VALIDATION OF THE CROATIAN VERSION OF THE SURGICAL FEAR QUESTIONNAIRE (SFQ) IN ADULT PATIENTS WAITING FOR ELECTIVE SURGERY

Andrija Karačić[1], Maurice Theunissen[2], Slavica Sović[3], Marko Sever[1], Branko Bakula[1]
and Kristina Semanjski[1]

[1]Division of Digestive Surgery, Department of Surgery, Sveti Duh University Hospital, Zagreb, Croatia;
[2]Department of Anesthesiology and Pain Management, Maastricht University Medical Center, Maastricht, the Netherlands;
[3]School of Medicine, University of Zagreb, Zagreb, Croatia

SUMMARY – The Surgical Fear Questionnaire (SFQ) is an instrument for self-assessment of surgical fear and consists of two subscales, one assessing the fear of short-term consequences (SFQ-s) and another one of long-term consequences (SFQ-l) of surgery. The aim of this study was to test the Croatian version of the SFQ with regard to its psychometric properties. This prospective cohort study included patients who presented to the Department of Surgery for elective surgery in the inpatient setting at a tertiary health care facility in Croatia between April 1 and May 31, 2019. Data on 144 patients were suitable for data analysis. Data collection was performed in the afternoon before surgery using the Personal Information Form, Numerical Rating Scale self-report instruments (NRS), SFQ and Hospital Anxiety and Depression Scale (HADS) assessing sociodemographic factors, surgical fear via NRS and SFQ, expected pain and emotional state. The Cronbach alpha value as a statistical measure for reliability of psychometric tests for the SFQ-s subscale was 0.79, for SFQ-L subscale 0.84, and for total SFQ 0.81. The exploratory factor analysis (EFA) showed a two-factor structure. Significant correlations of the SFQ with the NRS and HADS-anxiety subscale were demonstrated. Our study demonstrated the Croatian version of the SFQ to have a high level of reliability and hence can be used as a self-report instrument for surgical fear with two subscales. Convergent validity of the SFQ with other self-report instruments is shown.

Key words: *Perioperative; Preoperative; Questionnaire; Reliability; Surgical fear; Validity*

Introduction

Surgical fear is defined as the emotion of fear patients experience before surgery. Hospitalization and physical conditions are among the most stressful events in one's life and are related to high levels of anxiety[1], so

it is clear that surgery may have an additional negative impact on the patient's emotional state[2]. There are many aspects about surgery that have been mentioned in the literature as the possible objects of surgical fear, e.g., fear of the disease or disablement, fear of the procedure itself, anesthesia, and postoperative pain[3,4]. Surgical fear affects a vast majority of patients[5] and is a major burden not only for the patient[6] but for the whole healthcare system[7]. It has been demonstrated in previous studies that surgical fear has a negative impact on many aspects of recovery[8] after surgery and

can lead to an increased morbidity and mortality[9]. Surgical fear is related to higher levels of acute and chronic postoperative pain, hence increased use of anesthesia and analgesia[10]. It is also related to a delay in wound healing, negative compliance to treatment plan, prolonged hospital stay and treatment, losses in physical functioning, poor mental health, and worse quality of life[5]. This indicates the need to develop means to identify surgery related fear and analyze the specific objects of surgical fear. Preoperative assessment of surgical fear would provide important data, which in turn would enhance perioperative nursing care and would open ways to designed intervention[11,12]. One can assume that appropriate treatment of patients experiencing a respectable level of surgical fear would increase their well-being after surgery[13]. The reported level of surgical fear is influenced by the type of surgery performed, waiting time before surgery, previous surgical procedures and anesthesia, adequate information about the operation, and factors such as age, sex and character of the patient[18]. Clearly, the instrument which is used for assessment can influence the reported level of fear. Previous studies have used a variety of instruments, e.g., Numerical Rating Scales (NRS), State Trait Anxiety Inventory[14], Hospital Anxiety and Depression Scale (HADS)[15], or disease specific tests such as the Bypass Graft Fear Scale[16]. This study focused on a questionnaire developed to assess and identify self-reported surgical fear and various fears related to all types of surgical procedures, the Surgical Fear Questionnaire (SFQ)[17]. The SFQ is an eight-item index of surgical fear which can be divided into fear of short- and long-term consequences of surgery. The questionnaire has been validated in Dutch, Portuguese, Turkish and Hungarian[5,18-20]. There have been studies in the Croatian literature exploring general anxiety of patients[21,22], but there are no studies on the validity of the SFQ in the Croatian culture to date, reinforcing the need to clarify the gaps in clinical practice. This study aimed to test the psychometric properties of the Croatian version of the SFQ.

Ethics

Prior to conduction of this study, the research protocol was approved by the Ethics Committee on Human Research of the Sveti Duh University Hospital, Zagreb, Croatia, confirmed by the approval letter no. 01-1095/15 as of March 28, 2019. Signed informed consent was obtained from all study patients.

Patients and Methods

Patients

This prospective observational cohort study was performed at the Department of Surgery, Sveti Duh University Hospital, Zagreb, Croatia, a tertiary health care facility affiliated with the School of Medicine, University of Zagreb, from April 1 to May 31, 2019. Inclusion criteria were age ≥18, consciousness of the patient, informed consent, and being scheduled for elective surgery within a day from baseline data collection. Exclusion criteria were no proficiency in the Croatian language, illiteracy, presenting an unstable medical condition, e.g., severe pain, dyspnea, history of any mental disorder or cognitive impairment (dementia), physical disablement that hindered the patient to complete data collection (e.g., blindness, neuromotor disorder), and participation in another trial.

Patients and Methods

After hospital admission to the Department, the main researcher included patients following the criteria mentioned above. Data collection was performed on regular work days in the afternoon before the procedure between 3.00 and 5.00 pm. The patients were informed about the study by the researcher at the patient bedside. After obtaining written consent, a booklet containing the self-assessment tools was administered to the patients. The booklet contained the Personal Information Form, NRS assessing surgical fear, expected pain and expected course of recovery, SFQ, and HADS. The patients were given time to complete the booklet in their own pace in their bed and booklets were collected by the nursing staff during their evening rounds. Booklets with more than two items incomplete in either of the tools were excluded from the study. Data entry was performed by the main researcher in Excel spreadsheet and stored in Google Drive.

Instruments

The first tool was the Personal Information Form. It assessed the sociodemographic and clinical characteristics of the participants, used for baseline description and analysis of the potential predictors of surgical fear. This form features 14 questions: year of birth, gender, type of surgery, name of the operating surgeon, marital status (single, married, divorced, widowed), occupation, type of residence (apartment, house, senior residence, rented apartment, other), educational level (elementary, secondary, college, university), employment

state (full-time, part-time, freelancing, other), income level (0-5000 HRK; 5000-7500 HRK, 7500-10000 HRK, more than 10000 HRK), smoking (number of cigarettes/time span in days, weeks, months), alcohol intake (never, occasionally, regularly, daily), and medication use. Stress levels were assessed by the question "How much stress do you experience on a daily basis?", which was scored on the NRS 11-point scale, 0 indicating no stress to 10 immense stress.

Psychological and pain measures

The principal tool of this study was the SFQ. The questionnaire was developed in the Netherlands to assess the level of fear in adult patients scheduled for elective surgery[17]. It consists of eight items scored using an NRS. A score 0 indicates "not afraid at all" and score 10 indicates "very afraid". Research has demonstrated that the questionnaire consists of two subscales, one subscale concerning fear of short-term consequences (SFQ-s) and another one concerning fear of long-term consequences (SFQ-l)[17]. Items 1 to 4 belong to the SFQ-s and items 5 to 8 belong to the SFQ-l. To obtain the patient's total score, the results on both subscales have to be added. While the lowest and highest scores on the subscales are 0 and 40, the range of total scores lies between 0 and 80. A high score indicates a high level of surgical fear.

For this study, the SFQ was translated in the Croatian language. The first step in the translation process was translation into Croatian by the author and a translation agency specialized in translating medical documents (STUDIUM Translation Agency, Zagreb, Croatia). The second step was, after thorough review of both versions, completion of a single Croatian version of the questionnaire. In the third step, back-translation into English by AK and the same translation company was performed. Finally, the three versions were compared, i.e., the English version (2014) of the SFQ provided by the author of the SFQ, the final Croatian version, and the back-translated English version. No differences in the meaning of the items were detected. The translation was then evaluated and approved by the Department specialists MS, BB and KS.

To test the convergent validity of the SFQ, the following tools were used: questions about surgical fear, expected pain, expected recovery, and the HADS. Surgical fear was assessed with one question: "How afraid of the surgery are you in this moment?" using an 11-point NRS (0 not at all afraid to 10 very afraid). The level of expected

pain after surgery was assessed with the question: "In your mind, how much pain do you expect from surgery?" It was also scored on an NRS, 0 indicating no pain at all to 10 worst pain imaginable. Expected recovery after surgery was also assessed at baseline using the question: "Please indicate on a scale from 0 to 100% to what extent you expect to be recovered from the operation four weeks after the operation; 100% recovery means that your health is back at the level it was before you developed your complaints". The HADS[23] assesses the level of anxiety and depression among hospitalized patients. It was developed to detect changes in the emotional state after and during hospitalization. The scale is not meant to be a diagnostic tool and does not assess physical symptoms. It was tested by Miljanović *et al.*[21] for its psychometric properties in Croatia and was proven to be a valid and reliable self-report instrument for assessing symptoms of depression and anxiety in hospitalized patients. The HADS uses a 4-point Likert scale and consists of 14 items. Seven items concern the symptoms of depression (HADS-D subscale) and seven items are on the symptoms of anxiety (HADS-A subscale).

Statistical analysis

Sample size was established following the general guideline of 5-10 subjects *per* item of instrument[24]. The SFQ has eight items, therefore we planned to include 100 adult patients to ensure enough power. The fact that the final number of 144 patients surpassed the expected 100 patients was a result of a greater than expected number of patients who during the time span of the study met the inclusion criteria, agreed to participate in the study, and correctly filled out the booklet. In descriptive analysis, parametric data were described using mean and standard deviation, nonparametric data with median and interquartile range and minimum and maximum values, number (%) or boxplot.

The reliability of the SFQ subscales and total score was determined by the Cronbach's alpha test. A Cronbach alpha above 0.7 was regarded as fair, and above 0.8 as good[25]. To test internal consistency, Pearson correlation coefficients between the subscales and total score of the SFQ were assessed. To explore the factor structure of the SFQ, exploratory factor analysis (EFA) was performed with a desired percentage of total explaining variance greater than 60% and factor loadings above 0.40 as acceptable.

The convergent validity of the SFQ was assessed by calculating Pearson correlation coefficients with the scores of the NRS self-report instruments and HADS. Correlations were assessed between SFQ-s, SFQ-l, SFQ total score and expected pain, recovery and fear-NRS. Correlations were also assessed between the SFQ-s, SFQ-l, SFQ total score and the HADS-A, HADS-D and total HADS score.

To examine the association of patient characteristics with surgical fear, statistical analysis was performed using linear mixed modeling, Kruskal-Wallis test, χ^2-test, and Mann-Whitney test. Age, gender, employment status, educational level, daily stress level, income, smoking, and alcohol intake were included as independent variables. All statistical analyses were performed using Statistica (version 13, TIBCO Software Inc. Palo Alto, USA).

Results

The study was conducted between April 1 and May 31, 2019. The nonprobability sample comprised 144 patients.

Baseline characteristics are presented in Table 1. The population consisted of hospitalized patients who were scheduled to undergo minor, intermediate or major elective general surgery. Proctologic procedures for benign diseases and repairs of the abdominal wall were considered as minor surgery, all laparoscopic cholecystectomies and appendectomies and complicated hernia repair (ventral postoperative hernias, recurrent hernia) as medium surgery, and all procedures targeting malignant disorders as major surgery.

Detailed information on the results of psychological measures is shown in Table 2.

Detailed information on scores at the item level is shown in Table 3.

Concerning reliability of the subscales and SFQ total score, the Cronbach alpha test showed good values, which are listed in Table 3. The Cronbach alpha value for the SFQ-s subscale was 0.79, for the SFQ-L subscale 0.84, and for the total SFQ 0.81.

Pearson correlation between the SFQ subscales was r=0.71 (p<0.000), between the SFQ-s and total score of SFQ r=0.93 (p<0.000), and between the SFQ-l and total score of SFQ r=0.92 (p<0.000), indicating high internal consistency.

The EFA identified a clear two subscale structure of the questionnaire based on two factors together explaining 66.8% of the total variance. One factor contained items related to fear of short-term consequences of surgery explaining 40.8% of variance and the factor containing items related to long-term consequences explained 37.5% of variance. The results of the EFA are shown in Table 4.

Convergent validity

First convergent validity of the SFQ was assessed by testing the correlation with the single item surgical fear NRS. Pearson correlations between the SFQ-s and SFQ-l were r=0.87 and r=0.61, and total SFQ r=0.81 (p<0.001). This indicates strong association between the scores of the single item surgical fear and SFQ-s subscale and the total score of the SFQ and moderate association between the single item surgical fear and SFQ-l subscale, and therefore confirms convergent validity of the SFQ.

The correlation of the SFQ scores and the expected pain were lower, r=0.66 for SFQ-s, r=0.62 for SFQ-l, and r=0.69 for total SFQ (p<0.001) but significant. There was positive association between expected pain and all of the scores of the SFQ and its subscales, which means that higher expected pain levels were associated with an increase in surgical fear.
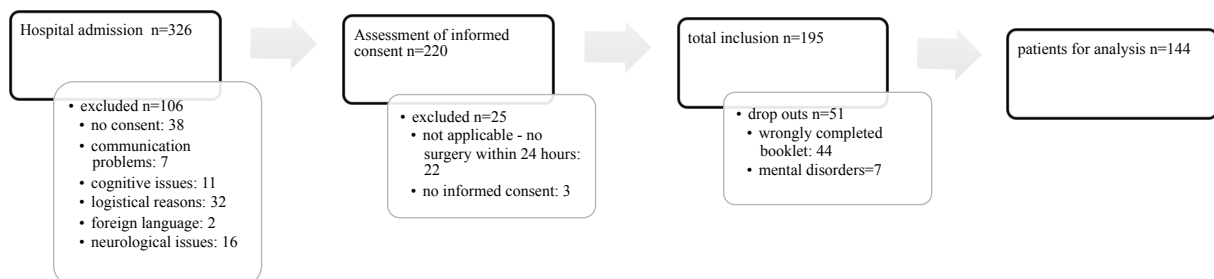

Fig. 1. Patient flow.

Table 1. Baseline sociodemographic characteristics

Age group (yrs)	55.9	15.4
20-50	40	27.7%
50-65	57	39.6%
>65	47	32.6%
Gender		
Male	94	65.3%
Female	50	34.7%
Type of surgery		
Minor surgery	68	47.2%
Medium surgery	65	45.1%
Major surgery	11	7.6%
Name of surgeon	62	43.1%
Missing data	82	56.9%
Marital status		
Single	33	22.9%
Married	79	54.9%
Divorced	12	8.3%
Widowed	14	9.7%
Missing data	6	4.2%
Type of residence		
Apartment	47	32.6%
House	86	59.7%
Senior residence	4	2.7%
Rented apartment, other	2	1.4%
Missing data	5	3.5%
Educational level		
Elementary	9	6.3 %
Secondary	77	53.5%
College	27	18.8%
University	24	16.7%
Missing data	7	4.9%
Type of employment		
Full-time	15	10.4%
Part-time	52	36.1%
Other	55	38.2%
Missing data	22	15.3%
Income (HRK/month)		
<5000	75	52.1%
5000-7500	30	20.8%
7500-10000	11	7.6%
>100000	10	6.9%
Missing data	18	12.5%
Smoking		
Yes	109	75.7%
No	35	24.3%
Alcohol intake		
Never	60	41.7%
Occasionally	75	52.1%
Regularly	6	4.2%
Daily	1	0.7%
Missing data	2	1.4%

Mean (SD), number and percentage (%); HRK = hrvatska kuna, Croatian kuna; Minor surgery: proctologic procedures and all repairs of the abdominal wall, including all hernias; Medium surgery: laparoscopic cholecystectomies and appendectomies; Major surgery: all procedures targeting malignant disorders; Name of surgeon: patient knows the name of his/her surgeon.

Table 2. Scores of psychological measures

Subscale	N	Minimum	Maximum	Mean	SD	Median	IQR
SFQ-s	142	0	40	14.56	10.13	13	7-21
SFQ-l	141	0	40	8.09	9.17	5	0-12.5
Total SFQ	140	0	80	22.65	17.86	18	9-33
HADS-A	142	3	15	8.18	2.33	8	7-10
HADS-D	144	4	15	9.24	1.78	9	8-10
Total HADS	142	7	28	17.42	3.27	17	15-19
Daily stress	143	0	10	3.61	2.59	3	2-5
Surgical fear	144	0	10	3.73	2.99	3	1-6
Expected pain	142	0	10	4.59	2.25	5	3-6
Expected recovery	140	10	100	75.28	21.82	80	60-100

N = number of participants who completed the whole subscale; SD = standard deviation; IQR = interquartile range, 25th to 75th percentile; SFQ = Surgical Fear Questionnaire; SFQ-s = Surgical Fear Questionnaire-Short-term; SFQ-l = Surgical Fear Questionnaire-Long-term; HADS = Hospital Anxiety and Depression Scale; Daily stress = Numerical Rating Scale (NRS)-daily stress level; Surgical fear = single item surgical fear question; Expected pain = NRS-expected postoperative pain; Expected recovery = percentage of expected postoperative after four weeks.

Table 3. SFQ item scores and reliability

SFQ item	N	Mean	SD	Min	Max	Cronbach's alpha
Operation	144	3.72	3.05	0	10	0.84
Anesthesia	143	3.50	3.21	0	10	0.78
Pain	143	4.27	2.73	0	10	0.79
Side effects	144	3.13	2.75	0	10	0.76
Health deterioration	142	2.37	2.85	0	10	0.84
Failed operation	144	1.81	2.44	0	10	0.84
Incomplete recovery	144	1.48	2.18	0	10	0.84
Prolonged rehabilitation	143	2.48	2.82	0	10	0.84

N = number of participants who completed the whole subscale; Min = minimum; Max = maximum; SD = standard deviation; SFQ = Surgical Fear Questionnaire

Table 4. Exploratory factor analysis

SFQ item	Factor 1	Factor 2
Operation	0.34	**0.86**
Anesthesia	0.23	**0.89**
Pain	0.43	**0.69**
Side effects	0.39	**0.69**
Health deterioration	**0.77**	0.40
Side effects	**0.79**	0.38
Incomplete recovery	**0.92**	0.26
Prolonged rehabilitation	**0.84**	0.33

SFQ = Surgical Fear Questionnaire

Finally, negative correlations with expected recovery were found, r=-0.28 for SFQ-l and r=-0.18 for total SFQ (p<0.001 and p<0.033, respectively). There was a low but significant negative relationship between the expected fast course of recovery and fear of long-term consequences of surgery, which means that people who expected fast recovery were less afraid of surgery.

Second, convergent validity of the SFQ was assessed by comparison with the HADS. A positive relationship was found between the HADS-A subscale and both subscales and total score of the SFQ, with Pearson correlation coefficients r=0.47 SFQ-s, r=0.57 SFQ-l and r=0.56 (p<0.001 all). The above mentioned finding confirms that the SFQ and HADS-A will positively correlate, which is an additional validation of the SFQ and demonstrates that people who are more anxious at the time of hospitalization are also more afraid of surgery. No relation was found between the HADS-D subscale and either subscale and total score of the SFQ, which indicates that patients who feel depressed are not more afraid of surgery (for SFQ r=0.19, p<0.025).

Patient characteristics in relation to surgical fear

In the analysis of the potential patient characteristics associated with surgical fear, SFQ scores of younger participants were higher compared to those reported by older participants, as expected. The difference reached statistical significance regarding SFQ-s, SFQ-l and total SFQ scores but was most drastic in the case of SFQ-l scores using the Kruskal-Wallis ANOVA test 11.24, p=0.004. This means that in our study, younger patients were significantly more afraid especially of long-term consequences of surgery than older patients.

However, in contrary to other studies, we found no differences between the SFQ scores of males and females (for SFQ Mann-Whitney U test Z=0.46, p<0.643). Similarly, neither daily stress levels, education levels, occupation, way of employment, nor other sociodemographic factors seemed to have a significant influence on SFQ scores, hence surgical fear.

Discussion

Although studies scanning patient anxiety have been performed in Croatia[21,26,27], no study yet has assessed surgical fear among Croatian patients. Thus, our primary objective was to verify the psychometric properties of the SFQ after translating it for Croatian patients, and secondary objective was to evaluate the potential factors associated with surgical fear.

This study showed the SFQ to be a valid self-report instrument to assess surgical fear, appropriate for general use in elective adult surgery. Our findings revealed a two factor structure, with two subscales indicating the level of fear of the short-term and long-term consequences of surgery.

In comparison to studies using the SFQ conducted in other countries, our study yielded similar results. Compared with the findings of a study conducted in the elective surgery setting in the Netherlands containing an almost ten-fold bigger population sample (1275 subjects), our results are almost identical (median SFQ-s=14, SFQ-l=8, SFQ=22; Cronbach's alpha SFQ-s=0.77, SFQ-l=0.84, SFQ=0.87)[17]. The mean SFQ-s is similar compared to the results of studies conducted in Turkey and Hungary[5,19], while the mean SFQ-l is similar to the results of a study using the SFQ translated to Portuguese in Brazil[20]. One could conclude from the results that the average Croatian surgical patient feels about the short-term consequences of surgery similarly to the European patient, but about the long-term consequences like the Latin-American patient.

Considering sociodemographic patient characteristics, the study demonstrated a significant influence of age on surgical fear, confirming that with higher age fear decreases, especially fear of the long-term consequences of surgery, similar to the results reported in previous literature[28,29]. The study did not verify difference in surgical fear between men and women. Although in many studies around the world elevated levels of surgical fear have been observed among woman[30-32], only a study conducted in Hungary has reported no such difference. Therefore, one could attribute it to the Central-European culture.

The main limitation of our study was that generalization of our findings was confined due to the fact that all participants were recruited in a single hospital due to the use of a convenience sample. Also, all participants were alert, adult, literate patients who participated voluntarily and lived in the capital region of Croatia. Therefore, generalization of our results should be done with caution because they may not represent truly the clinical reality. Another weakness of the study were the rather low scores of the SFQ-l, which reduced the possibility of precise analysis of the potential risk factors for fear of the long-term consequences of surgical fear.

Preferably, the psychometric properties of the Croatian version of the SFQ will be further confirmed by other studies. Given the findings and limitations mentioned above, additional research should be conducted by replicating this study with larger samples, different health care settings, and different patient populations. Additionally, the high percentages of participants not indicating the operating surgeon should be further examined in future studies, and it should be explored whether these percentages are a result of just poor compliance in completing the forms or the result of poor patient-clinician relations. Furthermore, now that the SFQ has been shown to be a valid instrument, an intervention study with the aim of reducing surgical fear should be planned; reducing surgical fear could eventually lead to better recovery and an improved outcome of the surgical intervention.

We conclude that the translated Croatian version of the SFQ is a valid and appropriate self-report instrument for the assessment of surgical fear.

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Sažetak

VALIDACIJA HRVATSKE VERZIJE UPITNIKA O STRAHU OD OPERACIJE U ODRASLIH BOLESNIKA PLANIRANIH ZA ELEKTIVNI ZAHVAT

A. Karačić, M. Theunissen, S. Sović, M. Sever, B. Bakula i *K. Semanjski*

Surgical Fear Questionnaire (SFQ) je instrument za procjenu straha od operacije, a sastoji se od dvije podljestvice: jedna ispituje strah od kratkoročnih posljedica (SFQ-s), a druga strah od dugoročnih posljedica (SFQ-l) operativnog zahvata. Cilj ove studije bio je testirati psihometrijska svojstva hrvatske inačice SFQ. Ova prospektivna kohortna studija uključivala je bolesnike hospitalizirane na Klinici za kirurgiju zbog planiranog elektivnog operativnog zahvata u sklopu jedne zdravstvene ustanove treće razine u Hrvatskoj od 1. travnja do 31. svibnja 2019. godine; podatci 144 ispitanika pokazali su se pogodnima za analizu. Prikupljanje podataka odvijalo se tijekom poslijepodneva na dan prije operacije uz primjenu Obrasca za osobne podatke, Brojčane ljestvice (NRS), SFQ te *Hospital Anxiety and Depression scale* (HADS) kojima su se dobile informacije o sociodemografskim čimbenicima, strahu od operacije preko NRS i SFQ, očekivanoj boli te o emotivnom stanju. Mjerena je vrijednost Cronbach alfa kao statistička mjera za pouzdanost psihometrijskih testova; ona je za SFQ-s iznosila 0,79, za SFQ-l 0,84, a za ukupni SFQ 0,81. Eksploratorna faktorska analiza (EFA) pokazala je dvofaktornu strukturu upitnika. Dokazane su značajne korelacije SFQ-a s ljestvicama NRS i HADS-anksioznost. Naša studija pokazala je kako hrvatska inačica SFQ ima visoku razinu pouzdanosti te se stoga može rabiti kao instrument za procjenu straha od operacije s dvije podljestvice. Dokazana je konvergentna valjanost SFQ s drugim instrumentima.

Ključne riječi: *Perioperacijski; Prijeoperacijski; Upitnik; Pouzdanost; Strah od operacije; Valjanost*