Measuring Self-Compassion in Medical Students: Factorial Validation of the Self-Compassion Scale–Short Form (SCS-SF)

Objective: The primary purpose of this study was to evaluate the factorial structure of the short-form version of the Self-Compassion Scale (SCS-SF) and validate its use with medical students.

Methods: Two hundred medical students completed an electronic questionnaire containing the 12-item SCS-SF and the 16-item Oldenburg Burnout Inventory. The authors performed reliability and confirmatory factor analyses (CFA) to evaluate the internal consistency and factorial structure of the SCS-SF scores, and correlational analyses to examine relationships of self-compassion with student engagement and exhaustion.

Results: The internal consistency of the SCS-SF was 0.86. Self-compassion scores were positively correlated with engagement scores ($r = 0.24$; $p < 0.01$) and negatively correlated with exhaustion scores ($r = –0.44$; $p < 0.001$). The CFA results for the two-factor model (formed by three positive and three negative components) indicated an improved fit over the single-factor model. The positive factor (self-compassion) was positively correlated with engagement scores ($r = 0.17$; $p < 0.05$) and negatively correlated with exhaustion scores ($r = –0.32$; $p < 0.001$). The negative factor (self-criticism) was negatively correlated with engagement scores ($r = –0.25$; $p < 0.001$) and positively correlated with exhaustion scores ($r = 0.44$; $p < 0.001$).

Conclusions: The SCS-SF scores had good internal consistency and expected relations with student engagement and exhaustion. Although the single, general self-compassion factorial structure had an acceptable fit with the data, the hierarchical two-factor structure of the SCS-SF provides support for the idea that distinguishing between self-compassion and self-criticism in medical students may be important.

Keywords: self-compassion; validity; medical students

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The criteria by which prospective students are selected into medical school likely favours individuals high on perfectionism and low on self-compassion. Medical training and practice, on the other hand, are inherently stressful and require self-compassion – an ability to manage stressful events with compassion and understanding when one has encountered difficulty, made an error or failed [1-3]. According to Neff [1, 2], self-compassion entails: self-kindness – the ability to treat oneself with care rather than harsh self-judgment; common humanity – recognizing that imperfection is a shared aspect of the human experience rather than feeling isolated by one's failure; and mindfulness – holding one's experience in a balanced perspective rather than over-identifying with it. Empirical research indicates that compassion for oneself promotes psychological wellbeing because painful experiences, such as errors and failures, are not amplified through harsh self-condemnation and feelings of isolation but are approached as valuable opportunities for change and growth [3].

From this perspective, self-compassion is an essential protective factor, enabling individuals to manage difficulties constructively and fostering emotional resilience [4, 5]. Compassion for oneself is suggested to ameliorate burnout and secondary traumatic stress in medical students and residents [6]. In a national longitudinal survey of pediatric residents in the United States, self-compassion was found to be longitudinally associated with lower stress and burnout [7]. On behalf of the Pediatric Resident Burnout-Resilience Study Consortium, the authors of the national survey concluded self-compassion to be a promising interventional target for trainees [7]. Research with practicing physicians indicates that those physicians, who approach the practice of medicine with a self-compassionate mindset, experience better

professional outcomes such as being more engaged and feeling less exhausted due to work demands [8].

Intervention research indicates that training in self-compassion helps individuals develop healthy attitudes toward themselves in challenging times, further enhancing learning, performance, and wellbeing [9, 10]. Although similar research in health professions is limited, we anticipate that self-compassion training programs have great potential with health professions learners and practitioners, enabling them to develop self-compassionate frames of mind. An important prerequisite to developing such programs is assessment tools that yield reliable and valid measures of self-compassion in health professions.

Self-compassion is typically assessed using the 26-item Self-Compassion Scale [1] that measures six components of self-compassion: self-kindness, self-judgement, common humanity, isolation, mindfulness, and over-identification. A single, general self-compassion factor has been shown to underlie these six factors or components that can be added to obtain a total score of self-compassion [1]. However, a recent study with community dwelling individuals in the Netherlands could not confirm the general factor structure of the SCS, with results suggesting two factors (self-compassion and self-criticism) to underlie the three positive and three negative components, respectively [11].

Based on the single, general self-compassion factor structure proposed by Neff [1], a short form of the SCS has been developed (SCS-SF; 12 items, 2 items per each factor) [4], with good psychometric properties reported with samples of university students and community-dwelling adults. Although the SCS-SF has been used to measure self-compassion in health professions learners and practitioners [6-8], its factorial structure in these populations is yet to be empirically confirmed. In the present study, we sought to evaluate the SCS-SF factorial structure

and the validity of the scale scores [12] with medical students. The short form is particularly useful in time-constrained settings, including busy academic schedules of medical students, where the use of the long form is less feasible (e.g., when multiple measures or scales are included in a questionnaire).

Methods

This study is part of a research on personal and contextual factors, including self-compassion, in learning and wellbeing of medical trainees and practicing physicians [8, 13-15]. In the present study, we sought validity evidence for the use of the SCS-SF in medical students. Institutional ethics approval was obtained prior to data collection. Using an online questionnaire, quantitative data were collected from medical students at a large Canadian university. Of 640 students in all four years of the medical program, 267 students agreed to participate in the study. Cases with no missing values on the SCS-SF items were used in the analyses. Two hundred students had complete responses on the SCS-SF; of these students, five students chose not to disclose their gender and/or age. Overall, 60% of participating students were female and 93% were under 30 years of age; 23% were in year 1, 30% in year 2, 21% in year 3, and 26 % in year 4 of the medical program.

The SCS-SF [4] was used to measure the degree of compassion students exhibited toward themselves during challenging time. Using a five-point response scale (1–almost never; 5–almost always), students were asked to indicate how often they behaved in a certain way (see Table 1 for items). Scale scores range from 12 to 60, and according to the scale developers, higher scale scores are indicative of greater self-compassion, with the mean score of 36 (SD = 7.3) in the normative population of university students [4]. The reported internal consistency reliabilities of the SCS-SF with university students and community-dwelling adults are 0.86-0.87 [4].

The Oldenburg Burnout Inventory – Student version (OLBI-S), with good psychometric properties reported elsewhere [16], was used to measure academic burnout. The OLBI-S consists of two subscales that measure levels of engagement (8 items) and exhaustion (8 items). Using a four-point response scale (1–strongly disagree; 4–strongly agree), students were asked to indicate the level of agreement with each statement in relation to their medical program. Sample items are: "I find my studies to be a positive challenge" (engagement) and "After school, I tend to need more time than in the past to relax and feel better" (exhaustion). Higher scores on each subscale are indicative of greater engagement and exhaustion, respectively.

Statistical analyses

Descriptive analyses (means, standard deviations (SD), ranges) were performed to examine distributions of the study variables. Reliability analyses (Cronbach alphas) were performed to determine internal consistencies of the scales. Correlational analyses (Pearson's correlation coefficients) were performed to investigate bivariate associations between the variables. These analyses were performed in SPSS 25.0 (IBM Corp., Armonk, NY, USA).

Confirmatory factor analyses (CFA) were performed to test the factorial structure of the SCS-SF, using R 3.5.1 (R Foundation for Statistical Computing, Vienna, Austria). Polychoric correlations were used as input in R, since SCS-SF items are rated on a Likert-type scale (ordinal data) and the sample size in this study is moderate. Two factorial structures were tested. First, as in the original SCS-SF construction and validation study [4], we tested the single, general self-compassion factor underlying its six components. Next, we tested the two-factor model, formed by three positive and three negative components (self-compassion and self-criticism), as suggested by Lopéz and colleagues [11] based on their findings for the SCS long form. Model fit was assessed using the following established indices: χ^2/degrees of freedom (df) ratio, the root

mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the goodness of fit index (GFI). A $\chi^2/df \leq 3$, RMSEA ≤ 0.08, SRMR ≤ 0.06, CFI ≥ 0.90, and GFI close to 1.0 are cut-offs for an acceptable model fit in the analysis of factorial structures [17,18].

Results

The distributions of the self-compassion, engagement, and exhaustion scores are shown in Figure 1. The corresponding means (SDs; ranges; internal consistencies) were as follows – self-compassion: 37.74 (7.69; 18–56; 0.86); engagement: 23.85 (3.68; 12–32; 0.78); exhaustion: 20.62 (3.69; 12–31; 0.82). Self-compassion scores were positively correlated with engagement ($r = 0.24$; $p < 0.01$) and negatively correlated with exhaustion ($r = –0.44$; $p < 0.001$) scores.

The CFA results indicated that the single, general self-compassion factor model had a borderline acceptable level of fit. Except for the RMSEA value (0.082), which was slightly above the recommended upper limit of 0.08, the model fit indices met the criteria for the good model fit: $\chi^2/df = 2.35$, SRMR = 0.058, CFI = 0.92, and GFI = 0.92. Based on the suggested modification indices in the R output, a residual correlation between the components of common humanity (CH) and over-identification (OI) was added to the model to improve the model fit. This minor modification did not result in changes of the hierarchical factor structure in that all the items loaded on their respective components. The modified CFA model fitted the data well: $\chi^2/df = 2.07$, RMSEA = 0.073, SRMR = 0.057, CFI = 0.94, and GFI = 0.93.

The CFA results for the two-factor model (formed by three positive and three negative components) indicated a slightly better fit than the single-factor model. All the indices met the criteria for the good model fit: $\chi^2/df = 1.94$, RMSEA = 0.069, SRMR = 0.048, CFI = 0.95, and GFI = 0.93. The SCS-SF positive factor (self-compassion; alpha = 0.72) was positively

correlated with engagement scores ($r = 0.17$; $p < 0.05$) and negatively correlated with exhaustion scores ($r = –0.32$; $p < 0.001$). The SCS-SF negative factor (self-criticism; alpha = 0.85) was negatively correlated with engagement scores ($r = –0.25$; $p < 0.001$) and positively correlated with exhaustion scores ($r = 0.44$; $p < 0.001$). The observed correlation between the positive and the negative factors was negative and of moderately strong size ($r = –0.59$; $p < 0.001$).

Discussion

This study examined the psychometric properties of the Self-Compassion Scale – Short Form in a sample of medical students. The internal consistency of the SCS-SF was good. The average total score on the SCS-SF in this study was slightly above the average score in the normative population of university students [4]. The self-compassion scores correlated positively with student engagement and negatively with exhaustion scores. That is, students who were less self-compassionate reported being less engaged with their studies and feeling more exhausted. On the other hand, those students who were more self-compassionate reported being more engaged with their studies and feeling less exhausted. Results of the factor analyses indicated that, although the single, general self-compassion factorial structure had an acceptable fit, the two-factor structure had an improved fit with the data. The internal consistencies of the two factors, formed by three positive and three negative components of self-compassion, were acceptable (>0.70). These two factors also had significant correlations with student engagement and exhaustion, in the expected directions.

A key finding is that a hierarchical structure of the SCS-SF with six components of self-compassion was observed in the sample of medical students. This finding is in line with what has been reported in samples of university students and community-dwelling adults [4]. In the present study, however, the two-factor, hierarchical structure had a better fit with the data than

the single-factor, hierarchical structure. Although it is possible that the two factors are an artifact of the positively and negatively formulated items, recent research indicates that it may be theoretically accurate to distinguish between the SCS-SF positive and negative components because they seem to be capturing two distinct processes – self-compassion and self-criticism, respectively [11]. However, the moderately strong correlation observed between the two factors in this study yields evidence against the idea that the constructs of self-compassion and self-criticism are independent, as suggested by Lopéz and colleagues [11] based on their findings with community-dwelling individuals.

In the past, authors of the studies conducted with medical students and residents [6, 7] assumed the presence of the single, general factor underlying the six components of self-compassion. The findings of the present study suggest that this may not be the case and point to the need to test this assumption when using the self-compassion scale. Studies testing the factorial structure of the SCS-SF with students in other medical schools as well as students in other health professions education programs are warranted to provide further evidence on the factorial structure of the SCS-SF in these populations. If the two-factor structure is confirmed, suggesting two distinct processes (i. e., self-compassion and self-criticism), future studies are needed to determine what learning environments are likely to foster self-compassion in medical learners, while reducing self-criticism in this population.

When interpreting our findings some limitations need to be considered. This study focused on psychometric properties of the SCS-SF, specifically its factorial structure when used with medical students. We were unable to examine the criterion validity of the SCS-SF because the scale is the only available self-report measure of self-compassion to date. It is also advisable to use the long form of the SCS in the development and evaluation of programs that focus on

increasing self-compassion and use the short form in later stages. Finally, the sample in this study came from a single institution in Canada, and although our medical school is representative of other medical schools in the country, our findings may not be generalizable to other schools/countries.

In conclusion, empirical evidence to date indicates that self-compassion psychologically benefits the self [1-11], providing emotional resilience when faced with challenges. In studies with university students, including medical students, residents, and community-dwelling individuals, strong negative relationships have been observed between self-compassion and rumination, perceived stress, anxiety, depression, and burnout [1, 6, 7, 10, 11]. In this study, the positive factor (self-compassion) was positively correlated with engagement and negatively correlated with exhaustion. The negative factor (self-criticism) was negatively correlated with engagement and positively correlated with exhaustion. The hierarchical two-factor structure of the SCS-SF scores observed in this study provides support for the idea that distinguishing between self-compassion and self-criticism in medical students may be important.

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Figure 1. The distributions of self-compassion, engagement, and exhaustion scores in the study sample of medical students (*n*=200)