Psycho-trauma, psychosocial adjustment, and symptomatic post-traumatic stress disorder among internally displaced persons in Kaduna, Northwestern Nigeria

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Background: In April 2011, a post election violent conflict in Northern Nigeria led to resettlement of internally displaced persons (IDPs) in a camp in Kaduna, the worst affected state. We set out to determine prevalence and socio-demographic factors associated with post-traumatic stress disorder (PTSD) among IDPs. We also determined types of psycho-trauma experienced by the IDPs and their psychosocial adjustment.

Methods: Cross-sectional systematic random sampling was used to select 258 adults IDPs. We used Harvard trauma questionnaire to diagnose “symptomatic PTSD,” composite international diagnostic interview (CIDI) for diagnosis of depression, and communal trauma event inventory to determine exposure to psycho-trauma. We assessed social adjustment using social provision scale. Multiple logistic regression analysis was used to determine independent predictors of PTSD.

Results: Of the 258 IDPs, 109 (42.2%) had a diagnosis of PTSD, 204 (79.1%) had poor living conditions, and only 12 (4.7%) had poor social provision. The most frequent psycho-traumas were destruction of personal property (96.1%), been evacuated from their town (96%) and witnessing violence (88%). More than half (58%) of IDPs had experienced 11–15 of the 19 traumatic events. Independent predictors of PTSD among respondents were having a CIDI diagnosis of depression (adjusted odds ratios 3.5, 95% confidence interval 1.7–7.5; \( p = 0.001 \)) and witnessing death of a family member (3.7, 1.2–11.5; \( p = 0.0259 \)).

Conclusion: We concluded that exposure to psycho-trauma among IDPs in Kaduna led to post conflict PTSD. Death of a family member and co-morbid depression were independent predictors of PTSD among IDPs. Though their living condition was poor, the IDPs had good psychosocial adjustment. We recommended a structured psychosocial intervention among the IDP targeted at improving living condition and dealing with the psychological consequences of psycho-trauma.

Keywords: post traumatic stress disorder, internally displaced persons, psychosocial adjustment, depression, psycho-trauma

INTRODUCTION
In April 2011, a post election violent conflict in Northern Nigeria killed 800 and displaced 65,000 people over a period of 3 days (1). The majority of the fatalities (88%) were from Kaduna state of Nigeria, known for ethno-religious conflicts. A camp for the internally displaced persons (IDPs) was set up in Kaduna city, the capital of the state to cater for the medical and social needs of the IDPs. Despite the increase in communal conflicts in Northern Nigeria after the country returned to democratic rule in 1999 (2), only few studies had been conducted on possible development of post-traumatic stress disorder (PTSD) among the survivors of the violent conflicts. Obilom and Thacher (3) studied PTSD following ethno-religious conflict in Jos, a neighboring state to Kaduna. He found “witnessing or being victims of personal attacks,” “losing possessions,” and “burning of homes” as the leading psycho-trauma among the study population.

We set out to determine the prevalence of PTSD, and types of psycho-trauma experienced by the IDPs and their psychosocial adjustment. We also determined factors associated with PTSD.

MATERIALS AND METHODS
STUDY SETTING
The study was conducted in Kaduna city, the capital of Kaduna state located in the Northwestern zone of Nigeria in March 2013. The IDP camp was located on the outskirt of the city in a transit camp originally built for Hajj pilgrims (Muslims traveling to Saudi Arabia).
Arabia for the holy pilgrimage). Over 2,500 IDPs were settled in the camp.

STUDY DESIGN
We conducted a cross-sectional study among male and female IDPs aged ≥18 years. We defined IDPs as people living within the camp, who have been displaced from their original communities as a result of the violent conflict following the April 2011 elections in Nigeria. We excluded persons already diagnosed with a mental disorder prior to the post election conflict and those who refused consent.

SAMPLE SIZE DETERMINATION
A minimum sample size of 230 was calculated using the Leslie and Kish (4) formula for estimating sample size for cross-sectional study.

\[ n = \frac{(Z^2pq)}{d^2} \]

where \( n \) = minimum sample size; \( Z \) set at 5% significant level = 1.96; \( p = \) estimate of prevalence of arousal symptoms of PTSD among the IDPs in a similar study in Nigeria = 84% = 0.84 (3); \( d = \) level of precision (5%); \( q = 1 - p \).

\[ n = \frac{(1.96^2 \times 0.84 \times 0.16)}{0.05^2} \]
\[ n = 206 \]

Adjusting for non-response rate of 10%

\[ n = \frac{nr}{(r - 1)} \]

where \( n \) = calculated sample size and \( r = 10 \)

\[ = \frac{206 \times 10}{10 - 1} \]
\[ = 228 \]

minimum sample size = 228.

For the study, we sampled 258 IDPs.

SAMPLING TECHNIQUE
We used systematic sampling technique to select the respondents for the study. A sampling frame was created from the line list of all the IDPs obtained from the welfare committee of the camp. We excluded IDPs who were <18 years of age. Of the 2,500 IDPs, 1,502 were included in the final sampling frame for the study. We divided the sampling frame by the study sample size to determine the sampling interval. The first IDP was selected from the sampling frame using a table of random numbers, and then using the sampling interval we selected subsequent respondents until the required sample size was achieved.

STUDY INSTRUMENT
We designed a questionnaire to measure the socio-demographic characteristics of IDPs and their living conditions, which was assessed by asking the following questions: availability of sleeping mat, private facility, toilets or latrine, sufficient food, and protection from animals and insects for individual IDPs. We also asked if the accommodations were cramped, if their health was good, and if they had enough organizational support. Conflict-related trauma was assessed with a shortened version of the communal traumatic events inventory used to study Bosnian refugees (5). We included only trauma events, the IDPs were likely to have experienced and respondents were to indicate “yes” or “no” depending on experience during the conflict. To measure the IDPs psychosocial adjustment, we adapted the social provision scale originally developed by Cutrona and Russell (6). Twelve of the 24 questions that captured the components of reassurance of worth, reliable alliance, and guidance were used for the study. We defined good psychosocial adjustment as answering “strongly agree” or “agree” to 8 of the 12 questions.

DATA COLLECTION AND PROCEDURE
We recruited six data collectors who could speak both English and Hausa fluently and were experienced in data collection from prior activities. They were trained for a period of 5 days on the use of the study questionnaire and interview techniques prior to the commencement of the study. Data collection took place over a period of 6 days and the average duration of each interview was 40 min. Five supervisors made up of psychiatrists and senior resident doctors supervised the data collectors.

DATA ENTRY AND ANALYSIS
Data were entered into Epi info 3.3.2, cleaned, and edited for inconsistencies before analysis. Descriptive statistics were used in summarizing the data, while analytical statistics were used to test
Table 1 | Socio-demographic characteristics of IDPs* by gender of respondents (n = 258).

| Characteristics          | N   | (%)  |
|--------------------------|-----|------|
| Sex                      |     |      |
| Female                   | 134 | (51.9)|
| Male                     | 124 | (48.1)|
| Religion                 |     |      |
| Islam                    | 258 | (100)|
| Quranic                  | 101 | (39.3)|
| Primary                  | 68  | (26.5)|
| Secondary                | 50  | (19.5)|
| None                     | 31  | (12.1)|
| Tertiary                 | 7   | (2.7)|
| Employment status        |     |      |
| Unemployed               | 176 | (68.2)|
| Employed                 | 65  | (25.2)|
| Student                  | 2   | (0.8)|
| Retired                  | 3   | (1.2)|

*IDPs, internally displaced persons.

Table 2 | Exposure of IDPs* to traumatic events (N = 258).

| Events                              | Number | %     | 95% CI  |
|-------------------------------------|--------|-------|---------|
| Type of trauma event experienced    |        |       |         |
| Destruction of personal property    | 247    | 96.1  | 93.1–98.1|
| Evacuated from town                 | 247    | 95.7  | 92.5–97.9|
| Lost property                       | 246    | 95.7  | 92.5–97.9|
| Separated from loved ones           | 239    | 92.6  | 88.7–95.5|
| Witness violence                    | 227    | 88.0  | 83.4–91.7|
| Death of family member              | 224    | 86.8  | 82.1–90.7|
| Ill health                          | 215    | 83.7  | 78.6–88.0|
| Family beaten                       | 180    | 69.8  | 63.8–75.3|
| Witness torture                     | 177    | 68.9  | 62.8–74.5|
| Witness death of family member      | 175    | 68.1  | 62.0–73.7|
| Without shelter                     | 165    | 64.2  | 58.0–70.1|
| Stolen possession                   | 154    | 59.9  | 53.7–66.0|
| Shortage of clothing                | 150    | 58.4  | 52.1–64.5|
| Shortage of medicine                | 149    | 58.0  | 51.7–64.1|
| Physical injury                     | 118    | 45.7  | 39.5–52.0|
| Beaten                              | 101    | 39.1  | 33.2–45.4|
| Lack of food                        | 100    | 38.8  | 32.8–45.0|
| Loved ones disappear                | 86     | 33.3  | 27.6–39.4|
| Rape or sexual molestation          | 4      | 1.7   | 0.5–4.2 |

Cumulative trauma events experienced

| Events | Number | %     | 95% CI  |
|--------|--------|-------|---------|
| 0–5    | 4      | 1.6   | 0.4–3.9 |
| 6–10   | 57     | 22.1  | 17.2–27.7|
| 11–15  | 149    | 57.8  | 51.5–63.9|
| ≥16    | 48     | 18.6  | 14.0–23.9|

*IDPs, internally displaced persons.

RESULTS

A total of 258 interviews were conducted. The mean age of the IDPs was 38.7 years (SD: 15.2 years) with a range of 18–95 years. Of the 258 IDPs, 134 (51.9%) were females, all (100%) practiced Islam, 53 (20.5%) were widowed and 68.2% were unemployed (Table 1).

Of the 258 respondents, 109 (42%) of them had a diagnosis of PTSD.

The most trauma event experienced by the IDPs (Table 2) were destruction of personal property (96.1%) and been evacuated from their town (96%). More than three-quarter had witnessed violence (88%), reported the death of a family member (87%), and suffered ill health (84%). More than two-thirds had witnessed torture (69%) and witnessed death of family member (68%). Only four (1.7) IDPs reported rape or sexual molestation. More than half (58%) of the IDPs had experienced 11–15 of the 19 traumatic events covered by the questionnaire.

The exposure of female and male IDPs to 9 of the 19 traumatic events showed significant variations (Table 3). Of the IDPs that...
Table 3 | Types of trauma event experienced by IDP* by gender.

| Type of trauma event experienced          | Number of persons experiencing event | OR* (95% CI) | p Value |
|------------------------------------------|--------------------------------------|--------------|---------|
|                                          | Female | % | Male | % |              |             |         |
| Beaten                                   | 27     | 26.7 | 74   | 73.3 | 0.2 (0.1–0.3) | <0.000 |
| Witness death of family member           | 76     | 43.4 | 99   | 56.6 | 0.3 (0.2–0.6) | <0.000 |
| Physical injury                          | 44     | 373  | 74   | 62.7 | 0.3 (0.2–0.6) | <0.000 |
| Witness torture                          | 79     | 44.6 | 98   | 55.4 | 0.4 (0.2–0.7) | <0.001 |
| Lack of food                             | 39     | 39.0 | 61   | 61.0 | 0.4 (0.3–0.7) | <0.001 |
| Loved ones disappear                     | 32     | 372  | 54   | 62.8 | 0.4 (0.2–0.7) | <0.001 |
| Stolen possession                        | 68     | 44.2 | 86   | 55.8 | 0.5 (0.3–0.8) | 0.003 |
| Without shelter                          | 79     | 47.9 | 86   | 52.1 | 0.6 (0.4–1.1) | 0.01   |
| Ill health                               | 118    | 54.9 | 97   | 45.1 | 2.0 (1.0–4.0) | 0.05   |
| Lost property                            | 131    | 53.3 | 115  | 46.7 | 3.0 (0.8–11.7) | 0.09   |
| Evacuated from town                      | 124    | 51.0 | 121  | 49.0 | 0.4 (0.1–1.5) | 0.2    |
| Family beaten                            | 89     | 49.4 | 91   | 50.6 | 0.7 (0.4–1.2) | 0.2    |
| Destruction of personal property         | 127    | 51.4 | 120  | 48.6 | 0.5 (0.1–1.8) | 0.3    |
| Shortage of clothing                     | 74     | 49.3 | 76   | 50.7 | 0.8 (0.5–1.3) | 0.4    |
| Witness violence                         | 116    | 51.1 | 111  | 48.9 | 0.8 (0.4–1.6) | 0.5    |
| Shortage of medicine                     | 79     | 53.0 | 70   | 47.0 | 1.1 (0.7–1.9) | 0.6    |
| Separated from loved ones                | 125    | 52.3 | 114  | 47.7 | 1.2 (0.5–3.1) | 0.7    |
| Death of family member                   | 117    | 52.2 | 107  | 47.8 | 1.1 (0.5–2.2) | 0.8    |
| Rape or sexual molestation               | 2      | 50.0 | 2    | 50.0 | 0.8 (0.1–5.7) | 0.8    |

*IDPs, internally displaced persons.

**OR, odds ratio.

† CI, confidence interval.

were beaten, only 27% were females [odd ratio (OR) 0.2, 95% CI 0.1–0.3; p < 0.000]. Among IDPs witnessing death, less than half (43%) were females (0.3, CI, 0.2–0.6; p < 0.000) and only 37% of females had physical injury (0.3, 0.2–0.6; p < 0.000). Among IDPs that had witnessed torture, 45% were females (0.4, 0.2–0.7; p < 0.001). Other traumatic events that showed significantly less exposure to females were lack of food (0.4, 0.3–0.7; p < 0.000), disappearance of loved ones (0.4, 0.2–0.7; p < 0.001), having personal belongings been stolen (0.5, 0.3–0.8; p = 0.003), and being without shelter (0.6, 0.4–1.1; p = 0.01). The only psycho-trauma with more females been exposed (54.5%) was ill health (2.0, 1.0–4.0; p = 0.05).

Of the 258 IDPs, 109 (42.2%) had a diagnosis of PTSD, 204 (79.1%) had poor living conditions, but only 12 (4.7%) had poor social provision.

At bivariate analysis 6 of the 19 trauma events covered by this study were significantly associated with a diagnosis of symptomatic PTSD (Table 4). IDPs who had PTSD were 5 times more likely to have witnessed death of a family member (5.03, 1.9–13.5; p < 0.000), 3 times more likely to have witnessed ≥16 trauma events (2.8, 1.5–5.3; p < 0.000), and twice more likely to have had their personal belongings stolen (2.0, 1.2–3.4; p < 0.01). Furthermore, IDPs with a diagnosis of PTSD were four times more likely to have a co-morbid diagnosis of depression (3.8, 1.9–7.7; p < 0.000). There were no socio-demographic associations of PTSD.

We performed multiple logistic regression analysis on all the eight factors that were significantly associated with PTSD at bivariate analysis (Table 5). Of the eight factors, having a CIDI diagnosis of depression (AOR 3.5, 1.7–7.5; p < 0.001) and experiencing death of a family member (3.7, 1.2–11.5) remained as independent predictors of PTSD among the IDPs.

**DISCUSSION**

In this study, destruction of personal property, being evacuated from town, witnessing violence, reported death of a family member, and suffering ill health were the most frequent psycho-trauma experienced by the IDPs. The violent nature of the conflict was demonstrated by more than half of the IDPs experiencing 11–15 psycho-traumatic events during the conflict. The level of exposure of IDPs to psycho-traumatic events such as witnessing death of a relative, possessions being stolen, and witnessing violence were much higher among this IDPs compared to a similar study done in Northern Nigeria (3). Rape and sexual molestation violence appeared not to have been widely used in this conflict. The prevalence of rape and sexual molestation was similar to that reported in a study in Bosnia (18), but it is much lower than that reported in a study of IDPs in Northern Uganda (16). We found females to be significantly less exposed to psycho-trauma, which is consistent with the findings of higher exposure of men to psycho-trauma during conflicts reported in Northern Uganda. Due to the less exposure of females to...
Table 4 | Factors associated with PTSD among IDPs.

| Characteristics                  | PTSD (% | No PTSD (% | OR (95% CI) | p Value |
|----------------------------------|---------|------------|-------------|---------|
| Death of family member           | 5.03 (1.9–13.5) | <0.00 |
| Yes                              | 104 (95.4) | 120 (80.5) |             |         |
| No                               | 5 (4.6) | 29 (19.5) |             |         |
| Total                            | 109 (100) | 149 (100) |             |         |
| CIDI Depression                  | 3.8 (1.9–7.7) | <0.00 |
| Yes                              | 29 (26.6) | 13 (8.7) |             |         |
| No                               | 80 (73.4) | 136 (91.3) |             |         |
| Total                            | 109 (100) | 149 (100) |             |         |
| Exposed to ≥16 events            | 2.8 (1.5–5.3) | <0.00 |
| Yes                              | 30 (27.5) | 18 (12.1) |             |         |
| No                               | 79 (72.5) | 131 (87.9) |             |         |
| Total                            | 109 (100) | 149 (100) |             |         |
| Stolen possession                | 2.0 (1.2–3.4) | <0.01 |
| Yes                              | 75 (69.4) | 79 (53.0) |             |         |
| No                               | 33 (30.6) | 70 (47.0) |             |         |
| Total                            | 108 (100) | 149 (100) |             |         |
| Witness violence                 | 2.9 (1.2–6.8) | 0.02 |
| Yes                              | 102 (93.6) | 125 (83.9) |             |         |
| No                               | 7 (6.4) | 24 (16.1) |             |         |
| Total                            | 109 (100) | 149 (100) |             |         |
| Ill health                       | 2.4 (1.1–4.9) | 0.02 |
| Yes                              | 94 (89.9) | 117 (79.1) |             |         |
| No                               | 11 (10.1) | 31 (20.9) |             |         |
| Total                            | 105 (100) | 148 (100) |             |         |
| Witness death                    | 2.0 (1.1–3.3) | 0.02 |
| Yes                              | 82 (75.9) | 93 (62.4) |             |         |
| No                               | 26 (24.1) | 56 (37.6) |             |         |
| Total                            | 108 (100) | 149 (100) |             |         |
| Shortage of clothing             | 1.7 (1.0–2.8) | 0.04 |
| Yes                              | 71 (65.7) | 79 (53.0) |             |         |
| No                               | 37 (34.3) | 70 (47.0) |             |         |
| Total                            | 108 (100) | 149 (100) |             |         |

*PTSD, post traumatic stress disorder.
*OR, odds ratio.
*CI, confidence interval.

We found death of a family member and co-morbid depression to be the only independent predictors of PTSD among the IDPs. Several studies have found association between PTSD and depression (19, 20). Depressive disorders can occur independently after exposure to psycho-trauma and a previous depressive disorder is a risk factor for developing PTSD. We did not find significant association between socio-demographic characteristics and PTSD despite the high degree of unemployment among the IDPs. Despite the apparent poor social provisions at the camp, the IDPs did not report significant poor psychosocial adjustment, this may be explained by the lack of social amenities that is characteristic of communities were the IDPs were living prior to the conflict. The communities lack portable water, poor environmental sanitation, and poor housing conditions. Therefore, the camp condition may not differ significantly from their pre conflict environmental conditions and thus have little effects on IDPs psychosocial adjustment.

The findings of this study are subjected to the following limitations. This study was conducted 2 years post conflict therefore recall bias was possible but the nature of the psycho-trauma made it possible that the IDPs recollected their experience easily. The response to sensitive traumatic events, especially rape and molestation may have been under reported, especially among the females. We studied only IDPs living in the camps and excluded those that were staying with relatives or have moved out of the camps for other reasons. Some researchers have questioned the validity of PTSD diagnosis in non-western setting (21), but the instruments used for this study have been widely used and validated for different cultural settings.
CONCLUSION
We concluded that exposure to psycho-trauma among IDPs living in Hajj camp in Kaduna, Northern Nigeria led to post conflict PTSD. Though males were more exposed to psycho-trauma there was no difference in gender PTSD prevalence. Death of a family member and co-morbid depression were independent predictors of PTSD among the IDPs. Though there living condition was poor, the IDPs had good psychosocial adjustment. PTSD among the IDPs can be predicted by IDPs who witnessed the death of a family member or had a co-morbid diagnosis of depression. We recommended a structured psychosocial intervention among the IDP targeted at improving living conditions and dealing with the consequences of psycho-trauma to the state government. We also advocated for the setting up of weekly mental health clinic in the camp to help those IDPs with mental distress.

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