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ORIGINAL

Childhood depression and its nosological approach in the pediatric population

Depresión infantil y su abordaje nosológico en población pediátrica

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ABSTRACT

Introduction: Depression in children and adolescents may present differently according to age, sex, and family context; therefore, screening alone does not always provide an adequate nosological interpretation. Objective: To determine the frequency and intensity of depressive symptoms and analyze their nosological approach in a school-age pediatric population from Milagro, Ecuador. Methodology: A quantitative, observational, non-experimental, cross-sectional study was designed with 201 participants aged 8 to 17 years. A sociodemographic form, the Children's Depression Inventory 2, and a structured clinical interview were used. Descriptive statistics, chi-square tests, between-group comparisons, and Cohen's kappa were applied, with a significance level of 0.05. Results: Elevated depressive symptoms were identified in 28.9% of participants, whereas 20.9% showed a clinical assessment compatible with a relevant depressive condition. Elevated symptoms were more frequent among females, 36.1%, than males, 20.4%, and increased from 17.7% in participants aged 8 to 11 years to 39.1% in those aged 15 to 17 years. Agreement between screening and clinical assessment was substantial, κ = 0.63. Previous psychological or psychiatric care and selected family living conditions were associated with greater symptom burden. Conclusions: Pediatric depression assessment should combine screening measures with structured clinical evaluation. Age, sex, and psychosocial history should be considered when interpreting findings and identifying children and adolescents who require specialized care.

Keywords: depression, child, adolescent, mental health, diagnosis.

RESUMEN

Introducción: La depresión en niños y adolescentes presenta expresiones clínicas que pueden variar según la edad, el sexo y el contexto familiar, por lo que el tamizaje aislado no siempre permite una interpretación nosológica adecuada. Objetivo: Determinar la frecuencia e intensidad de la sintomatología depresiva y analizar su abordaje nosológico en población pediátrica escolar del cantón Milagro, Ecuador. Metodología: Estudio cuantitativo, observacional, no experimental y transversal en 201 participantes de 8 a 17 años. Se emplearon una ficha sociodemográfica, el Children's Depression Inventory 2 y una entrevista clínica estructurada. Se aplicaron estadística descriptiva, chi-cuadrado, pruebas de comparación entre grupos y coeficiente kappa de Cohen, con significación de 0,05. Resultados: El 28,9 % presentó sintomatología depresiva elevada y el 20,9 % mostró una valoración clínica compatible con un cuadro depresivo relevante. La frecuencia fue mayor en el sexo femenino, 36,1 %, que en el masculino, 20,4 %, y aumentó desde 17,7 % en participantes de 8 a 11 años hasta 39,1 % en aquellos de 15 a 17 años. La concordancia entre tamizaje y valoración clínica fue sustancial, κ = 0,63. Los antecedentes de atención psicológica y determinadas condiciones de convivencia familiar se asociaron con mayor sintomatología. Conclusiones: La evaluación de la depresión pediátrica requiere integrar instrumentos de tamizaje con valoración clínica estructurada. La edad, el sexo y antecedentes psicosociales deben considerarse en la interpretación de los hallazgos y en la identificación de participantes que requieren atención especializada.

Palabras clave: depresión, niño, adolescente, salud mental, diagnóstico.

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INTRODUCTION

Depression during childhood and adolescence is a mental health problem with potential effects on emotional development, family relationships, social integration, and academic performance. Contemporary diagnostic systems recognize that depressive disorders can begin in early stages and that their identification requires assessing both affective symptoms and their duration and functional impact (1). In pediatric populations, assessment requires particular attention because the clinical presentation does not always mirror the pattern observed in adults. Persistent sadness and loss of interest may coexist with irritability, isolation, changes in sleep or appetite, decreased school performance, and concentration difficulties. Current clinical guidelines recommend a comprehensive assessment that includes functioning, safety, and differential diagnoses (2). Likewise, the clinical approach in adolescents requires distinguishing between transient distress, significant depressive symptomatology, and an established depressive disorder (3). In the pediatric setting, this differentiation is especially relevant when the initial manifestations are somatic or behavioral (4).

The magnitude of the problem has been documented across different regions and age groups. A systematic review and meta-analysis focusing on depressive disorders diagnosed in children under 13 years of age showed that clinical depression also occurs before adolescence and that its estimate depends on the type of disorder and the diagnostic procedures used[5]. On a broader scale, a recent meta-analysis on depression and depressive symptoms in children and adolescents reported a considerable global burden and noted variations according to region, study period, and sample characteristics[6]. These differences help explain why figures obtained using self-report scales are often higher than those derived from diagnostic interviews. Therefore, when studying childhood depression, it is necessary to specify whether symptomatology, clinical risk, or the presence of a disorder defined by nosological criteria is being estimated.

The onset of depressive symptoms is not attributable to a single factor. Among the associated factors, adverse experiences, family conflicts, interpersonal difficulties, victimization, isolation, school problems, and other contextual conditions that may interact with individual vulnerabilities have been described (7). The expression of distress also varies according to developmental stage. Irritability, for example, may play a relevant role in children and adolescents and may appear alongside mood disorders, anxiety, or behavioral problems; it should therefore be interpreted within the overall symptom profile rather than as an isolated indicator (8). Comorbidity between anxiety and depression adds complexity to the diagnostic process because certain symptoms act as links between both conditions and may be associated with greater impairment (9). Likewise, sex differences have been observed in the organization of anxious and depressive symptoms during early adolescence, reinforcing the need to consider sociodemographic variables in the analysis (10).

From a nosological perspective, identifying depression in the pediatric population requires determining whether the set of manifestations meets sufficient criteria for duration, intensity, and functional impairment to constitute a depressive disorder, as well as exploring possible alternative explanations. A high score on a questionnaire may indicate the need for evaluation, but it does not replace a clinical interview. This distinction is important in school contexts, where early detection can facilitate referral, although there is also a risk of labeling a transient emotional response as a disorder if a complementary assessment is not performed. Therefore, integrating screening instruments with a structured clinical assessment allows a more precise approach to the nosological component of childhood and adolescent depression.

In Ecuador, the available evidence suggests that depressive disorders represent a relevant part of the mental health burden in the pediatric population. A national analysis of hospitalizations between 2015 and 2022 found that depressive disorders were among the main causes of hospitalization for mental problems and that female adolescents were more likely to be admitted for these conditions[11]. In the educational setting, a study carried out in adolescents from Guayaquil identified symptoms of depression, anxiety, and stress and found a significant relationship between these dimensions and family functioning(1[2]). Although these findings provide valuable information, school research is still needed to differentiate between symptoms detected by scales and clinical characteristics compatible with a depressive condition, especially outside hospital settings.

Given this need, the present study aims to determine the frequency and intensity of depressive symptomatology and to analyze its nosological approach in children and adolescents aged 8 to 17 years from public educational institutions in the Milagro canton, Ecuador. In addition, differences are analyzed according to age, sex, history of psychological or psychiatric care, and family living conditions, as well as the agreement between a screening instrument and a structured clinical assessment.

METHODS

A quantitative, observational, non-experimental and cross-sectional study was designed, with a descriptive and analytical scope. The methodological structure was organized according to the recommendations of STROBE for observational studies[13]. The research was carried out for three public educational institutions in the canton of Milagro, province of Guayas, Ecuador, during the period of 2026. The reference population was set at 420 students aged 8 to 17 years, enrolled from Basic General Education to Unified General Baccalaureate. With a confidence level of 95%, margin of error of 5% and expected proportion of 0.50, a minimum sample of 201 participants was established. To compensate for losses or incomplete forms, it was considered to invite approximately 222 students.

Proportional stratified probability sampling by institution and age group was established. Participants were organized into three age categories: 8 to 11, 12 to 14, and 15 to 17 years. Students within the defined age range were included if informed consent from the legal guardian and assent from the minor were obtained and if they were able to complete the instruments. Incomplete or duplicate records, unauthorized participants, and students with conditions that would prevent them from providing valid responses without appropriate adaptation were excluded.

Data collection was conducted using a sociodemographic form, the Children's Depression Inventory 2 (CDI 2), and a structured clinical interview. The form recorded age, sex, educational level, family living arrangements, and history of psychological or psychiatric care. The CDI 2 was used as a screening instrument to assess the intensity of depressive symptomatology. As a complement, the clinical assessment explored the presence, duration, intensity, and functional impact of depressive symptoms. The combination of a screening scale with a structured diagnostic interview has been useful in differentiating elevated symptoms from clinically relevant depressive conditions[14]. The nosological analysis considered depressed mood, loss of interest, sleep and appetite disturbances, decreased energy, concentration problems, feelings of worthlessness or guilt, psychomotor manifestations, thoughts of death or self-harm, and school, family, or social impairment.

Data were coded anonymously and processed using statistical software. For categorical variables, frequencies and percentages were calculated. For quantitative variables, the mean and standard deviation or the median and interquartile range were calculated, according to the distribution. Associations between categorical variables were examined using the Pearson chi-square test or Fisher's exact test. Differences between 2 groups were analyzed using Student's t-test or the Mann-Whitney U test, and comparisons among 3 groups were analyzed using ANOVA or the Kruskal-Wallis test. Agreement between screening and clinical assessment was estimated using Cohen's kappa. A significance level of 0.05 and 95% confidence intervals were adopted. The research protocol received institutional ethics approval. Informed consent was also obtained from legal representatives, and assent was obtained from participating minors. When risk of self-harm or suicide was identified, an immediate pathway for evaluation and professional referral was established.

RESULTS

The analytical sample consisted of 201 children and adolescents aged 8 to 17 years. Of the total, 108 were female, 53.7%, and 93 were male, 46.3%. The mean age was 13.2 ± 2.8 years. By age groups, 62 participants, 30.8%, were between 8 and 11 years old; 70, 34.8%, between 12 and 14 years old; and 69, 34.3%, between 15 and 17 years old. Twenty-nine participants, 14.4%, had a history of psychological or psychiatric care.

The overall mean CDI 2 score was 12.9 ± 8.3 points. In 143 participants (71.1%), scores remained within ranges without clinically relevant elevation, whereas 58 (28.9%) presented elevated depressive symptomatology. Within the latter group, 25 participants (12.4% of the total) showed mild elevation; 20 (10.0%) moderate elevation; and 13 (6.5%) high levels. Mean scores increased with age: 10.2 ± 7.1 in the 8- to 11-year group, 12.8 ± 8.0 in the 12- to 14-year group, and 15.4 ± 8.9 in the 15- to 17-year group. The difference was statistically significant, $F = 6.80$; $p = 0.001$.

The frequency of elevated symptomatology was higher in females: 39 of 108 participants (36.1%) versus 19 of 93 male participants (20.4%). The difference was significant, $\chi^2 = 5.25$; $p = 0.022$. Female participants had 2.20 times greater odds of reporting elevated symptomatology than males, OR = 2.20; 95% CI: 1.16-4.17. Age distribution also showed differences; the proportion increased from 17.7% in the 8- to 11-year group to 39.1% in adolescents aged 15 to 17 years, $\chi^2 = 7.28$; $p = 0.026$.

The structured clinical interview identified manifestations compatible with a clinically relevant

depressive condition in 42 participants (20.9% of the sample). Depressed mood was the most frequent manifestation, followed by loss of interest or pleasure, sleep disturbances, concentration difficulties, and decreased energy. Regarding functioning, 32 participants with positive clinical assessment (76.2%) presented school impairment; 25 (59.5%) family difficulties; and 21 (50.0%) alterations in social relationships.

Table 1. Distribution of elevated depressive symptomatology according to sex and age group

Variable	n	Elevated symptomatology, n	%
Total	201	58	28,9
Female sex	108	39	36,1
Male sex	93	19	20,4
8–11 years	62	11	17,7
12–14 years	70	20	28,6
15–17 years	69	27	39,1

Note. n = absolute frequency; % = percentage within each category. Elevated depressive symptomatology was determined based on the interpretation criteria of the Children's Depression Inventory 2 (CDI 2). Own elaboration based on the study data.

Table 2. Clinical manifestations among participants with positive clinical assessment

Manifestation	n	%
Depressed mood	35	83,3
Loss of interest or pleasure	30	71,4
Sleep disturbances	28	66,7
Difficulty concentrating	27	64,3
Fatigue or decreased energy	26	61,9
Feelings of worthlessness or guilt	18	42,9
Thoughts of death or self-harm	9	21,4

Note. Percentages were calculated based on the 42 participants with a positive clinical assessment. The same participant could present multiple clinical manifestations, so the percentages are not mutually exclusive and do not necessarily sum to 100 %. Prepared by the authors based on the study data.

9 participants presented thoughts related to death or self-harm, equivalent to 4,5 % of the total sample. From a nosological perspective, 30 of the 42 cases with a positive clinical assessment showed characteristics compatible with one current depressive episode; 7 presented a history and characteristics compatible with a recurrent depressive pattern; and 5 showed clinically relevant symptomatology without meeting all the necessary elements for a specific depressive classification.

Table 3. Agreement and performance of screening versus structured clinical assessment

Indicator	Value
True positives	36
False positives	22
True negatives	137
False negatives	6
Sensitivity	85,7 %
Specificity	86,2 %
Positive predictive value	62,1 %
Negative predictive value	95,8 %
Overall accuracy	86,1 %
Cohen's kappa	0,63

Note. Structured clinical assessment was considered the reference for calculating sensitivity, specificity, positive predictive value, and negative predictive value. Cohen's kappa coefficient expresses the degree of agreement between the CDI 2 and the structured clinical assessment. Prepared by the authors from the study data.

Of the 58 participants identified by the CDI 2 with elevated symptomatology, 36 also had a positive clinical assessment. There were 22 false positives and 6 false negatives. The sensitivity of the screening was 85.7%, the specificity was 86.2%, the positive predictive value was 62.1%, and the negative predictive value was 95.8%. Overall accuracy reached 86.1%. Cohen's kappa coefficient was 0.63, compatible with substantial agreement between both assessment strategies.

Elevated symptomatology was present in 17 of the 29 participants with a history of psychological or psychiatric care, 58.6%, compared with 41 of 172 students without this history, 23.8%. The association was significant, $p < 0.001$, with OR = 4.53; 95% CI: 2.00-10.26. Likewise, 22 of 48 participants who did not live with both parents, 45.8%, presented elevated symptomatology, compared with 36 of 153 students who lived with both, 23.5%; $p = 0.005$, OR = 2.75; 95% CI: 1.39-5.43.

Table 4. Variables associated with elevated depressive symptomatology

Variable	With symptoms, n/N	%	p
Female sex	39/108	36,1	0,022
Male sex	19/93	20,4	
8–11 years	11/62	17,7	0,026
12–14 years	20/70	28,6	
15–17 years	27/69	39,1	
History of psychological care	17/29	58,6	<0,001
No history	41/172	23,8	
Not living with both parents	22/48	45,8	0,005
Living with both parents	36/153	23,5	

Note. n/N = number of participants with elevated depressive symptoms out of the total participants in each category; % = corresponding percentage. p values were obtained using Pearson's chi-square test or Fisher's exact test, as appropriate. Statistical significance was considered when $p < 0.05$. Own elaboration based on the study data.

Overall, the results showed a greater presence of depressive symptomatology in older adolescents, female participants, students with a history of psychological or psychiatric care, and those who did not live with both parents. The difference between the proportion detected through screening and clinical assessment confirmed that a high score does not necessarily equate to a nosological classification of depressive disorder.

DISCUSSION

The frequency of elevated depressive symptomatology found in the study, 28,9 %, falls within the broad range described for adolescents when self-report instruments are used. Shorey et al. estimated a global prevalence of elevated depressive symptoms close to a third of the adolescent population, although they noted substantial variations by region, sex, and measurement tool[15]. During the pandemic period, Racine et al. also documented a significant increase in depressive and anxiety symptoms in children and adolescents, with a greater burden in older age groups and in women (16). This background helps interpret the figure obtained as an estimate of symptomatology and not as prevalence of depressive disorder, especially because structured clinical assessment reduced the proportion to 20,9 %.

The difference between screening and clinical assessment constitutes one of the most relevant findings. The CDI 2 made it possible to identify a broad group of students with a higher symptom burden, but it generated 22 false positives and 6 false negatives compared with the clinical interview. Houghton et al. have noted that the CDI 2 in its short form is useful for screening depressive symptoms in adolescents, although its main function is to identify possible cases requiring subsequent evaluation[17]. In Spanish-speaking populations, Cumba-Avilés et al. reported adequate psychometric properties for the Spanish version and highlighted its usefulness as a measure of symptomatology, not as a substitute for a clinical diagnosis[18]. The substantial agreement observed, $\kappa = 0.63$, supports the combined use of both approaches.

The use of a structured interview made it possible to explore duration, functional impact, and organization of the symptoms. The K-SADS-PL was developed precisely to integrate information from the child or adolescent and from their caregivers, to assess impairment, and to establish psychiatric diagnoses in a systematic manner[19].

In this study, depressed mood, loss of interest, sleep disturbances, and concentration difficulties were the most frequent manifestations among the clinically relevant cases. These findings are consistent with the notion that pediatric depression has a multidimensional expression and that somatic, cognitive, and affective symptoms must be interpreted together with school, family, and social functioning.

The school and family context also merits attention. Elevated symptomatology was more frequent among those who did not live with both parents, although this result should not be interpreted as evidence of a causal relationship or as equivalent to family dysfunction. Available evidence indicates that greater connection to school may act as a protective factor against symptoms of depression and anxiety, especially during adolescence[20]. Similarly, family interventions have shown benefits for depressive symptoms in children and adolescents, suggesting that caregiver involvement may be relevant in both prevention and treatment[21]. Consequently, future research should directly measure family support, communication, conflict, and school connection instead of using only household structure as a proxy.

The presence of thoughts related to death or self-harm in 9 participants is a finding that requires careful clinical interpretation. Although this variable alone does not equate to suicidal behavior, its detection necessitates safety protocols, immediate assessment, and referral when appropriate. Lu and Muñoz-Laboy emphasized that screening programs for depression and suicide risk in pediatric populations must be linked to clear care and follow-up pathways and must not be limited to the administration of questionnaires[22]. In school-based studies, this aspect is especially sensitive because the researcher may identify risk in participants who had not previously sought help.

The results also dialogue with the Ecuadorian evidence. Erazo et al. described psychosocial alterations in children and adolescents in the country during the COVID-19 lockdown, showing the susceptibility of this population to important changes in the environment and routines (23). On the other hand, Asanov et al., in a sample of secondary school students in Ecuador, found indicators of depression in a relevant proportion during the period of remote education and pointed out differences associated with social and educational conditions (24). Although both studies were carried out in exceptional circumstances, they confirm the need to produce local evidence on school mental health and to avoid simply extrapolating the estimates of countries with different education systems and family contexts.

The higher frequency observed in participants aged 15 to 17 years and in the female sex is consistent with patterns described in the international literature and with Ecuadorian hospitalization data. However, early-onset depression is the result of the interaction of biological and environmental components. Singh et al., in an umbrella review, identified genetic, epigenetic, neurobiological, and contextual evidence associated with childhood-onset depression, which supports a multifactorial model and discourages interpretations based on a single sociodemographic characteristic[25]. Thus, age and sex should be considered distribution markers rather than sufficient explanations of the disorder.

A history of psychological or psychiatric care showed a marked association with elevated symptomatology. This result may reflect persistence or recurrence of previous emotional problems, but the cross-sectional design does not allow temporality to be established. The usefulness of screening should also not be extended beyond what the evidence permits. The recommendation of the US Preventive Services Task Force supports screening for depression in adolescents aged 12 to 18 years when adequate systems for diagnosis, treatment, and follow-up exist, whereas the evidence is insufficient to recommend universal screening in younger children (26). This difference is pertinent to the studied sample, which included participants from age 8, and reinforces the need to interpret the results of the younger groups with particular caution.

The limitations include the cross-sectional design, which allows associations to be identified but not causality to be established. The sample was restricted to 3 public educational institutions in a single canton, so the findings cannot be generalized to the entire Ecuadorian pediatric population. Self-report may be affected by comprehension of the items, social desirability, or willingness to communicate emotional experiences. In addition, variables such as family functioning and school support were approximated using general indicators. Strengths include the integration of different age groups, a stratified selection procedure, and the combination of screening with structured clinical assessment. This last feature made it possible to distinguish between elevated symptomatology and a nosological approach, avoiding the assumption that both categories are equivalent.

Taken together, the findings support a stepped approach to pediatric depression: initial screening, clinical assessment, analysis of functional impairment, and referral when risk or persistent

symptomatology is present. Early identification in educational institutions may facilitate access to care, provided that it is accompanied by clear protocols and coordination with families and mental health services.

CONCLUSIONS

Depressive symptomatology was notably frequent in the evaluated children and adolescents and was more common among older participants and females. These findings indicate that the expression of pediatric depression is not homogeneously distributed and that its interpretation should consider the developmental stage and individual characteristics.

Clinical assessment showed that depressed mood, loss of interest, sleep disturbances, concentration difficulties, and decreased energy were the most frequent manifestations among participants with clinically relevant impairment. The identification of thoughts related to death or self-harm in a subset of the sample reinforces the need for assessment, safety, and referral protocols within any school screening strategy.

The agreement between the CDI 2 and the structured interview was substantial, albeit not absolute. The existence of false positives and false negatives confirms that screening instruments are useful for identifying possible cases, but they should not be used in isolation to establish a diagnostic classification. The nosological approach requires the integration of symptom intensity and duration, functional impairment, history, and clinical assessment.

Associations were also observed with a history of psychological or psychiatric care and with certain family living conditions. Therefore, early detection strategies should link educational institutions with families and mental health services, seeking a response proportional to the level of risk and avoiding equating a high score with a confirmed depressive disorder.

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