Associations between childhood trauma and childhood psychiatric disorders in Brazil: a population-based, prospective birth cohort study

Andreas Bauer, Graeme Fairchild, Gemma Hammerton, Joseph Murray, Ina S Santos, Luciana Tovo Rodrigues, Tiago N Munhoz, Aluíso J D Barros, Alicia Matijasevich*, Sarah L Halligan*

Summary

Background Childhood trauma is a proposed transdiagnostic risk factor for psychopathology, but epidemiological evidence from low-income and middle-income countries (LMICs) is scarce. We investigated associations between trauma and child psychiatric disorders in a birth cohort in Brazil.

Methods The 2004 Pelotas Birth Cohort is an ongoing, population-based, prospective birth cohort, including all hospital births occurring between Jan 1 and Dec 31, 2004, in the city of Pelotas, Brazil. When the children were aged 6 and 11 years, trained psychologists administered the Development and Well-Being Assessment clinical interview to caregivers to assess current child psychiatric disorders (anxiety disorders, mood disorders, ADHD and hyperactivity disorders, and conduct and oppositional disorders), and lifetime trauma exposure (ie, experiencing or witnessing life-threatening events) including interpersonal and non-interpersonal events. Analyses used multiple imputation and logistic regression models.

Findings Of 4263 live births, 4231 children were included in the study sample, and 4229 (2195 [51·9%] boys and 2034 [48·1%] girls; 2581 [61·7%] with White mothers and 1600 [38·3%] with Black or mixed race mothers) were included in the imputed analyses. 1154 (34·3%) of 3367 children with complete data at age 11 years had been exposed to trauma by that age. After adjusting for confounders, at age 6 years, trauma was associated with increased odds of anxiety disorders (adjusted odds ratio 1·79 [95% CI 1·33–2·42]) and any psychiatric disorder (1·59 [1·22–2·06]), and at age 11 years, with any psychiatric disorder (1·45 [1·17–1·79]) and all four specific diagnostic classes of anxiety disorders (1·47 [1·04–2·09]), mood disorders (1·66 [1·08–2·55]), ADHD and hyperactivity disorders (1·47 [1·01–2·13]), and conduct and oppositional disorders (1·76 [1·19–2·61]). Interpersonal trauma and non-interpersonal trauma were each associated with increased odds of multiple psychiatric disorders, even when adjusting for their co-occurrence.

Interpretation A considerable mental health burden associated with childhood trauma is evident already by middle childhood in this sample from Brazil. Evidence-based efforts to reduce the incidence of childhood trauma in Brazil and address its consequences are urgently needed.

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Introduction Diagnostic classification systems define trauma as comprising exposure to events that are extremely threatening or horrifying (ICD-11), or involve actual or threatened death, serious injury, or sexual violence (DSM-5). Trauma can include events that are directly experienced by the individual, are witnessed happening to someone else, or happen to a loved one (eg, serious injury or sudden death of a parent). Trauma exposure is common in childhood, when it can have substantial adverse consequences for developmental trajectories. Importantly, childhood trauma has been proposed as a key transdiagnostic risk factor for psychopathology, being associated with almost half of all childhood-onset psychiatric disorders. Such observations have led to childhood trauma being considered as a leading preventable cause of mental illness. Nonetheless, epidemiological evidence relating to trauma exposure and risk for psychiatric disorders in children is limited, and major gaps exist in the understanding of trauma-related psychopathology, especially across geographical locations and different types of trauma.

For adults, there is strong empirical support for non-specific associations between childhood trauma and increased risk of several psychiatric disorders, suggesting that there are general trauma-linked mechanisms underlying multiple forms of adult psychopathology. However, equivalent evidence from youth samples is limited and findings are mixed, with some studies identifying particularly strong associations for conduct
and oppositional disorders \(^6\) or anxiety and mood disorders \(^7\) but others reporting no diagnostic specificity.\(^4\,^8\) Notably, these studies focused on adolescents and even less is known about the pattern of associations in younger children exposed to trauma. Given that substantial changes occur in the incidence of specific mental disorders across development, epidemiological studies in childhood can provide crucial insight into the generality versus specificity of links between trauma and psychopathology, requiring different preventive and treatment strategies.\(^6\) Furthermore, although false positives in adult retrospective reports of childhood adversities are thought to be rare,\(^14\) there is some evidence

**Research in context**

**Evidence before this study**

Research has established substantial associations between childhood trauma and later mental ill-health, but population-based evidence during childhood is scarce, and there are major gaps in our knowledge relating to generalisability across geographical locations and types of trauma. We searched PubMed on Oct 9, 2021, with no restrictions on language or publication date, using the following search strategy: ((child* [Title/Abstract] AND (adversit* [Title/Abstract] OR trauma [Title/Abstract]) OR “adverse childhood” [Title/Abstract] OR ((interpersonal [Title/Abstract] OR non-interpersonal [Title/Abstract]) AND (adversit* [Title/Abstract] OR trauma [Title/Abstract]) OR “psychiatric disorder*” [Title/Abstract])) AND (“adverse childhood” [Title/Abstract] OR psychopathology [Title/Abstract]). We sought population-based studies investigating associations of childhood trauma exposure across a broad range of psychiatric disorders. 21 relevant studies were identified, of which just four used youth samples, the remainder examining the consequences of childhood trauma in adulthood. The evidence from youth samples is mixed, with some studies showing strong associations for specific disorder classes and others showing transdiagnostic effects. Furthermore, most studies focus on childhood adversity in general rather than trauma specifically, and mainly in the family context. Understanding of the consequences of trauma exposure including events beyond family-related exposures (eg, non-interpersonal traumas) is therefore limited. Finally, we found only one study using a representative sample of young people from a low-income or middle-income country (Mexico), even though children living in such countries are disproportionately more likely to experience traumatic events than children from high-income countries.

**Added value of this study**

Our study uses a population-based cohort in Brazil, a middle-income country, to show associations between childhood trauma and a broad range of psychiatric disorders in middle childhood, and contrasting associations for interpersonal versus non-interpersonal trauma. Trauma exposure was relatively common, with 34·3% of children being exposed by age 11 years. At age 6 years, trauma exposure was associated with increased odds of psychiatric disorder overall and with anxiety disorders in particular. By age 11 years, childhood trauma was associated with increased odds of all four disorder classes examined: anxiety disorders, mood disorders, ADHD and hyperactivity disorders, and conduct and oppositional disorders. Both interpersonal trauma and non-interpersonal trauma were associated with multiple disorder classes, even when adjusting for their co-occurrence, with children exposed to interpersonal trauma being at particularly high risk. **Implications of all the available evidence**

Our findings support transdiagnostic models of the effects of childhood trauma exposure. There is an urgent need to understand the underpinnings of the associations between trauma and negative mental health outcomes and to identify mechanisms that could be harnessed to protect against the harmful effects of childhood trauma exposure. Clinicians, particularly from low-income and middle-income countries, should be aware that trauma exposure is already common in middle childhood, and that children exposed to trauma might present diverse diagnostic profiles, including internalising and externalising disorders.
that effect sizes increase with the length of the recall period, suggesting recall bias. Thus, studies relying on retrospective data might have overestimated the effects of childhood trauma on psychopathology.

Finally, most studies have been conducted in high-income countries, mainly in the USA, and population-based evidence from low-income and middle-income countries (LMICs) is scarce. Using a representative sample of Mexican adolescents aged 12–17 years, Benjet and colleagues reported largely non-specific associations between maladaptive family functioning and a wide range of childhood psychiatric disorders. By contrast, using a nationally representative sample of adults in South Africa, Slopen and colleagues observed mainly associations between family-related childhood adversities and anxiety disorders, suggesting some diagnostic specificity. However, the focus on family functioning gives an incomplete picture regarding the effects of childhood trauma, because traumatic events outside of the family environment are largely ignored. This evidence gap is highly problematic, considering that almost 90% of the world’s children live in LMICs, with a disproportional rate of experiencing traumatic events compared with children from high-income countries.

We aimed to address these research gaps using data from a population-based, prospective birth cohort from Brazil, a middle-income country. Specifically, we aimed to examine associations between lifetime trauma exposure and risk for psychiatric disorders at ages 6 and 11 years, investigating disorder-specific versus transdiagnostic associations across major diagnostic groups, and associations between psychiatric disorders and interpersonal trauma versus non-interpersonal trauma.

Methods
Study design and population
The 2004 Pelotas Birth Cohort is an ongoing, population-based, prospective birth cohort, including all hospital births occurring between Jan 1 and Dec 31, 2004, in the city of Pelotas, Brazil, to mothers resident in Pelotas. Participating children were assessed at birth and when the child was aged 3, 12, 24, and 48 months, and 6 and 11 years. Cohort profiles have been published previously.

Assessments were approved by the Federal University of Pelotas Medical School Research Ethics Committee and parents provided written informed consent. More details on the study setting are described in appendix 2 (p 1).

Procedures
The Development and Well-Being Assessment (DAWBA) interview was administered to primary caregivers when the children were aged 6 and 11 years by trained psychologists. Training for the administering psychologists (approximately 40 h) was provided by an experienced child psychiatrist and a psychologist with a background in epidemiological assessment, comprising teaching on the principles and practicalities of administering the DAWBA and experience of conducting the interviews in a clinical setting. Weekly supervision of the administering psychologists was provided throughout data collection by the training psychiatrists and psychologists. The primary caregiver was always the mother if she lived with the child and was capable of understanding and answering study questions; otherwise, another main caregiver with whom the child lived was interviewed.

Child lifetime trauma exposure was assessed using the PTSD section of the DAWBA. Caregivers were asked whether the child was ever exposed to items on a checklist: interpersonal traumas, specifically being victim of an attack or threat, physical abuse, sexual abuse, rape, domestic violence, witnessing an attack on a family member or friend, or learning about an attack on a family member or close friend (the last item assessed in children aged 11 years only); non-interpersonal traumas, specifically being in a serious accident, fire, or disaster (eg, earthquake), witnessing a serious accident or sudden death, or hearing about a serious accidental injury to a loved one (the last item assessed in children aged 11 years only); and other severe trauma, an additional item capturing exposure to events not covered by the checklist.

We used responses to index trauma exposure up to age 6 years and up to age 11 years (coded as present or absent). We also coded interpersonal trauma and non-interpersonal trauma as present or absent on the basis of the checklist; there were no data available to classify events endorsed under the other severe trauma item in these categories; therefore, they were not captured under these trauma subtypes.

All confounders were assessed at birth and were based on maternal self-report, unless otherwise stated, including child sex, maternal relationship status, maternal race or ethnicity, maternal smoking, maternal alcohol consumption, maternal education, family income, maternal depression (at 12 months postpartum, measured using the self-reported Edinburgh Postnatal Depression Scale), and previous child mental health symptoms (from when the child was aged 48 months, assessed using subscales from the parent-reported Child Behaviour Checklist), including aggressive behaviour, being anxious or depressed, attention problems, rule-breaking behaviour, somatic complaints, social problems, thought problems, and withdrawn or depressed. Full assessment details are in appendix 2 (p 1).
oppositional disorders. Additionally, we created a category for any psychiatric disorder, which included the aforementioned diagnoses in addition to less frequent disorders (eating disorders, psychotic disorders, autism, attachment disorders, undifferentiated anxiety or depression disorder, and other disorders). Disorders were coded as present if diagnostic criteria from either DSM-IV (aged 6 years), DSM-5 (aged 11 years), or ICD-10 (both ages) were met. A second psychologist independently assessed 10% of clinical assessments.

Choice of primary measure
The Development and Well-Being Assessment (DAWBA) is a well validated clinical interview, which was designed to generate DSM-IV, DSM-5, and ICD-10 psychiatric diagnoses for children aged 5–17 years.20 The DAWBA is widely used and has been translated into more than 25 languages, including Portuguese.21 It has shown good reliability in population-based samples in Brazil,22 and has been used previously in children aged 11 years in the 1993 Birth Cohort Study, an earlier epidemiological study in the same city.22 The DAWBA can be accessed after payment of a fee.

Statistical analysis
We used binary logistic regression analysis to examine associations between childhood trauma and presence or absence of the diagnostic classes of anxiety disorders, mood disorders, ADHD and hyperactivity disorders, and conduct and oppositional disorders, in addition to the category of any psychiatric disorder. We examined previous trauma exposure (present or absent) reported at age 6 years in relation to disorder status at age 6 years; and trauma reported at age 6 or 11 years in relation to disorder status at age 11 years. Additionally, we examined separate interpersonal trauma codes and non-interpersonal trauma codes up to age 11 years in relation to diagnosis at age 11 years (not completed at 6 years due to low frequencies). All analyses were adjusted for the aforementioned confounders. The regression models examining interpersonal trauma and non-interpersonal trauma up to age 11 years were additionally adjusted for the co-occurrence of these trauma categories by including both exposure types in the same model. In sensitivity analyses, we examined whether associations between childhood trauma and psychiatric diagnoses were similar when excluding the non-specified other severe trauma category. Additionally, to make full use of the longitudinal design, we examined associations between childhood trauma at age 6 years and psychiatric diagnoses at age 11 years, to test possible causal influence of trauma exposure on child psychopathology.

Descriptive statistics were based on complete data at age 6 and 11 years. When examining associations between trauma and psychiatric disorders, we addressed

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**Table 1: Sample characteristics and comparisons according to trauma exposure status at age 11 years**

| Total sample | Trauma | OR (95% CI) or r (p value) |
|--------------|--------|--------------------------|
|              | Unexposed | Exposed |                      |
| **Binary variables** | | | |
| Female       | 1665/3444 (48.3%) | 1067/2213 (48.2%) | 598/1231 (48.6%) |
| Male         | 1779/3444 (51.7%) | 1146/2213 (51.8%) | 633/1231 (51.4%) |
| Maternal race or ethnicity: Black or mixed race | 1281/3406 (37.6%) | 795/2187 (36.4%) | 486/1219 (39.9%) |
| Maternal alcohol consumption (yes) | 928/3444 (26.9%) | 530/2213 (23.9%) | 399/1231 (32.3%) |
| Maternal smoking (yes) | 111/3444 (3.2%) | 58/2213 (2.6%) | 53/1231 (4.3%) |
| Maternal relationship status (single, divorced, or widowed) | 542/3444 (15.7%) | 329/2213 (14.9%) | 212/1231 (17.3%) |

| Continuous variables | | | |
| Family income, BRL | 794.4 (1083.2) | 831.8 (1138.4) | 727.1 (972.9) |
| Maternal education, years | 8.1 (3.4) | 8.2 (3.4) | 7.9 (3.3) |

Data are n (%) or mean (SD), except where otherwise stated. Based on complete data for each set of variables as per listwise deletion. BRL=Brazilian real (2·89 BRL=1 USD in January, 2004, when recruitment of the families commenced). OR=odds ratio. r=correlation coefficient.
Statistical analyses were done using RStudio. The prevalences of current psychiatric diagnoses at ages 6 and 11 years according to previous trauma exposure status are shown in table 2. Up to age 6 years, any trauma exposure up to age 6 years and psychiatric diagnoses at age 6 years. *Complete data refers to data for all trauma exposure variables up to age 6 years and psychiatric diagnoses at age 6 years. †Complete data refers to all trauma exposure variables up to age 11 years and psychiatric diagnoses at age 11 years.

### Table 2: Prevalence of current psychiatric diagnoses at ages 6 and 11 years according to previous trauma exposure status

| Total sample | Any trauma | Interpersonal trauma | Non-interpersonal trauma |
|--------------|------------|----------------------|-------------------------|
|              | No (%)     | Yes (%)              | No (%)                  | Yes (%)              |
| Children aged 6 years | 3577 | 3132 (87.7%) | 440 (12.3%) | 3397 (95.0%) | 180 (5.0%) | 3401 (95.1%) | 176 (4.9%) |
| Any psychiatric disorder | 584 (16.3%) | 468 (14.9%) | 116 (26.4%) | 529 (15.6%) | 55 (30.6%) | 542 (15.9%) | 42 (23.9%) |
| Anxiety disorders | 317 (8.9%) | 244 (7.8%) | 73 (16.6%) | 276 (8.1%) | 41 (22.8%) | 294 (8.6%) | 23 (13.1%) |
| Mood disorders | 46 (1.3%) | 34 (1.1%) | 12 (2.7%) | 41 (1.2%) | 5 (2.8%) | 43 (1.3%) | 3 (1.7%) |
| ADHD and hyperactivity disorders | 94 (2.6%) | 80 (2.6%) | 14 (3.2%) | 85 (2.5%) | 9 (5.0%) | 87 (2.6%) | 7 (4.0%) |
| Conduct and oppositional disorders | 94 (2.6%) | 77 (2.5%) | 17 (3.9%) | 81 (2.4%) | 13 (7.2%) | 89 (2.6%) | 5 (2.8%) |

Data are n (%). *Complete data refers to data for all trauma exposure variables up to age 6 years and psychiatric diagnoses at age 6 years. †Complete data refers to all trauma exposure variables up to age 11 years and psychiatric diagnoses at age 11 years.

### Table 3: Associations between any trauma exposure up to age 6 years and psychiatric diagnoses at age 6 years, and any trauma exposure up to age 11 years and psychiatric diagnoses at age 11 years

|                   | OR (95% CI) p value | OR (95% CI) p value |
|-------------------|---------------------|---------------------|
| Any trauma up to age 6 years | Unadjusted | Adjusted (confounders) | Adjusted (confounders and CBCL subscales at age 48 months) |
| Any psychiatric disorder | 2.08 (1.65–2.64) <0.0001 | 1.78 (1.46–2.17) <0.0001 |
| Anxiety disorders | 2.33 (1.76–3.08) <0.0001 | 1.83 (1.31–2.56) 0.005 |
| Mood disorders | 2.83 (1.43–5.60) 0.0029 | 2.11 (1.40–3.16) 0.003 |
| ADHD and hyperactivity disorders | 1.20 (0.66–2.16) 0.55 | 1.82 (1.28–2.58) 0.008 |
| Conduct and oppositional disorders | 1.59 (0.92–2.75) 0.093 | 2.35 (1.62–3.40) <0.0001 |

| Any trauma up to age 11 years | Unadjusted | Adjusted (confounders) | Adjusted (confounders and CBCL subscales at age 48 months) |
| Any psychiatric disorder | 1.93 (1.43–2.54) <0.0001 | 1.58 (1.29–1.93) <0.0001 |
| Anxiety disorders | 2.09 (1.57–2.79) <0.0001 | 1.62 (1.16–2.28) 0.0053 |
| Mood disorders | 2.23 (1.16–4.71) 0.018 | 1.89 (1.25–2.85) 0.0026 |
| ADHD and hyperactivity disorders | 1.02 (0.56–1.85) 0.96 | 1.64 (1.14–2.35) 0.0071 |
| Conduct and oppositional disorders | 1.22 (0.70–2.15) 0.48 | 1.98 (1.35–2.90) 0.0049 |

Based on imputed data (N=4229). Confounders include child sex, maternal smoking, maternal relationship status, maternal alcohol consumption, maternal race or ethnicity, maternal education, maternal depression, and family income. CBCL subscales include aggressive behaviour, anxious or depressed, attention problems, rule-breaking behaviour, somatic complaints, social problems, thought problems, and withdrawn or depressed. CBCL=Child Behaviour Checklist. OR=odds ratio.

### Results

Of 4263 live births, 4231 (99.2%) children were included in the study sample, and 4229 (99.2%) boys and 2034 (48.1%) girls; 2581 (61.7%) with White mothers and 1600 (38.3%) with Black or mixed race mothers; figure) were included in the imputed analyses. At child age 11 years, of 3572 interviewed caregivers, 3478 (97.1%) were mothers. There were complete data for 3577 children aged 6 years and 3367 children aged 11 years (figure). Sample characteristics, according to trauma exposure at age 11 years, are presented in table 1. In the 10% of clinical assessments that were assessed by a second psychologist, the inter-rater agreement ranged from 91.2% (any psychiatric disorder) to 72.7% (ADHD and hyperactivity disorders).

The prevalences of current psychiatric diagnoses at ages 6 and 11 years according to previous trauma exposure status are shown in table 2. Up to age 6 years, of the 3577 children with complete data, 440 (12.3%) had experienced a traumatic event. When trauma subtypes were examined, 154 (4.3%) participants reported only interpersonal trauma, 150 (4.2%) were exposed to only non-interpersonal trauma, and...
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26 (0.7%) were exposed to both trauma types. A further 132 (3.7%) participants were exposed to other severe trauma (appendix 2 p 2).

By age 11 years, of 3367 children with complete data, 1154 (34.3%) children had been exposed to trauma, including 282 (8.4%) exposed to only interpersonal trauma, 336 (10.0%) exposed to only non-interpersonal trauma, and 209 (6.2%) exposed to both trauma types. A further 536 (16.4%) children were exposed to non-specified other severe trauma (appendix 2 p 2).

For children age 6 years, when adjusting for confounders and mental health symptoms at age 48 months in the analysis of childhood trauma up to age 6 years and psychiatric diagnoses at age 6 years, children exposed to trauma had higher odds of developing anxiety disorders (adjusted OR 1.79 [95% CI 1.18–2.69], p=0.0007) and any psychiatric disorder (1.59 [1.22–2.06], p<0.0001) and any psychiatric disorder, after adjusting for confounders and previous mental health symptoms at age 48 months (table 4). When additionally accounting for co-occurring non-interpersonal trauma, these associations were retained, albeit slightly attenuated (table 4). Non-interpersonal trauma was associated with increased odds of anxiety disorders, mood disorders, and any psychiatric disorder, after adjusting for confounders and previous mental health symptoms (table 4). The associations for anxiety disorder and any psychiatric disorder were retained, albeit slightly attenuated, when additionally controlling for co-occurring interpersonal trauma (table 4).

Finally, to establish temporality, we examined whether childhood trauma up to age 6 years was associated with psychiatric diagnoses at age 11 years. Models adjusted for confounders showed increased odds of any psychiatric disorder at age 11 years (OR 1.45 [95% CI 1.10–1.91]), mood disorders (1.84 [1.11–3.03]), ADHD and hyperactivity disorders (1.73 [1.12–2.69]), and conduct and oppositional disorders (1.68 [1.05–2.69]), but not anxiety disorders (1.20 [0.74–1.93]). We additionally adjusted for psychological disorder status on the DAWBA at age 6 years and conclusions were unchanged (appendix 2 p 7).

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**Table 4: Interpersonal trauma and non-interpersonal trauma up to age 11 years and psychiatric diagnoses at age 11 years**

|                          | Interpersonal trauma at age 11 years | Non-interpersonal trauma at age 11 years |
|--------------------------|------------------------------------|-----------------------------------------|
|                          | Unadjusted                         | Adjusted (confounders)                  |
| Any psychiatric disorder | 1.96 (1.52–2.53)                   | 1.71 (1.31–2.21)                        |
| Anxiety disorders        | 2.25 (1.51–3.34)                   | 1.79 (1.37–2.31)                        |
| Mood disorders           | 2.68 (1.71–4.20)                   | 2.12 (1.31–3.47)                        |
| ADHD and hyperactivity disorders | 1.82 (1.18–2.81) | 1.58 (1.02–2.66) |
| Conduct and oppositional disorders | 2.06 (1.78–2.38) | 1.83 (1.43–2.30) |

Based on imputed data (N=4229). Confounders include child sex, maternal smoking, maternal relationship status, maternal alcohol consumption, maternal race or ethnicity, maternal education, maternal depression, and family income. CBCL subscales include aggressive behaviour, anxious or depressed, attention problems, rule-breaking behaviour, somatic complaints, social problems, thought problems, and withdrawn or depressed. CBCL=Child Behaviour Checklist. OR=odds ratio.
Discussion

We examined associations between childhood trauma and childhood psychiatric disorders using data from a Brazilian birth cohort study in which more than one in three children were exposed to trauma by age 11 years. By age 6 years, trauma exposure was associated with increased odds of anxiety disorders and any psychiatric disorder, even after adjusting for previous mental health symptoms at age 48 months and key confounders. By age 11 years, trauma exposure was additionally associated with the occurrence of mood disorders, ADHD and hyperactivity disorders, and conduct and oppositional disorders. Interpersonal trauma and non-interpersonal trauma were each associated with increased odds of psychiatric disorders at age 11 years, even when accounting for their co-occurrence. However, more robust effects were observed in association with interpersonal trauma exposure than non-interpersonal trauma.

Trauma exposure was common among children in our sample, increasing from 12.3% at age 6 years to 34.3% at age 11 years. By comparison, 1231 (15.9%) of 7745 children from a representative UK birth cohort had experienced trauma up to age 10 years, with exposure being assessed via the same caregiver diagnostic interview used here, albeit with some administrative differences. It is possible that childhood trauma is more prevalent in Brazil due to relatively low levels of socioeconomic prosperity and one of the highest levels of income inequality globally, both of which are associated with major risk factors for trauma (eg, violent crime). However, standardised approaches to measuring childhood trauma across studies are needed to support robust, country-level comparisons of rates of trauma exposure.

Crucially, trauma exposure in childhood was associated with about 1-8 times the odds of any psychiatric disorder at age 6 years and just over 1-6 times the odds at age 11 years, when adjusted for confounders. Associations were also found when adjusting for mental health symptoms at age 48 months, with trauma exposure still being associated with approximately 1-5 times the odds of any psychiatric disorder at both ages. We also established longitudinal associations between trauma and mental health outcomes, with trauma up to age 6 years being associated with increased odds of disorder at 11 years, after adjusting for confounders. Comparisons with similar studies are difficult, owing to differences in study characteristics and methodological approaches. For example, using representative samples of adolescents from the USA and Mexico, two studies focusing on maladaptive family functioning reported broadly similar effect sizes. By contrast, focusing on childhood trauma, Copeland and colleagues reported effect sizes 3 times the size of those found in the current study in a sample of US youth. Nevertheless, the current study based on prospective data from a middle-income country demonstrates the importance of trauma exposure for understanding child psychopathology.

Analyses of major diagnostic groupings indicated that at age 6 years, mainly anxiety disorders were elevated in children exposed to trauma, whereas at age 11 years, associations with childhood trauma were evident across all categories of psychiatric disorders examined. This broadening of associations with development might partially reflect developmental trends—some anxiety disorders (eg, simple phobias and separation anxiety) show a peak age at first onset in early childhood, whereas other disorders peak in adolescence or young adulthood. Such trends might also have contributed to the unexpected decline seen in the prevalence of current anxiety disorders between age 6 and 11 years in our sample. It will be important to re-examine associations between trauma and mental health outcomes in the Pelotas cohort at older ages, to provide a comprehensive picture of possible effects in the current sample. Notably, we found no evidence of differential associations between trauma and mental health outcomes by diagnostic group, supporting a transdiagnostic model of the associations between trauma exposure and mental health problems.

Clinical attention to trauma as a possible causal influence in diverse presentations of psychopathology among children in LMICs is warranted. We also examined interpersonal trauma versus non-interpersonal trauma up to age 11 years, finding that after adjusting for their co-occurrence, each was uniquely associated with increased odds of any psychiatric disorder. Additionally, interpersonal trauma was associated with anxiety disorders, mood disorders, and conduct and oppositional disorders, and non-interpersonal trauma was associated with anxiety disorders. These indicators of possible specificity require replication; previous studies have found interpersonal trauma to be a particular risk factor for some specific disorders (eg, PTSD). Nonetheless, our findings highlight the independent associations that interpersonal trauma and non-interpersonal trauma exposure each have with psychiatric disorders emerging during childhood, and the crucial need to ensure that both of these trauma types are consistently captured in epidemiological studies.

The results of our study should be interpreted in the context of the Pelotas population, which comprises predominantly urban residents, has lower gross domestic product per capita, and has a higher than average income inequality than the Brazilian national average (appendix 2 p 1). A single city cohort might not capture the considerable socioeconomic variation that is present in Brazil, and it is notable that trauma tends to be more frequent in contexts of socioeconomic deprivation. The study was also not adequately powered to conduct sex-specific analyses, and future studies testing whether findings generalise across sexes are needed.

The following limitations should also be considered in interpreting the findings of our study. First, clinical interviews were conducted only with caregivers, and previous research has shown limited agreement between
self-reports and caregiver reports for both childhood trauma and psychopathology. Reliance on caregivers could result in under-reporting of some traumas (eg, sexual abuse) and disorders (eg, PTSD), possibly diminishing the strength of associations, or could introduce single informant bias, inflating associations between trauma and mental health outcomes. Second, we were unable to consider the frequency or severity of traumatic experiences or to determine at what age trauma exposure occurred, with the latter particularly limiting our ability to make causal inferences. The longitudinal associations observed between trauma at age 6 years and disorders at age 11 years partially address this concern. Nonetheless, we cannot rule out that associations between trauma and mental health outcomes reflect unmeasured or residual confounding (eg, due to shared genetic risk or parental mental health problems) rather than causal effects of trauma on child mental health.

In conclusion, our findings suggest that associations between trauma and mental disorder are already present by age 6 years and hold across multiple diagnostic groupings by age 11 years. Effects of both interpersonal trauma and non-interpersonal trauma were identified. Clinicians, particularly from LMICs, should be aware that trauma exposure is already common in middle childhood, and that these children might present diverse diagnostic profiles. Furthermore, policy makers are advised to develop violence and maltreatment prevention programmes, considering the potential impact of interpersonal trauma specifically. In Pelotas, a city-led intervention programme (Pelotas pela Paz) to reduce violence and crime is currently under evaluation.

Declaration of interests
We declare no competing interests.

Contributors
AB and AM accessed and verified the data in the study. AB, SLH, GF, AM, and GH designed the analysis plan. JM contributed to the analysis plan. AB coded the trauma variables. AB and GH performed the statistical analyses. All authors interpreted the data. AB, SLH, GF, AM, GH, and JM drafted the manuscript. ISS, LTR, TNM, and AJDB revised the manuscript. All authors had access to all the data in the study and had final responsibility for the decision to submit for publication.

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