

Level of Depression by Sex Among High School Students in Three Municipalities of Antioquia, Colombia

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ABSTRACT

Introduction: The mental health of school-going adolescents is an issue of concern for some administrators in health and education fields at some municipalities in the department of Antioquia. **Development:** The aim was to determine the distribution of depression levels among high, mild, and none levels according to the gender of adolescents attending school in three municipalities of Antioquia. In each population, a random sample was obtained, designed with a 95 % confidence level for the presence of depression in students aged 11 to 19 years, with an-error ranging between 3 and 5 %. The research group measured the presence of depression with the Children's Depression Inventory (CDI). Municipal authorities provided the permission and the consent of parents, teachers, and students. The group analyzed simple correspondence using the statistical software SPSS and RStudio. **Results:** At the highest level of depression are mainly women from Marinilla and Carmen de Viboral; at the mild level are women from the two areas in Medellín; at the no depression level are men from Carmen de Viboral and the two areas in Medellín. **Conclusions:** depression is a public health problem, and when it occurs, it is more likely in women than in men; in some municipalities, there is no difference between men and women, and the whole population should be intervened to remedy the situation.

Keywords: mental health, school-age population, health statistics, sampling, psychological research, psychological testing, social research.

INTRODUCTION

This study about depression in adolescents attending school in five municipalities of Antioquia presents the prevalence found according to gender and the three emerging types of depression, shedding light on the emphasis on both individual and collective treatment. It is investigated whether depression is more prevalent in one sex than in the other; is standardizing its individual treatment and collaborative approach in public health making invisible the differences that cause it to occur more frequently in women than in men? The treatment of depression in children and adolescents has been the focus of severe recent debate (1).

The importance of this study is correlated from the global to the local level. In this sense, depression is recognized as a worldwide public health problem due to its high prevalence (2).

It is a disorder of complex etiology due to the combination of biological, genetic, psychological, and social factors already recorded in numerous investigations (3,4).

Mental health disorders such as depression and anxiety tend to coexist frequently with somatization disorders, the latter being a frequent cause of consultation in medical specialties in children and adolescents (5). Psychiatric disorders in adolescents show a high prevalence and disability, especially anxiety and depressive disorders (6). In addition, untreated major depression can lead to several negative health and social consequences among adolescents (7), and evidence of time trends in adolescent depression stratified by sociodemographic characteristics is needed (8).

Depression as a psychopathological condition is different from sadness (9). The usual variations in mood and brief emotional responses produce sadness arising from the problems of everyday life. In this sense, a person overcomes their sadness through means and coping resources. As depression is of longer duration, it can become a severe health problem, especially when it is recurrent; if it is of high and moderate intensity, in this state, the person does not get out of it on their own and requires others to come to their aid. It can cause great suffering to the affected person, producing more significant stress and dysfunction, altering their self-care, work, school, family, and social habits and routines, and in the worst cases, it can lead to suicide (10,1).

Depression is one of the leading causes of disability worldwide; more than 7.5% of all years lived with disability in 2015. It is estimated that more than 300 million people of all ages suffer from depression, and the prevalence is higher in women than in men. According to the World Health Organization, the prevalence of depression among women is 5.1 percent, while in men it is 3.6 percent (11).

The causes and risk factors for depression are complex and may vary by individual and culture. Some common risk factors and causes include a family history of depression, stressful life events, lack of social support, substance use, mental and physical health problems, as well as hormonal and other biological changes (3,12).

Protective factors can help reduce the risk of depression. Some common protective factors include social support, regular physical activity, healthy sleep habits, healthy self-esteem, and stress-coping skills (13).

It is essential to keep in mind that depression is a complex disorder and may require an individualized approach to treatment. A comprehensive approach combining therapy and lifestyle changes may be effective for the treatment of depression in young people (3). Protective factors can help reduce the risk of depression. Some common protective factors include social support, regular physical activity, healthy sleep habits, healthy self-esteem, and stress-coping skills (13).

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This article presents the distribution of the levels high, mild, and none of the levels of depression in school adolescents in three municipalities of Antioquia. The databases analyzed were constructed by the authors in research carried out in the places described in the results and are registered in research projects that have the endorsement of the technical committee of research and the ethics committee of the National Faculty of Public Health of the University of Antioquia; the databases used for the writing of this article are available for anyone who wishes to review them; the authors directed and carried out the collection of information and statistical analysis; permissions have been obtained from the health and education secretariats of the municipalities and they, in turn, have referred the research team to the educational authorities of the schools. We agree to process our data for the purposes required by the journal. This article presents the distribution of the levels high, mild, and none of the levels of depression in school adolescents in three municipalities of Antioquia. The databases analyzed were constructed by the authors in research carried out in the places described in the results and are registered in research projects that have the endorsement of the technical committee of research and the ethics committee of the National Faculty of Public Health of the University of Antioquia; the databases used for the writing of this article are available for anyone who wishes to review them; the collection of information and statistical analysis was directed and carried out by the authors; permissions have been obtained from the health and education secretariats of the municipalities and they, in turn, have referred the research team to the educational authorities of the schools. We agree to process our data for the purposes required by the journal.

In this article, which is unpublished and original, the association between the level of depression and gender and the age group to which the student belongs is initially explored. Next, the distribution of the level of depression according to gender is shown because it was the resulting association in four of the six populations. Then, employing a simple correspondence analysis, a multivariate relationship is constructed between sex and the levels of depression in the four populations studied in the three municipalities. In this article, which is unpublished and original, the association between the level of depression and gender and the age group to which the student belongs is initially explored. Next, the distribution of the level of depression according to gender is shown because it was the resulting association in four of the six populations. Then, employing a simple correspondence analysis, a multivariate relationship is constructed between sex and the levels of depression in the four populations studied in the three municipalities.

METHODS

Participants

In each study, the team designed a random sample (14) of schooled adolescents aged 11-19 years who were enrolled and studying at the time of the study; the prevalence of interest was taken as the presence of depression; the sample size was calculated with 95 % confidence and an error between 3 and 5 % in the estimation of that prevalence. The projects in the five populations were endorsed by the technical committee and the ethics committee of the National Faculty of Public Health of the University of Antioquia. Permission to conduct the studies was obtained from the secretary of education of Medellín and the local health directorates and health secretariats of the municipalities under consideration. The research obtained consent from parents and school principals and permission from the students participating in the study. The participating students are 779 adolescents from the north-

eastern area of Medellín, 605 from the north-western area of Medellín, 524 students from Ebéjico, 405 from Copacabana, 700 students from Marinilla, and 700 students from Carmen de Viboral.

Instrument

The Children's Depression Inventory (CDI) is an instrument designed by Dr. Maria Kovacs (1977) (15), Canadian psychiatrist, as a test to detect depressive symptomatology in children and adolescents; this questionnaire emerged as a response to the lack of these scales in the adolescent population, it is easy to apply and analyze, it has been widely used internationally in different studies in countries such as Canada, England, Australia, Germany, the United States, Finland, Spain, etc.

The test was adapted and validated for our environment by Ana Carmenza Posada I. and Claudia María Rua P. (1996) (16); the validation was carried out on a sample of adolescents between 13 and 17 years of age; two populations were taken, one clinical (42 men and 31 women) and one non-clinical, consisting of 249 men and 248 women from educational establishments in the Metropolitan Area of Medellín. This validation resulted in the CDI-LA (Children's Depression Inventory Latin America).

Procedure

First, the frequency distribution of the level of depression according to sex was obtained for each of the study populations. Overall percentages and absolute values were obtained in the categories high, mild, and none for the three levels of depression.

Next, the test of independence was performed to determine the statistical association between the level of depression and sex and between the level of depression and age group; statistically significant associations are those with a p-value of less than 0.05 (17).

Thirdly, a Simple Correspondence Analysis, SCA (18), is run, which starts from a contingency table (19) constructed with the levels of depression, high, mild, and none in the columns; in the rows are placed the absolute frequencies of men and women in each of the levels of depression and in the four populations where there is a statistical association between the level of depression and sex according to those reported in table 3; it can be observed that there is a statistical association in the north-eastern and north-western areas of Medellín and the municipalities of Marinilla and Carmen de Viboral.

The ACS makes it possible to obtain a typology taking into account each category of the level of depression (20) in which the most critical frequencies are expressed in each of the three levels of depression for each sex. This typology is supported by two graphs that will be shown below. All analyses were completed with SPSS version 27 (21) and RStudio 4.1.2 (22).

RESULTS

There is a significant association between the level of depression and gender in the north-eastern and north-western areas of Medellín and the two municipalities of eastern Antioquia, Marinilla and Carmen de Viboral. It means that the level of depression is different between men and women in these locations.

In Ebéjico and Copacabana, there is no statistical association ($p\text{-value} > 0.05$), and this indicates that the whole population, regardless of gender, should be intervened to improve their level of depression. There is no statistical association between the level of depression and the age group of the students. It means that all students, with no distinguishing of their age group, should be intervened to improve the depression that is present among them (Table 1).

Table 1: Chi-square test of independence between the level of depression and the sex and age group to which the schooled adolescent belongs.

	Sex		Age group	
	Chi-Square	P value	Chi-Square	P value
North-eastern zone	9,590	0,008*	1,332	0,514
Northwestern part	8,362	0,015*	0,379	0,827
Ebejico	2,457	0,293	0,050	0,975
Copacabana	4,813	0,090	0,498	0,780
Marinilla	8,238	0.016*	1,502	0,472
Carmen de Viboral	18,066	0,000*	0,351	0,839

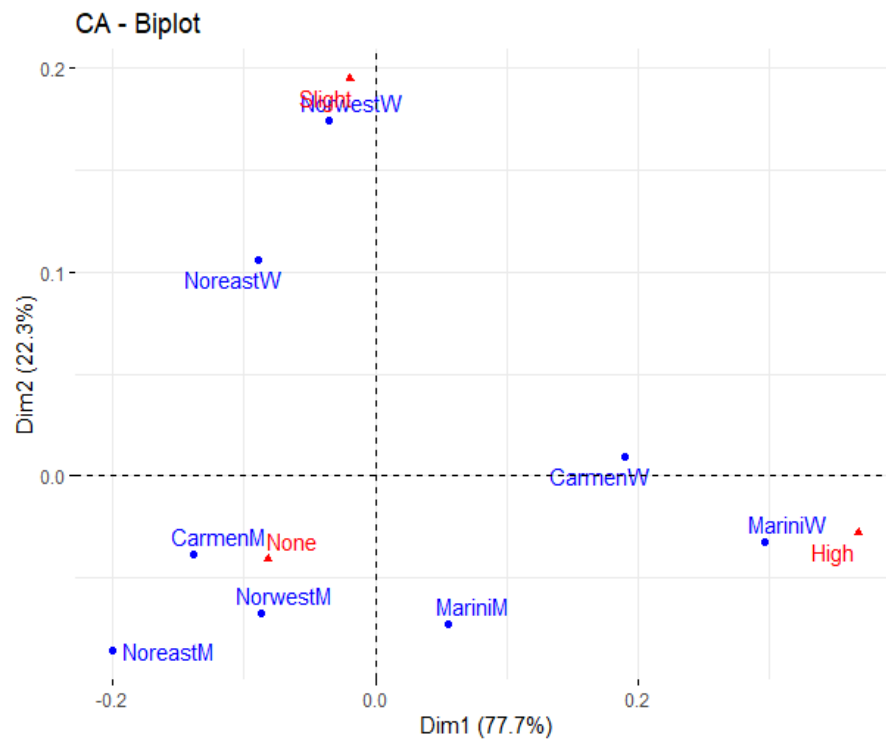
*: there is an association between the level of depression and the student's sex

Graph 2 Presents three typologies about the distribution of levels of depression among students:

- **The first typology** is made up of adolescents with a high level of depression. This typology is mainly found among the women of Marinilla and those of Carmen de Viboral and, to a lesser extent, among the men of Marinilla.
- **The second typology** groups together adolescents who are classified as mildly depressed and includes female adolescents from the two areas of Medellín.
- **The third typology** is built of men from the north-eastern and north-western areas of Medellín and men from Carmen de Viboral; they are located on the opposite side of the spectrum from the women most affected by depression.

It is observable that typology 1 supports 78% of the distribution of the level of depression and is characterized by being of a high level; between typologies 1 and 2, with 22% of the distribution, it corresponds to the mild and none levels of depression.

Also, very relevant for this study is to find in the prevalence according to sex that typology 1 (13.4% in Marinilla and 11.9% in El Carmen are women) and 2 (7.4% in Marinilla and 8.6% in El Carmen are women); women predominate with high and mild levels of depression, while in typology 3 (37.0% in the north-east, 35.0% in the north-west and 35.1% in El Carmen de Viboral, are men) men predominate with no level of depression. The presence of depression expressed high levels and mild levels of depression groups, mainly women, which means that out of every three young people with depression, two of them are women.



Graph 2: Perceptual map of the level of depression according to sex and population studied in three municipalities of Antioquia, Colombia.

DISCUSSION

This study guarantees the quality of the data collected by the authors of the article, as well as the analysis process carried out by them, which presents the distribution of the level of depression among high, mild, and none levels according to the sex of adolescents attending school in three municipalities of Antioquia, Colombia. The merit of this study is the empirical evidence found with the information collected from random samples designed by the authors in the population of school adolescents, where the results obtained show that depression is present in both men and women and with a greater probability of occurring in women than in men, with the highest value in the high level of depression in women in the municipality of Marinilla (M 18.3%, W 26.8%) and followed by another higher value at the high level in Carmen de Viboral (M 11.1%, W 22.7%); at the mild level of depression, the highest values are found in women in the two zones of Medellín (North-eastern M 13.6%, W 20.5%) (Northwestern M 14.1%, W 22.9%). At the no depression level, the highest values are found in men in Carmen de Viboral and the two zones of Medellín. The merit of this study is the empirical evidence found with the information collected from random samples designed by the authors in the population of schooled adolescents, where the results obtained that depression is present in both men and women and with a greater probability of occurring in women than in men, with the highest value in the high level of depression in women in the municipality of Marinilla (M 18.3%, W 26.8%) and followed by another higher value at the high level in Carmen de Viboral (M 11.1%, W 22.7%); at the mild level of depression, the highest values are found in women in the two zones of Medellín (North-eastern M 13.6%, W 20.5%) (Northwestern M 14.1%, W 22.9%). At the no depression level, the highest values are found in men in Carmen de Viboral and the two zones of Medellín.

These results present that depression is a psychosocial problem that is more prevalent in women than in men; furthermore, by age group, no difference was found among students.

According to the World Health Organisation (WHO), in global estimates, depression is a common illness worldwide, with an estimated 5% of adults suffering from depression. It affects more women (5.1%) than men (3.6%) (23). In the US study of mood disorders in children and adolescents, the prevalence of major depression in 13 to 18-year-olds was found to be 14.3% in females and 7.7% in males. Although prevalence varies by region, the sex ratio remains the same, as illustrated by comparisons between regions in the Pan American Health Organisation (PAHO) study, ranging from a lower prevalence of 2.6% in males in the Western Pacific Region to a prevalence of 5.9% in females in the African Region (23).

Depression among young people has gone from global studies to more local studies; as corroborated in this article, the prevalence of every three young people, two are females. Among young people with depression, 2/3 are female, and 1/3 are male; where these differences between males and females with depression can be affected by many factors, including cultural, ethnic, social, economic, and gender-related hormonal factors, access to medical care, and the methods used to measure depression. The prevalence of depression in young people is different for males and females. The overall prevalence of Major Depression in adolescents in 2003 in Colombia was 7.1%, equivalent to 108 young people out of a total sample of 1520. The female sex variable was decisive, with a result of 2.122 (24); therefore, we can say that the risk of having depression was twice as high for females. In general, women have been found to have higher rates of depression than men. One study reports a similar result to the one found because it says that girls, compared to boys, exhibited more symptoms of anxiety and anxiety sensitivity in 2016. They also reported a significant increase in the average level of depression from 2016 to 2017 (25). Another study, also conducted in the adolescent school population in Medellín, indicates that, at the cognitive level, female adolescents showed more negative automatic thoughts; at the emotional level, they showed higher levels of negative affect and more depressive symptoms (26). One more indicates that Depressive symptomatology is prevalent in youth and adults in Mexico, as in many other countries, with a higher proportion of cases among females (27).

This finding opens the discussion about the approach to mental health problems in young people and, in particular, in young people with depression: At the individual level, no two people are depressed in the same way. Each person has different memories, different experiences, different emotional reactions, experiences their losses differently, and uses resources and skills differently to cope with the adversities they face, hence the standardization in the understanding of what a person with depression presents, as diagnostic and statistical manuals present (28) and standardized treatment runs the risk of ignoring the particularities that have led to the generation of depression in each young person.

And by showing that for every three people with depression, 2 are women, here we add the different characteristics according to gender, cultural, ethnic, social, (29) economic (30), hormonal (31), and if we read with gender differences in mind, it is necessary to recognize the particularity and individuality of young people in individual care.

With collective actions in mental health from the public health perspective, it also applies that, although they are conceived as actions for the entire population, this study highlights that the approaches for men and women with depression have different characteristics, especially if 2/3 of young people with depression are women.

Innovative information and communication technologies, such as virtual reality, augmented reality, and the internet, can support the provision of therapeutic services, increasing people's accessibility to psychological treatment (32). Nowadays, there are unconventional methods that support the identification and treatment of depression in young people, such as the use of computerized cognitive behavioral therapy (CCBT), with a growing body of evidence indicating that these programs can be successful in decreasing symptoms of depression and anxiety in this younger population (33).

The study does not include variables and characteristics such as the differences in communication and sensitivity between men and women. From these, a perspective to be developed in future research arises with being able to demonstrate whether the sensitivity and the character of being more communicative in women lead them to consult more frequently, to seek more help, and to register a more significant number of reasons that increase the cases of registered episodes of depression.

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