ORIGINAL ARTICLE

Psychometric properties of the Sexual Adjustment Questionnaire (SAQ) in the Iranian population with spinal cord injury

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Study design: This is a cross-sectional study

Objectives: The objective of this study was to examine the psychometric properties of the Sexual Adjustment Questionnaire (SAQ) for Iranian people with spinal cord injury

Setting: This study was conducted in the Brain and Spinal Cord Injury Research Center, Tehran University of Medical Sciences, Tehran, Iran

Methods: We assessed the psychometric properties of the SAQ, with 200 participants (men = 146, women = 54) completing the scale. An evaluation of its test–retest reliability was performed over a 2-weeks period, on a subsample of 30 patients recruited from the overall group. Cronbach's α -coefficient was computed for assessment of internal consistency reliability. In addition, content and face validity were examined by an expert committee. Construct validity was assessed by examining convergent and discriminant validity. Finally, exploratory factor analysis was used to extract the factor structure of the questionnaire.

Results: The Cronbach's α and intraclass correlation coefficient were 0.77 and 0.72 retrospectively. With regard to construct validity, there was a significant ($P=0.009$) negative correlation ($r=-0.28$) between the SAQ score and age. Those with lower levels of education scored significantly lower on the SAQ ($P=0.04$). The exploratory factor analysis indicated a four-factor structure for the questionnaire, accounting for 68.9% of the observed variance. The expert committee approved the face and content validity of the developed measure.

Conclusion: The SAQ is a valid measure for assessing sexual adjustment in people with spinal cord injury. The evaluation of sexual well-being may be useful in clinical trials and practical settings.

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INTRODUCTION

Spinal cord injury (SCI) is a common physical disability around the world. In the United States, the annual incidence of SCI is up to 40 cases per million.¹ The point prevalence of SCI in Iran is relatively common and it is estimated to be 4.4 [95% CI = 1.2–11.4] per 10 000.² Individuals with SCI experience more physical and psychological problems, which has inevitable effects on their sexual life.³ The extent of sexual response changes depend partly on the location and degree of the SCI.⁴ Erectile dysfunction is one of the most common sexual complications in men with SCI. In addition, decreased arousal and orgasmic dysfunction are common sexual problems among women.^{5,6} Although there are medical treatments suggested for sexual rehabilitation in people with spinal cord injury, sexual adjustment is an important issue for people living with SCI.^{7,8} Overall, sexual adjustment is defined as the couple's similarities in the aspects of psycho-cognition and behaviors influencing their sexual relationships.⁹ Purnine and Carey (1997) defined sexual adjustment as sexual

agreement between couples, which means dyadic or mutual understanding of sexual preferences and priorities of each other and the level of harmony in their sexual encounters.¹⁰

In SCI, sexual adjustment can encompass two aspects: personal and interpersonal. A person with SCI is more likely to adapt to changes in his/her sexual life; however, such adaptation is often more challenging when the interpersonal aspect of sexual relationship is considered.^{6–8} It is important to understand and address changes in sexual relationship as a part of the overall adjustment to life after injury for people with SCI and their partners.^{7,8}

To assess sexual adjustment in people with spinal cord injury, there is a need for a valid and reliable measure. Abramson *et al.*¹¹ introduced four sexual health outcome measures for individuals with SCI: Emotional Quality of the Relationship Scale, Sexual Activity and Satisfaction Scale, Sexual Attitude and Information Questionnaire and Sexual Interest and Satisfaction Scale. Emotional Quality of the Relationship Scale is a seven-item self-reported scale that measures

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feelings of affection and intimacy, ability to solve problems within the relationship, ability to communicate about sex with one's partner and relationship satisfaction. The second measure, Sexual Activity and Satisfaction Scale, focuses on the sexual activity, sexual desire and sexual satisfaction of people with spinal cord injury. The third tool, Sexual Attitude and Information Questionnaire, is designed to evaluate the effectiveness of counseling programs and sexual education for individuals with SCI and their partners. Abramson *et al.*¹¹ explained that the fourth tool, Sexual Interest and Satisfaction Scale, was designed to measure sexual adjustment after SCI; however, it seems that the main focus of this scale is on sexual interest and satisfaction. There can be no question that sexuality is culturally conceptualized. The Sexual Adjustment Questionnaire (SAQ) may not be claimed as a different or superior tool compared with the existing measures; however, SAQ has emerged from the community with a shared culture. In other words, it may propose the same outcomes as other tools do, but in a culturally appropriate way. The aim of this study, therefore, was to test the psychometric properties of the SAQ among Iranians with SCI. This instrument is one of the multidimensional measures initially developed by Merghati-Khoei *et al.*'s project in 2013 to assess the spinal cord injured population's sexual health holistically. In this project, item generation was conducted on the basis of encounters with people having SCI. In addition, questionnaire development was guided by an extensive literature review, as well as opinions of 12 experts from various disciplines that included sexologists, urologists, epidemiologists, psychiatrists, midwives, general practitioners, rehabilitation physician and religious leaders. At the end of this phase, 11 items were generated to assess the sexual adjustment in SCI (Appendix 1). Each item was rated on a five-point response (completely agree to completely disagree). Developed measures included social life, sexual adjustment, sexual activity, sexual fantasies, partnership satisfaction and sexual performance.¹² In our previous paper, we conducted and reported the reliability and validity of the measures. The findings in the sexual adjustment dimension were significant and alarming. Our patients had tremendous problems with

their sexual adjustments compared with other dimensions. Therefore, we were encouraged to test the psychometric properties of the SAQ as a priority.

MATERIALS AND METHODS

To achieve the objective of this study, a sample of Iranian people with SCI, who were referred to the Brain and Spinal Injury Research Center, Tehran/Iran, filled out the SAQ.

Design and data collection

This was a cross-sectional study with convenience sampling including 200 people with spinal cord injury referred to the Brain and Spinal Cord Injury Research center in Imam Khomeini Hospital, Tehran, Iran from April 2012 to July 2013. Individuals were eligible for recruitment if they were at least 18 years of age and had no medical diseases other than SCI that affected their health. In addition, participants were evaluated by the American Spinal Injury Association Impairment Scale as a standard neurological classification measure, which is modified of the Frankel scale.¹³ Using this scale, the degree of disability was graded on a 5-point scale from A to E (see Table 1). After explaining the objectives of the study, people with spinal cord injury who were referred to the Brain and Spinal Cord Injury Research clinic and agreed to take part in the study completed the SAQ in person. The trained female and male interviewers were accessible at the study site to assist those with any question about the questionnaire.

Statistical analysis

Psychometric properties of the SAQ were assessed by several statistical tests as follows:

Floor and ceiling effects. Ceiling and floor effects were taken as being the percentage of respondents with scores of five and one respectively, for each item of the questionnaire. Ceiling and floor effects were less than 20% for all items, indicating that the scale seemed to adequately capture the full range of potential responses within the population of patients.

Reliability. Selected from the total population of 200 participants with SDI, a subsample of 30 participants completed the questionnaire twice, with a 2-week interval in order to assess the test-retest reliability using the interclass correlation coefficient. Interclass correlation coefficient values of 0.40 or above were considered satisfactory ($r \geq 0.81$ –1.0 as excellent, 0.61–0.80 very good, 0.41–0.60 good, 0.21–0.40 fair and 0.0–0.20 poor).¹⁴ Thereafter, Cronbach's α -coefficient was computed for assessment of internal consistency reliability. Values equal or >0.60 were considered satisfactory.¹⁵

Validity. We assessed content, face and construct validity of the SAQ. Face validity, defined as whether the scale appears to measure what it is supposed to measure,¹⁶ and content validity or the extent to which a measure comprehensively covers domains of interest were examined by an expert panel.^{14,16} Construct validity was assessed by examining convergent validity for age and discriminant validity by making a comparison between subgroups of the patients based on educational level. It was assumed that patients with a lower level of education would attain a lower SAQ score, and that the SAQ score would be lower in older patients.

Factor analysis. Finally, exploratory factor analysis was used to extract the factor structure of the SAQ questionnaire. EFA was determined using principal component analysis with varimax rotation.¹⁴

Ethics

The Ethics Committee of Tehran University of Medical Sciences approved the study. All participants were informed about the objectives of the study and were assured about confidentiality. Consequently, written informed consent was obtained from all participants.

Table 1 Demographic and clinical pathologic characteristics of the study sample ($n=200$)

Variable	Men	Women	Total
Age (Mean $\pm$ s.d.)	34.4 $\pm$ 9.6	33.1 $\pm$ 10	33.6 $\pm$ 9.8
Duration of marriage (Mean $\pm$ s.d.)	10.3 $\pm$ 9.7	11.5 $\pm$ 8.9	10.7 $\pm$ 9.4
Duration of SCI (Mean $\pm$ s.d.)	8.4 $\pm$ 6.3	7.7 $\pm$ 7.1	8.2 $\pm$ 6.9
Educational status (N(%))			
Under diploma	66 (78.8%)	14 (21.2%)	80 (100%)
Diploma or more	80 (66.7%)	40 (33.3%)	120 (100%)
Occupation (N(%))			
Unemployed/housewife	69 (73.4%)	25 (26.6%)	94 (100%)
Office employed	16 (76.2%)	5 (23.8%)	21 (100%)
Nonoffice employed	61 (71.8%)	24 (28.2%)	85 (100%)
Marital status (N(%))			
Married	146 (100%)	54 (100%)	200 (100%)
Degree of incompleteness (N(%))			
A	31 (75.6%)	10 (24.4%)	41 (100%)
B	25 (78.1%)	7 (21.9%)	32 (100%)
C	57 (71.25%)	23 (28.75%)	80 (100%)
D	33 (70.2%)	14 (29.8%)	47 (100%)

RESULTS

The study sample

Two hundred people with spinal cord injury, 146 men (73%) and 54 women (27%), completed the SAQ. The mean age of participants was 33.6 ± 9.8 years. The demographic characteristics of participants are shown in Table 1. The total score in each participant was calculated by summing the items.

The SAQ scores were compared between subgroups of educational level of patients. As anticipated, patients with a lower educational level scored significantly ($P=0.03$) lower than the others (32.1 ± 12.1 for those with no diploma, vs 38.9 ± 16.5 for those with a diploma or more). Educated people with SCI basically gather the sexually related information from networks, press and media. This would rationalize our selection of this variable and finding. Furthermore, there was a significant negative correlation between SAQ score and age of people with spinal cord injury ($P=0.04$, $r=-0.28$) and duration of SCI ($P<0.001$, $r=-0.4$). No question, age is one of those interactive variables that alters all aspect of SCI' life.¹⁷

Reliability

The Cronbach's α -coefficient, which was used to test internal consistency reliability for the SAQ, was 0.77, indicating that it is above acceptable thresholds. In addition, the intraclass correlation coefficient was 0.72, showing that the SAQ had a dependable consistency between two assessments with a gap of 2 weeks.

Validity

The results of content validity showed that grammar, wording and item allocation were found to be appropriate. In the assessment of face validity all participants reported that they had no problems in reading and understanding the items.

Exploratory factor analysis

Using factor analysis with the principal component analysis and varimax rotation, regarding eigenvalues >1 and factor loading equal or >0.4 on 200 people with SCI, we found a 4-factor structure for the questionnaire items, jointly accounting for 68.9% of the observed variance. The Kaiser–Meyer–Olkin measure of sampling adequacy was 0.69, which is above the recommended value of 0.60, and the Bartlett's test of sphericity was found to be highly significant ($\chi^2=228.5$, $P<0.001$). Results showed that the SAQ items could be summarized

into 4 components. These components comprised the following: positive motivation (4 items: good feeling about oneself, sexual attractiveness for partner, adaptation in sexual interest with partner and like to have active sexual life), negative motivation (3 items: feeling of sin or anxiety in sexual life, sadness of sexual encounter and frigid sexual relationship), acceptance (2 items: acceptance that the disability is a part of life and having enough knowledge about the effects of SCI in sexual life) and sexual capacity (2 items: high sexual activity and receive sexual counseling). The factor loading matrix for patterns identified in the SAQ questionnaire is shown in the Table 2.

DISCUSSION

The results of the study showed that the SAQ is a valid and reliable questionnaire to assess the sexual adjustment of people with SCI. Content validity was approved by the expert committee. With regard to face validity, all participants reported that they had no problems in reading and understanding the items. The reliability of the SAQ was confirmed by the Cronbach's α coefficient and the interclass correlation coefficient indicated good stability. On the basis of the EFA, there were four factors identified in the SAQ. Positive motivation, negative motivation, acceptance and sexual capacity are the main constructs of the SAQ, which can provide an assessment of the state of sexual adjustment in people with SCI. These constructs can describe the meaning of sexual adjustment from the perspective of Iranian people living with SCI. In comparison, Kreuter *et al.* explained that sexual adjustment can be a psychological component of a person's sexuality including sexual interest, satisfaction, self-esteem and feeling of interpersonal attractiveness.¹⁸

Although some instruments such as the Female Sexual Function Index and the International Index of Erectile Function have been applied to assess sexual issues in people with SCI,¹⁹ there are few measures specified in people with SCI. For instance, Perceived Sexual Distress Scale is a 38-item questionnaire in Hindi language developed by Paneri and Aikat.²⁰ The Perceived Sexual Distress Scale informs the rehabilitation team's work regarding the level of perceived sexual distress in people with SCI. In contrast to the Perceived Sexual Distress Scale, which assesses only distress surrounding changes in sexual life due to SCI, the SAQ evaluates each individual's sexual adjustment in four main domains: positive motivation, negative motivation, acceptance and sexual capacity.²¹

While sexuality has been recently recognized as an important aspect of health care in people with SCI, it is often difficult to measure sexual function and sexual adjustment as part of the assessment and care of this population, largely because sexuality is a delicate topic to broach and furthermore sexual function is often absent in people with SCI. This paper reported the psychometric validation of the SAQ to measure sexual adjustment according to a specific definition and context: sexual motivation, acceptance and sexual capacity, which are applicable to both male and female patients.

There were some limitations, as there was no examination of convergent and known-groups validity. Therefore, to support the generalizability of the SAQ, we suggest these validity tests and also recommend this tool to be used in the further research with larger sample size.

CONCLUSION

The SAQ is a reliable and valid measure that can assess sexual adjustment in people with SCI. Sexual adjustment is an important aspect of one's post-SCI life. This questionnaire will provide information about the patient's sexual motivation, recognition and acceptance of her/his altered sexual capacity. Therefore, the patient, as well as

Table 2 Factor loading matrix for patterns identified in the SAQ

Items	Factor 1	Factor 2	Factor 3	Factor 4
Good feeling about oneself	0.720	-0.064	0.143	0.043
Sexual attractiveness for partner	0.780	0.138	0.074	0.109
Feeling of sin or anxiety in sexual life	0.186	0.582	0.231	0.176
High sexual activity	0.224	0.017	0.135	0.622
Adaptation in sexual interest with partner	0.801	0.122	0.075	0.301
Like to have active sexual life	0.506	0.227	0.110	-0.14
Acceptance that the disability is a part of life	0.110	0.108	0.747	0.193
Having enough knowledge about the effects of SCI in sexual life	0.186	-0.109	0.762	0.166
Sadness of sexual encounter	0.198	0.791	-0.025	0.214
Frigid sexual relationship	0.115	0.769	-0.092	0.196
Receive sexual counseling after SCI	-0.016	0.03	0.122	0.502
Explained variance (%)	24.36	20.48	13.46	10.6
Eigen value	2.8	2.6	1.8	1.2

her/his partner, would be provided a comprehensive and individualized sexuality education at the first visit by a trained and qualified practitioner. The practitioner would screen thoroughly for impairment of sexual adjustment, and develop an individualized therapeutic plan. This is the first study to validate a tool of sexual adjustment on a sample of people with SCI in Iran. Future research with a larger sample and with a different level of injury is suggested in order to assess the other psychometric characteristics of SAQ.

DATA ARCHIVING

There were no data to deposit.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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APPENDIX 1

Sexual Adjustment Questionnaire (SAQ)

Question	Completely disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Completely agree
1. I feel good about myself					
2. My body is attractive to my partner					
3. I feel sin or anxiety through my sexual life					
4. I have more sexual activity than those people like me					
5. I think that my sexual desire is like my partner's					
6. I like to have more active sexual life					
7. I accept that SCI and related disability are part of my sexual life					
8. I have enough knowledge about the effects of SCI on my sexual life					
9. I have physical and emotional interaction with my partner but I no longer want sexual contact					
10. Our sexual relationship has become more frigid than before					
11. After SCI, my partner and I received sexuality education and counseling					