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Psychometric Validation of the Persian Self-Compassion Scale Youth Version

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Abstract

Objectives Empirical research investigating self-compassion is a rapidly developing field, and it is potentially crucial in early adolescence. The primary aim of the present study was to psychometrically evaluate the Persian translation of the Self-Compassion Scale Youth version (SCS-Y) and evaluate its factor structure among young adolescents. The second aim was to explore the buffering effect of self-compassion against the negative effect of difficulties in emotion regulation on COVID-19-related anxiety.

Methods A sample of young students ($n = 532$; mean age 13.57 years) completed an online survey, which included the SCS-Y, Patient Health Questionnaire, Difficulties In Emotion Regulation Scale, Coronavirus Anxiety Scale, Youth Life Orientation Test, Brief Resilience Scale, and Brief 10-Item Big Five Inventory. First-order (six-factor) confirmatory factor analysis (CFA) and bi-factor exploratory structural equation modeling (ESEM) analysis were used to evaluate the factor structure of the SCS-Y.

Results Results showed that the SCS-Y had very good internal consistency (Cronbach's alpha coefficient: 0.88; McDonald's omega coefficient: 0.90), composite reliability (0.87), and adequate test–retest reliability after 4 weeks (0.60). The first-order (six-factor) CFA and bi-factor ESEM analysis demonstrated the SCS-Y had excellent dimensionality. Further analysis found negative associations between self-compassion with both depression and neuroticism, and positive associations between self-compassion with both resilience and optimism. Moreover, self-compassion moderated the association between emotion dysregulation and anxiety generated by the COVID-19. Overall, the findings indicated that the SCS-Y had acceptable criterion-related validity, convergent validity, and discriminant validity.

Conclusions The findings provide evidence that the SCS-Y is a reliable and valid instrument for assessing the six factors of self-compassion among younger adolescents. Based on the study's findings, self-compassion appears to be a protective factor against mental health problems during the COVID-19 pandemic for younger adolescents.

Keywords Self-compassion · Emotion regulation · Personality · Optimism · Adolescents · COVID-19

For most adolescents, self-criticism, self-blame, and self-negative evaluation are automatic and habitual responses to rejection or failure associated with psychopathological vulnerability (Cleare et al., 2019). However, self-compassion is related to well-being and more adaptive response in times of personal struggle (Di Fabio & Saklofske, 2020; Neff et al., 2007; Werner et al., 2012). Self-compassion, rooted in Buddhist philosophy, represents the balance between decreased negative and increased positive self-responding (Neff, 2003; Neff, 2016). Numerous studies have shown that self-compassion is associated with positive psychological well-being (McKay & Walker, 2021) and is a

protective factor in the development of psychopathology (Wilson et al., 2018) in different cultures (Neff et al., 2019) and genders (Yarnell et al., 2019) among adults.

Regarding adolescents, most research examining self-compassion has been carried out among older adolescents. More specifically, empirical studies indicate that self-compassion in older adolescents is a protective factor against anxiety (Gill et al., 2018), depression (Pullmer et al., 2019), risky behaviors (Marsh et al., 2018), and post-traumatic disorders (Neff & McGehee, 2010). Self-compassion is associated with positive psychological indicators among older adolescents, including resilience (Bluth et al., 2018), subjective well-being (Ge et al., 2019), optimism, and emotion regulation (Gilbert, 2014). Empirical research investigating self-compassion is a rapidly developing field, and it is potentially crucial during early adolescence. Moreover, growing evidence indicates that self-compassion can develop during childhood and younger adolescents can benefit from self-compassion (Cheang et al. 2019). However, there are far fewer self-compassion studies comprising younger adolescents compared to those with older adolescent and adult samples. The lack of specific instrument that measures the self-compassion across early adolescents can be considered one reason for this bias in published research.

Early adolescence is a distinct and complex transitional stage of human growth and development, situated between childhood and later adolescence. Early adolescence is characterized by physical and psychological changes, identity formation, gender conformity, and self-concept development (Roeser & Pinela, 2014). Also, brain development during early adolescence impacts emotional, cognitive, physical, and mental ability. For example, while emotional reactivity increases, the brain region related to control are still immature (Morales & Fox, 2019). Suicidal ideation and body dissatisfaction peak during early adolescence (Strandheim et al., 2014) Compared with older adolescents, younger adolescents are at the incipient stages in the development of the cognitive and emotional resources to regulate emotions. Consequently, younger adolescents may be more vulnerable to psychopathology and maltreatment. Compared with maltreatment or mental health problems in later adolescence, such experiences occurring in early adolescence lead to more significant negative effects

on mental health and social adjustment (Pechtel & Pizzagalli, 2011). Self-compassion is also likely to play an important role in the well-being of younger adolescents given the importance of identity formation and self-concept development during this period (Erikson, 1968; Harter, 1999). To date, self-compassion studies have employed the same instruments across different developmental stage groups and have applied adult self-compassion measures to adolescents with little or no modification.

For example, the adult Self-Compassion Scale (SCS; Neff, 2003) is a widely used instrument that has also been used to assess self-compassion in adolescents. Younger adolescents may potentially find problems with the concept of SCS. To better understand the concept, the scale and items must be brief, understandable, appropriate to the developmental stage, and be relevant to the experiences of younger adolescents. Moreover, the development of a scale and collection of quantitative data directly from children, rather than relying on the measure for adults, provides more reliable information. Therefore, the precise assessment of such strategies may be helpful for the diagnosis of emotional problems during early adolescence and for designing more efficacious prevention programs. For an accurate self-compassion assessment, a developmental approach in designing a specific instrument may provide the opportunity to carry out more robust research comprising younger adolescents who are often overlooked in research examining well-being. The Self-Compassion Scale for Children (SCS-C) is a 12-item scale developed to assess self-compassion among children aged 8-12-years-old (Sutton et al., 2018). However, this brief scale is arguably narrow in assessing all six dimensions of self-compassion.

The Self-Compassion Scale-Youth (SCS-Y) version is a multi-dimensional scale specifically developed to assess self-compassion and its six dimensions across younger adolescents (Neff et al., 2020). The six dimensions comprise self-kindness, common humanity, self-judgment, isolation, mindfulness, and over-identification. The six dimensions refer to conceptually different strategies and a range of individual responses implicated in struggle situations. All six elements of self-compassion are conceptually separable but comprise an integrated system in which the dimensions interact and influence each other. Self-kindness versus self-judgment refers to a range of individual differences in

emotional responses to suffering. Common humanity versus isolation refers to a range of individual cognitive understandings of difficulties and disadvantages. Mindfulness versus over-identification refers to paying attention to painful feelings and thoughts in a mindfully balanced manner rather than over-identified repeated biased attention. Self-compassion theory encourages individuals to embrace their fears, shortcomings, and disappointments as an inherent part of common humanity so that individuals can be more forgiving and compassionate to themselves and others.

Recently, research into self-compassion has raised issues concerning the factor structure and dimensionality of the adult SCS (Neff, 2003). Self-compassion has typically been assessed as a bi-dimensional construct, comprising the positive dimension or self-warmth (self-kindness, common humanity, and mindfulness) and the negative dimension or self-coldness (self-judgment, isolation, over-identification) (Muris et al., 2016; Potter et al., 2014). However, using two scores representing positive (compassionate) responses and negative (uncompassionate) responses is not optimal given that studies have demonstrated poor psychometric properties for the two factors (e.g., Neff et al., 2019). Conceptually, the two-factor approach fails to distinguish between different domains of individual-responding (e.g., emotional, cognitive, and attentional).

Bi-factor exploratory structural equation modeling (ESEM) has been used to help conceptualize self-compassion as an integrated system with six independent subscales (Neff, 2016). ESEM is a robust psychometric method and has been utilized to overcome the limitations of confirmatory factor analysis (CFA; i.e., all cross-loadings constrained to zero; overestimated correlations between latent constructs) (Marsh et al., 2011). ESEM also incorporates the benefits of exploratory factor analysis (EFA) approach (i.e., cross-loadings) and the CFA approach (i.e., *a priori* defined structure; Asparouhov & Muthén, 2009). ESEM is a promising framework representing superior model fit over CFA and a possible alternative to CFA (Asparouhov & 2015; Marsh et al., 2014). A bifactor-ESEM approach provides a more precise psychometric examination in simultaneously evaluating both general factor and six-factor construct-relevant multidimensionality

(Morin et al., 2016). Recent investigations have demonstrated that utilizing the bifactor-ESEM approach is best when addressing the balance between self-compassion as an integrated system with six independent subscales (Neff et al., 2019; Tóth-Király et al.,2017; Tóth-Király & Neff, 2020).

Exposure to trauma and maltreatment in early adolescence may prevent the development of adaptive emotion regulation skills and self-compassion (Vettese et al. 2011). While difficulty with emotion regulation is associated with internalizing disorders and mental health problems (Li et al., 2021), there is growing evidence demonstrating that self-compassion may mitigate the initiation and maintenance of internalizing symptomatology. On the other hand, the relationship between self-compassion and anxiety appears to be well-documented (Conversano et al., 2020). A higher level of self-compassion can potentially diminish the severity or intensity of negative affective response, emotional reactivity, and adverse psychological consequences in response to daily emotive situations and stressful events, particularly among vulnerable groups such as children (Coyne et al., 2020). Higher self-compassion can reduce neuroticism by reducing negative self-responding to traumatic life events (Zeller et al., 2015; Hayes et al., 2016; Li et al., 2021). A longitudinal study of adolescents involved in a traumatic event demonstrated that students with higher self-compassion were protected against later development of both anxiety and depressive symptoms (Zeller et al., 2015). Also, lower levels of self-compassion have been found to be predictive of internalizing symptoms and anxiety and post-traumatic stress during the COVID-19 pandemic (Braehler & Neff, 2020). Moreover, self-compassion has been found to be the main predictor of improvements in perceived stress, rumination, and depressive symptoms among adolescents (Galla, 2016), and predicted less physiological reactivity among adolescents exposed to stressors (Bluth et al., 2016). Regarding exposure to traumatic life events, recent research has shown that self-compassion protects against anxiety in response to stressors (Neff et al., 2007) and is associated with adaptive responses to everyday negative life events (Leary et al., 2007). The anxiety, isolation, and uncertainty as a consequence of the COVID-19 pandemic has been an unprecedented traumatic situation (Wu et al., 2021). Also, the physical closing of schools (resulting in considerable social isolation for students) has been considered one of the central factors

in developing psychological health issues (e.g., lower social connectedness, higher social isolation, higher psychological distress, and higher depression), all of which can be risk factors for anxiety symptoms (Sekowski et al., 2020). Despite accumulating evidence for the mental health benefits of self-compassion, there is a dearth of literature examining self-compassion during adolescence.

The present study was conducted because the validation of a specific instrument to assess self-compassion among early adolescents is important, particularly during the COVID-19 pandemic. The study assessed the reliability and validity of an instrument assessing self-compassion among early adolescents, which captures the core concepts of self-compassion and that is easily read and understood by younger adolescents. The present study was also conducted to contribute to the growing body of empirical evidence of the benefits of self-compassion during adolescence. Additional analysis was carried out to examine whether self-compassion moderates the association between emotion dysregulation and COVID-19 anxiety.

Method

Participants

A sample of 532 young adolescents (270 boys and 262 girls) recruited in the study. The mean age was 13.57 years (*SD* = 1.01, range 12–15). The eligibility criteria comprised being aged between 11-15 years, having the ability to understand questions, read and complete a consent form and survey, and having Persian language fluency. Permission by the developer of the SCS-Y to use the scale was granted before data collection. Socioeconomic characteristic (SEC) information was not requested because young adolescents may not have not reliable knowledge of their family's SEC.

Procedure

Transcultural adaptation of the SCS-Y: The English version of the SCS-Y was translated to Persian following international guideline (Beaton, Bombardier & Guillemin, 2000). In the first step, the English version of the SCS-Y was translated independently into Persian by two Persian translators.

One of the translators was aware of the concepts being examined in the scale (a psychologist). The other translator was neither informed nor aware of the scale concepts and had no psychological background. To synthesize a consensus version, an expert committee reviewed the two versions. Then, an English translator completed a backward translation (Persian-to-English) of the consensual version. There were no major changes made during this cultural adaptation.

Pilot study: In the pre-test stage, 32 students were selected from the target sample to evaluate the consensus translated SYS-Y. The participant debriefing was conducted to identify actual and potential linguistic understanding, grammar, and ambiguity. No significant changes to the scale were needed.

Sampling: A convenience sample of the younger adolescent general Persian population was recruited face-to-face and via the internet and utilizing snowball sampling. The teachers collected data during school hours. The teachers were post-graduate and doctoral students in educational psychology, and they were fully aware of how to collect data and obtain digitally informed consent.

Sample size: A priori power analysis for multiple linear regression was calculated using G-Power, using an alpha of .05, a power of 0.80, Cohen's $f^2 = .02$, and self-compassion as a predictor to determine the sample size (Faul, Erdfelder, Lang, & Buchner, 2009). The Cohen's $f^2 = .02$ value signifies a small effect size (Cohen, 1988). The desired total sample size was 395. Finally, 532 participants were recruited in the present study, which allowed for a 15% loss of data.

Measures

Self-Compassion Scale-Youth version (SCS-Y; Neff et al., 2020). The 17-item SCS-Y was used to assess self-compassion among adolescents (aged 11 to 15 years). The SCS-Y comprises six subscales (i.e., self-kindness, common humanity, and mindfulness, self-judgment, isolation, and over-identification) with items rated on a five-point scale from 1 (*almost never*) to 5 (*almost always*). Scores range from 17 to 85. A grand mean of the six subscale means was used to calculate a total score. A

higher score indicates higher self-compassion. The psychometric properties of the scale are presented in the Results section.

Two-Item Patient Health Questionnaire (PHQ-2; Kroenke, Spitzer & Williams). The PHQ-2 was used to assess depression in the past two weeks. Respondents rate the two items (e.g., "*Trouble falling or staying asleep, or sleeping too much*") on a four-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Scores range from 0–6. A higher score indicates more severe depression symptoms. The scale demonstrated very good internal consistency in the present study (α = .84).

Brief 10-Item Big Five Inventory (BFI-10; Rammstedt & John, 2007). In the present study, two items were used to assess neuroticism (e.g., *"I see myself as someone who gets nervous easily*"). Respondents rate the items on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores range from 2–10. A higher score indicates a higher level of neuroticism. The scale demonstrated very good internal consistency in the present study (α = .86).

Test Brief Resilience Scale (BRS; Smith et al., 2008). The six-item BRS was used to assess adolescent abilities to recover from adversity. Respondents rate the items (e.g., *"I usually come through difficult times with little trouble*") on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate greater levels of resilience. The scale demonstrated very good internal consistency in the present study (α = 0.85).

Difficulties in Emotion Regulation Scale Short Form (DERS-SF; Kaufman et al., 2016): The 18-item DERS-SF was used to assess emotion dysregulation. Respondents rate the items (e.g., "*When I'm upset, I have difficulty focusing on other things*") on a five-point scale ranging from 1 (*almost never*) to 5 (*almost always*). Scores range from 18-90. Higher scores indicate greater difficulty in regulating emotion. The scale demonstrated very good internal consistency in the present study (α = .85).

Youth Life Orientation Test (YLOT; Ey et al., 2005). The 16-item YLOT was used to assess children's optimism and pessimism. Respondents rate the items (e.g., "*I usually expect to have a good*

day") on a four-point scale ranging from 0 (*strongly disagree true for me*) to 3 (*strongly agree true for me*). Scores range from 0-48. Higher scores indicate greater positive expectations for future events. The scale demonstrated very good reliability in the present study (α = 0.81).

Coronavirus Anxiety Scale (CAS; Lee, 2020). The five-item CAS was used to assess COVID-19-related anxiety. Respondents rate the items (e.g., "*I had trouble falling or staying asleep because I was thinking about the coronavirus*") on a five-point scale ranging from 1 (*strongly disagree*) 5 (*strongly agree*). Scores range from 5-25. A higher score indicates a greater level of COVID-19-related anxiety. The scale demonstrated very good internal consistency in the present study (α = 0.84).

Data analyses

Descriptive analyses were performed using SPSS version 25 (SPSS Inc., Chicago, IL) with a two-tailed 5% level of significance. There were no missing values in the assessed variables. Therefore, no imputation method was implemented. Chi-squares and independent *t*-tests investigated the differences between groups (boys and girls). The univariate normality assumption was examined using the values of skewness and kurtosis. Additionally, the multicollinearity issue was checked using the variance inflation factor (VIF) (1<VIF<3) (Hair et al., 2018).

Construct validity

The SCS-Y item responses are ordinal. Therefore, six-factor first-order CFA model and bi-factor ESEM model were investigated to examine the construct validity of the SCS-Y, using weighted least squares mean-variance adjusted (WLSMV) estimator in Mplus Version 7 (Muthén & Muthén, 2012). The benchmark suggested by Hu and Bentler (1999) was considered to evaluate the goodness of fit the models: (comparative fit index [CFI] and Tucker-Lewis index [TLI] >.95; standardized root mean square residual [SRMR] and root mean square error of approximation [RMSEA] <.06). Measurement invariance was evaluated across gender (girls/boys) for the superior model. The models were compared utilizing better goodness of fits, higher factor loadings, and lower values of the Bayesian information criterion. The superior CFA model was evaluated across both girls' and boys'

samples. Once the quality of the respective models was established, multi-group analysis was conducted with four models, including more constrained models that evaluated configural invariance, metric invariance, scalar invariance, and error variance invariance. A change in CFA (ΔCFI) < .01), a change TLI (ΔTLI) < .01, and a change in RMSEA (ΔRMSEA) < .015 indicate non-invariance between models (Chen, 2007; Cheung & Rensvold, 2002, 2009). Moreover, the guideline was used to compare whether there were significant differences in the two models' quality.

Reliability

Reliability was assessed with a several of indices. The values of Cronbach coefficient > .8, McDonald's (1970) model-based composite reliability (CR)> .7, and The McDonald's ω of the total SCS-Y > .7 were deemed to be very good psychometric properties. The test-retest analysis was conducted four weeks from the validation study, and reliability was calculated utilizing the intraclass coefficient (ICC). Convergent validity was tested for SCS-Y and its sub-scales utilizing average extracted variance (AVE>.5) (Hair et al., 2018). Discriminant validity was checked using Fornell-Larcker criterion. It compares the square root of the AVE with the correlations of latent construct. Statistically, the square root of each construct's AVE values should be greater than its highest correlations with other latent structures (Henseler et al., 2016).

SEM analysis was performed using AMOS version 24 to establish criterion-related validity of SCS-Y. To evaluate criterion-related validity of the SCS-Y its six subscales, correlation analyses was performed using the scores on the scales assessing depression, neuroticism, resilience, and optimism. It was expected that the SCS-Y, self-kindness, mindfulness, and common humanity would be (i) positively associated with resilience and optimism, and (ii) negatively associated with depression and neuroticism. As for discriminant validity, it was also expected that self-judgment, over-identification, and isolation would be (i) positively associated with depression and neuroticism, and (ii) negatively associated with resilience and optimism. Z test was performed to compare the correlation coefficient of resilience and optimism with self-compassion.

Moderation analyses

SEM was conducted to confirm if overall individual abilities in the six dimensions of self-compassion would moderate the effects of emotion dysregulation on COVID-19 anxiety. The interaction effects of maladaptive emotion and self-compassion *(maladaptive emotion × self-compassion)* on COVID-19 anxiety were also investigated (see Figure 1). An indirect effect is statistically significant when the calculated 95% bias-corrected confidence interval (CI) does not include zero (Hayes, 2017). The 95% CI was generated by the bias-corrected method for the point estimate with 5,000 bootstrapped samples.

Figure 1

Results

Descriptive characteristics at baseline

The descriptive characteristics of the sample are presented in Table 1. For all 17 items of SCS-Y, the absolute values of skewness and kurtosis and the VIF values were in the acceptable range ($1<VIF<3$). Overall, there was no violation according to normality and multicollinearity assumptions (see Table 2). Boys obtained higher scores in self-compassion and resilience than girls. Girls obtained higher scores in neuroticism and COVID-19 anxiety. Significant gender differences were found for self-compassion (t [530] = 2.69, $p<.01$, Cohen's d = .31, 95%CI [.17, .49]), Cohen's d = .38, 95% [.21, .53]) and resilience (t [530] = 2.53, $p<.01$, Cohen's d = .29, 95% CI [.15, .46] for boys, and neuroticism (t [530] = 2.65, $p<.01$, Cohen's d = .35, 95% CI [.19, .51]) and COVID-19 anxiety (t [530] = 2.04, p = .03, Cohen's d = .15, 95% CI [.04, .25]), for girls. No other gender differences were found on any other variables (see Table 1).

Tables 1 & 2

Construct validity

Evaluation of the fit indices showed that the six-factor first-order CFA model (χ^2/df = 2.68, CFI = .965, SRMR = .048, RMSEA = .056, 90% CI [.049, .064]), and bi-factor ESEM model (χ^2/df = 1.45, CFI = .990, SRMR = .029, RMSEA = .03, 90% CI [.016, .046]) fitted the data well. Also,

comparison of both models found superior fit for the bifactor solution. The standardized factor loadings for the models showed that all 17 SCS-Y items loaded significantly on their specific factors, factor loading > .30 (see Table 2). The bifactor ESEM model demonstrated excellent goodness of fit. Moreover, the bifactor ESEM loading factors were higher than loading factors for six-factor CFA model. Measurement invariance was conducted across gender for the bi-factor ESEM. The analysis produced excellent fit for both the boy sample (χ^2/df = 1.19, CFI = .996, SRMR = .027, RMSEA = .01, 90% CI [.001, .034]), and girl sample (χ^2/df = 1.24, CFI = .991, SRMR = .033, RMSEA = .031, 90% CI [.001, .048]). Finally, the results of the multi-group CFA analysis are presented in Table 3 (Δ*T*LI < .01, Δ*CFI* < .01). The measurement invariance analysis indicated that the SCS-Y was fully invariant across gender.

Table 3

Reliability

The values of Cronbach alpha (α = 0.88), The McDonald's (ω = 0.90), and the McDonald's model-based composite reliability (CR = .87) of the total SCS-Y were satisfactory. The calculated Cronbach alpha and CR for SYS-Y subscales were psychometrically satisfactory (see Table 4). The Cronbach alpha if item deleted values (higher than .7) and the squared multiple correlation values (higher than .3) were all well above the recommended levels (see Table 2). After four weeks of the validation study, the SCS-Y was sent to sample who were randomly selected from the study sample by a random number generator (*n* = 250). Of these, 122 surveys were received. The ICC was .60 with 95% CI [0.40, 0.74], *F* (1, 121) = 2.16, *p*<.001). The AVE value was higher than .50 for SCS-Y (.67) and for each SCS-Y dimension (ranging between .566 and .775). Moreover, the following relationship was obtained: MSV<AVE<CR<MaxR (H). Moreover, the squared root of AVE values were higher than the coefficient of the correlation between factors (See table 4).

Table 4

The SEM analysis found negative associations between self-compassion with both depression and neuroticism and positive associations between self-compassion with both resilience and optimism (demonstrating convergent validity). Also, self-compassion was more significantly associated with resilience (Z score = 2.49; p = .007), compared with optimism(demonstrating discriminant validity), It was also found that self-compassion predicted neuroticism (β = -.46, SE = .03, p<.001), depression (β = -.24, SE = .04, p<.001), resilience (β = .38, SE = .04, p<.001), and optimism (β = .28, SE = .04, p<..0.01) (see Figure 2). Moreover, the six dimensions of self-compassion were significantly correlated with depression, neuroticism, resilience, and optimism. More specifically, each positive mechanism of self-compassion was positively associated with resilience and optimism and each negative mechanism of self-compassion was negatively associated with depression, COVID-19 anxiety, and neuroticism (see Table 5).

Figure 2 and Table 5

Moderation analyses

The moderation model is shown in Figure 3. The results suggested the model fitted the data well; χ^2/df = 1.00, CFI = 1.00, TLI = 1.00, RMSEA = 0. 90% CI [.0, .04]. The standardized total effect of emotion dysregulation on COVID-19 anxiety was statistically significant, with a large effect size; β = .54, SE = .05, p<.001, t = 7.91, Cohens f^2 = .42, 95% CI [0.46, 0.61]. The moderation analysis showed emotion dysregulation directly predicted COVID-19 anxiety with low to moderate effect size: Cohen's f^2 = .09, 95% CI [0.15, 0.39]. Moreover, self-compassion directly predicted COVID-19 anxiety but with a low effect size; Cohen's f^2 = .04, 95% CI [0.02, 0.09]). The interaction effect of emotion dysregulation and self-compassion (emotion dysregulation × self-compassion) significantly predicted COVID-19 anxiety with medium effect size: Cohen's f^2 = .12, 95% CI [-0.37, -0.21].

Figure 3

Discussion

The primary aim of the present study was to translate the Self-Compassion Scale Youth Version to the Persian and assess its validity and reliability among young adolescents. The second aim was to

explore the buffering effect of self-compassion (as assessed using the SCS-Y) against the negative effect of maladaptive emotion regulation strategies on COVID-19 anxiety. The study findings demonstrated that the SCS-Y is a valid instrument to assess self-compassion across six subscales among the general younger adolescent population. The study's findings also provided evidence of the superiority of the bi-factor ESEM of self-compassion compared to first-order CFA (six-factor). The factor structure analysis suggested that the SCS-Y is a six-factor construct, and therefore the findings were consistent with the original psychometric validation study (i.e., Neff et al., 2020).

The present study provides further empirical evidence of the psychometric robustness of the SCS-Y and its factor structure, using the novel bi-factor ESEM framework, and the testing of measurement invariance. Bi-factor ESEM reflected the excellent dimensionality of self-compassion. Findings correspond to the growing evidence that self-compassion and its six components can be fully understood within a multidimensionality framework that captures construct-relevant psychometric (e.g., Tóth-Király, Bőthe, & Orosz, 2017; Tóth-Király & Neff, 2020). Also, the measurement invariance for bifactor-ESEM structure yielded further support for the structure stability across gender, which was not evaluated in the original study. The measurement invariance analysis indicated that the SCS-Y was fully invariant across gender. Therefore, the SCS-Y can be used to make reliable comparisons between gender (girls/boys; i.e., the items in the SCS-Y are interpreted the same whether the respondent is boy or girls).

The values of Cronbach alpha, CR, and McDonald's ω demonstrated that the Persian SCS-Y had very good internal consistency. In line with research comprising older adolescents and young adults, self-compassion was associated with positive psychological constructs which have previously been identified in the extant literature. This includes resilience (Trompetter et al., 2017; Neff & McGehee, 2010) and optimism (Muris et al., 2020; Shapira & Mongrain, 2010). Self-compassion was negatively associated with other constructs identified in the literature including depression (Barlow et al.,2017; Lathren et al., 2019; Raes, 2011) and neuroticism (Geiger et al., 2018; Pyszkowska, 2020). In line with research, the positive SCS-Y subscales (self-kindness, common humanity, and

mindfulness) were significantly and positively associated with resilience and optimism (Mona & Angela, 2018), and significantly and negatively associated with depression, emotion dysregulation, COVID-19 anxiety, and neuroticism. Also, the higher scores on the self-judgment, over-identification, and isolation sub-scales of the SCS-Y were associated positively with higher scores for depression, emotion dysregulation, COVID-19 anxiety, and neuroticism (Dreisoerner et al., 2020) and they were associated with lower scores on resilience and optimism. Moreover, the findings support the convergent and discriminant validity for self-compassion construct. Overall, the study's findings indicate the SCS-Y had acceptable criterion-related validity, convergent validity, and discriminant validity.

Significant gender differences were also found. Consistent with previous research, boys reported higher total self-compassion scores than girls (Yarnell et al., 2015). The study findings align with previous studies indicating that females are more likely to develop anxiety symptoms and be more neurotic than boys, globally (Schmitt et al., 2016). In addition, Iranian females reported more psychological problems (i.e., anxiety) associated with COVID-19 than males, which also concurred with previous research (e.g., Nazari & Griffiths, 2020; Ahourso et al., 2020). Previous findings also suggest that culture shapes not only our emotions but also the way they are experienced and expressed (von Suchodoletz& Hepach, 2021). Therefore, One possible explanation of gender differences can be related to cultural contexts (Khramtsova & Chuykova, 2016; Neff et al., 2008; Pfabigan et al., 2018). For example, in Eastern cultures, individuals are encouraged to dampen their negative emotions, particularly females. Cultural differences suggest that females in Eastern communities may more likely to be engaged with maladaptive coping strategies (e.g., self-judgment) than boys.

The moderation analysis indicated the buffering effect of self-compassion in the association between emotion dysregulation and anxiety generated by COVID-19. Difficulty with emotion regulation was a strong predictor of the COVID-19 anxiety with large effect size. The study offers insights into the way that self-compassion may work to weaken the associations between emotion

dysregulation with anxiety generated by COVID-19. The findings suggest the potential positive influence of self-compassion in therapeutic programs designed to reduce the adverse effect of the COVID-19 pandemic, particularly among female adolescents with higher emotion dysregulation. The mechanisms involved with emotional regulation appear to be related to self-compassion, mainly being aware and accepting emotions, managing emotional impulses, and having strategies to deal with distressing emotions (Shattell & Johnson, 2018). These findings highlight the role of self-compassion in acting as an adaptive strategy to regulate emotions (Diedrich et al., 2014; Ferguson et al, 2014; Finlay-Jones et al., 2015; Neff, 2003).

The impact of high state emotion dysregulation on anxiety generated by COVID-19 was lower for adolescents with high self-compassion than for individuals with lower levels of self-compassion. The findings are in line with an increasing number of studies showing a negative association between self-compassion and psychopathology vulnerability in the form of anxiety (Werner et al., 2012; Pérez-Aranda et al., 2021). Additionally, adaptive emotion functioning such as self-compassion is a viable predictor of subsequent psychopathology in early adolescence than in later adolescence. Moreover, the promotion of adaptive coping strategies during early adolescence may reduce the risk of internalizing disorders in the later stages of adolescence and emerging adulthood. While self-compassion predicts optimism, there is evidence indicating that traits related to optimism, such as self-compassion, facilitate the recovery from the impacts of trauma and other mental health symptoms (Gilbert & Procter, 2006; Nazari et al., 2021). The adapted Mindful Self-Compassion intervention for adolescents is effectiveness intervention to enhance sense of connectedness (Bluth et al. 2016). Self-compassion and its six subscales may address the different ways that individuals emotionally respond to suffering (with kindness or judgment), cognitively understand their predicament (as part of the human experience or as isolating), and the way individuals pay attention to pain (in a mindful or over-identified manner) (Allen & Leary, 2010; Zeller et al., 2015).

Limitations and Future Research Directions

The findings of the study should be interpreted in light of several limitations. The study was conducted during the COVID-19 pandemic, and to minimize infection risk, data collection occurred online. Using an online data collection method may limit specific relevant population groups (e.g., disadvantaged groups) and other vulnerable groups. Therefore, the data cannot represent the views of these disadvantaged groups, and affects the study findings' generalizability. However, online data collection tends to provide more honest and truthful responses than those utilizing offline methods (Griffiths, 2010). Another limitation of the present study was that the data relied entirely on self-report measures which have well established methodological biases. Finally, while this study provided novel insight into the relationship between self-compassion and other variables among adolescents, cross-sectional studies do not provide evidence of a temporal relationship in relation to these variables. Longitudinal data would be required to confirm the causal nature of the concepts investigated and cross-lagged panel analysis is warranted. For future research, validation of the specific multi-dimensional research instrument based on the development stage is a promising approach in assessing self-compassion and supporting professionals in reducing the burden of mental health problems among adolescents (Glasner et al., 2021).

Declaration

Ethics approval and consent to participate

The study was performed in accordance with the Declaration of Helsinki and was approved and registered by the ethical and research committees from the following collaborating centre. The study was reviewed and approved by the Ethics Committee of Hakim University (IR.IAU.S.REC.1399.006) prospectively. All participants provided a signed written consent.

Competing interests

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

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Availability of data and material

The data that support the findings of this study are available on request from the corresponding author.

Authors' Contributions

NN: Conceptualization, Methodology Writing- Original draft preparation MDG: Data curation, Writing- revision draft preparation. Validation. Supervision. RMH & YOF: Visualization, Investigation, Software. All authors Writing- reviewing and editing.

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Table 1 Demographic characteristics of the sample ($N = 532$)

Item	Value	Test	*p-value*
Categorical variables			
Gender, *n (%)*			
Girl	270 (50.8)	$\chi^2 = .12$	.73
Boy	262(49.2)		
Grade, *n (%)*			
7th	181(34)		
8th	191 (35.9)	$\chi^2 = 2.83$	..24
9th	160 (30.1)		
Continues variables *M (SD)*			
Age	13.57 (1.01)	$t(1, 530) = .60$	.54
Self-compassion youth	2.51 (0.65)	$t(1, 530) = 2.68$	< .01
COVID-19 anxiety	10.35(3.70)	$t(1, 530) = -2.04$	.03
Emotion dysregulation	41.16 (13.92)	$t(1, 530) = 1.75$	.059
Depression	1.85 (.95)	$t(1, 530) = -1.73$	.052
Neuroticism	5.36 (1.92)	$t(1, 530) = -2.56$	< .01
Resilience	2.43 (0.53)	$t(1, 530) = 2.53$	< .01
Optimism	12.29 (3.11)	$t(1, 530) = 1.65$	.60

Note: *n* frequency; *y* years; *M* mean; *SD* standard deviation

t = independent t-test to compare gender; negative t value = girls obtained higher score

Table 2 Item analysis of the SCS-Y ($N = 532$)

	CFA	Bi-factor ESEM							Item analysis				
	SF	SC	CH	SJ	ISO	SK	MI	OI	Correlation	Cronbach's	Skewness	Kurtosis[a]	VIF
SK1	**.796**	**.828**	.167	.142	.238	**.854**	.052	.096	.558	.868	.770	-.701	1.49
SK2	**.787**	**.875**	.146	.169	.218	**.812**	.157	.015	.534	.867	-.034	-.667	1.54
SK3	**.806**	**.894**	.168	.214	.218	**.791**	.033	.054	.519	.866	.369	-.686	2.33
SJ1	**.825**	**.922**	.219	**.845**	.155	.202	.019	.067	.634	.861	.027	-1.361	1.54
SJ2	**.767**	**.765**	.197	**.802**	.148	.153	.058	.116	.537	.863	.057	-1.31	1.58
SJ3	**.867**	**.943**	.168	**.870**	.133	.145	.089	.013	.593	.862	-.249	-.471	1.58
CH1	**.801**	**.828**	**.871**	.188	.166	.132	.081	.019	.586	.864	.082	-.580	2.66
CH2	**.810**	**.875**	**.888**	.151	.122	.175	.007	.052	.572	.866	.046	-.814	2.66
CH3	**.868**	**.829**	**.867**	.249	.143	.152	.031	.065	.626	.863	.785	-.235	2.76
IS1	**.858**	**.922**	.165	.120	**.849**	.262	.043	.062	.335	.876	.598	-.508	2.19
IS2	**.756**	**.765**	.154	.143	**.845**	.233	.065	.029	.463	.874	1.19	1.11	1.79
IS3	**.624**	**.828**	.111	.169	**.797**	.153	.107	.075	.512	.873	.434	-.645	2.18
MI1	**.865**	**.828**	-.007	.053	.044	.105	**.815**	-.015	.683	.864	-.083	-.980	1.33
MI2	**.874**	**.875**	.046	.032	.066	.114	**.856**	.048	.676	.863	.577	-.448	2.35
MI3	**.901**	**.829**	.059	.052	.068	-.028	**.819**	.017	.707	.863	.275	-.596	1.58
OI1	**.846**	**.875**	.043	.066	.060	.070	.014	**.933**	.606	.870	.416	-.536	2.25
OI2	**.798**	**.829**	.082	.113	.096	.075	.041	**.917**	.638	.868	-.047	-.825	2.49

Note: *CFA* confirmatory factor analysis; *Bi-factor ESEM* bi-factor exploratory structural equation modeling; *SK* self-kindness; *SJ* self-judgment (reverse-coded); *CH* common humanity; *IS* isolation (reverse-coded); *MI* mindfulness; *OI* over-identification (reverse-coded); *SC* self-compassion general factor; significant target loadings in bold

Table 3 Invariance measurement ($N = 532$)

Model	Invariance type	χ^2/df	CFI	ΔCFI	TLI	ΔTLI	AIC	RMSEA 90% [CI]
Bi-factor ESEM								
	Configural	1.331	.992	—	.986	—	549.7	.020 [.005, .029]
	Weak (metric)	1.413	.984	-.008	.978	-.008	554.3	.026 [.018, .034]
	Strong (scalar)	1.453	.982	-.010	.976	-.010	549.3	.027 [.017, .034]
	Strict	1.390	.983	-.009	.980	-.006	522.4	.025 [.017, .032]

Note: *CFI* comparative fit index; *TLI* Tucker-Lewis index; *RMSEA* root mean square error of approximation (RMSEA); *CI* confidence interval; *AIC* Akaike information criterion

Table 4 Validity analysis and correlations between SCS-Y factors

Item	Mean	SD	α	MSV	AVE	CR	MaxR(H)	1	2	3	4	5	6
1. Self-kindness	2.63	.83	.82	.413	.634	.839	.84	**.796*****					
2. Self-judgment	2.51	.98	.85	.417	.674	.861	.87	.641**	**.821*****				
3. Common humanity	3.02	.70	.86	.417	.683	.88	.871	.506**	.646***	**.827*****			
4. Isolation	2.60	.98	.82	.061	.566	.83	.841	.162**	.221***	.246***	**.752*****		
5. Mindfulness	3.44	1.06	.90	.290	.775	.91	.913	.353**	.538***	.393***	.224***	**.88*****	
6. Over-identification	2.43	.81	.807	.413	.676	.81	.81	.643**	.504***	.438***	.239***	.296***	**.822*****

Note: In bold: squared root of the AVE

MSV < AVE < CR < MaxR(H), and .5 < CR

CR composite reliability; *SD* standard deviation; *AVE* average extracted variance; *MSV* maximum shared variance; *MaxR(H)* maximum reliability

***$p < .001$

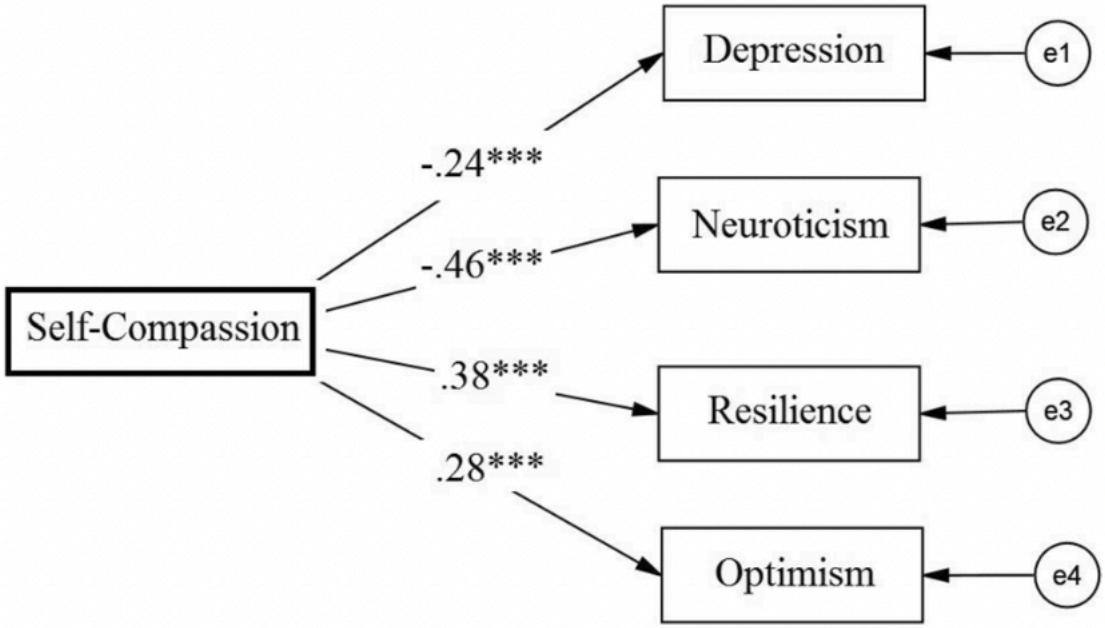

Fig. 1 Associations between self-compassion and well-being indicators

Table 5 The SCS-Y dimension bivariate correlations with interested variables

Item	Depression	Neuroticism	Resilience	Optimism
Self-kindness	−.37**	−.32**	.42**	.30**
Self-judgment	.32**	.44**	−.39**	−.24**
Common humanity	−.22**	−.14**	.24**	.22**
Isolation	.28**	.25**	−.32**	−.29**
Mindfulness	−.34**	−.39**	.38**	.27**
Over-identification	.22**	.16**	−.23**	−.18**

Note: *$p < .05$; **$p < .01$

Fig. 2 Moderation analysis