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Validity Evidence of the Revised Child Anxiety and Depression Scale-30 in Colombian Children

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Abstract

Emotional disorders are highly prevalent in children worldwide. Accordingly, it is necessary to develop assessment tools for these disorders. The Revised Child Anxiety and Depression Scale (RCADS) is a widely used screening instrument for children and adolescents that can also be used as an outcome measure. A short version of the RCADS (the RCADS-30) has been analyzed extensively in Spain and, more scarcely, in Latin American countries. This study examined the psychometric properties of the RCADS-30 in Colombia for the first time. A large sample of Colombian children between 8 and 12 years responded to the RCADS-30. The internal consistency of the RCADS-30 subscales was acceptable, except for the obsessive-compulsive disorder scale. A confirmatory factor analysis showed that the six-factor model obtained an acceptable fit to the data. This factor model showed scalar measurement invariance across gender and age. The RCADS-30 subscales showed discriminant construct validity according to the heterotrait-monotrait ratio of correlations and convergent validity according to the correlations with the Depression Anxiety and Stress Scale -Youth. Girls showed higher scores on all the RCADS-30 subscales than boys, with differences being higher for Depression, Panic Disorder, and Social Phobia. Older children showed higher scores than younger children in Depression and Social Phobia but lower scores in Separation Anxiety Disorder. In conclusion, the RCADS-30 has demonstrated good psychometric properties in Colombian children.
Key words: RCADS-30, Depression, Anxiety, Children, Psychometric study.

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Novelty and Significance

What is already known about the topic?

- The RCADS is a widely used instrument to assess anxiety and depressive disorders in children.
- A 30-item version of the RCADS has shown good psychometric properties in Spain and some Latin American countries.

What this paper adds?

- Psychometric analysis of the RCADS-30 in a large sample of Colombian children.
- The internal consistency and fit of the six-factor model of the RCADS-30 was acceptable.
- The RCADS showed measurement invariance across gender and age, and convergent and discriminant construct validity.

Emotional disorders present high levels of prevalence worldwide, with depression and anxiety disorders being the most common conditions in mental health consultation and the main reasons for disability in the world (Aderka, Hofmann, Nickerson, Hemesh, Gilboa-Shechtman, & Marom, 2012; Lépine & Briley, 2011). These disorders are also common in the child population, with the onset of symptoms as early as three years of age (Luby, 2010). Specifically, the prevalence rate of anxiety disorders in children is between 9% and 32% (Creswell, Waite & Cooper, 2014), and depression is estimated at 2.60% (Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). These prevalences are thought to have increased after the COVID-19 pandemic (da Silva, Barbosa Rocha, Buheji, Jahrami, & da Costa Cunha, 2021; Pillai, Patel, & Balkrishnan, 2023; Samji *et alii*, 2022; Wang *et alii*, 2020).

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Suffering emotional disorders interferes with adequate child development at the social, emotional, familial, cognitive, and academic levels (Ghandour *et alii*, 2019). As in adults and adolescents, there is a high rate of comorbidity between anxiety disorders and depression in the child population (Cummings, Caporino, & Kendall, 2014). When comorbidity exists, the symptoms of these disorders present greater severity and resistance to psychological and pharmacological interventions (Melton, Croarkin, Strawn, & Mcclintock, 2016), as well as a higher risk of suicide (Foley, Goldston, Costello, & Angold, 2006). Accordingly, the assessment of emotional disorders should be careful, considering that symptoms may overlap given the high level of comorbidity (Zsamboky, Haskell, Vick, & Schoroer, 2021). Thus, it is necessary to have assessment instruments that identify symptoms of anxiety and depression at early ages, as well as the comorbidity between them, that are validated in different languages and adjusted to different types of populations.

The Revised Child Anxiety and Depression Scale (RCADS; Chorpita, Yim, Moffitt, Unemoto, & Francis, 2000) is an instrument widely studied and applied in different countries to measure symptoms of child anxiety and depression. The RCADS was developed to overcome the limitations of the existing tools: (a) not being aligned with DSM criteria and (b) lacking the assessment of some anxiety disorders (Chorpita *et alii*, 2000; Sandín, Valiente, & Chorot, 2009). The RCADS was based on the Spence Children's Anxiety Scale (SCAS; Spence, 1998), which is a multidimensional measure focused on anxiety disorders, including panic attacks and agoraphobia, separation anxiety disorder (SAD), obsessive-compulsive disorder (OCD), social phobia, generalized anxiety disorder (GAD), and fears of physical injury (Orgilés, Fernández Martínez, Guillen Riquelme, Espada, & Essau, 2016). The RCADS reformulated the GAD subscale of the SCAS, added the major depressive disorder subscale, and removed the fear of physical pain subscale. The RCADS consists of 47 items and has been employed as a screening instrument in many countries, including the Netherlands (Buil, Kösters, & Koot, 2023), Greece (Giannopoulou, Pasalari, Bali, Grammatikaki, & Ferentinos, 2021), China (Lu *et alii*, 2021), Poland (Skoczeń, Rogoza, Rogoza, Ebesutani, & Chorpita, 2019), and Ireland (Donnelly, Fitzgerald, Shevlin, & Dooley, 2018).

Over the years, the RCADS has undergone various adaptations, resulting in shorter versions showing similar psychometric properties to the original version (Piqueras, Martín Vivar, Sandin, San Luis, & Pineda, 2017). One of these versions is the RCADS-25 (Muris, Meesters, Schouten, 2002), which streamlines the questionnaire to 25 items while omitting the OCD subscale. The RCADS-25 has been validated in multiple languages, including Swedish (Carlander, Cassel, J-Son Höök, Lundgren, & Löf, 2024), Norwegian (Lisøy, Neumer, Waaktaar, Ingul, Holen, & Martinsen, 2022), Dutch (Klaufus *et alii*, 2022), and Spanish (Young, Ramachandran, Stewart, Orengo Aguayo, Chorpita, 2021). Additional variations of the RCADS include the RCADS-25-P (Ebesutani, Bernstein, Nakamura, Chorpita, Weisz, & Research Network on Youth Mental Health, 2010), tailored for parental assessment, alongside the 47-item variant (RCADS-47-P; Chorpita *et alii*, 2000), as well as a concise 11-item rendition (RCADS-11; Radez *et alii*, 2021).

Another widely utilized adaptation is the 30-item RCADS version (RCADS-30; Sandín, Chorot, Valiente, & Chorpita, 2010). This version preserves the framework of the original six-factor structure, encompassing panic disorder, social phobia, SAD, GAD, OCD, and major depressive disorder. As in the RCADS-25, each factor comprises five items, but the two versions did not retain exactly the same items from the original RCADS version. The RCADS-30 has demonstrated reliability and validity coefficients on

par with the original instrument (Martínez González, Veas, & Piqueras, 2022; Piqueras, Martín Vivar, Sandín, San Luis, & Pineda, 2017; Piqueras, Pineda, Martín Vivar, Sandín, 2017). However, some studies have revealed that the OCD subscale usually exhibits lower internal consistency levels than those of the other subscales (e.g., Selva-Batista & Saenz Martínez, 2013; Cervin, Veas, Piqueras, & Martínez González, 2022; Piqueras, Pineda, *et alii*, 2017; Sandín, Chorot, Valiente, & Chorpita, 2010).

The RCADS-30 was initially validated in Spain (Sandín *et alii*, 2010), where it showed measurement invariance across gender, age, and modality of application (Pineda, Martín Vivar, Sandín, & Piqueras, 2018). This version of the RCADS has also shown promising psychometric properties in Chile (Martínez González *et alii*, 2022) and Cuba (Selva Batista & Saenz Martínez, 2013). The six-factor model of the RCADS-30 has shown factorial equivalence across Spain, Chile, and Sweden (Cervin *et alii*, 2022). The RCADS-30 has also been used as an outcome measure in several clinical trials (García Escalera, Valiente, Sandín, Ehrenreich-May, & Chorot, 2020; Lara Ros, Rodríguez Jiménez, Martínez González, & Piqueras 2017; Stallard *et alii*, 2014), showing to be sensitive to the effect of psychological interventions. This is consistent with the review conducted by Wolpert, Cheng, and Deighton (2015), which showed that the RCADS was the most sensitive to change measures. The following cutoffs have been established in the Spanish context: 5 for panic disorder, 5 for social phobia, 8 for SAD, 7 for GAD, 4 for OCD, and 4 for major depressive disorder (Piqueras, Pineda, *et alii*, 2017).

Given the significant burden of emotional disorders among children in Colombia (Gómez Restrepo, Aulí, Tamayo Martínez, Gil, Garzón, & Casas, 2016), there is a need for comprehensive assessment tools in this context. The RCADS-30 would be a convenient instrument given its extensive use in Spain (e.g., García Escalera *et alii*, 2020; Sandín *et alii*, 2010; Torres Fernández, Rodríguez Valverde, Reyes Martín, & Hernández López, 2022) and the promising psychometric properties found in some Latin American countries (Cervin *et alii*, 2022; Martínez González *et alii*, 2022; Selva Batista & Sáenz Martínez, 2013). Accordingly, this study aims to analyze the psychometric properties of the RCADS-30 in Colombian children. Specifically, we administered the RCADS-30 to a large sample of children and analyzed its item quality, internal consistency, factor structure, measurement invariance across gender and age, and the discriminant and convergent construct validity.

Method

Participants

A total of 585 students between 8 and 12 years of age (47.7% female, *M*= 10.37 *SD*= 1.25) participated. All participants attended public schools in the Department of Boyacá in Colombia: 63.34% were in elementary school, and 36.75% were in middle school.

Instruments

Revised Child Anxiety and Depression Scale-30 (RCADS-30; Sandín *et alii*, 2010). This scale is a screening measure that determines symptoms of anxiety and depression in children and adolescents. It comprises 30 items with a 4-point Likert-type response option (0= never; 3= always). It is composed of 6 subscales, each with five items: depressive disorder, panic disorder, social phobia, SAD, GAD, and OCD. The RCADS-30 was initially validated in Spanish by Sandín *et alii* (2010) and has shown good internal

consistency, a 6-factor structure, and discriminant validity (Cervin *et alii*, 2022; Martínez González *et alii*, 2022; Sandín *et alii*, 2010).

Depression Anxiety Stress Scales-Youth (DASS-Y; Szabo & Lovibond, 2022; Spanish version by Ruiz *et alii*, submitted). The DASS-Y is a self-report instrument comprising 21 items with a 4-point Likert-type response option (0= never true; 3= always true). The DASS-Y measures symptoms of depression (e.g., "I could not stop feeling sad"), anxiety (e.g., "My hands were shaking"), and stress (e.g., "I was stressed about many things"). The DASS-Y has shown the expected three-factor structure and adequate indicators of internal consistency (between .77 and .81) in the Colombian child population (Ruiz *et alii*, submitted).

Procedure

The Institutional Ethics Committee approved the procedure. Subsequently, contact was made with two public schools in the Department of Boyacá in Colombia, and the study's objectives and the procedure to be followed were introduced. Once the school authorized, informed consent forms were sent to the parents with information on the study, including the objective, procedure description, retribution and benefits of participation, possible risks and discomfort, confidentiality, and voluntary participation. Finally, the children who had the authorization of their parents or legal representatives were invited to an evaluation session in the school auditorium. Children were given an informed consent form similar to the one sent to their parents, and those who decided to participate filled out a questionnaire package.

The total number of parents invited to the study was 850. Of these, 76.47% consented to their children's participation. Of the total number of children authorized by their parents, 98% signed the informed consent for their participation. However, 8% of the children were absent due to moving to a new city and the consequent school change. The participants filled out a sociodemographic data form and the questionnaire package for the study. Information on the children's results was sent to interested parents as compensation for participation.

Data Analysis

We performed all statistical analyses using JASP 0.18.3.0. We investigated how the RCADS-30 items operated by calculating corrected item-total correlations. Any items with a discrimination index below .20 were deemed faulty and removed. Afterward, we assessed the reliability of the RCADS-30 subscales by calculating both Cronbach's alpha and McDonald's omega.

To examine internal construct validity, we performed a confirmatory factor analysis (CFA) on the six-factor structure of the RCADS-30, utilizing robust maximum likelihood (MLR) estimation. We computed the Satorra-Bentler chi-square test and the following goodness-of-fit indexes: (a) the root mean square error of approximation (*RMSEA*), (b) the comparative fit index (*CFI*), (c) the non-normed fit index (*NNFI*), and (d) the standardized root mean square residual (*SRMR*). According to Hu and Bentler (1999), *RMSEA* values of 0.08 signify an acceptable fit, while values below 0.05 indicate a good fit to the data. For *SRMR*, values below 0.08 suggest a good fit, with values below 0.05 indicating a very good fit. Regarding *CFI* and *NNFI*, values above 0.90 suggest acceptable models, while values above 0.95 indicate a good fit for the data.

We conducted additional CFAs to examine the measurement invariance of the six-factor model across gender (boys and girls) and age groups (8-10 years and 11-12

years). Following the recommendations of Jöreskog (2005), Kline (2005), and Millsap and Yun-Tein (2004), we assessed metric, scalar, and strict invariances by examining the equality of item factor loadings, item intercepts, and item error variances across the specified variables. In so doing, we compared the relative fit of four increasingly constrained models. First, the multiple-group baseline model permitted unstandardized factor loadings to differ across groups while assuming the factor structure remains consistent across groups (configural invariance). Second, the metric invariance model, nested within the previous model, enforced equality of factor loadings across groups (i.e., weak factorial invariance). Thirdly, the scalar invariance model, nested within the metric invariance model, constrained both factor loadings and item intercepts to be identical across groups (i.e., strong factorial invariance). Finally, the strict invariance model, nested within the scalar invariance model, assumed equal error variances across groups. In comparing models, we assessed the *CFI*, *NNFI*, and *RMSEA* indices across the nested models. We selected the more restricted model (e.g., the second model versus the first, and the third versus the second) following the criteria outlined by Cheung and Rensvold (2002) and Chen (2007): (a) $\Delta RMSEA$ was less than 0.01, and (b) $\Delta NNFI$ and ΔCFI were 0.01 or greater.

We assessed the discriminant validity of the RCADS-30 subscales by calculating the heterotrait-monotrait ratio of correlations (HTMT; Henseler, Ringle, & Sarstedt 2015). HTMT provides an estimate of the correlations between constructs using structural equation modeling. According to Henseler *et alii* (2015), an HTMT value below .90 or .85 indicates evidence of discriminant validity across constructs. This method has demonstrated superior performance to the traditional Fornell-Larcker criterion (1981).

Pearson correlations were computed between the RCADS-30 and the DASS-Y subscales to evaluate convergent construct validity. Descriptive statistics were computed for the entire sample and were further stratified by gender and age group. A two-way analysis of variance (ANOVA) was conducted to examine disparities in RCADS-30 scores across these variables. Partial eta squared (η^2) was calculated to indicate the effect sizes of the factors, with the following benchmarks: .01 for a small effect, .06 for a medium effect, and .14 or higher for a large effect.

Results

Table 1 shows the RCADS-30 items, their corrected item-total correlations, and descriptive data for each item. The discrimination indexes were good for Depression (from .418 to .536), Panic Disorder (from .480 to .609), Social Phobia (from .424 to .620), and SAD (from .369 to .508). Similar results were obtained for GAD and OCD items, except for Item 5 (.282) and Item 12 (.280), which showed acceptable values.

Table 2 indicates that Cronbach's alpha and McDonald's omega were acceptable for all subscales, except for OCD (alpha values from .702 for Separation Anxiety Disorder to .779 for both Panic Disorder and Social Phobia; omega values from .701 for SAD to .784 for Panic Disorder). This subscale obtained an alpha value of .659 and an omega value of .653, which can be considered questionable values (George & Mallery, 2003; Ventura León & Caycho Rodríguez, 2017).

Regarding the dimensionality of the RCADS-30, the six-factor model obtained an acceptable to good fit to the data according to X^2/df= 2.190 ($\chi^2_{S\text{-}B}(390)$= 854.172, p <.001), *RMSEA*= 0.049 (90% *CI* [0.045, 0.053]), *SRMR*= 0.056, and *CFI*= 0.902. The *NNFI* value (0.890) indicated a poorer fit. Given that the guidelines to evaluate the

Table 1. RCADS items, corrected item-total correlations and completely standardized factor loadings for each subscale, and descriptive data for each item.

	Item	Corrected item-total correlation	Factor loading	*M*	*SD*
Depression	1. Me siento triste o decaído/a	.448	.399	0.962	0.697
	7. Me cuesta divertirme o pasarlo bien	.418	.482	0.734	1.039
	13. Me siento con muy poca energía para hacer las cosas	.536	.586	0.959	0.971
	19. Me resulta muy difícil pensar con claridad	.514	.621	0.890	0.974
	25. Siento que no valgo para nada	.526	.784	0.820	1.092
Panic Disorder	2. De repente siento como si no pudiera respirar sin saber porqué	.510	.467	0.556	0.804
	8. De repente empiezo a temblar o a agitarme sin saber porqué	.572	.619	0.795	0.986
	14. De repente me siento muy asustado/a sin saber porqué	.593	.717	0.836	0.986
	20. De repente mi corazón empieza a latir rápido sin saber porqué	.609	.718	0.976	1.068
	26. Me preocupa que de repente me sienta asustado/a, aunque no haya nada por lo que deba tener miedo	.480	.606	0.758	0.937
Social Phobia	3. Me preocupa parecer tonto/a ante la gente	.561	.664	0.932	1.024
	9. Me da miedo hacer las cosas mal	.564	.761	1.523	1.087
	15. Me preocupa lo que otras personas piensen de mí	.620	.820	1.192	1.134
	21. Me da miedo si tengo que hablar delante de la clase	.424	.622	1.425	1.168
	27. Me asusta ponerme en ridículo delante de la gente	.604	.784	1.314	1.122
Separation Anxiety Disorder	4. Sentiría miedo si estuviera solo/a en casa	.467	.605	0.861	1.063
	10. Estar lejos de mis padres me da miedo	.508	.735	1.313	1.155
	16. Si tengo que dormir solo/a siento miedo	.481	.608	0.634	1.033
	22. Por las mañanas al ir al colegio me da miedo separarme de mis padres	.480	.535	0.527	0.958
	28. Sentiría miedo si tuviera que pasar la noche fuera de casa	.369	.621	1.494	1.248
Generalized Anxiety Disorder	5. Me preocupo mucho por las cosas	.282	.354	1.559	1.024
	11. Me preocupa que le ocurra algo terrible a alguno de mis familiares	.440	.483	2.364	.892
	17. Me preocupa que me ocurran cosas malas	.578	.771	1.637	1.092
	23. Me preocupa que me ocurra algo malo	.545	.774	1.548	1.104
	29. Me preocupa lo que vaya a ocurrir	.468	.648	1.320	1.079
Obsessive-Compulsive Disorder	6. Me siento mal por tener pensamientos malos o tontos, o imágenes en mi cabeza	.449	.749	0.966	1.036
	12. Tengo que seguir comprobando que he hecho las cosas bien (como que el interruptor está apagado o la puerta cerrada)	.280	.342	1.460	1.123
	18. Tengo pensamientos malos o tontos que no puedo quitar de mi cabeza	.446	.718	0.998	1.030
	24. Tengo que concentrarme en pensamientos especiales (como números o palabras) para que no ocurran cosas malas	.444	.565	0.911	1.095
	30. Tengo que repetir algunas cosas una y otra vez (como lavarme las manos, limpiar o colocar cosas en un orden determinado)	.449	.569	1.410	1.177

Table 2. Cronbach's alpha, McDonald's omega, and 95% confidence intervals.

RCADS subscales	Cronbach's alpha 95% *CI*	McDonald's omega 95% *CI*
Depression	.724 [.687, .757]	.732 [.697, .766]
Panic Disorder	.779 [.749, .805]	.784 [.757, .812]
Social Phobia	.779 [.749, .806]	.783 [.755, .811]
Separation Anxiety Disorder	.702 [.662, .738]	.701 [.663, .740]
Generalized Anxiety Disorder	.706 [.667, .741]	.720 [.684, .755]
Obsessive-Compulsive Disorder	.659 [.613, .701]	.653 [.608, .699]

Notes: *CI*= Confidence Interval; RCADS= Revised Child Anxiety and Depression Scale.

goodness-of-fit indexes should be considered globally (Brown, 2015), we can conclude that the six-factor model of the RCADS showed an acceptable fit to the data.

Table 3 presents the results of the measurement invariance analyses. All levels of measurement invariance were supported across gender because changes in *RMSEA*, *CFI*, and *NNFI* were lower than 0.01. The analyses of factorial equivalence across groupage

Table 3. Metric and scalar invariance across gender and groupage of the six-factor model of the RCADS-30.

Model		*RMSEA*	Δ*RMSEA*	*CFI*	Δ*CFI*	*NNFI*	Δ*NNFI*
Measurement invariance across gender	MG Baseline model	0.053		0.883		0.869	
	Metric invariance	0.052	0.001	0.883	0.000	0.874	0.005
	Scalar invariance	0.052	0.000	0.881	-0.002	0.875	0.001
	Strict invariance	0.053	-0.001	0.873	-0.008	0.871	-0.004
Measurement invariance across groupage	MG Baseline model	0.054		0.882		0.869	
	Metric invariance	0.053	0.001	0.884	0.002	0.874	0.005
	Scalar invariance	0.054	-0.001	0.878	-0.006	0.872	-0.002
	Strict invariance	0.057	-0.003	0.856	-0.022	0.854	-0.018

also supported invariance at metric and scalar levels. However, the criteria to claim for the strict level was not completely met because the change in *CFI* was higher than 0.01.

With respect to discriminant construct validity, Table 4 displays the *HTMT* values among the RCADS-30 subscales. The RCADS-30 subscales demonstrated satisfactory discriminant validity when applying the most conservative threshold recommended by Henseler *et alii* (2015) of .90. However, some potential discriminant validity issues emerged when applying the stricter threshold of .85. Specifically, the *HTMT* values between Depression and Panic Disorder (*HTMT*= .861), and Panic Disorder and OCD (*HTMT*= .876) were slightly above this cutoff.

Table 4. Heterotrait-monotrait ratios of the RCADS-30 subscales.

	Depression	Panic Disorder	Social Phobia	SAD	GAD
Depression	--	--	--	--	--
Panic Disorder	.861	--	--	--	--
Social Phobia	.751	.730	--	--	--
SAD	.446	.564	.540	--	--
GAD	.485	.627	.728	.683	--
OCD	.811	.876	.765	.616	.805

Table 5 shows the correlations obtained by the RCADS-30 with the DASS-Y to analyze convergent construct validity. The Depression subscale of the RCADS-30 showed a strong correlation with DASS-Depression (*r*= .644), which was expected. This subscale also strongly correlated with DASS-Anxiety (*r*= .586) and DASS-Stress (*r*= .558). Within the RCADS-30, Depression showed strong correlations with Panic Disorder (*r*= .642), Social Phobia (*r*= .581), and OCD (*r*= .549).

As expected, Panic Disorder showed a strong correlation with DASS-Anxiety (*r*= .723) and lower correlations with DASS-Depression and DASS-Stress (*r*= .577

Table 5. Pearson correlations between the RCADS subscales and the DASS-Y.

	RCADS-30 subscales					
	Depression	PD	SP	SAD	GAD	OCD
Depression	--	--	--	--	--	--
PD	.642*	--	--	--	--	--
SP	.581*	.568*	--	--	--	--
SAD	.333*	.429*	.386*	--	--	--
GAD	.359*	.447*	.516*	.490*	--	--
OCD	.549*	.612*	.539*	.426*	.503*	--
DASS-Total	.671*	.689*	.565*	.290*	.395*	.560*
DASS-Dep	.644*	.577*	.517*	.236*	.293*	.477*
DASS-Anx	.586*	.723*	.470*	.319*	.380*	.548*
DASS-Str	.558*	.541*	.523*	.220*	.382*	.470*

Notes: Anx= Anxiety; DASS= Depression Anxiety and Stress Scale; Dep= Depression; GAD= Generalized Anxiety Disorder; OCD= Obsessive-Compulsive Disorder; PD= Panic Disorder; SAD= Separation Anxiety Disorder; SP= Social Phobia; Str= Stress; *= p <.001.

and .541, respectively). Within the RCADS-30, Panic Disorder also showed strong correlations with Social Phobia (r= .568) and OCD (r= .612). Social Phobia showed similar correlations across the DASS-Y subscales (from .470 for Anxiety to .523 for Stress). Within the RCADS-30, Social Phobia also showed strong correlations with GAD (r= .516) and OCD (r= .539).

SAD and GAD showed smaller correlations with the DASS-Y (SAD from .220 for Stress and .319 for Anxiety; GAD from .293 for Depression to .382 for Stress). Lastly, OCD showed a strong correlation with DASS-Anxiety (r= .548) and lower for the remaining subscales. The OCD subscale showed stronger correlations with other RCADS subscales than SAD and GAD.

Table 6 presents the descriptive data on the RCADS-30 subscale by separating mean scores across gender and groupage, and Table 7 summarizes the two-way ANOVA results. The gender factor was statistically significant in all RCADS-30 subscales, with girls showing higher scores than boys. The differences were stronger for Depression, Panic Disorder, and Social Phobia, with medium or near medium effect sizes, than for SAD, GAD, and OCD, with small effect sizes. The factor of groupage was statistically significant for Depression, Social Phobia, and SAD. Older children showed higher scores than younger children in Depression and Social Phobia (with small effect sizes) but lower scores on SAD (with a medium effect size). Lastly, the interaction between gender and groupage was statistically significant for Depression, Panic Disorder, and Social Phobia, with small effect sizes in all cases. In the case of Depression and Social Phobia, mean scores were similar for younger and older boys; however, the mean scores for older girls were higher than for younger girls. Regarding Panic Disorder, the scores of older boys were lower than for young boys, with girls showing the opposite pattern (i.e., older girls showed higher scores than younger girls).

Table 6. Descriptive Data of the Mean Scores on the RCADS-30 Subscales.

Gender	Age	*n*	Depression *M* (*SD*)	PD *M* (*SD*)	SP *M* (*SD*)	SAD *M* (*SD*)	GAD *M* (*SD*)	OCD *M* (*SD*)
Boys	8-10	159	0.721 (0.587)	0.694 (0.655)	1.110 (0.794)	1.040 (0.756)	1.644 (0.756)	1.077 (0.712)
	11-12	147	0.731 (0.621)	0.570 (0.618)	1.123 (0.780)	0.726 (0.635)	1.592 (0.646)	1.044 (0.690)
Girls	8-10	151	0.906 (0.663)	0.883 (0.711)	1.319 (0.794)	1.248 (0.800)	1.725 (0.736)	1.217 (0.740)
	11-12	128	1.191 (0.696)	1.02 (0.741)	1.623 (0.769)	0.801 (0.625)	1.725 (0.665)	1.277 (0.682)
Overall	8-12	585	0.874 (0.665)	0.784 (0.700)	1.279 (0.808)	0.962 (0.740)	1.687 (0.707)	1.149 (0.712)

Notes: GAD= Generalized Anxiety Disorder; OCD= Obsessive-Compulsive Disorder; PD= Panic Disorder; SAD= Separation Anxiety Disorder; SP= Social Phobia.

Table 7. Summary of the Two-Way ANOVAs.

	Depression F (η^2)	PD F (η^2)	SP F (η^2)	SAD F (η^2)	GAD F (η^2)	OCD F (η^2)
Gender	36.821*** (.060)	32.323*** (.053)	29.605*** (.048)	5.717 (.010)	5.763* (.010)	10.029** (.017)
Groupage	7.667** (.013)	0.019 (.000)	5.915* (.010)	41.310*** (.066)	1.032 (.002)	0.052 (.000)
Gender x Groupage	6.650** (.011)	5.481* (.009)	5.002* (.009)	1.272 (.002)	0.017 (.000)	0.634 (.001)

Notes: GAD= Generalized Anxiety Disorder; OCD= Obsessive-Compulsive Disorder; PD= Panic Disorder; SAD= Separation Anxiety Disorder; SP= Social Phobia; *= p <.05; **= p <.01; ***= p <.001.

Discussion

The RCADS is one of the most used instruments to assess emotional disorders in children. In recent years, a short Spanish version of the RCADS, the RCADS-30, has been extensively analyzed in Spain (e.g., García Escalera *et alii*, 2020; Sandín *et alii*, 2010; Torres Fernández *et alii*, 2022) and begins to be explored in Latin American countries (Cervin *et alii*, 2022; Martínez González *et alii*, 2022; Selva Batista & Saenz Martínez, 2013). Given the lack of a validated and comprehensive assessment instrument for emotional disorders in Colombia and the promising results obtained from the Spanish version of the RCADS-30, this study aimed to analyze its psychometric properties in a large sample of Colombian children.

Most of the RCADS-30 items showed good discrimination indexes (i.e., values above .30). Two items showed acceptable indexes, one pertaining to the GAD subscale (Item 5, r= .282) and the other pertaining to the OCD subscale (Item 12, r= .280). However, the relatively low discrimination index of Item 5 has been observed in studies conducted with Spanish-speaking samples (e.g., Cervin *et alii*, 2022; Martínez González *et alii*, 2022; Selva Batista & Saenz Martínez, 2013). Item 12 also presented low discrimination index in Piqueras, Pineda, *et alii* (2017) with clinical and non-clinical samples and that of Selva Batista and Saenz Martínez (2013).

The RCADS subscales showed Cronbach's alpha and McDonald's omega above the usual threshold of .70 to consider acceptable internal consistency. The only exception was the OCD subscale, which showed a value of .65 for both indicators. These results are coherent with previous research (Selva Batista & Saenz Martínez, 2013; Cervin *et alii*, 2022; Piqueras, Pineda, *et alii*, 2017; Sandín *et alii*, 2010). In this sense, Cervin *et alii* (2022) suggested employing a different scale to assess OCD symptoms instead of using the OCD subscale of the RCADS-30. Indeed, some studies have already used the RCADS-25, which does not include the OCD subscale plus another specialized OCD scale as a screening measure (Krause, Edbrooke-Childs, Singleton, & Wolpert, 2020). However, it is worth noting that, although the RCADS-30 and RCADS-25 have 5-item subscales for Depression, Panic Disorder, Social Phobia, SAD, and GAD, the items are not exactly the same. Despite this, the current evidence regarding the Spanish version of the RCADS-30 would support adopting a similar strategy by eliminating the OCD subscale.

The factor analyses showed that the six-factor model of the RCADS-30 obtained an acceptable fit to the data without needing to be respecified. This factor model has shown at least scalar invariance across gender and groupage. Although the criteria to claim strict invariance were not fully met for groupage, this does not impede comparing the mean scores on the RCADS-30 across different ages (Greiff & Scherer, 2018).

Another contribution of this research was the discriminant validity analysis of the RCADS-30. We found evidence of discriminant validity of the RCADS-30 factors according to the more liberal criterion suggested by Henseler *et alii* (2015) for the HTMT values. Further studies should confirm these results given that Depression and Panic Disorder, and Panic Disorder and OCD factors had HTMT values slightly above the most conservative suggestion regarding HTMT values. To our knowledge, this is the first study that assessed the discriminant validity of the RCADS-30.

Regarding convergent construct validity, the RCADS-30 subscales showed statistically significant correlations with all subscales of the DASS-Y. Specifically, the Depression subscale of the RCADS-30 showed the strongest correlation with DASS-

Depression, whereas the Panic Disorder subscale showed the strongest correlation with DASS-Anxiety. It is worth noting that the correlation of the GAD subscale did not show especially strong correlations with the DASS-Y subscales. This might be due to the item content of this scale. Specifically, the mean scores on the GAD subscale were by far the highest ones, which can be due to the acquiescence provoked by statements such as "I worry that something awful will happen to someone in my family" (Item 11). Since the item does not include references to the extent to which the respondent worried (e.g., too much) or the interference caused by worrying (e.g., focusing on the present moment), the item might be responded to as something that one necessarily does or is expected to do.

The descriptive data analyses showed that girls scored higher than boys on all the RCADS-30 scales, especially in Depression, Panic Disorder, and Social Phobia, in which effect sizes approached medium size. In these symptoms, the difference between boys and girls increased with age, which speaks about the increase of emotional symptoms for girls when approaching adolescence. In terms of groupage, older children scored higher on Depression and Social Phobia but lower on SAD. The increase in mean scores in Depression and Social Phobia was relatively small, but the decrease in SAD scores was higher. This is expected given the higher autonomy usually seen in preadolescents.

Some limitations of this study are worth mentioning. First, we did not recruit a clinical sample. Thus, the current findings should be replicated in children suffering from emotional disorders. Also, administering the RCADS-30 to clinical and nonclinical samples might allow the establishment of cutoffs specific to Colombian children. In this regard, it is important to note that the cutoffs established for Spanish children were apparently too low for Colombian children, as the mean scores surpassed the cutoffs for Depression, Social Phobia, GAD, and OCD (Piqueras, Pineda *et alii*, 2017). Second, the data was collected from two schools in a Colombian region. Therefore, these findings need to be replicated in other departments of the country, which would facilitate the generalization of the data. Third, we explored the RCADS-30 functioning only in children between 8 and 12 years. Further studies should analyze the psychometric properties of the RCADS-30 in Colombian adolescents. Lastly, we did not analyze the RCADS-30's treatment sensitivity. Further studies should examine whether it shows a similar level of treatment sensitivity as the one found by Wolpert, Cheng, and Deighton (2015).

In summary, this study examined the psychometric properties of the RCADS-30 in Colombian children for the first time. The RCADS-30 showed acceptable internal consistency, similar to previous validation studies. The six-factor structure fitted the data acceptably and showed measurement invariance across gender and groupage. The RCADS-30 also showed evidence of convergent and discriminant construct validity. Thus, the RCADS-30 shows promising psychometric properties in Colombian children.

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