

Difficulties in Emotion Regulation Scale-Short Form (DERS-SF): Psychometric Validation and Measurement Invariance Testing in a Sample of Urban Indian Adolescents

Naseer A. Bhat¹, Bangalore N. Roopesh² , Binukumar Bhaskarapillai³ , Srinivasan Chokkanathan⁴ and Vivek Benegal⁵

ABSTRACT

Background: Adolescents are particularly vulnerable to emotion dysregulation (ED), a transdiagnostic marker of psychological disorders with implications for academic achievement, identity development, social bonding, mental health, and the overall well-being and development of adolescents. A well-validated tool for the assessment of ED is imperative for credible advances in research on ED among Indian adolescents. Difficulties in Emotion Regulation Scale-Short Form (DERS-SF) is a promising tool to assess ED but requires proper psychometric validation among Indian adolescents. The current study validated the factor structure and examined psychometric aspects including gender invariance testing of the DERS-SF in Indian adolescents aged between 14 and 20 years.

Methods: In a cross-sectional study, a community sample of $n = 2079$ adolescents

completed the English version of the DERS-SF, the Strengths, and Difficulties Questionnaire, the Barratt Impulsiveness Scale, and the Adolescent Problem Behaviour Index.

Results: The six-factor model of the DERS-SF exhibited an acceptable model fit in the current study sample. Invariance testing revealed that the DERS-SF is conceptually interpreted in a similar manner by male and female adolescents. Two-way MANOVA indicated gender and age variations on a few DERS-SF subscales. Reliability for DERS-SF was good, $\alpha = 0.86$. Adequate construct validity was demonstrated by moderate to strong associations of the DERS-SF subscales with measures of internalizing and externalizing symptoms, adolescent problem behaviors, and impulsivity.

Conclusions: DERS-SF retained the popular six-factor structure with acceptable psychometric properties and hence can be reliably used with Indian adolescents.

Keywords: Adolescence, Difficulties in Emotion Regulation Scale-Short Form (DERS-SF), emotion dysregulation, measurement invariance, psychopathology

Key Messages

- The six-factor model of the DERS-SF is valid in the Indian adolescent population and it represents the best interpretable factor solution of the DERS-SF.
- The DERS-SF and its factor structure holds good across genders and is interpreted in a similar manner by male and female adolescents that justify mean comparisons across genders.
- The awareness subscale though exhibits good reliability, yet it fared poorly on construct validity as compared to all other scales and hence should be interpreted with caution.
- Significant age and gender variations on the DERS-SF further lend credence to the construct validity of the DERS-SF which can be reliably used with Indian adolescents.

¹Jindal School of Psychology and Counselling, O.P. Jindal Global University, Sonapat, Haryana, India. ²Dept. of Clinical Psychology, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India. ³Dept. of Biostatistics, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India. ⁴Dept. of Social Work, National University of Singapore, Singapore. ⁵Dept. of Psychiatry, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India.

HOW TO CITE THIS ARTICLE: Bhat NA, Roopesh BN, Bhaskarapillai B, Chokkanathan S and Benegal V. Difficulties in Emotion Regulation Scale-Short Form (DERS-SF): Psychometric Validation and Measurement Invariance Testing in a Sample of Urban Indian Adolescents. *Indian J Psychol Med.* 2024;XX:1–8.

Address for correspondence: Bangalore N. Roopesh, Dept. of Clinical Psychology, National Institute of Mental Health and Neurosciences (NIMHANS), Hosur Road, Bengaluru, Karnataka 560029, India.
E-mail: bn.roopesh@gmail.com

Submitted: 06 Apr. 2023
Accepted: 28 Jan. 2024
Published Online: xxxx



Copyright © The Author(s) 2024

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<http://www.creativecommons.org/licenses/by-nc/4.0/>) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the Sage and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

ACCESS THIS ARTICLE ONLINE
Website: journals.sagepub.com/home/szj
DOI: 10.1177/02537176241232936

The concept of emotion dysregulation (ED) has evolved over time and crystallized into a comprehensive construct. Gratz and Roemer defined ED as the “relative absence of any or all” the following abilities related to the emotions of an individual: (a) awareness about one’s emotions; (b) acceptance of one’s emotions; (c) inhibition of undesired behaviors and promotion of goal-directed behaviors in distressing situations; and (d) adaptive use of existing emotion regulation strategies to modulate one’s emotions to meet personal goals and situational demands.

Adolescents as compared to other age groups experience greater ED because they exhibit increased emotionality partly due to significant developmental transitions.² ED is believed to interfere negatively with adolescents’ adjustment,^{3,4} academic achievement,⁵⁻⁸ career building,⁹ development of clear identity,^{10,11} social bonding, and overall psychosocial well-being.^{12,13} ED in general has also been linked to many psychiatric disorders and is considered a transdiagnostic marker of psychopathology.¹⁴⁻¹⁷

ED in adolescents has received relatively little attention of researchers in India. Assessment of any construct or phenomenon is key to its scientific progress and the lack of well-validated assessment tools has been considered by many as one of the contributing factors to the relative dearth of literature on adolescent emotion regulation.¹⁸⁻²⁰ Most of the studies undertaken to examine emotion regulation in adolescents either directly use or adapt tools originally developed and standardized for children or adults. One of the widely used tools to assess emotion regulation-related difficulties in adolescents is the Difficulties in Emotion Regulation Scale (DERS).¹ DERS has 36 items that assess difficulties in emotion regulation across six domains, namely: awareness of emotions, clarity about emotions, negative reactions toward one’s emotional responses, access to existing emotion regulation strategies, control of impulsive behaviors, and engagement in goal-directed behaviors. Kaufman et al.²¹ transformed the original DERS into an abridged version, called the DERS-Short Form (SF). DERS-SF has 18 items that capture all the six dimensions of ED assessed by the original DERS. DERS-SF is suitable for use with both adolescents and adults and has demonstrated “equivalent

to improved” psychometric properties as compared to the original DERS.²² While shorter versions of assessment tools are desired in several contexts, especially clinical and longitudinal research, their use with adolescents is intuitively relevant. This is because adolescents as compared to adults may quickly experience boredom or fatigue when filling lengthy assessment tools, and therefore gives rise to the risk of random responding and lower response rates.²³⁻²⁷

In view of the background above highlighting the need and implications of a psychometrically tested ED tool, the present attempted to validate the factor structure and psychometric aspects of the DERS-SF among Indian adolescents. Since DERS-SF has largely a known six-factor structure, the present study directly examined the validity of the same six-factor model by employing confirmatory factor analysis (CFA) techniques. Next, the current study expanded the scope of CFA to include multi-group analysis for testing measurement invariance of the DERS-SF across genders of adolescents. Invariance testing is a rigorous psychometric exercise that determines if the DERS-SF is interpreted conceptually in a similar manner by adolescent males and females.^{28,29} In colloquial terms, invariance testing will ensure that the DERS-SF does not mean apples to male adolescents and oranges to female adolescents or vice. Therefore, invariance testing examined if there is equivalence across genders in the factor structure, factor loadings, means and intercepts, and item residuals of the DERS-SF. Finally, the study examined internal consistency reliability, and construct validity by examining the association of the DERS-SF total score and its subscale scores with measures of internalizing and externalizing symptoms, and adolescent problem behaviors. The evaluation of construct validity was further supplemented by examining the association of the DERS-SF with other measures that have theoretical relevance to the construct of ED.

Method

Participants

The participants included school and college-attending adolescents (14–20 years; mean age 17 years) who could read, write, speak, and comprehend English. Though hard data regarding all the sociodemographic

characteristics were not acquired, the targeted schools and colleges, however, varied in board affiliations (CBSE, ICSE, State board), fee structure, course specializations, socio-cultural milieu, and geographical locations. The approximate sample size of the study from which the current data was drawn was estimated according to the $N:p$ ratio, where N was the required sample size and p was the number of observed variables.³⁰ The total number of participants recruited in the main study was $n = 2079$, but for the present study, the data was analyzed from $n = 1993$ adolescent participants who met the study criteria. Approximately 49% of the participants identified themselves as females and 51% as males.

Measures

Difficulties in Emotion Regulation Scale-Short Form (DERS-SF)²¹

It is an 18-item shorter version of the original DERS.¹ DERS-SF measures ED-related difficulties among adolescents and adults across six domains: strategies, non-acceptance, impulse, goals, awareness, and clarity. DERS-SF employs a Likert response format: 1 = almost never to 5 = almost always. It gives a separate score on each subscale and an overall score where higher scores suggest a greater degree of ED. DERS-SF has exhibited excellent psychometric properties such as internal consistency reliability and concurrent validity among adolescents and adults.²¹

Apart from the DERS-SF, the study also used other self-report measures including the Strengths and Difficulties Questionnaire,³¹ the Barratt Impulsiveness Scale³² (BIS-15), and the Adolescent Problem Behaviour Index for assessing the participant’s degree of impulsivity, psychological maladjustment, and extent of involvement in problematic or risky behaviors such as substance use and unsafe sexual practices.

Procedure

The study was approved by the ethics committee of the institute where the study was registered. Next, various schools and colleges in central Bengaluru were approached for sample selection which was based on convenience mode of sampling. The data collection was done in group settings and lasted from June 2017 to February 2018. The participants were sensitized regarding the

nature and purpose of the study, freedom of participation, risks and benefits, confidentiality of identity (both individual and school/college), and the potential uses of the survey results. Any doubts, clarifications, or queries regarding the survey were addressed by the first author as and when the need arose. The study obtained written consent as well as assent from all the participants including the parents.

Data Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) and Analysis of Moment Structures (AMOS) version 20. Eighty-six adolescents who had more than one item missing on the DERS-SF were removed from analysis leaving the total eligible sample for analysis at $n = 1993$. The series mean method was used to replace the single missing value of $n = 135$ cases on the DERS-SF. Normality was tested by estimating absolute measures of skewness and kurtosis, and Q-Q plots. Means, standard deviation, and percentages were used to summarize quantitative and categorical variables respectively. Cronbach's alpha (α) was used to estimate the internal consistency reliability. CFA was employed to test the pre-existing six-factor model of the DERS-SF in the current study sample. Specifically, the maximum likelihood estimation procedure was used which is a preferred method of estimating model fit statistics for data sets with normal distribution and continuous variables. Gender invariance of the DERS-SF was examined by adopting multi-group CFA procedures. Age and gender variations across the DERS-SF subscales were examined with two-way MANOVA. To facilitate this comparison, adolescents falling in the age bracket of 14–17 years were labeled as middle adolescents and those in the 18–20 brackets were labeled as late-adolescents. Construct validity was examined by estimating Pearson's correlation coefficients between the DERS-SF total and the subscale scores with other measures used in the study.

Results

CFA of the DERS-SF

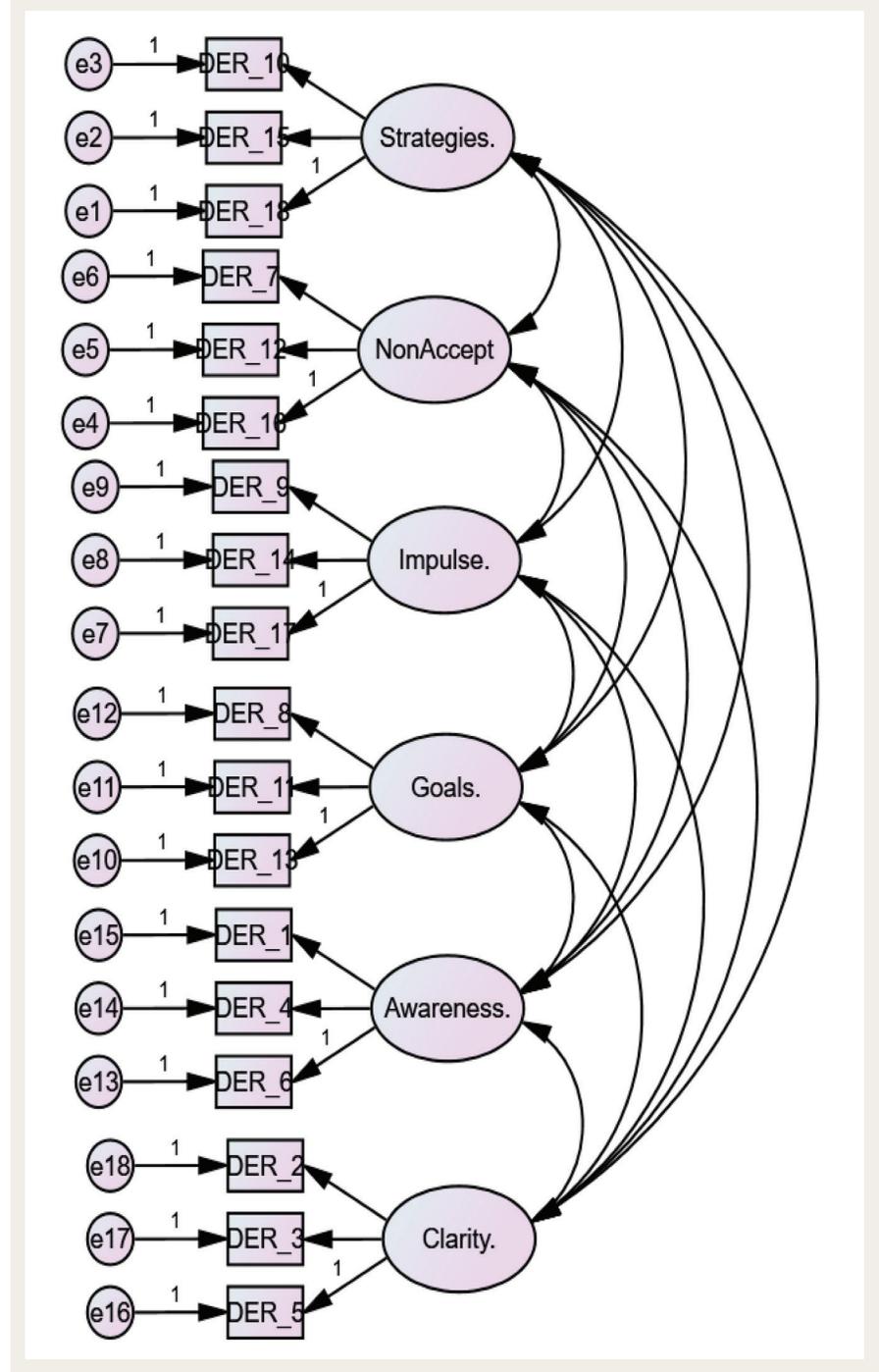
The data was normally distributed as revealed by a closer visual inspection of the Q-Q plots and absolute values of skewness and kurtosis which were within the acceptable range of ± 1 . The path diagram of the measurement model for CFA of the

DERS-SF is depicted in **Figure 1**. We followed a conventional method of reporting the CFA results used in several validation studies involving the original DERS¹ as well as its short forms.^{19,33–35} Specifically, we reported the following incremental and absolute measures of fit indices: Model chi-square (χ^2), Bentler's comparative fit index (CFI), the Tucker Lewis Index (TLI), the

goodness of fit index (GFI), the root mean square error approximation (RMSEA) and the standardized root mean square residual (SRMR). We did not rely on the model chi-square (χ^2) statistic and normed chi-square (χ^2/df) for evaluating model fit to avoid the risk of committing type 1 error.³⁶ The CFA results suggested that the six-factor model of the DERS-SF exhibited an

FIGURE 1.

The AMOS Path Diagram for the Six-factor Measurement Model of the DERS-SF.



acceptable model fit with the data ($\chi^2 = 845.98, df = 120, p < .001; \chi^2/df = 7.05; CFI = 0.95; TLI = 0.94; GFI = 0.95; SRMR = 0.04,$ and $RMSEA = 0.05$). The factor loadings, which express a correlation between the item and the factor, were statistically significant and are depicted in **Table 1**.

Measurement Invariance of the DERS-SF Across Gender

We tested gender invariance of the DERS-SF at all four levels as recommended in the literature on invariance testing.^{29,37} These include configural invariance (equivalent factor structure across gender), metric invariance (equivalent factor loadings across gender), scalar invariance (equivalent mean intercepts across gender), and residual invariance (equivalent item residuals across gender).

We considered significant changes in the alternate fit indices such as ΔCFI and $\Delta RMSEA$ for establishing measurement invariance or non-invariance of the DERS-SF across male and female participants. Specifically, $\Delta CFI > 0.01$ and $\Delta RMSEA > 0.015$ indicated non-invariance of the DERS-SF at any of the four levels and vice-versa.^{28,38} Although we have also reported $\Delta \chi^2$ statistics, they were not considered for deciding measurement invariance because of the large sample size of the present study.³⁹ The results of the measurement invariance analysis were largely organized in accordance with the recommendations of Putnick and Bornstein²⁹ and are depicted in **Table 2**. It is evident from **Table 2** that $\Delta CFI < 0.01$ and $\Delta RMSEA < 0.015$ for all four models. These results indicate a lack of credible change in the model

fit statistics across genders after constraining of parameters at the metric, scalar, and residual levels.

Age and Gender Variations in the DERS-SF Subscales Among Indian Adolescents

Age and gender variations across the DERS-SF subscales were examined with the help of two-way MANOVA. We categorized adolescents between 14 and 17 years of age as belonging to “mid adolescence,” and those between 18 and 20 years of age as belonging to “late adolescence.” A statistically non-significant interaction between age and gender ($F_{6, 1796} = 0.69, p = .66$) was evident from the results of two-way MANOVA. There was, however, a significant main effect of the age ($F(6, 1796) = 9.31, p < .001$) and

TABLE 1.
Confirmatory Factor Analysis Loadings of the DERS-SF Items in the Study Sample.

Factors	Item No.	Items	Factor Loadings
Strategies	DERS_18	When I'm upset, it takes me a long time to feel better.	0.64
	DERS_15	When I'm upset, I believe there is nothing I can do to make myself feel better.	0.67
	DERS_10	When I'm upset, I believe that I will end up feeling very depressed.	0.75
Non-acceptance	DERS_16	When I'm upset, I become irritated at myself for feeling that way.	0.75
	DERS_12	When I'm upset, I feel guilty for feeling that way.	0.71
	DERS_7	When I'm upset, I become embarrassed for feeling that way.	0.57
Impulse	DERS_17	When I'm upset, I lose control over my behavior.	0.78
	DERS_14	When I'm upset, I have difficulty controlling my behavior.	0.79
	DERS_9	When I'm upset, I become out of control.	0.77
Goals	DERS_13	When I'm upset, I have difficulty getting work done.	0.76
	DERS_11	When I'm upset, I have difficulty focusing on other things.	0.83
	DERS_8	When I'm upset, I have difficulty getting work done.	0.63
Awareness	DERS_6	When I'm upset, I acknowledge my emotions.	0.56
	DERS_4	I care about what I am feeling.	0.73
	DERS_1	I pay attention to how I feel.	0.77
Clarity	DERS_5	I am confused about how I feel.	0.73
	DERS_3	I have difficulty making sense out of my feelings.	0.78
	DERS_2	I have no idea how I am feeling.	0.68

DERS-SF = Difficulties in Emotion Regulation Scale-Short Form.

TABLE 2.
Measurement Invariance Fit Statistics for the DERS-SF for the Female and Male Adolescents.

Model	χ^2 (df)	CFI	RMSEA	Model Comparison	ΔCFI	$\Delta RMSEA$
M0: Baseline model	845.79 (120)	0.948	0.055	–		
M1: Configural invariance	990.951 (240)	0.945	0.040	M0	0.003	0.015
M2: Metric invariance	1045.392 (258)	0.943	0.040	M1	0.002	0.00
M3: Scalar invariance	1169.484 (276)	0.935	0.041	M2	0.008	0.001
M4: Residual invariance	1236.699 (309)	0.932	0.039	M3	0.002	0.001

DERS-SF = Difficulties in Emotion Regulation Scale-Short Form; χ^2 = Chi-square; df = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error approximation.

gender ($F(6, 1796) = 7.96, p < .001$) across certain DERS-subcales as is evident from **Table 3**. The main effect of gender was observed only for the clarity and the awareness subscales of the DERS-SF. In general, the male adolescents exhibited higher scores on the awareness subscales compared to female adolescents ($^1M_m = 8.5, ^2M_f = 7.76$), whereas the reverse was true for the clarity subscale ($M_m = 7.52, M_f = 7.98$). Similarly, the main effect of age was reflected only across the awareness, impulse, and non-acceptance dimensions. In general, the middle adolescents exhibited greater mean scores on awareness ($M_{mid} = 8.31, M_{late} = 7.95$), non-acceptance ($M_{mid} = 5.15, M_{late} = 4.89$), and impulse ($^3M_{mid} = 7.00, ^4M_{late} = 6.40$) subscales as compared to late adolescents.

Psychometric Properties of the DERS-SF Among Indian Adolescents

Tables 4 and 5 summarize different psychometric aspects of the DERS-SF among Indian adolescents. Internal consistency reliability as measured by Cronbach's alpha (α) was 0.87 for the overall DERS-SF scale for the study sample. Cronbach's alpha (α) for the six DERS-SF subscales ranged from 0.72 to 0.82.

Pearson's correlation coefficient estimates of the DERS-SF with other variables as shown in **Table 5** reflect its construct validity. The correlations of DERS-SF subscales with internalizing and externalizing symptoms were positive and largely moderate

to high in magnitude. However, the awareness subscale showed a weak to very weak correlation with the externalizing and the internalizing symptoms respectively. The DERS-SF subscales, excluding the awareness and non-acceptance subscales exhibited modest positive correlations with the adolescent problem behaviors. The overall score of impulsivity exhibited a moderately positive correlation with the DERS-SF subscales, except for the awareness, and the non-acceptance subscales. The non-acceptance and the awareness subscales were modestly associated with the total impulsivity score.

Discussion

This study attempted to validate the six-factor model of the DERS-SF in a large community sample of urban

TABLE 3.

Mean (SD) Values of the DERS-SF Subscales Across Subgroups of Gender and Age Along with p Values.

DERS-SF Subscales	Gender			Age Group		
	Male	Female	p Value	Middle-adolescents	Late-adolescents	p Value
Goals	7.92 (2.87)	8.12 (3.06)	>.05	7.98 (2.97)	8.06 (3.01)	>.05
Impulses	6.69 (3.01)	6.68 (3.21)	>.05	7.00 (3.15)	6.40 (3.07)	<.001
Strategies	7.20 (3.02)	7.42 (3.19)	>.05	7.26 (3.07)	7.36 (3.19)	>.05
Clarity	7.52 (2.72)	7.98 (3.11)	<.01	7.63 (2.84)	7.87 (3.04)	>.05
Awareness	8.50 (2.73)	7.76 (2.91)	<.001	8.31 (2.89)	7.95 (2.78)	<.01
Non-acceptance	4.97 (2.05)	5.07 (2.23)	>.05	5.15 (2.13)	4.89 (2.16)	<.05

DERS-SF = Difficulties in Emotion Regulation Scale-Short Form. p Values of difference between means were taken from two-way MANOVA output.

TABLE 4.

Correlations Between the DERS-SF Subscales and Their Cronbach's Alpha (α) in Indian Adolescents.

	Factor	I.	II.	III.	IV.	V.	VI.	Cronbach's Alpha (α)
I.	Impulse	–						0.82
II.	Goals	0.60** (0.000)	–					0.78
III.	Clarity	0.37** (0.000)	0.45** (0.000)	–				0.77
IV.	Awareness	0.02 (0.363)	0.01 (0.801)	0.06** (0.002)	–			0.72
V.	Strategies	0.60** (0.000)	0.75** (0.000)	0.50** (0.000)	0.04 (0.056)	–		0.74
VI.	Non-acceptance	0.45** (0.000)	0.50** (0.000)	0.38** (0.000)	–0.06** (0.009)	0.53** (0.000)	–	0.72
VII.	DERS-Total	0.77** (0.000)	0.81** (0.000)	0.69** (0.000)	0.28** (0.000)	0.82** (0.000)	0.67** (0.000)	0.87

DERS-SF = Difficulties in Emotion Regulation Scale-Short Form. Absolute p values in brackets.

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

TABLE 5.

Pearson's Product Moment Correlation Coefficients Between the DERS-SF Subscales and Other Measures Used in the Study.

Variables	Impulse	Goals	Clarity	Awareness	Strategies	Non-acceptance	DERS-Total
Internalizing symptoms	0.37** (0.000)	0.48** (0.000)	0.43** (0.000)	0.08** (0.001)	0.52** (0.000)	0.38** (0.000)	0.57** (0.000)
Externalizing symptoms	0.51** (0.000)	0.44** (0.000)	0.40** (0.000)	0.20** (0.000)	0.40** (0.000)	0.26** (0.000)	0.56** (0.000)
Total difficulty score	0.52** (0.000)	0.56** (0.000)	0.49** (0.000)	0.16** (0.000)	0.56** (0.000)	0.39** (0.000)	0.68** (0.000)
Attentional impulsivity	0.31** (0.000)	0.37** (0.000)	0.31** (0.000)	0.17** (0.000)	0.30** (0.000)	0.19** (0.000)	0.43** (0.000)
Motor impulsivity	0.36** (0.000)	0.27** (0.000)	0.33** (0.000)	0.06** (0.006)	0.27** (0.000)	0.21** (0.000)	0.39** (0.000)
Non-planning impulsivity	0.21** (0.000)	0.20** (0.000)	0.21** (0.000)	0.28** (0.000)	0.15** (0.000)	0.09** (0.000)	0.30** (0.000)
Impulsivity total score	0.38** (0.000)	0.36** (0.000)	0.36** (0.000)	0.23** (0.000)	0.31** (0.000)	0.21** (0.000)	0.49** (0.000)
Adolescent problem behaviors	0.17** (0.000)	0.17** (0.000)	0.18** (0.000)	0.02 (0.323)	0.18** (0.000)	0.06** (0.007)	0.20** (0.000)

DERS-SF = Difficulties in Emotion Regulation Scale-Short Form. Absolute *p* values in brackets.

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Indian adolescents. The results revealed an acceptable fit for the pre-existing six-factor model of the DERS-SF among the Indian adolescent sample. Hence our findings were consistent with Kaufman et al.²¹ and other previous dealing with the psychometric aspects of the DERS among non-Indian adolescents.^{19,20,34}

The findings from invariance testing were also fully consistent with the findings of Kiekens et al.⁴⁰ Configural and metric invariance indicated that the DERS-SF has an identical factor structure, and the items contribute equivalently to their corresponding latent factors in male and female Indian adolescents. Scalar invariance justified the calculation and comparison of latent mean scores on the DERS-SF subscales between male and female adolescents. More importantly, these results also demonstrated that any gender differences on the DERS-SF subscales are reflective of actual differences in trait ED between male and female adolescents.

The results on gender differences indicated that male adolescents exhibited slightly greater deficits related to the awareness of emotions, whereas, female adolescents had greater deficits related to the clarity of emotions. Though the previous findings in the literature are slightly mixed, the results concurred with findings from the majority of the earlier studies.^{19,20,34} The middle-aged

adolescents as compared to older adolescents exhibited greater deficits related to the awareness of emotions, non-acceptance of emotional responses, and difficulty inhibiting impulsive behaviors. Emotion regulation skills are shaped and influenced by the neuro-maturational process and the extent of socializing experiences, both of which are relatively underdeveloped and less extensive respectively among mid-adolescents as compared to older adolescents.⁴¹⁻⁴⁴

The overall DERS-SF score including its subscale scores showed significant correlations with measures of internalizing and externalizing symptoms, impulsivity, and adolescent problem behaviors, thereby providing empirical support for its construct validity among Indian adolescents. These results largely concurred with the findings from previous studies.^{19,20,22,34,45-47} A notable exception to these results was the relatively poor validity of the awareness subscale as depicted by its modest correlations with the measures of psychopathology and adolescent problem behaviors. The poor validity of the awareness subscale has been consistently reported in the literature and has been explained from a methodological, conceptual, and operational point of view.^{1,19,20,33} For example, some researchers attribute the poor validity of the awareness subscale to

the reverse coding of the items in this subscale.⁴⁸⁻⁵⁰ Conceptual explanations emphasize the relevance of emotional awareness to the construct of ED. Awareness about one's emotions is the first and most important component of the emotion regulation process that directly affects the perception of emotions. However, emotional awareness may not have a much active strategic role in the actual process of emotion regulation. For example, Bardeen et al.⁴⁸ maintain that the effective components of emotion regulation with potential implications for altering affective states and influencing psychopathology follow later in the series of steps of the emotion regulation process. Operational explanations attribute the poor validity of the awareness subscale mainly to the wording and framing of items of the awareness subscale. For example, Weinberg and Klonsky²⁰ argued that the wording used in the items of the awareness subscale may not be developmentally appropriate for adolescents. Based on this line of reasoning, it may be argued that the choice of words such as "care" and "acknowledge" in the awareness subscale ("I care about what I am feeling, When I'm upset, I acknowledge my emotions") may not have clearly articulated or conveyed the intended aspects of emotions to adolescents in the present study.

Limitations, Future Directions, and Implications

Despite examining several psychometric aspects of the DERS-SF, the current study still has several deficiencies and limitations. The present study could not conduct comprehensive psychometric testing to include convergent validity, divergent validity, or test-retest reliability. Studies in the future involving Indian adolescents should include measures that assess constructs closely related to ED, and consider longitudinal assessments with the DERS-SF to address these deficiencies. Additionally, examining the specific relevance of the DERS-SF subscales to internalizing and externalizing symptoms would address the issue of the discriminant validity of the subscales. Another limitation is the generalization of findings to populations that were not part of the study sample notably early adolescents aged 11–13 years, rural adolescents, adolescents from other parts of India, adolescents with inadequate English comprehension skills, and adolescents with clinical conditions who are beset by significant emotion regulation difficulties. The self-report measures are prone to response bias and adolescents have been found to exaggerate their emotion regulation difficulties in comparison to their parental reports.⁵¹ Task-based objective measures of emotion regulation could be employed in future studies to rigorously verify the validity of the DERS-SF among Indian adolescents. Future studies should also consider the adaptation and translation of the original DERS-SF into local languages and examine their psychometric aspects.

Emotion regulation difficulties are widely assessed in clinical and non-clinical settings. The DERS-SF would provide an efficient alternative to its lengthy parent version, the DERS,¹ to comprehensively assess adolescents for emotion regulation difficulties. Generating the percentile norms for the DERS-SF would be helpful in identifying adolescents whose emotional regulation skills deviate significantly from typically developing adolescents. For clinicians, the DERS-SF would be helpful for identifying specific emotion regulation deficits and can aid in individualizing the subsequent intervention programs for training such

adolescents in emotion regulation skills. In clinical research settings, it can be used as an outcome measure to evaluate the efficacy of treatment modules such as emotion-focused therapy or dialectical behavior therapy which teach and train on emotion regulation skills. The findings of the present study represent a valuable addition to the cross-cultural literature on the factor structure, psychometric aspects, and measurement invariance testing of the DERS-SF.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval

This paper was the outcome of PhD study, for which ethical approval was granted by the Institute Ethics Committee (IEC) of the National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Bangalore N. Roopesh  <https://orcid.org/0000-0003-0272-8647>
Binukumar Bhaskarapillai  <https://orcid.org/0000-0003-3056-941X>

Notes

1. M_m = mean score of males.
2. M_f = mean score of females.
3. M_{mid} = mean score of middle adolescents.
4. M_{late} = mean score of late adolescents.

References

1. Gratz KL, Roemer L. Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *J Psychopathol Behav Assess* 2004; 26(1): 41–54.
2. Allen NB, Sheeber LB. The importance of affective development for the emergence of depressive disorders during adolescence. In: *Adolescent emotional development and the emergence of depressive disorders*. Cambridge: University Press; 2008. p. 1–10.
3. Schäfer JÖ, Naumann E, Holmes EA, et al. Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *J Youth Adolesc* 2017; 46: 261–276.
4. Silk JS, Steinberg L, Morris AS. Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child Dev* 2003; 74: 1869–1880.
5. Djambazova-Popordanoska S. Implications of emotion regulation on young children's emotional wellbeing and educational achievement. *Educ Rev* 2016; 68: 497–515.
6. Graziano PA, Reavis RD, Keane SP, et al. The role of emotion regulation in children's early academic success. *J Sch Psychol* 2007; 45: 3–19.
7. Ivcevic Z, Brackett M. Predicting school success: Comparing conscientiousness, grit, and emotion regulation ability. *J Res Pers* 2014; 52: 29–36.
8. Oram R, Ryan J, Rogers M, et al. Emotion regulation and academic perceptions in adolescence. *Emot Behav Difficult* 2017; 22: 162–173.
9. Wang L, Xu H, Zhang X, et al. The relationship between emotion regulation strategies and job search behavior among fourth-year university students. *J Adolesc* 2017; 59: 139–147.
10. Crocetti E, Klimstra T, Keijsers L, et al. Anxiety trajectories and identity development in adolescence: A five-wave longitudinal study. *J Youth Adolesc* 2009; 38: 839–849.
11. Jankowski P. Identity status and emotion regulation in adolescence and early adulthood. *Polish Psycho Bul* 2013; 44: 288–298.
12. Chervonsky E, Hunt C. Emotion regulation, mental health, and social wellbeing in a young adolescent sample: A concurrent and longitudinal investigation. *Emotion* 2019; 19: 270–282.
13. Verzeletti C, Zammuner VL, Galli C, et al. Emotion regulation strategies and psychosocial well-being in adolescence. *Cogent Psychol* 2016; 3. <https://doi.org/10.1080/23311908.2016.1199294>.
14. Schäfer JÖ, Naumann E, Holmes EA, et al. Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *J Youth Adolesc* 2017; 46: 261–276.
15. Barlow DH, Allen LB, Choate ML. Toward a unified treatment for emotional disorders – Republished Article. *Behav Ther* 2016; 47(6): 838–853. [https://doi.org/10.1016/S0005-7894\(04\)](https://doi.org/10.1016/S0005-7894(04)).
16. Brockmeyer T, Skunde M, Wu M, et al. Difficulties in emotion regulation across the spectrum of eating disorders. *Compr Psychiatry* 2014; 55: 565–571.
17. McLaughlin KA, Hatzenbuehler ML, Mennin DS, et al. Emotion dysregulation and adolescent psychopathology: A prospective study. *Behav Res Therap* 2011; 49: 544–554.

18. Gómez-Simón I, Penelo E, de la Osa N. Estructura factorial e invariancia de la Escala de Dificultades en la Regulación Emocional (DERS) en adolescentes españoles. *Psicothema* 2014; 26: 401–408.
19. Neumann A, van Lier PAC, Gratz KL, et al. Multidimensional assessment of emotion regulation difficulties in adolescents using the difficulties in emotion regulation scale. *Assessment* 2010; 17: 138–149.
20. Weinberg A, Klonsky ED. Measurement of emotion dysregulation in adolescents. *Psychol Assess* 2009; 21: 616–621.
21. Kaufman EA, Xia M, Fosco G, et al. The difficulties in emotion regulation scale short form (DERS-SF): Validation and replication in adolescent and adult samples. *J Psychopathol Behav Assess* 2016; 38: 443–455.
22. Kaufman EA, Cundiff JM, Crowell SE. The development, factor structure, and validation of the self-concept and identity measure (SCIM): A self-report assessment of clinical identity disturbance. *J Psychopathol Behav Assess* 2015; 37: 122–133.
23. Edwards P, Roberts I, Clarke M, et al. Increasing response rates to postal questionnaires: Systematic review. *BMJ* 2002; 324: 1183.
24. Fan W, Yan Z. Factors affecting response rates of the web survey: A systematic review. *Comput Human Behav* 2010; 26: 132–139.
25. Revilla M, Ochoa C. Ideal and maximum length for a web survey. *Int J Mark Res* 2017; 59: 557–565. <https://doi.org/10.2501/IJMR-2017-039>.
26. Wise SL. An investigation of the differential effort received by items on a low-stakes computer-based test. *Appl Measur Educ* 2006; 19: 95–114.
27. Rauti CM. Assessing the effects of survey instructions and physical attractiveness on careless responding in online surveys. Doctoral dissertation, University of Windsor, Canada; 2017.
28. Cheung GW, Rensvold RB. Evaluating goodness-of-fit indexes for testing measurement invariance. *Struct Equat Model* 2002; 9: 233–255.
29. Putnick DL, Bornstein MH. Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Develop Rev* 2016; 41: 71–90.
30. Everitt BS. Multivariate analysis: The need for data, and other problems. *Br J Psychiatry* 1975; 126: 237–240.
31. Goodman R. Psychometric properties of the strengths and difficulties questionnaire. *J Am Acad Child Adolesc Psychiatry* 2001; 40: 1337–1345.
32. Spinella M. Normative data and a short form of the Barratt impulsiveness scale. *Int J Neurosci* 2007; 117: 359–368.
33. Li J, Han ZR, Gao MM, et al. Psychometric properties of the Chinese version of the difficulties in emotion regulation scale (DERS): Factor structure, reliability, and validity. *Psychol Assess* 2018; 30: e1–e9.
34. Saritaş-Atalar D, Gençöz T, Özen A. Confirmatory factor analyses of the difficulties in emotion regulation scale (DERS) in a Turkish adolescent sample. *Euro J Psychol Assess* 2015; 31: 12–19.
35. Yiğit İ, Guzey Yiğit M. Psychometric properties of Turkish version of difficulties in emotion regulation scale-brief form (DERS-16). *Curr Psychol* 2019; 38: 1503–1511.
36. Markus KA. Principles and Practice of Structural Equation Modeling by Rex B. Kline. *Struct Equat Model* 2012; 19: 509–512. doi: 10.1080/10705511.2012.687667
37. Widaman KF, Reise SP. Exploring the measurement invariance of psychological instruments: Applications in the substance use domain. *Sci Prevent: Methodolog Adv Alcohol Subs Abuse Res* 1997; 281–324.
38. Chen FF. Sensitivity of goodness of fit indexes to lack of measurement invariance. *Struct Equat Model* 2007; 14: 464–504. <https://doi.org/10.1080/10705510701301834>.
39. Chen FF, Sousa KH, West SG. Testing measurement invariance of second-order factor models. *Struct Equat Model* 2005; 12: 471–492.
40. Kiekens G, Hasking P, Boyes M. Measurement invariance of three brief emotion regulation questionnaires in people with and without a history of non-suicidal self-injury. *Euro J Psychol Assess* 2019; 35: 835–841.
41. Ahmed SP, Bittencourt-Hewitt A, Sebastian CL. Neurocognitive bases of emotion regulation development in adolescence. *Develop Cogn Neurosci* 2015; 15: 11–25.
42. Beauchaine TP. Future directions in emotion dysregulation and youth psychopathology. *J Clin Child Adolesc Psychol* 2015; 44: 875–896. <https://doi.org/10.1080/1537441620151038827>.
43. Morris AS, Silk JS, Steinberg L, et al. The role of the family context in the development of emotion regulation. *Soc Develop* 2007; 16: 361–388.
44. Raver CC. Placing emotional self-regulation in sociocultural and socioeconomic contexts. *Child Dev* 2004; 75: 346–353.
45. Bardeen JR, Fergus TA, Hannan SM, et al. Addressing psychometric limitations of the difficulties in emotion regulation scale through item modification. *J Pers Assess* 2016; 98: 298–309.
46. Bjureberg J, Ljótsson B, Tull MT, et al. Development and validation of a brief version of the difficulties in emotion regulation scale: The DERS-16. *J Psychopathol Behav Assess* 2016; 38: 284–296.
47. Fowler JC, Charak R, Elhai JD, et al. Construct validity and factor structure of the difficulties in emotion regulation scale among adults with severe mental illness. *J Psychiatr Res* 2014; 58: 175–180.
48. Bardeen JR, Fergus TA, Orcutt HK. An examination of the latent structure of the difficulties in emotion regulation scale. *J Psychopathol Behav Assess* 2012; 34: 382–392.
49. Benfer N, Bardeen J. *Factor structure and incremental validity of the original and modified versions of the difficulties in emotion regulation scale*. 2018. <https://www.researchgate.net/publication/325933964>.
50. Kökönyei G, Urbán R, Reinhardt M, et al. The difficulties in emotion regulation scale: Factor structure in chronic pain patients. *J Clin Psychol* 2014; 70: 589–600.
51. Saritaş D, Grusec JE, Gençöz T. Warm and harsh parenting as mediators of the relation between maternal and adolescent emotion regulation. *J Adolesc* 2013; 36: 1093–1101.