

SERBIAN TRANSLATION AND CROSS-CULTURAL VALIDATION OF THE QUESTIONNAIRE FOR ASSESSING PATIENT SATISFACTION WITH ENDOSCOPIC EXAMINATION OF THE DIGESTIVE TRACT

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SRPSKI PREVOD I MEĐUKULTURALNA VALIDACIJA UPITNIKA ZA PROCENU ZADOVOLJSTVA KOD PACIJENATA KOJI SU PODVRGNUTI GASTROINTESTINALNOJ ENDOSKOPIJI

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ABSTRACT

Patient satisfaction is a key indicator to assess the quality of gastrointestinal endoscopy. The aim of this study was to examine the Serbian translation and cross-cultural validation of the questionnaire for the assessment of satisfaction in patients who underwent gastrointestinal endoscopy.

After obtaining the consent of the author of the original questionnaire, translation and cross-cultural validation of the GESQ (Gastrointestinal Endoscopy Satisfaction Questionnaire) were carried out in accordance with the conductors of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR). The study was conducted in the Center for Gastroenterohepatology (GEH) of the Kragujevac Clinical Center and included 165 patients. The reliability of the Serbian translation of the GESQ was estimated by calculating Cronbach's alpha for the whole questionnaire in order to implement the structural validation. The overall score of the questionnaire was compared and correlated with the total scores on the Short Subjective Well-being scale (KSB) and visual analogue scale (VAS), which were administered to the same patients.

The Serbian translation of the GESQ showed high reliability with a Cronbach's alpha coefficient of 0.763, good structure and homogeneity by randomly sharing the questionnaire into two parts. Exploratory factor analysis indicated the existence of four factors that explain 57.200% of the variability.

The Serbian version of the GESQ showed similar psychometric characteristics to the original English questionnaire, with a similar factor structure, and represented a valid, reliable and acceptable tool for the assessment of patient satisfaction with the endoscopic examination of the digestive tract.

Keywords: gastrointestinal endoscopy, questionnaire, patient satisfaction, translation, cross-cultural validation.

SAŽETAK

Zadovoljstvo pacijenata je ključan indikator za procenu kvaliteta gastrointestinalne endoskopije. Cilj ove studije je bio prevod i međukulturalna validacija upitnika za procenu zadovoljstva kod pacijenata koji su podvrgnuti gastrointestinalnoj endoskopiji.

Nakon dobijanja saglasnosti autora originalnog upitnika, prevod i međukulturalna validacija GESQ upitnika izvršena je u skladu sa vodičima Međunarodnog društva za farmakoekonomiju i ishode istraživanja (ISPOR). Studija je sprovedena u Centru za Gastroenterohepatologiju (GEH) Kliničkog centra Kragujevac i obuhvatila je 165 pacijenata. Pouzdanost srpskog prevoda GESQ upitnika je procenjena izračunavanjem parametra Cronbach's alpha za upitnik u celini u cilju sprovođenja konstruktivne validacije skale.

Njen ukupni skor je upoređen i koreliran sa ukupnim skorom Kratke skale subketivnog blagostanja (KSB) i vizuelno analognom skalom (VAS) koje su sprovedene na istim pacijentima.

Srpski prevod GESQ upitnika pokazao je visoku pouzdanost sa vrednošću Cronbach's alpha koeficijenta od 0,763, dobru konstrukciju i homogenost pitanja prilikom nasumičnog deljenja upitnika na dva dela. Eksplorativna faktorska analiza je ukazala na postojanje četiri faktora koja objašnjavaju 57,200 % varijabilnosti.

Srpska verzija GESQ upitnika, pokazuje slične psihometrijske karakteristike kao i originalni upitnik na engleskom jeziku sa sličnom faktorskom strukturom i predstavlja validno, pouzdano i prihvatljivo sredstvo za merenje zadovoljstva pacijenata sa endoskopskim pregledima digestivnog trakta.

Ključne reči: gastrointestinalna endoskopija, upitnik, zadovoljstvo pacijenata, prevod, međukulturalna validacija



INTRODUCTION

Endoscopic examinations of the digestive tract are commonly used safe and secure methods for the diagnosis and treatment of the gastrointestinal tract diseases (1,2). Procedures include diagnostic or therapeutic upper and lower endoscopy (3). As invasive procedures, these examinations are not without risks and risk of complications (1,4,5). Examinations can be performed with or without anaesthesia and can often be very unpleasant and painful for patients (2,6).

In today's health care system, a lot of attention has turned to patients' satisfaction with different diagnostic and therapeutic procedures. Patient satisfaction has become a key indicator of quality measures in gastrointestinal endoscopy. The European and American Society for Gastrointestinal Endoscopy gave the recommendation for the routine collection of quality indicators which include the satisfaction of patients (7-9).

Previous studies showed that patients who experienced complications during or after endoscopy were less satisfied with these procedures and that they rarely decided to repeat this type of examination or give approval for their implementation (3). Fear, anxiety and feelings of shame may affect the submission of the examination and complicate the communication between the patient and endoscopic team. These problems will increase the dissatisfaction of the patient and may lead to possible injury and inability to complete the examination (1,7,10,11). Previous studies have indicated that approximately 5% of patients refused a proposed endoscopic examination, and an additional 10% required persuasion to undergo the examination. While some studies indicate that nearly 40% of these patients have difficulty tolerating examinations, approximately 10% of patients experience severe discomfort during the examination (5,12,13). The most common reasons for refusal of these procedures are the fear of pain and a feeling of shame. The pain intensity is associated with a variety of factors and can cause immediate and long-term adverse effects. Effects of acute pain are comprised of a variety of emotional, physical and psychological events. Fear is a normal emotional response to a real threat and is recognized as truth by individuals, while anxiety represents a state of mind that is non-rational and characterized by a sense of insecurity and the presence of various neurovegetative symptoms (14). Patients have expressed fear of the examination and possible complications more often than fear related with a possible diagnosis (15). Previous studies indicated that pain that occurred during and after completion of the examination had a lot of influence on the tolerance of examination, and was the most important factor related with patients' decision to repeat this type of examinations (16-18).

In previous studies, instruments which were used to measure the satisfaction of patients failed to show satisfactory reliability and validity (7). The modified GHAA-9 questionnaire was recommended by the American Society

for Gastrointestinal Endoscopy for the assessment of satisfaction and did not include all the necessary factors for evaluation of patient satisfaction (3,7,19). Some other instruments are mainly used to examine factors affecting the toleration of the examination (2-4,12,14,16,17,20). In the Serbian language, there is no validated questionnaire for the assessment of patient satisfaction with the endoscopic examination of the digestive tract.

The aim of this study was to examine the Serbian translation and cross-cultural validation of the questionnaire for assessing patient satisfaction with the endoscopic examination of the digestive tract. To achieve better cooperation of patients with endoscopic teams, preventative measures were applied, which increased patient satisfaction and significantly improve the diagnostic and therapeutic procedures.

MATERIALS AND METHODS

Serbian Translation and cross-cultural validation of the questionnaire

Serbian translation and cross-cultural validation of the GESQ (Gastrointestinal Endoscopy Satisfaction Questionnaire) was carried out in accordance with the recommendations of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) (20). Permission for translation and cross-cultural validation of the GESQ from English to Serbian has been obtained by the author of the original questionnaire: Professor Hayley Hutchings from College of Medicine, Swansea University, United Kingdom. The original GESQ (version 2) was developed and validated in the UK (7). This questionnaire was first translated to Serbian by two independent translators who were not members of the research team. One of the translators was Ana Braković, a lecturer of English at the Medical School in Kragujevac, and the other was Biljana Jelić, a lecturer of English at the Polytechnic School in Kragujevac. These lecturers translated the questionnaire independently of each other, and then the translations were combined to create one version in Serbian. The combined Serbian version was then translated back to English by Dr. Marko Babić, a general practitioner, who is a native English speaker and a citizen of United States of America. When translating back to English, Dr. Babić was not aware of the original English version of the questionnaire. The back-translation to English was then compared with the original English version of the questionnaire. Additionally, the translation was sent for review to the author of the original questionnaire, Professor Hayley Hutchings. Comparisons of all versions were performed, and the necessary corrections were introduced, and linguistic errors were checked. The authors' precision and clarity of the questions was considered, including whether the questions referred to the wrong answer and whether it is necessary that respondents have clinical knowledge in order to provide the answers to the



GESQ

This survey was made for the purpose of assessing YOUR personal views after having an endoscopic procedure. There are no correct or wrong answers to the following questions: just put a cross in the box that best describes how you think. Your answers will be confidential, and won't influence the way you will be treated in any way. The information will be used to determinate how many people were satisfied with their endoscopy, and to improve the endoscopy service.

1. How easy was it for you to understand the information that was sent to you before your endoscopy?

Very easy	Easy	Fair	Difficult	Very difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 2. Was the information given to you before your endoscopy appointment useful in answering any of your questions?

Very useful	Useful	Fair	Not very useful	Not at all useful
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 3. Before performing your endoscopy, how much opportunity did you have to ask questions about the endoscopy procedure?

	Much	A little	Not at all	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
 4. How easy was for you to understand the explanation of given to you before your endoscopy?

Very easy	Easy	Fair	Difficult	Very difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 5. Was the explanation you received before your endoscopy helpful in answering your questions?

Very useful	Useful	Fair	Not very useful	Not at all useful
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6. How would you grade the communication skills (e.g. courtesy, respect, sensitivity, friendliness) of the person who performed your endoscopy?

Very poor	Poor	Fair	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 7. How would you grade the technical skills (eg. thoroughness, carefulness, competence) of the person who performed your endoscopy?

Very poor	Poor	Fair	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 8. How would you grade the communication skills (eg. courtesy, respect, sensitivity, friendliness) of the other staff in the endoscopy unit?

Very poor	Poor	Fair	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 9. How much discomfort did you feel during your endoscopy?

Very much	Much	Fair	Little	None
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 10. How much pain did you experience during your endoscopy?

Very much	Much	Fair	Little	None
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 11. How much discomfort did you experience after your endoscopy?

Very much	Much	Fair	Little	None
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 12. How much pain did you experience after your endoscopy?

Very much	Much	Fair	Little	None
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 13. After you had your endoscopy, how much opportunity did you have to ask questions about the findings?

Very much	A little	None		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
 14. After you had your endoscopy, how much explanation of the findings did you receive?

Too much	About right	Not enough
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- If you did not receive an explanation, then please go directly to question 21.*
15. How easy was it for you to understand the explanation given to you after your endoscopy?

Very easy	Easy	Fair	Difficult	Very difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 16. Was the explanation given to you after your endoscopy useful in answering your questions?

Very useful	Useful	Fair	Not very useful	Not at all useful
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 17. Overall, satisfied were you with your endoscopy?

Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 18. If, in the future, you have another endoscopy, how satisfied would you be, if it was performed by the same person?

Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 19. How would you grade the overall reputation of the hospital?

Very poor	Poor	Fair	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



questions. Compliance with these principles was intended to achieve similar meaning of questions between the original and translated versions of the questionnaire.

The final version of the Serbian translation of the GESQ was then tested in a pilot study on 20 respondents in order to determine the existence of any ambiguity in the questions and to identify additional questions that patients think are relevant to the assessment of their satisfaction with endoscopy. We examined whether all the questions were sufficiently clear, precise and comprehensible, and whether a correction of some questions in the questionnaire was needed. After the pilot study implementation, the necessary changes were made, and then the final version of the scale in Serbian was multiplied and prepared for testing reliability. Data obtained from the pilot study were not taken into account in the statistical analysis.

Population and sample

The final version of the Serbian GESQ was tested on patients who underwent gastrointestinal endoscopy at the Center for GEH at the Clinical Center Kragujevac. The study involved 165 patients and lasted two months, from 02.10.2016. to 10.04.2016. This study was conducted with the approval of the Ethics Committee of the Clinical Center Kragujevac. The questionnaire was offered to all patients who were referred for endoscopic examination in the Centre for GEH of Clinical Center Kragujevac to complete. After endoscopic examination the patients who agreed to participate in the study were given a questionnaire for assessing patient satisfaction with endoscopic examinations of the digestive tract. Before completing the questionnaire, patients got the informer and gave informed consent. After the completion of examinations, study participants were interviewed by the principal investigator, who then filled out the questionnaires. Question number 18 (How would you rate the comfort in the recovery area in the endoscopy suite?) was omitted from the questionnaire, since the study involved patients who had an examination done without anaesthesia, so there was no need to lie down in the recovery room where patients usually lie while recovering from endoscopy with anaesthesia. Patients who are hospitalized in the Center for GEH also did not lie in this room, but rather in their room at the hospital at the centre for GEH after the examination. Question number 15 (Did the person who performed your endoscopy give you the explanation?) was also omitted out from the questionnaire because patients who responded to this question with a NO did not complete the questionnaire and were excluded from the study. The study included all patients who were referred for endoscopic examination in the Centre for GEH, of Clinical Center Kragujevac, 18 years or older, who agreed to participate in the study and had the ability to understand and complete the questionnaire. In the study, respondents who did not answer all the questions in the questionnaire, those who refused to participate in the study, and patients with

diagnosed psychiatric illness, dementia, neoplastic or other concomitant serious illness were excluded. Assessment of patient satisfaction with the specified questionnaire was conducted only among those patients in whom the examination was carried out without anaesthesia. Those patients who had examination done with anaesthesia were excluded from the study, because anaesthesia might influence their satisfaction assessment.

The original GESQ (version 2) consists of 21 questions. The questionnaire contains questions that were formulated in the form of a five-point and three-point Likert scale. The original questionnaire also contains dichotomous questions with the options YES and NO (7). Two questions are different than all others (I'm always willing to admit it when I make a mistake? I have always had trust in my doctors?) and were selected as socially desirable when offered questions on a five-point Likert scale. Socio-demographic questions offered relating to sex, place of residence, education, marital status, habits of respondents are an integral part of the questionnaire. When filling out the questionnaire respondents enter their first and last name, age and date of completing the questionnaire. This questionnaire contains information about the type of examination that was carried out, their urgency, the symptoms for which patients are referred for examination, etc. As an addition to this questionnaire, the VAS was used. On a 10-cm-long line, respondents mark the level of satisfaction with the endoscopic examination of the digestive tract. By marking the cross on the line, the respondents expressed their satisfaction. Satisfaction was then evaluated by measuring the distance from the left end of the scale, which was equal to 0, to the crosses. Satisfaction was quantified by values from 0 to 10, where 0 indicated dissatisfaction with examinations, and a maximum of 10 indicated maximum satisfaction with preformed examinations. With the first version of the questionnaire, patients responded to three open questions about whether they understood all the questions, what issues are less understood, whether there was a question which they did not want to answer, and why.

Reliability tests

Reliability of the Serbian translation of the GESQ was tested using two methods. Internal consistency was assessed by calculating the Cronbach's alpha parameter for the whole questionnaire. By the second split-half method the questionnaire was split into two equal parts with the same number of questions. Cronbach's alpha was calculated for each of the two equal parts. Using the parameters for both parts, the number of questions in both parts and the average correlation between the questions in both parts of the original questionnaire, the Spearman-Brown coefficient for the whole questionnaire was calculated through the Spearman-Brown's predictive formula (22). The collected data were statistically analysed by SPSS 18.00 for Windows (23).



Factor analysis

Eligibility of the questionnaire and sample factor analysis were tested by the Kaiser-Meyer-Olkin method that measures the adequacy of sampling and by Bartlett's sphericity test. Then, the factors were initially extracted without rotation, provided that their Eigenvalues were greater than 1, using a Scree plot (extracting factors which were above the fracture on the chart). Referential orthogonal rotation axis was performed by the Varimax method, and factors' extraction were performed by the same criteria as for unrotated solutions.

Validity

Content validation of the Serbian translation of the GESQ was tested by a three-member committee of the Center for GEH of Clinical Center Kragujevac. To implement constructive validation of the Serbian translation of the GESQ, its overall score was compared and correlated with the total score on the KSB scale, which contained 8 questions and offered answers on the Likert scale of 1 to 5 (which are categorized from 1- completely disagree to 5-strongly agree), and the VAS scale, which was implemented on the same subjects (3,7,24). Before using the scale on the same subjects, permission for use was granted by the original author - Assistant Professor Veljko Jovanović from University of Novi Sad, Faculty of Philosophy, Department of Psychology. This scale was previously validated in a Serbian population.

RESULTS

Characteristics of the sample

In a study conducted in the city of Kragujevac 165 respondents participated. Of the total respondents, 13 respondents did not provide answers to all questions in the questionnaire, and they were excluded from the study. Statistical analysis included 152 respondents. Percentages of respondents by sex, age groups and mean value of VAS are shown in Table 1. The urgency, type examination carried out, symptoms for which the respondents were sent to examination, and information on whether the examination was carried out for the first time or not are shown in Table 2.

Reliability analysis

The correlation matrix was built to indicate the correlation of mutual questions, and the correlation of each question with the remaining questions from the questionnaire. Questions 6, 7 and 20 were shown to have negative correlation. By inversion of the scores of questions 6, 7, 8 and 20, the correlation of these questions becomes positive.

Table 1: Percentage of respondents by sex, age groups, mean VAS.

	Respondents	
Sex	Male	52.6 %
	Female	47.4 %
Age group	18-29	15.1 %
	30-49	19.7 %
	50-65	45.4 %
	Over 65	19.7 %
Age	Age range	19-84
	Average	50.75 +/-15.206
VAS scale-mean	7.035 +/-1.2744.	

Table 2. Urgency of examination, type examination, symptoms, patients who were first sent for examination

Urgency examination	Urgent	131 86.2 %
	Routine	21 13.8 %
Type examination	Gastroscopy	75 49.3 %
	Colonoscopy	71 46.7 %
	FRSS, Rectosygmoidoscopy	6 3.9 %
The symptoms for which the patient is sent for examination Gastroscopy	Dyspeptic symptoms	61 81.3%
	Weht loss, anemia, anorexia	14 18.7%
The symptoms for which the patient is sent for examination Colonoscopy	Bleding per rectam	32 41.6 %
	Change in bowel habit	29 37.7 %
	Stomach pain, anemia	16 20.8 %
The first examination	Yes	65 42.8 %
	No	87 57.2 %

Descriptive statistics

The mean values of most questions were in the range of 2 to 4, except in the case of questions 3 and 13, which were 1.60 and 1.65. These questions were separated by their low variance. The value of Cronbach's coefficient for the entire questionnaire was 0.612. Then, the change of its value was analysed by the elimination of some questions in the questionnaire. By eliminating the remaining questions (questions number 15 and 18) Cronbach's coefficient has a final value of 0.763. The obtained definitive version of the questionnaire contains 19 questions, which were carried out for factor analysis. The questionnaire was then divided into two parts by the split-half method, and Cronbach's coefficient was determined for each part individually. Cronbach's coefficient values were 0.649 and 0.614. The correlation between these two parts was 0.570. After the distribution of the questionnaire into two parts, the Spearman-Brown coefficient for the whole questionnaire was calculated through the Spearman-Brown's predictive formula. The Spearman-Brown coefficient had value of 0.726. Factor analysis was conducted by the principal component analysis (PCA) method with the remaining 19 questions in the questionnaire. Prior to implementation of the PCA, the adequacy of data for the factor analysis was assessed. The value of the KMO test,



as an indicator of the adequacy of the sample was 0.788, which exceeded the recommended value of 0.6. Bartlett's test of sphericity reached statistical significance ($p = 0.000$), indicating that the factor analysis could be carried out. Principal components analysis revealed the presence of four factors which had an eigenvalue greater than 1. Extracting these four factors explained 28.573%, 12.605%, 9.102% and 6.921% of the variance. By examining the scree plot, the existence of a clear point of fracture after the fourth factor was confirmed, as shown in Figure 1. To make it easier to interpret these four factors, the Varimax orthogonal rotation method was conducted. These four factors explain 57.200% of the variance. Share of variance, the cumulative percentage of variance and eigenvalues of these four factors after the rotation are shown in Table 3. Table 4 shows the weight factor matrix after performing the rotation. The rotated solution revealed the existence of different structures, and that all four components have different factor weights.

The values of the factor weights in Table 4 suggest that the first factor includes five questions (questions 1, 2, 3, 4, 5), the second factor includes six questions (questions 13, 14, 16, 17, 18, 20), the third factor includes four questions (questions 6, 7, 8, 19) and the fourth factor includes four questions (questions 9, 10, 11, 12). Among the questions that belong to each factor, there is a connection. These questions explain the same phenomenon, and it is reasonable to assign the structure of the questionnaire in this way. Names of factors, questions that belong to them, Cronbach's alpha coefficient and mean value of the score of each factor with the total score of the questionnaire are presented in Table 5.

Temporal stability

In this study, time stability of the translation was not tested (test-re-test method), because patients were supposed to undergo the same endoscopic examination twice at two different time points carried out by the same person and under the same conditions (same type, time of examination, and endoscopist). It was not feasible to contact people who live outside the city where the studies were conducted.

Divergent validity

As we did not have a questionnaire that would measure the related phenomena in this study, divergent validity was verified by respondents completing the questionnaire and scale to measure entirely different phenomena related to satisfaction with the endoscopic examination, such as the Short scale of subjective well-being (KSB) and the visual analogue scale (VAS). The correlation between the total scores of the questionnaire and these two scales was then examined. Divergent validity was tested using the non-

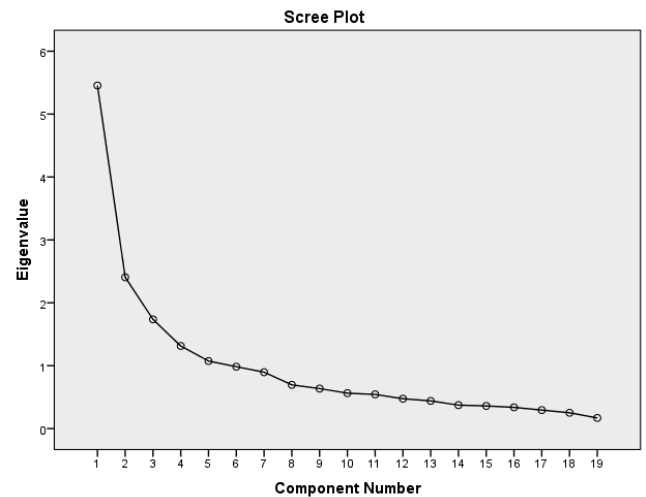


Figure 1. Scree plot

Table 3. Percentage of variance, the cumulative percentage of variance and value "eigenvalue" four factors after the rotation

Factors	„Eigenvalue”	Percentage of explained variance	The cumulative percentage of explained variance
1	3.273	17.224 %	17.224 %
2	2,932	15.434 %	32.557 %
3	2.446	12.873 %	45.530 %
4	2.217	11.670 %	57.200 %

Table 4. Matrix factors weight after rotation

	Component			
	1	2	3	4
GESQ1	.576	.198	.362	.160
GESQ2	.803	.158	.088	-.049
GESQ3	.609	.253	-.080	-.219
GESQ4	.861	.167	.044	.101
GESQ5	.861	.160	.040	.000
GESQ6	.227	.218	.712	.023
GESQ7	.074	.145	.736	-.155
GESQ8	-.120	.107	.749	-.037
GESQ9	.043	.126	-.413	.595
GESQ10	-.031	-.068	.042	.767
GESQ11	.015	-.117	-.210	.660
GESQ12	-.021	-.067	.048	.742
GESQ13	.203	.692	.131	-.028
GESQ14	.038	.791	.086	.010
GESQ16	.181	.662	.322	.009
GESQ17	.238	.750	.196	.006
GESQ18	.362	.485	.237	-.249
GESQ19	.276	.347	.495	-.248
GESQ20	.169	.413	-.040	-.230



Table 5. Names of factors, questions pertaining to them, Cronbah's coefficient values and the mean value of each factor

	Questions	Cronbah coefficient	The mean value of the score
Factor 1 Information before endoscopy	1. How easy to understand was the information that was sent to you before your endoscopy ? 2. Was the information sent to you before your endoscopy appointment useful in answering your questions? 3. Before you had your endoscopy, how much opportunity did you have to ask questions about the endoscopy procedure 4. How easy to understand was the explanation given to you before your endoscopy? 5. Was the explanation given to you before your endoscopy useful in answering your questions?	0,840	11,184
Factor 2 Information after endoscopy	13. After you had your endoscopy, how much opportunity did you have to ask questions about the findings? 14. After you had your endoscopy, how much explanation of the findings did you receive? 16. How easy to understand was the explanation given to you after your endoscopy? 17. Was the explanation given to you after your endoscopy useful in answering your questions? 18. Overall, how satisfied are you with your endoscopy? 20. How would you rate the overall reputation of the hospital?	0,767	13,348
Factor 3 Communicative and technical skills of the staff	6. How would you rate the communication skills (eg. courtesy, respect, sensitivity, friendliness) of the person who performed your endoscopy? 7. How would you rate the technical skills (eg. thoroughness, carefulness, competence) of the person who performed your endoscopy? 8. How would you rate the communication skills (eg. courtesy, respect, sensitivity, friendliness) of the other staff in the endoscopy unit? 19. If, in the future, you have another endoscopy, how satisfied would you be to have it done by the same person?	0,728	8,263
Factor 4 Pain or discomfort during or after endoscopy	9. How much discomfort did you experience <u>during</u> your endoscopy? 10. How much pain did you experience <u>during</u> your endoscopy? 11. How much discomfort did you experience <u>after</u> your endoscopy? 12. How much pain did you experience <u>after</u> your endoscopy?	0,687	14,164

parametric correlation (Spearman correlation coefficient). Nonparametric correlation was chosen because, some of the scores did not follow a normal distribution.

Based on the correlation coefficient between the questionnaire and these two scales ($r = -0.246$, $p = 0.02$; $r = -0,374$, $p = 0:00$), it can be concluded that there is not a high correlation between the questionnaire and these two scales, thereby supporting the divergent validity. The Multitrait-Multimethod correlation matrix is shown in Figure 2.

DISCUSSION

The final version of the GESQ for the assessment of patient satisfaction with endoscopic examinations of the digestive tract, for use in Serbian populations, contains 19 questions and shows high reliability, with a Cronbach's coefficient value of 0.763, and good structure and homogeneity of random questions while sharing the questionnaire into two parts. Exploratory factor analysis indicated



	GESQ questionnaire	KSB scale	VAS scale
GESQ questionnaire	1	-.246	-.374
KSB scale	-.246	1	.235
VAS scale	-.374	.235	1

Figure 2. Multi-trait, multi-method correlation matrix (nonparametric Spearman correlation)

the existence of four factors that explain 57.200% of the variability. The method of principal component analysis discovered four factors that are clinically relevant to the assessment of patient satisfaction with gastrointestinal endoscopy. The identified factors are as follows: the information that the participants get before endoscopy; the information that the participants get after endoscopy; communicative and technical skills of the staff; and pain and discomfort during and after endoscopy. These are the same factors that are defined by the author of the original questionnaire. Additionally, these subscales displayed similar alpha values as the subscales in the original questionnaire.

Receiving adequate information before endoscopic procedures can reduce the anxiety and fear in patients that are normally present prior to the implementation of these procedures. The study conducted by S. Pehlivan et al. showed that providing verbal or written information to patients before performing endoscopic examination significantly affects their submission to the examination, reduces anxiety and increases patient satisfaction with this kind of examination (1). Similar results were found in a study by M. Qureshi et al. (3). In our centre, before performing invasive endoscopic procedures, patients receive written information about the proposed procedure, and then patients give their written consent to undergo the procedure. Providing adequate information to patients is intended to reduce the level of anxiety, to relax patients and to answer their questions, doubts and fears (17).

A study conducted in England examined the experiences of patients endoscopic examinations and determined that respondents react differently upon completion of the examination and disclosure of the results. While patients low in pre-examination anxiety indicated satisfaction with the results of the examination and believed in the results, another group of patients, which who reported showed frustration and increased nervousness, did not believe in the results of the examinations (13).

A study by Sánchez del Río A et al. used a questionnaire that was approved by the American Society of Gastrointestinal Endoscopy (GHAA-9) and showed that patients who experienced these examinations for the first time could hardly estimate the technical skills of the staff, a possible cause of a stated lack of experience with patients undergoing endoscopic examinations. This study of a large number of participants was the first to encounter this type of examination (9). A study that used the same questionnaire and was carried out in Canada investigated the factors influencing patient satisfaction with endoscopic examinations

and the factors that influenced patients' willingness to repeat the endoscopic examination. The study found that patients who positively evaluated the technical skills of the staff and who experienced less pain during the procedure, who were more willing to repeat endoscopic examination. Additionally, patients who had a positive assessment of the communicative skills of the staff and received quality information before and after the completion of the examination were more satisfied (19).

A study by Ussu VM et al. showed that the presence of pain during and after the completion of endoscopy had a substantial influence on the toleration of the examination and on patient satisfaction (4). A study by Campo R et al. indicated that having prior endoscopy can significantly affect the tolerance of examinations (5). Two studies conducted in Taiwan, which included respondents who had an upper endoscopy without sedation, found associations between negative experience with prior endoscopies and increased anxiety before the endoscopic examination as well as patient satisfaction (12,16). Similar results were obtained from a study conducted in Germany on patients who were included in the screening programme for colorectal cancer, where researchers tried to establish a link between the avoidance of examinations and previous bad experiences (18). A study conducted in Iran came to the opposite conclusion, that prior experience of patients with endoscopic examinations is not a reliable parameter for assessing the tolerance of the forthcoming examinations (20).

Certainly, the use of conscious sedation may increase patient satisfaction with gastrointestinal endoscopy (18). While conscious sedation is routinely used during lower endoscopies, the role of conscious sedation during an upper endoscopy is still insufficiently defined (10). The use of conscious sedation varies from country to country, continent to continent, and even in different endoscopy centres within the same country. The use of conscious sedation is associated with higher costs, an extension of the duration of the procedure, the need for the monitoring of vital functions and an increasing incidence of complications (10,12,14,16,18).

In a study conducted in the UK, constructive validity of the questionnaire with other questionnaires and scales was not checked (7). This study tested the divergent validity of the questionnaire with the Short Subjective Well-being scale (KSB) and the VAS scale.

The main limitation of this study is that it was not possible to perform retesting of patients 15-30 days after completion of the endoscopic examination to determine the temporal stability of the questionnaire. This study included only patients who underwent examinations without anaesthesia, unlike other studies which included patients who underwent examinations without anaesthesia and patients who had an examination performed in analogosedation (4). This study was conducted in a single endoscopic centre on a smaller number of specific subjects. The limitation of this study is the absence of a second questionnaire that



measured the same phenomenon. Additionally, convergent validity of the questionnaire has not been checked; however, divergent validity of the structure was checked. When interpreting the results, it should be taken into account that the answers about patient satisfaction may have been influenced by other factors, such as information derived from relatives and friends as well as attitudes about health and medical information (9).

CONCLUSION

The Serbian translation of the GESQ shows similar psychometric characteristics to the original version of the questionnaire in English, with a similar factor structure. We believe that this questionnaire is a reliable tool for assessing patient satisfaction with endoscopic examinations of the digestive tract, and can be used as an indicator of quality for this purpose.

In future work, the questionnaire would be applied to endoscopist training to determine whether the advancement of endoscopic beginners affects the satisfaction of patients and whether there is a positive correlation with increased experience of endoscopist. The authors suggest that in the future, this questionnaire should be tested in different groups of patients who underwent other endoscopic procedures, such as endoscopic ultrasound (EUS) and endoscopic retrograde cholangiopancreatography (ERCP).

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REFERENCES

1. Pehlivan S, Ovayolu N, Koruk M, Pehlivan Y, Ovayolu O, Gülşen MT. Effect of providing information to the patient about upper gastrointestinal endoscopy on the patient's perception, compliance and anxiety level associated with the procedure. *Turk J Gastroenterol.* 2011; 22(1): 10-7.
2. Hakan Unal, Gamze ozcurumez, fieniz Saritafi, Murat Korkmaz, Haldun Selcuk1. Which factors affect anxiety

- level before upper gastrointestinal endoscopy. 2012; 20(3): 67-71
3. Qureshi MO, Shafqat F, Ahmed S, Niazi TK, Khokhar N. Factors affecting patient satisfaction during endoscopic procedures. *J Coll Physicians Surg Pak.* 2013; 23(10): 775-9.
4. Ussui VM, Silva AL, Borges LV, Silva JG, Zeitune JM, Hashimoto CL. What are the most important factors regarding acceptance to the colonoscopy?: study of related tolerance parameters. *Arq Gastroenterol.* 2013; 50(1): 23-30.
5. Campo R, Brullet E, Montserrat A, Calvet X, Moix J, Rué M, Roqué M, Donoso L, Bordas JM. Identification of factors that influence tolerance of upper gastrointestinal endoscopy. *Eur J Gastroenterol Hepatol.* 1999; 11(2): 201-4.
6. Ersöz F, Toros AB, Aydoğan G, Bektaş H, Ozcan O, Arıkan S. Assessment of anxiety levels in patients during elective upper gastrointestinal endoscopy and colonoscopy. *Turk J Gastroenterol.* 2010; 21(1): 29-33.
7. Hutchings HA, Cheung WY, Alrubaiy L, Durai D, Russell IT, Williams JG. Development and validation of the Gastrointestinal Endoscopy Satisfaction Questionnaire (GESQ). *Endoscopy.* 2015; 47(12): 1137-43.
8. Petitti T, Candela ML, Ianni A, de Belvis AG, Ricciardi W, De Marinis MG. Validation of the Italian version of the GHAA-9 m questionnaire on patient satisfaction in digestive Endoscopy). *Ig Sanita Pubbl.* 2015; 71(5): 465-76.
9. Sánchez del Río A, Alarcón Fernández O, Baudet JS, Sainz Menéndez Z, Socas Méndez M. Reliability of the Spanish version of a brief questionnaire on patient satisfaction with gastrointestinal endoscopy. *Rev Esp Enferm Dig.* 2005; 97(8): 554-61.
10. Trevisani L, Sartori S, Gaudenzi P, Gilli G, Matarese G, Gullini S, Abbasciano V. Upper gastrointestinal endoscopy: are preparatory interventions or conscious sedation effective? A randomized trial. *World J Gastroenterol.* 2004; 10(22): 3313-7.
11. El-Hassan H, McKeown K, Muller AF. Clinical trial: music reduces anxiety levels in patients attending for endoscopy. *Aliment Pharmacol Ther.* 2009; 30(7): 718-24.
12. Huang HH, Lee MS, Shih YL, Chu HC, Huang TY, Hsieh TY. Modified Mallampati classification as a clinical predictor of peroral esophagogastroduodenoscopy tolerance. *BMC Gastroenterol.* 2011; 11(1):1.
13. Mikocka-Walus AA, Moulds LG, Rollbusch N, Andrews JM. "It's a tube up your bottom; it makes people nervous": the experience of anxiety in initial colonoscopy patients. *Gastroenterol Nurs.* 2012; 35(6): 392-401.
14. Trevisani L, Zelante A, Sartori S. Colonoscopy, pain and fears: Is it an indissoluble trinomial? *World J Gastrointest Endosc.* 2014; 6(6): 227-33.
15. Miller SJ, Iztzkowitz SH, Redd WH, Thompson HS, Valdimarsdottir HB, Jandorf L. Colonoscopy-specific fears in African Americans and Hispanics. *Behav Med.* 2015; 41(2): 41-8.



16. Jung-Pin C, Chia-Long L, Chi-Hwa W, Yung-Chih L, Ruei-Neng, Tien-Chien T. Identification of Factors That Impact on Patient Satisfaction of Unsedated Upper. *Gastrointestinal Endoscopy*. 2009; 20: 359-66.
17. Pontone S, Tonda M, Brighi M, Florio M, Pironi D, Pontone P. Does anxiety or waiting time influence patients' tolerance of upper endoscopy? *Saudi J.Gastroenterol*. 2015; 21(2): 111-5.
18. Kilgert B, Rybizki L, Grottke M, Neurath MF, Neumann H. Prospective long-term assessment of sedation-related adverse events and patient satisfaction for upper endoscopy and colonoscopy. *Digestion*. 2014; 90(1): 42-8.
19. Loftus R, Nugent Z, Graff LA, Schumacher F, Bernstein CN, Singh H. Patient satisfaction with the endoscopy experience and willingness to return in a central Canadian health region. *Can J Gastroenterol*. 2013; 27(5):259-66.
20. Farhadi A, Fields JZ, Hoseini SH. The assessment of esophagogastroduodenoscopy tolerance a prospective study of 300 cases. *Diagn Ther Endosc*. 2001; 7(3-4): 141-7.
21. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, Erikson P; ISPOR Task Force for Translation and Cultural Adaptation. Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: report of the ISPOR Task Force for Translation and Cultural Adaptation. *Value Health* 2005; 8(2): 94-104.
22. Streiner DL, Norman GR. *Health Measurement Scales - a practical guide to their development and use*. 4th edition. Oxford University Press. Oxford; 2008.
23. SPSS Inc. Released 2012. *PASW Statistics for Windows, Version 18.00*. Chicago: SPSS Inc.
24. Jovanović V. Validacija Kratke skale subjektivnog blagostanja. *Primenjena psihologija* 2010; 3 (2) : 175-190.