted for approval prior to implementation, unless they are immediately required to ensure the safety of subjects or others.



CPT Gary Chen

Signature block of Principal Investigator

Date 14 Sept 2018


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Approving Official

I have read the description of the above activity and have made the following determination:

- Approved - No Additional Comments
- Approved - See Additional Comments Below
- Disapproved - See Additional Comments

Additional Comments:


Signature block of Approving Official Date 14 SEP 14

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Carl R. Army Medical Center
Human Research Protection Program

IMPACT STATEMENT FOR EXEMPT RESEARCH

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PROTOCOL TITLE: Psychosocial risk factors and bruxism in the United States military population

PRINCIPAL INVESTIGATOR: CPT Gary Chen

SERVICE/DEPARTMENT: BJDC (AEGD 2 Residency Program)

ASSISTANCE REQUESTED: CPT Chen is requesting the command team representative from the respective dental clinic (**BILLY JOHNSON DENTAL CLINIC**), to acknowledge and give permission to pursue his research study titled "Psychosocial risk factors and bruxism in the United States military population." Bruxism is parafunctional activity consisting of involuntary grinding or clenching of teeth that may be triggered by various risk factors. The risk factors that have been explored in past literatures include perceived stress, dental anxiety, and self-reported sleep quality. The primary purpose of this study using a questionnaire is to examine the risk factors of bruxism in the United States active duty Army personnels.

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Date 14-Sept 2018


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- Approved - See Additional Comments Below
- Disapproved - See Additional Comments

Additional Comments:


Signature block of Approving Official Date 19/14/18

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Carl R. Army Medical Center
Human Research Protection Program

IMPACT STATEMENT FOR EXEMPT RESEARCH

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X

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- Disapproved - See Additional Comments

Additional Comments:


Signature block of Approving Official Date 14 Sept 18

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APPENDIX C

2018 QUESTIONNAIRE ON HABITS AND SLEEP

INTRODUCTION: The purpose of the questionnaires study is to understand our Soldiers' lifestyles and their dental habits. Participation is voluntary and anonymous, hence not personally identifiable, so DO NOT INCLUDE ANY PERSONALLY IDENTIFIABLE INFORMATION. If you choose to participate in this questionnaire study, please answer each item to the best of your ability. The questionnaire has two sides, please be sure TURN THE PAGE.

CIRCLE ONE											
AGE	17-21	22-26	27-31	32-36	37+						
GENDER	Male	Female	Others								
Branch	Army	Navy	Marines	Air Force	Coast Guard	Others					
RANK	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9		
	WD-1	CW-2	CW-3	CW-4	CW-5						
	O-1	O-2	O-3	O-4	O-5	O-6	O-7	O-8	O-9	O-10	O-11
SECTION 1.											
During the past 6 months as follows (MARK EITHER YES OR NO)								YES	NO		
1. Are you aware, or has anyone heard you, grinding your teeth during sleep?											
2. Are you aware that your teeth are worn down more than they should be?											
3. Are you aware of any of the following symptoms upon awakening?											
(i) Sensation of fatigue, tightness or soreness of your jaw upon awakening?											
(ii) Feeling that your teeth are clenched or that your mouth is sore upon awakening?											
(iii) Headaches upon awakening?											
(iv) Difficulty in opening your mouth wide upon awakening?											
(v) Feeling of tension in your jaw joint upon awakening and feeling as if you have to move your lower jaw to release it?											
(vi) Hearing or feeling a "click" in your jaw joint upon awakening that disappears afterwards?											
4. Have you ever been aware of grinding your teeth during wakefulness or while awake?											
SECTION 2.											
IN THE PAST MONTH: (CIRCLE ONE)											
0= Never 1=Almost never 2=Sometimes 3=Fairly often 4=Very often											
1. How often have you been upset because of something that happened unexpectedly?							0	1	2	3	4
2. How often have you felt that you were unable to control the important things in your life?							0	1	2	3	4
3. How often have you felt nervous and stressed?							0	1	2	3	4
4. How often have you felt confident about your ability to handle your personal problems?							0	1	2	3	4
5. How often have you felt that things were going your way?							0	1	2	3	4
6. How often have you found that you could not cope with all the things that you had to do?							0	1	2	3	4
7. How often have you been able to control irritations in your life?							0	1	2	3	4
8. How often have you felt that you were on top of things?							0	1	2	3	4
9. How often have you been angered because of things that happened that were outside of your control?							0	1	2	3	4
10. How often have you felt difficulties were piling up so high that you could not overcome them?							0	1	2	3	4

SECTION 3.					
During the past month:					
1. When (or what time) have you usually gone to bed? (WRITE THE TIME)					
2. How long (IN MINUTES) has it taken you to fall asleep each night? (CIRCLE ONE)					
	(0) <15min	(1) 16-30min	(2) 31-60min	(3) >60min	
3. What time have you usually gotten up in the morning? (WRITE THE TIME)					
4a. How many hours of actually sleep did you get in an average night? (WRITE THE HOURS)					
4b. How many hours were you in bed? (WRITE THE HOURS)					
	(0) Not during the past month	(1) Less than once a week	(2) Once or twice a week	(3) Three or more times a week	
During the past month: (MARK ONE)					
5. How often have you had trouble sleeping because:					
a. Cannot get to sleep within 30 minutes					
b. Wake up in the middle of the night or early morning					
c. Have to get up to use the bathroom					
d. Cannot breathe comfortably					
e. Cough or snore loudly					
f. Feel too cold					
g. Feel too hot					
h. Have bad dreams					
i. Have pain					
j. Other reason(s): please describe, including how often you have had trouble sleeping because of this reason(s)					
6. How often have you taken medicine (prescribed or over the counter) to help you sleep?					
7. How often have you had trouble staying awake while driving, eating meals, or engaging in social activity?					
8. How much of a problem has it been for you to keep up enthusiasm to get things done?					
9. How would you rate your sleep quality overall? (CIRCLE ONE)					
	(0) Very good	(1) Fairly good	(2) Fairly bad	(3) Very bad	
SECTION 4.					
1. If you had to go to the dentist tomorrow for a check-up, how would you feel about it? (CIRCLE ONE)	1. I would look forward to it as a reasonably enjoyable experience.	2. I wouldn't care one way or the other.	3. I would be a little uneasy about it.	4. I would be afraid that it would be unpleasant and painful.	5. I would be very frightened of what the dentist would do.
2. When you are waiting in the dentist's office for your turn in the chair, how do you feel? (CIRCLE ONE)	1. Relaxed	2. A little uneasy	3. Tense	4. Anxious	5. So anxious that I sometimes break out in a sweat or almost feel physically sick.
3. When you are in the dentist's chair waiting while the dentist prepares the instruments used to work on your teeth, how do you feel? (CIRCLE ONE)	1. Relaxed	2. A little uneasy	3. Tense	4. Anxious	5. So anxious that I sometimes break out in a sweat or almost feel physically sick.
4. Imagine you are in the dentist's chair to have your teeth cleaned. While you are waiting and the dentist or hygienist is getting out the instruments which will be used to scrape your teeth around the gums, how do you feel? (CIRCLE ONE)	1. Relaxed	2. A little uneasy	3. Tense	4. Anxious	5. So anxious that I sometimes break out in a sweat or almost feel physically sick.