BJGH Brazilian Journal of Global Health
Revista Brasileira de Saúde Global

Gender and age differences in the prevalence of depression among adolescents

Victória Costa[1], Isabella Paschoal Costa[1], Dra. Yára Juliano[3], Dra. Teresa Negreira Navarro Barbosa[2],

[1]Medical student of Universidade Santo Amaro - UNISA, São Paulo/SP, Brasil.
[2]Advisor and Professor with a Master's Degree in Pediatrics and Applied Pediatric Sciences from the Medical Program at Universidade Santo Amaro, São Paulo (SP), Brazil.
[3]Co-advisor and Professor with a Ph.D. in Sciences from the Federal University of São Paulo.

ABSTRACT

OBJECTIVE

To assess the risk of depression among adolescents treated at a specialized outpatient clinic.

METHODOLOGY

This was a cross-sectional observational study analyzing medical records with PHQ-9 data from adolescents aged 12 to 18 years, of both genders, treated at the Adolescent Medicine Clinic of the Dr. Wladimir Arruda Health Complex 2, from January 2023 to December 2023. Data were tabulated and subjected to the following statistical tests: prevalence, chi-square, and Kruskal-Wallis.

RESULTS

A total of 113 medical records were analyzed, comprising 58 boys and 55 girls. The overall prevalence of depression was 69.2%, with 85% of girls and 54% of boys scoring ≥ 5 on the PHQ-9. Additionally, no specific age group was identified as more predisposed to developing the condition.

CONCLUSION

The findings highlight a higher prevalence of depression among girls, aligning with existing literature, attributed to biological, social, and psychological factors. These results underscore the importance of early interventions targeting girls and strategies that address gender differences. Future studies could explore additional factors associated with depression prevalence, contributing to the development of prevention and management strategies.

DESCRIPTORS

Adolescents; Depression; Gender; PHQ-9; Vulnerable groups.

Corresponding Author:
Victória Costa.
Estrada da aldeia, Number 451, House 276, CEP: 06709-300, Sao Paulo. Brazil.
E-mail: vicvicosta2014@gmail.com.
ORCID ID: https://orcid.org/0009-0005-6446-4212.

DOI: https://doi.org/10.56242/globalhealth;2024;4;15;1-5%20

INTRODUCTION

Depression is one of the most significant global health concerns and is the leading cause of disability worldwide. It is estimated that approximately 300 million people of all ages are affected by depression, with around 800,000 deaths by suicide annually. This makes depression the second leading cause of death among individuals aged 15 to 29 years[1,2].

However, recent data indicate that adolescents, aged between 12 and 18 years, represent an emerging group both in terms of prevalence and severity of depressive disorders. Global studies report that the prevalence of elevated depressive symptoms among adolescents ranges from 13% to 23%, highlighting the importance of this age group. In Brazil, research reveals that approximately 15% of adolescents exhibit clinical depressive symptoms, with higher rates observed among girls due to biological and social factors[3].

According to a study conducted in Brazil that analyzed the years lived with disability (YLD) due to depression, approximately 544 years were lived with disability per 100,000 people as a result of the disease. Depressive disorders account for 5% of all years lived with disability in the country, underscoring the significance of depression as one of the leading causes of disability in Brazil. This increase is attributed to population growth and the aging of the Brazilian population, but it also reflects a rising prevalence of depressive disorders among the youth[4].

Adolescence is characterized by changes in various aspects of life, including biological, hormonal, psychological, and social transformations, as well as the formation of personality and identity. These changes contribute to increasing the vulnerability of this population, making them susceptible to developing potentially depressive conditions[5].

There is a complexity to individual experiences during this crucial phase of development, which can vary considerably across different age groups and genders, reflecting the multiple adversities faced by each adolescent. These distinctions underscore the importance of personalized approaches when addressing adolescent mental health, recognizing effective strategies that account for the specific nuances of each individual. By understanding these complexities, healthcare professionals and policymakers will be better equipped to implement more targeted and comprehensive preventive interventions and programs6. Based on this premise, this article aims to highlight the factors that predispose adolescents to a higher risk of developing depression.

METHODS

This cross-sectional observational study was conducted through the analysis of medical records of adolescents treated at the Adolescent Medicine outpatient clinic of the Dr. Wladimir Arruda 2 Health Complex, from January to December 2023. The final sample consisted of 113 medical records, selected after applying inclusion and exclusion criteria. Adolescents aged between 12 and 18 years of both genders, whose medical records contained the completion of the Patient Health Questionnaire-9 (PHQ-9) were included. Medical records of patients outside the analyzed age range, as well as those without a recorded PHQ-9, were excluded. When there was more than one PHQ-9 questionnaire in the medical record, only the most recent one was considered for analysis.

The study was approved by the institution's Research Ethics Committee (CEP), in accordance with Resolution 466/12 of the National Health Council, which regulates research involving human beings. The approval statement issued by the CEP has the number 6.226.958.

The PHQ-9, used as a screening tool to assess the risk of depression, is based on the DSM-IV criteria and consists of nine questions that evaluate the frequency of depressive symptoms over the past two weeks. These symptoms include: little interest or pleasure in doing things, feeling down or hopeless, difficulty sleeping or sleeping too much, feeling tired or having little energy, poor appetite or overeating, feeling bad about yourself or like a failure, difficulty concentrating, psychomotor agitation or retardation, and thoughts of death or self-harm.

The responses are recorded on a Likert scale from 0 to 3, with the options: "not at all," "several days," "more than half the days," and "nearly every day." The sum of the scores classifies participants into five risk levels: no risk (0–4 points), mild depression (5–9 points), moderate depression (10–14 points), moderately severe depression (15–19 points), and severe depression (20–27 points)[6]. In this study, adolescents with a score equal to or greater than 5 were considered at risk for depression.

The data collected by the authors were tabulated in Excel spreadsheets and analyzed using the Statistical Package for the Social Sciences (SPSS) software. The analysis included calculating the prevalence of adolescents at risk for depression, the chi-square test to check for significant differences in prevalence between genders, and the Kruskal-Wallis test to assess possible differences in risk classifications between age groups. The significance level adopted was $p < 0.05$.

RESULTS

With the analysis of the medical records of all adolescents aged 12 to 18 who attended the Adolescent Medicine outpatient clinic (n=113) throughout 2023, the occurrence of depression-related disorders was 69% (using a PHQ-9 cutoff ≥ 5), considering the number of patients who scored from mild to severe risk for depression (n=78) out of the total number of patients interviewed (n=113). Among the 55 girls, 47 were classified as having the condition, corresponding to a prevalence of 85.4%. Among the boys, 31 out of 58 were also classified within the studied severity levels, representing 53.4%.

In Table 1, the distribution of ages for the risk of depression by gender is shown, considering the total number of adolescents who fit into the mild to severe risk categories (n=78).

Table 1 - Distribution of ages and genders among adolescents at risk for depression (mild to severe).

Age group (years)	Number of cases at risk for depression	Percentage	Number of adolescentes	
			Female	Male
12	10	12,82%	6	4
13	18	23,07%	11	7
14	15	19,23%	10	5
15	12	15,38%	7	5
16	6	7,69%	4	2
17	15	19,23%	9	6
18	2	2,56%	0	2
Total	**78**	**100%**	**47**	**31**

Source: Authors (2024).

In Table 2, the distribution of scores obtained on the PHQ-9 is presented, classified as no risk, mild, moderate, moderately severe, and severe, according to the gender of the adolescents evaluated. A marked difference between genders is noted, especially in the higher risk classifications, with severe cases observed only among girls.

Table 2 - Relationship between depression risk classification according to PHQ-9 and the number of male and female patients.

	Score					
	No risk	Mild	Moderate	Moderately severe	Severe	**Total**
Gender Female	**8**	**18**	**13**	**12**	**4**	**55**
Male	**27**	**16**	**8**	**7**	**0**	**58**
Total	**35**	**34**	**21**	**19**	**4**	**113**

Source: Authors (2024).

Table 3 displays the results of the chi-square test applied to

analyze the association between PHQ-9 scores and participant gender. In the analysis of differences between genders, since the p-value equals 0.002, it suggests that there is a statistically significant difference in the depression risk classifications between female and male adolescents. The presence of cases in the "severe" category only among girls further reinforces this conclusion.

Table 3 - Chi-Square Test Result.

	Variables		
	x^2	df	p-valor
Pearson Chi-Square	16.870	4	0.002*
Likelihood Ratio	19.009	4	<0.001
Number of Valid Cases	113		

x^2 = chi-square test value

df = degree of freedom.

Source: Authors (2024).

Table 4 presents the results of the Kruskal-Wallis test, conducted to investigate differences in the distribution of PHQ-9 scores across different age groups for both genders. Since the p-value > 0.05, the test interpretation demonstrates that the analysis of the median ages for the risk classifications did not show a significant difference, illustrating that there is no specific age group among adolescents that predisposes them to a higher or lower risk for depression severity.

Table 4 - Test conducted to evaluate whether there is a predominant age among different classifications of depression risk (according to the PHQ-9 score) for male and female genders separately.

	Sex	
	Male	Female
Total number	58	55
Test value	4.999[a]	1.276[a]
Degrees of freedom	3	4
p-value	0.172	0.866

a. The Statistical test value is adjusted for ties.
The applied test was the Kruskal-Wallis.

Source: Authors (2024).

DISCUSSION

In Brazil, only a minority of adolescents with mental disorders receive mental health care. According to a cross-sectional study conducted in four Brazilian regions, there is a lower rate of assistance for the following groups: females, those with adequate academic performance; mothers or primary caregivers living with a partner; and residents of impoverished regions. Additionally, data collected from TabNet regarding mortality due to mental and behavioral disorders among adolescents aged 10 to 14 years in 2022, the most recent update from the government database, revealed 64 reported deaths in the country, with the Southeast region standing out with 28 recorded deaths, representing 43,7% of the total[8,9].

From the analysis of the 113 patients interviewed, 69% scored for some degree of depression. This rate can be explained by the fact that depression in adolescence tends to increase significantly during puberty, due to pronounced biological and social changes[5]. Puberty begins as a social milestone that is accompanied by specific social opinions and expectations. Evidence shows that, particularly, girls living in low socioeconomic family contexts experience earlier onset of puberty, which brings forth feelings and perceptions that make them aware of the vulnerability of their circumstances[10]. Thus, exposure to scenarios of violence, multidimensional poverty, and stressful situations, including deaths and family conflicts, are factors that increase the likelihood of mental health problems[11]. As a result, exposure to scenarios of violence, multidimensional poverty, and stressful situations, including deaths and family conflicts, are factors that increase the likelihood of mental health problems[11].

In this study, 47 girls (85.4%) are at risk of developing depression, showing that they had higher rates of depression compared to boys due to a combination of biological, social, and psychological factors. Hormonal fluctuations during puberty and the menstrual cycle influence neurotransmitters and neuroendocrine systems associated with mood disorders, increasing female vulnerability to depression. Additionally, gender socialization, which encourages girls to be more sensitive and relationship-focused, can intensify emotional stress, while boys are encouraged to be independent and suppress emotions, thereby masking depressive symptoms[12]. These combined factors explain the higher incidence of depression in girls, highlighting the need for early interventions and appropriate support[12,13].

A study conducted in the United States revealed that, although women are twice as likely to be diagnosed with depression as men, men die by suicide approximately 3 to 4 times more often[14]. Men express symptoms of depression differently compared to women; when atypical symptoms such as overworking, substance abuse, and aggression are evaluated, the differing rates of depression between men and women disappear. This demonstrates that gender socialization processes significantly influence how adolescents and men express depression, resulting in many of them remaining undiagnosed[15]. This discrepancy does not solely reflect a greater biological and psychological predisposition among women but may also be associated with social and cultural factors that affect genders in different ways[16].

In accordance with the results found, the analyzed literature does not identify any relationship between age group differences and the classification of depression risk. Globally, very similar diagnostic criteria are used to define Major Depressive Disorder (MDD) in children, adolescents, and adults. The use of the same criteria demonstrates that the presentation of the disorder is not age-related. Some evidence suggests that when it comes to risk factors, neural perceptions, and con-

tinuity over a lifetime, MDD that begins during adolescence may be considered an early form of the adult disorder[17].

Underfunding in child mental health, fragmentation of health systems, and inequalities intensified by the pandemic hinder the implementation of effective structural changes[8,9]. In this context, intersectoral mobilization involving governments, communities, and non-governmental organizations is crucial to create culturally adapted strategies aimed at expanding prevention programs for adolescents in school and community settings, as well as strengthening the psychosocial support network. This approach promotes equity in access to mental health services[12].

Regarding the validity of the applicability of the PHQ-9 questionnaire, it has been demonstrated that there is strong endorsement by the International Consortium for Health Outcomes Measurement (ICHOM) for the use of the PHQ-9 in screening for depression risk at its various levels. The research reported the adequacy of the PHQ-9, highlighting its comprehensive understanding of domains, its well-assessed feasibility, and its careful review subject to psychometrics. Therefore, the reliability emerges that the questionnaire can be adopted in clinical practice[18].

CONCLUSION

The results of this study highlight a high prevalence of depression risk among adolescents attending a specialized outpatient clinic, with a greater proportion of girls at all levels of severity assessed. The prevalence of 85.4% among girls reflects the influence of biological, social, and psychological factors that increase their vulnerability to the disorder. On the other hand, the absence of a significant association between the analyzed age groups suggests that the risk of depression is not limited to specific periods of adolescence but is influenced by multidimensional factors throughout this developmental phase.

These findings reinforce the need for early interventions and targeted strategies that consider gender differences and the social and cultural specificities of adolescents. Inequality in access to mental health services and the challenges of implementing public policies make intersectoral mobilization essential to promote equity and strengthen psychosocial support networks. Future research is essential to explore additional factors and develop effective prevention and management strategies that reduce the impact of depression among vulnerable youth. Implementing evidence-based and culturally adapted policies is crucial to transforming the reality of these young people and reducing the impact of depression on society.

REFERENCES

1. Brasil. Ministério da Saúde. Governo Federal lança estratégias de cuidados para a saúde mental. Brasília: Ministério da Saúde; 2022, 14 de junho. Disponível em:https://www.gov.br/casacivil/pt-br/assuntos/noticias/2022/junho/governo-federal-lanca-estrategias-de-cuidados-com-a-saude-mental-dos-brasileiros #:~:text=Entre%20as%20a%C3%A7%C3%B5es%20est%C3%A3o%20a.
2. Organização Pan-Americana da Saúde (OPAS). Depressão [Internet]. Washington, DC: PAHO; c2024. Disponível em:https://www.paho.org/pt/tópicos/depressão.
3. WHO. World health organization [Internet]. Who.int. World Health Organization; 2021. Available from: https://www.who.int/.
4. Bonadiman CSC, Passos VMA, Mooney M, Naghavi M, Melo APS. Transtornos depressivos no Brasil: resultados do Global Burden of Disease Study 2017. Popul Health Metrics. 2020 set;18(S1).
5. Richburg A. Depressão, ansiedade e momento da puberdade: pesquisa atual e direções futuras. Univ Mich Undergrad Res J. 2021 Dez 20;15(0).
6. Shorey S, Ng ED, Wong CH. Prevalência global de depressão e sintomas depressivos elevados entre adolescentes: uma revisão sistemática e meta-análise. [Internet]. 2021 Set [citado em 24 de maio de 2023]. Disponível em: https://pubmed.ncbi.nlm. NIH.gov/34569066/.
7. Santos IS, Tavares BF, Munhoz TN, Almeida LSP, da Silva NTB, Tams BD, *et al*. Sensibilidade e especificidade do Patient Health Questionnaire-9 (PHQ-9) entre adultos da população geral. Cad Saúde Pública. 2013 Agosto;29(8):1533–43.
8. Paula CS, Lauridsen-Ribeiro E, Wissow L, Bordin IA, Evans-Lacko S. A lacuna de cuidados de saúde mental entre crianças e adolescentes: dados de um inquérito epidemiológico de quatro regiões brasileiras. PLoS One. 2014 Fev 18; 9(2):e88241.
9. Brasil. Ministério da Saúde. DATASUS. Tabnet [Internet]. Brasília: Ministério da Saúde; 2022. Disponível em: https://datasus.saude.gov.br/informacoes-de-saude-tabnet/.
10. Obeidallah D, Brennan RT, Brooks-Gunn J, Earls F. Ligações entre o momento da puberdade e os contextos da vizinhança: implicações para o comportamento violento das meninas. J Am Acad Child Adolesc Psychiatry. 2004 Dez;43(12):1460–8.
11. Ziebold C, Silva LM, Matijasevich A, Santos IS, Gonçalves H, Barros AJ, *et al*. Pobreza infantil e transtornos de saúde mental no início da vida adulta: evidências de um estudo de coorte brasileiro. Eur Child Adolesc Psychiatry. 2 de dezembro de 2021.
12. Child Mind Institute. Nova York: Child Mind Institute; 2024. Disponível em: https://childmind.org/.
13. Murphy JM, Horton NJ, Laird NM, Monson RR, Sobol AM, Leighton AH. A crescente prevalência de depressão: implicações para a avaliação. [Internet]. [citado em 24 de maio de 2023]. Disponível em: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4478054/#:~:text=The%204o.
14. Mergl R, Koburger N, Heinrichs K, Székely A, Tóth MD, Coyne J, *et al*. Quais são as razões para as grandes diferenças de gênero na letalidade de atos suicidas? Uma análise epidemiológica em quatro países europeus. PLoS One . 2015 Jul 6;10(7):e0129062.
15. Martin LA, Neighbors HW, Griffith DM. A experiência de sintomas de depressão em homens vs mulheres. JAMA Psychiatry. 2013 Out;70(10):1100– 6.
16. Kirmayer LJ. Variações culturais na apresentação clínica da depressão e ansiedade: implicações para o diagnóstico e tratamento. J Clin Psychiatry. 2001;62 Suppl 13:22–8; discussão 29-30.
17. Rice F, Riglin L, Lomax T, Souter E, Potter R, Smith DJ, et al. Diferenças entre adolescentes e adultos nos perfis de sintomas de depressão grave. J Affect Disord. 2019 Jan;243:175–81.
18. Krause KR, Chung S, Adewuya AO, Albano AM, Babins-Wagner R, Birkinshaw L, *et al*. Consenso internacional sobre um conjunto padrão de medidas de resultados para ansiedade infantil e juvenil, depressão, transtorno obsessivo-compulsivo e transtorno de estresse pós-traumático. Lancet Psychiatry. 2021 Jan;8(1):76–86.