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Research report

Depression among Brazilian adolescents: A cross-sectional population-based study

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ABSTRACT

Background: Depression is the most common mental disorder during adolescence. Mental disorders often begin between infancy and adolescence, persisting throughout the rest of life and even affecting the well-being of subsequent generations.
Methods: This was a cross-sectional population-based study, with two-stage, probability-proportional-to-size cluster sampling, conducted in the city of Pelotas, in southern Brazil. All individuals aged 10–19 years and living in the selected dwellings were invited to participate in the study. To identify depression, we applied the Patient Health Questionnaire-9. We defined minor depression as the presence of two or more depressive symptoms, at least one of which is depressed mood or anhedonia. The symptoms were considered valid only if reported to persist for a week or more or to occur nearly every day, the exception being suicidal thoughts, which was considered valid regardless of frequency.
Results: We interviewed 743 adolescents, among whom the prevalence of minor depression was 17.0% (95% confidence interval, 14.0–20.0), being higher among girls than among boys, as well as among individuals aged 14–15 years, those self-identifying as an ethnic minority, those who were smokers and those who lived with a depressed individual.
Limitations: The reverse causality bias that is a problem inherent to cross-sectional studies, which precluded the establishment of temporal relationships between exposures and the outcome of interest.
Conclusions: Our results illustrate the relevance of depression in adolescents, underscoring the need for mental health policies targeting this population, with the objective of minimising the short- and long-term effects of early-onset depression.

1. Introduction

Mental disorders affect a large proportion of adolescents worldwide (Kieling et al., 2011), and depression is the most common such disorder in this population (World Health Organization, 2012). One systematic review found that the prevalence of depression among adolescents ranged from 2.2%, in the Netherlands, to 22.9%, in China (Bertha and Balazs, 2013).

In the international literature, there are two types of definitions for depression, one categorical and the other dimensional (Ayuso-Mateos et al., 2010). The categorical definition is based on the presence or absence of major depression, whereas the dimensional definition takes into consideration subtypes of depression, such as minor depression. Various authors have argued in favour of the use of the dimensional classification, with the objective of facilitating the identification of depression even in cases of lesser severity and promoting the early treatment of such cases, thus preventing the progression to greater severity (Andrews et al., 2007; Ayuso-Mateos et al., 2010). Minor depression, which is currently one of the diagnostic categories within the dimensional classification system, is characterised by the presence of two or more symptoms of depression over a two-week period, at least one of those symptoms being depressed mood or anhedonia (Ayuso-Mateos et al., 2010).

Many aspects of modern life are associated with an increase in the prevalence of depression among adolescents. Studies conducted in various countries have shown that, during adolescence, the prevalence of depression is higher among girls than among boys (Kessler and Walters, 1998; Sykes, 1987), as well as among ethnic minorities (Cuijpers et al., 2008), individuals between 14 and 16 years of age (Cooper and Goodyer, 1993), with less schooling (Cuijpers et al., 2008),

Abbreviations: DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; NEI, National Economic Indicator; PHQ-9, Patient Health Questionnaire-9; CI, confidence interval; PR, prevalence ratio; WHO, World Health Organisation

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from parents with mental disorders (Gonzalez-Tejera et al., 2005), with less social support (Gonzalez-Tejera et al., 2005) and who have ever suffered any form of physical or psychological violence (Gonzalez-Tejera et al., 2005). Studies evaluating individuals between 14 and 19 years of age in Brazil have shown that the prevalence of depression was higher among the females than among the males (Jatobá and Bastos, 2007; Menezes et al., 2013; Zinn-Souza et al., 2008), as well as among adolescents with family relationship problems (Zinn-Souza et al., 2008), smokers or alcohol consumers on a regular basis (Zinn-Souza et al., 2008), those not engaged in physical activity (Zinn-Souza et al., 2008) and among those who belong to families in the lowest income quintiles (Menezes et al., 2013). One such study also showed that depression among adolescents was associated with parental, intrauterine and early-life factors, including being the product of an unplanned pregnancy, as well as lack of support provided to the mother by her partner, maternal alcohol consumption during gestation, and *in utero* exposure to tobacco smoke from active or passive maternal smoking (Menezes et al., 2013). In a study of pregnant girls between 10 and 19 years of age in Brazil, the prevalence of depression was found to be highest among those with less schooling, who were employed, multiparous, who reported having experienced stressful life events, who had suffered any type of violence in the last year and those with only minimal social support (Coelho et al., 2013).

Mental disorders often begin between infancy and adolescence, persisting throughout the rest of life and even affecting the well-being of subsequent generations. Individuals who have depression early in life are at a higher risk for developing mental disorders, especially depression, in adulthood (Thapar et al., 2012). However, early mental health interventions could minimise the adverse effects that depression during childhood or adolescence has in adulthood (Copeland et al., 2013).

Cross-sectional studies are potentially important for the identification of high-risk groups, as well as for the planning of mental health interventions. The objective of the present study was to evaluate the prevalence of minor depression, as well as the associated demographic, socioeconomic and behavioural factors, among Brazilian adolescents.

2. Methods

2.1. Study site

Pelotas is a city in the Brazilian state of Rio Grande do Sul, located in the southern region of the country. According to the 2010 census, Pelotas has approximately 328,000 inhabitants, 93.3% of whom live in the urban area of the city. In 2010, individuals between 10 and 19 years of age—i.e., adolescents, as defined by the World Health Organisation (WHO)(WHO/UNFPA/UNICEF Study Group on Programming for Adolescent Health (1995: Saillon Switzerland) World Health Organization, 1999) accounted for 16% of the population of Pelotas, and 84% of those individuals were enroled in school (IBGE, 2012). The mean monthly household income *per capita* among residents living in permanent private housing in the urban area of the city in 2010 was approximately US$490 (median, US$271), and the local gross domestic product for the same year was US$5976, lower than the US$8161 reported for the country as a whole (IBGE, 2012).

2.2. Study design

This was a cross-sectional population-based study, conducted in the urban area of Pelotas between February and June of 2012. The study was designed to investigate various health outcomes.

2.3. Sample size calculation

Considering a level of significance of 5%, with a margin of error of 3%, and assuming a prevalence of major depression disorder of 7.5% in the target population (Zinn-Souza et al., 2008), we calculated the minimum sample size to be 296 subjects. Adding 10% to compensate for losses and considering a design effect of 1.2, we arrived at a final sample size of 392 subjects needed in order to study the prevalence of depression in adolescents.

For the association study, we calculated the *post-hoc* power to study the variables of interest. The size of the available sample ($n=743$) allowed us to determine, at a power $\geq 80\%$, whether depression in adolescence is associated with the variables age, sex, smoking and living with a depressed individual.

2.4. Sampling

The sampling was conducted in two stages, with probability proportional to size. The primary sampling units were 130 census tracts defined in the 2010 census. The secondary sampling units were the households. We created a list of all private permanent dwellings that were occupied within those census tracts in December 2011. We then systematically selected households to be included in the sample, with probability proportional to size. The present study is a part of a larger project in which all individuals ≥ 10 years of age and living in the selected households were invited to participate. Individuals with cognitive impairment, as determined by the field supervisor of the project, were excluded, as were those who were institutionalised (in hospitals, nursing homes or other facilities). For the purposes of this study, we evaluated only individuals between 10 and 19 years of age.

2.5. Definition of depression

To identify minor depression in the adolescents under study, as well as in other residents of the selected households, we used the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 evaluates nine depressive symptoms listed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV): depressed mood; anhedonia (loss of interest in or inability to gain pleasure from engaging in activities); sleep disturbances; fatigue or lethargy; changes in appetite or body weight; feelings of guilt or worthlessness; difficulty in concentration; feelings of being slow or restless; and suicidal thoughts. Various international studies have evaluated minor depression in children and adolescents, defining it as the presence of two or more depressive symptoms, at least one of which is depressed mood or anhedonia (Bertha and Balazs, 2013; Wesselhoeft et al., 2013). In the present study, we used that same approach, employing an algorithm by which an adolescent who reports two or more depressive symptoms is classified as testing positive for minor depression, assuming that at least one of those symptoms is depressed mood or anhedonia. An additional criterion was that each of the symptoms reported was considered valid only if reported to persist for a week or more or to occur nearly every day, the exception being suicidal thoughts, which was considered valid regardless of frequency.

2.6. Definition of exposures

We collected demographic data related to sex (male or female), age (in whole years completed, stratified as 10–11, 12–13, 14–15, 16–17 and 18–19), and self-reported ethnicity (categorised as White, Black or Indigenous/Asian/Mixed). We also collected data related to socioeconomic variables, including the level of education of the head of household (categorised as none/<6 years of schooling; 6–8 years of schooling; 9–11 years of schooling; ≥ 12 years of schooling, with or without some college; or college completed), the National Economic Indicator (NEI) and employment status. The NEI was determined through a principal component analysis based on assets (televisions, automobiles, radios, refrigerators, freezers, video players/recorders, clothes washers, microwave ovens, telephones, computers and air conditioners), characteristics of the dwelling (number of bedrooms