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Predictors of psychological resilience among Nigerian army personnel with combat experience

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Abstract

The ability to move on in the face of stressful life events has been termed psychological resilience. It has been shown that the adversities experienced by some individuals help them to develop resilience in certain situations. This may be applicable to military personnel, as their duties constitute job roles that are psychologically demanding, and this may build resilience in them. The objective of this study was to evaluate the predictors of psychological resilience among Nigerian army personnel with combat experience. In this cross-sectional study, 320 army personnel who had been deployed to combat areas in Nigeria were selected from battalions and brigades under the first division of the Nigerian Army using a multi-stage sampling technique. Participants were taken through the socio-demographic and service-related questionnaires, followed by the RS-14 Resilience Scale. The data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS) version 22. The ages of the participants ranged between 19 and 48 years, with an average of 32.17±5.941 years, and 95.9% were males. Moderate resilience was observed in 46.6% of participants, while 40.9% had high resilience. Only 12.5% of participants had low resilience. Factors such as older age, higher cadre, higher income, shorter duration away from family, multiple combat experiences, and strong social support were found to be associated with resilience; however, shorter duration spent away from family, multiple combat deployments, and strong support networks were found to be predictors of resilience. Nearly half of Nigerian army personnel with combat experience had moderate resilience. Predictors of resilience were found to be spending fewer months away from family, multiple combat deployments, and strong support networks.

Key words: predictors, resilience, Nigeria, army, combat.

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Introduction

Evidence has shown that certain people seem to recover or "bounce back" from negative events quite effectively.[1,2] This ability to move on in the face of stressful life events has been termed resilience. Therefore, psychological resilience is defined as positive adaptation in the context of adversity.[2] Studies have shown that people who have had a history of much adversity or no history of adversity have worse mental health outcomes compared to people with a history of some lifetime adversity. This means that although adversity can have negative effects on mental health, for some individuals, it helps them to develop resilience in certain situations.[3] According to Dienstbier, exposure to stressors has a positive toughening effect when the exposure is limited, with an opportunity for recovery.[4] People whose resilience is high cope better and are less likely to engage in maladaptive coping styles.[5] Also, resilience has been found to be a predictor of success in settings such as universities and military academies.[6]

The military constitutes job roles that are psychologically demanding, especially during times when personnel have to be deployed for combat during wars and periods of heightened internal security challenges.[7,8] This has necessitated some military organizations to develop resiliency-building training programs to help military personnel to survive and withstand extremes of stress.[9]

Personal factors, such as optimism, self-esteem, and self-efficacy[10-12] are associated with resilience, in addition to factors such as education, relationships with family, peers, and the broader community.[13] The other factors reported are age and gender, regular exercise, and marriage.[14-16] Despite the above-documented associations, an electronic search revealed that studies on resilience among Nigerian military deployed to combat are sparse. Findings from other military populations may not generalize to the Nigerian context because of its low-resource setting status, with military personnel tagged with prolonged deployment because of understaffing, use of less sophisticated weapons making their jobs more difficult, poor remuneration, and welfare.

Considering that electronic searches revealed that studies on resilience among Nigerian military personnel deployed to combat are sparse and the extent of valuable information such a study could provide, including identifying factors associated with resilience and subsequent recommendations to improve resilience and quality of life, the objective of this study is therefore to evaluate the predictors of psychological resilience among Nigerian army personnel with combat experience.

Materials and Methods

The study was cross-sectional in design. The study population was 320 army personnel who had been deployed to combat areas in Nigeria, and they were selected from battalions and brigades under the first division of the Nigerian Army, including the 3rd brigade garrison Kano, the 73 battalion Janguza Kano, the 241 Recce battalion Nguru Yobe state, and the 171 battalion Katsina, Katsina state, using a multi-stage sampling technique.

The sample size was determined using the standard formula for calculating sample size,[17,18] with prevalence (P) obtained from a previous similar study.[19]

$$n = \frac{z^2 P(1-P)}{e^2}$$

$$n = \frac{1.96^2 \times 0.25(1-0.25)}{0.05^2}$$

$$n = \frac{0.25 - 0.0625 \times 3.8416}{0.0025}$$

$$n = \frac{0.1875 \times 3.8416}{0.0025}$$

$$n = \frac{0.7203}{0.0025}$$

$$n = 288.12$$

Adjustment was made to increase the sample size to account for the anticipated number of non-response and absent subjects.

The formula for calculating adjusted sample size: $\mathbf{N}=\frac{n}{1-q}$
Where **N** is the adjusted sample size
n is the calculated sample size
q is the proportion of expected non-response, which is 10% (0.1)

Therefore,

$$N = \frac{288.12}{1-0.1}$$

$$N = \frac{288.12}{0.9}$$

$$N = 320.133$$

$$N = 320$$

Sampling technique

In the first stage, four (25%) of the 18 operational brigades and battalions under one division were selected using a simple random sampling method. All of them were written on paper and blinded. A doctor was asked to select four pieces of paper from among them, one at a time.

The 3 Brigade garrison Kano, the 73-Battalion, Janguza, 241 Recce battalion Nguru, and 171 Battalion Katsina were picked and thus selected. The number of personnel who had been in combat currently in the 3rd brigade garrison, 73 battalions, 241 recce battalions, and 171 battalions were 430, 800, 675, and 525, respectively, each serving as the sampling frame.

Total population of personnel who had been in combat was 430+800+675+525=2430.

In the second stage, a stratified sampling technique was used where proportionate allocation of sample size was applied to the selected brigades and/or battalions, during which 57, 105, 89, and 69 participants emerged, respectively, as sample size for each brigade/battalion.

In the final stage, a systematic sampling technique was used where participants were selected using sampling intervals of 8 as obtained from the formula:

$$\text{sampling interval} = \frac{\text{Sampling frame}}{\text{Sample size}}$$

Participants who met the inclusion criteria were assigned a number starting from one as they arrived at the clinic. The 1st participant was selected from a table of random numbers. The 8th participant was selected in succession thereafter until the allocated sample sizes were reached. Inclusion criteria were being army personnel who had been deployed to combat areas and those who could communicate in English.

Exclusion criteria were being previously diagnosed with a major psychiatric disorder or having a medical condition which made participation in the study difficult. Ethical approval to conduct the study was obtained from the Research Ethics Committee of Aminu Kano Teaching Hospital (NHREC/28/01/2020/AKTH/EC/3565) and the Ministry of Defense Health Research Ethics Committee (NHREC/MOD-EC/15/02/23C and MOD/SC/HREC/1/123). Each participant also signed a written informed consent form.

The socio-demographic questionnaire, followed by the RS-14 Resilience Scale and Oslo 3 Social Support Scale (OSSS-3), were administered to participants by research assistants who were senior residents in Psychiatry. The RS-14 is scored on a 7-point scale from 1, strongly disagree, to 7, strongly agree. Scores on the scale range from 14 to 98.[20] The closer the score is to 98, the higher the resilience, while a lower score indicates lower resilience. Its psychometric properties have been assessed previously, and it has been used in various studies in Nigeria.[21-23] The cut-off scores used in this study are as follows: scores above 81, high resilience; 65-81, moderate resilience; less than 65, low resilience.[20] Administration time was five minutes. OSSS-3 was used to assess the level of social support in this study. Its psychometric properties have been assessed among the Nigerian population.[24] It consists of 3 items that ask for the number of close confidants, the sense of concern from other people, and the relationship with neighbors, with a focus on the accessibility of practical help.[25] Administration time was 3 minutes. The sum score ranges from 3-14, with higher values representing strong levels and low values representing poor levels of social support. The cut-off used in this study includes scores 3-8, poor social support; 9-11, moderate social support; 12-14, strong social support.[26] The interviews were conducted in quiet rooms at the barracks clinics between 9:00 am and 2:30 pm. The study duration spanned four months, between March and June 2024. The data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS) version 22. All statistical tests were done at a 5% level of significance ($p<0.05$) and 95% confidence interval. Statistical tests, such as the chi-square test, as well as Fisher's Exact test, were employed to test for associations between variables and resilience. Variables that were significant in bivariate

analysis were subjected to a multinomial logistic regression model to determine the predictors of resilience.

Results

A total of 320 participants were approached and enrolled in the study; hence, the response rate was 100%. The age ranged from 19-48 years, with an average of 32.17±5.94. Details of the socio-demographic characteristics of participants are shown in Table 1.

Most participants (91.3%) had spent two years or more in military service, while only 8.8% had served for less than two years. Most (86.9%) personnel had been away from their families for less than 12 months, with 13.1% being away for 12 months or more. The majority (71.6%) of participants had been deployed to multiple combats, while 28.4% had been deployed to only one combat. A significant proportion (63.7%) of the army personnel had spent 12 months or more in combat areas, while 36.3% had spent less than 12 months in combat areas.

Nearly half (46.6%) of the participants had a moderate level of resilience. Table 2 shows the distribution of resilience scores among participants.

Regarding factors associated with resilience, younger personnel (<40 years) predominantly showed moderate resilience (49.6%), whereas personnel aged 40-59 years showed stronger resilience (75%). Age was significantly associated with resilience; the older the personnel, the higher the resilience (χ^2=23.235, p<0.001). Non-commissioned personnel had more moderate (47.6%) resilience compared to commissioned personnel who predominantly showed strong resilience (81.8%). Higher salary (>150,000 Naira) was associated with stronger resilience (77.8-100%). Married personnel showed strong resilience (55.3%) compared to single ones who showed more moderate resilience (57.6%). Personnel with more than two children showed strong resilience (63.8%) and the association was statistically significant. Living with a spouse and children showed strong resilience (68.6%) compared to living alone (59.0%). Living circumstances; living with others (including family) is significantly associated with high resilience (χ^2=52.793, p<0.001). Ethnicity also has a significant association with resilience (χ^2=29.924, p<0.001). Personnel practicing Islam and Christianity showed stronger (82.8%) resilience compared to those who do not practice any of the faiths, who only showed moderate (8%) resilience. Table 3 shows the socio-demographic factors associated with resilience. Years in the military showed a significant association with resilience; the more the years in military service, the more the resilience (χ^2=26.520, p<0.001). Personnel who had been away from family for less than 12 months had higher moderate resilience (50.5%). Long time away from family was associated with less resilience (χ^2=36.323, p<0.001). Multiple deployments to combat areas were associated with stronger resilience (47.6%) compared to only one combat (60.4%). Personnel with more than 12 months of battle duration showed stronger resilience (46.3%). Those with strong social support showed the strongest resilience (57.5%). Service-related factors associated with resilience are shown in Table 4.

Factors with significant association in bivariate analysis were subjected to multinomial logistic regression. As shown in Table 5, the following were found to be independent predictors of resilience: months spent away from family (spending shorter duration away from home), deployment to multiple combats, and strong social support.

Discussion

In this study, the majority of the Army personnel showed moderate to high resilience. This finding highlighted that a substantial number of Army personnel possess strong coping abilities even in stressful combat environments. Older personnel (40-59 years) had notably higher resilience compared to younger personnel. This aligned with findings from the National Health and Resilience in

Table 1. Sociodemographic characteristics of participants.

Variables	Frequency (N=320)	Percentage
Gender		
Male	307	95.9
Female	13	4.1
Age group (years)	Mean =32.17±5.94	
Young (<40)	280	87.5
Middle adulthood (40-59)	40	12.5
Cadre		
Commissioned officer	11	3.4
Non-commissioned officer	309	96.6
Marital status		
Single	132	41.2
Married	152	47.5
Divorced	14	4.4
Separated	20	6.3
Widowed	2	0.6
Number of children		
Two and less	262	81.9
More than two	58	18.1
Living circumstances		
Alone	150	46.9
With others (including family)	170	53.1
Ethnicity		
Hausa	96	30
Fulani	40	12.5
Yoruba	48	15
Igbo	35	10.9
Other	101	31.6
Years of education		
12	209	65.3
15	94	29.4
>15	17	5.3
Religion		
Islam	174	54.4
Christianity	138	43.1
Other	8	2.5
Monthly earnings (Naira)		
<100,000	263	82.2
100,000-150,000	46	14.4
150,000-200,000	2	0.6
>200,000	9	2.8

Table 2. Distribution of RS-14 resilience score among the participants.

Score	Frequency (N=320)	Percentage
Low (14-64)	40	12.5
Moderate (65-81)	149	46.6
High (82-98)	131	40.9

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Veterans Study (NHRVS) which suggests that older veterans, especially those over 40 years, often exhibit greater resilience and psychological well-being compared to their younger counterparts.[27] These veterans tend to display adaptive characteristics such as stronger social connections, gratitude, and a sense of purpose, which are associated with improved coping and reduced risk of mental health issues, including Post-Traumatic stress Disorder (PTSD).[27] Both male and female respondents exhibited high resilience levels, with females slightly more likely to show strong resilience; this could be due to skewness of the data on gender.

Commissioned officers displayed the highest resilience. Research indicates that commissioned officers generally display higher resilience than non-commissioned officers, largely due to their intensive training, leadership roles, and strategic responsibilities within the military. They participate in specialized programs like Officer Candidate School and other leadership-focused courses, which are designed to strengthen resilience for high-stakes decision-making.[28] Furthermore, the expectation for commissioned officers to lead by example under pressure reinforces their ability to manage challenges. This mental readiness and self-assurance play a crucial role not only in their own resilience but also in maintaining the morale and performance of their teams.[28]

Table 3. Socio-demographic factors associated with resilience among the participants.

Variables	Low n (%)	Moderate n (%)	Strong n (%)	χ^2	p
Age			23.235	<0.001[a]	
<40 years	40(14.3)	139(49.6)	101(36.1)		
40-59 years	0(0.0)	10(25.0)	30(75.0)		
Gender				1.368	0.505*
Male	38(12.4)	145(47.2)	124(40.4)		
Female	2(15.4)	4(30.8)	7(53.8)		
Cadre				8.045	0.020*[a]
Non-commissioned officer	40(12.9)	147(47.6)	122(39.5)		
Commissioned officer	0(0.0)	2(18.2)	9(81.8)		
Average monthly income (Naira)				15.659	0.022*[a]
<100,000	34(12.9)	133(50.6)	96(36.5)		
100,000-150,000	6(13.0)	14(30.4)	26(56.5)		
150,000-200,000	0(0.0)	0(0.0)	2(100)		
>200,000	0(0.0)	2(22.2)	7(77.8)		
Marital status				42.269	<0.001*[a]
Single	23(17.4)	76(57.6)	33(25.0)		
Married	11(7.2)	57(37.5)	84(55.3)		
Divorced	4(28.6)	2(14.3)	8(57.1)		
Separated	2(10.0)	14(70.0)	4(20.0)		
Widowed	0(0.0)	0(0.0)	2(100)		
Number of children				35.196	<0.001[a]
None	19(14.0)	79(58.1)	38(27.9)		
One	11(14.7)	40(53.3)	24(32.0)		
Two	4(7.8)	15(29.4)	32(62.7)		
More than two	6(10.3)	15(25.9)	37(63.8)		
Living circumstances				52.793	<0.001*[a]
Alone	23(13.9)	98(59.0)	45(27.1)		
With spouse	0(0.0)	21(63.6)	12(36.4)		
With spouse/children	7(10.0)	15(21.4)	48(68.6)		
With others	10(20.8)	15(31.3)	23(47.9)		
Not alone	0(0.0)	0(0.0)	3(100)		
Ethnicity				29.924	0.001[a]
Hausa	8(8.3)	35(36.5)	53(55.2)		
Fulani	6(15.0)	22(55.0)	12(30.0)		
Yoruba	7(14.6)	34(70.8)	7(14.6)		
Igbo	4(11.4)	18(51.4)	13(37.1)		
Other	15(14.9)	40(39.6)	46(45.5)		
Years of education				13.621	0.009[a]
12	30(14.4)	87(41.6)	92(44.0)		
15	10(10.6)	56 (59.6)	28(29.8)		
>15	0(0.0)	6(35.3)	11(64.7)		
Religion				13.055	0.012*[a]
Islam	22(12.6)	71(40.8)	81(46.6)		
Christianity	18(13.0)	70(50.7)	50(36.2)		
Other	0(0.0)	8(100.0)	0(0.0)		

*Values from Fisher's exact test. [a]Significant p-values.

Resilience appears to be associated with income and education level, as seen in participants with higher salaries and education years. This conforms with having higher resilience among commissioned officers and those above 40 years of age because these groups have higher education and have spent more time in service, which translates to relatively higher salaries. Participants identifying with Islam and Christianity were more likely to have high resilience compared to those who do not practice any religion. The presence of high resilience in religious groups may reflect supportive community structures or values promoting resilience, as portrayed by many studies.[29,30]

Married personnel and those with multiple children showed higher resilience, potentially indicating the support associated with family. Studies have reported that social support networks significantly contribute to resilience, and individuals who have supportive relationships are better equipped to handle adversity.[31] This also aligns with the findings that married personnel and those with children may experience higher resilience due to the supportive nature of family. Those with over two years of service and multiple combat exposures showed significant resilience, suggesting that prolonged service and combat exposure may foster adaptive coping strategies. This is similar to what was found in a study conduct-

Table 4. Service-related factors associated with resilience among the participants.

Variables	Low n (%)	Moderate n (%)	Strong n (%)	χ^2	p
Years in the military				26.52	<0.001*[a]
Less than two years	0 (0)	26 (92.9)	2 (7.1)		
Two years and above	40 (13.7)	123 (42.1)	129 (44.2)		
Time away from family				36.323	<0.001[a]
<12 months	24 (8.4)	145 (50.5)	118 (41.1)		
≥12 months	15 (45.5)	11 (33.3)	7 (21.2)		
Number of combats				14.833	0.001[a]
One	14 (15.4)	55 (60.4)	22 (24.2)		
Multiple	26 (11.4)	94 (41.0)	109 (47.6)		
Battle duration				32.114	<0.001[a]
<12 months	4 (3.5)	81 (70.4)	30 (26.1)		
≥12 months	35 (17.1)	75 (36.6)	95 (46.3)		
Social support				23.717	<0.001[a]
Poor	20 (19.0)	57 (54.3)	28 (26.7)		
Moderate	14 (12.8)	53 (48.6)	42 (38.5)		
Strong	6 (5.7)	39 (36.8)	61 (57.5)		

*Values from Fisher's exact test. [a]Significant p-values.

Table 5. Regression analysis of factors associated with resilience.

Variables	B	p	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)
Marital status				
Single	-2.256	0.060	0.105	0.010-1.100
Divorced	0.009	0.994	1.009	0.091-11.196
Married	0.539	0.614	1.713	0.212-13.868
Widowed	Reference			
Number of children				
None	3.010	0.014	20.280	0.818-226.177
1	0.456	0.569	1.578	0.328-7.586
2	0.574	0.524	1.775	0.304-10.368
>2	Reference			
Ethnicity				
Hausa	0.441	0.502	1.554	0.429-5.630
Yoruba	-1.515	0.049	0.220	0.048-1.997
Igbo	-1.237	0.155	0.290	0.053-1.595
Fulani	-1.024	0.149	0.359	0.089-1.442
Other	Reference			
Military & deployment factors				
Months spent away from family (<12 months)	1.511	0.006[a]	4.532	1.528-13.440[a]
Number of combat deployments (1)	-1.414	0.026[a]	0.243	0.070-0.844[a]
Total battle duration (<12 months)	Reference			
Social support				
Poor support	-1.688	0.019[a]	0.185	0.045-0.756[a]
Moderate support	-0.401	0.518	0.669	0.198-2.258
Strong support	Reference			

aSignificant p-values and confidence intervals.

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ed on United States military veterans, which found that prolonged exposure to military service, particularly through multiple deployments, is associated with higher levels of resilience, suggesting that repeated exposure to combat-related stressors may lead to the development of effective coping mechanisms that enhance psychological resilience.[32]

Many studies of resilience among the U.S. military personnel demonstrated a high level of resilience among the personnel.[33,34] Even though different approaches and instruments were used by most of these studies, the findings indicate that soldiers, on average, are highly resilient. Similar findings and the importance of resilience were reported by Sefidan *et al*., who found high resilience among the Swiss Army.[34] Anyaegbu *et al*. also found high resilience among Nigerian soldiers who returned from fighting against insurgency.[36]

This study identified several factors, such as age above 40 years, being a commissioned officer, higher salary, being married, having more than two children, not living alone, certain ethnic groups (especially being Hausa), more than 15 years of education, being a Muslim or Christian, more than two years in service, more than 12 months away from family, multiple deployments to combat, longer battle duration, and stronger social support, to be associated with resilience.

These are in keeping with findings from similar studies: Gooding *et al.* found that older adults tend to have higher resilience due to life experiences and developed positive coping mechanisms.[37] Also, Lee *et al*. found that higher-ranking officers, such as commissioned officers, often display greater resilience due to their leadership training and responsibilities, which enhance their coping skills in stressful situations.[38]

A study highlighted that financial stability, indicated by higher income, is associated with greater resilience. Financial resources reduce stress, provide stability, and provide access to supportive services, and lead to higher resilience.[39] The associations found between being married and having children with strong resilience as found in this study showed that family support provides emotional stability and a sense of purpose, which may enhance resilience. This is supported by many studies that found that married individuals and those with children often exhibit higher resilience due to the social support and the community support and integration they build around their families.[40] The finding of a significant association between living with others and strong resilience aligns with what was reported by King *et al*. that social support from cohabitating family members or peers significantly enhances resilience.[41]

The finding of a significant association between more years of education and resilience is corroborated by Benight and Bandura, who demonstrated that higher levels of education are associated with better problem-solving skills and cognitive flexibility, which contribute to greater resilience.[42]

Service-related characteristics such as duration away from family, higher number of combats exposed to, and longer duration of combat exposure were all significantly associated with resilience in this study. In support of these findings, King *et al.* indicated that exposure to multiple combat situations and longer combat durations can enhance resilience by increasing familiarity with stressors and improving coping mechanisms.[43]

The importance of social support in predicting strong resilience is explained by Bonanno. He emphasized the critical role of social support in enhancing resilience and highlighted that strong social networks provide emotional support, practical assistance, and a sense of belonging.[44] This conforms to the finding of a strong association between social support and resilience in this study and also that social support is a predictor of resilience.

Limitations of the study include the cross-sectional design, self-report and social-desirability bias, and sampling from formations under one army division, all limiting generalizability.

Conclusions

In conclusion, resilience among the Nigerian army personnel varied, with nearly half demonstrating moderate resilience while one-eighth showed low resilience.

Socio-demographic factors found to be associated with resilience included older age, higher cadre, higher income, being married, having more than two children, not living alone, ethnicity, higher years of education, and religious affiliation. Whereas service-related factors associated with resilience are longer years in service, shorter time spent away from family, multiple combat experiences, longer battle duration, and strong social support.

However, shorter time spent away from family, multiple combat deployments, and strong support networks were found to be independent predictors of psychological resilience.

Recommendations

The Nigerian Army needs to strengthen the existing and provide more regular psychological evaluations, counseling services, and resilience training workshops for its personnel.

Communication between deployed personnel and their families should be facilitated to mitigate the psychological association between long separations and resilience.

The military and individual personnel need to strengthen social support networks within the divisions, brigades, battalions, and units by encouraging peer support groups, family support programs, and community engagement activities.

A focused group discussion involving military personnel with combat deployment experience is recommended to gain in-depth insight into their experiences and understand its relationship with their mental health. This approach would provide qualitative data to complement quantitative findings and help identify specific stressors and coping mechanisms unique to their roles.

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