ORIGINAL ARTICLE

Continuity of psychiatric disorders between 6 and 11 years of age in the 2004 Pelotas Birth Cohort

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Objective: To investigate the incidence and homotypic and heterotypic continuity of psychiatric disorders between ages 6 and 11.

Methods: In 2004, all live births in the city of Pelotas, Brazil, were recorded (n=4,231). Psychiatric disorders were assessed by the Strengths and Difficulties Questionnaire (SDQ). SDQ subscale scores (emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems) were categorized as normal or abnormal. To examine associations between problems over time, odds ratios were computed using logistic regression.

Results: Any SDQ difficulty was observed in 350 children (10.4%, 95%CI 9.4-11.5) at age 6 and 476 (14.2%, 95%CI 13.0-15.4) at age 11, with a higher prevalence among boys at both ages. Between ages 6 and 11, there was a 50 and a 45% increase in the prevalence of emotional and hyperactivity/inattention symptoms, respectively. Among those who had any SDQ difficulty at age 6, that status persisted in 81% at age 11. We found homotypic continuity of emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems.

Conclusions: Our results indicate an increasing incidence of psychiatric disorders in this age group, with rates of disorders and continuity patterns similar to those observed in other studies.

Keywords: Adolescent psychiatry; incidence; cohort study

Introduction

Mental and substance use disorders account for a significant proportion of the global burden of diseases, surpassing cardiovascular problems and cancer.[1] Approximately 30% of all years lived with disability are due to psychiatric disorders. Between 1990 and 2013, the global burden attributed to psychiatric disorders and substance use disorders increased by 45%.[2] It is estimated that, worldwide, 13.4% of children and adolescents have at least one psychiatric disorder.[3] In addition, it is known that a chronic trajectory is a hallmark of psychiatric disorders.[4]

Psychiatric disorders that arise during childhood or adolescence frequently tend to persist, are often undertreated, impair quality of life, have a negative effect on the family environment, and increase the risk of other problems, such as substance abuse, crime, unemployment,

psychiatric disorders in adulthood, and mortality.[5-8] Children and adolescents with a psychiatric disorder are more likely to use health care services, with great economic impact on families and society.[9]

There is evidence that psychiatric disorders show continuity from childhood to adulthood.[7,10-12] The early onset of psychiatric disorders is predictive of such continuity, and factors such as a low initial response to treatment, symptom severity, and comorbidities favor the persistence of these disorders from adolescence into adulthood.[13]

The study of continuity of psychopathology during the transition from childhood to adolescence deserves special attention, given the multiple biological, cognitive, and social changes that occur in individuals at that development stage.[14] These studies allow us to examine the natural course of psychiatric disorders, their clinical significance,

and future implications, as well as inform the planning of early interventions.[15]

Psychiatric continuity can be distinguished into homotypic and heterotypic types.[16] Homotypic continuity is defined as the presence of the same diagnosis at different points in time. Conversely, the term heterotypic continuity is used when a particular psychiatric disorder predicts onset of another disorder at a later time point.[17] A large body of evidence has supported both homotypic and heterotypic continuity of psychiatric disorders in children and adolescents.[16-18]

Valid diagnostic criteria was first articulated by Robin & Guze, in 1970, when they proposed five phases to establish an accurate classification of mental disorders: clinical description, laboratory study, exclusion of other disorders, follow-up studies, and family study.[19] According to their proposal, follow-up studies are needed to investigate psychopathological stability or discontinuity in a sample of individuals, which would help in diagnostic prediction and definition.[19] It stands to reason that birth cohort studies constitute the most appropriate design to evaluate the continuity of psychiatric disorders and the validity of diagnoses, as they follow individuals for years, decades, or even throughout their entire lives.[19]

Within this context, the present study aimed to evaluate the cumulative incidence and prevalence of psychiatric disorders between the ages of 6 and 11 among members of a Brazilian birth cohort, and to investigate the homotypic and heterotypic continuity of these disorders.

Methods

Population and study design

The 2004 Pelotas Birth Cohort is a population-based birth cohort of children born in the Brazilian city of Pelotas, state of Rio Grande do Sul, from January 1, 2004 to December 31, 2004. All live births to women residing in the urban area of the city (n=4,231) during that year were recruited for the study (nonresponse rate at recruitment < 1%). Face-to-face interviews were conducted within the first 24 h after delivery. Trained interviewers collected information on maternal and infant health using a structured questionnaire, and all newborns were examined under the supervision of a pediatrician. The cohort members were evaluated at various time points. The mean ± standard deviation age of the subjects at the fifth and sixth evaluation was 6.8±0.3 years and 11.0±0.3 years, respectively. Both evaluations were performed at a research clinic run by the Programa de Pós-Graduação em Epidemiologia, Universidade Federal de Pelotas (UFPel), with high response rates (90 and 87% in 2011 and 2015, respectively). Mothers or caregivers were also interviewed with a standardized questionnaire to collect information about maternal and child health. Detailed descriptions of methodology are given elsewhere.[20,21]

Study population characteristics

The sociodemographic characteristics of the cohort members and their mothers included: monthly family income in the month prior to delivery, expressed as multiples of the Brazilian national minimum wage (equivalent to approximately US$ 80.00 in 2004); maternal education (years of schooling); age (years); maternal skin color (as categorized by the interviewer); parity (number of previous viable pregnancies); smoking during pregnancy (maternal self-assessment); infant sex; and low birth weight (< 2,500 g).

Mental health assessment

At the 6- and 11-year follow-ups, mothers or caregivers were interviewed by trained psychologists using the Strengths and Difficulties Questionnaire (SDQ), an instrument designed to assess mental health problems in children and adolescents. The SDQ was developed by Goodman and validated for use in Brazil by Fleitlich-Bilyk & Goodman.[22,23] The instrument consists of 25 questions divided into five subscales of five items each: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behavior. Each question is scored on a three-point scale (not true = 0; somewhat true = 1; certainly true = 2). We used total SDQ scores and those of the emotional, conduct, attentional/hyperactivity, and peer problems subscales. The total difficulty score (any SDQ difficulty) was calculated by adding the results of the subscales (except prosocial behavior). The resulting score ranged from 0 to 40, and could be stratified into three categories: normal (0-13), borderline (14-16), and abnormal (17-40). The subscale scores ranged from 0 to 10 and were also categorized as normal, borderline, or abnormal, according to the suggested cutoff points available on the SDQ website.[24] We used a dichotomous classification of SDQ scores, whereby subjects in the borderline and abnormal categories were compared to those in the normal group.

Data analysis

To describe the characteristics of the sample, we performed univariate analyses of absolute and relative frequencies. Prevalence rates and 95% confidence intervals (95%CI) for any SDQ difficulty, emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems were calculated at age 6 and age 11. The cumulative incidence of any SDQ difficulty between 6 and 11 years of age was calculated as the proportion of children with any SDQ difficulty at age 11 among those who tested negative at age 6. The cumulative incidence of emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems was calculated using the same procedure. The persistence of any SDQ difficulty between 6 and 11 years of age was calculated as the proportion of children with any SDQ difficulty at age 11 among those who tested positive at age 6. The same procedure was used to calculate the persistence of emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems. To compare the rates of disorders in the evaluations performed at age 6 with those recorded in the evaluations performed at age 11, we conducted McNemar tests for paired proportions. To examine associations between

problems over time, odds ratios (OR) were computed using logistic regression, with age 6 problems being entered as independent variables and age 11 problems being entered as dependent variables. In the heterotypic analyses, we present crude ORs and ORs adjusted for comorbidity at age 6, with their respective 95%CI. All analyses were conducted both for the sample as a whole and stratified by sex, and all were performed in the STATA statistical software package, version 14.0.

Ethics statement

The study was approved by the research ethics committees of Faculdade de Medicina da Universidade de São Paulo (USP; protocol 015/15, dated March 18, 2015) and UFPel. When the members of the birth cohort were 6 and 11 years old, written informed consent was obtained from their mothers or legal guardians; at the age 11 follow-up, written informed assent was also obtained from the members themselves. Data confidentiality and voluntary participation were guaranteed throughout, as was the option to withdraw from the study at any time, without giving a reason. Those diagnosed with serious mental health problems were referred to the appropriate local health care facilities.

Results

Attrition analyses

Of the 4,231 participants constituting the original cohort, 98 died in the first 11 years of life. At ages 6 and 11, we interviewed 3,721 and 3,566 individuals, respectively. Data on SDQ scores at both ages were available for 3,362 individuals (79.5% of the original cohort). Among members not included in the analysis, those belonging to families with higher socioeconomic status, those born to mothers aged 20-34, and those born with low birth weight were overrepresented (Table 1).

Sample description

The sample profile is described in Table 1. Approximately 70% of families earned three times the current minimum wage or less, and 15% of mothers had 4 years of schooling or fewer. Of the mothers, 73% were white; 40% were primiparous; 67% were between 20 and 34 years of age; and 73% did not smoke during pregnancy. Boys accounted for 52% of the sample, and 9% of the cohort members had a low birth weight.

Prevalence, incidence, and persistence of mental health problems

The prevalence of any SDQ difficulty was found to be 10.4 and 14.2% at ages 6 and 11, respectively, which translates to a 50% increase between the two time points (Table 2). From 6 to 11 years of age, there was an increase in the prevalence of emotional and hyperactivity/inattention symptoms, whereas the prevalence of conduct problems declined. In the sex-stratified analyses, the

Table 1 Baseline characteristics of mothers and infants included and not included in the study

Variables	Included (n=3,362)	Not included (n=869)	p-value*
Monthly family income (× minimum wage)			0.005
≤ 3.0	2,246 (67.0)	577 (66.8)	
3.1-6.0	768 (22.9)	176 (20.4)	
6.1-10.0	185 (5.5)	58 (6.7)	
> 10.0	154 (4.6)	53 (6.1)	
Maternal educational attainment (years)			0.059
≤ 4	499 (15.0)	156 (18.1)	
5-8	1,395 (41.9)	336 (39.1)	
≥ 9	1,433 (43.1)	368 (42.8)	
Maternal age (years)			0.005
≤ 19	640 (19.0)	160 (18.5)	
20-34	2,246 (66.8)	619 (71.4)	
≥ 35	475 (14.1)	88 (10.2)	
Maternal skin color			0.792
White	2,459 (73.1)	631 (72.7)	
Black/other	903 (26.9)	237 (27.3)	
Parity			0.109
0	1,329 (39.5)	337 (38.8)	
1	897 (26.7)	214 (24.6)	
2	545 (16.2)	135 (15.5)	
≥ 3	590 (17.6)	183 (21.1)	
Smoking during pregnancy			0.069
No	2,460 (73.2)	609 (70.1)	
Yes	902 (26.8)	260 (29.9)	
Infant sex			0.308
Male	1,732 (51.5)	464 (53.5)	
Female	1,630 (48.5)	404 (46.5)	
Low birth weight (< 2,500 g)			< 0.001
No	3,062 (91.1)	741 (85.6)	
Yes	299 (8.9)	125 (14.4)	

Data presented as n (%).
* Chi-square test.

prevalence of any SDQ difficulty was higher in boys than in girls, at both ages (Table S1, available as online-only supplementary material). Among girls, there were no changes from age 6 to age 11 regarding conduct problems, hyperactivity/inattention, or peer relationship problems.

The overall incidence of any SDQ difficulty over the study period was 10.6% (Table 2), 12.7% in boys and 8.4% in girls (Table S1). The overall incidence of emotional symptoms was higher than that of all other problems investigated. The incidence of conduct problems was similar (approximately 9%) between boys and girls, whereas hyperactivity/inattention and peer relationship problems were both more prevalent among boys than among girls (Table S1).

Over the study period, the persistence of any SDQ difficulty in the overall population was 45%. Emotional symptoms, hyperactivity/inattention, and peer relationship problems persisted in about 40-45% of the sample, whereas conduct problems persisted in only 33.3% (Table 2). Persistence of hyperactivity/inattention was higher among boys than among girls (55 vs. 31%).

Table 2 Prevalence, incidence, and persistence of any SDQ difficulty, emotional symptoms, conduct problems, hyperactivity/ inattention, and peer relationship problems at ages 6 and 11 (2004 Pelotas Birth Cohort, Pelotas, RS, Brazil)

Disorder	Prevalence at age 6		Prevalence at age 11			Cumulative incidence from ages 6 to 11[†]		Persistence between ages 6 and 11[‡]	
	n (%)	95%CI	n (%)	95%CI	p-value*	%	95%CI	%	95%CI
Any SDQ difficulty	350 (10.4)	9.4-11.5	476 (14.2)	13.0-15.4	< 0.001	10.6	9.5-11.7	44.9	39.6-50.2
Emotional symptoms	449 (13.4)	12.2-14.6	672 (20.0)	18.6-21.4	< 0.001	16.3	15.0-17.7	43.9	39.2-48.6
Conduct problems	492 (14.6)	13.5-15.9	433 (12.9)	11.8-14.1	0.018	9.4	8.3-10.5	33.3	29.2-37.7
Hyperactivity/inattention	455 (13.5)	12.4-14.7	535 (15.9)	14.7-17.2	0.001	11.3	10.2-12.5	45.5	40.9-50.2
Peer relationship problems	466 (13.9)	12.7-15.1	450 (13.4)	12.3-14.6	0.526	9.4	8.3-10.5	38.4	34.0-43.0

95%CI = confidence interval; SDQ = Strengths and Difficulties Questionnaire.
* McNemar test for difference in prevalence between ages 6 and 11.
[†] The cumulative incidence of any SDQ difficulty between 6 and 11 years of age was calculated as the proportion of children with any SDQ difficulty at 11 years among all those who had tested negative at 6 years. The same procedure was used to calculate cumulative incidence of emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems.
[‡] The persistence of any SDQ difficulty between 6 and 11 years of age was calculated as the proportion of children with any SDQ difficulty at 11 years among all those who had tested positive at age 6. The same procedure was used to calculate persistence of emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems.

Table 3 Logistic regression analyses of disorders at age 6 as predictors of disorders at age 11* (2004 Pelotas Birth Cohort, Pelotas, RS, Brazil)

Assessment at age 6	Emotional symptoms		Conduct problems		Hyperactivity/inattention		Peer relationship problems	
	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value
Emotional symptoms	4.0 (3.3-5.0)	< 0.001	2.3 (1.8-3.0)	< 0.001	2.1 (1.7-2.7)	< 0.001	3.2 (2.5-4.1)	< 0.001
+ comorbidity[†]			1.4 (1.0-1.8)	0.034	1.2 (0.9-1.6)	0.160	1.9 (1.5-2.5)	< 0.001
Conduct problems	1.5 (1.2-1.9)	< 0.001	4.8 (3.9-6.1)	< 0.001	3.4 (2.7-4.2)	< 0.001	2.7 (2.1-3.4)	< 0.001
+ comorbidity[†]	0.9 (0.7-1.1)	0.317			1.6 (1.3-2.1)	< 0.001	1.4 (1.1-1.9)	0.018
Hyperactivity/inattention	1.7 (1.4-2.2)	< 0.001	3.5 (2.8-4.4)	< 0.001	6.6 (5.3-8.2)	< 0.001	2.4 (1.9-3.0)	< 0.001
+ comorbidity[†]	1.3 (1.0-1.7)	0.053	1.9 (1.5-2.5)	< 0.001			1.3 (1.0-1.8)	0.046
Peer relationship problems	2.3 (1.8-2.8)	< 0.001	2.5 (2.0-3.2)	< 0.001	2.3 (1.8-2.9)	< 0.001	6.0 (4.8-7.6)	< 0.001
+ comorbidity[†]	1.7 (1.3-2.1)	< 0.001	1.5 (1.1-1.9)	0.005	1.4 (1.1-1.9)	0.007		

95%CI = 95% confidence interval; OR=odds ratio.
* n=3,362 individuals with data available for evaluation at ages 6 and 11.
[†] Analyses conducted to control for concurrent comorbidity at age 6 in the heterotypic analyses.

Homotypic and heterotypic continuity

From age 6 to age 11, there was significant homotypic continuity for emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems (Table 3), with no significant difference between boys and girls (Table S2, available as online-only supplementary material). There was also heterotypic continuity for all four of those outcomes. After adjusting analyses for comorbidity at age 6, emotional symptoms and hyperactivity/ inattention during childhood were found to be associated with conduct and peer relationship problems at age 11. Conduct problems at age 6 were associated with hyperactivity/inattention and peer relationship problems at age 11. Peer relationship problems at age 6 were associated with emotional symptoms, conduct problems, and hyperactivity/inattention in early adolescence (Table 3). Hyperactivity disorders in childhood were associated with conduct disorders at age 11 in both sexes. For the emotional symptoms, conduct, and peer relationship problems sub-scales, there were sex-related differences in the patterns of heterotypic continuity (Table S2).

Discussion

The prevalence of any SDQ difficulty increased by 50% between ages 6 and 11, with a higher prevalence of psychiatric disorders in boys than in girls for both ages. From age 6 to age 11, the prevalence of emotional symptoms increased by 50%, whereas that of conduct problems declined by 12%. During the study period as a whole, the overall incidence and the persistence of any SDQ difficulty was 10.6 and 45%, respectively. During the transition from childhood to early adolescence, homotypic continuity was observed for emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems. For emotional symptoms, conduct problems, and peer relationship problems, the patterns of heterotypic continuity differed between girls and boys.

In the present study, we observed an increase in the prevalence of psychiatric disorders, especially emotional symptoms and hyperactivity/inattention, from age 6 to age 11. A recent review reported changes in the prevalence of psychiatric disorders from childhood to adolescence.[10] In that review, the largest epidemiological study that covered

childhood and early adolescence was the British Child and Adolescent Mental Health Survey, conducted in 1999 and involving over 10,000 children aged 5-15 years. The prevalence of any psychiatric disorder (DSM-IV criteria) rose from 8.6% at 8-10 years of age to 9.6% at 11-12 years of age. As in the present study, that review showed increased rates of most internalizing disorders as children moved into adolescence. However, contrary to our results, most of the studies included in the review showed decreasing rates of attention-deficit/hyperactivity disorder (ADHD). The results of trend analyses for conduct disorder and oppositional defiant disorder were mixed, increasing rates of conduct disorder and decreasing rates of oppositional defiant disorder in the British Child and Adolescent Mental Health Survey, whereas results were divergent across the other studies included.

Anxiety disorders are the most common psychiatric disorders of children and adolescents, and their incidence is known to increase during adolescence and adulthood, as does that of depressive disorders.[25] Specifically in relation to childhood and adolescence, there is evidence that boys initially experience a higher prevalence of depressive disorders than do girls, although that pattern tends to reverse between 11 and 13 years of age.[26] Those differences are associated with a multifactorial etiology, which includes biological, psychosocial, and socioeconomic aspects.[27] The pattern of occurrence of internalizing and externalizing symptoms during childhood and adolescence can be explained from the perspective of multilevel developmental psychopathology.[28] In keeping with the findings of the present study, previous investigations evaluating internalizing symptoms in children aged 2-10 years have reported only small differences between boys and girls in terms of the developmental trajectories of symptoms, and both presented three trajectories of symptoms: low-stable, decreasing/increasing, or elevated-stable.[25,29,30] However, twice as many girls as boys showed elevated symptom patterns.[30] Factors related to temperament and to the quality of interpersonal relationships have been shown to be major predictors of such disorders in children and adolescents.[29] A lifetime history of exposure to stressors has been associated with an increase in occurrence of depressive symptoms, especially in girls.[31] In addition, psychiatric comorbidity rates are considerably higher among girls than among boys. Although girls are less likely to exhibit externalizing symptoms, such as antisocial or aggressive behavior, those who do are more likely to be depressed or anxious.[25] Zahn-Waxler et al. suggested possible processes that may be related to the differences in psychiatric disorders and symptoms between girls and boys, such as distinctions of experience and levels of environmental risk factors, disparities of biological and gene expression processes, and diversity in environmental and genetic interactions based on sex moderation.[25]

The combined prevalence of ADHD in children and adolescents (age < 18 years) is 5%.[32] The symptomatology that accompanies these disorders affects all aspects of the lives of children and adolescents, as well as those of their parents and siblings, impairing family and marital functioning.[33] In our sample, we observed an increase in hyperactivity/inattention between the ages of 6 and 11 years. That could be attributable to the fact that the symptoms of hyperactivity are more harmful and easier to recognize as they magnify academic challenges and make behavioral control essential to achieving educational goals.

Our results are consistent with previous studies of individuals in similar age groups in which psychiatric disorders have been found to show homotypic and heterotypic continuity. Shevlin et al. evaluated 4,815 subjects aged 7.5-14 years from the Avon Longitudinal Study of Parents and Children Cohort, and observed high rates of homotypic and heterotypic continuity.[17] A study of 1,584 adolescents reported continuity of psychiatric disorders between the ages 11 and 19, mainly due to recurrence of mood disorders and chronicity of anxiety disorders.[18] In that study, there was stronger evidence of continuity for externalizing disorders (especially ADHD) than for internalizing disorders such as depression and anxiety. In the United States, Costello et al. evaluated homotypic and heterotypic continuity in 1,420 individuals between 9 and 16 years of age who were enrolled in the Great Smoky Mountains Study.[16] The authors found that presence of any psychiatric diagnosis in childhood increased the chance of presenting any psychiatric disorder in adolescence, with greater risk among girls than among boys. Homotypic continuity, especially for depressive and anxiety disorders (generalized anxiety, social phobia, and specific phobia), was more common among girls in their study. The authors also observed heterotypic continuity for internalizing disorders (anxiety and depressive disorders) and externalizing disorders (ADHD and conduct disorder),[16] as in the present study. In a recent study of children and adolescents aged 9-11 years conducted at 73 primary schools in London, the persistence rates of internalizing and externalizing symptoms were found to be approximately 17% over the 2 years between the baseline and follow-up assessments.[34] In Brazil, a study analyzing a sample of 601 children, all of whom were members of the 1993 Pelotas Birth Cohort, showed that conduct problems and emotional symptoms observed at 4 years of age persisted at 12 years of age in approximately 30% of the children.[35] In the present study, mirroring the findings of Wichstrom et al., early behavioral disorders increased the chance of later symptoms of hyperactivity, whereas early symptoms of hyperactivity increased the chance of later emotional symptoms and behavioral disorders.[36]

The patterns of heterotypic continuity observed in the present study are in line with the most current concept of psychopathology, i.e., as a phenomenon subject to changes in its manifestations and phenotypic plasticity.[37] Two hypotheses have been proposed to explain the development of psychiatric disorders: that of shared etiology and that of causal interaction. The shared etiology hypothesis suggests that the persistence of risk factors could explain the co-occurrence and continuity of psychiatric disorders over time. For example, genetic factors could predispose individuals to certain psychiatric disorders, the manifestations of which could appear over time, possibly reflecting changes in environmental factors.[38] An

alternative interpretation of heterotypic continuity establishes causal interactions among psychopathological comorbidities. The causal interaction hypothesis suggests that, within a complex network, psychiatric symptoms/disorders have the potential to influence one another directly and indirectly over time.[39]

One of the strengths of our study is its population-based design, involving face-to-face interviews and a large sample of enrollees. In addition, we assessed mental health problems with an internationally recognized screening tool validated for use in Brazil, which was applied by trained psychologists to ensure the quality of data collection. The low proportion of nonrespondents is also noteworthy. There were few differences between the individuals who were included and those who were not included in the analysis, suggesting that any attrition bias is likely to be small.

Our study does have some limitations. We applied only the parent-report version of the SDQ. As the behavior of children varies according to context, use of a multiple informant strategy is important to allow observation of the child in different contexts. Indeed, there is evidence that parent-teacher agreement of SDQ scores is low to moderate, indicating that different informants provide distinct, unique information on children's mental health.[40] Application of the teacher-report and self-report versions in our study might have revealed other symptoms not recognized by mothers or caregivers, contributing to a more accurate screening for psychiatric disorders in the cohort.

In conclusion, our findings underscore the importance of identifying psychiatric disorders and intervening during childhood in order to prevent the onset, chronicity, and recurrence of such disorders in adolescence, even when the etiological factors involved are not specifically addressed. The results of the present study will contribute to addressing the lack of population-based studies on psychiatric disorders in adolescents from low- and middle-income countries. Our findings could also inform decisions regarding the provision of mental health services for this age group, minimizing the short- and long-term impacts of psychiatric disorders in early life.

Disclosure

The authors report no conflicts of interest.

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