

Study of Youths in Urban Cities Exposure to Trauma and Posttraumatic Stress Disorder

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Abstract: This study estimates the cumulative occurrence of traumatic events and Posttraumatic Stress Disorder (PTSD) using Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) criteria, in a high-risk sample of youth in urban city of Lagos, Nigeria. Participants were interviewed about history of trauma and PTSD in 2006-2007 when their mean age was 16 years ($n = 1,702$). The study revealed that the lifetime occurrence of assaultive violence was 62.5% in males and 33.6% in females. Females had a higher risk of PTSD than males following assaultive violence (odds ratio = 4.0, 95% confidence interval (2.0-8.3) but not following other traumas. A comparison of the results from this heterogeneous sample of youth from urban city of Lagos with the results from study of suburban sample in United States in which the same criteria and measures of trauma and PTSD were used suggested the possibility that males' risk for assaultive violence and females' risk for PTSD following exposure to assaultive violence might vary by characteristics of the environment especially social environment.

Key words: Youths, Urban Trauma, PTSD, social environment, violence

INTRODUCTION

In the background of this study is the consistent finding that a majority of resident in Nigeria communities have experienced one or more traumatic events that meet the stressor criterion for Posttraumatic Stress Disorder (PTSD), as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM) of qualifying stressors in successive DSM editions and with variations in the methods used to elicit history of traumatic experiences.

Report of research findings presented estimates of exposure to traumatic events and posttraumatic stress disorder in a community sample assessed using the DSM-W criteria (Breslau *et al.*, 1998). The sample was drawn from the Detroit primary metropolitan statistical area, a six county area containing >4 million people, 77% residing in suburban communities surrounding the city of Detroit. The results revealed an interesting sex difference in the occurrence of trauma and PTSD, with variation across classes of traumas (Breslau *et al.*, 1998).

These researchers found that males' greater risk of experiencing traumatic events is true for assaultive violence, serious accidents and witnessing violence but not for disaster, sudden unexpected death of loved one, or learning about various traumas to a loved one. With respect to females' greater risk of developing PTSD, it was

found that females had a greater risk of PTSD following assaultive violence but not following other classes of trauma. The excess occurrence of rape and other sexual assault among females (relative to males) did not count for females' excess risk of PTSD associated with assaultive violence as a composite category (Breslau *et al.*, 1999).

Similar patterns have been observed in other studies of Kessler *et al.* (1995) and Stein *et al.* (2000). In Southeast Michigan, people of African heritage constituted the disadvantaged racial minority and had a higher risk of assaultive violence, as did residents of the inner city when compared to residents of the suburbs. Place of residents (Urban vs. Suburban) and racial minority status were highly confounded in that study because of the racial distribution of the population of the area. Consequently, urban residence could not be disadvantaged from racial minority status with respect to the risk of exposure to assaultive violence and the risk of PTSD.

This study however intends to focus on traumatic events and PTSD among the adolescents who had grown up in heterogeneous population of Lagos in Nigeria.

MATERIALS AND METHODS

Sample: Participants sample were senior students in 25 secondary schools selected from public school system of heterogeneous population of Lagos in Nigeria. The

25 schools were located in five specified local government areas, with residents ranging from very poor to low middle class and varying numbers of Hausa, Igbo and Yoruba. The five different Local Government areas within the school were selected with the involvement of the Local Inspectors of Education (LIES).

Five schools were selected from each Local Government areas. The school counsellors/career masters in each school provided information on child's sex, birth date, address, ethnicity using the cumulative record folder.

The sample of 1,702 was drawn using random sampling technique after the school have been selected through cluster sampling process.

This sample consists of 752 males (44.2%) and 950 females (55.8%). Out of this sample 786 (46.2%) were Yoruba 604 (35.5%) were Igbo, while 312 (18.3%) were Hausa. Based on Local government of study the samples drawn from LG1 were 172 (22.8%) male and 206 (22.0%) females, LG 2 had 164 (21.8%) males and 202 (21.3%) females. The participants from LG 3 were 150 (19.9%) males and 186 (19.6%) females. LG 4 had 142 (18.8%) male and 180 (19%) females, while LG 5 consist of 124 (16.5%) males and 176 (18.5%) females. About 822 (48.2%) of the participants were Christians, while 882 (51.8%) were Muslims (Table 1).

Assessment of traumatic events and posttraumatic stress disorder: The PSTD module was embedded within the face-to-face interview. Trained interviewers were engaged and the interview with the respondents focused on their life history, health and behaviour of the young adult from first year of entry to the time of the assessment, with adapted life chart methods used to anchor important life events and to promote recall (Lykestos *et al.*, 1994).

The instrument adopted for data collection in this research was Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-iv) (Table 2). It begins with a list of 18 events that operationalize the DSM-iv stressor criterion, the entire list of events except for combat experiences, which were unlikely to have been experienced by this young cohort. For each event in the list, respondents were asked if they had ever experienced an event of that type.

An endorsement of an event type was followed by questions about the number of times it had occurred and the age of the respondents at each time. In cases of >1 traumatic event, a list of all the events reported by the respondent was read back by the interviewer and the respondent was asked to identify the one event that was the most stressful (the worst) PTSD was evaluated for that event using the PTSD section of version 2.1 of the World Health Organization Composite International Diagnostic Interview (World Health Organization, 1997).

Data analysis: Data were presented on 18 individual types of traumatic events and four composite groups (Table 3). Direct personal traumas were divided into two groups separating events that involved intentional violence, referred to as assaultive violence, from other types of directly experienced traumas, referred to as other injury or shocking experience. The third group covers traumas involving learning about traumatic events experienced by others. The single event type learning about the sudden unexpected death of a family member or a close friend was separated from the third group.

The fact that the assessment of PTSD focused on the trauma selected by the respondents as the worst, the extent to which respondents' selection of trauma types as the worst departed from expected values was evaluated, if all trauma types had equal prior probabilities of selection, using a Monte Carlo Method (randomization test).

Table 1: Sample characteristics data from 1,702 participants

Variables	Number	Parentage
Males	752	44.2
Female	950	55.8
Ethnicity		
Yoruba	786	46.2
Igbo	604	35.5
Hausa	312	18.3
Religion		
Christian	822	48.2
Muslim	882	51.8
Local governments areas of study	Males (%)	Females (%)
LG 1	172 (22.8)	206 (22)
LG 2	164 (21.8)	202 (21.3)
LG 3	150 (19.9)	186 (19.6)
LG 4	142 (18.8)	180 (19)
LG 5	124 (16.5)	176 (18.5)
Total	752	950

Table 2: Characteristics of area of resident

Characteristics	LG 1 (%)	LG 2 (%)	LG 3 (%)	LG 4 (%)	LG 5 (%)
Ethnicity					
Yoruba	32.1	24.7	15.8	10.5	16.9
Igbo	35.8	22	12.0	15.3	14.9
Hausa	28.7	19.3	18.6	12.4	21
Households on public assistance	9.4	12.3	8.5	5.6	4.8
Households below poverty level	14.8	45.2	33.6	9.2	6.7
Households with children <18 years old below poverty level	18.8	56.3	42.9	11.2	9.6

Table 3: Cumulative exposure to DSM-IV Traumatic Events by Sex (odds ratios in footnote)

Traumatic events	Total (n = 1,702) n %	Male (n = 752) n %	Female (n = 950) n %	Wald	p-value
Assaultive violence	(798) 46.9	(470) 62.5	(320) 33.6	136.7	<0001
Rape	(93) 5.5	(11) 1.5	(92) 9.7	38.9	<0001
Held captive/tortured/kidnapped	(33) 1.9	(21) 2.7	(17) 1.8	0.79	(0.37)
Shoot/stabbed	(198) 11.6	(182) 24.2	(48) 5.1	109.3	<0001
Sexual assault other than rape	(110) 6.5	(22) 2.9	(96) 10.1	35.8	<0001
Mugged/threatened with weapon	(206) 12.1	(153) 20.3	(184) 19.4	224.0	<0001
Badly beaten	(617) 36.3	(108) 14.4	(60) 6.3	35.2	<0001
Other injury or shocking event	(865) 51.0	(460) 61.2	(397) 41.7	60.6	<0001
Serious car accident	(239) 14.0	(141) 18.8	(98) 10.3	21.0	<0001
Other serious accident	(115) 6.8	(79) 10.5	(33) 3.4	32.9	<0001
Natural disaster	(148) 8.7	(74) 9.8	(71) 7.5	3.7	0.06
Life-threatening illness	(51) 3.0	(22) 2.9	(27) 2.8	0.0003	0.99
Child's life threatening illness	(28) 1.6	(5) 0.66	(22) 2.3	9.6	0.002
Witnessed killing/serious injury	(612) 36.0	(365) 48.5	(237) 24.9	95.9	<0001
Discovering a dead body	(130) 7.6	(69) 9.2	(58) 6.1	6.5	0.01
Learning of traumas to close friend/relative	(863) 50.7	(388) 51.2	472 (49.7)	0.29	<(0.55)
Close friend/relative raped/sexually assaulted	(525) 30.8	(21) 28.2	(314) 33.0	5.1	0.02
Close friend/relative attacked	(409) 24.0	(228) 30.3	(174) 18.3	30.5	<001
Close friend relative car accident	(360) 21.2	(171) 22.7	185 (19.5)	1.97	(0.14)
Close friend/relative other accident	148 (8.7)	(72) 9.6	72 (7.5)	3.2	(0.07)
Learning about unexpected death	882 (51.8)	(407) 54.1	(468) 49.3	3.3	0.06
Any event	(1,403) 82.4	(652) 86.9	(742) 78.1	21.7	<0001

Composite categories in which event types are grouped are highlighted in bold. Male to Female odds ratios; Assaultive violence = 3.3 (95% confidence interval) (CI) (2.7-4.0) other injury or shocking event 2.2 (95% CI 1.8-2.6) learning of traumas to close friend/relative = 1.1 (95% CI 0.9-1.3); learning about unexpected death = 1.2 (95% C.I. 1.0-1.4) any event = 1.9 (95% CI 1.4-2.4)

A rate distribution of each of the 18 traumas was generated in 500 computer. Sampling iterations drawn from the total pool of traumas reported by the sample, one per respondent with one or more trauma. The expected rate of an event type was estimated by the median value from all 500 iterations. The p-value is the percentile of the observed rate that an event type was selected as the worst relative to the median rate from the Monte Carlo procedure.

Upon the respondents' reports of the lifetime history of events, the researcher estimated the rates of exposure by chronological age using life table methods. This is the attack rate of each age based on all respondents, including persons with prior exposures. A series of analyses was used to estimate the association between occurrence of categories of trauma and membership in subgroups of the population. A similar set of analyses estimated the conditional risk of DSM-IV PTSD (lifetime) following exposure. Odds ratios for exposure and for PTSD following exposure by sex were estimated for the composite categories of events. In additional analyses the researcher estimated these associations and conditional risks taking into account the sampling design which was based on clustering of students within schools.

RESULTS

Cumulative exposure to DSM-IV traumatic events: In Table 3, the vast majority of the sample (82.4%) had experienced one or more traumatic events up to the time of the research. The single most commonly experienced event type was learning about sudden unexpected death

of a close friend/relative (57.8%). The category of assaultive violence was experienced by 46.9% of the sample and the most common event type involving assaultive violence was badly beaten 36.3% of the sample.

Exposure to one or more traumatic events was higher in males than females, 86.9 vs. 78% ($p < 0.0001$). The overall excess of males' exposure reflected males' higher cumulative incidence of the two composite categories of personally experienced events, assaultive violence (Odds Ratio (OR) = 3.3, 95% Confidence Interval (CI) 2.7-4.0 and other injury or shocking event (OR = 2.2, 95% CI 1.8-2.6) odds ratios based on the clustered design of the data were 3.3 (95% CI 2.8-3.9) and 2.2 (95% CI 1.8-2.6). Among event types grouped under assaultive violence, rape and other sexual assault were more common in females, whereas other events were more common in males. In addition Igbo males had a somewhat higher cumulative incidence of assaultive violence than Yoruba and Hausa males.

The burden of exposure to DSM-IV traumatic events: Out of those who experienced any traumatic event, 16.2% were exposed to single trauma, 12.2% were exposed to two, 11.7% to three and 59.7% to four or more.

The total number of DSM-IV traumatic events experienced in lifetime in this sample of young cohorts was 8,168, which yielded a mean of 4.8 per respondent. Mean number of traumas was considerably higher in males than females 6.4 vs. 3.5, respectively ($t = 10.63$, $p < 0.0001$).

A higher proportion of males' burden traumas was in the two personally experienced composite categories,

58.5 vs. 44.6% of females burden (Table 4) of all assaultive violence experienced by males 81.6% involved weapons (the combined figures of mugged, held up, threatened with a weapon and shot/stabbed). The corresponding proportion in females was 43.2% rape and other sexual assault constituted 8.2% of all the traumatic events experienced by females and 1.2% of all male's events. The pattern of sex differences in the distribution of traumas was the same in Yoruba, Ibo and Hausa.

Conditional probability of posttraumatic stress disorder across event types: Out of the total sample of 1,702 youth,

124 (7.3%) met criteria for DSM-IV PTSD in lifetime, 51 (6.4%) of males and 73 (8.2%) of females estimates of the conditional probability of PTSD (i.e., percentage of exposed persons who met PTSD criteria) (Table 5). The highest probability of PTSD was associated with assaultive violence 16.3%, whereas the lowest probability was associated with learning about trauma to a loved one, 3.3%. The overall conditional probability of PTSD from any trauma was 8.7%.

There is one notable exception, the conditional risk of PTSD associated with the four composite categories did not vary between males and females (Table 5). The

Table 4: Distributed of total burden of traumatic events across event types n = 1,702

Categories of traumatic events	Total events N = 8,168 (%)	Male (n = 4,842) (%)	Female (n = 3326) (%)
Assaultive violence	24.6	27.6	21.8
Rape	1.8	0.5	3.9
Held captive/tortured/kidnapped	0.7	0.6	0.7
Shot/stabbed	3.2	5.7	1.6
Sexual assault of other than rape	3.5	0.3	4.2
Mugged/threatened with weapon	2.6	3.7	3.1
Badly beaten	12.8	16.8	7.3
Other injury or shocking event	28.2	30.9	22.8
Serious car accident	3.5	3.9	3.3
Other serious accident	2.3	2.1	1.1
Natural disaster	4.3	2.6	2.9
Life-threatening illness	0.9	0.7	1.1
Child's life-threatening illness	0.5	0.3	0.9
Witnessed killing/serious injury	14.8	16.5	10.8
Discovering a dead body	1.9	2.0	1.7
Learning of trauma to close friend/relative	26.2	23.1	31.8
Close friend/relative raped/sexually assaulted	9.7	6.9	13.9
Close friend/relative seriously attacked	7.6	7.8	7.2
Close friend/relative car accident	6.3	5.7	7.3
Close friend/relative other accident	2.6	2.7	2.4
Learning about unexpected death	21.0	18.4	23.6

Composite categories in which event types are grouped are highlighted in bold; For distribution of four composite vent categories by sex 14923, df = 3, p<0.0001

Table 5: Conditional Probability of Posttraumatic Stress Disorder (PTSD) across event types by sex (Odds ratios in footnote)

Categories of traumatic event	Total (n) PTSD (%)	Male (n) PTSD (%)	Female (n) PTSD (%)	p-value
Assaultive violence	(312) 16.3	(159) 7.4	(153) 24.3	14.7/000
Rape	(38) 44.6	(1) 100.0	(37) 42.5	(0.46)
Held captive/tortured/kidnapped	(12) 19.6	(7) 0.0	(5) 51.3	(0.13)
Shot/stabbed	(65) 9.7	(52) 8.9	(13) 10.1	(1.00)
Sexual assault other than rape	(40) 31.3	(8) 51.3	(32) 25.0	(0.33)
Mugged/threatened with weapon	(125) 4.9	(77) 3.4	(48) 7.2	(0.37)
Badly beaten	(32) 14.2	(14) 0.0	(18) 24.7	(0.11)
Other injury or shocking event	(291) 7.3	(154) 8.3	(137) 6.4	0.9 (0.36)
Serious car accident	(51) 11.2	(27) 7.9	(24) 12.5	(0.66)
Other serious accident	(18) 6.3	(13) 7.9	(5) 0.0	(1.00)
Natural disaster	(19) 0.0	(7) 0.0	(12) 0.0	
Life-threatening illness	(14) 23.5	(8) 38.3	(6) 0.0	(0.23)
Child's life threatening illness	(17) 4.1	(1) 0.0	(16) 4.9	(1.0)
Witnessed killing/serious injury	(152) 4.5	(90) 7.3	(62) 3.9	(0.47)
Discovery a dead body	(20) 4.4	(8) 0.0	(12) 10.1	(1.00)
Learning of traumas to close friend/relative,	(241) 3.3	(112) 2.9	(1330) 3.4	0.02 (0.89)
Close friend/relative raped	(95) 3.4	(37) 5.8	(58) 2.3	(0.56)
Close friend/relative seriously attacked	(51) 1.7	(30) 3.3	(21) 0.0	(1.00)
Close friend/relative car accident	(75) 2.1	(38) 0.0	(37) 3.1	(0.49)
Close friend/relative other accident	(24) 8.2	(7) 0.0	(17) 11.7	(1.00)
Learning about unexpected death	(547) 9.2	(254) 9.4	(289) 8.4	0.03 (87)
Any event	(1,391) 8.7	(679) 7.6	(712) 9.7	3.3 (0.07)

Composite categories in which event types are grouped are highlighted in bold; Female-to-male odds ratio: Assaultive violence 4.0 (95% confidence interval 2.0-8.3); other injury 0.6 (95% confidence interval 0.2-1.7); learning about others 1.1 (95% confidence interval 0.2-5.1); unexpected death 1.0 (95% confidence interval 0.5-1.7) any event 1.4 (95% confidence interval 1.0-2.1); *P for individual event types Fisher's exact test

exception was assaultive violence, which was associated with a significantly higher PTSD risk in females than males, 24.3 vs. 7.4%, respectively ($p < 0.0001$).

Odds ratio based on clustered sampling design was 4.0 (95% CI 1.8-88) no significant tribal differences were detected and the pattern of sex differences in the PTSD risk across event categories did not differ between the tribes (i.e., there were no tribal-by-sex interactions).

The major findings of this study of youth in urban city in Lagos are as follows:

- A high proportion of males 62.5% had experience one or more events involving assaultive violence: 20.3% had been mugged/threatened with a weapon and 24.2% had been shot/stabbed
- The overall conditional risk of PTSD was 8.7%; the PTSD risk following assaultive violence was the highest (16.3%)
- Females' conditional risk of PTSD following exposure to assaultive violence was higher than that of males; females' risk of PTSD did not exceed that of males following other event categories

DISCUSSION

In this study, the specific event types involving assaultive violence that were experienced more frequently by males versus the urban United States sample were shot or stabbed (24.2 vs. 8.2%) and mugged, held up or threatened with a weapon (20.3 vs. 55.0%). In females, the cumulative occurrence of assaultive violence did not vary between the two studies; in each study, approximately one third of females experienced events in this category. Further, females cumulative occurrence of rape and other sexual assault was similar in the two populations. Similar estimates were reported in the National comorbidity survey according to Breslau *et al.* (1999).

In the sample of young adults, the researcher observed no more than a modest association of between tribes with exposure to traumatic experiences. Specifically, she found a small tribal difference in exposure to assaultive violence in males and no difference in exposure to any trauma category in females. Furthermore, the marked sex differences in personally experienced traumatic events were nearly uniform between the three ethnic groups.

Overall, the conditional risk of DSM-IV PTSD associated with the worst event in this study was lower than the risk associated with the worst event in the United States urban sample 8.7 vs. 13.6%.

In both studies however, males were at higher risk of exposure to personally experienced trauma, primarily assaultive violence and females were at greater risk for PTSD following assaultive violence, although the extent of the sex gap in males exposure and in females PTSD response to assaultive violence differed.

Despite the overall lower conditional risk of PTSD in this study, the same rank order was observed across event categories with respect to the risk for PTSD. This finding supports the results obtained by Breslau *et al.* (1999) which found greater risk of developing PTSD in females. According to them females had greater risk of PTSD following assaultive violence but not following other classes of trauma.

CONCLUSION

The results of both epidemiological studies underscore the generalization that only a small minority of community residents who have experienced traumatic events meet the DSM-IV criteria for PTSD. Even among victims of assaultive violence—a trauma category associated with the highest PTSD risk—the vast majority do not develop PTSD.

This consistent finding across epidemiological studies emphasizes the need for investigations of early factors that render some persons susceptible to the PTSD effects of trauma. Future studies will examine potential childhood antecedents of exposure to traumatic events and PTSD.

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