Psychiatry and Primary Care

Recent epidemiologic studies have found that most patients with mental illness are seen exclusively in primary care medicine. These patients often present with medically unexplained somatic symptoms and utilize at least twice as many health care visits as controls. There has been an exponential growth in studies in this interface between primary care and psychiatry in the last 10 years. This special section, edited by Jürgen Unutzer, M.D., will publish informative research articles that address primary care-psychiatric issues.

Trauma exposure and stress-related disorders in inner city primary care patients ☆

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Abstract

Objective: This study was undertaken to increase understanding of environmental risk factors for posttraumatic stress disorder (PTSD) and major depressive disorder (MDD) within an urban, impoverished, population.
Method: This study examined the demographic characteristics, patterns of trauma exposure, prevalence of PTSD and MDD, and predictors of posttraumatic stress and depressive symptomatology using a verbally presented survey and structured clinical interviews administered to low-income, primarily African-American (>93%) women and men seeking care in the primary care and obstetrics–gynecology clinics of an urban public hospital.
Results: Of the sample, 87.8% (*n*=1256) reported some form of significant trauma in their lifetime. Accidents were the most common form of trauma exposure followed by interpersonal violence and sexual assault. Childhood level of trauma and adult level of trauma separately, and in combination, predicted level of adult PTSD and depressive symptomatology. The lifetime prevalence of PTSD was 46.2% and the lifetime prevalence of MDD was 36.7%.
Conclusions: These data document high levels of childhood and adult trauma exposure, principally interpersonal violence, in a large sample of an inner-city primary care population. Within this group of subjects, PTSD and depression are highly prevalent conditions.
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1. Introduction

Posttraumatic stress disorder (PTSD) is a severely debilitating, stress-related psychiatric illness associated with trauma exposure. The lifetime prevalence of PTSD in the general population has been estimated to be 5–10% [1] with higher rates of PTSD being observed among combat veterans [2,3] and individuals living in areas of high violence [4]. Depression [1,5,6], substance abuse [4,6] and suicide [7] are commonly observed behavioral comorbidities. Patients with PTSD experience intrusive and fearful memories as well as flashbacks and nightmares of the traumatic event(s) for much of their lives, may avoid other people and have difficulty retaining jobs. These psychiatric symptoms, in turn, have an adverse influence on patient compliance with treatment of concurrent medical illness [8–12] and substance use [13] and may independently influence progression and risk for non-psychiatric medical disease [11,14].

Among civilians, African American and Latino populations living in urban areas appear to be exposed to extreme amounts of trauma [15,16]. For example, economically disadvantaged African Americans living within urban environments experience high levels of trauma [16–20] and a very large amount of this exposure occurs during youth [18–20]. The clinical and biological consequences of trauma exposure and neglect during youth and adulthood are well documented and substantially elevate adult risk for mood and anxiety disorders [5–7,21,22], suicide attempt [6,21], substance abuse [6,21], unintended first pregnancy [23], systemic inflammation [24,25] and a variety of medical illnesses including obesity [21,26–28] cardiovascular disease [29–32], cerebrovascular disease [33], diabetes mellitus [28,32,34], cancer [33] and autoimmune disorders [32]. Further, a graded relationship appears to exist between exposure to trauma and psychiatric/health morbidity in adulthood [6,21]. A growing body of evidence suggests that trauma-related psychopathology contributes to intergenerational patterns of violence [35–39] with the potential for psychiatric illness and medical illness across generations and constitutes a major public health problem.

We have previously reported findings from a subset of the patients described in this manuscript with respect to gene×environment effects, consequent to child abuse, on risk for severity of symptoms of depression [40] and PTSD [41], two of the most common psychiatric outcomes of trauma exposure. The purpose of this article is to describe the demographic characteristics, rates and types of trauma exposure, rates of psychopathology and the inter-relationships between subject demographics, developmental timing of trauma exposure and psychopathology in our now significantly larger study population.

2. Methods

2.1. Sample, recruitment and procedure

The data from this study were collected to investigate the demographic and trauma exposure characteristics of a population of urban, low-income, predominantly African-American men and women and the relationship of these variables to posttraumatic stress and depressive symptomatology as well as the presence of PTSD and major depressive disorder (MDD).

Initial interviews were performed with 1600 participants approached while in the waiting rooms of primary care or obstetrical–gynecological clinics of Grady Memorial Hospital in Atlanta, GA, USA, from 2005 to 2008. Subject recruitment took place Monday–Friday during regular clinic hours. Subjects were approached while waiting for appointments in the primary care and obstetrical–gynecological clinics by a member of the research team and solicited for study participation. During the recruitment phase of this study, 58% of those approached agreed to participate, and a cumulative percentage of 84% and 91% of the second and third subject approached agreed if the initial subject approached did not participate. Subjects were informed at the time of initial contact that the study they were being asked to participate in examined trauma exposure during childhood and adulthood. Those subjects who agreed to participate completed a battery of self-report measures which took 45–75 min to complete (dependent in large part on the extent of the participant's trauma history and symptoms). Due to variation between subjects with respect to literacy, all self-report measures were obtained by verbal interview including measures originally designed and normed for paper and pencil response. Each person was paid $15 for participation in this phase of the study. Study participants completing the initial interview were invited to participate in a secondary phase of the study in which additional detailed measures of trauma exposure were administered. During this phase of the study, 318 subjects (participation refusal rate of 80.1%) completed additional self-report measures and structured clinical interviews, including the Clinician Administered PTSD Scale (CAPS) and Structured Clinical Interview for *DSM-IV* (SCID-DSMIV), to assess the presence or absence of PTSD and MDD. Participants were paid $60 for participation in this secondary phase of the study.

Eligibility requirements for all phases of the study included the ability to give informed consent. Written and verbal informed consent was obtained for all subjects. Exclusion criteria included mental retardation or active psychosis. All procedures in this study were approved by the institutional review boards of Emory University School of Medicine and Grady Memorial Hospital.

2.2. Measures

2.2.1. Demographic, legal and general medical history measures

2.2.1.1. Demographics form. The Demographics Form is locally developed and assesses subject age, self-identified race, marital status, education, income, employment and disability status.

2.2.1.2. Legal history form. The Legal History Form is locally developed and assesses legal history of subjects related to arrest and detention history.

2.2.1.3. General psychiatric history form. The General Psychiatric History Form is locally developed and assesses self-reported general psychiatric history with respect to family psychiatric history, diagnosis, voluntary/involuntary hospitalization, suicide attempts and past/present substance abuse.

2.2.2. Trauma exposure measure
2.2.2.1. The traumatic events inventory. The Traumatic Events Inventory (TEI) [39,42] is a 14-item screening instrument for lifetime history of traumatic events. For each traumatic event, the TEI assesses experiencing and witnessing of events separately. In addition to assessing presence and absence of each type of trauma exposure, the TEI also assesses frequency of trauma exposure within each type of trauma.

Child Abuse. Two of the TEI questions assess physical abuse and sexual abuse occurring before age 14. Based on these questions, 17.2% of the sample reported a history of childhood physical abuse, and 19% of the sample reported a history of childhood sexual abuse. With these data, we created a three-level categorical variable reflecting number of types of child abuse: no child abuse [70.6% (*n*=960) of sample], one type of either physical or sexual abuse [22.4% (*n*=304)] or two types — both physical and sexual abuse [7.0% (*n*=95)] for use in subsequent analyses.

Non-Childhood Abuse Trauma. The remaining TEI questions address other types of trauma exposure (see a subset of these traumas in Table 3). To summarize the level of exposure to trauma other than child abuse, we summed the total number of different types of non-child abuse trauma exposure reported by each subject. The average number of types of non-child abuse trauma reported in this sample was 2.5 types (range=0–17) (S.D.=2.05). Using the same data, we created a four-level categorical variable reflecting number of types of non-child abuse trauma experienced reported with 21.7% (*n*=263) falling into the no non-child abuse trauma exposure category, 13.7% (*n*=166) reporting 1 type, 33.3% (*n*=404) reporting 2-3 types and 31.3% (*n*=379) reporting 4 or more types of non-child abuse trauma. The total number or types of trauma exposure variable was created and used in our data analysis because in our prior work [39,42] and in other research on the impact of trauma exposure [43] it relates in a predictable and consistent manner with a number of measures of adaptive functioning and trauma related functioning.

2.2.3. Posttraumatic stress and depressive symptomatology and diagnoses
2.2.3.1. PTSD symptom scale. The PTSD Symptom Scale (PSS) is a psychometrically valid 17-item self-report scale assessing PTSD symptomatology [39,42,44–46] over the prior 2 weeks. Consistent with prior literature, we summed the PSS frequency items ("0: not at all" to "3: ≥5 times a week") to obtain a continuous measure of PTSD symptom severity ranging from 0 to 51. For this sample, the PSS frequency items had a standardized alpha coefficient of .93 (*M*=13.46, S.D.=12.18).

2.2.3.2. Beck depression inventory. Depressed mood was assessed with the 21-item Beck Depression Inventory (BDI) [47], a commonly used continuous measure of level of depressive symptoms [48]. In this sample, the BDI had a standardized alpha coefficient of .92 (*M*=10.86, S.D.=11.71).

2.2.3.3. Clinician administered PTSD scale. The CAPS [49,50] is an interviewer-administered diagnostic instrument measuring PTSD. It has excellent psychometric properties [49,51]. The CAPS provides a diagnostic measure of PTSD and assesses lifetime and current PTSD. For each of the 17 diagnostic criteria the CAPS rates frequency and intensity scores on a scale of 0 (absent) to 5 (extremely severe). The data reported here represents the CAPS score and diagnosis based on the subjectively worst trauma reported for each subject. The scoring rule we used was based on the presence/absence of each of the 17 *DSM* diagnostic criteria using a frequency rating of 1 or higher paired with an intensity score of 2 or higher [49,50]. Subjects were scored as having PTSD if they met *DSM-IV* PTSD criteria from the CAPS interview.

2.2.3.4. Structured clinical interview for DSM-IV. The SCID-DSMIV [52], is a validated interview assessment of *DSM-IV* mood disorders and was used to assess the presence or absence of MDD as well as other mood disorders within our study population.

2.3. Statistical analyses

2.3.1. Demographic characteristics, legal and psychiatric history of the sample
    Descriptive statistics on the demographic characteristics, legal history, general psychiatric history as assessed in the screening forms were calculated and expressed in terms of the total number of subjects and percentages of the sample as a function of gender and a particular characteristic. We examined gender differences with respect to these variables using chi-square tests.

2.3.2. Prevalence of childhood and non-childhood types of trauma exposure
    Descriptive statistics on the types of trauma exposure experienced by the subjects as assessed by the TEI were calculated and expressed in terms of percentages of the sample as a function of gender and a particular characteristic or trauma exposure. Gender differences with respect to type of trauma exposure were examined with chi square tests.

2.3.3. Prevalence of PTSD and MDD within the sample
    The current and lifetime prevalence of PTSD and MDD was estimated using a subset of subjects from within our sample that self-selected to proceed beyond the screening phase of our study. Demographic characteristics (sex, age, race, education, employment, disability status, monthly income) of this subsample differed from those of the general sample from which they were drawn. Compared to the general sample, the interview group had a greater percentage of male subjects (40.3% vs. 35.5%), with a lower rate of employment (22.8%

Table 1
Sample demographics

Demographic	Total sample (N), %	Male (n), %	Female (n), %
Age (n=1565)			
18–24	(287), 18.3%	(60), 10.7%	(223), 22.6%
25–34	(303), 19.4%	(86), 15.3%	(216), 21.9%
35–44	(285), 18.2%	(107), 19.0%	(176), 17.8%
45–54	(424), 27.1%	(195), 34.6%	(224), 22.7%
55–64	(242), 15.5%	(84), 14.9%	(158), 16.0%
≥65	(56), 3.6%	(20), 3.6%	(33), 3.3%
Self-identified race/ethnicity (n=1574)			
Black	(1469), 93.3%	(528), 93.1%	(926), 93.4%
White	(58), 3.7%	(18), 3.2%	(40), 4.0%
Hispanic or Latino	(9), 0.6%	(3), 0.5%	(6), 0.6%
Asian	(3), 0.2%	(3), 0.5%	(0), 0%
Mixed	(17), 1.1%	(6), 1.1%	(10), 1.0%
Other	(18), 1.1%	(9), 1.6%	(9), 0.9%
Education (n=1572)			
Did not complete 12th grade	(396), 25.2%	(136), 24.0%	(255), 25.8%
High school graduate	(576), 36.6%	(210), 37.1%	(359), 36.3%
Graduate equivalency diploma	(88), 5.6%	(31), 5.5%	(57), 5.8%
Some college/technical school	(320), 20.4%	(114), 20.1%	(204), 20.6%
Technical school graduate	(61), 3.9%	(17), 3.0%	(43), 4.3%
College graduate	(110), 7.0%	(48), 8.5%	(62), 6.3%
Graduate School	(20), 1.3%	(10), 1.8%	(10), 1.0%
Employment (n=1574)			
Currently unemployed*	(1029), 65.4%	(391), 68.8%	(629), 63.5%
Disability (n=1567)			
Currently receiving disability**	(346), 22.1%	(151), 26.8%	(192), 19.4%
Household monthly income, US$ (n=1539)			
0–249	(421), 27.3%	(177), 31.5%	(239), 24.8%
250–499	(150), 9.7%	(42), 7.5%	(106), 11.0%
500–999	(410), 26.6%	(141), 25.1%	(267), 27.8%
1000–1999	(375), 24.4%	(125), 22.2%	(246), 25.6%
≥2000	(183), 11.9%	(77), 13.7%	(104), 10.8%

Note that for the entire sample, N=1600; however, because some participants declined to answer some questions, the total n in each demographic category may vary slightly.
Gender differences with respect to the above demographic variables were assessed using chi-square.
  * $P<.05$.
  ** $P<.001$.

vs. 37.5%) and a higher rate of receiving disability support (30.5% v 20.0%). The presence or absence of PTSD was determined using the CAPS criteria for PTSD and the SCID-DSMIV criteria for MDD. Current and lifetime prevalence for PTSD and MDD was expressed as the percentage of the sample meeting diagnostic criteria for PTSD and MDD.

2.3.4. Effects of childhood and non-childhood types of trauma exposure on risk for posttraumatic stress and depressive symptoms

We assessed the individual and combined effects of childhood trauma and adult trauma on posttraumatic stress and depressive symptoms (as measured with the PSS and the

BDI) using trauma exposure variables constructed from the TEI. To perform these analyses, we first employed a general linear model (controlling for age and sex), using the PSS and BDI total scores as dependent variables, and a TEI categorical variable representing number of types of non-child abuse traumatic experiences as the independent variable. We then examined whether child abuse exposure also predicted the level of current PTSD and depressive symptomatology and performed the same analyses as above with a categorical child abuse variable (none, one type — physical or sexual, two types — physical and sexual) constructed from the TEI child abuse items. Finally, we examined the combined effects of child abuse and non-child abuse trauma using a general linear model that included both non-childhood abuse trauma and child abuse trauma and their interaction term as predictors of adult PTSD and depressive symptoms.

3. Results

3.1. Demographic, legal and general psychiatric characteristics of the sample

Table 1 summarizes the demographic characteristics of our sample. The mean±S.D. subject age was 40.4±13.9 years. Female subjects (n=993, 63.6%) outnumbered male subjects (n=569, 36.4%) and the self-identified race of our sample was predominantly African-American (n=1469, 93.3%). The majority of the subjects (n=1029, 65.4%)

Table 2
Legal and psychiatric history of study participants

Historical characteristic	Total sample (N), %	Male (n), %	Female (n), %
Legal history			
Ever arrested***** (n=1387)	(767), 55.3%	(395), 79.5%	(372), 41.8%
Ever been in jail***** (n=1392)	(721), 51.8%	(374), 75.1%	(347), 38.8%
Ever been in prison**** (n=1388)	(183), 13.2%	(131), 26.4%	(52), 5.8%
Violence charge* (n=1382)	(267), 19.3%	(126), 25.4%	(141), 15.9%
Weapons charge*** (n=1369)	(152), 11.1%	(87), 17.6%	(65), 7.4%
Psychiatric history			
Psychiatric hospitalization (n=1546)	(233), 15.1%	(84), 15.0%	(149), 15.1%
Involuntary psychiatric hospitalization (n=1539)	(78), 5.1%	(23), 4.1%	(55), 5.6%
Suicide Attempt** (n=1540)	(207), 13.4%	(43), 7.6%	(164), 16.8%

Note that because some participants declined to answer some questions, the total N in each legal and psychiatric history category may vary slightly. Gender differences with respect to the above legal and psychiatric history variables were assessed using chi-square.
  * $P<10^{-4}$.
  ** $P<10^{-6}$.
  *** $P<10^{-8}$.
  **** $P<10^{-25}$.
  ***** $P<10^{-35}$.

Table 3
Percent of sample reporting lifetime exposure to traumatic experiences assessed by traumatic events inventory

Trauma type experienced	Number of respondents	Total sample (N), %	Male (n), %	Female (n), %
Any significant trauma	1431	(1256), 87.8%	(472), 90.9%	(767), 86.1%
Natural disaster****	1396	(307), 22.0%	(149), 28.9%	(158), 17.9%
Serious accident or injury****	1264	(590), 46.7%	(261), 56.1%	(329), 41.2%
Sudden life-threatening illness***	1388	(336), 24.2%	(157), 30.7%	(179), 20.4%
Military combat******	1377	(44), 3.2%	(38), 7.5%	(6), 0.7%
Attacked with knife, gun or other weapon by someone other than intimate partner*******	1369	(468), 34.2%	(280), 55.1%	(188), 21.8%
Attacked with knife, gun or other weapon by intimate partner*	999	(179), 17.9%	(85), 22.2%	(94), 15.3%
Attacked without a weapon by someone other than intimate partner******	1351	(392), 29.0%	(202), 40.3%	(190), 22.4%
Attacked without a weapon by intimate partner*	987	(293), 29.7%	(91), 24.3%	(202), 33.0%
Witness of murder of friend or family Member**	1363	(126), 9.2%	(64), 12.7%	(62), 7.2%
Sexual Contact 17 years and older with physical force*****	1043	(91), 8.7%	(9), 2.2%	(82), 12.9%
Sexual Contact aged 14-17 years with physical force******	1322	(159), 12.0%	(18), 3.7%	(141), 16.9%
Sexual Contact aged 13 years and younger*****	1331	(253), 19.0%	(53), 10.8%	(200), 23.9%
Beaten as a Child	1340	(230), 17.2%	(84), 16.9%	(146), 17.3%

Note that because some participants declined to answer some questions, the total N in each trauma-type category may vary slightly.

Gender differences with respect to the above trauma exposure categories were assessed using chi-square.

* $P<.05$.
** $P<.01$.
*** $P<10^{-3}$.
**** $P<10^{-5}$.
***** $P<10^{-9}$.
****** $P<10^{-13}$.
******* $P<10^{-22}$.

were unemployed at the time of initial interview, and nearly a quarter of the subjects ($n=346$, 22.1%) were receiving disability payments. The socioeconomic status of the majority of subjects is very low, with 88.1% of the sample ($n=1356$) having a mean monthly household income of less than \$2000 and 27% of the sample ($n=421$) having a mean monthly household income of less than \$250.

Table 2 summarizes the history of legal and general psychiatric problems of our sample as a function of gender. Legal difficulties were common in our sample. Over half of the participants have been arrested ($n=767$, 55.3%) and jailed ($n=721$, 51.8%); 13.2% of the subjects ($n=183$) have served time in prison, 19.3% ($n=267$) have been arrested or detained on violence charges and 11.1% ($n=152$) have been arrested or detained on charges involving weapons. Legal problems of all categories were significantly more common in males than females.

We examined self-reported history of voluntary and involuntary psychiatric hospitalization and attempted suicide as basic markers of psychiatric morbidity in our study population. Of subjects, 15.1% ($n=233$) reported prior voluntary psychiatric hospitalization with equal rates of admission observed between genders; 5.1% ($n=78$) of subjects reported a history of involuntary psychiatric hospitalization which was more common in female ($n=55$, 5.6%) than male ($n=23$, 4.1%) subjects and 13.4% ($n=207$) of our sample have made suicide attempts which were accounted for by a greater percentage of female ($n=164$, 16.8%) than male subjects ($n=43$, 7.6%).

3.2. Prevalence of childhood and non-childhood types of trauma exposure

Table 3 summarizes the lifetime prevalence and gender differences in rates of different types of trauma exposure as measured with the TEI. Of the sample, 87.8% ($n=1256$) experienced some form of significant trauma in their lifetime and the rates of significant trauma exposure were similarly high for both female ($n=767$, 86.1%) and male ($n=472$, 90.9%) subjects. For female ($n=329$, 41.2%) as well as male ($n=261$, 56.1%) subjects, involvement in serious accidents was the most common traumatic exposure. Assault by intimate partner without a weapon was the second most common form of trauma exposure in female subjects ($n=202$, 33.0%) and assault with a weapon by a person other than intimate partner was the second most common form of trauma

Table 4
Point and lifetime prevalence of PTSD and MDD

Diagnosis and assessment method	Point prevalence: sample (n), %	Point prevalence: males (n), %	Point prevalence: females (n), %	Lifetime prevalence: sample (n), %	Lifetime prevalence: males (n), %	Lifetime prevalence: females (n), %
PTSD CAPS ($n=318$) subset followed up	(60), 18.8%	(20), 16.4%	(37), 20.4%	(146), 46.2%	(56), 45.5%	(85), 47.8%
MDD SCID ($n=312$) subset followed up	(51), 16.3%	(18), 13.8%	(30), 18.0%	(122), 36.7%	(46), 32.6%	(70), 39.8%

exposure in male subjects (n=280, 55.1%). Military combat was the least common form of trauma exposure for female subjects (n=6, 0.7%), and sexual assault as an adult was the least common exposure for male subjects (n=9, 2.2%). However, 12.9% (n=82) of female subjects report a history of sexual assault during adulthood.

With respect to childhood and adolescent trauma exposure, 17.2% (n=230) of the subjects reported a personal history of physical abuse. Rates of physical abuse were not significantly different for male (n=84, 16.9%) and female (n=146, 17.3%) subjects. In contrast, 19.0% (n=253) of the sample reported a history of sexual abuse during childhood (13 years old and younger) occurring slightly more than twice as often in female (n=200, 23.9%) than male (n=53, 10.6%) subjects. Forced sexual contact during adolescence (14–17 years old) was reported over four times as often by female subjects (n=141, 16.9%) compared to male subjects (n=18, 3.7%).

3.3. Prevalence of PTSD and MDD within the sample

All subjects from the initial interview were invited to participate in our more detailed secondary phase of interviews. Point and lifetime prevalence of PTSD was assessed, using the CAPS, in this subset (n=318) of subjects who self-selected into this secondary phase of the study. Table 4 summarizes the current and lifetime prevalence of PTSD and MDD in this subset. The point prevalence of PTSD for the sample as a whole, as determined using the CAPS, was 18.8% (n=60). With respect to gender, the point prevalence of PTSD was 16.4% (n=20) for male subjects and 20.4% (n=37) for female subjects. The lifetime prevalence of PTSD for the sample as a whole, as determined using the CAPS, was 46.2% (n=146). With respect to gender, the lifetime prevalence of PTSD was 45.5% (n=56) for male subjects and 47.8% (n=85) for female subjects.

Point and lifetime prevalence of MDD was also assessed in this subset using the SCID-DSMIV (n=312). The point prevalence of MDD for the sample as a whole, as determined using the SCID, was 16.3% (n=51). With respect to gender, the point prevalence of MDD using the SCID was 13.8% (n=18) for male subjects and 18.0% (n=30) for female subjects. The lifetime prevalence of MDD for the sample as a whole, as determined using the SCID, was 36.7% (n=122).

Table 5
Effects of non-child abuse trauma exposure on post-traumatic stress and depressive symptoms

Level of non-child abuse trauma	N	Mean PTSD symptom scale score	95% confidence intervals	N	Mean BDI Score	95% confidence intervals
None	229	4.3	3.3–5.3	245	8.7	7.3–10.0
1 Type	154	6.6	5.2–8.1	154	10.4	8.8–12.1
2–3 Types	374	11.3	10.2–12.5	358	13.5	12.3–14.7
≥4 Types	342	17.4	16.0–18.7	326	17.7	16.3–19.1

Table presents mean PSS and BDI scores and their 95% confidence intervals as a function of level of non-child abuse trauma exposure.

Table 6
Effects of child abuse trauma exposure and post-traumatic stress and depressive symptoms

Level of child abuse trauma	N	Mean PTSD symptom scale score	95% confidence intervals	N	Mean BDI Score	95% confidence intervals
No child abuse	887	8.5	7.8–9.2	893	11.2	10.5–12.0
1 Type of child abuse	291	15.1	13.8–16.5	273	18.2	16.7–19.8
2 Types of child abuse	86	21.4	18.4–24.4	79	21.1	17.9–24.3

Table presents mean PSS and BDI scores and their 95% confidence intervals as a function of level of child abuse trauma exposure.

With respect to gender, the lifetime prevalence of MDD using the SCID was 32.6% (n=46) for male subjects and 39.8% (n=70) for female subjects.

3.4. Effects of childhood and non-childhood trauma exposure on posttraumatic stress and depressive symptoms

Adult trauma exposure and childhood trauma exposure were both found to be predictors of the level of adult posttraumatic stress and depressive symptomatology alone and in combination.

3.4.1. Effects of non-child abuse trauma exposure on posttraumatic stress and depressive symptoms

We employed a general linear model (controlling for age and sex), using the PSS total score and BDI total score as the dependent variables, and the TEI categorical variable representing number of types of non-child abuse traumatic experiences as the independent variable. We found a significant gender effect (PSS: $F=22.1$, $P<.001$, BDI: $F=32.5$, $P<.001$) and a strong non-child abuse trauma exposure effect (PSS: $F=85.4$, $P<.001$, BDI: $F=38.3$, $P<.001$) (Table 5). In the zero types of non-child abuse trauma group, the mean (S.D.) PSS score was 4.35 (7.68) and continuously increased by more than fourfold to 17.4 (12.9) in the four or more types of trauma group. The BDI score increased slightly more than two-fold from the no trauma to severe trauma groups.

3.4.2. Effects of child abuse trauma exposure on posttraumatic stress and depressive symptoms

We examined whether child abuse exposure predicted adult posttraumatic stress and depressive symptomatology.

Table 7
Interaction of child abuse trauma and non-child abuse trauma exposure on post-traumatic stress symptoms

PTSD symptoms (PSS), mean±SE	Child abuse, none	Child abuse, 1 type	Child abuse, 2 types
Non-child abuse trauma None	3.8±0.51	7.0±1.93	11.0±5.57
1 Type	5.6±0.73	11.3±2.43	10.7±2.59
2–3 Types	9.8±0.65	14.9±1.19	19.0±3.32
≥4 Types	14.5±0.95	18.5±1.14	23.4±1.86

Table 8
Interaction of child abuse trauma and non-child abuse trauma exposure on depressive symptoms

BDI, mean±SE	Child abuse, none	Child abuse, 1 type	Child abuse, 2 types
Non-Child Abuse Trauma None	8.1±0.70	11.9±1.94	20.6±11.1
1 Type	9.3±0.88	15.6±2.67	15.2±5.20
2–3 Types	11.8±0.65	17.9±1.35	17.6±3.98
≥4 Types	15.0±0.89	19.9±1.28	21.8±1.96

We performed the same analyses as above, controlling for age and gender, with the categorical child abuse variable (none, one type — physical or sexual, two types — physical and sexual). Similar to the effect of non-child abuse trauma, we also found a significant effect of the presence of child abuse (PSS: $F=78.9$, $P<.001$; BDI: $F=50.7$, $P<.001$). The experience of child abuse increased the mean PSS scores nearly threefold, and the PSS, scores nearly twofold (Table 6).

3.4.3. Interaction of child abuse trauma and non-child abuse trauma exposure on posttraumatic stress and depressive symptoms

We then used a general linear model that included both non-childhood abuse trauma and child abuse trauma and their interaction term as predictors of adult PTSD symptoms (Table 7) and depressive symptoms (Table 8). For BDI total scores, we observed significant main effects of the two terms and gender (non-child abuse trauma $F=6.0$, $P<.001$; child abuse trauma $F=13.2$, $P<.001$, and gender $F=20.9$, $P<.001$) but no significant interaction ($F=0.27$, $P=.95$). Even after covarying for age, sex, race/ethnicity, income, education and relationship status, the main effects for BDI scores remain significant for non-child abuse trauma ($F=4.1$, $P=.007$), and child abuse trauma ($F=13.6$, $P<.001$). For PSS total scores, we observed significant main effects of the two terms and gender (non-child abuse trauma $F=19.3$, $P<.001$; child abuse trauma $F=12.8$, $P<.001$, and gender $F=11.1$, $P<.001$) but no significant interaction ($F=0.27$, $P=.95$). Even after covarying for age, sex, race/ethnicity, income, education and relationship status, the main effects for PSS scores remain significant for non-child abuse trauma ($F=17.0$, $P<.001$) and child abuse trauma ($F=12.8$, $P<.001$). With both PTSD symptom and depression symptom measures, we find a steady additive relationship such that each additional level of child abuse experience or each level of non-child abuse experience increases the PSS and BDI in a significant and graded fashion (Tables 7 and 8). These data demonstrate that exposure to child abuse increases risk for higher levels of PTSD symptoms in response to non-child abuse trauma exposure.

4. Comment

Our cross-sectional retrospective study replicates and extends the findings of previous reports [4,16,39] examining the prevalence and consequences of trauma exposure in urban, predominantly African-American and impoverished, popula-

tions. In this study, we found that African-American and subjects of other ethnicities with low socioeconomic status, ascertained while receiving primary care at an urban, public hospital, were at high risk of exposure to traumatic events and the development of stress-related psychiatric illness.

A number of studies have examined the prevalence of trauma exposure and risk for PTSD in both civilian primary care samples [4,53–56] and veteran primary care samples [57,58]. Reported rates of current PTSD range from 2% [54] to approximately 24% [4] depending on sample socio-economic characteristics and methodological variation in the determination of trauma exposure and psychiatric morbidity. Alim et al. [4] conducted a study with a predominantly African-American primary care sample, similar to our own, and found a lifetime trauma exposure rate of 65% whereas 87.8% of our sample experienced some form of traumatic event. In our study, these events consisted of serious accidents and various forms of interpersonal violence. A greater percentage of male than female subjects reported exposure to non-interpersonal trauma types (natural disaster, serious accidents, life-threatening illness) as well as most forms of nonsexual interpersonal violence (attacks with and without weapons by nonintimate partner, attacks with weapon by intimate partner) as observed by other investigators [4,16,59,60]. Consistent with previous reports [4,59,60], female subjects reported much higher rates of sexual assault during childhood and adulthood as well as attacks without a weapon by an intimate partner. Interestingly, the only category of trauma exposure that we were unable to identify a significant gender difference with respect to trauma exposure was that of physical abuse — being beaten as a child. It is not clear whether these differences represent gender-related differences with respect to actual trauma exposure, gender-related differences in reporting or recall bias or an interaction of these two factors. These data are similar with respect to rates of trauma exposure (83%) to those we have previously published [39] describing trauma exposure in a predominantly African-American sample of convenience recruited from an inner-city mental health clinic.

Compared to national averages, the lifetime prevalence of PTSD was substantially elevated in our sample (46.2%). In the National Comorbidity Survey, Kessler et al. [1] reported that the lifetime prevalence of PTSD was 7.8% with female subjects being twice (10.4%) as likely as male subjects (5.0%) to develop PTSD. Similar to our findings, Alim et al. [4], in their sample of urban African-American primary care patients, also found a high lifetime prevalence of PTSD (51%) with female subjects (60%) being nearly twice as likely as male subjects (33%) to develop PTSD consistent with gender differences in rates of PTSD previously reported by other investigators [61–67]. The lifetime prevalence of MDD was also very high (36.7%) in our sample and elevated relative to data from the National Comorbidity Survey [68]. As with PTSD, the lifetime prevalence of MDD within our sample was also comparable to the overall lifetime rate of MDD (35%) observed by Alim et al. [4]. Data from the

National Comorbidity Survey indicate that PTSD and MDD are frequently comorbid conditions in trauma exposed individuals [1].

In addition to our examination of the current and lifetime prevalence of PTSD and MDD, we also examined the effects of the type, extent and developmental timing of trauma exposure on post-traumatic stress and depressive symptoms. Consistent with previous reports [69], we found that trauma of an interpersonal nature such as sexual assault and physical child abuse followed by nonsexual assault had the largest impact on both post-traumatic stress and depressive symptoms. An important consideration in the interpretation of these data is the overrepresentation of female subjects in the sexual assault categories and overrepresentation of male subjects in the non-sexual assault categories. The increased vulnerability of women to the development of PTSD and MDD may be responsible for the large effects of sexual assault on post-traumatic stress and depressive symptoms. Conversely, the decreased vulnerability of men to develop PTSD and MDD (relative to women) may reduce the effects of nonsexual assault on posttraumatic stress and depressive symptoms. Of note, we did not identify a gender difference in the exposure rate of child physical abuse which had effects on posttraumatic stress and depressive symptoms comparable to those of sexual assault. Exposure to multiple traumatic events across the lifespan is relatively common, particularly in certain populations at high risk of trauma exposure [1,16,59,69–71] and is associated with elevated risk for negative psychiatric outcomes [6,7,69,71]. Consistent with this, we found that exposure to either childhood trauma, adult trauma, or both produced graded effects on posttraumatic stress as well as depressive symptoms as described in previously reported data derived from patients with PTSD [39,41,72–76] and MDD [77–82].

There are several limitations to this study. We utilized a cross-sectional approach to retrospectively assess the prevalence of trauma exposure and psychopathology in subjects recruited from the primary care clinics of an urban county hospital. Although the demographic characteristics of our sample limit the generalizability of our findings to the general population as well as many primary care and African-American samples, we believe that our report highlights the extensive trauma exposure experienced by urban African Americans with limited financial means and poor access to health care. The use of retrospective data is also a significant limitation of our study. Retrospective bias in the recall of putative etiological events has been studied the most with subjects who have major depression [77,83,84], and our use of retrospective data to assess trauma may have inflated our estimate of trauma exposure in subjects with PTSD as reports of trauma exposure are correlated with PTSD symptoms [85,86]. In general support of this, a recently reported prospective study of the effects of prior trauma exposure on risk for PTSD suggests that risk for PTSD is only increased by exposure to subsequent trauma in individuals who had previously developed PTSD in response to prior trauma [87]. Unfortunately, this report did not consider exposure to childhood trauma exposure in its analysis, which may limit interpretation of the effects of childhood trauma on adult risk for PTSD and MDD. Other additional limitations of this study include the possible induction of social desirability response bias caused by reading of items on screening instruments to subjects by study interviewers rather than having subjects submit written answers and the use of the BDI to assess depressive symptoms in our primary care-derived sample which may overestimate depressive symptoms due to overlap of medical and depressive symptoms on the BDI.

These data document the extraordinarily high levels of childhood and adult trauma exposure, principally in the form of interpersonal violence, in a large, sample of an urban, primary care population. Within this group of subjects, PTSD and depression are highly prevalent conditions. Civilian trauma-related disorders, especially among impoverished, urban populations, carry enormous societal burdens. Furthermore, these findings suggest that intergenerational cycles of violence and trauma may be endemic in America's urban environments.

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