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Somatic symptoms, peer and school stress, and family and community violence exposure among urban elementary school children

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Abstract Somatic symptoms are a common physical response to stress and illness in childhood. This study assessed 409, primarily African American (85.6 %), urban elementary school children to examine the association between: (1) somatic symptoms and potential external stressors (school and peer stress, family conflict, and community violence) and (2) parent and child agreement on children's self-report of somatic symptoms. The odds of self-report of somatic complaints were significantly associated with family conflict, school and peer stress, and community violence exposure (OR = 1.26, 95 % CI: 1.05–1.50; OR = 1.18, 95 % CI 1.08–1.28; and OR = 1.02, 95 % CI: 1.00–1.05, respectively). Identifying the associations between social, family, and community based stress and somatic symptoms may improve the quality of life for children living in urban environments through early identification and treatment.

Keywords Somatic symptoms · Peer relations · Family conflict · Youth · Minority · African American

Introduction

Somatic symptoms are subjective reports of physical symptoms such as headaches, stomachaches, or muscle pain. There are multiple socio-emotional factors associated with reports of somatic symptoms among elementary school-aged children (Garralda, 2010), including stress and reduced coping abilities (Walker et al., 2007). Children with chronic disease may have poor coping skills that may be related to somatic symptoms (Stewart et al., 2010). Personality characteristics and dysregulation in the first year of life are associated with children's development of somatic symptoms (Ramchandani et al., 2006; Walker et al., 2007). Children and adolescents with psychological disorders, such as anxiety and post-traumatic stress, may report somatic symptoms (Dhossche et al., 2001; Ginsburg et al., 2006; Hughes et al., 2008; Janssens et al., 2010; Terwogt et al., 2006). This is also true for individuals with depressive disorders (Bohman et al., 2010; Janssens et al., 2010; Terwogt et al., 2006; Williams et al., 2002). Familial issues that are associated with reports of somatic symptoms such as poor parent and child communication, parental rejection, hostility, unreasonable parent expectations, parental history of psychopathology and substance abuse may also be associated with increased stress and increased somatic symptoms (Bursch et al., 2008; Garralda, 2010; Riggs et al. 2007).

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Approximately one-fourth of school-aged children who report somatic symptoms also have subsequent mental health consequences (Dhossche et al., 2001). In a population-based longitudinal study of 800 Finnish children, those with a history of reporting somatic symptoms at 3 years of age were more likely to have internalizing and externalizing behavior problems at 12 years (Pihlakoski et al., 2006). Adolescents who reported somatic symptoms were six to nine times more likely to report somatic symptoms in adulthood (Dhossche et al., 2001). There are, however, few empirical studies on the prevalence of and associations between developing somatic symptoms and stress in urban children in the United States, particularly those who are African American (Brill et al., 2001; Kingery et al., 2007; Rask et al., 2009). The current study investigated the associations between external stressors and reports of somatic symptoms in a population of young, primarily African American, children living in an urban environment.

Somatic symptoms in African American children

Kingery et al. (2007) found an association between anxiety and somatic symptoms among African American adolescents. African American adolescents with increased self-reports of anxiety reported an average of 2.5 somatic symptoms (e.g., feeling tense or uptight, stomachaches, chest pains; Kingery et al. 2007). Youth in the "high anxiety" group reported four times more somatic symptoms compared to adolescents in the "low anxiety" group (Kingery et al. 2007). When girls and boys were examined separately, the association between anxiety and somatic symptoms was found only in girls. However, in the six-month follow-up study, initial reports of somatic symptoms predicted anxiety symptoms for both genders (Kingery et al. 2007). In another study of urban, low-income, primarily African American adolescents, perceived stress was associated with headaches and stomachaches more often than any other somatic symptoms (Reynolds et al. 2001). Urban youth who reported stress and exposure to violence also reported decreased appetites and difficulties sleeping (Bailey et al., 2005).

Social risk disparities among children living in urban communities

African American youth residing in low-income urban neighborhoods have higher exposure to adverse life and health outcomes compared to Whites (Moorman et al., 2007; Centers for Disease Control and Prevention, 2010; Bernard et al., 2007). It is estimated that more than 80 % of children living in inner-city neighborhoods have been exposed to violence in their neighborhoods and schools (Flannery et al., 2004; Weist et al., 2001). These exposures may increase the risk for health disparities related to life event stress (Attar et al., 1994; Deardorff et al., 2003; Francis, 2009). African American adolescents living in low-income areas who experienced or witnessed violence reported higher rates of headache and abdominal pain, suggesting that stress associated with violence exposure may contribute to somatic symptoms and anxiety (White & Farrell, 2006). When anxiety was statistically controlled, African American youths' reports of pain decreased, suggesting that the association between stress and somatic symptoms may be mediated by anxiety (White & Farrell, 2006). Another internalizing disorder, depression, may be related to somatic symptoms in African American children. Among ethnically diverse youth, negative life events across a variety of domains (e.g., economic, family, peer, discrimination, neighborhood/violence, school domains) were positively associated with depressive symptoms (Deardorff et al., 2003). Adverse life events, experienced by African American children, may alter the regulation of the hypothalamic pituitary adrenal (HPA) axis through epigenetic processes (Francis, 2009). Alteration in the function of the HPA axis may lead to increased vulnerability to, and disparities in, mental and physical health disorders (Francis, 2009).

There are a multitude of sources of stress for urban children; common examples include school underachievement, poor peer relations, family dysfunction, economic disadvantage, and community violence. The most frequently reported life event stressor among urban primarily African American youth was exposure to violence (Sanchez et al., 2010). Another study found that community violence exposure accounted for 10 % of the variance in child stress symptoms (Bailey et al., 2005). African American children who were victims of community violence had a 28 % increased risk of appetite problems, 94 % increased risk of sleeping problems, 57 % increased risk of headaches, and 174 % increased risk of stomachaches (Bailey et al., 2005). Relatedly, another study of low-income urban adolescents found higher rates of somatic symptoms than in a nationally representative normative sample of children and adolescents (Reynolds et al., 2001). Furthermore, somatic symptoms tended to co-occur with internalizing and externalizing symptoms (Reynolds et al., 2001).

Factors that mitigate against the deleterious effects of urban youth's stressors are less researched. For example, research on peer support—a critical developmental task—and somatic symptoms among urban ethnic minority youth populations is limited. In the international literature, a study of urban Italians found that children's reports of peer support were negatively associated with somatic symptoms whereas peer victimization was positively associated with somatic symptoms (Gini et al., 2009). Another study found

that children who were characterized as rejected or neglected by their peers reported high levels of social anxiety (Jellesma et al., 2008). Social anxiety was positively associated with somatic symptoms, even over a year later (Jellesma et al., 2008).

Cultural, peer, family, and community-based contexts are important considerations in examining somatic symptoms among urban youth. Externalizing behaviors among children residing in neighborhoods characterized by high crime and violence may be prevalent because these behaviors appear to be more adaptive in managing violent settings than internalizing behaviors (Sanchez et al., 2010). This is consistent with other research suggesting that urban African American youth residing in dangerous contexts are less likely to display their distress through internalizing behavior than externalizing behaviors (Grant et al., 2005), and instead express distress in ways that are less likely to be viewed as weakness (Grant et al., 2000). Urban African American youth may display externalizing emotional responses in an attempt to avoid appearing "weak" (e.g., fearful, nervous, emotionally needy) because weakness may make them more vulnerable to victimization (Cooley-Strickland et al., 2011). Urban children's endorsement of physical health symptoms may not be viewed with the same negative perception as internalizing psychiatric symptoms. As such, it is important to investigate the prevalence of somatic symptoms among ethnic minority children residing in urban, low-socioeconomic status neighborhoods.

Challenges to identifying somatic symptoms in elementary school-aged children

A widely used parent report inventory that assesses children's problem behaviors is the Child Behavior Checklist (CBCL; Achenbach, 1991a). Overall, it has valid psychometric properties demonstrated in both research and clinical populations (Salbach-Andrae et al., 2009; Yeh & Weisz, 2001), however, studies of the clinical usefulness of these measures in predominantly African American urban children are few. The Youth Self-Report (YSR; Achenbach, 1991b) is the complimentary self-report inventory for children's ratings of problem behaviors. Clinicians and researchers frequently use the Somatic Complaints subscales from either and/or both the CBCL and YSR to assess somatic symptomatology. Although the CBCL and YSR are some of the most commonly used behavior assessments, the concordance between parent and child reports is low (Rey et al., 1992; Salbach-Andrae et al., 2009; Yeh & Weisz, 2001; Zukauskiene et al., 2004). Studies yield poor-to-low parent–child agreement (Yeh & Weisz, 2001) or poor-to-moderate agreement (Rey et al., 1992; Salbach-Andrae et al., 2009; Zukauskiene et al., 2004). The highest agreement was found in areas that assessed "factual behaviors" and observable symptoms (e.g., asthma, conduct problems, externalizing behaviors; Rey et al., 1992; Salbach-Andrae et al., 2009), although results were mixed about whether the child or parent reported more problems (Zukauskiene et al., 2004; Salbach-Andrae et al., 2009; respectively).

Studies on parent–child agreement on the Somatic Complaint clinical subscale of the CBCL/YSR are also inconsistent. For example, Zukauskiene et al. (2004) found that parent–child agreement was highest for Somatic Complaints compared to all other syndromes of the CBCL and YSR, particularly for older children, whereas Yeh and Weisz (2001) found a negative association between parent and child reports of children's somatic symptoms. Of clinical concern is that parent–child agreement was lowest for children with co-morbid diagnoses, followed by children with one diagnosis, and then children with no diagnoses (Salbach-Andrae et al., 2009). Low parent–child agreement in identifying somatic symptoms may lead to delayed treatment, thereby increasing the risk of morbidity disparities in the highest risk children. Thus, systematically identifying somatic symptoms in urban children may be challenging.

The present study examined the association between somatic symptoms and life event stressors (i.e., school and peer stress, family conflict, community violence exposure) among a community sample of elementary-aged, primarily African American children residing in an urban setting. The goals of the current study were twofold. The first goal was to examine the association between urban children's somatic symptoms and their perceptions of school and peer stress, family conflict, and community violence exposure. It was hypothesized that these common types of life event stressors would be positively related to somatic symptoms among this urban cohort of children. Second, the goal was to assess agreement between parent and child reports' on the CBCL and YSR Somatic Complaints subscale. It was hypothesized that there would be low agreement between parent and child reports of children's somatic complaints. Examination of these goals may advance understanding of the physical manifestations associated with urban, primarily African American, children's exposure to family, peer, and community-based violence.

Methods

Participants

The current study used data from participants in the Multiple Opportunities to Reach Excellence (MORE) Project (Cooley-Strickland et al., 2009). The MORE Project is a

longitudinal community-epidemiological study designed to investigate the effects of urban children's exposure to community violence on emotional, behavioral, substance use, and academic functioning. Participants for the MORE Project were recruited from six Baltimore City public elementary schools located in one of three (low, moderate, high) strata of neighborhood violence exposure. The strata were based on rankings of 2002 Baltimore city homicide rates. (For study methodological details, see Cooley-Strickland et al., 2009).

The first wave of the MORE Project included 427 child interviews, 375 teacher interviews and 282 parent/caregiver interviews. Student participants who completed self-report measures (n = 409) and parent/caregivers for whom completed interviews were available (n = 238) were included in the analysis. The child's primary caregiver served as the informant; 90.2 % were female. Informants included the child's biological mother (77.9 %), biological father (9.9 %), grandmother (6.3 %), and aunt (2.8 %). Parents reported demographic information on themselves and their household (e.g., socioeconomic status, household residents); youth reported demographic (e.g., age, gender, grade) information on themselves. The mean child age was 9.6 years (SD = 1.1; Range = 8–13 years) and almost half of the sample was male (46.7 %; see Table 1). When the 409 child participants and the 238 parent/caregivers were compared with those for whom data was missing or incomplete, no statistically significant differences emerged with respect to race, age, gender, and SES (p's > 0.05). The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved this study.

Procedures

After obtaining parental consent and child assent, trained research staff conducted interviews with child participants at their schools. Child and parent assessments were individually conducted by trained interviewers using computer assisted programmed interviews. Students were individually interviewed in person in private areas in the school (e.g., empty classrooms, break rooms) with an average completion time of 120 min. Parents were interviewed over the telephone; average completion time was 60 min.

Measures

Children's somatic symptoms

The Somatic Complaints subscale from the Child Behavior Checklist (CBCL; Achenbach, 1991a) and the Youth Self-Report (YSR; Achenbach, 1991b) were used to measure children's somatic symptoms over the past 6 months. The Somatic Complaints subscale is comprised of 10 items on the YSR and 11 items on the CBCL. Although the YSR is designed for children 11 years and older, communication with a researcher from the YSR publication company (David Jacobwitz, Achenbach System of Empirically Based Assessment, June 24, 2003) confirmed that the YSR may be used with younger children by reading the items aloud to those with less than a fifth grade reading level. As such, YSR items were read to all children. The CBCL and YSR standard scores (T-scores: Mean = 50; SD = 10) were used to quantify the Somatic Complaints subscale. The published Cronbach's α for the Somatic Complaints subscale on the CBCL is 0.78 (Achenbach, 1991a), but was lower for the current study cohort of urban children (i.e., $\alpha = 0.62$). For the YSR, the published Cronbach's α for the Somatic Complaints subscale score was 0.80. Cronbach α of the Somatic Complaints subscale for the current study cohort was 0.75.

Exposure to community violence

The Children's Report of Exposure to Violence (CREV; Cooley et al., 1995), a 29-item questionnaire, was used to assess children's self-reported exposure to community violence. Community violence is defined as deliberate acts intended to cause physical harm against persons in the community and assesses being chased or threatened, beaten up, robbed or mugged, shot, stabbed, or killed. The two-week test–retest reliability ($r = .75$) and internal consistency (overall $\alpha = .78$) for the CREV are good (Cooley et al. 1995). Internal consistency for the computerized version of the lifetime CREV-R Total score was higher than the paper–pencil version (i.e., Cronbach's $\alpha = 0.88$; Cooley-Strickland et al., 2009). For the current study, the child CREV-R Total score Cronbach's α was 0.99, and the parent CREV-R Total Score Cronbach's α was 0.79.

Life event stress

Children's life event stress was assessed using subscales from the Multicultural Events Schedule for Adolescents (MESA; Gonzales et al. 1995). The MESA assesses major and minor life events specific to an inner city, multi-ethnic population. Although designed for adolescents, the MESA has been administered to children (e.g., Cooley-Strickland et al., 2009; Gonzales et al., 2006). African American, White and English and Spanish speaking Mexican–American adolescents were used to norm the measure. A total of 84 items are divided into eight subscales. The MESA's total score test–retest reliability is 0.71 (Gonzales et al. 1995) for an adolescent sample and the total score

Table 1 Demographics characteristics of study participants (N = 409) and their parents/guardians (N = 265)

Participant characteristic	n (%)	M (SD)
Child age (n = 409)		9.6 (1.1)
Child gender (n = 409)		
Male	190 (46.5)	
Child race (n = 409)		
African American	350 (85.6)	
Parent race (n = 265)		
African American	246 (92.8)	
Housing arrangement (n = 253)		
Own	90 (35.6)	
Rent	136 (53.8)	
Live with relative	24 (9.5)	
Other	3 (1.2)	
Highest level of education of parent/guardian		
Less than high school or GED	62 (24.6)	
High school graduate or GED	80 (31.7)	
Greater than high school or GED	110 (43.6)	
Parent/guardian employed		
Yes	176 (69.6)	
Annual income (n = 245)		
$0–$29,999	146 (59.6)	
$30,000+	99 (40.4)	
Somatic complaints[*a]		
Child (borderline/clinical) (n = 409)	127 (31.1)	60.5 (9.1)
Parent (borderline/clinical) (n = 238)	14 (5.9)	54.3 (5.8)
School and peer stress (n = 368)[b]		
Had a disagreement or fight with a close friend	178 (48.4)	
Other kids wanted or tried to fight with you	166 (45.1)	
A friend did not keep a secret	152 (41.3)	
Family violence (n = 368)[c]		
Family members had a serious disagreement or fight	118 (32.1)	
Parents had a serious disagreement or fight	88 (23.9)	
Family members refused to speak to each other	77 (20.9)	
Community violence (n = 371)[d]		
Seen somebody beaten up on TV, video games or in the movies	327 (88.1)	
Seen somebody being killed on TV, video games, or in the movies	292 (78.7)	
Seen somebody being shot or stabbed on TV, video games, or in the movies	288 (77.6)	
Somatic symptoms (n = 409)[e]		
Headaches	272 (66.5)	
Stomachaches	256 (62.6)	
Feeling nauseous or sick	216 (52.8)	

N = 409. * $\chi^2(1, N = 238) = 4.35$, $p = 0.04$

[a] Somatic complaints scale on the CBCL and YSR

[b] School stress combined scale from the MESA

[c] Family conflict scale on the MESA

[d] Community violence total score on the CREV

[e] Somatic complaints subscale from the YSR

Cronbach's α was 0.90 for an 8–12 year old sample (Cooley-Strickland et al., 2009). For the current study, the School Hassles and Peer Hassles subscales were combined to assess children's reports of their level of stress in the school setting. The former assesses children's relational difficulties with teachers and school administrators; the latter measures children's peer relational difficulties and violent experiences. The combined School and Peer Hassles subscales indicates school stress and relational difficulties with peers and includes children's exposure to physical violence with peers, disagreements with teachers and school administrators, gang exposure, and peer pressure. For the current study cohort, the child School Stress subscale consisted of six items related to school hassles and fourteen items related to Peer Hassles; yielding a total of 20 items. The Cronbach's α for the combined School Stress and Peer Hassles was 0.74. The child's "School Stress" is not measured on the parent MESA. To elicit parents' reports of the child's Peer Hassles, the parent was asked if their child "had a disagreement or fight with a close friend." The Family Conflict subscale of the MESA (Gonzales et al., 1995) was used to assess family violence exposure. The Family Conflict subscale assesses the level of conflict and relational violence within the family. There are five items on the parent's version of the Family Conflict subscale and seven items on the child's Family Conflict subscale. For the current study cohort, the Cronbach's α for the child version of the Family Conflict scale was 0.62. The Cronbach's alpha for the parent version of the Family Conflict scale was 0.63.

Data analysis plan

Descriptive statistics were used to summarize the study participants' demographic characteristics. Correlation analyses were conducted to examine the associations between the continuous variables of interest. The primary outcome variable was parent and child T-scores on the Somatic Complaints subscale from the CBCL and the YSR, respectively. A categorical Somatic Complaint outcome variable was created for use in logistic regression models to analyze the odds of having a borderline to clinically significant Somatic Complaint standard score (1 = T-score >64). Variables that were used to predict Somatic Complaints included School Stress and Peer Hassles, Exposure to Community Violence, and Family Conflict. Multivariate models were developed to control for demographic variables of child age and gender (1 = female), and neighborhood violence (low, moderate, high homicide rate).

To investigate parent and child agreement on somatic symptoms, the primary outcome variable was the difference between parent and child scores on the Somatic Complaints subscale of the CBCL and YSR, respectively. A variable, the difference between child and parent scores (c–p) was calculated. This difference score reflects the agreement between parent and child reports, with difference scores approaching "0" indicating greater agreement. Differences in child–parent mean scores on the Somatic Complaints scales were analyzed using paired sample *t*-tests. Discrepancies in child and parent ratings by child gender were also examined.

Because concordance between informant ratings are typically expressed in Pearson correlations in the literature, the Pearson *r* was chosen to describe the strength of association between child–parent scores on somatic symptoms. Additionally, Cohen's kappa (k) was also computed to analyze child–parent agreement. This measure was used because the product moment correlation may not be sensitive to additive and multiplicative biases and may overestimate agreement (Jensen et al. 1988). Kappa was computed based on the clinical cutoff score for the CBCL/YSR syndrome scales ($0 = \leq 64$, $1 = \geq 65$).

Trends in child–parent agreement were examined using the Bland–Altman Plot (Bland & Altman, 1986), a statistical method for assessing agreement between two clinical measurements. In this study, plots were used to analyze the correlation between child–parent mean difference scores for somatic symptoms and child–parent average scores for somatic symptoms. Finally, to determine if there was a significant difference between the dichotomous children's and parents' reports of somatic symptoms variables (non-clinical and borderline/clinical somatic complaints), a Chi-square analysis was conducted. STATA statistical package was used for data analysis (StataCorporation, 2009). Alpha levels were set at $p < 0.05$.

Results

Child's report of life event stressors and somatic symptoms

Summaries of the most common life event stressors and somatic complaints are presented in Table 1. In the school environment, the most common stressor reported at the item-level was "having a disagreement or fight with a close friend". For family conflict, the majority of children stated that their parents/caregivers had a serious disagreement or fight. As expected, the majority of the children reported being exposed to violence in the media as the most common community violence exposure. Child age was positively associated with school and peer stress ($r = .17$, $p < .0001$, Table 2).

The most common somatic symptoms were headaches (66.5 %) and stomachaches (62.6 %). Age was negatively associated with somatic symptoms reported by the child

($r = -.12$, $p < .05$). For each year of age, the child's odds of being in the borderline or clinically significant range for somatic complaints was 26 % less (unadjusted) and 38 % less (adjusted for gender, race, and external stressors [i.e., violence strata, school and peer stress, family conflict, community violence exposure]).

Somatic symptoms reported by the child were positively associated with both school and peer stress ($r = .37$, $p < .0001$), exposure to community violence ($r = .30$, $p < .0001$), and family conflict ($r = .38$, $p < .0001$). Exposure to community violence was associated with an increased odds of having borderline or clinically significant somatic complaints in both the unadjusted and adjusted models (OR = 1.04, 95 % CI 1.02–1.06 and OR = 1.02, 95 % CI 1.00–1.05, respectively, Table 3). For each unit increase of the school and peer stress scale, the odds of somatic symptoms increased 23 % in the unadjusted model (OR = 1.23, 95 % CI 1.15–1.31). Following adjustment, school and peer stress remained significantly associated with increased odds of borderline to clinical somatic complaints. For each unit increase in the family conflict scores, the odds of having a borderline to clinical somatic complaint score increased 54 % (95 % CI 1.33–1.79). Family conflict continued to be associated with an increased odds of having borderline or clinically significant somatic complaints in the adjusted model (26 %, 95 % CI 1.05–1.50). There were no statistically significant associations between the parent's report of their child's somatic symptoms and school and peer stress, family conflict, community violence, and demographic variables.

Parent–child agreement on the somatic complaints subscale

The concordance between parent and child reports on children's somatic symptomatology was significant but low ($r = 0.15, p < .05$). Cohen's kappa (k) was used to examine the agreement between child and parent reports as measured by the YSR and CBCL, respectively. Child–Parent agreement on the children's Somatic Complaints subscale was statistically significant (k = 0.09, $p < .05$). In this sample, the urban children reported significantly more somatic symptoms than their parents (T-scores = 60.51 and 54.33, respectively; t (237) = 9.15, CI = 4.85–7.52). Figure 1 shows the Bland–Altman plot (Bland & Altman, 1986) is used to plot the difference in the child and their parent's score and the child's and their parent's average score. The child's and their parent's average score is used as an estimate of child's "true" rate of somatic complaints. A linear regression analysis was used to estimate the average difference between parent's somatic symptom score and their child's somatic symptom score versus the average of that parent's and child's somatic symptom scores. The average difference in parent–child scores increases as the child's somatic symptoms increase (B = .48, 95 % CI .63–1.02). This indicates that urban children report more somatic problems, relative to their parents on average, as their symptoms worsen.

Table 2 Pairwise correlations between child's age, child's reports of stressors, and child and parent reports of somatic complaints

	1	2	3	4	5
1. Child's age					
2. School stress[a]	.172**				
3. Exposure to community violence[a]	.145**	.448**			
4. Family conflict[a]	−.016	.534**	.260**		
5. Somatic complaints[a]	−.117*	.370**	.302**	.379**	
6. Somatic complaints[b]	−.048	.098	−.011	.070	.155*

N = 409

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

[a] Child's self report

[b] Parent's report of child's complaints

Table 3 Logistic regression models predicting child- and parent-reported child somatic complaints with and without adjustment for demographic variables[a] and external stressors[b]

Variable	OR	95 % CI	AOR	95 % CI
Children's reports				
Age	0.74*	0.60–0.91	0.62*	0.48–0.78
Gender	0.87	0.57–1.33	1.01	0.63–1.62
Race	0.61	0.35–1.07	0.61	0.33–1.16
Violence strata	0.91	0.70–1.18	0.92	0.69–1.22
Community violence	1.04*	1.02–1.06	1.02*	1.00–1.05
School stress	1.23*	1.15–1.31	1.18*	1.08–1.28
Family conflict	1.54*	1.33–1.79	1.26*	1.05–1.50
Parents' reports				
Age	1.04	0.61–1.77	1.01	0.58–1.77
Gender	0.61	0.20–1.80	0.60	0.20–1.83
Race	0.96	0.21–4.52	0.97	0.20–4.62
Violence strata	1.00	0.51–1.96	0.97	0.49–1.92
Community violence	1.01	0.96–1.05	1.00	0.95–1.05
School stress	1.04	0.89–1.23	1.07	0.84–1.35
Family conflict	1.02	0.72–1.44	0.93	0.60–1.45

* Significant at the p value < 0.05

[a] Model adjusted for age, gender female = 1 and race (African American = 1)

[b] Violence strata is based on homicide rates. Community violence, school and peer stress, and family conflict are based on child's self-report

Discussion

The present study investigates the associations between childhood stressors and somatic symptoms among a cohort

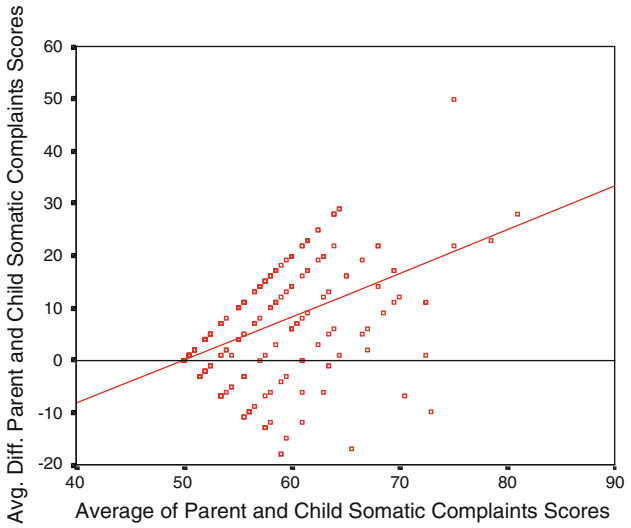

Fig. 1 Correlation between the average difference between parent and child somatic complaint scores and the average of parent and child somatic complaint scores (N = 409)

of elementary school-aged, primarily African American children. This study extends the limited research in this area by reporting the odds of clinically significant somatic complaints associated with peer, family, and community exposures in an urban population of young children. In addition, concordance between parent and child reports on children's somatic symptoms was analyzed to determine the reliability of somatic symptoms in this population. Increased understanding of potentially remediable peer, family, and community-based factors associated with somatic symptoms may lead to clinical practices that promote early identification and prevention of stressors. These clinical practices have the potential to improve behavioral mental health among minority children, especially African Americans, living in high risk urban environments.

This is one of the few studies to focus on evaluation of peer, family, and community-based stressors and the association of somatic symptoms in children living in an urban environment prior to adolescence. Exposure to trauma is associated with illness behaviors, such as somatic symptoms (Engel, 2004; Green & Kimerling, 2004) and seeking medical care (Walker et al., 2004). There are multiple hypotheses that may explain why trauma may increase negative health perceptions and illness behavior (e.g., Ford 1997; Rodin et al., 1988; van der Kolk, 1994), including biological changes associated with trauma exposure, focusing on physical symptoms diverts attention from the trauma (i.e., focusing on physical symptoms is less distressing than focusing on psychological distress), and secondary gain (i.e., reporting physical symptoms may elicit help and support; Pennebaker, 2000; Schnurr & Green, 2004). These perceptions may also be explained by physical consequences of stress and trauma (i.e., poor appetite and/or sleep and an increase in stress hormone levels). Boys in the current study endorsed more somatic symptoms than girls, but they also experienced more exposure to violence. In addition, socialization may play a role in this gender difference in reported somatic symptoms (Dulmus et al., 2003); given the perceived acceptability of reporting physical health complaints versus reporting emotional distress (Jellesma et al., 2008), especially among urban males (Cooley-Strickland et al., 2009).

Of note is that all stressors studied in the current study (i.e., school stress, exposure to community violence exposure, family conflict and violence) were associated with clinically significant somatic complaints by child's report, while none were associated with parent's rating of their child's somatic complaints. Caregiver's general lack of awareness of physical symptoms experienced by their children may delay or prevent parents from seeking medical or behavioral intervention for their children. This may further contribute to their children's distress and disparities in physical and mental health care delivery.

Similar to a previous study (Gini et al., 2009), the current study found that a lack of social support and peer victimization were associated with somatic symptoms. Contrary to the prevailing literature, community violence measured by an objective criterion (i.e., neighborhood homicide rate) was not associated with children's report of somatic symptoms (Bailey et al., 2005). However, children's self-reported exposure to community violence was strongly associated with somatic symptoms. This suggests that the child's *perceptions* of his or her exposure to community violence and stress supersede the emotional and behavioral effects of neighborhood-level crime rates. Of the stressors studied, family conflict yielded the highest odds of significant somatic symptoms. At this developmental stage, family conflict is reportedly the most potent stressor for urban youth, yet school stress and children's perception of community violence are closely aligned with urban children's feelings of well-being or disease.

As the children aged, their reports of somatic symptoms decreased. Consistent with the present study, a previous study found that younger children reported more abdominal pain than their adolescent counterparts (Masi et al., 2000). Several studies suggest that somatic symptoms are persistent and associated with externalizing and internalizing disorders in adolescence (Pihlakoski et al., 2006; Dhossche et al., 2001). In the present study, the narrow age range of the participants may limit the ability to demonstrate the persistence of symptoms or associations with later onset of externalizing or internalizing disorders. Currently, the developmental trajectory of somatic symptoms is largely unknown in urban, primarily African American children. As such, longitudinal studies are war-

ranted to determine whether there is a pathway from early onset somatic symptoms to later behavioral and mental disorders.

Identification and treatment of children with significant somatic complaints usually relies on parent recognition of the child's somatic symptoms. Indeed, identification is the first step to reduce the psychological and physical health consequences of traumatic exposure (Schnurr & Green, 2004). Research on parent–child agreement on the Somatic Complaints subscale yields mixed results. One study found that the Somatic Complaints subscale of the CBCL and YSR had the highest parent–child agreement (Zukauskiene et al., 2004), while a non-significant association for parent–child agreement was found by another (Yeh & Weisz, 2001). Failure to recognize extant somatic symptoms may result in delays in treatment and further compound health disparities found among ethnic minority, and particularly African American, youth populations.

In the present study, external stressors were significantly associated with the child's self-report of somatic symptoms. However, none of the peer, family, and community-based stressors were associated with the parent's report of their child's somatic symptoms. Conversely, parents/caregivers only rated their children as having high numbers of somatic symptoms when their children had a psychiatric disorder. There were positive correlations between the child's self report of somatic symptoms and peer, family, and community-based stressors; however, only children's perception of exposure to community violence was associated with parental reports of child's somatic symptoms. Although parent–child agreement and correlations of parent report and child's self report of somatic symptoms were statistically significant, the level of agreement was below what is considered acceptable (Leech et al., 2005). Clearly, there are clinical reporting differences between urban parents and children that indicate discordance in the parent and child's reports of somatic symptomatology.

Low concordance was also found in past studies with a majority of White participants (Rey et al., 1992; Salbach-Andrae et al., 2009; Yeh & Weisz, 2001; Zukauskiene et al., 2004). The children in the current study were from a non-clinical sample, which may partially contribute to the low concordance rate. It is also possible that urban children and parents view problems differently (Yeh & Weisz, 2001). Given that their parents/caregivers do not recognize their children's level of somatic symptomatology, compared to their children, they may be less able to provide emotional support and obtain appropriate intervention. This has particular public health significance given this sample of ethnic minority youth, who are at high risk for mental and physical health disparities. Because of the lack of concordance, future research would benefit from the inclusion of additional objective and clinical evaluation symptoms. Interestingly, although community homicide rates are an objective measure of community violence, it was not associated with somatic symptoms in the present study.

This study has some limitations that can be addressed in future studies. First, the study included data from an urban predominantly African American study population, which may limit the ability to generalize the findings to other populations. This, however, is also a strength of the current study as there are limited data on the effects of peer, family, and community-based life stressors and somatic symptoms, parent and child reporting agreement, and physical and mental illnesses among elementary school children living in urban environments. Second, there was low internal reliability for the Somatic Complaints subscale of the CBCL. Another methodological weakness is that the majority of the informants were mothers. Although mothers are children's typical primary caregivers, additional caregiver reports (e.g., fathers as additional informants) would enhance the generalizability of the study. The current study involves cross-sectional data which limits the ability to make causal inferences and examine long-term consequences of perceived violence and stressors, community violence measured by homicide levels, and outcomes of somatic symptoms. It is possible that the study's findings overestimate the association between children's reports of violence exposure and somatic symptoms. Because we examined the children's responses on multiple measures, it is likely that there was little variance in their response style (high violence exposure/high somatic symptoms or low violence exposure/low somatic symptoms) regardless of the actual violence exposure and somatic symptoms. Finally, it is possible that there is greater concordance between same (i.e., child/child and parent/parent) respondent reports of exposure to violence and somatic symptoms compared to discordant respondents (i.e., parent vs. child reports).

Innovative elements of this study offer new insights into somatic symptoms in a population of urban youngsters at risk for violence exposure. Results provide evidence that children's perception of violence and school stress, especially family conflict, is associated with reports of somatic symptoms. Importantly, children's reports of external stressors were associated with somatic symptoms while parents' reports were not. These results provide cautionary evidence for clinicians who may rely solely on parents' reports on young children. Instead, including urban children's self-reports of internalizing symptomatology and exposure to stressors is also recommended. Results of this study may assist in the development of strategies to reduce mental health disparities attributable to ameliorable peer, family, and community-based risk factors. The data from this study yield clinically significant information that

identifies remediable stressors for elementary school children that may place them at risk for clinical distress associated with somatic symptoms. Specifically, school-based interventions including pupils, teachers, administrators, and parents/caregivers to promote a positive interactive school environment may reduce school-related stress. Enhanced student behavioral health resources, problem-solving, and peer support to address highly rated social stressors (e.g., disagreements, fights, betrayal) may also benefit urban ethnic minority youth. Family, community, and municipal action to reduce children's exposure to community violence may alleviate some of the stress and somatic symptoms associated with exposure. Furthermore, enhanced family communication skills and parental support and education may be beneficial to facilitate the parent's understanding of the role of peer, family, and community stressors in their child's emotional and physical distress and to promote the child's trust in confiding information about stressors and symptoms to caregivers. These interventions may lead to early and appropriate mental, behavioral, and physical health services thereby reducing health disparities among African American and poor children.

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