Salud Mental 2015;38(2):103-107
ISSN: 0185-3325
http://dx.doi.org/10.17711/SM.0185-3325.2015.014

Study of depression in students from Mexico City and the state of Michoacán using the revised version of the CES-D

Alberto Jiménez Tapia,[1] Fernando Wagner,[2] María Elena Rivera Heredia,[3] Catalina González-Forteza[1]

Original article

ABSTRACT

Background

The prevalence of depression is increasing among adolescents. Major depressive disorder and dysthymia in children and adolescents involve a high risk of recurrent depressive episodes. Depression is related to certain factors (socioeconomic status, family history with problems of depression and alcohol use, experiences with violence, physical or sexual abuse and use of tobacco and illicit drugs) that increase the risk of other problematic behaviors.

Method

The objective of this paper is to describe depressive symptoms in adolescents from Mexico City and the State of Michoacán, obtained from the clinical categories generated with the revised version of the CES-D.

Results

Two cross-sectional studies with non-probabilistic samples were conducted (N=2,127). Some 12% of the adolescents measured had symptoms of a probable major depressive episode (MDE) (13.3% from Mexico City and 9.2% from Michoacán). The proportion was significantly higher among women (χ^2=56.294, DF=2, p<.001). The students from Mexico City had a significantly higher proportion of subjects with symptoms of a probable MDE than the ones from Michoacán (χ^2=30.78, DF=2, p<.001).

Discussion and conclusion

The proportion of students who had clinically significant symptoms stresses the need for information, awareness and training for parents, teachers, health professionals, and adolescents in terms of relevance to treat depression and analyze the distribution and the access of the population to care services. Although the CESD-R may be a quick and agile alternative for timely screening for a probable major depressive episode, it would be necessary to build a referral mechanism for individuals at risk, as well as strategies to ensure its quality and efficiency.

Key words: Adolescents, students, depression, CES-D.

RESUMEN

Antecedentes

La prevalencia de la depresión es cada vez mayor en los adolescentes y se relaciona con factores como el nivel socioeconómico, la historia familiar con problemas de depresión y de consumo de alcohol, experiencias con la violencia, abuso físico o sexual, así como consumo de tabaco y de drogas ilegales, todas las cuales aumentan el riesgo de otras conductas problemáticas.

Objetivo

Describir los síntomas depresivos en adolescentes de la Ciudad de México y del Estado de Michoacán.

Método

Se hicieron dos estudios transversales con muestras no probabilísticas (N=2127), utilizando las categorías clínicas de la Escala CESD-R.

Resultados

Un 12% de la muestra calificó dentro de la categoría de síntomas de probable episodio depresivo mayor (EDM) (13.3% D.F. y 9.2% Michoacán). La proporción fue significativamente mayor en las mujeres (χ^2 = 56.294, gl = 2, p<.001). Los estudiantes de la Ciudad de México tuvieron una proporción significativamente mayor de síntomas de probable EDM que los estudiantes de Michoacán (χ^2 = 30.78, gl=2, p<.001).

Discusión y conclusión

Dada la proporción de adolescentes que presentaron síntomas clínicamente significativos, es necesario crear acciones de información, sensibilización y capacitación para padres, educadores, profesionales de la salud y adolescentes en cuanto a la relevancia de atender la depresión y mejorar el acceso a los servicios de atención especializada.

La CESD-R puede ser una alternativa rápida para la detección oportuna del probable episodio depresivo mayor, pero faltaría construir el mecanismo para derivar a los individuos en riesgo a los servicios de salud mental pertinentes, así como estrategias para garantizar que éstos sean de calidad.

Palabras clave: Adolescentes, estudiantes, depresión, CESD-R.

[1] Department of Epidemiological and Psychosocial Research, National Institute of Psychiatry Ramón de la Fuente Muñiz, México.
[2] Department of Public Health Analysis. Morgan State University, USA.
[3] Department of Psychology. Michoacán University of San Nicolás de Hidalgo, Morelia, Mich., México.

Correspondence: Dra. María Elena Rivera Heredia, Research Professor in the Department of Psychology, Michoacán University of San Nicolás de Hidalgo. Gral. Francisco Villa 450, Edificio A, colonia doctor Miguel Silva. 58120, Morelia, Mich. Tel: 01(443) 317 - 8951 y 312 - 9909, ext. 126. Fax: 01(443) 312 - 9913. E-mail: maelenarivera@gmail.com

Received: February 19, 2014. Accepted: June 27, 2014.

BACKGROUND

Depression is a disorder with an increasingly high prevalence among the adolescent population.[1-3] The processes involved during that time of life can increase the likelihood of individuals being exposed to difficult situations, which can become stressful. As such, it is necessary to generate a conceptual focus that has a practical application and which allows a distinction between affective, cognitive, and somatic expressions and normal behavior during the adolescent period, from those that are associated with discomfort that has negative consequences for the mental and emotional health in the short and medium term.[4,5]

There is evidence which indicates that major depressive disorder and dysthymia in children and adolescents imply an elevated risk of presenting recurrent depressive episodes, associated with suicide and other self-destructive behavior that can last into adult life.[6,7] It is also known that depression is related to diverse factors that make treatment difficult, worsen the prognosis, and increase the risk of other problematic behaviors.[8] Among these are socio-economic status,[9] a family history of problems with depression and alcohol consumption,[10,11] experiences of violence,[12,13] physical or sexual abuse,[14] and consumption of tobacco and illegal drugs.[15-17]

The presence of depressive symptomatology during adolescence is an important indicator of a vulnerability in the emotional state, the seriousness of which can affect various areas of life and increase the probability of comorbidity with other psychiatric disorders.[1,18-20] Although timely detection is important, this is complicated within the education and health systems in Mexico and other countries, due to shortcomings in infrastructure and human resources.[21] This is a challenging situation, given the magnitude and growing tendency towards depression in the adolescent population. All of this makes it a priority to direct efforts towards early detection in order to provide timely treatment and create prevention strategies, as well as promoting the psychosocial development of adolescents.

This paper describes the presence of depressive symptoms in adolescents in Mexico City and the state of Michoacán. It also presents a comparison by sex and federal entity based on the clinical categories generated with the revised version of the CESD-R.

METHODS

Two cross-sectional studies were conducted with non-probabilistic samples in Mexico City and the state of Michoacán.

Mexico City. Data was collected from all students enrolled in two junior high schools located in the Historic Center of Mexico City. The participating schools were selected through a contrast criterion based on academic achievement from indicators from the Secretary for Public Education. The first had the highest rate of academic achievement and the other had the lowest.[19,22,23]

Michoacán. Information was gathered on students in the first year of junior high in public schools with populations from each of the ten socio-economic regions in the state of Michoacán: 1. Zamora, in the Lerma-Chapala region; 2. Zacapu, in the del Bajío region; 3. Morelia, in the Cuitzeo region; 4. Ciudad Hidalgo, in the Oriente region; 5. Apatzingán, in the Tepalcatepec region; 6. Uruapan, in the Purépecha region; 7. Pátzcuaro, in the Pátzcuaro-Zirahuén region; 8. Huetamo, in the Tierra Caliente region; 9. Lázaro Cárdenas, in the Sierra Costa region, and 10. Ario de Rosales, in the Infiernillo region. The participating schools were selected by quota (one group per school per participating region).

Participants

Mexico City. The sample size was 1,549 students (54% men, 46% women), with an average age of 14 years (standard deviation, SD=1.2); 83% advised being full-time students for most of the year prior to the study, and did not work for a wage (84%). The majority (81%) had a father or paternal figure and 95% had a mother or maternal figure.

Michoacán. The sample size was 578 students (47.9% men, 52.1% women), with an average age of 13.5 years (SD=0.7); 34.4% had a migrant father, 13.1% had a migrant mother, and 17.2% had at least one migrant sibling.

Instrument

For the two samples, the CESD-R was included in questionnaires with other scales, as it formed part of wider research projects. The Center for Epidemiological Studies Depression Scale (CES-D)[24] is a valid and reliable screening instrument which provides data to detect depressive symptomatology.

Table 1. Detection criteria with the CESD-R and for clinical diagnosis

CESD-R categories	CESD-R criteria	Clinical criteria
Clinically significant symptoms of probable MDE	Existence of symptoms in at least five dimensions including the presence of anhedonia or dysphoria for two weeks.	Presence of five clinical symptoms of depression, including anhedonia or dysphoria for two weeks.
Probable sub-threshold depressive episode	A score of 16 points (median plus a SD) or more and not belonging to the above category.	Presence of clinical symptoms of depression, excluding anhedonia or dysphoria.
No clinically significant symptoms of probable MDE	Including those who scored under 16 in the revised version.	Absence of clinical symptoms of depression.

Table 2. Proportion of students who scored in the CESD-R categories, by sex

CESD-R categories	Total		Men		Women	
	F	%	F	%	F	%
Clinically significant symptoms of probable MDE	304	12.4	101	7.7	200	17.8*
Probable sub-threshold depressive episode	667	27.3	372	28.5	292	25.9
No clinically significant symptoms of probable MDE	1473	60.3	834	63.8	634	56.3

* χ^2=56.294, DF=2, p<.001.

However, given the dynamic nature of the phenomenon and the populations, an update was made so that the measurement would agree with the diagnostic criteria for a major depressive episode (MDE) in the DSM-IV[25] (Table 1). This generated the revised version of the CESD-R,[26,27] which has satisfactory psychometric characteristics in Mexican populations.[27,28]

Procedure and ethical considerations

Contact was made with SPE authorities and the schools to obtain the relevant permissions. The participants received a written informed consent form advising them of the conditions of inclusion in the study, that their participation was voluntary, and that the records of information were anonymous. Data collection took place in the classrooms with a self-applicable, paper and pencil form of the instrument. There were no rejections. The application was performed by a team of duly trained and qualified trainee psychologists, and without the presence of the teachers or any other school authority. Version 15.0 of SPSS[29] was used to capture the data and the STATA 11.0 program was used to process it.[30]

RESULTS

Of the 2,127 students in the sample, 12% had a score which placed them within the clinically significant category of a probable major depressive episode (MDE); of those, the proportion was significantly higher among women (χ^2=56.294, DF= 2, p<.001) (Table 2).

The students in Mexico City obtained a significantly higher proportion of cases within the clinically significant category of a probable MDE than those from the state of Michoacán. Comparisons between men and women showed that in both cases, students in Mexico City had significantly higher proportions of symptoms of a probable MDE (Table 3).

A comparison by age between the adolescents in both groups only showed significant differences in the groups aged 13 and under (Table 4).

DISCUSSION AND CONCLUSION

Based on the diagnostic characteristics presented by the CESD-R and their concordance with the DSM-IV clinical criteria for diagnosing affective disorders, 9.2% of the Michoacán sample and 13.3% of the Mexico City sample were placed within the range of a probable MDE; a situation which requires medical and psychological treatment, given the effects that this disorder can have over a lifetime if timely and appropriate medical care is not received.[18-20,31]

Given that 12.4% of the adolescents in both samples presented clinically significant symptoms for a probable MDE, reflection should be made on the suitability of the physical and human infrastructure necessary to provide adequate care to these young people,[21] both in the ten regions of Michoacán as well as in Mexico City. Furthermore, it highlights the necessity to create actions of information, awareness, and training for parents, educators, health professionals, and adolescents around the relevance of treating this phenomenon of depression, as well as in analyzing the distribution and access to specialized treatment services.

The results of this study are in accordance with evidence that a greater percentage of women present depressive symptomatology.[1,32] However, there is still the need to review the sensitivity of the scale by sex and consider the possibility of questions designed to capture the more spe-

Translation of the original version published in spanish in: Salud Mental 2015, Vol. 38 Issue No. 2.

Table 3. Proportion of students who scored in the CESD-R categories, by sex and state

	Mexico City students						Michoacán students					
	Men		Women		Total		Men		Women		Total	
CESD-R categories	F	%	F	%	F	%	F	%	F	%	F	%
Clinically significant symptoms of probable MDE	88	8.5	161	19.4	249	13.3	13	4.8	39	13.2	52	9.2
Probable sub-threshold depressive episode	321	31.0	226	27.2	547	29.3	51	18.8	66	22.4	117	20.6
No clinically significant symptoms of probable MDE	626	60.5	444	53.4	1070	57.3	208	76.5	190	64.4	398	70.2

Comparison between Mexico City and Michoacán students: χ^2=30.78, DF=2, p<.001.
Comparison between Mexico City and Michoacán men: χ^2= 23.87, DF=2, p<.001.
Comparison between Mexico City and Michoacán women χ^2=11.25, DF=2, p=.004.

Table 4. Proportion of students who scored in the CESD-R categories, by age and state

	Mexico City students						Michoacán students					
	≤13		14		≥15		≤13		14		≥15	
CESD-R categories	F	%	F	%	F	%	F	%	F	%	F	%
Clinically significant symptoms of probable MDE	107	12.5	77	12.7	68	16.4	20	7.1	27	10.9	5	13.5
Probable sub-threshold depressive episode	279	32.6	162	26.8	109	26.3	58	20.5	50	20.2	9	24.3
No clinically significant symptoms of probable MDE	471	55.0	366	60.5	237	57.2	205	72.4	171	69.0	23	62.2

Comparison between Mexico City and Michoacán students: (≤13: χ^2=27.036, DF=2, p<.001); (14: χ^2=5.584, DF=2, p=.061); (≥15: χ^2=.372, DF=2, p=.830).

cific expressions of depressive symptoms in the male population.

The students in Mexico City obtained a significantly higher proportion of cases within the clinically significant category of a probable MDE than those from the state of Michoacán. It is possible that the latter group could be exposed to fewer stress factors, given that they reside in smaller communities, with greater social interaction between their members, and more contact with nature. It should be noted that the questionnaires were applied on dates prior to various social disturbances related to situations of violence and insecurity around the war on drugs and narcotrafficking, which happened in December 2010. It is likely that the levels of depression found are higher at the present time, as it is known that violence increases vulnerability to depression and other mental health problems,[12,13,33] which makes it necessary for new measures to take effect in this population. Furthermore, it should be taken into consideration that the adolescents who participated in this study were active students in junior high schools at the time of application, which would represent a protective factor. Due to the above, it is possible that young people of the same age who do not attend school may have a greater proportion of clinical symptoms of depression, which in turn would represent a future line of investigation. Furthermore, although the CESD-R may be a quick and agile alternative for timely screening of a probable major depressive episode,[28] it would be necessary to build a referral mechanism for individuals at risk, as well as strategies to ensure its quality and efficiency.

This paper makes a number of important contributions: 1. the data was obtained from a sector of the population which, due to its stage of life, is particularly vulnerable to risk factors which impact on mood; 2. the revised version of the CES-D was used, whose link with the diagnostic criteria of the DSM-IV allows a common language to be built for healthcare professionals; 3. the data describes a proportion of young people who present a probable MDE in one metropolis and one state in the interior of the country; and 4. it sets out the need for a major physical and human infrastructure, as well as more training for treating mood disorders in doctors and psychologists.

However, the work also leaves a few areas to be refined in later studies. As such, further studies should be developed with representative probabilistic samples and considering the inclusion of adolescents in different educational circumstances (regular and non-regular students).

Funding

None.

Conflict of interest

The authors do not declare any conflicts of interest.

Acknowledgements

We gratefully acknowledge the PROMEP-UMSNH-252 faculty for its support of the research project "Promoting health and preventing problem behaviors in junior high school students", as well as Lizeth Guadalupe Martínez Servín, who received the scholarship for this project.

REFERENCES

1. **Birmaher B, Ryan ND, Williamson DE, Brent DA et al. Childhood and adolescent depression, I: A review of the past 10 years. J Am Acad Child Adolsc Psychiatry 1996;35:1427-1439.**
2. **Benjet C, Borges G, Medina-Mora ME, Fleiz C et al. La depresión con inicio temprano: Prevalencia, curso natural y latencia para buscar tratamiento. Salud Pública Mex 2004;46(5):417-423.**
3. **Benjet C, Borges G, Medina-Mora ME, Méndez E et al. Diferencias de sexo en la prevalencia y severidad de trastornos psiquiátricos en adolescentes de la Ciudad de México. Salud Mental 2009;31:155-163.**
4. **De la Fuente R, Medina-Mora ME, Caraveo J. Salud mental en México. México: Fondo de Cultura Económica; 1997.**
5. **Weller EB, Weller RA. Depression in adolescents: growing pains or true morbidity. J Affect Disord 61 2000:(Suppl 1):9-13.**
6. **Weisman M, Wolf S, Golsdatein R. Depressed adolescents grown up. JAMA 1999; 218(18):1707-1713.**
7. **Giaconia R, Reinherz H, Paradis A, Carmola-Hauf A et al. Major depression and drug disorders in adolescence: general and specific impairments in early adulthood. J Am Acad Child Adolesc Psychiatry 2001;40(12):1426-1433.**
8. **Wu P, Hoven C, Okezie N, Fuller C et al. Alcohol abuse and depression in children and adolescents. J Child Adolesc Subst Abuse 2007;17(2):51-69.**
9. **Hasin D, Goodwin R, Stinson F, Grant B. Epidemiology of major depressive disorder: Results from the national epidemiologic sur-**

vey on alcoholism and related conditions. Arch Gen Psychiatry 2005;62(10):1097-1106.
10. Anda R, Whitfield L, Felitti V, Chapman D et al. Adverse childhood experiences, alcoholic parents, and later risk of alcoholism and depression. Psychiatr Serv 2002;53(8):1001-1009.
11. Olfson M, Marcus S, Druss B, Alan-Pincus H et al. Parental depression, child mental health problems, and health care utilization. Med Care 2003;41(6):716-721.
12. Reinherz H, Paradis A, Giaconia R, Stashwick C et al. Childhood and adolescent predictors of major depression in the transition to adulthood. Am J Psychiatry 2003;160(12):2141-2147.
13. Castillo-Manzano R, Arankowsky-Sandoval G. Violencia intrafamiliar como factor de riesgo para trastorno depresivo mayor en mujeres: estudio de casos y controles. Rev Biomédica 2008;19(3):128-133.
14. Chapman D, Whitfield C, Felitti V, Dube S et al. Adverse childhood experiences and the risk of depressive disorders in adulthood. J Affect Disord 2004;82(2):217-225.
15. Martini S, Wagner F, Anthony J. The association of tobacco smoking and depression in adolescence: evidence from the United States. Subst Use Misuse 2002;37(14):1853-1867.
16. Lenz B. Tobacco, depression, and lifestyle choices in the pivotal early college years. J Am Coll Health 2004;52(5):213-220.
17. Milani R, Parrott A, Turner J, Fox H. Gender differences in self-reported anxiety, depression, and somatization among ecstay/MDMA polydrug users, alcohol/tobacco users, and nondrug users. Addic Behav 2004;29:965-971.
18. Rivera-Heredia ME, Andrade P. (2006). Recursos individuales y familiares que protegen al adolescente del intento suicida. Rev Intercont Psicol Educ 2006;8(2):23-40.
19. Jiménez JA, Mondragón L, González-Forteza C. Self-esteem, depressive symptomatology, and suicidal ideation in adolescents: Results of three studies. Salud Mental 2007;30(5):20-26.
20. Pérez-Amezcua B, Rivera-Rivera L, Atienzo E, De Castro F et al. Prevalencia y factores asociados a la ideación e intento suicida en adolescentes de educación media superior de la República mexicana. Salud Pública Mex 2010;52(4):324-333.
21. Benjet C, Borges G, Medina-Mora ME, Zambrano J et al. Youth mental health in a populous city of the developing world: results from the Mexican adolescent mental health survey. J Child Psychol Psychiatry 2009;50(4):386-395.
22. González-Forteza C, Ramos-Lira L, Caballero-Gutiérrez MA, Wagner FA. Correlatos psicosociales de depresión, ideación e intento suicida en adolescentes mexicanos. Psicothema 2003;15(4):524-532.
23. Ramos-Lira L, Gonzalez-Forteza C, Wagner FA. Violent victimization and drug involvement among Mexican middle school students. Addiction 2006;101(6):850-856.
24. Radloff L. The CES-D Scale: A self report depression scale for research in the general population. Appl Psychological Measurement 1977;1:385-401.
25. American Psychiatric Association. DSM-IV. Barcelona, España: MASSON; 1997.
26. Eaton W, Muntaner C, Smith C. Revision of the Center of Epidemiological Studies Depression (CES-D) Scale. Baltimore: Johns Hopkins University Prevention Center; 1998.
27. Reyes M, Soto A, Milla J, García-Vázquez A et al. Actualización de la escala de depresión del Centro de Estudios Epidemiológicos (CES-D). Estudio piloto en una muestra geriátrica mexicana. Salud Mental 2003;26(1):59-68.
28. González-Forteza C, Jiménez JA, Ramos-Lira L, Wagner F. Aplicación de la escala de depresión del Center of Epidemiological Studies en adolescentes de la Ciudad de México. Salud Pública Mex 2008;50(4):292-299.
29. SPSS para Windows, versión 15.0. Illinois: SPSS INC; 2006.
30. Stata Statistical Software: Release 11. College Station. Texas: Stata Corp; 2010.
31. Birhamer B, Williamson D, Dahl R, Axelson D et al. Clinical presentation and course of depression in youth: Does onset in childhood differ from onset in adolescence? J Am Acad Child Adolesc Psychiatry 2004;43(1):63-70.
31. Osorno-Munguía JR, Vallejo-Casarín A, Segura B, Mazadiego TJ. Evaluación del funcionamiento diferencial de los ítems (DIF) de la escala de depresión del Centro para Estudios Epidemiológicos (CES-D) respecto del género en una muestra de adolescentes mexicanos. Revisa Electrónica Psicología Iztacala 2008;11(2):138-152.
33. Borges G, Medina-Mora ME, Orozco R, Ouéda C et al. Distribución y determinantes sociodemográficos de la conducta suicida en México. Salud Mental 2009;32:413-425.

Translation of the original version published in spanish in:
Salud Mental 2015, Vol. 38 Issue No. 2.