Validation of the Somatic Symptom Disorder-B Criteria Scale for Adults in South Korea

ABSTRACT

Background: The Somatic Symptom Disorder-B Criteria Scale measures the cognitive, affective, and behavioral features of the Diagnostic and Statistical Manual of Mental Disorders-5 somatic symptom disorder. This study examined the psychometric properties of the Korean version of the Somatic Symptom Disorder-B Criteria Scale in a community sample of Korean adults.

Methods: The sample included 349 Korean adults (71.6% female (n = 250); mean age, 22.6 SD = 4.8). Exploratory and confirmatory factor analysis was performed for construct validity, Pearson r correlations were used to assess convergent validity, and internal consistency was calculated by Cronbach’s alpha coefficients and item-total correlation.

Results: Findings of exploratory and confirmatory factor analysis demonstrated that the Korean version of the Somatic Symptom Disorder-B Criteria Scale had a modified unifactorial structure. Indices of convergent validity, test–retest reliability, and internal consistency reliability of the Korean version of the Somatic Symptom Disorder-B Criteria Scale were acceptable.

Conclusions: These results suggest that the Korean version of the Somatic Symptom Disorder-B Criteria Scale is suitable for assessing the cognitive, affective, and behavioral features of the Diagnostic and Statistical Manual of Mental Disorders-5 somatic symptom disorder in Korean adults in community settings.

Keywords: Medically Unexplained Symptoms, reliability, validity, Korea

Introduction

The diagnosis of somatic symptom disorder (SSD) has been incorporated in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5).1 Somatic symptom disorder is defined by one or more persistent physical complaints (the A criterion), and excessive and disproportionate thoughts, feelings, and behaviors associated with these symptoms (the B criterion). In addition, the symptoms can be distressing and impair functioning. The physical complaints may or may not be explained by a general medical condition. That is, the new DSM-5 criteria for SSD deemphasizes the role of an adequate medical explanation for a physical symptom, which is a central symptom in somatoform disorders in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV).2

According to recent research on mental disorders in South Korea,3 the lifetime and 12-month prevalence rates for DSM-IV somatization disorder were 1.2% and 1.0%, respectively. Those for specific disorders were as follows: (1) somatization disorder, 0.04% and 0.02%; (2) conversion disorder, 0.3% and 0.3%; (3) pain disorder, 0.3% and 0.2% and (4) hypochondriasis, 0.6% and 0.5%. The prevalence of most somatoform disorders in Western countries seems to be higher than that in Korea. For example, data from the Epidemiologic Catchment Area (ECA) studies in the United States show that the lifetime and 12-month prevalence rates for DSM-III somatization disorder were 0.12% and 0.13%, respectively.4

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Valid instruments to measure the B criteria for SSD are essential for both clinicians and researchers. Though a structured diagnostic interview is considered a gold standard to measure the B criteria for SSD and to establish a diagnosis, a self-report assessment of the B criteria for SSD may be advantageous in clinical and research contexts because of the objectivity of the items coupled with the short amount of time required.

Several valid and reliable self-reporting scales that assess the severity of somatoform disorders (DSM-IV) were developed. These instruments include the Whiteley Index, the Illness Attitude Scale, and the Patient Health Questionnaire Somatic Symptom Severity Scale. These scales are good predictors of the somatoform disorders in DSM-IV but may not apply to the SSD in DSM-5. Therefore, a new self-report questionnaire that assesses criterion B is needed to accurately detect a person with SSD in clinical practice.

In this context, the SSD-B Criteria Scale (SSD-12) is a self-reporting measure specifically developed to assess the B criterion for SSD in DSM-5. The SSD-12 was administered to 698 German patients from a psychosomatic outpatient clinic and Toussaint et al concluded that the SSD-12 has sufficient validity and reliability in the clinical setting. The SSD-12 was administered to 448 participants from the general community and Kop et al concluded that the SSD-12 is a valid and reliable tool in the general population.

However, no psychometric study has investigated the adequacy of the Korean version of the SSD-12. Therefore, it is important to evaluate whether the SSD-12 has sound methodological properties for the Korean population. The goal of this study was therefore to examine psychometric properties of a Korean version of the SSD-12. It was hypothesized that: (i) the SSD-12 would consist of 3 intercorrelated factors consistent with the factor structure evidenced in Toussaint et al’s study; (ii) the SSD-12 would be internally consistent; and (iii) it was expected that the SSD-12 would be significantly correlated with hypochondria, abnormal illness behavior, and sensitivity to mild bodily sensations with respect to convergent validity.

Methods

Participants

The participants were 349 adults in Gyeongbuk province, South Korea. They were recruited using the convenient sampling method. The participants ranged in age from 19 to 54 years. The mean age was 22.57 years, with a standard deviation (SD) of 4.84 years. 71.6% (n=250) were female. The data collection was done online. All participants signed informed consent prior to enrollment, the author complied with the APA ethical standards in the treatment of human subjects, and this study was conducted under the approval of an Institutional Review Board (IRB) of the Daegu University Institutional Review Board (Approval Number: 2020-021-01).

MAIN POINTS

- The K-SSD-12 showed satisfactory psychometric properties.
- The K-SSD-12 is a tool for assessing excessive feelings, thoughts, and behaviors associated with physical symptoms.
- The K-SSD-12 had a modified unifactorial structure.

Measures

The Korean version of the Somatic Symptom Disorder-B Criteria Scale (K-SSD-12).

The SSD-12 was developed by Toussaint et al. The SSD-12 consists of 12 items, each representing the cognitive, affective, and behavioral aspects of the B criterion of the SSD. Each subscale has 4 items. Participants rate these items using a 5-point Likert scale, where 0 = never and 4 = very often. The total score ranges between 0 and 48, with a higher score reflecting higher levels of the psychological features of the SSD. Cronbach’s α of the SSD-12 was 0.95. The standard forward–backward translation method was applied to evaluate linguistic equivalence of the K-SSD-12.

Illness Attitude Scale (IAS)

The IAS consists of 29 items and 9 subscales assessing attitudes, fears, and beliefs associated with hypochondriacal concerns and abnormal illness behavior. Nine subscales are worry about illness (W), concern about pain (CP), hypochondriacal beliefs (HB), health habits (HH), disease phobia (DP), thanatophobia (Th), bodily preoccupations (BP), treatment experience (TE), and effects of symptoms (ES). Participants rate the items on a 5-point Likert scale, where 0 = no and 4 = most of the time. Item 22 and 26 are not included in the total score, which ranges between 0 and 108. It was reported that the Korean version of the IAS has a Cronbach’s alpha of 0.85. This scale was used to determine convergent validity.

The Somatosensory Amplification Scale (SSAS)

The SSAS evaluates sensitivity to mild bodily sensations which are disturbing and unpleasant but non-pathological. Participants rated the items on a 5-point Likert scale, where 1 = not at all and 5 = extremely. The Korean version of the SSAS has good internal consistency (Cronbach’s alpha = 0.74-0.76). This scale was used to examine convergent validity.

Statistical Analyses

Descriptive data for categorical variables are expressed as frequency and percentage and descriptive data for continuous variables are presented as mean (SD). The statistical analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM SPSS Corp.; Armonk, NY, USA) and Mplus Statistical Modeling Software: Release 7.0. (Muthén & Muthén;Los Angeles, CA, USA). The dataset was randomly divided into 2 datasets to be used for independent exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The number of factors to be extracted is based on Kaiser’s criterion (i.e., if eigenvalues were above 1), scree plot, and parallel analysis. Pearson correlation coefficients were used to assess the relationships between the K-SSD-12, the SSAS, and the factors of the IAS. Internal consistency was assessed using Cronbach’s alpha and item-total correlation coefficients. Cut-off points for interpreting adequate internal consistency were set at 0.70 for Cronbach’s alpha coefficients and 0.40 for item-total correlation.

Assessment of Model Fit

To evaluate the fit of the CFA models, the Tucker–Lewis index (TLI), the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were used. Tucker–Lewis index and comparative fit index values above 0.95 and RMSEA and SRMR values of 0.08 or less are indicative of acceptable model fit.
Results

Exploratory Factor Analysis

The factor structure was examined using EFA. The Kaiser–Meyer–Olkin measure of sampling adequacy (0.90) and Bartlett’s test of sphericity \( (\chi^2(66) = 1107.411, P < .001) \) confirmed that the data were suitable for factor analysis. It was found that 2 factors had eigenvalues greater than 1 (5.846, 1.419). Examination of the scree plot indicated a unidimensional structure (Figure 1). Also, the parallel analysis

![Figure 1. Scree plot for the EFA of the K-SSD-12. EFA, exploratory factor analysis; K-SSD-12, Korean version of the Somatic Symptom Disorder-B Criteria Scale.](image1)

| Item  | Factor I |
|-------|----------|
| SSD9  | 0.872    |
| SSD12 | 0.808    |
| SSD8  | 0.779    |
| SSD5  | 0.759    |
| SSD3  | 0.737    |
| SSD6  | 0.732    |
| SSD11 | 0.690    |
| SSD2  | 0.668    |
| SSD1  | 0.620    |
| SSD4  | 0.594    |
| SSD7  | −0.185   |
| SSD10 | 0.167    |

Note. Factor values >0.40 are shown in boldface.

K-SSD-12, Korean version of the Somatic Symptom Disorder-B Criteria Scale; SSD, somatic symptom disorder.

Table 2. Goodness-of-Fit Indices For K-SSD-12 Models: Confirmatory Factor Analysis

| Model       | \( \chi^2 \) | df  | TLI  | CFI  | RMSEA | SRMR  |
|-------------|---------------|-----|------|------|-------|-------|
| One factor  | 149.040       | 54  | 0.883| 0.905| 0.100 | 0.060 |
| Modified one factor | 97.780 | 51  | 0.939| 0.953| 0.072 | 0.041 |

TLI, Tucker–Lewis index; CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean squared residual; K-SSD-12, Korean version of the Somatic Symptom Disorder-B Criteria Scale.

![Figure 2. Path diagram for the modified single factor model of the K-SSD-12. K-SSD-12, Korean version of the Somatic Symptom Disorder-B Criteria Scale.](image2)
in Korean culture. The content of the 2 items is related to revealing one’s somatic symptoms to others. Koreans are less likely to reveal their physical symptoms to others. Second, this difference may be due to the difference between the sample of this study and the samples of the previous studies. Participants in this study are community samples, not clinical samples. Therefore, it is likely that they have less “serious” somatic symptoms than clinical samples, and they think it is unnecessary to reveal their somatic symptoms to others. Those items that failed to load on the latent factor were not removed after EFA was performed even though factor loadings were insufficient to sustain because the study using different samples and populations would show different factor structures.

The total score of SSD-12 in this study was significantly higher than that of the Dutch general population. These results are consistent with the characteristics of Asians who are accustomed to expressing pain through somatic channels rather than psychological channels and call for caution in applying the Westerners’ SSD-12 norm to Koreans.

In the present study, the reliability of the K-SSD-12 total score is sufficient because internal consistency and test–retest reliability was good in Korean adults. These results justify the use of the K-SSD-12 sum score. Estimates of internal consistency were parallel to those demonstrated in previous studies using German samples and the Dutch version of the SSD-12.

The K-SSD-12 had significant correlations with the factors of the IAS and SSAS showing an optimal convergent validity. These results are consistent with the hypothesized predictions and with the findings of previous studies.

This study has shown that K-SSD-12 has good psychometric properties and represents the cognitive, affective, and behavioral features of DSM-5 somatic symptom disorder, so this scale is expected to help researchers and practitioners to determine excessive feelings, thoughts, and behaviors associated with physical symptoms. Specifically, the evaluation of using the K-SSD-12 can provide an important guideline for the clinicians who need to develop prevention and intervention programs against somatic symptom disorder. Also, because the SSD-12 is short, simple, and can be completed without the aid of a clinician, this scale can function as a tool to select individuals with somatic symptom disorder in time-constrained settings.

Some limitations to this study should be noted. First, participants were sampled based on a convenience sampling strategy, so a more representative sample of the population is needed to get a complete picture of the general population. Second, because only self-reported data were used to assess the cognitive, affective, and behavioral aspects of the somatic symptom disorder, the relationship between variables could be affected by common method variance, so interviewer rating methods should be included in future studies. Third, cognitive functions of the participant were not provided. In a previous study, those with somatic symptoms and related disorders reported worse neurocognitive functioning, so in future research, it is necessary to scrutinize whether the scores of the SSD-12 vary with the cognitive functioning. Finally, because the current study was not carried out in a clinical setting, caution should be taken in applying these findings to people with mental disorders. Further investigation is needed in various clinical fields and settings.

Table 3. Descriptive Statistics, Correlations, And Internal Consistency Reliabilities

|                | SSD-12 | IAS  | SSAS |
|----------------|--------|------|------|
| SSD-12         | -      |      |      |
| IAS            | 0.72*  | -    |      |
| SSAS           | 0.44*  | 0.65*| -    |
| Mean (SD)      | 12.72 (7.85) | 24.72 (14.86) | 11.30 (5.97) |
| Cronbach’s alpha | 0.86    | 0.92 | 0.77 |

SSD-12, Somatic Symptom Disorder-B Criteria Scale; IAS, Illness Attitude Scale; SSAS, Somatosensoy Amplification Scale; SD, standard deviation.

*P < .001.

indicated that a one-factor solution is retained. Table 1 shows factor loadings of the one-factor model.

Confirmatory Factor Analysis

The EFA results indicated a unidimensional model for the K-SSD-12 items. The CFA was used to evaluate the fit indices of the one-factor model. As can be seen in Table 2, RMSEA, TLI, and CFI values of the unidimensional model of the K-SSD-12 were found to be a poor fit. Thus, the post hoc CFA analysis was performed. After CFA, modification indices were used to find possible ways to enhance the model fit indices. The modification indices showed that allowing the error variance of items #1 and #2, #7 and #10, and #8 and #12 to covary would improve the fit values. As in Table 2 and Figure 2, SRMR, RMSEA, and CFI values of the model showed that the modified unidimensional model of the K-SSD-12 had an acceptable fit.

Internal Consistency and Test–Retest Reliability

Internal consistency tests showed a Cronbach’s alpha of 0.86. Cronbach’s alpha was above the recommended threshold level of 0.70 level (Table 3). Corrected item-total correlations of items 7 and 10 were 0.04 and 0.26, respectively. These 2 values did not meet accepted standards. Corrected item-total correlations for items other than items 7 and 10 met standards (0.55-0.77). Test–retest reliability tests conducted at 3-week intervals provided a coefficient of 0.91.

Convergent Validity

Table 3 shows Pearson correlation coefficients between the K-SSD-12, the SSAS, and the factors of the IAS. The K-SSD-12 was found to be positively and significantly associated with the IAS (r = 0.72, P < 0.001), and the K-SSD-12 was positively and significantly correlated with the SSAS (r = 0.44, P < 0.001). These results support the convergent validity of the K-SSD-12.

Discussion

The current study was carried out to examine the psychometric properties of the K-SSD-12. The K-SSD-12 was found to have a modified single-factor structure. This finding is inconsistent with the results of the German study. However, this finding is generally similar to the Dutch study. These inconsistent study results show that the factor structure of the SSD-12 varies across cultures.

Another difference between the results of the current research and those of the previous study was revealed. Two items (item 7: “Other people tell me that my physical symptoms are not serious” and item 10: “I don’t think doctors take my physical complaints seriously”) failed to load on the latent factor. This result can be explained in 2 ways. First, both items might be unrelated to health behavior...
Conclusion

Nevertheless, the current research suggests that the K-SSD-12 is a valid and reliable tool for excessive feelings, thoughts, and behaviors associated with physical symptoms in Korean adults. The K-SSD-12 is similar to the original version of the tool, which encourages cross-cultural studies about the cognitive, affective, and behavioral aspects of somatic symptom disorder. However, further researches are necessary to evaluate the usefulness and functioning of the scale using larger and more diverse clinical samples. In addition, further studies are needed to validate the K-SSD-12 according to the objective rating scale. Although the K-SSD-12 needs further scrutiny, this scale appears to be a promising one.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Daegu University (Approval Number: 2020-021-01).

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

Peer-review: Externally peer-reviewed.

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Declaration of Interests: The author has no conflicts of interest to declare.

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References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, DC: Author; 2013.
2. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed. Washington, DC: Author; 1994.
3. Cho MJ, Chang SM, Lee YM, et al. Prevalence of DSM-IV major mental disorders among Korean adults: a 2006 National Epidemiologic Survey (KECA-R). Asian J Psychiatry. 2010;3(1):26-30. [CrossRef]
4. Bourdon KH, Rae DS, Locke BZ, Narrow WE, Regier DA. Estimating the prevalence of mental disorders in U.S. adults from the Epidemiologic Catchment Area Survey. Public Health Rep. 1992;107(6):663-668.
5. Axelsson E, Andersson E, Ljotsson B, Wallhed Finn D, Hedman E. The health preoccupation diagnostic interview: inter-rater reliability of a structured interview for diagnostic assessment of DSM-5 somatic symptom disorder and illness anxiety disorder. Cogn Behav Ther. 2016;45(4):259-269. [CrossRef]
6. Toussaint A, Murray AM, Voigt K, et al. Development and validation of the somatic symptom disorder-b criteria scale (SSD-12). Psychosom Med. 2016;78(1):5-12. [CrossRef]
7. Kop WJ, Toussaint A, Mols F, Löwe B. Somatic symptom disorder in the general population: associations with medical status and health care utilization using the SSD-12. Gen Hosp Psychiatry. 2019;56:36-41. [CrossRef]
8. Kellner R. Manual of the IAS (Illness Attitude Scales). Albuquerque: University of New Mexico; 1981.
9. Son HJ, Lee KE. The influence of health concern, health anxiety, and communication with healthcare providers on health information seeking behavior on the internet. J Health Info Stat. 2019;44(1):73-82. [CrossRef]
10. Barsky AJ. Amplification, somatization, and the somatoform disorders. Psychosomatics. 1992;33(1):28-34. [CrossRef]
11. Won HT, Shin HK. A study on the cognitive characteristics of somatization (I): The Reliability and Validity of the Korean versions of Somatosensory Amplification Scale and Symptom Interpretation Questionnaire. Korean J Clin Psychol. 1998;17:33-39.
12. Kaiser H. A note on Guttman’s lower bound for the number of common factors. Multivar Behav Res. 1961;1:249-276.
13. Horn JL. A rationale and test for the number of factors in factor analysis. Psychometrika. 1965;30:179-185. [CrossRef]
14. Nunnally JC, Bernstein IH. Psychometric Theory. 3rd ed. New York: McGraw-Hill; 1994.
15. Ullman JB. Structural equation modeling: reviewing the basics and moving forward. J Pers Assess. 2006;87(1):35-50. [CrossRef]
16. De Vroege L, van Eck van der Sluijs JF, Kamp RC, Kop WJ, Van Der Feltz-Cornelis CM. Validation of the somatic symptom disorder–b criteria scale (SSD-12) in a clinical centre of excellence in the Netherlands. J Psychosom Res. 2017;97:144. [CrossRef]
17. Toussaint A, Löwe B, Brähler E, Jordan P. The somatic symptom disorder–b criteria scale (SSD-12): factorial structure, validity and population-based norms. J Psychosom Res. 2017;97:9-17. [CrossRef]
18. Hoge EA, Tamrakar SM, Christian KM, et al. Cross-cultural differences in somatic presentation in patients with generalized anxiety disorder. J Nerv Ment Dis. 2006;194(12):962-966. [CrossRef]
19. de Vroege L, Timmermans A, Kop WJ, van der Feltz-Cornelis CM. Neurocognitive dysfunctioning and the impact of comorbid depression and anxiety in patients with somatic symptom and related disorders: a cross-sectional clinical study. Psychol Med. 2018;48(11):1803-1813. [CrossRef]