

ORIGINAL ARTICLE

Reliability and validity of the Turkish version of spinal cord lesion-related coping strategies

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Objective: Spinal Cord Lesion-Related Coping Strategies Questionnaire (SCL CSQ) is a specific test that is developed for evaluating the coping strategies of the persons with spinal cord injury (SCI). The aim of this study was to evaluate the reliability and validity of the Turkish version of SCL CSQ (SCL CSQ-T) in persons with SCI.

Methods: One hundred persons with SCI were included in the study. All participants were evaluated with SCL CSQ-T and Brief Coping Styles Inventory (BCSI) at the baseline. SCL CSQ-T was repeated twice in 15 days. American Spinal Injury Association Impairment Scale and Functional Independence Measurement were used for the evaluation of the neurological loss severity and functional status. Emotional status was assessed by Hospital Anxiety and Depression Scale (HADS). Internal consistency reliability, test-retest reliability and construct validity of SCL CSQ-T were evaluated.

Results: Intraclass correlation coefficients of the SCL CSQ-T were between 0.51–0.86. Cronbach's alpha values and test-retest reliability of the acceptance, fighting spirit and social reliance subscales were good. Three factors were found in exploratory factor analysis. There was a positive correlation between the subscales of SCL CSQ-T. There was a statistically significant positive correlation between acceptance strategy of SCL CSQ-T and self-confidence and optimism of BCSI. The fighting spirit strategy positively correlated with self-confidence and optimistic strategies. The social reliance strategy positively correlated with helplessness and seeking social support. Coping strategies did not correlate with HADS.

Conclusion: The results of this study revealed good internal consistency reliability, test-retest reliability and concurrent validity of the SCL CSQ-T factors acceptance and fighting spirit in relation to general coping strategies. The coping strategy social reliance needs revisions.

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Keywords: coping strategies; spinal cord injury; SCL CSQ; Turkish version; validation

INTRODUCTION

Spinal cord injury (SCI) is a condition characterized by the sudden onset of neurological deficit below the injury level and consequently it affects the person physically, psychologically and socially.

'Coping' is a dynamic cognitive and behavioral process needed to manage the internal and external stressful situations that exceed the person's own ability.¹ Coping strategies that have a role in the adaptation of people with SCI may vary over time.²

Although there are various scales that help to evaluate the physical disability and quality of life of the persons with SCI, the scales that examine the coping process remain limited. There are some well-known, generic scales developed to investigate coping strategies, such as 'Ways of Coping Questionnaire' (WCQ), COPE Inventory, and Multidimensional Coping Inventory.^{1,3,4} The length of WCQ may sometimes cause confusion and/or be assumed difficult to complete.⁵ Thus, some of the scales have been shortened to make them more practical.⁶ Brief Coping Styles Inventory (BCSI) is a shorter test developed in Turkey on the basis of the WCQ⁷ and is used in persons with SCI.⁸

The disease-specific scales can provide more thorough information about the disability. Spinal Cord Lesion-Related Coping Strategies Questionnaire (SCL CSQ), is a specific scale developed to evaluate the

coping strategies of persons with SCI.⁹ The SCL CSQ that was developed by Elfström *et al.*,⁵ has been reported to be a valid and reliable test for persons with SCI. This study was set to investigate the psychometric performance of the SCL CSQ in another culture than it was previously cross validated in. Cross-cultural validation is an important part of the validation process of a psychometric measure.¹⁰ To our knowledge no SCI-related coping strategies measure has been validated in countries outside the US and west European countries. The aim of this study was to investigate the reliability and validity of the Turkish version of the SCL CSQ (SCL CSQ-T). For the validity of SCL CSQ, we aimed to compare the correlation between the SCL CSQ and BCSI.

MATERIALS AND METHODS

This study was conducted between 1 January 2010 and 31 December 2010 in one of the three largest rehabilitation centers in Turkey; the Spinal Cord Rehabilitation Unit of Istanbul Physical Medicine and Rehabilitation Training Hospital, Istanbul. One hundred consecutive people with traumatic or nontraumatic SCI admitted to the Spinal Cord Injury Outpatient clinic were included in the study. The people with SCI unable to cooperate and those with concomitant traumatic brain injuries were not included.

Participants completed SCL CSQ twice in 15-day intervals. All the participants were evaluated with BCSI and Functional Independence

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Measurement (FIM) at the baseline. Hospital Anxiety and Depression Scale (HADS) was used for the assessment of the emotional status at the beginning. All data were collected by face-to-face interviews in the rehabilitation center.

Measurements

Spinal cord Lesion-related Coping Strategies Questionnaire. SCL CSQ, which was developed in Swedish by Elfström *et al.*,⁹ is a specific test for persons with SCI. It is a scale that consists of 12 items mirroring three strategies.

Acceptance: This strategy that consists of four items, is characterized by the injured person's reforming of life values. It can be rendered as his acceptance of disease, re-interpretation of life and attempt to replace the values withheld from his capability because of the lesion, that the person is incapable of withholding, with new ones.⁹

Fighting spirit: This strategy that consists of five items, reflects the effort to conduct independent behavior. The fighting spirit strategy expresses the efforts of the individual to find new goals to lessen the effects of the injury.⁹

Social reliance: This three-item negative strategy is used for the manner of psychologically-dependent behavior on others. The individual feels dependent on others and their help (in need).

The person using the acceptance strategy tries to adapt to his new life by making the necessary changes about himself. The person, who takes up the fighting spirit strategy, however, holds the control of his life himself, whereas the person with the social reliance strategy has left the control to others. Acceptance and fighting spirit are active strategies, whereas social reliance is a passive strategy.

A four-point scale is used for the assessment:

1. Completely disagree
2. Somewhat disagree
3. Agree
4. Strongly agree

Total score ranges from one to four points. High scores indicate more utilization of the related strategy.⁹

Preparation of the Turkish version

The original SCL CSQ was developed in Swedish and has been translated into English (SCL CSQ v 1.0).¹¹ After some minor changes related to the translation of some words, the English version 2.0 of the SCL CSQ (SCL CSQr) was built up.¹² The English version of SCL CSQr with the permission of Magnus Elfström on 3 August 2006, was used for the forward and backward translations. The translations of SCL CSQ was made by three Turkish physiatrists, one clinical psychologist and one non-medical person, all of whom were proficient in English. There were some discrepancies between the different forward translations. The discrepancies were resolved by a panel that consisted of three experienced physiatrists and one psychologist. The further review of SCL CSQ after the backward translation was conducted by an independent Turkish speaking person with a proficient command of English. Then the prepared Turkish version was used on 20 people with SCI as a pilot test. Three items were revised after the pilot test (see appendix).

Brief Coping Styles Inventory

BCSI is derived from WCQ by Sahin and Durak. The scale has a total of 30 items and a five-factor structure. The factors are self-confidence, optimistic, submissive, helplessness and seeking social support. BCSI measures two basic coping strategies as problem oriented that is an adaptive strategy and emotion oriented that is a maladaptive strategy. Self-confidence, optimistic and seeking social support strategies are adaptive coping strategies. The people who use self-confidence and optimistic strategies may cope stress effectively. Maladaptive strategies are submissive and helplessness. The people who use helplessness and submissive strategies may not cope with stress effectively. BCSI measures the coping strategies with a four-point scale. If a person has higher scores of a particular strategy that means this person prefers the strategy.⁷

Hospital Anxiety and Depression Scale

HADS is a simple and reliable test that can be used in medical practice. Validity and reliability of the Turkish version of HADS has been studied.¹³ It can be used both in hospital and community settings. It has a two-factor structure with seven items for evaluating anxiety and seven reflecting depression. Each item is evaluated on a four-point scale. The total possible scores are between 0 and 21 both for anxiety and depression. 0–7: normal, 8–10: suggestive of the presence of anxiety or depression, 11–21: higher indication for the presence of anxiety or depression.¹⁴

This study was approved by the hospital's ethical committee. Informed consent was obtained from the participants.

Statistical analysis

SPSS 10.0 software (SPSS Inc., Chicago, IL, USA) was used for the statistical analyses and $P < 0.05$ was considered as statistically significant. Paired sample correlations were used to assess the reliability of the SCL CSQ-T factors. As the values become closer to one, reliability increases. Test-retest reliability was measured by using the intraclass correlation coefficient and Pearson's correlation analysis.

Cronbach's alpha coefficient was used for the evaluation of internal consistency reliability. Cronbach's alpha coefficient is useful for evaluating the homogeneity of a scale. Cronbach's alpha is a value between one and negative infinity. The relationship between the subscale scores of the SCL CSQ-T and BCSI was investigated by using Pearson's correlation coefficient for convergent validity.

Factor analysis was performed on the results of the SCL CSQ-T from all subjects with use of principal component analysis to extract factors. The retained factors in each scale had eigenvalues > 1 . Independent factors were obtained by use of the varimax rotation method. Correlation analysis established the strength of the relationships between the SCL CSQ-T and both the positive and negative outcomes. Identical logistic regression analysis, which examined the relationship between all SCL CSQ-T factors and each psychological outcome, while keeping demographic and injury-related characteristics constant, were performed. This analysis was used owing to expected positive skewing of the outcome results.

RESULTS

Demographic and clinical characteristics of the persons are summarized in Table 1. Seventy four percent of the participants were male. In this study, the most frequent cause of SCI was falls. Traffic accidents were the second most common cause of SCI. The duration of SCI was more than 1 year in 52 persons.

Internal consistency reliability of the SCL CSQ-T as assessed by Cronbach's alpha values of fighting spirit (good), acceptance (good) and social reliance (low but acceptable) are shown in Table 2 (respectively, 0.81, 0.80 and 0.67). Intraclass correlation coefficients are summarized in Table 3. Fighting spirit and acceptance were excellent, social reliance was good (respectively, intraclass correlation coefficients 0.80, 0.80 and 0.60). Pearson's correlation was used for the test-retest reliability.

Varimax rotation was used for factor analysis of the SCL CSQ-T and three factors were found (Table 4). The three-component solution explained a total of 62.09% of the variance in the Coping Strategies Scale.

Convergent validity was tested by the correlation between BCSI and SCL CSQ-T strategies (Table 5). There were statistically significant positive correlations between SCL CSQ-T acceptance and BCSI self-confidence and optimism ($P < 0.01$). The fighting spirit of SCL CSQ-T correlated positively with BCSI self-confidence and optimistic strategies ($P < 0.04$, $P < 0.02$). SCL CSQ-T social reliance showed statistically significant positive correlations with BCSI helplessness and seeking social support ($P < 0.005$, $P < 0.02$). Moreover, fighting spirit and social reliance showed statistically nonsignificant negative

Table 1 Characteristics of participants (N= 100)

	Mean ± s.d.	Min-max
Male/female, n (%)	74/26	
Age (years)	40.83 ± 16.12	17–75
Education (years)	6.77 ± 3.32	0–15
Marital status (%)	Married 62 Single 38	
Injury duration (months)	28.47 ± 44.02	1–240
Motor FIM	43.05 ± 20.80	13–89
Etiology	Traffic accidents Falls Other injuries Nontraumatic	31 42 7 20
AIS	A, B (motor complete) C, D (motor incomplete)	40 60
Level of lesion	Tetraplegia Paraplegia	26 74
<i>SCL CSQ</i>		
Acceptance	2.91 (0.69)	1–4
Fighting spirit	3.15 (0.68)	1–4
Social reliance	2.78 (0.67)	1–4
HADS anxiety	7.59 (4.67)	0–20
Depression	5.74 (3.53)	0–16

Abbreviations: AIS, Association Impairment Scale; FIM, Functional Independence Measurement; HADS, Hospital Anxiety and Depression Scale; SCL CSQ, Spinal Cord Lesion-Related Coping Strategies Questionnaire.

Table 2 Internal consistency (Cronbach's alpha) within subscales

	Cronbach's alpha
Fighting spirit	0.81
Acceptance	0.80
Social reliance	0.67

Table 3 Intraclass correlation coefficients

	ICC	95% CI	P-value
Fighting spirit	0.80	0.739–0.86	<0.0001
Acceptance	0.80	0.725–0.853	<0.0001
Social reliance	0.61	0.515–0.78	<0.0001

Abbreviation: ICC, intraclass correlation coefficient.

Table 4 Factor analysis of SCL CSQ-T loadings

	Factors		
	Fighting spirit	Acceptance	Social reliance
Loadings	3. item 0.784 5. item 0.797 7. item 0.774 10. item 0.716 12. item 0.51	1. item 0.707 2. item 0.697 4. item 0.734 6. item 0.712 11. item 0.631	8. item 0.852 9. item 0.821
Explained variance	24.46%	24.26%	13.36%

Table 5 Correlation between SCL CSQ-T and BCSI

	Self-confidence P<	Helplessness P<	Submissive P<	Optimistic P<	SSS P<
Acceptance	0.252 (0.01) ^a	-0.120	-0.160	0.244 (0.01) ^a	0.078
Fighting spirit	0.199 (0.04) ^a	-0.064	-0.172	0.219 (0.02) ^a	0.018
Social reliance	-0.19	0.278 (0.005) ^a	0.086	0.029	0.225 (0.02) ^a

Abbreviations: BCSI, Brief Coping Styles Inventory; SCL CSQ-T; Turkish version of Spinal Cord Lesion-Related Coping Strategies Questionnaire; SSS: seeking social support.
^aStatistically significant.

correlations with FIM ($P > 0.05$). There was a statistically nonsignificant weak correlation between acceptance and FIM ($r = 0.118$, $P = 0.07$).

Although far from significant, the directions of the relations in both correlations and regressions between the SCL CSQ-T coping strategies and anxiety and depression were theoretically interpretable. That is, the more acceptance and fighting spirit the less emotional distress, and the more social reliance the more emotional distress.

DISCUSSION

According to the result of this study, SCL CSQ-T has good reliability and good convergent construct validity concerning two of its factors in relation to general coping strategies, but weak construct validity in relation to anxiety and depression. Cronbach's alpha values of the acceptance, fighting spirit and social reliance subscales were 0.80, 0.81 and 0.67, respectively. Whereas the internal consistency reliability of the acceptance and fighting spirit subscales were found to be good, social reliance was the subscale with the lowest, but acceptable, reliability in this study. The results of this study are parallel with the previous studies.^{15,16} Elfström *et al.*¹⁵ reported that Cronbach's alpha values of the acceptance, fighting spirit and social reliance subscales were 0.78, 0.64 and 0.74, respectively in the original study. Cronbach's alpha values of acceptance, fighting spirit and social reliance strategies were 0.78, 0.68 and 0.61, respectively in a multicenter study that was conducted in Austria, Germany, Switzerland and England.¹⁶ Elfström *et al.*⁵ reported that both SCL CSQ and WCQ had moderate acceptable reliability in a group of traumatic SCI patients with an injury duration of more than 1 year.

In this study intraclass correlation coefficients were between 0.61 and 0.80 for the three subscales of SCL CSQ-T. Test-retest reliability of acceptance and fighting spirit strategies were excellent, whereas the reliability of social reliance was good.¹⁷

This study revealed a three-factor structure of SCL CSQ-T. In contrast with the original factor structure, one item (no. 4) loaded on acceptance instead of social reliance. This one item deviation from the original structure can partly emanate from the relatively small sample size for factor analysis. Another reason may be that we made some changes in items four, eight and nine by using more informative words to make them clear and understandable in Turkish. Item 4 was changed to 'I believe in other people can help me' in the backward translation of the SCL CSQ-T. Item 8 was revised to 'I would feel completely helpless if others did not support me'. Item 9 was changed to 'I understood that I am dependent on others after my injury'. Furthermore, the social reliance scale was in previous translations the scale that needed the most revisions,¹⁵ adding evidence of specific cultural impact on this scale.

Another finding of this study was the correlations between SCL CSQ-T and BCSI subscales. Convergent validity of SCL CSQ-T in relation to general coping strategies was good for acceptance and fighting spirit, but more mixed for social reliance. There was a

statistically significant positive correlation with the acceptance strategy of the SCL CSQ-T and self-confidence and optimistic strategies of BCSI ($P=0.01$, $P=0.01$). Fighting spirit strategy of the SCL CSQ-T correlated significantly with self-confidence and optimistic strategies of BCSI ($P=0.04$, $P=0.02$). Social reliance strategy of the SCL CSQ-T showed significant correlation with helplessness and seeking social support strategies of BCSI ($P=0.005$, $P=0.02$). Elfström *et al.*⁹ reported an inverse correlation between helplessness and acceptance and a positive correlation between helplessness and social reliance strategy as parallel with that of our study. In another study, a positive correlation was found between social reliance and psychological distress.¹⁵ Migliorini *et al.*¹⁸ have found a relationship between helplessness, as measured by SCL Emotional Wellbeing Questionnaire, and anxiety and depression. They concluded that high helplessness may cause a five-time increase in anxiety and 15-fold increase in depression. Coping strategies did not correlate with anxiety or depression in this study. Kennedy *et al.*¹⁹ reported that the coping strategies at the 6th week after injury has been related with 67% variance of depression and adjustment in traumatic SCI. Elfström *et al.* revealed that SCL CSQ related with the SCL-related psychological outcome as measured by SCL-related psychological outcome scale.⁹

HADS was used for the evaluation of anxiety and depression in this study. Mean values of HADS anxiety and depression indicated low levels of emotional distress in the study group. The floor effect in both anxiety and depression scales might hide the relationship between coping strategies and psychological status in this study. If there was a floor effect, the use of a condition-specific psychological outcome questionnaire, like the SCL-related psychological outcome scale^{9,15} for persons with SCI might be better to investigate this relationship. However, the nonsignificant relations between SCL CSQ-T coping factors and emotional distress might also mirror social desirable answers owing to the face-to-face interview procedure used. The use of coping strategies might have been over-reported in persons experiencing emotional distress. This is not to say that social desirability could explain the nonsignificant relations, the mean coping values are not high enough to allow that conclusion, but the combination of a floor effect in HADS scales and over-reporting in a number of individuals could be responsible for the lack of association between SCL CSQ-T and HADS.

Elfström and Kreuter²⁰ concluded that the people who use social reliance strategy try to compensate their disability by the help of others. Moreover, they stated that social reliance strategy represents low autonomy, whereas the fighting spirit indicates high autonomy. For this reason social reliance is a negative or passive strategy and the people with social reliance strategy cannot deal well with the injury.

Active coping strategies for example, acceptance and fighting spirit are related with increased well-being, however, social reliance is related with decreased well-being. There is a relationship between internal locus of control and coping strategies and emotional well-being.²¹

As a result of this study, the mean scores of the fighting spirit, acceptance and social reliance were 3.15, 2.90 and 2.78, respectively. The most widely used coping strategy was the fighting spirit in this study. Kennedy *et al.*¹¹ concluded that fighting spirit and acceptance strategies were used more than social reliance among the people with SCI living in the community in the United Kingdom, Germany, Austria and Switzerland. The coping strategies of the participants in this study were similar to that of European people with SCI. Elfström *et al.*⁵ reported that the mean scores of the fighting spirit, social reliance and acceptance were 3.28, 2.70 and 2.57, respectively, in a group of 181 traumatic SCI persons living in the community.

Statistically nonsignificant negative correlations were found between fighting spirit and social reliance strategies and functional status in this cross-sectional study. There was a weak correlation between acceptance and functional independence. Kennedy *et al.*¹² concluded that acceptance and social reliance strategies measured by SCL CSQ were related with functional independence evaluated with FIM in a longitudinal study. Social reliance strategy was reported to be the most prominent negative predictor of the functional status in the same study. Kennedy *et al.*²¹ reported that age, gender, injury level, social reliance strategy and depression status at 12 weeks after injury were responsible for 33.5% of the variance in the motor FIM at 1 year after injury.

The limitations of this study are the relatively small group and the cross-sectional design. Furthermore, one item of the original social reliance factor (that is, no. 4) was found to load on acceptance instead of social reliance in SCL CSQ-T, and the social reliance scale had a positive correlation with seeking social support. For this reason, the social reliance subscale needs to be developed in a revised Turkish version. By the present Turkish translations of the items of social reliance, item 4 might have been oriented toward general trust in other people, whereas item 8 and 9 might have kept the originally intended orientation of being surrendered to other people, and thus having low autonomy. If the meaning of item 4 has shifted as compared with what was originally intended, that could explain why the item loaded on the acceptance factor, as one way to change priorities in life after an injury (that is, use acceptance) is to put a greater emphasis on the importance of close relationships with others. Moreover, further longitudinal studies may help to reveal the relationship between coping strategies and functional status. The importance of this study is that it is the first one using SCL CSQ to evaluate the coping strategies of the people with SCI outside western Europe and that all the participants were evaluated in the rehabilitation hospital.

CONCLUSION

SCL CSQ-T factors acceptance and fighting spirit are reliable and valid in terms of their relation to general coping strategies. SCL CSQ that is developed specifically to measure the coping strategies in the SCI population, can be useful in Turkish people. Further studies of the social reliance strategy are needed.

DATA ARCHIVING

There were no data to deposit.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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APPENDIX

SCL CSQ TURKISH V 1.0

1. Yaralanmamı hayattaki başka olaylarla kıyaslamayı başarabiliyorum (A)
2. Yaralanmamdan sonra hayatta daha önce düşünmediğim şeylere değer vermeyi öğrendim (A)
3. Bana göre başarmak için uğruna mücadele edebileceğim hedefler koymak önemlidir (FS)
4. Diğer insanların bana yardım edebileceğine inanırım (A)
5. Yaşamımda yaralanmaya rağmen elimden gelenin en iyisini yapmaya çalışırım (FS)
6. Fiziksel olarak kaybettiklerimi, diğer birçok başka yolla tekrar kazanıyorum (A)
7. Yaralanmanın hayatımı kontrol etmesini reddediyorum (FS)
8. İnsanlar bana destek olmasa kendimi tamamen çaresiz hissederdim (SR)
9. Yaralanmamdan sonra birçok konuda diğer kişilere bağımlı olduğumu anladım (SR)
10. Kendimi her zaman idare etmeye çalışırım (FS)
11. Sanırım yaralanmamı kabullendim (A)
12. Her zaman hayatı kolaylaştırmak için yeni yollar ararım (FS)