

Development of the Trait Depression Scale for Adolescents (EDRA)

Construcción de la Escala de Depresión Rasgo para Adolescentes (EDRA)

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Abstract

Detection and diagnosis of depression in adolescents presents significant challenges, highlighting the need for valid and reliable instruments specifically designed for this population. For this purpose, the Trait Depression Scale for Adolescents (EDRA) was developed. Initially, focus groups were conducted to construct the items. The initial instrument factorial structure and internal consistency were tested with data obtained from a group of 215 adolescents aged 15 to 19. Subsequently, 600 adolescents in the same age range were evaluated, confirming the instrument factorial structure with Confirmatory Factor Analysis. Internal consistency was evaluated, and we obtained evidence of convergent and criterion validity. As a result, a theoretically coherent instrument was obtained, with the required structural, convergent, and criterion validity. The instrument also has Cronbach's alpha (.970) and McDonald's omega coefficients (.970) that indicate a high instrument reliability. It is concluded that EDRA is useful, valid, and reliable for measuring trait depression in adolescents. It represents a promising tool for early detection and monitoring of depression in this population, with potential applications in clinical, educational, and research settings.

Keywords: psychometrics, validity, reliability, mental health, young people.

Resumen

La detección y el diagnóstico de la depresión en adolescentes presentan desafíos significativos lo que resalta la necesidad de contar con instrumentos válidos y confiables diseñados específicamente para esta población. Con este propósito, se desarrolló la Escala de Depresión Rasgo para Adolescentes (EDRA). Inicialmente, se realizaron grupos focales para construir los reactivos. La estructura factorial inicial y la consistencia interna del instrumento se analizaron con los datos obtenidos de 215 adolescentes de 15 a 19 años. Posteriormente, se evaluó a 600 adolescentes en el mismo rango de edad. Se confirmó la estructura factorial del instrumento con un Análisis Factorial Confirmatorio, se evaluó la consistencia interna y se obtuvieron evidencias de validez convergente y de criterio. Como resultado, se obtuvo un instrumento teóricamente coherente, con la validez de estructura, convergente y de criterio requeridas. El instrumento cuenta con coeficientes de alfa de Cronbach (.970) y omega de McDonald (.970) que indican una alta fiabilidad de la escala. Se concluye que la EDRA es útil, válida y confiable para medir depresión rasgo en adolescentes, siendo una herramienta prometedora para la detección temprana y el monitoreo de la depresión en este grupo poblacional, con potenciales aplicaciones en entornos clínicos, educativos e investigativos.

Palabras clave: psicometría, validez, confiabilidad, salud mental, jóvenes.

INTRODUCTION

Depression in adolescents represents a significant public health challenge due to its high prevalence, the negative impact on the well-being of adolescents who suffer from it, the consequences for their psychosocial development, and the risk to life that it entails (Bodner et al., 2017; Navío & Pérez, 2020). According to the World Health Organization (WHO) (2021), depression is the fourth leading cause of illness among adolescents aged 15 to 19 worldwide, placing them at greater risk of suicide, which is the fourth leading cause of death in this demographic group.

In Mexico, adolescents aged 15 to 19 years old show greater depressive symptoms compared to those aged 10 to 14 years old, with a prevalence of 12.9% (Shamah-Levy et al., 2020). Furthermore, according to data from the National Institute of Statistics, Geography, and Informatics (INEGI, from their Spanish initials), young people aged 15 to 19 are the most likely to commit suicide, which is the third leading cause of death in this population (INEGI, 2022). Finally, ENSANUT reports that 31.3% of adolescents presented one depressive symptom and 7.1% presented two symptoms (Vázquez-Salas, 2023). Additionally, González-Forteza (2015) identified that almost a third of the school population had “subclinical depression,” which implies the presence of significant emotional problems that require attention and prevention. However, the detection and diagnosis of depression in adolescents faces significant challenges, and it is even possible that the true magnitude of depression in this population is underestimated (National Academy of Medicine of Mexico, 2017; Irarrázaval et al., 2016; Medina-Mora et al., 2015) and that approximately 70% of cases of depression in adolescents are not properly diagnosed (Campos et al., 2014 in Jadán, 2017).

These diagnostic difficulties can be attributed to the fact that the clinical criteria and instruments used were created more than three decades ago based on the analysis of depression in the adult population (Franco-Díaz et al., 2018; Jadán, 2017; Rivera, 2019). This is despite the emotional, physical, cognitive, and social differences between adolescents and adults. In addition, depression in adolescents includes symptoms characteristic of this stage, such as somatic complaints, reactive affect, anger, hypersomnia, weight gain, irritability, and extreme sensitivity to

rejection (Rey et al., 2017). That is, the unstable nature of mood at this stage of life makes measurements particularly susceptible to the moment when the assessment is performed, which also makes it difficult to diagnose depressive symptoms during adolescence.

In summary, clinical differences between adolescents and adults with depression, as well as possible false positives and false negatives in depressive symptoms due to the mood typical of adolescent development, can contribute to diagnostic errors.

In this context, a useful alternative is to evaluate depression not only as a state but also as a trait. The concept of trait depression refers to a tendency to experience a depressed mood, regardless of momentary emotional states. This approach is relevant in adolescence, as it allows for the identification of individuals who present symptoms despite not meeting the diagnostic criteria for major depressive disorder and who, if not identified and treated, could develop more severe forms of the disorder (Buela-Casal & Agudelo Vélez, 2009).

Thus, detecting depressive traits in adolescents can be crucial in preventing the progression to major depressive disorder in the future (Chiappelli et al., 2014; Guillot-Valdés et al., 2020). Furthermore, this approach offers greater sensitivity in detecting less severe symptoms and facilitates the application of assessment instruments in non-clinical populations (Agudelo et al., 2007; Guillot-Valdés et al., 2020), which is essential for prevention and early intervention in adolescence.

However, although instruments such as the State/Trait Depression Inventory (IDER, from Spanish initials) (Agudelo Vélez, 2009) and the Brief Trait Depression Scale for Adolescents (Silva & Jiménez, 2016) exist, both have limitations when applied to the adolescent population. The IDER, which mainly measures the affective component of depression, was not specifically designed for adolescents. In its validation with adolescents (Agudelo Vélez, 2009), although the instrument has adequate psychometric properties, the reliability values are higher in university students than in adolescents. This suggests that the IDER may not be as effective in capturing the emotional particularities of adolescents. For its part, the Brief Depression Scale, although aimed at young people, was originally constructed with a sample

of 17- to 23-year-olds, actually covering a predominantly adult population. When reviewed for use in adolescents, it was found that the scale did not achieve high psychometric quality in this age group (Rivera, 2019).

Therefore, there is a need to develop a new instrument that is specifically adapted to the adolescent population and measures trait depression.

Thus, the objective of this study was to develop a valid and reliable instrument for assessing trait depression in adolescents, with the aim of contributing to its timely and accurate detection in this population. To this end, two studies were conducted: 1. Construction, content validity, and exploratory factor analysis of the trait depression scale for adolescents (EDRA) and 2. Validation of structure (AFC), criteria, convergence, discrimination, and internal consistency of EDRA.

STUDY 1. Construction, content validity, exploratory factor analysis, and internal consistency of the EDRA

MÉTODO

Design

A psychometric and instrumental study was carried out (Ato et al., 2013).

Participants

Two hundred and fifteen young people from the Mexico City metropolitan area participated in the study; 38.1% were female and 61.9% were male, aged between 15 and 19 years ($M = 16.03$; $SD = .98$). Participants were selected using a non-probabilistic, purposive sampling method. Data collection took place during a regular academic term at a public school. Students who met the established age range for the study and were enrolled were included. Minors participated only if they signed the consent form and presented the informed consent form signed by their mother, father, or guardian. In the case of adult participants, their informed consent was required. Cases presenting inconsistent response patterns were established as exclusion criteria. No diagnostic criteria were applied, nor were participants excluded due to clinical conditions.

Instruments

Trait Depression Scale for Adolescents (EDRA).

Development of the scale. The literature refers to trait depression as the tendency to experience a depressed mood (Silva & Jiménez, 2016), which is considered one-dimensional (Guillot-Valdés et al., 2020).

Based on this definition, the diagnostic criteria for major depressive disorder in DSM 5 (American Psychological Association (APA), 2014) and the information gathered in four focus groups conducted with adolescents aged 15 to 19, 109 items with six response options were developed.

Content validity. Ten judges who are experts in health and psychometrics evaluated the relevance, coherence, and clarity of the items, response options, and instructions on a scale of 1 to 5. Aiken's V (Aiken, 1930) was calculated, and the [95%] confidence interval was determined for the 109 items. A critical value of $\geq .75$ was considered for Aiken's V (with Type I error $\leq .05$) and $\geq .70$ for the lower limit of the confidence interval (Penfield & Giacobbi, 2004; Ventura León, 2019). Based on the scores obtained and the qualitative responses of the judges, 30 items were eliminated.

Following the judges' suggestions, 15 additional items were developed and resubmitted for evaluation. Aiken's V and the [95%] confidence interval were calculated for this set of items, applying the same criteria as in the previous round. After analyzing the results, the 15 additional items were retained, resulting in a scale consisting of 92 items with six response options (1 = never, 2 = almost never, 3 = rarely, 4 = often, 5 = almost always, and 6 = always).

Procedure

A pilot application of the scale was conducted with 40 participants of similar ages to those who would make up the final group, in order to evaluate the instructions, the clarity of the items, and the response options. Subsequently, structured interviews (Zucker et al., 2004) were conducted with six of the participants to obtain additional feedback. With the information obtained, the wording of nine items was adjusted.

In order to apply the instrument, the corresponding institutional authorization was obtained from a public school in the metropolitan area selected for convenience. The application was carried out

in the classroom, during school hours, using an online form under the direct supervision of the principal investigator. The process took place over the course of a week.

To ensure that the conditions of application were consistent, a standardized protocol was followed in each session in which the instructions were read aloud, doubts were resolved before starting, individual work in silence was requested, and participants were instructed not to open tabs or applications during the response. Each student had a device with an internet connection, and the instrument was presented in the same order for all participants. The presence of the researcher allowed for monitoring of protocol compliance and control of possible distractions associated with the online modality.

Data analysis

SPSS version 25, R version 4.2.0 (R Core Team, 2021), and Factor 12.04.05 (Ferrando & Lorenzo-Seva, 2017) were used for data analysis. There were no missing data, so the analyses were performed on all cases obtained.

Initially, the items were screened to identify those that did not meet the necessary psychometric standards (Reyes Lagunes & García y Barragán, 2008). The frequency distribution of each item was analyzed to eliminate those in which more than 50% of the responses were concentrated in a single option, as this indicates that the items are not appropriate for analysis using methods that require variability in responses (Calleja & Mason, 2020). In addition, items that showed floor and/or ceiling effects were eliminated (Chyung, 2020).

To verify whether the items were capable of discriminating between extreme groups, the scores corresponding to quartiles 1 and 3 were calculated from the total scale score. Comparisons were made using t-tests for each item within these subgroups, and those that did not show a significant difference among the groups were eliminated.

Subsequently, a multicollinearity analysis was performed to discard redundant items, and inter-item correlations $\geq .80$ were eliminated (Grim & Yarnold, 2000). item-total correlations (corrected homogeneity index, CHI) were obtained, and items with a correlation $\leq .20$ were eliminated (Schmeiser & Welch, 2006).

The normality of the data was tested using Mar- dia's statistic (1970) and, when normality was not found, Exploratory Factor Analysis (EFA) was performed with unweighted least squares extraction (Ferrando et al., 2022). This calculation was performed with R using the MVN package (version 5.9).

Subsequently, the Kaiser-Meyer-Olkin (KMO) sample adequacy coefficient (Kaiser, 1974) was obtained, which had to be $>.90$, and Bartlett's sphericity test was performed to assess whether the correlation matrix was equal to the identity matrix (Calleja & Mason, 2020). The number of factors to be retained was established using parallel analysis (Lloret-Segura et al., 2014) with FACTOR software. In order to determine the associated items, communalities $\geq .50$ (Hair et al., 1999) and factor loadings $>.40$ (Lloret-Segura et al., 2014) were considered.

To assess the internal reliability of the scale, Cronbach's alpha coefficients were calculated, which were expected to be greater than $.80$ (DeVellis, 2016). The calculation of the "alpha coefficient if the item is removed" was evaluated for each item, which should not exceed that obtained for the total scale. If it did, the item would be discarded. In addition, McDonald's omega coefficient (McDonald, 1999) was calculated, ordinal, estimated from the polychoric correlation matrix.

Ethical aspects

The Ethics Committee for Psychological Research at the Faculty of Psychology of the National Autonomous University of Mexico (UNAM) approved this study with reference number FPSI/422/CEI/324/2024.

This study adhered to the ethical principles established by the American Psychological Association (2010) and ensured voluntary participation, anonymity, confidentiality, and the exclusive use of information for research purposes.

In the case of underage participants, informed consent was obtained from their parent or guardian, as well as informed assent from each student before participating. Consent was obtained by the school administration after explaining the objectives and procedures of the study to the parents or guardians. For participants of legal age, informed consent was requested directly. All consent and assent forms were physically filed in folders kept under lock and key by the researcher in charge.

The data was handled solely by the research team and stored in secure systems.

RESULTS: ESTUDY 1

Discrimination of items

Fifteen items were eliminated because more than 50% of the responses were concentrated in a single option, with values ranging from 51.2% to 83.7%. No items were eliminated due to the ceiling effect, but 25 items that showed a floor effect were discarded. All t-test values were significant ($p < .001$), indicating that all items discriminated among groups. Twenty-one items were also eliminated due to redundancy, as they had inter-item correlations greater than .80. Finally, item-total correlations ranged from .69 to .85, so no items were eliminated for this reason.

Exploratory Factor Analysis

An initial analysis was performed with the 31 items that remained after the initial analyses. The multivariate normality was evaluated using Mardia's statistic, and it was observed that the data did not have a normal distribution (Mardia's skewness = 9346.84, $p < .05$; Mardia's kurtosis = 29.1 $p < .05$), so OLS was performed

using the unweighted least squares method. An initial analysis was performed with the 31 items that remained after the initial analyses. The multivariate normality was evaluated using Mardia's statistic, and it was observed that the data did not have a normal distribution (Mardia's skewness = 9346.84, $p < .05$; Mardia's kurtosis = 29.1 $p < .05$), so OLS was performed using the unweighted least squares method.

This first EFA showed a Kaiser-Meyer-Olkin (KMO) index value of .965 and the significance of Bartlett's sphericity test was $p < .001$, indicating that the data were suitable for factor analysis. The results of the parallel analysis indicated a one-factor solution, as expected.

Through Exploratory Factor Analysis (EFA), 54% of the variance was explained, and 10 items that did not meet the minimum required commonality ($\geq .50$) for inclusion in the scale were progressively eliminated. Up to the eleventh EFA performed, a Kaiser-Meyer-Olkin (KMO) sample adequacy index of .961 and a significance of $p < .001$ in Bartlett's sphericity test were obtained. Thus, the unidimensional factor structure explained 61% of the variance, and each of the items showed communalities $\geq .50$ and factor loadings $> .40$, thus ensuring their contribution to the underlying construct of trait depression (Table 1).

Table 1

Factor structure and internal consistency of the instrument

Items	Factors (λ)	Communalities (h^2)
DR1. I have little interest in doing things	.869	.754
DR2. I feel discouraged	.850	.723
DR3. I get frustrated by little things	.846	.715
DR4. It's hard for me to feel happy	.828	.686
DR5. I find it difficult to enjoy the things I do	.826	.683
DR6. It is difficult for me to stay motivated on my activities	.822	.676
DR7. I see that others are happier than me	.806	.649
DR8. I feel restless	.805	.648
DR9. I feel empty	.794	.631
DR10. I find it difficult to concentrate on my activities	.787	.620

DR11. I feel excluded	.776	.603
DR12. Everything bores me	.774	.599
DR13. Everything makes me feel lazy	.760	.577
DR14. I easily lose interest in what I do	.759	.576
DR15. I am always sleepy	.750	.562
DR16. I find it harder to make choices than other people my age	.744	.554
DR17. It bothers me to think that there are people my age who are more successful than me	.726	.526
DR18. I do things slowly	.723	.523
DR19. Things go wrong because of me	.714	.509
DR20. I feel like I get angry about everything	.721	.506
DR21. I feel sad	.707	.500

Internal Consistency

The internal consistency index obtained with Cronbach's alpha for the total scale was $\alpha = .970$ [95% CI: .964-.975], indicating high reliability of the instrument. No item was found with an "alpha if the item is removed" higher than that obtained for the total scale, which supports the importance of each item in measuring trait depression and the homogeneity of the scale. In addition, McDonald's omega was calculated; it was $\Omega = .970$ [95% CI: .963-.975], corroborating the internal consistency of the scale.

The final result was a one-dimensional instrument with a total of 21 items evaluated on a six-point Likert scale (Table 1).

STUDY 2 Validation of factorial structure, criterion, convergent and discriminant validity, and obtaining internal consistency of the EDRA

METHOD

Design

A psychometric and instrumental study was conducted (Ato et al., 2013).

Participants

A total of 600 students from public high schools in the Mexico City metropolitan area participated, 61.2% female and 38.8% male, aged between 15 and 19 years. Table 2 details the composition of the group. Participants were selected using non-probabilistic, purposive sampling during a regular academic period. The inclusion and exclusion criteria were the same as those used in Study 1.

Table 2

Description of participants in study 2

Total sample (N= 600)			Women (n=367)		Men (n= 233)	
Age	M	SD	M	SD	M	SD
	16.97	1.01	16.98	1.02	16.95	1.04

Instruments

Adolescent Depression Rating Scale (EDRA).

The EDRA, constructed and validated in the initial study, was applied.

Beck Depression Inventory. (Contreras-Valdez et al., 2015). A 21-item self-report questionnaire that assesses symptoms of depression in individuals over the age of 13. With four response options, participants must rate the intensity of each symptom during the previous two weeks. The score can range from 0 to .63. In the Mexican adolescent population, this inventory has a Cronbach's alpha reliability index of .88. The CFA yielded two factors that demonstrate structural validity.

Mini-International Neuropsychiatric Interview for children and adolescents. (Mini kid)

Section B. Suicide risk (Colón-Soto et al., 2005). This is a structured diagnostic interview divided into modules, with a section that assesses suicide risk. It consists of nine questions that are answered with yes or no. This interview was validated in Mexico, showing evaluator reliability (.9 to 1) and temporal reliability (.60 to .75). Its concurrent validity with clinical interviews yields correlation coefficients of .35 to .50 (De la Peña et al., 2009; Palacios et al., 2004).

Family and Friends Social Support Scale (AFA-R)

(González & Landero, 2014). It is a questionnaire with 14 items with responses ranging from "never" to "always," distributed across five alternatives. These items are divided into two dimensions: support from friends (7 items) and support from family (7 items) with high reliability ($\alpha = .918$). Factor analysis confirms a two-factor structure that explains 66.09% of the variance. Studies in Mexico have observed a significant negative correlation between social support and stress ($r_s = -.337$, $p = .001$), demonstrating criterion validity.

Procedure

A psychometric and instrumental study (Ato et al., 2013) was conducted, for which an electronic battery was developed in Google Forms. With the authorization of school authorities, the application was carried out in two public high schools in Mexico City, selected through convenience sampling.

The application was carried out in classrooms during school hours, with trained staff present to answer questions and provide support during

the online application of the instrument. In order to maintain uniformity in the application conditions, the same protocol implemented in Study 1 was followed. Each student had a device with an internet connection, and the instruments were presented in the same order of items for all participants.

Minors participated only if they had informed consent and a signed informed consent form from their mother, father, or guardian. Adults participated by signing an informed consent form.

The presence of trained staff in each classroom allowed for verification of protocol compliance and control of potential distractions related to the online application mode. The process was carried out in two phases: in one of the schools, the application was completed in approximately two weeks, while in the other, it was extended over a month.

Data analysis

The SPSS program, version 25, and R, version 4.2.0 (R Core Team, 2021) was used for data analysis. No missing data were recorded in the study, so the analyses were performed on all cases.

To corroborate the structure of the scale, a Confirmatory Factor Analysis (CFA) was performed. Multivariate normality was evaluated (Mardia, 1970) and, as it did not meet the condition of normal distribution, the unweighted least squares method was applied (Ferrando et al., 2022). To evaluate the model fit (Hu & Bentler, 1999), the CFI (Comparative Fit Index), NFI (Normed Fit Index), GFI (Goodness of Fit Index), and AGFI (Adjusted Goodness of Fit Index) were considered, which are interpreted as indicators of adequate fit when their values are $>.90$. In addition, the RMSEA (Root Mean Square of Approximation) and SRMR (Standardized Root Mean Square Residual) were analyzed, which suggest an adequate fit when their values are $<.06$ and $<.08$, respectively. The fit indices were calculated using R 4.2.0 with the "lavaan" package (version 0.6.17) (Rosseel, 2012). In addition, the RMSEA (Root Mean Square of Approximation) and SRMR (Standardized Root Mean Square Residual) were analyzed, which suggest an adequate fit when their values are $<.06$ and $<.08$, respectively. The fit indices were calculated using R 4.2.0 with the "lavaan" package (version 0.6.17) (Rosseel, 2012).

A two-factor model with one general factor and three specific factors was estimated, grouping the items sequentially, to evaluate the essential unidimensionality of the scale and whether the use of a total sum score was appropriate. Because the theoretical conceptualization supports unidimensionality, sequential grouping was chosen, avoiding the imposition of a factorial structure that was not theoretically grounded. The model was configured with orthogonality restrictions, where the general factor and the specific factors do not correlate with each other, complying with the independent cluster structure required for the calculation of bifactor indices.

The following essential unidimensionality indices were calculated: (a) Explained Common Variance (ECV), which indicates the proportion of common variance attributable to the general factor; (b) hierarchical reliability omega (Ω_H), which estimates the reliability of the general factor by controlling for specific factors; and (c) Percentage of Uncontaminated Correlations (PUC), which assesses the proportion of correlations influenced solely by the general factor.

The criteria of Rodriguez et al. (2016) were used to interpret the results: $ECV \geq .85$ indicates essential unidimensionality, $\Omega_H \geq .70$ suggests that the general factor is sufficiently reliable to justify a total score, and $PUC \geq .70$ indicates that there are sufficient indicators of the general factor. Additionally, specific factors were evaluated to have virtually zero hierarchical reliability levels ($\Omega_H < .10$) as evidence that they do not contribute substantially to the construct once the general factor is controlled. Bifactor indices were calculated using the BifactorIndicesCalculator package (Dueber, 2017).

The internal consistency was assessed using Cronbach's alpha with expected values above .80 (DeVellis, 2016) and McDonald's Omega (McDonald, 1999) ordinal, calculated from the polychoric correlation matrix. To obtain evidence of convergent validity, the average extracted variance (AEV) was calculated, which must be $> .50$ to demonstrate adequate convergence (Ab Hamid et al., 2017). To assess criterion validity, the assumptions of normality of the variables were

verified. Since these were not met, Spearman's correlations were used, considered the most appropriate alternative under these conditions (Field, 2018).

Ethical aspects

The Research Ethics Committee in Psychology of the Faculty of Psychology at UNAM endorsed this study with official letter number FPSI/422/CEI/324/2024.

This study adhered to the ethical principles established by the American Psychological Association (2010), guaranteeing voluntary participation, anonymity, confidentiality, and the exclusive use of information for research purposes.

In the case of minors, informed consent was obtained in advance from their father, mother, or guardian. For students of legal age, informed consent was requested. At the first school, consent was obtained by a psychologist responsible for the groups; at the second school, the principal investigator managed the procedure with the support of teaching staff from each group.

All consent and assent forms were collected in printed form, signed by the relevant parties, and filed in physical folders under the exclusive custody of the researcher in charge, in a secure space with restricted access. The data were handled only by the research team and stored in secure systems.

RESULTS: STUDY 2

Confirmatory Factor Analysis

The multivariate normality was assessed using the Mardia test, revealing a lack of normality in the data (Mardia skewness = 3972.53, $p < .05$; Mardia kurtosis = 36.1 $p < .05$), so the CFA was performed using the unweighted least squares method. Figure 1 presents the resulting model, detailing the standardized coefficients, while the fit indices obtained are shown in Table 3, indicating an excellent fit to the proposed factorial structure.

Figure 1
CFA of the EDRA with standardized factor loadings

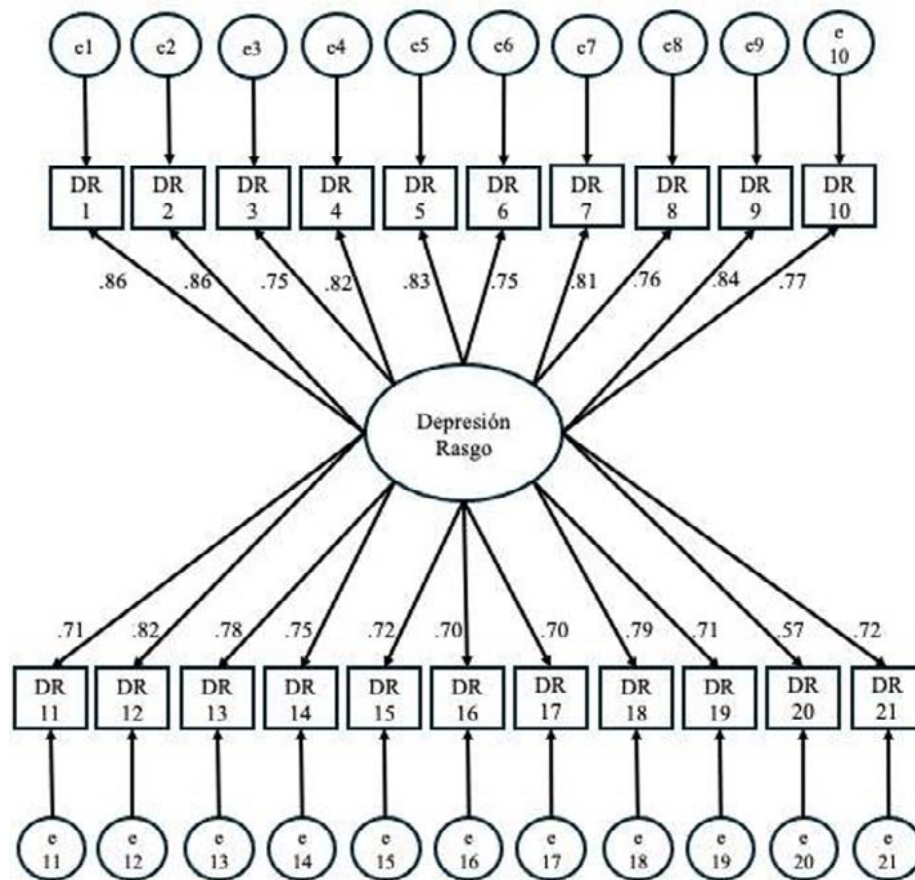


Table 3
CFA adjustment indices for the EDRA model

CFI	NFI	GFI	AGFI	SRMR	RMSEA
.996	.992	.997	.995	.051	.038 [.032-.044]

The factor loadings obtained in the model ranged from .57 to .84 and were statistically significant ($p < .001$, Figure 1).

Essential unidimensionality

The essential unidimensionality indices exceeded all recommended criteria (ECV = .89, Ω_H = .95, PUC = .70), confirming that the scale is essentially unidimensional. The specific factors showed virtually zero hierarchical reliability ($\omega_H < .10$), confirming the dominance of the general factor. The results demonstrate the essential unidimensionality of the construct and provide solid evidence to justify the use of a summed

total score.

Internal Consistency

The internal consistency index obtained for the total scale was $\alpha = .962$ [95% CI: .957-.966], while McDonald's Omega coefficient (ω) was .962 [95% CI: .957-.966], indicating high reliability of the instrument. fue de .962 [IC 95%: .957- .966], lo que señala una alta fiabilidad del instrumento.

Convergent Validity

It was observed that all reagents obtained statistically significant values (Figure 1). In addition, the AVE value was .60, which provides evidence of convergent validity.

Criterion Validity

The criterion validity evidences of the Trait Depression Scale for Adolescents (EDRA) were evaluated using the theoretical relationships

that the construct maintains with measurements of other variables, such as state depression, suicide risk, and social support. Given that the variables did not meet normality assumptions, the Spearman correlations are reported.

Table 4

Correlation coefficients between the EDRA and the total score of constructs associated with trait depression.

	Expected Relationship	Trait Depression Scale
Beck Depression Inventory	Positiva	.830*
Mini Kid. Risk of Suicide	Positiva	.582*
Family and Friends Support Scale	Negativa	-.367*

*p < .001.

The correlation analyses between the total scale scores and the scores of the three instruments applied are presented in Table 4. The results showed significant correlations in the expected direction, demonstrating the convergent and divergent validity of the scale. The highest correlation was observed with the Beck Depression Inventory.

DISCUSSION

The construction and validation of the Adolescent Trait Depression Scale (EDRA) took into account the particularities of depression in adolescents, resulting in a valid and reliable instrument adapted to the characteristics of this population (Rivera, 2019; Rey et al., 2017).

The psychometric results obtained support the validity and reliability of the EDRA. The evaluation of the items in the initial study provided evidence of content validity, and the elimination of items that did not meet psychometric standards ensures the accuracy of the scale (DeVellis, 2016; Ventura-León, 2022).

The EFA supported the dimensional structure confirmed by the CFA. The factor loadings of all items were high and significant, indicating the relevance of the items for measuring trait depression (Lloret-Segura et al., 2014). Additionally, the bifactor model analysis confirmed the essential unidimensionality of

the scale. These findings are consistent with the theoretical conceptualization of trait depression (Guillot-Valdés et al., 2019; Guillot-Valdés et al., 2020) and support the structural validity of the EDRA.

La AVE obtenida, superior a .50, indica que los reactivos comparten una proporción elevada de la varianza (Ab Hamid et al., 2017). Los coeficientes de confiabilidad fueron consistentemente altos, con valores superiores a .95 para el coeficiente alfa de Cronbach y el Omega de McDonald en ambos estudios, lo que indica una alta fiabilidad del instrumento (Catalán, 2019).

The validity of the EDRA criteria was also supported by significant correlations, in the expected direction, with instruments used to measure depression, suicide risk, and social support. The correlations observed suggest an association between trait depression and these constructs, which is consistent with both theoretical and empirical evidence (Chiappelli, et al., 2014; Guillot-Valdés et al., 2020; Navío & Pérez, 2020; Luna-Contreras & Dávila-Cervantes, 2021; González-Lugo et al., 2018).

In this initial phase, clinical cut-off points were not established, given that the EDRA was conceptualized as a trait measure to capture gradual variations in depressive symptoms. Therefore, the determination of clinical cut-off points, through external criteria and sensitivity/specificity analyses, is reserved for subsequent research.

One limitation of this study was that the sample was convenient and limited to adolescents from public schools in Mexico City, so generalization to other contexts should be approached with caution. It would be desirable to analyze the psychometric characteristics of the EDRA in larger samples.

Another potential limitation of this study is the lack of assessment of the temporal stability of the EDRA. Test-retest reliability is crucial for determining the consistency of the scale over time (Aldridge et al., 2017) and its ability to capture changes in depressive symptomatology in adolescents. Although the results of Cronbach's alpha and McDonald's Omega were consistent in two different samples, it is important to conduct longitudinal studies to examine the temporal stability of the EDRA and its ability to predict the development of major depressive disorders.

Additionally, future studies should evaluate measurement invariance (configural, metric, and scalar) across demographic groups (e.g., gender) with adequate sample sizes per group to ensure stability in multigroup models.

Even so, EDRA can be a valuable tool for the early detection of depression in adolescents in both clinical and educational settings. It could also be a useful tool in research seeking to understand the course of depression and the risk factors associated with depression in adolescents.

CONCLUSION

The result of this study is a reliable scale with content, structure, and criterion validity (convergent with depression and suicide risk, and divergent with social support) for measuring trait depression in adolescents, which may facilitate early detection and timely intervention for depression in this population, although it will need to be further tested in different contexts and populations to continue testing its psychometric properties.

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The authors of this paper declare that there is no conflict of interest.

Authors' Roles:

CVG: Conceptualization, data curation, formal analysis, funding acquisition, research, methodology, project management, resources, visualization, and original draft writing.

CS: Conceptualization, methodology, supervision, writing-revision, and editing.

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