JOURNAL OF BEHAVIORAL HEALTH, 2023
VOL 12, NO. 1, PAGE 1 – 7

RESEARCH ARTICLE

Open Access

Moral Injury and Suicide Attempts in Nigerian Military Veterans

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ABSTRACT

Military suicide prevention and control has become a priority to military authorities due to its increasing rates and consequences. However, there is still paucity of research examining associated factors that put veterans at risk for suicidal attempts. This study examined association between moral injury, mental health outcomes, contextual factors (pre-deployment ideation, post-deployment duration) and suicidal attempts by rank in Nigerian military veterans. A total of 582 purposively sampled military veterans who were exposed to insurgency completed a cross-sectional survey and standardised instruments were utilised to assess study variables. To examine associations of exposure to potentially morally injurious events (PMIEs; witnessing, perpetrating, and betrayal), control variables and suicidal attempts, we estimated two series of multivariable binary logistic regressions stratified by rank, with suicide attempt as the dependent variable. Results indicated that potentially morally injurious events, particularly due to perpetration was the greatest risk factor for suicidal attempts for both enlisted and officers. Enlisted veterans who reported perpetration (OR1.9, 95%CI; 1.1-2.8) and betrayal (OR-1.7,95%CI; 1.2-2.6) were more likely to report suicidal attempts than those who denied perpetration and betrayal. Witnessing morally injurious events emerged as a significant risk factor for suicidal attempts in military officers (AOR = 1.54, 95% CI 1.2-1.8) but not in the enlisted veterans. The fully adjusted model revealed no significant association between moral injury due to betrayal and suicide attempts after post-deployment other factors were controlled. Military authorities should give more attention to moral injury when assessing and designing intervention for suicide prevention, especially among enlisted veterans.

ARTICLE HISTORY

Received Date: 14 Feb 2023
Accepted Date: 20 Mar 2023
Published Date: 25 Mar 2023

KEYWORDS

Suicidal behaviours, Moral Injury.

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Introduction

Suicidal behaviours are gradually and increasingly becoming very common among military personnel across nations, posing great concerns to military authorities and organizations [1]. In the last five years, there have been astronomical rise in sucidality among military personnel deployed to war zones, manifesting through self-directed negative thoughts, attempted suicide and actual suicide [2]. Consequently, recent statistics from United States Department of Veterans Affairs (VA) ranked suicide as the second major cause of military death, with over 6,000 annual mortality rate, which is 1.5 times higher than the general population. These statistics are similar to findings obtained in Russian, Canadian and British veterans where prevalence rates range between 14-21% [2].

Although there are limited literatures on suicidality in Nigeria, especially among military veterans, Okulate [3] findings among military personnel revealed that 15 out of 51 veterans who were hospitalised for various psychological ailments had suicide-related problems. More recently from 2014 to 2022, more than 100 military personnel deployed to combat insurgency in the north-east have exhibited different suicidal behaviours ranging from expressing death wishes, self-directed violence, inflicting self-injury and even self-termination of life. These behaviours have persisted even after homecoming as formations that are more military and departments continue to receive cases of attempted suicide and even actual suicide from their personnel. The situation has become even more disturbing, due to its imminent consequences on military efficiency, wellbeing and national security. Therefore, to ensure effective suicidal prevention, control and management, there is need to identify risk factors that influence suicidal attempts in the veterans. Unfortunately, however, there are no documented findings on risk factors for suicidal attempts in Nigeria.

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In the US for instance, several studies have demonstrated that a combination of demographic and military characteristics place veterans at increased risk [4,5]; while others factors such as prior suicidal attempts and mental health diagnosis, including depression, substance use disorder and posttraumatic stress disorder (PTSD) have also been implicated in suicidality [6-8]. Incidentally, these factors constitute some of the negative postwar experiences characterising military deployment in Nigeria [9,10], but their roles in suicide attempts remains largely unknown. In addition, while the mental health effects of certain risk factors such as combat exposure, number and duration of deployment are well documented [9], and may be associated with suicidal thoughts and attempts [11], there are other war-related factors- not straightforward to unravel- but potentially damaging and likely to predict suicidality. For example, Ames et al., [12] and Kelley et al., [13] have found that veterans at risk for moral injury emanating from combat deployment are more likely than those not at risk to commit suicide.

Moral injury is an emerging construct that has received growing attention over the last decade and is defined as 'perpetrating, failing to prevent or bearing witness to acts that transgress deeply held moral beliefs or values' [14]. Moral injury can manifest if a veteran feels like they have crossed a line of their personal or shared values while serving in the war, and consequently experiences profound guilt, shame, withdrawal, a failure to self-forgive, sabotaging behaviors, and functional impairment [14,15]. In addition, moral injury may occur when there are feelings of betrayal, such as when a veteran feels betrayed by military authority regarding acceptable norms of morality or military conduct. According to Bryan et al. [16], events perceived as potentially morally injurious may include acts of commission (e.g. killing in war) and omission (e.g. failing to save someone), witnessing serious injury or death and dying, or betrayal.

A plethora of research evidence suggest that moral injury in veterans may be a distinct risk factor for suicide, separate from combat exposure and other mental health conditions. Available findings have shown that exposure to potentially morally injurious events (PMIEs) and moral injury are associated with suicidal ideation and attempts [12,17]. In one study, suicidal ideation was nearly double for those who endorsed greater killing experiences in war, even after adjusting for the effects of PTSD, depression, substance use, and general combat [18]. There are however, other studies revealing that, a combination of moral injury and mental health problems such as PTSD further increase the risk for suicidal behaviour in veterans [19].

Military rank (junior or enlisted vs. senior or officer) is one of the factor that is differentially associated with negative mental outcomes, including veterans' suicidal behaviour and their experience of traumatic events [20]. Recent studies have found differences in suicidal behaviours between commissioned and non-commissioned military veterans [21]. Similarly, Rosenbuam submitted that increased access to firearms make soldiers more vulnerable to suicidal behaviours. One American finding associated enlistment status (enlisted and non-enlisted) with military rank, with additional results revealing that the later were more likely to attempt suicide Hyman, Ireland, Frost & Cottrell, 2012). In addition, a recent study found important rank differences in the manifestation and expression of moral injury, with some evidence that the relationship between the type of moral injury exposure and functional outcomes varies by rank. More specifically, Nieuwsma, O'Brien, Xu and Smigelsky [22] found different types of PMI were significantly associated with gender, enlisted vs. officer status, and post-battle traumatic experiences among veterans. Although there are no specific studies pinpointing these types, observations have shown that enlisted veterans being the engine room are more likely to perpetrate morally injurious events and may experience betrayal from military commanders during operation. That is to say, during deployment, enlisted personnel are more likely to kill, destroy properties than their officers' counterpart. In studies, involving gender for example, Maguen et al. [18] found that perpetration (acts of omission and commission) was most consistently associated with functional impairment across domains for men, whereas betrayal was most consistently associated with functional impairment for women. In sum, this research highlights the importance of examining associations between moral injury and suicide behaviors separately from enlisted and military officers.

Another crucial factor to be considered when examining association between moral injury and suicide attempts is the duration of post-deployment. The transition period between exposure to morally injurious events and reintegration into normal military life may have significant influence on suicide attempts. Indeed, prolonged duration upon homecoming may gradually reduce the shame, guilt and distress associated with experiences of morally injurious events, making it less likely to predict suicidality. Existing research indicates that the relationship between exposure to trauma and subsequent manifestation of distress is affected by time [23,24]. In one study examining the effects of combat exposure on PTSD, Denneson et al., [25] established that more symptoms were recorded immediately after deployment than two years later. This suggests that the period separating exposure to morally injurious events and post-deployment life may confer differences in the manifestation and expression of moral injury, which will consequently impact suicidality. Therefore, considering that, many of the personnel have returned at different times, and with documented research highlighting the importance of time in psychological effects of war, there is need to examine associations between time-related post-deployment moral injury and suicidality (thoughts and attempts) in Nigerian context. Finally, examining multiple factors- moral injury, post-deployment period, PTSD and depression as risk factors to suicidal attempts will offer a broad perspective [7] and guide robust intervention plans for suicide prevention and management.

To address these knowledge gaps, we investigated moral injury emanating from potentially morally injurious events related to acts of perpetration, witnessing, and betrayal and examined how these influence suicidal attempts by rank among Nigerian military veterans exposed to insurgency. We hypothesized that moral injury related to acts of perpetration, witnessing and betrayal would predict suicidal attempts, and that the

relationship between moral injuries by perpetration will be stronger for enlisted than military officers, after controlling for covariates.

Method

Participants and Procedure

This study examined suicidal behaviour (suicidal attempts) in a sample of 582 Nigerian military veterans who reported exposure to morally injurious events from insurgency operation in the north-east and are currently resident across three military barracks in Borno, Taraba and Adamawa states. Veterans who participated in the study comprised the enlisted 456 (78.3%) and officers 126 (21.7%); Christians 413 (71%) and Muslims 169 (29%); single 224 (38.49%) and married 358(61.51%). They were deployed to Galumbagana 60 (10.3%), Dalwa 86 (14.6%), Monguno 108(18.6%), Baga 112 (19.2%), Kangarwa 116 (19.9%), Damboa 23 (4.3%), Alargano 42 (7.2%) and Damasak 35 (6.0%). A total of 343 (58.9%) were deployed once, 183 (31.3%) were deployed twice while 57 (9.8%) had multiple deployments. The overall prevalence of suicidal attempts was among both enlisted and officers was 23.9.

The procedure for data gathering began with obtaining an official approval from the military authorities. The permission was followed by seeking and obtaining consent from individual respondent, with the assurances of confidentiality and voluntary participation. Participants were also screened for eligibility in line with study inclusion/exclusion criteria using self-report questions. Eligibility required veterans to have at least a deployment experience, be English speaking and demonstrate interest to participate in the survey. Because we aimed to understand the influence of time, our instruments required participants to indicate how long they had returned from the last operation. In all, the researchers administered a standardised instrument containing measures of suicidality, moral injury, posttraumatic stress disorder, depression and demographic factors from July to September 2022. Participants were visited and administered the instrument in their various barracks and formations. Data collected from participants were screened and analysed using Statistical Package for Social Sciences (SPSS-Version-22).

Measures

Suicidal Behaviours

We adopted the Suicidal Severity Rating Scale [26,27] to assess the prevalence of active suicidal ideation (Have you ever actually had any thoughts of killing yourself?) and suicidal attempts (Have you ever made a suicide attempt?) in Nigerian military veterans. The scale required veterans to reports report if they have had suicidal thoughts or attempts, and responses are scored as no=1, yes=2. We added the total scores for all positive responses to compute composite scores for suicidal thoughts and attempts. The SRRS has been widely used by clinicians and researchers alike to assess the severity and lethality of suicidal behaviors and ideations, and can be used to monitor treatment outcomes and establish suicide risk in different population [28]. Recent research have established the scale as valid and reliable measure of sucidality among veterans [18], with others reported high reliability coefficient of 89 [28].

Moral Injury

The Moral Injury Events Scale was adapted and used to assess the severity of moral injury. This is a widely used and highly standardised self-report instrument that measures exposure to potentially morally injurious events (PMIEs), by (1) witnessing, (2) perpetrating (through acts of commission or omission), or (3) being betrayed. Sample items include: "I acted in ways that violated my own moral code or values.' And 'I am troubled by having acted in ways that violated my own morals or values.' Accordingly, we categorised items based on the three categories and asked veterans to respond how these experiences violate their moral values using 6-item response format (1= strongly disagree to 6= strongly agree).

In order to enhance the interpretability of our results, we artificially created binary variables for perpetration, witnessing and betrayal by merging responses into two categories: veterans who reported slight, moderate, and strong disagreement with items and those who reported slight moderate, and strong agreement with items [18]. We also employed the three-factor structure proposed by Bryan et al., [16] to assess exposure to a PMIE by witnessing, perpetrating, and being betrayed. Thus, positive response on the witnessing variable indicates an 'agree' response to either or both items 1 and 2, positive response on the perpetrating variable indicates an 'agree' response to one or more of items 3 through 6, and a positive response on the being betrayed variable indicates an 'agree' response to one or more of items 7 through 11. With this, it was possible to use binary logistic regression analysis to determine how each dimension influenced suicidal thoughts. The scale has been extensively used among veterans and found to have good reliability and validity [16]. In our study, we found internal consistency (α= 0. 78).

PTSD

Posttraumatic stress disorder symptoms were assessed using the Posttraumatic Stress Disorder Checklist [1], which is 20-item self-report instrument corresponding to the Diagnostic and Statistical Manual-5 (DSM-5) symptom criteria for PTSD. Participants indicated how much they were bothered (0 = not at all, 4 = extremely) by each symptom in the prior month. Item responses were summed to create a total score, and the recommended cut-off of 33 was used to indicate a positive screen for PTSD [29]. The PCL-5 is a widely used and psychometrically sound measure of PTSD among veterans in both foreign [18] and Nigerian population [9,10].

Depression

The Patient Health Questionnaire – 9 [30] was used to assess symptoms of depression. The scale contains nine items based on the DSM-5 criteria for Major Depressive Disorder and has widely been utilized in military population with proven impressive psychometric properties [18]. Internal consistency in the current study was good ((α = 0.92). Participants were asked to indicated the frequency with which they were

bothered by each symptom during the previous 2 weeks using a 4-point response format (0 = not at all, 3=nearly every day). Item scores were summed to create a total score, and the recommended cut off of 10 was used to indicate a positive screen for depressive disorder [30].

We assessed rank by asking veterans to indicate if they were enlisted (other ranks) or commissioned (officers' rank). Similarly, veterans were asked to indicate how long they have returned from their last deployment. We also assessed for location and some demographic factors such as age, marital status and religious affiliation.

Data Analyses

Data were analysed using Statistical Package for Social Sciences (SPSS-V-21). Preliminary analyses included bivariate comparisons between enlisted and officers in terms of the prevalence of PMIE exposure and mental health problems using weighted simple logistic regression. To further assess whether veterans exposed to PMIEs by witnessing, perpetrating, and being betrayed were more likely to attempt suicide, we performed a series of weighted multiple logistic regressions. Partially adjusted models accounted for variance in suicide attempts explained by exposure to a PMIE, after controlling for covariation between the three types of moral injury: perpetration, witnessing and being betrayed. The fully adjusted model also accounted for variance in suicidal attempts explained by other factors such as post-deployment duration, pre-deployment suicidal ideation and mental health outcomes including PTSD and depression. Adjusted odds ratios (AOR) with 95% confidence intervals (95% CI) form the basis for reporting our findings in all the models.

Results

Our study as presented in Table 1 observed differences in the weighted prevalence of suicidal attempts between officers and enlisted military veterans who were deployed for insurgency in the north-east, Nigeria. From the binary logistics analysis, we observed that enlisted veterans reported higher prevalence of suicidal attempts (enlisted = 6.7%) than officers (3.5%) prior to deployment. Overall, 23.9 % of both enlisted and officers reported at least one suicidal attempts due to exposure to the three morally injurious events. Except for moral injury related to witnessing that was higher among officers(35.7%), enlisted veterans were more likely to report exposure to morally injurious events by perpetration (71. 6%;) and being betrayed (68.4%) that those in the officers' cadre. Our result also indicated a sizeable number of veterans who screened positive for PTSD (22.9%) and depression (8.2%). The partially adjusted model further revealed that enlisted veterans who reported perpetration (OR1.9, 95%CI; 1.1-2.8) and betrayal (OR-1.7,95%CI; 1.2-2.6) were more likely to report suicide attempts than those who denied perpetration and being betrayed by military authorities. There was no significant

Table 1: Logistics Regression Analysis showing bivariate comparison of study variables by rank.

	Sample.	Enlisted	Officer	OR	95CI
Perpetration				**1.9***	**1.1-2.8**
Agree	47.4	71.6	22.4		
Disagree	52.6	28.4	77.6		
Witnessing					
Agree	58	25.4	35.7	**0.6**	**1.2-1.6**
Disagree	42	74.6	64.3		
Betrayal					
Agree	46.5	68.4	41.2	**1.7***	**1.2-2.6**
Disagree	53.5	31.6	58.8		
PTSD				**1.45***	**1.4-3.3**
Positive	22.9	72.0	30.5		
Negative	77.1	18.0	69.5		
Depression				**1.33**	**1.2-1.9**
Positive	8.2	64.2	33.4		
Negative	91.8	35.8	66.6		
Pre-Suicidal ideations				**2.3***	**2.6-2.8**
Yes	10.2	6.7	3.5		
No	92.8	93.3	93.3		

Table 2: Fully Adjusted Logistics Regression Showing Relative Risk Factors in Suicide in Enlisted and Military Officers.

	Enlisted AOR	CI	Officers	AOR	CI
Perpetration	**1.93***	1.5-3.3		**1. 7***	**1.2-2.4**
Witnessing	0.87	0.6-1.4		**1.54***	1.2-1-8
Betrayal	1.34	1.2-1.6		1.4	1.2-1.9
PTSD	**1.9***	1.3-2.8		**1.04***	**0.9-1.5**
Depression	1.26	0.87-1.8		1.07	0.6-1.3
Post-deployment. Duration	1.03	0.6-1.4		1.35	1.3-1.7
Pre-suicidal. ideations	**1.07**	1.2- 1.7		1.62	1.2-1.9

statistical evidence to support differences in suicidal attempts between enlisted and military officers concerning witnessing immoral acts.

As is shown in Table 2, perpetrating immoral acts still emerged as a significant predictor of suicidal attempts in both officers and enlisted veterans in the fully adjusted model, after PTSD, depression, post-deployment duration and pre-suicidal ideations were controlled. However, enlisted veterans who reported perpetration were more likely to attempt suicide (AOR = 1.93, 95% CI 1.5–.3.3) that the military officers (AOR = 1.7, 95% CI 1.2–2.4). Witnessing morally injurious events emerged as a significant risk factor for suicidal attempts in military officers (AOR = 1.54, 95% CI 1.2-1.8) but not in the enlisted veterans. In addition, results in the fully adjusted model indicated that moral injury due to betrayal was no longer signifant in predicting suicidal attempts among enlisted veterans after other factors were controlled for. However, posttraumatic stress disorder also emerged as a significant predictor of suicidal attempts in both enlisted (AOR = 1.9, 95% CI 1.3-2.8) and military officers (AOR = 1.04, 95% CI 0.9-1.5). Depression, post-deployment location and pre-deployment ideation were statistically insignificant in explaining suicidal attempts in both enlisted and officers' veterans.

Discussion

The present study examined factors that influence suicidal attempts among Nigerian military veterans. Particularly, it examined association between exposure to morally injurious events (perpetration, witnessing, being betrayed) and suicidal attempts in enlisted and military officers who were exposed to insurgency in the north-east. Accordingly, the hypothesis guiding the study was that moral injury related to acts of perpetration, witnessing and betrayal would predict suicidal attempts, and that the relationship between moral injury by perpetration will be stronger for enlisted than military officers, after controlling for covariates.

Preliminary results using binary logistics regression revealed higher prevalence of suicide attempts in enlisted (6.7%) than officers (3.5%) prior to deployment. Overall, 23.9% of the veterans reported at least one form of suicide attempt due to their exposure to insurgency. Out of this, veterans who reported perpetration and betrayal were more likely to report suicide attempts than those who denied perpetration and being betrayed by military authorities. This result imply that, amongst veterans who are deployed for operation, perpetrating acts that conflict moral beliefs and values can leave moral pains, making suicide attempts more likely. Similarly, if veterans feel betrayed by military authority or their actions, it can cause demoralization, hopelessness and thwarted belongingness, thus contributing to suicide behaviours. The finding is supported by previous studies showing that perceptions of institutional betrayal are associated with increased odds of attempting suicide (Monteith, Bahraini, Matarazzo, Soberay, and Smith, and could constitute barrier to treatment. This highlight the importance of assessing perpetration and betrayal when designing interventions for suicide prevention and control in military veterans. We also found a significant number of veterans who were screened positive for posttraumatic stress disorder and depression and those who endorsed pre-deployment suicidal ideation.

When considering all risk factors in the fully adjusted model, PMIE exposure, and perpetration in particular, still emerged as a significant predictor of suicidal attempts in both enlisted and military officers. This finding corroborates several studies demonstrating that suicide ideation and attempts are higher in individuals who reported killing or feeling responsible for the death of another during warfare [18,21]. Understandably, killing during deployment or failing to save a life can leave many veterans with moral burden, making many to express death wish and attempts. In line with our hypothesis, the analysis further confirmed that the effects of perpetration on suicide attempts was greater for enlisted personnel than the officers. This findings support LeardMan, Matsuno, Boyko, Powell et al., [21]; Hyman, Ireland, Frost and Cottrell [20] findings that soldiers were more likely than officers to attempt suicide when exposed to traumatic events. They however, attributed suicide attempts in soldiers to lack of support and having more access to firearms among this group. These findings therefore support the value and significance of clinical education and training and intervention delivery concerning morally injurious incidents as a prevention strategy, particularly among enlisted veterans who, probably due to high exposure, stands higher risk of suicidal attempts following deployment.

Surprisingly, we found significant association between moral injury due to witnessing immoral acts and suicide attempts in military officers but not in enlisted veterans. This result is somewhat consistent with Nieuwsma, O'Brien, Xu and Smigelsky [22]. Though surprising, it is possible that military officers, who in most cases are commanders, witness more morally injurious events in the line of duty. As leaders, it is mandatory that they lead in front and this obviously could increase contact and visibility to morally injurious situations more likely to induce suicidal behaviours upon homecoming. Even though military officers are likely to keep deployment events private, their long-term impact on self-injurious behaviours like suicidal attempts are imminent, which makes suicide assessment and intervention necessary for the coveted group.

However, reported moral injury relating to betrayal did not predict suicide attempts in all category of veterans, after the effect of time (post-deployment duration) and other factors were controlled. This result may indicate that, among enlisted veterans particularly, the effect of betrayal may wane with time, making it less likely predict suicide attempts. This is partially supported by prior research which shows that the relationship between exposure to trauma and subsequent manifestation of distress is affected by time [23,24], implying that though betrayal from military authorities and fellow veterans may inflict moral injury and propel suicide attempts, its ability to influence suicide may become less with prolonged post-deployment time.

We also found that PTSD was associated with suicide attempts in veterans, for both enlisted and officers. This result have shown that, aside moral injury, PTSD is a crucial factor for

suicide attempts among veterans. Extendedly, it is unsurprising as rates of PTSD are high in Nigerian veterans [10] and this may increase burden, resulting in suicidal behaviours. However, even though high prevalence of PTSD is reported in Nigerian veterans, it is unclear if they are associated with moral injury and related to military rank. Our finding may shed more light on the importance of examining these relationships by rank rather than using it as demographic or control variable.

Despite the impressive findings of this study, there are limitations. Our study is limited by sample size and scope, which has implication for external validity. In addition, even though we controlled for other factors, including pre-deployment suicide ideation, post-deployment duration and current mental health outcomes, we did not adjust for lifetime mental health diagnoses given that these were measured dichotomously over the lifetime and it was not clear whether these preceded or followed our suicide attempt dependent variable. Additional limitations include the use of questionnaire and the cross-sectional nature of the study, which may all affect the validity of our results.

Overall, findings of this study suggest that even after accounting for a plethora of factors including post-deployment duration and mental health symptoms, PMIE exposure due to perpetration is a risk factor for suicide in veterans, especially enlisted personnel. Moral injury due to witnessing is a risk factor for officers' suicide attempts but not to the enlisted personnel. Being betrayed during deployment is a significant risk factor to suicide in enlisted veterans, but can become insignificant when the effects of post-deployment duration and other factors are controlled. Posttraumatic stress disorder is a consistent risk factor for suicide among all category of veterans who experience moral injury, while depression, pre-deployment suicidal ideation have no significant role suicide attempts among military veterans who perpetrate, witness or report being betrayed during deployment. Findings from this research suggest that risk assessment for suicide prevention programme should take cognizance of moral injury separately between enlisted and officers, to have a comprehensive and effective suicide management to enhance military wellbeing and functioning in Nigeria and beyond.

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