

Development of the Calgary Symptoms of Stress Inventory (C-SOSI)

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Objective: The objective of this study was to develop a revision of the Symptoms of Stress Inventory (SOSI), the Calgary SOSI (C-SOSI), which would be shorter, easier to administer and score, and have excellent factor structure, reliability, and validity for use with oncology patients. Methods: The SOSI was administered to 344 cancer patients registered for a stress-management program. Exploratory factor analysis (EFA) was applied using three criteria based on communality, factor loading, and desired subscale size. Scores on the revised C-SOSI were correlated with scores on measures of quality of life, mood disturbance, sleep, and spirituality to begin investigation of convergent and discriminant validity. Results: The EFA resulted in a 56-item scale (down from the original 94 items) with 8 subscales, each consisting of 6–9 items named: Depression, Anger, Muscle Tension, Cardiopulmonary Arousal, Sympathetic Arousal, Neurological/GI, Cognitive Disorganization, and Upper Respiratory Symptoms. Cronbach's alpha reliabilities for the subscales ranged from 0.80 to 0.95. Convergent and discriminant validity was supported by correlations with other measures as conceptually predicted. Conclusions: The C-SOSI is a reliable tool with converging validity for assessing stress symptoms in an oncology population. Further validation work is recommended to support use in other patient or community groups.

Key words: stress, stress measurement, exploratory factor analysis, psycho-oncology

Background

The measurement of stress has received a great deal of attention in the stress and coping literature (Fink, 2000; Zalaquett & Wood, 1998). Over its developmental history, stress measurement has moved from assess-

ing simple occurrence of stressful life events (with the underlying assumption that similar events result in similar levels of stress across individuals; e.g., Holmes & Rahe, 1967), to focusing more on individuals' perception of the subjective stressfulness of their own lives (Cohen, Kamarck, & Mermelstein, 1983; Derogatis, 1980)—a recognition of concurrent developments in cognitive theories of perception and appraisal of life events.

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Linda E. Carlson conceived of the need for this study and a shortened tool, coordinated the data collection and data tabulation, and drafted the manuscript introduction and discussion sections. Bejoy Cherian Thomas participated in the design of the study, designed the methodology, performed the statistical analysis, and drafted the manuscript Methods and Results sections. All authors read and approved the final manuscript.

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Although the most commonly used measures of perceived stress have been well-validated and a considerable amount of data accrued to support their validity (Cohen et al., 1983), they tend to be quite short and contain one factor, without subscales that tap into different domains where stress may be manifest. While this is an advantage in many research settings, for programs that aim to assess stress responses and symptoms in more depth other multidimensional comprehensive tools may prove useful, particularly for clinical research applications. A comprehensive measure based on the biopsychosocial model of stress and health would assess stress symptoms in several domains including the physical (cardiopulmonary and sympathetic arousal), psychological (depression, anxiety), and social (behavioral symptoms, anger). The Symptoms of Stress Inventory (SOSI; Leckie & Thompson, 1979) is one such instrument. The SOSI was developed at the University of Washington through a Stress Management Project to quantify perceptions of

physiological, behavioral, and cognitive components of clients' stress response (Thompson, 1989). It was originally a modification of the much longer Cornell Medical Index (Brodman, Erdman, & Wolff, 1947), which assesses a wide range of symptomatology with a yes/no response format. Questions were extracted, reworded, rescaled, and new items added to more accurately reflect the authors' understanding of stress symptoms. A detailed description of the original SOSI is provided in the Methods section.

We have been using the SOSI in our program of psycho-oncology research since 1997, and have found it to be a useful and responsive instrument that taps into many domains of stress symptoms, including both physical and psychological manifestations of stress, and have published several papers using it as a primary outcome (Carlson & Garland, 2005; Carlson, Specca, Patel, & Goodey, 2003, 2004; Carlson, Ursuliak, Goodey, Angen, & Specca, 2001; Specca, Carlson, Goodey, & Angen, 2000). The SOSI fits well with the theoretical conceptualization of stress as taught in the Mindfulness-Based Stress Reduction (MBSR) program we administer, which considers both the physiological stress reaction and the stress response as mediated by cognitive appraisal (Kabat-Zinn, 1990).

Drawbacks of the SOSI as developed by the Washington group include its exceedingly long length (94 items), which can make its use prohibitive in the context of large test batteries, and the lack of published psychometric data on its reliability and validity in a cancer population. It is also difficult to find in the literature. There is a strong desire to maintain an instrument with a multidimensional focus to assessment of stress symptoms that is responsive to clinical interventions, but with fewer items that could be administered in 5–10 min. Therefore, we compiled collected SOSI data, some of which has been published as outcome data in clinical research (Carlson et al., 2001, 2003, 2004; Carlson & Garland, 2005; Garland, Carlson, Cook, Lansdell, & Specca, 2007; Specca et al., 2000), reanalyzed its factor structure and modified the questionnaire and scoring syntax with the intention of decreasing its length while retaining its desired properties.

Methods

Participants

The baseline SOSI assessment data of 344 patients who had attended the MBSR course over the past 5 years were extracted from the test battery they had provided written consent to complete, compiled, and a data set prepared. Mean age was 51.14 years (male = 53.9 years, female = 50.58 years). More than 85% of the participants were female patients. At the time of assessment, less than 15% were single, nearly 70% were married, 11% were divorced, 3% were widowed,

and the rest common-law. Average number of years in school for the group was 15 years, which was similar for both males and females. The majority of the patients (53.5%) had a diagnosis of a breast cancer, with or without metastatic involvement. A wide range of other cancer diagnoses were represented in the sample as well.

Instrument

The original SOSI consists of 95 items that form 10 subscales and a total stress score. The respondent is instructed to rate the frequency with which they experience various stress-related symptoms on a 5-point scale ranging from *never* to *frequently* during a designated time frame selected by the investigator (usually the past week). Ten subscale scores are derived from the 95 individual items: 1) peripheral manifestations; 2) cardiopulmonary symptoms, 2a) symptoms of arousal, 2b) upper respiratory symptoms; 3) central neurological symptoms; 4) gastrointestinal symptoms; 5) muscle tension; 6) habitual patterns (e.g., smoking, drinking, nail biting); 7) depression; 8) anxiety/fear; 9) emotional irritability; and 10) cognitive disorganization. In the original validation sample of 532 participants in the University of Washington Stress Reduction Program, Cronbach's alpha for the SOSI total score was 0.97, with subscale coefficients ranging from 0.62 (neurological) to 0.91 (emotional irritability). Test-retest correlations ranged from 0.47 (respiratory) to 0.86 (muscle tension; Thompson, 1989).

Data Analysis

Factor analysis. Exclusion criteria for the factor analysis were created with the following endpoints in mind: 1) that items were not excluded only to satisfy the objective of a smaller scale; 2) subscales needed to have sufficient items so as to provide suitable variance within the subscale scores; and, most importantly, 3) interpretability and psychological meaningfulness of the extracted factors be maintained. The Exploratory Factor Analysis (EFA)—principal component analysis (PCA) with varimax rotation—was run on SPSS version 13.0 (SPSS Inc., Chicago, IL) following decision rules as depicted in Figure 1. The oblique rotation (Oblimin on SPSS) was not run because the correlations in the component correlation matrix were all less than 0.3.

To begin the process of establishing discriminant and convergent validity, scores on the C-SOSI were correlated with well-known and validated questionnaires covering several related constructs. They tapped into quality of life (European Organisation for Research and Treatment in Cancer Quality of Life Questionnaire (EORTC QLQ C-30; Aaronson et al., 1993); mood states (Profile of mood states [POMS]; McNair, Lorr, & Droppelman, 1971); sleep quality (Pittsburgh

Table 1. *C-SOSI Subscales, Number of Items, Internal Consistency and Mean Subscale Scores*

Factor	Title	Items	Cronbach's α	Mean	SD
1	Depression	8	.90	9.50	7.27
2	Anger	7	.92	9.30	6.36
3	Muscle tension	8	.89	11.13	7.69
4	Cardiopulmonary arousal	6	.86	3.68	4.23
5	Sympathetic arousal	9	.83	14.93	7.61
6	Neurological/GI	6	.85	4.31	4.53
7	Cognitive disorganization	6	.85	6.13	4.68
8	Upper respiratory symptoms	6	.80	5.04	4.49
	C-SOSI total	56	.95	64.06	34.02

Sleep Quality Index [PSQI]; Buysse, Reynolds, Monk, & Berman, 1989); and spirituality (Functional Assessment of Chronic Illness Therapy—Spiritual Well-Being [FACIT-Sp]; Peterman, Fitchett, Brady, Hernandez, & Cella, 2002), for which we had also collected data from subgroups of participants.

Each of these domains was expected to be positively correlated with stress symptoms on the C-SOSI, but in terms of the total scores, we hypothesized the strongest associations would occur with mood states, as there is considerable conceptual overlap between the constructs being assessed; followed by quality of life which may be largely affected by stress symptoms; sleep which can easily be disrupted by high levels of stress symptoms; and finally spirituality, which relates more to meaning and purpose in life and connections with others than stress symptoms per se. No specific hypotheses regarding subscale correlations were postulated.

Results

Factor Analysis

Seventy-one questionnaires (20%) had at least one missing item (missing item range = 1–94). Of these, four questionnaires were excluded from the factor analysis as responses to more than 20% of the SOSI items were missing. The item on “changes in one’s sexual relationship” (item #58) was left unanswered by nearly 5% of the study sample. Data from 340 participants was used in the EFA.

The exclusion criterion resulted in 56 items remaining (from the original 94), all of which had communalities greater than or equal to 0.4, a positive factor loading greater than or equal to 0.4, and were distributed among 8 subscales (6–9 items in each subscale). The subscales showed psychological meaningfulness, and were appropriately named (Table 1). The revised tool is described in Table 2 along with factor loadings for each item, and eigenvalues of each factor.

Item redundancy was observed in the Neurological/GI subscale with items NG1 and NG2 (“Feeling faint” and “Feeling weak and faint,” respectively). It

was felt that the second item was a double-barreled question (i.e., confounding the answer to “weak” with that of “faint”), and was therefore truncated to “feeling weak,” as “weak” was considered the novel part of the question. The responses to item NG2 were, therefore, dropped from the dataset and it was treated as a missing item.

C-SOSI Scoring

The questionnaire instructions from the original SOSI were retained verbatim for the new tool, as was the 5-point Likert rating scale response pattern (0 [*never*], 1 [*infrequently*], 2 [*sometimes*], 3 [*often*], and 4 [*very frequently*]). Scoring guidelines for the new C-SOSI questionnaire were set as follows:

1. Only data whose *subscales* had a minimum 50% response rate, as well as had a minimum 80% total tool response rate, would be scored.
2. Missing items of valid responses would be prorated within subscales to obtain subscale scores.
3. The total score would be the sum of all (prorated) subscale scores.

Internal consistency (Cronbach’s alpha) of the revised tool was observed to be 0.95 (subscale range = .80–.92; Table 1).

An MS Excel-based template to prorate and calculate raw scores and *T* scores from the *Z*-scores from raw data was also developed, and is available on request. The original data set was rescored using the MS Excel template, and it was noted that of the 344 patients, 338 had valid scores on all the subscales as well as the total score. Descriptive statistics of the C-SOSI scores are presented in Table 1. The resulting data was somewhat positively skewed (skewness ranging from 0.57 to 1.29); however, perfect symmetry in real-time data is unusual, and no scales were above the cut-off for statistically significant skewness of 2.0. Intercorrelations performed between the eight subscales found significant positive correlations (Table 3). The subscale intercorrelations were primarily in the moderate range, from a low of $r = .31$ between

Table 2. *The Calgary Symptoms of Stress Inventory (C-SOSI) with Factor Loadings*

Factor Loading	Factor Loading
Depression (eigenvalue: 16.77): Stress is often accompanied by a variety of emotions. During the last week, have you felt:	
D1 Like life is entirely hopeless (0.76)	
D2 Unhappy and depressed (0.74)	
D3 Alone and sad (0.71)	
D5 That worrying gets you down (0.67)	
D4 Like crying easily (0.66)	
D6 That you wished you were dead (0.64)	
D7 Frightening thoughts keep coming back (0.58)	
D8 You suffer from severe nervous exhaustion (0.55)	
Anger (eigenvalue: 3.97): Does it seem:	
A1 You become mad or anger easily (0.85)	
A2 When you feel angry, you act angrily toward most everything (0.81)	
A3 You are easily annoyed and irritated (0.78)	
A4 That little things get on your nerves (0.74)	
A5 Angry thoughts about an irritating event keep bothering you (0.70)	
A6 You let little annoyances build up until you just explode (0.68)	
A7 Your anger is so great that you want to strike something (0.62)	
Sympathetic arousal (eigenvalue: 2.01): Do you experience:	
SA1 Difficulty in staying asleep at night (0.69)	
SA2 Hot or cold spells (0.63)	
SA3 Having to get up in the night to urinate (0.62)	
SA4 Sweating excessively even in cold weather (0.61)	
SA5 Having to urinate frequently (0.58)	
SA6 Early morning awakening (0.57)	
SA7 Flushing of your face (0.56)	
SA8 Difficulty in falling asleep (0.52)	
SA9 Breaking out in cold sweats (0.43)	
Neurological/GI (eigenvalue: 1.94): Have you experienced:	
NG1 Feeling faint (0.78)	
NG2 Feeling weak ^a (—)	
NG3 Spells of severe dizziness (0.71)	
NG4 Nausea (0.66)	
NG5 Blurring of your vision (0.54)	
NG6 Severe pains in your stomach (0.54)	
Muscle tension (eigenvalue: 2.64): Muscle tension is a common way of experiencing stress. Have you noticed excessive tension, stiffness, soreness or cramping in the muscles in your:	
MT1 Shoulders (0.81)	
MT2 Neck (0.79)	
MT3 Back (0.69)	
MT4 Jaw (0.61)	
MT5 Forehead (0.61)	
MT6 Eyes (0.59)	
MT7 Hands or arms (0.56)	
MT8 Have you experienced tension headaches? (0.53)	
Cardiopulmonary (eigenvalue: 2.42): Have you noticed the following symptoms when not exercising:	
C1 Thumping of your heart (0.73)	
C2 Rapid or racing heart beats (0.71)	
C3 Rapid breathing (0.69)	
C4 Irregular heart beats (0.64)	
C5 Difficult breathing (0.61)	
C6 Pains in your heart of chest (0.56)	
Cognitive disorganization (eigenvalue: 1.69): Does it seem:	
CD1 You must do things very slowly to do them without mistakes (0.76)	
CD2 You get directions and orders wrong (0.73)	
CD3 Your thinking gets completely mixed-up when you have to do things quickly (0.68)	
CD4 You have difficulty in concentrating (0.61)	
CD5 You become suddenly frightened for no good reason (0.49)	
CD6 You become so afraid you can't move (0.42)	
Upper respiratory symptoms (eigenvalue: 1.65): Have you experienced:	
UR1 Colds (0.70)	
UR2 Hoarsness (0.63)	
UR3 Colds with complications (e.g. bronchitis) (0.60)	
UR4 Nasal stuffiness (0.60)	
UR5 Having to clear your throat often (0.58)	
UR6 Sinus headaches (0.54)	

Response options: 0 = never, 1 = infrequently, 2 = sometimes, 3 = often, 4 = very frequently. Cumulative % of explained variance = 58.043%. ^aRephrased item. Original item with its factor loading: Feeling weak and faint (0.74).

Cardiopulmonary Arousal and Anger, to a high of $r = .61$ between Depression and Anger. The highest correlations, not surprisingly, were between each of the subscales and the total C-SOSI score (range of $r = .66$ to $r = .78$). This range of intercorrelations suggests that the constructs comprising the subscales are moderately related to one another, but are divergent enough to be considered separate subscales.

Relationships between item scores and age and gender were also explored, but except for Sympathetic Arousal significantly correlating with patient age ($r = .15$), patient age or gender did not correlate with the subscales.

Divergent-Convergent Validity

Pearson's Product Moment Correlations were conducted between the C-SOSI total and subscale scores and the scores on the other tools that were administered (Table 4). Negative correlations with the EORTC QLQ C-30 functional scales occurred because higher scores on the EORTC QLQ C-30 subscales indicate better functioning, whereas higher scores on the C-SOSI indicate more stress symptoms. A cut-off correlation of approximately 0.75 was chosen for hypothesis testing to represent evidence of convergent validity, as recommended by Colton (1974). Although several of the subscales were statistically significantly correlated

Table 3. *C-SOSI Scale and Subscale Intercorrelations*

	Dep	Anger	MT	CA	SA	N/G	CD	UR
Anger	.61							
Muscle tension	.48	.44						
Cardiopulmonary arousal	.45	.31	.51					
Sympathetic arousal	.40	.39	.47	.46				
Neurological/GI	.47	.36	.43	.48	.46			
Cognitive disorganization	.58	.52	.52	.40	.46	.49		
Upper respiratory symptoms	.35	.32	.56	.49	.43	.41	.39	
C-SOSI Total	.77	.70	.78	.68	.73	.68	.75	.66

MT = muscle tension, CA = cardiopulmonary arousal, SA = sympathetic arousal, N/G = neurological/GI, CD = cognitive disorganization, UR = upper respiratory symptoms.

Note. All correlations significant at $p < .01$.

with medium-sized effects (i.e., $r = .40-.60$), consistent with the hypotheses, subscales that had a similarity by psychological meaningfulness and construct to the C-SOSI subscales had stronger correlations, demonstrating convergent validity. C-SOSI Depression scores highly correlated with the emotional functioning subscale score of the EORTC QLQ C-30 ($r = -.76$). C-SOSI Depression also highly correlated with the POMS subscales of Depression ($r = .87$) and total mood disturbance (TMD; $r = .83$). Convergence was also noted between the Anger subscale of the C-SOSI and the POMS Anger scale ($r = .77$). Other subscales whose correlations were very high included the C-SOSI's cognitive disorganization scale and the POMS confusion scale ($r = .72$), and the overall C-SOSI with the POMS TMD ($r = .74$), which was predicted based on construct similarity.

Supporting divergent validity, the FACIT-Sp (spirituality) scale was significantly correlated at a low level with depression and anxiety, but not at all with the other more physiological subscales, as spirituality and specific stress symptoms might be expected to diverge more than other much more similar constructs that were assessed. Additionally, the subscales of the EORTC QLQ C-30 physical and role functioning were not correlated with C-SOSI scores, suggesting that stress levels were not highly associated with the physical and functional ability of these participants.

Discussion

The iterative factor analysis applied to the 94-item SOSI was successful in reducing the number of items to 56, and the subscales to 8, while still maintaining the essence of the questionnaire, which assesses both physical and psychological manifestations of stress. The subscales remaining were named: Depression, Anger, Muscle Tension, Cardiopulmonary Arousal, Sympa-

thetic Arousal, Neurological/GI, Cognitive Disorganization, and Upper Respiratory symptoms. Items left out were generally from the catch-all previous subscale of "Habitual Patterns" and the "Anxiety" subscale—the items from these subscales have either been removed or redistributed among the other subscales where appropriate. The resultant items and subscales fit with our understanding of stress symptoms and needs for program evaluation. The criteria of requiring communality greater than 0.4 and a factor loading greater than 0.4 resulted in scales with high internal consistency (0.8–0.9) and factor loadings consistently well over the cut-off value. The C-SOSI also correlated surprisingly well and very specifically with other well-validated measures of mood disturbance, quality of life, sleep, and spirituality as expected. There was high convergence between similar subscales and increasing divergence as subscales were conceptually more removed from one another. For example, using a cut-off correlation of 0.75 as an indicator of convergent validity (Colton, 1974), the Depression subscale on the C-SOSI converged with Emotional Functioning on the EORTC QLQ C-30, and Depression, Tension, and the Total Mood Disturbance score on the POMS, all scales purported to measure essentially the same construct. The Anger subscale specifically correlated with Anger on the POMS, but with no other subscales on any instruments—a very specific example of excellent convergence and divergence. Hence, in terms of the applicability of this tool in cancer patients, it will add another very sensitive measure that covers a wide array of symptoms, perhaps eliminating the need for multiple assessment tools that are often used in psychosocial oncology research. This will subsequently ease the burden of research participants. Specifically, both the POMS and the C-SOSI may not need to be administered, but the PSQI and the FACIT-Sp should not be eliminated as they are quite divergent from the C-SOSI.

Similar to other measures of depression and anxiety in medical populations, it should be noted that

Table 4. Correlations between C-SOSI and EORTC QLQ C-30, POMS, PSQI, and FACIT-Sp Scores

Scale	(Number of Valid Responses)	Dep	Anger	MT	CA	SA	N/G	CD	UR	C-SOSI
European Organization for Research and Treatment in Cancer Quality of Life Questionnaire Functional Scales—EORTC QLQ C-30										
Physical functioning	(326)	-.12*	-.08	-.14*	-.13*	-.07	-.19**	-.20**	-.10	-.17**
Role functioning	(330)	-.11	-.07	-.13*	-.08	-.10	-.19**	-.20**	-.07	-.16**
Emotional functioning	(328)	-.76**	-.63**	-.44**	-.41**	-.37**	-.40**	-.51**	-.29**	-.68**
Cognitive functioning	(328)	-.41**	-.38**	-.42**	-.35**	-.44**	-.43**	-.66**	-.33	-.59**
Social functioning	(331)	-.34**	-.31**	-.25**	-.25**	-.33**	-.35**	-.33**	-.21**	-.41**
Global QL score	(330)	-.47**	-.25**	-.32**	-.32**	-.36**	-.48**	-.35**	-.28**	-.49**
Profile of Mood States—POMS										
Tension	(330)	.74**	.60**	.43**	.40**	.40**	.47**	.57**	.35**	.69**
Depression	(334)	.87**	.61**	.34**	.33**	.32**	.43**	.52**	.29**	.65**
Anger	(334)	.63**	.77**	.27**	.24**	.24**	.35**	.44**	.20**	.56**
Vigor	(334)	-.48**	-.36**	-.25**	-.26**	-.20**	-.32**	-.38**	-.19**	-.42**
Fatigue	(334)	.55**	.39**	.40**	.32**	.39**	.57**	.51**	.37**	.61**
Confusion	(332)	.69**	.54**	.41**	.35**	.37**	.49**	.72**	.32**	.68**
Total mood disturbance score	(334)	.83**	.68**	.41**	.38**	.39**	.52**	.62**	.34**	.74**
Pittsburgh Sleep Quality Index—PSQI	(223)	.41**	.31**	.39**	.41**	.56**	.35**	.40**	.31**	.54**
Functional Assessment for Chronic Illness Therapy—Spiritual—FACIT-Sp	(87)	-.36**	-.23**	-.02	-.16	-.12	-.14	-.14	-.07	-.23*
Total score										

*Significance at 0.05 level, **Significance at 0.01 level.

MT = muscle tension; CA = cardiopulmonary arousal; SA = sympathetic arousal; N/G = neurological/GI; CD = cognitive disorganization, UR = upper respiratory symptoms.

Note. Bold values support convergent validity.

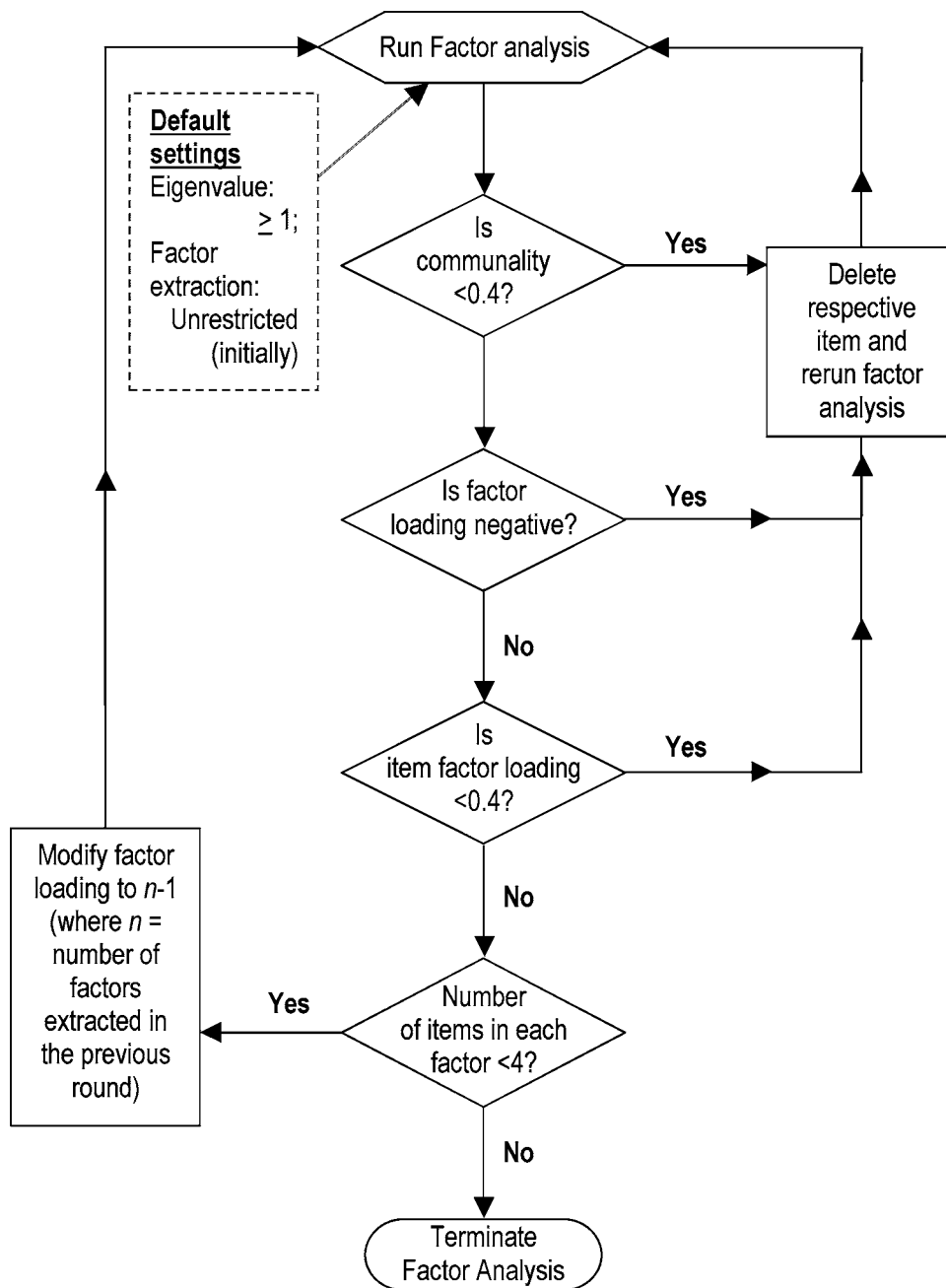


Figure 1. Flowchart on factor analysis decision process.

scores on the C-SOSI may be reflective of not only psychological stress responses, but also of symptoms related to illness and treatment. For example, chemotherapy treatments may lead to accelerated heart rates, and immune therapies such as Interferon-alpha are known to cause symptoms of depression. Physical signs of disease such as fatigue may also be reflected in elevated scores on scales such as depression. This issue should be taken into account when interpreting scores, but is by no means unique to this specific tool.

Of note is that this revision was based upon the responses of cancer patients only, and of those who were preparing to take part in a stress reduction course. They

were also an average age of 51 years old and 85% were women. Due to the relatively small numbers of men, we were not able to analyze separately by gender, but none of the subscale scores were correlated with age or gender in this group, suggesting that norms may not be different when applied to men or women, and to older versus younger participants. However, the scores of this group may not be representative of cancer patients in general, and the tool has not been validated for use in other populations. The content itself is not unique to a cancer population as the questions are not specific to cancer stressors. Therefore the C-SOSI could be applied to any group of people. However, we do note

that the subscales were derived from data collected on a predominantly female middle-aged group of cancer patients, so the tool would need to be tested for internal consistency and the factor structure confirmed for other applications. We do, however, feel this would be a useful future direction. One further caveat is the relatively small sample size (340 participants), which doesn't allow conclusions to be drawn with as much authority as a larger sample size would permit. Further investigation and validation of the C-SOSI with larger data sets would be valuable.

Conclusions

A need was identified to develop a tool for measuring symptoms of stress that would be relatively short (5–10 min) and responsive to interventions, yet long enough to capture multiple domains of stress symptoms, including both physical and psychological manifestations of stress, and possess good psychometric qualities. The SOSI was revised with these objectives in mind, and the revised tool, the C-SOSI, was the result of EFA on data collected from a group of cancer patients. The final questionnaire consists of 56 items and 8 subscales, tapping into multiple domains of stress reactivity. It has excellent internal consistency, good face validity, and excellent signs of both convergent and divergent validity with well-known scales. Further validation studies using multiple measurement methods and divergent constructs in varying populations would be appropriate and helpful. The tool is now ready to be used by behavioral medicine researchers and will hopefully add to the toolbox for accurately and responsively measuring stress symptoms in psycho-oncology settings.

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