

Mediatory Role of Substance Use Coping in the Relationship between Combat Exposure and PTSD among Nigerian Police Exposed to Boko-Haram Insurgency

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Abstract

Over the years, studies have identified posttraumatic stress disorder as one of the greatest problems in military and police population worldwide. Apparently, extant literature have associated this problem with combat exposure; however, what is still unclear is whether adopting certain coping strategies like substance use after homecoming from combat deployment could increase vulnerability to combat-related PTSD especially among Nigerian police population that has been associated with high substance use coping. This study therefore examined the mediatory role of substance use coping in the relationship between combat exposure and posttraumatic stress disorder among Nigerian mobile police personnel exposed to Boko-Haram insurgency in the North-eastern, Nigeria. Data were collected using standardized questionnaires on a sample of 630 participants. Two hypotheses were stated and analysed using Pearson correlation, linear and hierarchical multiple regression, and results revealed a significant positive relationship between combat exposure ($r = .36$; $p < .01$), substance use coping ($r = .28$; $p < .01$) and PTSD; as well as combat exposure and substance use ($r = .19$; $p < .05$). Additional findings indicated that combat exposure ($\beta = .09$, $t = 2.2$; $p < .05$) and substance use coping strategy ($\beta = .26$, $t = 6.74$; $p < .01$) independently and jointly [$F(1,622) = 29.05$; $R = .29$, $R^2 = .09$; $p < .01$] influenced PTSD, and that substance use coping significantly mediated the relationship between combat exposure ($\beta_1 = .136^{**}$, $\beta_2 = .85^*$) as indicated by a significant reduction in the beta values. This shows that police personnel who experience combat and resort to substance use to cope are more vulnerable to PTSD. Thus, police authorities must restrain use of substance coping to reduce vulnerability to combat-related PTSD.

Keywords: Combat exposure; Boko-Haram; Substance use coping; PTSD

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1. Introduction

Undoubtedly, the problem of posttraumatic stress disorder has dominated research on mental health in both academic and institutional circles for more than three decades. Findings from trauma-based studies particularly in western countries among victims of different traumatic experiences such as rape, accidents, community violence and natural disasters e.t.c. have consistently identified posttraumatic stress disorder as a common psychological effect with general prevalence ranging between 7-11% [1,2]. However, the prevalence of PTSD appears to be more alarming in military and police population with combat experiences [3-5]. Dating back from the period after the first and second world wars, when it was first diagnosed, the prevalence of PTSD among military personnel have continued to rise. For instance, the general prevalence ranging from 7%-14% in studies involving American military and Chinese Police personnel exposed to combat events have been found [6, 7]. Higher prevalence has been reported among Operation Enduring Freedom (OEF) and Iraqi Freedom (OIF) [3-5]. This is even worse in African setting where [8] reported 33% prevalence among South African military personnel exposed to war combat.

According to the Diagnostic and Statistical Manual of mental disorders [9], posttraumatic stress disorder is a psychological problem (with symptoms of re-experiencing, avoidance, physiological arousal, and negative alteration in mood), that occurs in people who have experienced diverse traumatic events including combat situation. This definition implies that exposure to any form life-threatening situation could precipitate PTSD. Suffice to say that previous studies among Nigerian military have revealed an astronomical rise in prevalence from 12-22% after combat deployment to Liberia, Sierra-Leone and Darfur region of Sudan [10,11]. This clearly suggest an impending danger on the Nigerian police population which previous studies have shown to have had tremendous amount of stress from Boko-Haram activities in recent years [12,13]. Since two thousand and nine (2009), Boko-Haram has been a major security challenge facing the country. Accordingly, many security personnel including members of Nigerian mobile police force have been posted severally to the troubled north-east region to contain the menace. In the course of the deployments, many of these personnel have lost their lives and those who survived have reported being exposed to potentially traumatic combat experiences such as watching the death of their colleagues, having exposure to high improvised explosives, harsh weather, hostile incoming fire, mass burial of colleagues among others. According to Aremu [12], the Boko-Haram operation has been the worst and most traumatic combat operation witnessed by Nigerian police personnel in recent years. According to him, this exposure could place psychological burden on the personnel, making them vulnerable to developing different mental health problems chiefly which could be PTSD [12]. Investigating the problem becomes imperative due to the deleterious effects that previous studies have shown are associated with PTSD in security personnel. These include depression to relationship and marital problems [14], high cost of mental care, cynicism and aggressive behaviour [2], compromised immune system, risky health behaviours, substance abuse problems, cardiac-related problems and general burnout [15,16]. All these unfortunate strains could affect police performance, lead to early retirement, and thus aggravate the already fragile security situation in the country.

Though; combat exposure has consistently been associated with PTSD, emerging studies show that coping behaviours after trauma could be more important in producing stressful outcome- posttraumatic stress disorder [17]. Defined coping as the act of constantly changing cognitive and behavioral effort to manage a situation perceived as tasking or exceeding the capacity of an individual. According to Lazarus and Folkman [18], individuals who have experienced stressful or traumatic situations utilize different ways to cope in order to maintain homeostasis. Basically, extant studies have identified two major coping styles relating to distress following a traumatic exposure- problem-focused or adaptive coping and emotion-focused or

avoidant coping strategies [19]. Problem-focused coping involves actively planning or engaging in specific behaviours in order to overcome the stressor. It involves altering, eliminating or managing the problem that is causing the stress and is highly action-focused. People who use this form of coping focus their attention on gathering the required resources (skills, knowledge and tools) necessary to confront the stressor. They initiate plans and seek out information from others to overcome the effect of a stressor [19]. Emotion-focused coping, though quite varied, is a style of coping that generally seeks to lessen the negative emotion associated with a stressor. It deals with using cognitive and behavioral efforts directed towards reducing, denying or ignoring a stressful situation with the sole aim of escaping from it [20].

Substance use is reported to be the most prevalent coping strategy used by police personnel in managing stressful situations. According to Violanti [21] police personnel usually employ substance as a convenient coping strategy whenever they encounter traumatic situations or stressful working environment. In a similar vein, research testing the self-medication hypothesis has shown that after traumatic encounter, many people resort to alcohol to control distressing thoughts and feelings associated with the exposure, but later tend to experience more distress [22]. In Military population for example, it was reported that 50% of American veterans deployed to Afghanistan and Iraq reported alcohol abuse and that over 43% those with alcohol use met full criteria for PTSD²³. This becomes an issue of concern for Nigeria police in particular as [24], found that this group of security personnel adopt substance as a way of coping with stress. This is basically utilized to evade or reduce the impact of stressful events. This was further confirmed at the exploratory phase of this study where substances use as coping strategy was found recurring among the population. Consequently, Angkaw AC et al. [23] pointed out that when war victims resort to substance use after combat exposure; it affects concentration, emotional numbing, social isolation, irritability, anger and the feeling of needing to be on guard. This further aligns with previous findings showing a strong relationship between alcohol and arousal symptoms and that alcohol withdrawal may sometimes induce flashback symptoms of posttraumatic stress disorder [25]. In Nigerian military population, Ameh S et al. [11] reported that increased substance use after combat deployment was an associated factor with posttraumatic stress disorder [11]. However, this relationship is yet to be examined in police and most importantly, no documented evidence on whether using substance to cope after homecoming from a combat deployment could be a catalyst in the development of posttraumatic stress disorder.

This research gap is worth filling because a significant number of Nigerian police have been reported to resort to substance as a coping tool during stress [24]. According to 18 transactional theory of stress, the impact of any stressful event is largely determined by the coping strategy used in handling the situation. Therefore, testing this theory within the stress-strain (combat-PTSD) context will help in understanding the exact role of substance use coping in trauma in the substance-endemic Nigerian police population that is yet to be explored. Based on these identified gaps, two hypotheses were generated: (1) to investigate whether there is any significant positive relationship between combat exposure, substance use coping and posttraumatic stress disorder among Nigerian police personnel and two; (2) to determine whether substance use coping strategy could significantly mediate the relationship between combat exposure and posttraumatic stress disorder among Nigerian mobile police personnel exposed to Boko-Haram Insurgency.

2. Method

A cross-sectional survey design was employed to collect data from 630 purposively sample mobile police personnel who participated in Boko-Harm operation. Their ages range from 18-60 (mean= 55.4 SD= 7.35). Concerning marital status, 191

(30.4%) of the participants were single, 417 (66.4%) were married, while 20 (3.2%) of the respondents were divorced. Further frequency distribution on rank of the participants showed that 585 (93%) were junior personnel, while 44 (7%) senior police officers were assessed in the study. On participants' job experience, the data reveals that 35 (5.6%) had worked between 0-5 years, 228 (36.6%) had worked between 5-10 years, 360 (57.8%) had worked for more than ten years. On religious affiliation of the participants, a total of 409 (65.1%) were Christian, 215 (34.2%) were of Islamic religion while 4 (0.6%) endorsed other religions. In addition, 95 (15.2%) of the participants were Hausa, 162 (25.9%) Yoruba, 98 (15.7%) Ibo, while the remaining 271 (43.3%) were of other ethnic minorities in Nigeria. Information on educational qualification of the respondents showed that 239 (38.1%) of the participants had S.S.C.E., 307 (48.9%) of the participants had N.C.E/O.N.D, while 82 (13.1%) had H.N.D/Degree qualifications. Finally, a total of 295 (46.8%) were drawn from Benue state command while 335 (53.2%) were sampled from the Oyo state command of the force.

3. Instruments

3.1 Demographic and contextual characteristics

Demographic and contextual information bothering on age, marital status, rank, job experience, religious affiliation, tribe, educational qualification and deployment setting were gathered from the participants.

3.2 Combat exposure

Combat exposure was assessed using a self-developed 11-item combat exposure scale specifically designed to reflect combat events peculiar to Boko-Haram situation. The scale asks respondents to report the frequency to which they encounter combat events during the period of Boko-Haram deployment using the Likert format ranging from: 1= never, 2= once or twice, 3= several times over entire deployment, 4= several times each week, 5= daily or almost daily. Possible total scores ranges between 11 to 55, with high scores indicating high combat exposure. Psychometric properties examination for the scale indicated a sound internal consistency ($\alpha = 0.72$), equal length Spearman Brown split-half reliability ($\alpha = 0.69$), and convergent validity of ($r = 0.73$) in relation to combat exposure scale [26]. In addition, the scale had a divergent validity ($r = -.23$, $P < .01$) in relation to Happiness scale, and a criterion-related validity ($r = .24$; $p < .01$) in relation to Davidson trauma scale, hence demonstrating a good measure of criterion validity.

4. Section E: Substance Use Coping Strategy

Substance use coping was measured using the substance use subscale of the multidimensional coping inventory [27]. Basically, the scale comprises 15 conceptually different dimensions of coping that assess a variety of coping strategies in which individuals may adopt under stressful conditions. However, only substance use dimension was adopted due to its applicability in the present study. The substance use coping dimension consists of four items in which respondents are asked to indicate how much they have used substance in the past month in relation to trauma using a four-point scale (1= I haven't been doing this at all; 2= I've been doing this a little bit; 3= I've been doing this a medium amount; 4= I've been doing this a lot) Sample questions include: "I have been using alcohol or other drugs to make myself feel better", "I have been using drugs or alcohol in order to think less about the problem". Psychometrically, Carver et al. [27] reported a sound cronbach's alpha ($\alpha = .73$), and in the present study, a cross-validation revealed even a higher cronbach's alpha ($\alpha = .80$) demonstrating an excellent reliability and a sound measure in Nigeria police population. The mean and standard deviation for the dimension

was found at ($\pi= 11.80$, $SD= 3.00$). High scores at or above the mean indicate high use of substance use coping and vice versa.

5. Post-Traumatic Stress Disorder

The 17-item Davidson Trauma scale was used to assess PTSD in this study. The questionnaire ask respondents to rate on a 5-scale how much they were affected by each of the symptoms of the disorder over the previous weeks upon return from the deployment. The frequency and severity of the symptoms are scored on a 5-point Likert-type scale 1= not at all, 2= a little bit, 3= moderately, 4= quite a bit, 5= extremely. Scores at or above one standard deviation above te mean ($\pi= 35.68$, $SD= 7.40$) infers the presence of posttraumatic stress disorder. The Davidson Trauma scale has demonstrated an excellent internal consistency ($\alpha= 0.99$) and strong convergent validity ($\alpha= 0.78$) among military personnel [28]. In the present study, the overall internal consistency ($\alpha = .67$) was obtained.

6. Procedure

The study took place at two mobile police squadrons; Oyo and Benue respectively. Relevant police authorities were approached and permission was granted before data gathering took place. With the directive the commissioners of police from the two states, the researcher contacted some senior police officers in charge of operation who assisted in gathering data from 686 purposively selected mobile police personnel that participated in the insurgency. Both commands had a total number of 1780 and 1650 for Oyo and Benue respectively. This sample frame was used to determine the sample size using Slovin formula for sample size determination. Participants were recruited mainly at the base, informed about the study and asked to carefully read and complete the informed consent form. After obtaining ethical permission and adhering to all possible ethical principles; questionnaires were administered to participants for about four weeks. However, only 630 questionnaires were correctly filled and returned to the researcher for data analysis.

7. Ethical Consideration

Ethical approval for this study was obtained from Oyo state ministry of health ethics committee and University of Ibadan faulty of the social sciences ethics review committee. The researcher prepared a comprehensive proposal and other relevant document that were later submitted to the UI Research Ethics committee and Oyo State Research Ethics Review Committee respectively. The approval with reference number AD13/479/647 was issued by the Oyo State Review Ethics Committee. Later, ethical approval with reference number UI/SSHEC/2017/0026 was issued to him by UI Research Ethics committee before commencement of data collection.

However, before participants took part in the study, their consent was duly sought to ensure that their participation was by free will and once this consent was given by filling a written consent form the researcher assured them of strict confidentiality of the information so provided. This promise was kept in earnest. The researcher also ensured that only relevant information pertaining the study were collected through the questionnaire in order to avoid unnecessary invasion of privacy. On the issue of risk, he ensured that no participant was meant to incur any physical risk. However, the possibility of minimal economic and social risk, such as stigma and impact on career prospects made him strictly adhered to the principle

of confidentiality. No name or any obvious means of identification was required, except for the phone numbers, which provided direction for identifying participants for the intervention. More so, participation for the study required no cost and was voluntary as he assured them that they had the right to withdraw participation at any time they so desired. On research benefits, the researcher offered some health talks through psycho-education, provided little token and refreshment to the desired participants and assured them that the research findings would be implemented to improve their health and welfare.

8. Data Analysis

The Pearson r correlation statistics was used to establish the relationships between study variables. Linear and hierarchical multiple regression was used to test for the mediatory role of substance use coping in the relationship between combat exposure and posttraumatic stress disorder among the population.

9. Results

TABLE 1. Descriptive statistics and variable intercorrelations.

	M	SD	1	2	3
Combat Exposure	27.4	2.7	1		
Substance Use Coping	11.8	3.0	.19*	1	
PTSD	35.7	7.4	.36**	.28**	1

* $p < .05$; ** $p < .01$

Results on TABLE 1 revealed that combat exposure is significantly related to substance use coping strategy and posttraumatic stress disorder. Result also indicated a significant relationship amongst substance use coping, combat exposure and posttraumatic stress disorder, implying that these variables are significantly related. Thus the researcher proceeded further to test the predictive impacts of the independent variable, the mediating variable on the dependent variable in line with Baron and Kenny’s principles for mediation.

Step one: $Y = B_0 + B_1X + e$ Regressing the Dependent variable on the independent variable.

TABLE 2. Linear regression table showing summary of the independent predictive influence of combat exposure on Posttraumatic Stress Disorder.

Predictor	R	R²	F	P	β	t	P
Age				>.05	-.11	2.19	>.05
Combat exposure	.14	.02	11.80	<.05	.14	3.44	<.05

Results from TABLE 2, reveal that combat exposure is a significant predictor of posttraumatic stress disorder ($\beta=.14$, $t= 3.44$; $p<.05$) and account for 1.9% in variance of posttraumatic stress disorder. This indicates that the first condition for mediation is fulfilled.

Step Two: $M = B_0 + B_1X + e$

TABLE 3. Linear regression table showing summary of the independent predictive influence of combat exposure on substance use coping.

Predictor	R	R ²	F	Sig	β	T	P
Combat exposure	.19	.04	24.39	<.01	.19	4.94	<.01

Results from TABLE 3, reveal that combat exposure significantly predicted substance use coping strategy among mobile police personnel exposed to Boko-Haram insurgency ($\beta= .19$, $t= 4.94$; $p<.01$), accounting for 3.7% in variance of posttraumatic stress disorder in the population. The result implies that increase in combat deployment will lead to a consequent increase in substance use coping by police personnel. The result fulfills the second step of Baron & Kenny’s [29] requirements for mediation.

Step Three: $Y = B_0 + B_1M + e$

Table 4: Linear regression table showing summary of the independent predictive influence of substance use coping strategy on posttraumatic stress disorder.

Predictor	R	R ²	F	Sig	β	T	P
Substance Use Coping	.28	.08	53.08	<.01	.28	7.29	<.01

Results from table 4, revealed that substance use coping had a significant independent influence on posttraumatic stress disorder ($\beta= .28$, $t= 7.29$; $p<.01$) and account for 7.8% in the variance of posttraumatic stress disorder among the police personnel . These results from Steps 1-3 established that significant correlations exist among the study variables and as such, mediation may exist. This warranted the introduction of a mediator in the fourth model.

Step Four: $Y = B_0 + B_1M + B_2M + e$

TABLE 5. Multiple regression table showing summary of the predictive influence of combat exposure and substance use coping strategy on posttraumatic stress disorder.

Predictors	R	R ²	F	Sig	β	T	P
Combat Exposure	.29	.09	29.05	<.01	.09	2.17	<.05
Substance Use Coping					.26	6.74	<.01

Results from TABLE 5, show that combat exposure and substance use coping strategy (mediator) significantly jointly predicted posttraumatic stress disorder [$F_{(1,622)} = 29.05$; $R = .29$, $R^2 = .09$; $p < .01$] and account for 8.5% in variance of posttraumatic stress disorder. Further results on the influence of combat exposure and the mediator variable (substance use coping), reveal that combat exposure ($\beta = .09$, $t = 2.17$; $p < .05$) and substance use coping strategy ($\beta = .26$, $t = 6.74$; $p < .01$) emerged as independent predictors of posttraumatic stress disorder among this population.

To verify if substance use coping mediated the relationship between combat exposure and posttraumatic stress disorder, the beta (β) weights and p-value of combat exposure in step 1 and 4 of the model were compared and results are presented on TABLE 6.

TABLE 6. Table showing comparison of β weights in step 1 and step 4 of the model.

	Step 1		Step 4	
	B ₁	P	β ₂	P
Combat Exposure	.14*	<.01	.09*	<.05
Substance Use Coping (mediator)			.26**	<.01

A comparative analysis of results from Step 1 and Step 4 reveals that the predictive value of combat exposure on posttraumatic stress disorder reduced significantly ($\beta_1 = .14^{**}$, $\beta_2 = .09^*$), after controlling for the mediating variable; consistent with partial mediation. This indicates that substance use coping strategy partially mediated the relationship between combat exposure and posttraumatic stress disorder in this population. The path coefficients of the independent variable and the mediator were determined by deriving the differences in β weights of the variables in Step 1 and Step 4 of the model. Results are presented in TABLE 7.

TABLE 7. Path coefficients of direct effect of combat exposure on posttraumatic stress disorder.

Path	Variables	Path Coefficients
A	Combat Exposure	.05*
B	Substance Use coping	.26**

NB: ** = $p < .01$, * = $p < .05$

TABLE 7 shows the direct path coefficients (beta) which is a standardized regression coefficient for the studied variables. This beta coefficient shows the direction, strength and significance level of combat exposure and the mediating variable on posttraumatic stress disorder. Based on the result, substance use coping strategy is a partial mediator of the relationship between combat exposure and posttraumatic stress disorder.

10. Discussion

The purpose of this study was to explore whether substance use coping can mediate the relationship between combat exposure and posttraumatic stress disorder among a sample of Nigerian mobile police personnel exposed to Boko-Haram Insurgency. Results on hypothesis one first established a significant positive relationship between combat exposure ($r = .36$; $p < .01$), substance use coping ($r = .28$; $p < .01$) and PTSD. There was also a statistical significant relationship between combat exposure and substance use coping ($r = .19$; $p < .05$), implying that an increase in the level of combat exposure by police personnel will lead to an increased use of substances to cope with the exposure which will also result in a consequent increase in level of posttraumatic stress disorder.

Furthermore, using [29] four steps for mediation, result showed a significant predictive impact of combat exposure on PTSD ($\beta = .14$, $t = 3.44$; $p < .05$); combat exposure on substance use coping ($\beta = .19$, $t = 4.94$; $p < .01$); and substance use coping on PTSD ($\beta = .28$, $t = 7.29$ $p < .01$). This shows that the three variables are related and according to Baron & Kenny [29], have fulfilled the conditions for mediation. Thus, introducing substance use coping in the fourth model testing mediation revealed that combat exposure ($\beta = .09$, $t = 2.17$; $p < .05$) and substance use coping strategy ($\beta = .26$, $t = 6.74$; $p < .01$) still retained independent influence and jointly [$F(1,622) = 29.05$; $R = .29$, $R^2 = .09$; $p < .01$] influenced PTSD. A comparative analysis of results from Step 1 and Step 4 reveals that the predictive value of combat exposure on posttraumatic stress disorder reduced significantly ($\beta_1 = .14^*$, $\beta_2 = .09^*$), after controlling for the mediating variable; consistent with partial mediation. This indicates that substance use coping strategy partially mediated the relationship between combat exposure and posttraumatic stress disorder in this population. This result shows that, though combat exposure can result to PTSD, using substance to cope after a combat encounter is a more significant risk factor as it has the potential to play even more significant influence in the development of PTSD among the police population.

Findings from this study is consistent with previous studies in the military as seen in [10,11,8] who in their separate studies found combat exposure and substance use as positive correlates of posttraumatic stress disorder. This therefore means that the higher police personnel are exposed to combat stress, the more likely they will report symptoms of PTSD. It also shows that, irrespective of the age of the personnel, increased combat exposure will lead to a corresponding use of substance as coping tool and this again will result to increase in the level of PTSD among the personnel. Furthermore, on the partial mediation relationship between substance use coping in the influence of combat exposure on PTSD, this implies that when police personnel experience combat trauma, they will experience psychological problems, but what might play a more significant role in this case is the use of avoidance coping strategies like various substances to suppress the trauma. This therefore, aligns with the self-medication hypothesis which explains the pathway from substance use during stressful encounter and the development of PTSD. Thus, with this finding, it has proven [24] assertion that high use of substance as a stress managing technique among Nigerian police personnel might be inimical to their psychological health. The study concluded that

increased combat exposure would lead to corresponding increase in substance use and sadly, using this coping strategy to manage trauma could become even a major significant risk factor to the development of combat-related PTSD.

Based on this finding, the study recommends that Nigerian police authorities should ensure proper training to restrain her personnel from substance use coping during and after traumatic experiences as this avoidance technique has proven to rather propel PTSD in this study. They should be trained on appropriate coping method and those who are found to adopt substance use, be given proper attention to prevent future occurrence of PTSD after exposure to combat zones.

11. Limitations

1. The study has a major limitation for using self-report which might affect the true validity of the findings since many respondents may not answer the questions honestly.
2. Secondly is the lack of psychological intervention that could have helped to ameliorate the PTSD condition in the affected personnel.
3. The study was so limited to a few contextual variables, hence denying us the opportunity to robustly understand the role of psychological factors that affect PTSD, as found in previous studies.

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