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Reliability of the Turkish version of the hospital anxiety and depression scale in the people with traumatic spinal cord injury

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Abstract.
BACKGROUND: Emotional problems are common in spinal cord injury (SCI). Self report questionnaires are easy and useful for screening the emotional status in clinical practice.
OBJECTIVES: The aim of this study was to assess the reliability of the Turkish version of the Hospital Anxiety and Depression Scale (HADS) as well as to investigate the frequency of anxiety and depression in a group with SCI admitted to the outpatient clinic of a rehabilitation hospital.
METHODS: One hundred seventy-five persons with traumatic SCI were included in this study. The American Spinal Injury Association Impairment Scale, Functional Independence Measure (FIM) and HADS were used for assessments.
RESULTS: The mean age of the participants was 35 ± 13 years, and the mean time elapsed since injury was 13 ± 29 months. The mean motor FIM score was 41 ± 21. The Cronbach's alpha coefficient was 0.90 and 0.77 for the anxiety and depression subscales of the HADS, respectively. Forty percent of the participants had anxiety and 28% had depression. Anxiety was positively correlated with time since injury ($r = 0.2$). Depression was negatively correlated with the education level ($r = 0.25$), and positively correlated with age ($r = 0.17$). There was a positive correlation with completeness and anxiety and depression ($r = 0.49$, $r = 0.55$).
CONCLUSION: The Turkish version of the HADS is a reliable psychological screening test for anxiety and depression in people with SCI. Rehabilitation team should gather maximum information about the emotional status of the person with SCI, and plan the appropriate treatment for anxiety and depression.

Keywords: Anxiety, depression, hospital anxiety and depression scale, reliability, spinal cord injury

1. Introduction

In most of the people with spinal cord injury (SCI), secondary disorders occur in addition to neurologic and musculoskeletal system problems. Psychological disorders due to disability results from a sudden trauma are among them. Depression is more common among those with SCI as compared to the normal population [16, 19]. A previous study reported that approximately 30% of persons with SCI experienced a psychological disorder [5].

Physical rehabilitation patients are also monitored for signs and symptoms of anxiety and depression by the healthcare professionals in the rehabilitation team. People with SCI who experience depression or psychological distress spend longer time in bed, are less likely to go out of the home, require extra help for personal care, and use more medications [21]. Anxiety and depression unfavorably affect the quality of life of the people with SCI. Secondary problems, even

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a single one, affect the life expectancy of the people with SCI living in the community. Moreover, probable major depression has been reported as a risk factor for mortality in people with SCI [13].

Since the standard psychological assessments are time consuming for both the physician and the patient, short self-report questionnaires are more advantageous in evaluating emotional status [16]. Self-report screening tests can also be applied by professionals other than psychiatrists or psychologists [7]. The diagnosis of depression according to the standard criteria cannot be made via self-report depression scales. Nevertheless, these scales can be easily used even in patient groups with mobility disorders [17]. There are various scales with proven validity and reliability, which can be used to evaluate depression and anxiety in the people with SCI [12]. There is not yet sufficient evidence about which scale is better [7]. The Hospital Anxiety and Depression Scale (HADS) is a practical screening test that can be used in the people with SCI who are living in the community and in those who are hospitalized.

A previous study reported that the HADS demonstrated good internal consistency in a population with SCI [22]. In that particular study, the construct validity of the HADS anxiety subscale was found adequate whereas the construct validity of the depression subscale was found excellent by the correlation study with the Life Satisfaction Questionnaire [22].

To the best of our knowledge, the reliability of the Turkish version of the HADS has not yet been investigated in spinal cord injured population in Turkey. The aim of the present study is to investigate the reliability of the Turkish version of the HADS, as well as to investigate the frequency of anxiety and depression in people with SCI admitted to the outpatient clinic of our rehabilitation hospital.

2. Materials and methods

One hundred seventy-five persons with traumatic SCI who were admitted to the outpatient clinic of our hospital between January 1, 2010, and February 28, 2011 were included. Demographic and clinical characteristics of the patients including age, gender, occupation, years of education, and time since injury were recorded. All participants completed the HADS in a room at the hospital. The patients were excluded from the study for the following reasons: failure to cooperate; known psychiatric disorder; and age $\leq$17 years at the time of injury. Scales applied to the patients are summarized below.

2.1. American spinal injury association impairment scale (AIS)

The American Spinal Injury Association impairment scale (AIS) shows the severity of neurological injury in people with traumatic SCI. This scale is widely used in clinics dealing with SCI, and gives information about both motor and sensory loss in people with SCI. AIS A and B define motor complete injuries, whereas AIS C and D define motor incomplete injuries.

2.2. Functional independence measure (FIM)

The Functional Independence Measure (FIM) is an assessment method that gives information about the motor and cognitive status of rehabilitation patients. The FIM consists of 18 items involving six subscales. The motor domain of the FIM consists of 13 items involving four subscales. Each item is scored from 1 to 7, where 1 represents total dependence and 7 indicates complete independence. Total score ranges between 13 and 91, with higher scores indicating better functional status [14].

2.3. Hospital anxiety and depression scale (HADS)

The HADS is an easily applicable and reliable screening test that evaluates the anxiety and depression status of patients. Although the HADS was initially developed for hospitalized patients, it can be used both for outpatients and the community. Patients are asked to answer with his/her feelings during the last week [20]. It takes 2 to 5 minutes to complete the test. This scale, which has a two-factor structure is comprised of 14 items. Seven of these items assess the anxiety status and the remaining seven assess depression. Each item is scored on a four-point scale. Total score ranges between 0 and 21 for anxiety and depression. Scores between 0 and 7 indicate normal emotional status. Zigmond and Snaith [23] reported that scores greater than 7 on the anxiety or depression subscales of the HADS indicated anxiety and depressive disorder. The Turkish version of the HADS has proven validity and reliability in healthy college students and in hospitalized patients [2].

This study was approved by the local ethics committee of the hospital. Informed consents of the participants were obtained.

2.4. Statistical analysis

Statistical analysis was carried out using the Statistical Package for the Social Sciences (version 10.0; SPSS Inc., Chicago, IL, USA). Descriptive statistics were presented. The Pearson's correlation coefficient was used to investigate the relationship between normally distributed quantitative variables while the Spearman's correlation coefficient was used to investigate the relationship between non-normally distributed variables. Results were evaluated within the 95% confidence interval, and at a significance level of $p < 0.05$. Internal consistency of the HADS was assessed by the Cronbach's alpha coefficient.

3. Results

Demographic characteristics of the participants are summarized in Table 1. Intriguingly, 81.7% of the participants were male and the mean age was 35 years. The clinical characteristics are shown in Table 2. The most common cause of injury was falling (47.4%), followed by road traffic accidents (36.6%). The most common level of injury was thoracic (53.7%), followed by cervical and lumbar levels.

The Cronbach's alpha coefficient was 0.90 for the anxiety subscale and 0.77 for the depression subscale, in this study.

In the present study, 71 (40.6%) participants had anxiety and 49 (28%) had depression.

Table 1
Demographic characteristics of the patients

	Mean ± standard deviation	Min-max
Age (years)	35 ± 13	18–77
Education (years)	7.3 ± 3	0–15
Gender		
Male	143 (81.7%)	
Female	32 (18.3%)	
Marital status		
Married	94 (53.7%)	
Single	81 (46.3%)	
Time since injury (months)	17 ± 33	1–240

Depression was negatively correlated with years of education ($p = 0.001$, $r = -0.25$), and was positively correlated with age ($p = 0.02$, $r = 0.17$). Anxiety was not correlated with age and years of education ($p > 0.05$). However, anxiety was positively correlated with time since injury ($p = 0.008$, $r = 0.2$). There was a positive correlation with the completeness of the injury and both anxiety and depression ($p = 0.0001$, $r = 0.49$; $p = 0.0001$, $r = 0.55$) (Table 3).

Neither anxiety nor depression was correlated with gender, marital status, level of injury and level of functional independence ($p > 0.05$).

4. Discussion

The present study showed that the Cronbach's alpha coefficient of the Turkish version of the HADS was 0.90 and 0.77 for the anxiety and depression subscales, respectively. These results indicated the good internal consistency reliability of the HADS anxiety subscale and the acceptable internal consistency of the HADS depression subscale in people with SCI. These results are parallel with the previous studies [15, 22].

In a study carried out by Woolrich et al. [22] in people with SCI, Cronbach's alpha coefficient was reported as 0.85 and 0.79 for the anxiety and depression subscales of the HADS, respectively.

Table 2
Clinical characteristics of the patients

	Patients	Min-max
AIS *n* (%)		
A	81 (46.5%)	
B	27 (16%)	
C	45 (25%)	
D	22 (12.5%)	
Level of injury *n* (%)		
Paraplegia	131 (74.9%)	
Tetraplegia	44 (25.1%)	
Motor FIM (mean ± SD)	41 ± 21	11–89
HADS-Anxiety (mean ± SD)	7.7 ± 5	0–21
HADS-Depression (mean ± SD)	5.8 ± 3.4	0–16

AIS: American Spinal Injury Association Impairment Scale; FIM: Functional Independence Measure; HADS: Hospital Anxiety and Depression Scale.

Table 3
Correlations between anxiety and depression, and demographic and clinical parameters of the patients

	Age		Education		Time since injury		Motor FIM		AIS A (completeness)	
HADS-A	$r = 0.009$	$p = 0.9$	$r = -0.01$	$p = 0.8$	$r = 0.2$	$p = 0.008$*	$r = 0.04$	$p = 0.5$	$r = 0.49$	$p = 0.0001$*
HADS-D	$r = 0.1$	$p = 0.02$*	$r = -0.25$	$p = 0.001$*	$r = 0.08$	$p = 0.2$	$r = 0.01$	$p = 0.8$	$r = 0.55$	$p = 0.0001$*

FIM: Functional Independence Measure; HADS-A: Hospital Anxiety and Depression Scale-Anxiety; HADS-D: Hospital Anxiety and Depression Scale-Depression, AIS: ASIA Impairment Scale.

In a large, population-based study by Myketun et al. [15], reported a Cronbach's alpha coefficient of 0.80 and 0.76 for the anxiety and depression subscales, respectively. This large population-based study reported that the basic psychometric properties of the HADS were satisfactory.

The other important finding of the present study was that 40.6% of the persons with SCI had an anxiety disorder and 28% had depression. The people with SCI frequently experience anxiety or depression after injury. In a previous study significantly higher anxiety and depression scores in the SCI group has been found as compared to the control group [5]. However, it has been suggested that stroke and multiple sclerosis patients have higher depression scores than SCI patients [4].

In their study involving 963 people living in the community with an SCI, Woolrich et al. [22] investigated psychological disorders using the HADS, and reported the rate of anxiety and depression as 31.8% and 20.8%, respectively.

Banerja et al. [3] found the prevalence of mental illness to be 20% among 8338 veteran health administration clinic users with SCI. The authors reported that depression was the most common mental illness in the same study.

Anxiety rates measured in SCI patients during different periods ranging from rehabilitation to reintegration within the community varies between 10% and 60% [16]. In a review by Craig et al. [4], it was reported that the prevalence rate of depressive symptoms among SCI patients living in the community ranged from 11.4% to 60%.

In their study assessing depressive symptoms at four time points during 12 months after injury via the Beck Depression Inventory (BDI) in 130 patients with acute SCI, Hassanpour et al. [10] reported that the depressive symptoms remained stable during the first year, and that the BDI scores were slightly higher than the mean score of the normal population.

According to the previous studies, depressive symptoms continue at a decreasing rate beginning from the first year until the fifth year [1, 11]. On the other hand, in their study involving long-term traumatic SCI from rehabilitation hospitals, Saunders et al. [18] reported that probable major depression continued over time. However, there are studies that investigate the depression rates in different SCI populations, the low rate of antidepressant drug use in this group of patients was pointed out [8, 19].

There was a positive correlation with depression and age, whereas, an inverse relationship was found between the depression and education level in this study. Anxiety was positively correlated with time since injury. Both anxiety and depression was found to be related with completeness of the lesion in the patients with SCI. There was no relationship between anxiety or depression and other demographic or clinical characteristics in this study. Fullerton et al., concluded that postinjury depression was more frequent in the people with complete SCI, however, there was no difference between paraplegics and tetraplegics in term of depression [9]. Completeness of the injury is defined as a risk factor for depression in SCI because of no hope from rehabilitation [6]. A previous study reported no significant association between probable major depression and level of injury, severity of injury, FIM scores, gender, and educational level [18].

The strengths of this study is the relatively big number of the participants with traumatic SCI. As our knowledge, this study is the first biggest study that evaluate the emotional status in the people with SCI in Turkey. The limitation of this study is the lack of follow-up because of the cross-sectional design.

In conclusion, the Turkish version of the HADS is a practical reliable self-report test that can be used in screening people with SCI for both anxiety and depression. Just like the other secondary conditions, psychological status should also be screened in people with SCI and those with anxiety or depressive disorder should be treated properly.

Declaration of interest

There is no conflict of interest.

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