

Refinement of the emotional dysregulation scale (EDS-16): Dimensionality, internal consistency and gender differential item functioning

Refinamiento de la escala de desregulación emocional (DERS-16): Dimensionalidad, consistencia interna y funcionamiento diferencial por género

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Abstract: Emotional regulation has shown great importance in people's mental health, which is why instruments have been designed for their measurement. The Difficulties in Emotional Regulation Scale (DERS) is an instrument with an integrative conceptualization. However, the number of items and the limited psychometric performance has led to the development of new versions with varying lengths. This study aimed to refine a 16-item version of the DERS in Colombian adults through dimensionality, internal consistency, and gender differential item functioning (gender-DIF). An online study was designed in which 435 adults between 18 and 79 participated (M = 35.30, SD = 14.13), 70.57% of whom were female. A confirmatory factor analysis was conducted to corroborate the dimensionality; internal consistency was calculated using Cronbach's alpha coefficients, McDonald's omega, and the gender-DIF using Kendall's tau-b. The 16-item version showed poor indicators of dimensionality and internal consistency. Refinement achieved a ten-item version distributed in two dimensions, with high internal consistency and without gender-DIF.

Keywords: emotional regulation; adults; factor analysis; validation studies.

Resumen: La regulación emocional ha evidenciado una gran importancia en la salud mental de las personas por lo cual se han diseñado instrumentos para la medición. La Escala de Dificultades en la Regulación Emocional (DERS) es un instrumento con una conceptualización integradora. Sin embargo, el número de ítems y el limitado desempeño psicométrico han llevado al desarrollo de nuevas versiones con diversa extensión. El presente estudio tuvo como objetivo fue refinar una versión de 16 ítems de la DERS en adultos colombianos mediante la dimensionalidad, la consistencia interna y el funcionamiento diferencial de los ítems por género (DFIG). Se diseñó un estudio en línea en el que participaron 435 adultos con edades entre 18 y 79 años (M = 35,30; DE = 14,13), 70,57% de género femenino. Se llevó a cabo un análisis factorial confirmatorio para corroborar la dimensionalidad, se calculó la consistencia interna mediante los coeficientes de alfa de Cronbach, omega de McDonald y el DFIG mediante la *tau-b* de Kendall. La versión de 16 ítems mostró pobres indicadores de dimensionalidad y consistencia interna. El refinamiento logró una versión de diez ítems distribuidos en dos dimensiones, con alta consistencia interna y sin DFIG.

Palabras clave: regulación emocional; adultos; análisis factorial; estudios de validación.

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Introduction

Emotional regulation is understood as the ability of an individual to modulate subjective experience (Heiy & Cheavens, 2014). Emotional regulation is critical in social and human situations, as it influences how people handle, express, and control their emotions in both social interactions and everyday situations. The ability to perceive, understand, and manage one's feelings, as well as those of others, is essential for successful adaptation to the conditions and demands of the environment (Tull et al., 2015). Emotional regulation is a fundamental pillar of mental health (Brandeen et al., 2012; Muñoz et al., 2016). Emotional regulation is associated with behaviors that can compromise health, such as the consumption of psychoactive substances, sexual behaviors at risk for sexually transmitted infections or unwanted pregnancies, and self-injurious behaviors (Kaufman et al., 2016).

The proliferation of instruments evidences the growing interest in emotional regulation to measure this construct; among the most recognized scales are the *Trail Metamood scale* (Salovey et al., 1995), the *Emotional Regulation Questionnaire* (ERQ) (Gross & John, 2003), the *Emotional Coping Scale* (*Emotional Approach Coping* (EAC) (Stanton et al., 2000), *Negative Mood Regulation* (NMR) (Catanzaro & Mearns, 1990) and the *Difficulties in Emotion Regulation Scale* (DERS).

Each of these instruments proposes a different approach to emotional regulation. Consequently, it is necessary to have an instrument based on an integrative conceptualization that is useful for clinical and research purposes (Gratz & Roemer, 2004).

The difficulty in emotional regulation arises as an alternative to existing approaches, with an expanded and holistic conceptualization of emotional regulation based on dysfunctional elements or emotional dysregulation (Hervás & Jódar, 2008; Lausi et al., 2020). This view addresses the denial of emotional responses, lack of control of goal-directed behaviors, impulsivity, strategies, awareness, and emotional clarity (Gratz & Roemer, 2004).

Currently, various processes of adaptation and validation of scales revolve around aspects such as 1) verifying dimensionality through confirmatory factor analysis, 2) simplification or shortening the length of the test, and 3) its relationship to some sociodemographic variables such as gender. This process overcomes the

limitations of classical test validation theories, improves their practical use, and observes whether the differences between groups are authentically generated by the measurement carried out (Anderson et al., 2016).

Dimensionality analysis

Internal consistency is a measure of reliability and the degree of relationship between the items that make up a dimension (Rodríguez-Rodríguez & Reguant-Álvarez, 2020). Reliability is one of the most widely used methods to indirectly estimate the validity of a health measurement instrument (Apaza et al., 2022). However, internal consistency can be affected by the extension of the scale and collinearity or redundancy of items (Apaza et al., 2022).

The original version of the Emotional Regulation Difficulties Scale (Gratz & Roemer, 2004) comprises 36 items distributed in six dimensions: Non-acceptance (six items), Goals (five items), Impulse (six items), Conscientiousness (six items), Strategies (eight items), and Clarity (five items). These dimensions showed high internal consistency, with Cronbach's alpha values between 0.80 and 0.89 and good test-retest reliability ($r=0.88$) (Gratz & Roemer, 2004). However, some studies have reported lower than recommended indicators of reliability and validity for internal consistency, correlation between dimensions, and predictive validity of the conscientiousness dimension (Lausi et al., 2020; Moreira et al., 2022; Osborne et al., 2017; Weiberg & Klonsky, 2009). Therefore, it can be thought that this dimension is independent of the other five dimensions and the construct (Bardeen et al., 2012; Osborne et al., 2017).

Given these limitations, the present dimensionality study more robustly explores whether the items proposed for a dimension are coherent with the proposed theoretical construct (Campo-Arias et al., 2012). Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are helpful statistical strategies for verifying previously established dimensions or models and provide essential information for the validity of the construct (Herrero, 2010).

Factor analysis is the best multivariate strategy for reviewing the dimensionality of scales and, therefore, for reviewing the extent of health measurement instruments; this has favored the introduction of versions with a smaller number of items for a large number of scales (Kaufman et al., 2016; Lausi et al., 2020; Moreira et al., 2022; Shahabi et al., 2018; Westerlund & Santila,

2018) or the theoretical reconceptualization of dimensions (Lausi et al., 2020; Moreira et al., 2022). The Emotional Regulation Difficulties Scale has various adaptations with these characteristics in different contexts.

Reduction of the number of items

Currently, the development of brief psychometric scales is frequent since they are more widely accepted by users, require less time to complete, and maintain the validity and reliability of the extended versions (Betancur, 2018; Ehde et al., 2015; Topp et al., 2015; McDicken et al., 2019). These reasons have been proven in versions of the Emotional Regulation Difficulties Scale with fewer items (Bjureber et al., 2016; Kaufman et al., 2016; Lausi et al., 2020; Moreira et al., 2022; Shahabi et al., 2018; Victor & Klonsky, 2016; Westerlund & Santtilla, 2018).

In the United States, it was observed that a version of the Difficulties in Emotional Regulation Scale of 16 items distributed in four dimensions (except the dimension of consciousness) showed high internal consistency, Cronbach's alpha between 0.92 and 0.94, and good test-retest reliability. This revised version, in a Finnish sample, presented an acceptable dimensionality and internal consistency, between 0.70 and 0.87 (Westerlund & Santtilla, 2018) and in a Persian sample, high internal consistency was found between 0.71 and 0.83 and in the CFA, good dimensionality indicators: normalized chi-square of 2.09, CFI of 0.98, TLI of 0.97 and RMSEA of 0.05 [90% CI of 0.04-0.06] (Shahabi et al., 2018).

The version of the Difficulties in Emotional Regulation-SF (DERS-SF) Scale, developed by Kaufman et al. (2016), comprises 18 items and the six dimensions initially proposed. In the U.S. population, the DERS-SF was tested for dimensionality, with high values of Cronbach's alpha between 0.78 and 0.91 (Kaufman et al., 2016).

The Portuguese adaptation of the DERS-SF showed McDonald's omega of 0.89 and 0.89 in adults and adolescents, respectively, and adequate dimensionality. In this same study, a model composed of five dimensions (except consciousness) and 15 items also showed excellent internal consistency (McDonald's omega of 0.92 and 0.93 in adults and adolescents) and excellent dimensionality indicators: CFI of 0.96, TLI of 0.95, SRMR of 0.04 and RMSEA of 0.06 [90% CI 0.06-0.06] (Moreira et al., 2022).

Other versions, such as the 20-item Emotional Regulation Difficulties Scale, composed of five factors (except consciousness), in an Italian sample, showed high general internal consistency in each of its subscales (Cronbach's alpha between 0.88 and 0.94). The data were adjusted to the proposed dimensionality (Lausi et al., 2020).

Two studies have been identified in Colombia on the scale's psychometric properties. Herrera et al. (2008) found that the 36-item Emotional Regulation Difficulties Scale showed high internal consistency (Cronbach's alpha of 0.90) but did not perform dimensionality analyses. On the other hand, Muñoz et al. (2016) adapted 15 items with a test-retest consistency of $r = 0.88$, in which the population distribution restricts the generalization of the results, as it is applied only in a sample of students. Likewise, dimensionality was investigated using EFA, finding that the dimensions of non-acceptance, *goals*, *impulsivity*, *strategies*, and *clarity* contributed to factor 1 and explained 54% of the variance. At the same time, *conscientiousness* was a fundamental part of factor 2, accounting for 15% of it.

Emotional Regulation Difficulties Scale and Gender

Sociodemographic factors, such as gender, have been little addressed in the psychometric evaluation of the Difficulties in Emotional Regulation Scale (Girimoni et al., 2017). Some describe the absence of significant differences between men and women in total scores or any of their dimensions (Fowler et al., 2014; Hervás & Jódar, 2008; Miguel et al., 2017; Reivan et al., 2020); and others reported significant differences, such as higher scores in women in the categories of non-acceptance, clarity, or impulsivity (Hallion et al., 2018; Medrano & Trógolo, 2014; Miguel et al., 2017; Weinberg & Klonsky, 2009) or high scores in men in the dimension of consciousness (Coté et al., 2013; Gratz & Roemer, 2004).

Studies on the differential functioning of items by gender have been even less frequent. This procedure explores unequal probabilities of responding to the items on a scale (Chen & Revicki, 2024). Using ordinal logistic regression, Anderson et al. (2016) evidenced significant differences in two items in a combined sample of studies applied to American university students. The first is in the dimension of "non-acceptance," which inquires about the shame associated with the feeling of annoyance, and the second is in the dimension of "strategies," which refers to whether it takes a long time to feel better when you are upset. For the author, these differences may be indicators

of 1) a greater female willingness to recognize and express the feeling of shame and 2) the existence of a smaller repertoire of strategies on the part of men, which makes short-term emotional relief difficult (Anderson et al., 2016).

The assessment of differential functioning by gender allows us to understand whether the differences presented between groups correspond to fundamental differences in the answers given or to factors related to the measurement, so it is necessary to delve into possible associated biases (Anderson et al., 2016).

Emotional regulation can be mediated by external factors such as social and cultural contexts (Keltner et al., 2022). The perception, expression, and control of emotions can be significantly influenced by cultural norms, social values, and expectations (Ramzan & Amjad, 2017). The present study is an effort that contributes to the adaptation of an emotional dysregulation scale in the sociocultural context, which responds to the need to identify clinical conditions in mental health and assess treatment. Variations in social and cultural contexts generate the need for scale adaptation studies. It also joins the efforts that seek to simplify the scale of the Difficulties in Emotional Regulation Scale to improve its practical performance at the research level. In addition, this study is a step forward in responding to the gaps in existing knowledge and contributing to the limitations of scale in Colombia. This analysis would allow for an

excellent verification of the dimensionality, reliability analysis, gender differential item functioning of the Emotional Regulation Difficulties Scale, and adaptation in population groups other than the student.

This study aimed to adapt the 16-item Difficulties in Emotional Regulation scale (Bjureberg et al., 2016) by studying Colombian adults' dimensionality and internal consistency.

Method

A psychometric methodological study was designed in which different statistical processes were used to establish some indicators of validity (dimensionality) and reliability (Cronbach's alpha and McDonald's omega) for a measurement instrument that lacks a clinical assessment standard (Sireci & Benítez, 2023).

Participants

A total of 435 Colombian adults were aged between 18 and 79 years ($M = 35.30$, $SD = 14.13$)—more details in Table 1. Non-probabilistic sampling was implemented for convenience. The sample size is acceptable for the calculation of internal consistency coefficients and to carry out a confirmatory factor analysis if there are between ten and twenty participants for each item of the instrument (Kyriazos, 2018; Rodríguez-Rodríguez & Reguant-Álvarez, 2020).

Table 1.
Demographic characteristics of the sample

Variable	n	%
Emerging age (years)		
Yes (between 18 and 29)	202	46,44
No (30 or more)	233	53,56
Gender		
Female	307	70,57
Male	128	29,43
Schooling		
Primary or secondary	43	9,89
Universitario	392	90,11
Single, separated, or widowed filing status		
Yes	243	55,86
No	192	44,14
Residence		
Urban	32	7,36
Rural	403	92,64
Residency (region)		
Caribbean	371	85,29
Andean	64	14,71

Instrument

Emotional regulation was quantified with a 16-item version of the Emotional Regulation Scale (Bjureberg et al., 2016). This version has four dimensions or subscales: *acceptance* (items 9, 11, 12, 13, 15, and 16), *clarity* (items 3, 4, 5, and 9), *awareness* (items 1, 2, 6, and 8), and *goals* (10 and 14). Each item has four answer possibilities

(always, almost always, sometimes, and never) graded from one to four. The total scores are observed between 16 and 64, and items 1, 2, 6, and 8 are interpreted in the opposite direction; the higher the score, the lower the emotional regulation (Bjureberg et al., 2016).

Table 2.
Emotional Regulation Scale-ERS, version 16 items

No. Items	Sub-scale	Questions
1	Conscience	I have total clarity about my feelings.
2	Conscience	He paid attention to the way I feel.
3	Clarity	I feel that my emotions dominate me, and I am unable to control them.
4	Clarity	I have little idea how I feel.
5	Clarity	I have a hard time understanding my emotions.
6	Conscience	I know exactly how I am feeling at any given moment.
7	Clarity	I am confused about my feelings.
8	Conscience	When I get angry, I recognize the emotional state I am in.
9	Acceptance	When I get angry, I reproach myself for it.
10	Goals	When I am angry, I have difficulty doing my job.
11	Acceptance	This state of mind will last a long time when I get angry.
12	Acceptance	When I am angry, I feel like I am a weak person.
13	Acceptance	When I get angry, I feel guilty for being like this.
14	Goals	When I get angry, I lose control.
15	Acceptance	When I am angry, I feel like I cannot do anything to regain my composure.
16	Acceptance	When I am angry, the only thing I can do is think about it.

Procedure

An electronic questionnaire was distributed to collect information through emails and WhatsApp messages to the people in the investigators' contact list. Initially, it was projected to have the exhibition in a month, between August 11 and September 10, 2020. The period was extended by one week as the minimum number had not been reached. The collection period ended at the end of the strict confinement due to COVID-19 decreed in Colombia by the National Government, which began on March 18 and ended on September 30, 2020.

(Hefetz & Liberman, 2017). In successive AFCs, items that showed factor loads less than 0.30 were observed and eliminated to retain and refine the 24-item scale. Items with factor loads less than 0.30 usually contribute little to the construct's measurement, generating confusion and, therefore, can be eliminated (Ferrando et al., 2022).

Statistical analysis

Dimensionality

A CFA was performed, and the factor loadings were observed for each item in the 16-item version. These loads are interpreted as other correlation coefficients and indicate the relationship between the item and the factor

In addition, the coefficients of the normalized chi-square (chi-square divided by the degrees of freedom), RMSEA (the root of the mean square of the approximation error) and 90% confidence interval (90% CI), CFI (comparative fit index), the Tucker-Lewis index (TLI) and SRMR (standardized average squared residual) were calculated. Under the best conditions, a normalized chi-square below 5, RMSEA, and SMSR with values close to 0.06 and CFI and TLI values greater than 0.89 is expected. The theoretical model is accepted if at least three calculated coefficients are within the desirable

values (Hu & Bentler, 1999). The Factor program carried out the CFA (Lorenzo-Seva & Ferrando, 2013).

Internal consistency

Internal consistency was calculated using Cronbach's alpha (1951) and McDonald's omega (1970) coefficients. McDonald's omega coefficient is a better indicator of internal consistency when items show significant differences in factor loads (Rodríguez-Rodríguez & Reguant-Álvarez, 2020). It is recommended that these values be between 0.70 and 0.95 (Amirrudin et al., 2021). These coefficients were calculated in the statistical program Jamovi in version 1.2.27.0.

Differential Item differential

The gender differential item functioning was quantified with Kendall's tau-b (1938). Kendall's *tau-b* test is usually used as a correlation measure when one of the variables analyzed is dichotomous. In the present study, it was possible to assign zero (0) or one (1) indistinctly to men or women because the sign of the correlation would be unimportant. Intuitively, gender differential item functioning was considered in those correlations greater than 0.20 (Hambleton, 2006). These calculations were performed in the SPSS version 23 program (2015).

Ethical Statement

This study was endorsed by a Colombian public university's institutional research ethics committee (minutes 002 of the extraordinary meeting of March

2020). The ethical aspects of the Declaration of Helsinki were considered for the study's implementation: the participants gave their informed consent, and their anonymity was maintained throughout the process (Ministry of Health of Colombia, 1993; World Medical Association, 2024).

Results

The data did not fit the four-dimensional structure proposed for the 16-item Emotional Regulation Difficulties Scale. In the TFA, two goodness-of-fit indicators were observed below the suggested values (normalized chi-square) and three below the desirable values (RMSEA, TLI, and SRMR), and consequently, this structure was rejected. In addition, the internal consistencies of the dimensions were between 0.44 and 0.82: Cronbach's alpha of 0.62 for the dimension of *consciousness*, 0.82 for the *dimension of clarity*, 0.81 for the *dimension of acceptance*, and 0.44 for the *dimension of goals*. The internal consistency values for *consciousness* and *goals* were observed below 0.70.

The 10-item Brief Emotional Regulation Scale (DERS-10C) selected ten items demonstrating the best performance. These items showed acceptable factor loads greater than 0.30. They were grouped into two dimensions: *clarity, awareness, acceptance, and goals* (Table 2).

Table 3.
Brief Emotional Regulation Scale (DERS-10C)

Clarity-awareness

1. I have complete clarity about my feelings*
 3. I feel like my emotions dominate me, and I am unable to control them
 4. I have little idea how I feel
 5. I have a hard time understanding my emotions
 6. I know exactly how I am feeling at all times*
-

Acceptance-goals

9. When I get angry, I reproach myself for it
 10. When I am angry, I have trouble studying or doing work
 13. When I get angry, I have feelings of guilt for being like this
 14. When I get angry, I lose control
 15. When I am angry, I feel like it is impossible to regain my cool
-

(*) Reverse rating.

Total scores ranged from 6 to 20 ($M = 10.06$; $SD = 2.91$) in the dimension of emotional regulation in acceptance

and goals and between 5 and 17 ($M = 8.94$; $SD = 2.77$) in clarity and awareness.

Dimensionality

The *clarity-awareness dimension* showed a self-value of 2.55, explaining 50.91% of the variance; the acceptance-goals dimension reached a self-value of 2.54, responsible for 50.76%; and the complete scale (theoretically as one-dimensional) presented an eigenvalue of 4.21, accounting for 42.05% of the variance. Factor loads for one-dimensional and two-dimensional solutions were observed between 0.41 and 0.86. These values were adequate since they were higher than 0.30. All the values of the factor loads are shown in Table 3.

The *clarity-awareness dimension* showed three goodness-of-fit indicators (CFI, TLI, and SRMR), the acceptance-goal dimension showed none, and the complete scale with ten items understood as two-dimensional showed three (normalized chi-square, CFI, and SRMR). Details of goodness-of-fit indicators are presented in Table 4.

Table 4.
Factorial loads of the dimensions and the DERS-10C

<i>Clarity-awareness</i>	<i>Load</i>
1. I have complete clarity about my feelings	0,41
3. I feel like my emotions dominate me, and I am unable to control them	0,63
4. I have little idea how I feel	0,65
5. I have a hard time understanding my emotions	0,86
6. I know exactly how I am feeling at all times	0,52
<i>Acceptance-goals</i>	
9. When I get angry, I reproach myself for it	0,64
10. When I am angry, I have trouble studying or doing work	0,62
13. When I get angry, I have feelings of guilt for being like this	0,75
14. When I get angry, I lose control	0,55
15. When I am angry, I feel like it is impossible to regain my cool	0,50
<i>Emotional regulation (one-dimensional)</i>	
1. I have complete clarity about my feelings	0,46
3. I feel like my emotions dominate me, and I am unable to control them	0,69
4. I have little idea how I feel	0,58
5. I have a hard time understanding my emotions	0,75
6. I know exactly how I am feeling at all times	0,49
9. When I get angry, I reproach myself for it	0,56
10. When I am angry, I have trouble studying or doing work	0,61
13. When I get angry, I have feelings of guilt for being like this	0,66
14. When I get angry, I lose control	0,55
15. When I am angry, I feel like it is impossible to regain my cool	0,53

Internal consistency

The internal consistency of the global scale (ten items) and each subscale was observed between 0.75 and 0.85.

These values are considered adequate since they are more significant than 0.70. See details in Table 5.

Table 5.

Internal consistency and goodness-of-fit indicators for the possible factorial solutions of DERS-10C and DERS-16

Solution	Alpha	omega	Chi-square ¹	RMSEA ²	CFI	TLI	SRMR
Clarity-awareness	0,75	0,76	5,20	0,10 (0,06-0,14)	0,96	0,92	0,04
Acceptance-Goal	0,75	0,76	12,80	0,17 (0,13-0,20)	0,88	0,76	0,06
DERS-10C	0,84	0,85	4,25	0,09 (0,08-0,11)	0,91	0,88	0,05
DERS-16	0,73	0,80	3,39	0,07 (0,06-0,09)	0,91	0,89	0,06

¹ Standardized.

² In parentheses CI 90% (ninety percent is the usual for this test).

The gender DIF of the DERS-10C showed values between 0.02 and 0.07. These values were well below 0.20, so it was accepted that the items lacked response

bias by gender. The values of tau *b* are presented in Table 6.

Table 6.

Gender DIF of the DERS-10C

Item	tau b
1. I have complete clarity about my feelings	0,06
3. I feel like my emotions dominate me, and I am unable to control them	0,06
4. I have little idea how I feel	0,04
5. I have a hard time understanding my emotions	0,03
6. I know exactly how I am feeling at all times	0,02
9. When I get angry, I reproach myself for it	0,07
10. When I am angry, I have trouble studying or doing work	0,03
13. When I get angry, I have feelings of guilt for being like this	0,05
14. When I get angry, I lose control	0,06
15. When I am angry, I feel like it is impossible to regain my cool	0,06

Discussion of results

The present research shows the DERS-10C ten items with two dimensions (clarity-awareness and acceptance-goal). The ten items and the two dimensions present high internal consistency, two indicators of validity and reliability for the DERS-10-C. Other research has already addressed the alternative of a two-dimensional version of the Difficulty in Emotional Regulation Scale. For example, Moreira et al. (2022) hypothesized that clarity and awareness could represent an early stage of emotional regulation for processing emotions, while the other factors emphasized emotional responses. This approach is consistent with the results of the present study, where the dimensions of clarity-awareness and acceptance-goal, presented in the final model, could represent these two processes of SR (Moreira et al., 2022).

Dimensionality testing by CFA reveals that the results meet the model's acceptance criteria (Hu & Bentler, 1999). However, compared to other studies on reduced versions of the Difficulty in Emotional Regulation Scale, the latter have used stricter acceptance criteria, and the results against the CFI and SMSR have shown better performance (Kaufman et al., 2016; Moreira et al., 2022; Shanabi et al., 2018; Westerlund & Santila, 2018). Likewise, the RMSEA and TLI scores, which respectively presented scores higher or lower than desired, did not present this difficulty in other versions of the international setting (Kaufman et al., 2016; Lausi et al., 2020; Moreira et al., 2022; Westerlund & Santila, 2018).

Generally, the instrument's internal consistency was good for each factor, with Cronbach's alpha of 0.75 and McDonald's omega of 0.76 for the first 0.84 and 0.85 for the second. These values are within theoretically

described acceptability ranges (Campo & Oviedo, 2008). They are also in agreement with the findings described in various studies that have investigated the psychometric properties of the instrument in its different versions (Fowler et al., 2014; Kaufman et al., 2016; Michelini & Godoy, 2022; Osborne et al., 2017). McDonald's omega values have been much less reported and have been observed between 0.83 and 0.91 (Moreira et al., 2022; Osborne et al., 2017; Reivan-Ortiz et al., 2020).

Regarding gender differences, no significant differences were observed in the measurements made, which is consistent with previous findings (Fowler et al., 2014; Hervás & Jódar, 2008; Miguel et al., 2017; Reivan-Ortiz et al., 2020). This observation could become an indicator that the differences presented in the results of this measure are little affected by the impact of gender and that other developmental variables, biological or social, could present a more significant weight (Giromini et al., 2017; Weinberg & Kinsky, 2009).

On the other hand, gender-DIF did not show significant differences in any of the items. However, the finding differs from what was reported by Anderson et al. (2016), who observed, for example, when comparing item 6 of the present study and item 21 of the original scale, which inquire about negative emotions as a consequence of emotional distress, item 21 uses "I feel ashamed," while item 6 of the present study "I reproach myself." Men may report shamelessness because of the perceived weakness associated with it. The difference between these results can be related to the wording of the statements (Anderson et al., 2016).

Future studies should explore the scale's behavior in samples of adolescents and subjects with clinical conditions. Likewise, the complementary use of other validation techniques is proposed, particularly the application of convergent validity studies against the variables of clinical interest with which it has traditionally been related (Hervás & Jódar, 2008).

Conclusion

The 16-item version of the Difficulty in Emotional Regulation Scale has limited dimensionality, and two subscales have low internal consistency. In contrast, the DERS-10C presented is a valid measure in the Colombian sociocultural context, verified by various statistical methods. The small number of items may facilitate its use in clinical practice and epidemiological research in

different contexts as a valid and reliable measure for identifying difficulties in emotional management (Gratz et al., 2014; Gratz et al., 2015). However, the present study exposes some limitations. The standards for accepting the proposed dimensions may be considered lax by some authors who suggest limits to those presented to test the dimensionality of DERS-10-C (Herrero, 2010). However, it should be taken into account that the process of construction and refinement of instruments is a continuous process and that over time, the criteria for acceptance of the validity and reliability of an instrument become stricter or more conservative to the extent that the construct and its measurement are consolidated (Campo-Arias & Pineda-Roa, 2022; Staples & Mohlman, 2012).

Authors' contribution

Joseph Espitia Correa: Study design and writing of the article.

Carmen Cecilia Caballero Domínguez: She supervised the development of the study and the writing of the article.

Adalberto Campo Arias: Study design, statistical analysis, review and approval of the final version of the manuscript.

Conflict of Interest Statement

The researchers declare that they have no conflicts of interest and that the research was not influenced by external agents or personal interests of the research team in any of its phases of development.

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