CLINICAL ISSUES

Validity and reliability of the 'good perioperative nursing care scale' for Turkish patients and nurses

Yelda Candan Donmez and Turkan Ozbayır

Aim. To test the validity and reliability of the Turkish version of Good Perioperative Nursing Care Scale for nurses and patients.
Background. The nursing care in operating departments has an important role in modern health care and therefore more research concerning perioperative care quality is needed and the development of a measurement tool is necessary.
Design. The study was designed as a cross-sectional survey.
Method. The research population was 346 patients who had surgery and 159 operating room nurses who worked at 11 hospitals. The GPNCS contains 32 items. The items on the nurses' form were changed as little as possible to create the form for patients to be able to directly compare them. To determine the tool's language equivalency/adaptation of the questionnaire for both nurses and patients, the tool was translated into Turkish then retranslated, and a pilot study was conducted.
Results. The total scale's total mean score and standard deviation for nurses was determined to be 113·23 (SD 2·13) and for patients was 128·23 (SD 1·27). To test the scale's stability over time, a test-retest was conducted and the results showed a strong confirmatory correlation.
Conclusions. The GPNCS was determined to be a tool that had indicators of being adequate, reliable and valid for the Turkish population.
Relevance to clinical practice. This study highlighted the importance of comparing the quality and effectiveness of nursing care in different operating departments. It is recommended that it be used to determine the quality of perioperative nursing care in Turkey.

Key words: nursing, perioperative care scale, quality, reliability, Turkish, validity

Introduction

The quality of care given in health care facilities is primarily determined by health care workers. There are two dimensions of quality of care in health care facilities; these are technical (scientific) quality and the art of practice. Care given by health care personnel who do not have scientific competence can cause results that make it impossible for advancement from the patient's viewpoint. On the other hand, health care workers' attitudes and behaviours towards patients are the most important factors affecting patient satisfaction as an indicator of quality (Kavuncubasi 2000).

The use of modern techniques and instruments used in every type of intervention in parallel with advancements in technology have significantly increased the scope and success of surgical interventions and decreased the negative effects of anaesthetising patients. However, the most important subject that is still a problem for patients and delays healing is the emotional effect of surgical interventions on patients. Surgical nurses' sensitivity to this subject and degree of importance given to patient care during this time can elevate patients'

Authors: *Yelda Candan Donmez*, PhD, Assistant Professor, Odemis School for Health Sciences, Ege University, Odemis; *Turkan Ozbayır*, PhD, Assistant Professor, Department of Surgical Nursing, School of Nursing, Ege University, Bornova, Izmir, Turkey

Correspondence: Yelda Candan Donmez, Assistant Professor, Odemis School for Health Sciences, Ege University, Odemis, Izmir, Turkey. Telephone: +90 232 5443450.
E-mail: candanyelda@hotmail.com

postoperative recovery to the best possible level (Leinonen *et al.* 1996, 2001, Leinonen & Leino-Kilpi 1999, Myles *et al.* 2000, Ozbayir 2002).

In developed and developing societies, because of developments and changes in health care expectations, there are also developments and changes in nursing care. One of these developments is the provision of 'people centered care' for patients and healthy individuals, families and societies in the place of 'task and treatment centered care.' It is one of the factors that has helped improve the quality of nursing care in hospitals. Taking patients' expectations into consideration is also a necessary step in improving quality (Bjork 1995, Elibol *et al.* 1998, Johansson *et al.* 2005).

In addition to the perceptions of patients or clients, the support of caregivers' opinions is an important subject for determining priorities in care. There are various factors which affect the quality of nursing care. The most important of these is how nurses perceive their professional role. For this reason, to be able to provide comprehensive, growing and knowledge-based patient-centred care, there is a need for priorities, and care needs to be well investigated from patients' viewpoints (Yavuz 1998, Velioglu 1999, Parsaie *et al.* 2000, Bassett 2002, Demir & Eser 2003, Suhonen *et al.* 2003).

According to previous research, one of the reasons why patients and caregivers have different perceptions of care behaviours is thought to be inadequate communication. In addition, for there to be accurate and adequate communication between patients and caregivers, it is necessary for caregivers to have special education and skills and to have an accurate determination of patients' expectations of their care. When nurses know how patients perceive care behaviours, they can be more aware of their own care behaviours (Von Essen & Sjoeden 1991, Hegedus 1999, Demir *et al.* 2002, Ozbayir *et al.* 2003, Suhonen *et al.* 2003).

Background

The Good Perioperative Nursing Care Scale (GPNCS) is a 34-item tool developed by Tuija Leinonen and Helena Leino-Kilpi at Turku University in Turku, Finland, in 2002, for the purpose of measuring the quality of perioperative nursing care. According to information in the literature, 24 hours after surgery, patients' stress has decreased or been eliminated, the effect of pain and anaesthetic gases decreased (Kumral 1975), and for this reason, the time selected for the first stage of data collection was on patients' first postoperative day.

Study aim

The main purpose of this study is testing the validity and reliability of the GPNCS. (Karasar 1995, Aksayan *et al.* 2002, Sumbuloglu & Sumbuloglu 2002). Also:

1 testing the validity and reliability of the GPNCS for Turkish perioperative patients,
2 testing the validity and reliability of the GPNCS for Turkish perioperative nurses,
3 to achieve a tool for Turkish society to determine the quality of perioperative nursing care.

Methods

Design, sample and setting

This research was conducted between 1 January–31 December 2005, at 11 hospitals (two university and nine public hospitals) in Izmir province, Turkey. A convenience sampling technique was used to select the research sample (Karasar 1995). The research population was comprised of hospitalised postoperative patients in 11 hospitals in Izmir province and the nurses working in the operating rooms associated with these wards.

Instrument

The GPNCS is a 34-item tool for measuring the quality of perioperative nursing care. The scale has six subscales: physical care, giving information, support, respect, personnel characteristics, environment and nursing process. The instrument is a Likert type scale (0–5). The responses are given as five points for 'I completely agree' to one point for 'I completely disagree'. A score of 0 was given for 'I can't evaluate this aspect' and a score of 3 was marked for 'I neither agree nor disagree, not different, I don't have any idea' (it does not matter). As a result of expert opinion and construct-language validity, study items that were similar to each other were removed, and the scale was revised to 32 items to prevent repetition.

According to Leinonon *et al.* (2003), to be able to use the GPNCS with both patients and nurses and to be able to compare the results with future research only minor modifications were made in the items on the scale to adapt it for nurses. For example, the item on the original scale for nurses was 'I have enough time to do my job in the operating room;' but for patients, it was 'The employees in the operating room have enough time for patients' (Leinonen *et al.* 2002, 2003). The data collection forms were completed by patients and nurses. It took

approximately 20–25 minutes for completion of the data collection forms.

Language validity study for the GPNCS

The scale was translated from English into Turkish by the researcher, three nursing faculty members, one nursing instructor and one English instructor whose mother language was Turkish and who knew English well. The most appropriate statements from the Turkish translations were chosen, and the final draft was sent to two individuals whose mother language was Turkish and who were given detailed information about the subject but had not seen the original for them to translate the scale back into English. Comparisons were made between the original and back-translated scale statements; necessary revisions were made, then the Turkish draft was sent to 10 experts for the opinions about content validity. As a result of their recommendations, revisions were made to improve the comprehensibility of the statements and the scale was put into its final draft (Oner 1994, 1997, Sahin 1994, Savasir 1994, Karasar 1995, Aksayan & Gozum 2002, Gozum & Aksayan 2003).

Getting expert opinion about the GPNCS

To determine content validity of the Turkish version of the GPNCS draft, it was sent to three nursing teaching faculty, four specialist nurses working in the operating room and three surgeons none of whom had seen the original scale for a total of ten expert opinions. On this index, a score of 1–4 is given for each item (1 = inappropriate, 2 = item needs modifications to make it appropriate, 3 = appropriate but needs minor changes, 4 = very appropriate) (Aksayan *et al.* 2002).

Data collection procedure

For the purpose of data collection for this research, the nurses were given a nine-item Nurse Descriptive Information Form and the patients a 28-item Patient Descriptive Information Form, and both groups were given the GPNCS to complete.

Participants

Out of the total of 137 787 patients who had surgery, the research sample was comprised of 346 patients who were 18 years and older, could read and write, did not have a psychiatric, visual or hearing problem, did not have a mental disability, were conscious, voluntarily agreed to participate in the research and had been hospitalised for at least one night and were on their first postoperative day. The sample was

selected using a stratified sampling method. To enable factor analysis in testing the validity and reliability of the instrument, the sample size ideally needs to be at least five times the number of items on the instrument, the sample size needed to be at least 320 people (32 items on the scale times 10) (Sumbuloglu & Sumbuloglu 2002).

For nurses, the research sample was comprised of all operating room nurses who voluntarily agreed to participate in the research. Of the total of 302 operating room nurses, 159 were included in the study; the rest were not included because they did not agree to participate or were off during the data collection. Nurses and patients included in the research were given information about the research, and those who wanted to participate gave their written consent.

Pilot testing

The draft scale, revised according to expert opinion, was administered to 10 nurses and 10 patients who had similar characteristics to the research population. No problems were experienced with the nurses and patients' understanding of scale.

Ethical considerations

Permission to conduct the research was obtained from Ege University Nursing School Ethics Committee (00–69) and hospitals. Participant consent was assumed by return of a completed questionnaire.

Data analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) 11.0 (SPSS Inc., Chicago, IL, USA). Number and percentage distribution were calculated for patients' and nurses' socio-demographic characteristics. Principal component analysis was performed for construct validity in the validity portion of the study, and *t*-test for independent groups was performed to compare the group means at an upper and lower 27% for construct validity.

In the reliability study of the scale, standard error, item total correlation coefficient, split half test reliability method with Pearson's product moment correlation coefficient, Cronbach's alpha coefficient for determining internal consistency, test-retest method for determining the stability of the scale over time with Pearson's product moment correlation coefficient were calculated (Karasar 1995, Aksayan & Gozum 2002, Aksayan *et al.* 2002, Sumbuloglu & Sumbuloglu 2002, Gozum & Aksayan 2003).

Results and discussion

Participants

In this study, 44·7% of the nurses were from a teaching hospital. Of the participating nurses, 54·0% worked in the central operating room. Almost all (98·8%) of the nurses were women and 33·3% in the 38 years and over age group. Almost half (49·1%) of the nurses graduated from four-year university programs, and the majority (63·5%) of the nurses were married, 32·1% single (Table 1). As can be seen in Table 1, the participating nurses' length of employment in the profession was 16 years or more for 37·1%. The length of time the nurses had worked in the operating room was one to five years for 34·6%.

Of the participating patients, 17·3% were from university hospital. The patients had surgical procedures in the following areas: 14·1% in general surgery. The patients' health insurance coverage was by the Social Security Institute for 42·4%, 'Emekli Sandigi' (government workers' pension fund). In this study, 50·0% of the patients were women and 50·0% were men; 20·2% were in the 18–28, 20·2% in the 40–50 and 20·2% in the 67–72-year-old age group. The majority of the patients (53·8%) could only read and write. Of the patients, 37·0% were employed. The majority (74·6%) of the patients was married.

Validity and reliability results

Validity analysis of GPNCS

A measurement instrument's serving its purpose is closely associated with its characteristic of accurately measuring what was intended to be measured. This makes it necessary to consider a measurement instrument's reliability and validity together. Although for a measurement instrument to be valid is associated with its reliability, it does not make sense to use a reliable instrument that is not valid (Ozguven 2000, Erkus 2003). The GPNCS's 'construct validity' study investigates what the characteristics of the scale are or what characteristics are measured with the scale as well as what the individuals' scores mean who are administered the scale (Aksayan & Gozum 2002, Aksayan *et al.* 2002).

The exploratory method was used to analyse the 'construct validity' of the GPNCS. Factor analysis is based on items being correlated with each other. Factor analysis is the collection of many variables under several headings (Akgul 1997, Akgul & Cevik 2003, Erkus 2003). Principal components analysis is performed with the scores given to items on an instrument for the purpose of examining factor constructs. The greater the percentage of variance obtained as a result of the analysis, the stronger the factor construct (Tavsancil 2002, Ozer 2003).

Factor analysis uses the number of variables the test measures and the contribution of scores obtained from the entire test for every one of these to reveal the construct or constructs being measured by the test. Factor analysis is a method that uses the collection of variables in specific groups which are related to each other (Tezbasaran 1996, Taskin 2002, Akgul & Cevik 2003).

Seven factors were obtained in the basic components analysis of the 32-item GPNCS for nurses (Table 2). 'Physical Care' was the first and largest factor which explained 36·856% of the variance; its factor load varied between 0·39–0·83. The remaining factors were Giving Information, Support, Respect, Personnel Characteristics, Environment and Nursing Process. Each factor explained a variance between 3·059–36·856% for a total of 66·975% of the variance explained.

Seven factors were also obtained in the basic components analysis of the 32-item GPNCS for patients. 'Physical Care' was also the first and largest factor which explained 35·123% of the variance; its factor load varied between 0·50–0·89 (Table 2). Each factor explained a variance between 3·555–35·123% for a total of 68·939% of the variance explained. As a result of confirmatory factor analysis, the factor constructs in both the nurses' version and the patients' version of the GPNCS were found to be consistent with the original scale. In calculating factors, the Eigenvalues were taken into consideration (Akgul 1997).

On the scale for nurses, every factor's Eigenvalue was greater than 1. In the analysis of the seven-factor scale, the Eigenvalues were found to be, respectively, 11·794 for Factor 1, 3·071 for Factor 2, 1·827 for Factor 3, 1·491 for

Table 1 The distribution of participants characteristics

Characteristics	Patients		Nurses	
	n	*%*	*n*	*%*
Gender				
Male	173	50·0	157	98·8
Female	173	50·0	2	1·2
Marital status				
Married	258	74·6	101	63·5
Single	52	15·0	51	32·1
Divorced or widowed	36	10·4	7	4·4
Employment status				
Employed	128	37·0	159	100·0
Unemployed	126	36·4	–	–
Students	12	3·5	–	–
Retired	80	23·1	–	–
Total	346	100·0	159	100·0

Table 2 Factor solution for GPNCS

Subscales and items	Factor loading
Factor 1: Pain management	
1 During my treatment in the operating room, I received sufficient pain medication and so did not have to suffer pain	0·53
2 During my stay in recovery room after the operation, I received sufficient pain medication and so did not have to suffer pain	0·59
3 I was handled gently, without any pain	0·50
4 Patients are put in a comfortable position on the operating room table; supportive devices did not cause pressure on any region of patients' bodies and there were no areas of numbness on their bodies	0·57
Temperature maintenance	
5 During the procedure in the operating room, my body temperature was well maintained (if necessary by using e.g. warmed blankets or forced warm air)	0·65
6 In the recovery room after operating, my body temperature was well maintained	0·77
Technical skills	
7 I think my anaesthesia (general or regional anaesthesia) was well formed	0·82
8 I think my operation/treatment was well formed	0·72
9 Staff in the operating department were professional	0·83
10 Staff have been very careful and meticulous in performing their duties related to my treatment	0·89
Factor 2	
11 In the operating room, I constantly received information about what was happening to me (without any medical jargon)	0·72
12 In the recovery room, I constantly received information about what was happening to me	0·65
13 Nurses in the operating department gave me enough information about matters related to my care	0·84
14 The surgeon gave me enough information about matters related to my operation	0·69
15 The anaesthesiologist gave me enough information about matters related to general or regional anaesthesia	0·76
Factor 3	
16 In the operating department, I was able to influence my treatment by saying what I thought and wanted	0·63
17 I was given the chance to listen to music if I wanted to	0·51
18 In the operating department, I was encouraged and supported mentally	0·55
19 If I was anxious on the operating department, that was taken into account for instance by means of sedatives or discussion	0·56
Factor 4	
20 I was treated respectfully and thoughtfully	0·62
21 In the operating department, I was not put in situations that would have annoyed or embarrassed me	0·75
22 I did not feel my care, and treatment was impersonal or provided as if on an assembly line	0·49
Factor 5	
23 Staff at the operating department were friendly	0·71
24 Staff at the operating department worked well with each other	0·81
25 Staff at the operating department had a good sense of humour	0·50
26 Staff have been polite and pleasant in their behaviour	0·79
Factor 6	
27 Staff at the operating department have had enough time for me	0·71
28 The atmosphere at the operating department was peaceful and unhurried	0·73
29 The recovery room was a peaceful place to recover from an operation	0·53
30 I felt safe at the operating room	0·54
Factor 7	
31 I did not feel I had to wait for too long (at the ward or in the emergency department) to be admitted to the operating department	0·71
32 I did not feel I was transferred too early from the recovery room to the ward	0·68

GPNCS, Good Perioperative Nursing Care Scale.

Factor 4, 1·162 for Factor 5, 1·108 for Factor 6 and 1·000 for Factor 7. On the scale for patients, every factor's eigenvalue was also found to be >1. In the analysis of the seven-factor scale, the Eigenvalues were found to be, respectively, 11·239 for Factor 1, 2·608 for Factor 2, 2·124 for Factor 3, 1·962 for Factor 4, 1·505 for Factor 5, 1·484 for Factor 6 and 1·138 for Factor 7.

When calculating factor analysis, it is important to take the adequacy of the sample size into consideration. The Kaiser–Meyer–Olkin (KMO) test was performed for the

Table 3 Mean, standard deviation and Cronbach alfa value of subscales for GPNCS

Subscales	Item number	n	Minimum-maximum score	Mean; SD	Cronbach's alpha
1 Physical care	10	159	0–50	41·78; 6·45	0·70
2 Giving information	5	159	0–25	19·10; 5·80	0·86
3 Support	4	159	0–20	13·26; 4·59	0·72
4 Respect	3	159	0–15	12·75; 2·82	0·78
5 Personnel characteristics	4	159	0–20	16·74; 4·49	0·88
6 Environment	4	159	0–20	16·58; 3·97	0·78
7 Nursing process	2	159	0–10	8·0; 2·33	0·63
Total	32	159	0–160	128·23; 1·27	0·9

GPNCS, Good Perioperative Nursing Care Scale.

determination of sample size. A KMO value over 0·60 is desirable for a good factor analysis (Akgul 1997). In the factor analysis conducted in this research, the KMO coefficient was found to be 0·87 (excellent) on the scale for nurses, and the Barlett test result was found to be highly significant (χ^2 = 3044·44, p < 0·001). On the scale for patients, the KMO coefficient was found to be 0·81 (excellent) and the Barlett test result was found to be highly significant (χ^2 = 8294·72, p < 0·001). In conclusion, both scales were determined to have 'construct validity' in the factor analysis obtained from principal components analysis.

The final version of the scale was found to be able to discriminate levels of perioperative nursing care from very high and low scores, and the scale differentiated three groups which was evidence of construct validity. The upper and lower 27% group means were compared to test the construct validity of this scale together with these analyses. The difference in the mean responses given to the items in these two comparison groups was at a statistically significant level which means the scale was able to differentiate upper and lower groups (Erkus 2003). In this study, the statistically significant difference found between the two group means shows that the GPNCS was seen to differentiate the level of care into high and low groups (t = 20·830, p < 0·001). A statistically significant difference was also found in the version of the scale for patients, and the scale was seen to be able to distinguish the level of care into high and low groups (t = 24·946, p = 0·001). Based on the results of the content validity, factor analysis and the comparison of the upper and lower 27% group means administered to test the GPNCS's validity, it was determined that both scales are valid.

The GPNCS's internal consistency coefficient (Cronbach's alpha coefficient) for nurses was found to be 0·9421 and for patients was found to be 0·9282 (Table 3). The item to total correlation values for the nurses' version was between

0·7185–0·3000 and for the patients' version was between 0·7914–0·3000. Based on the experts' recommendations, the items were reviewed, and the number of items on the scale was decreased from 34–32. The 11th item (I received continuous information about what was being performed to me in the operating room-without the use of any medical terminology) and the 13th item (I received detailed and clear information about my treatment in the operating room) were thought to have the same meaning, and the 13th item was removed. Similarly, the 29th item (The recovery room/intensive care unit was a calm environment for me to recover after surgery) and the 30th item (There was a calm and relaxed atmosphere in the recovery room/intensive care unit and operating room) were thought to have the same meaning, and the 30th item was removed, decreasing the item total to 32. None of the scores for the remaining 32 items were < 2, so no other items were removed. However, changes were made in the remaining items based on the opinions of the experts. The result was reached that the GPNCS for nurses and patients had indicators that they are very reliable and valid scales.

Reliability analysis of the GPNCS

Reliability is a basic requirement of measurement tools and is the ability of a measurement instrument to measure without error. This characteristic is determined by the instrument's ability to correctly collect data and be repeated (Aksayan & Gozum 2002, Erkus 2003). When an instrument's reliability level is determined with a Likert type scale, it is recommended that Cronbach's alpha coefficient be calculated (Tezbasaran 1997, Erkus 1999, Ozguven 2000, Gozum & Aksayan 2003). For physiologic measurements, the acceptable level is 0·90 and above; for attitude measures, the acceptable level is 0·70 and above (Aksayan & Gozum 2002).

As a result of analyses, the Cronbach's alpha coefficient which shows internal consistency reliability coefficient for the

GPNCS for nurses was found to be high at 0·94 and the items had a high correlation with each other. The Cronbach's alpha for the GPNCS for patients was also found to be high at 0·93, and the items had a high correlation with each other. These results show that both versions of the scale have internal consistency. The items on the scale are consistent with each other, and the scale is comprised of items which examine the components of the same characteristic. Said another way, the scales have an adequate level of homogeneity.

'Item Analysis' is performed to develop a test or instrument that has items with desired characteristics and to obtain information about the make-up of the sample group at the level of item or tool (Erkus 2003). The correlation of every item's score with the total score from the instrument is determined and examined. Although the level under which the item total correlation coefficient is considered to show unacceptable reliability is a specific standard according to Karasar (1995), items < 0·50 should be considered to have doubtful reliability, and according to Oner (1997), this level should be over 0·30 (Karasar 1995, Oner 1997). The item to total correlation coefficients for both the GPNCS for nurses and for patients were found to be 0·30 which is an acceptable level for reliability.

As a result of the 'item analysis' performed with the GPNCS for nurses, the item to total correlation values varied from 0·7185–0·3000. The lowest item to total correlation was 0·30 for item 4 (Patients are put in a comfortable position on the operating room table; supportive devices did not cause pressure on any region of patients' bodies and there were no areas of numbness on their bodies). The Cronbach's alpha coefficient for this item was 0·94. The highest item to total correlation on this scale was 0·72 for item 28 (The operating room is an unhurried and peaceful environment). This item's Cronbach's alpha coefficient was 0·94.

As a result of the 'item analysis' for the GPNCS for patients, the item to total correlation values varied between 0·7914–0·3000. The lowest item to total correlation was 0·30 for item 7 (I think patients are well anaesthetised – general or regional). This item's Cronbach's alpha coefficient was 0·93. The highest item to total correlation on this scale was 0·80 for item 23 (The operating room personnel were friendly to me). This item's Cronbach alpha coefficient was 0·92. As a result of these analyses, both scales are comprised of 32 items, and all of the items can be said to work and measure well. As a result of the 'item analysis' of the GPNCS, the decision was made that all items on the scale are reliable.

Cronbach's alpha coefficient was calculated for the Likert type GPNCS. The total scale for nurses' Cronbach's alpha coefficient was found to be 0·94 and for patients was 0·92. The correlations between scores for every item in a subscale and the subscale total scores were examined, and the subscale totals correlations with the total scale scores were also examined. The lowest item to subscale total score correlation for the nurses' scale was found to be 0·30 for the 4th item (Patients are put in a comfortable position on the operating room table) which is within acceptable limits, but is lower than the other items' correlation coefficients. This item was under the factor, 'Physical Care' which had the highest mean. There are 10 items under this factor.

The lowest item to subscale total score correlation for the patients' scale was found to be 0·30 for the 7th item (I think patients are well anaesthetised – general or regional), which is within acceptable limits but is lower than the other items' correlation coefficients. This item was also under the factor, 'Physical Care' which has 10 items. The subscale on the nurses' scale with the lowest correlation with the total score was the 'Support' subscale with a correlation coefficient of 0·70. The subscale on the patients' scale with the lowest correlation with the total score was the 'Nursing Process' subscale with a correlation coefficient of 0·63.

One of the methods to calculate 'internal consistency reliability coefficient' is with the 'split half reliability' test. In the split half method, the items on the scale or test are divided into two equal halves, and the correlation between the two halves is calculated (Aksayan & Gozum 2002). The Spearman-Brown formula is used to obtain reliability coefficient value for an entire test (Gozum & Aksayan 2003). According to the split half test, reliability results for the nurses' version of the GPNCS, the correlation value between the two halves of the scale was 0·71, the Cronbach's alpha coefficient was 0·90 for the first half (16 items) and 0·92 for the second half (16 items) with a Spearman–Brown coefficient of 0·83 and a Guttman split half reliability coefficient of 0·83 which indicate a high level of reliability.

According to the split half test, reliability results for the patients' version of the GPNCS the correlation value between the two halves of the scale was 0·80, the Cronbach's alpha coefficient was 0·83 for the first half (16 items) and 0·91 for the second half (16 items) with a Spearman-Brown coefficient of 0·88 and a Guttman Split Half Reliability coefficient of 0·88 which indicate a high level of reliability. These results show that both scales have internal consistency and are reliable scales.

Another test of reliability of measurement tools is the test of its 'stability over time'. In practice, this stability over time is used frequently and the most common technique is the test-retest (Karasar 1995, Tezbasaran 1997). Pearson's

product moment correlation coefficient calculated to determine the relationship between two administrations is affected by sample size, so in small groups, the group needs to have at least 30 individuals (Akgul 1997). Based on this information, data were collected again from 30 patients who came for follow-up postoperative appointments for weeks after the first administration for the test-retest reliability study of the GPNCS. As a result of the regression analysis, the GPNCS total score for nurses' test-retest result was 69% of their total score. The correlation coefficient was examined and found to be highly correlated between 0·70–0·89; therefore, there was a strong correlation between the values from the two administrations ($r = 0.84$, $R^2 = 0.69$, $p < 0.01$) (Akgul 1997).

As a result of the regression analysis, the GPNCS total score for patients' test-retest result was 92% of their total score. The correlation magnitude coefficient was examined and found to be highly correlated between 0·70–0·89, so it can be said that there was a strong correlation between the values from the two administrations ($r = 0.95$, $R^2 = 0.92$, $p < 0.00$) (Akgul 1997). This correlation is a linear relationship and is significant at a 99% confidence interval. Correlation coefficients of 0·70 in test-retest methods for instruments are considered to be acceptable (Gozum & Aksayan 2003). According to the results obtained, it is possible to say that the GPNCS for nurses and patients have a high level of stability over time.

Limitations and recommendations

- The GPNCS needs to be retested with nurses and patients who have different variables that can affect perceptions of nursing care (age, gender, educational level, socioeconomic level, etc.).
- The scale can be used for only Turkish Society.

Conclusion

The Turkish version of the GPNCS is a measurement instrument with a high level of validity and reliability for Turkish society and it is recommended that it be used to determine the quality of perioperative nursing care in our country:

- GPNCS is a measurement instrument with a high level of validity for Turkish perioperative patients.
- GPNCS is a measurement instrument with a high level of validity for Turkish perioperative nurses.
- It can be said that this scale can be reliably used to determine the quality of perioperative nursing care.

Relevance to clinical practice

This study highlighted the importance of comparing the quality and effectiveness of nursing care in different operating departments. It is recommended that it be used to determine the quality of perioperative nursing care in Turkey.

Contributions

Study design: YCD, TO; data collection and analysis: YCD and manuscript preparation: YCD, TO.

Conflict of interest

None.

References

Akgul A (1997) *Tibbi Arastirmalarda Istatistiksel Analiz Teknikleri (Statistical Analysis Techniques in Medical Research)*. Yuksekogretim Kurulu Matbaasi, Ankara 169–178, 492–586.

Akgul A & Cevik O (2003) *Faktor Analizi, Istatistiksel Analiz Teknikleri-SPSS'de Isletme Yonetimi ve Uygulamaları (Factor Analysis, Statistical Analysis Techniques-Business Management and Administration in SPSS)*. Yeni Mustafa Kitabevi, Ankara.

Aksayan S & Gozum S (2002) Kulturlerarasi Olcek Uyarlaması Icin Rehber I: Olcek Uyarlama Asamalari ve Dil Uyarlaması (Guidelines I for adapting intercultural instruments: instrument adaptation stages and language adaptation). Hemsirelik Arastirma Dergisi Cilt/Vol:4 Sayi/No:1, Haziran, 9–14.

Aksayan S, Bahar Z, Bayık A, Emiroğlu ON, Erefe İ, Görak G, Karataş N, Kocaman G, Kubilay G, Seviğ Ü (2002) *Hemsirelikte Arastirma Ilke, Surec ve Yontemleri, Arastirma ve Gelistirme Dernegi (Principles, Process and Methods in Nursing Research, Research and Development Association)*, 1st edn. Basim, Odak Ofset, Istanbul, pp. 114, 169–187, 208–210, 246.

Bassett C (2002) Nurses' perceptions of care and caring. *International Journal of Nursing Practice* 8, 8–15.

Bjork IT (1995) Neglected conflicts in the discipline of nursing: perceptions of the importance and value of practical skill. *Journal of Advanced Nursing* 22, 6–12.

Demir Y & Eser I (2003) Hasta ve Hemsirelerin Hemsirelik Bakimini Algilamalari (Patients and nurses' perceptions of nursing care). *Cinar Dergisi* 9, 33–37.

Demir F, Karayurt O & Dramali A (2002) *Hemsirelik Bakim Onceliklerinin Hasta ve Hemsireler Acisindan Degerlendirilmesi (Evaluation of Nursing Care Priorities from Patients' and Nurses' Viewpoints)*. Ulusal Cerrahi Kongresi Cerrahi Hemsireligi Seksiyonu Panel ve Bildirileri Kongre Kitabi, Ege Universitesi Basimevi, Antalya, 193–202.

Elibol N, Kaleli I, Avdan E & Yagar S (1998) *Hastalarin Hemsirelik Bakimindan Beklentileri (Patients' Expectations of Nursing Care)*. Uluslararası Katılımlı VI. Ulusal Hemsirelik Kongresi Kitabı, Ankara, 307–312.

Erkus A (1999) Istatistik Paket Programlarını Dogru Kullanabiliyor muyuz? Birkac Uyari (Are you using statistical packet programs correctly? Several warnings). Available at: http/www.psikolog.org.tr/bulten/12/12 (accessed 10 May 2010).

Erkus A (2003) *Psikometri Uzerine Yazilar (Psychometric Writings)*. Turk Psikologlar Dernegi Yayinlari 1. Basim, Ankara.

Gozum S & Aksayan S (2003) Kulturlerarasi Olcek Uyarlamasi Icin Rehber II: Psikometrik Ozellikler ve Kulturlerarasi Karsilastirma (Guidelines II for adapting intercultural instruments: psychometric characteristics and intercultural comparison). Hemsirelik Arastirma Gelistirme Dergisi Cilt/Vol:5 Sayi/No:1, 3–14.

Hegedus KS (1999) Providers' and consumers' perspective of nurses' caring behaviours. *Journal of Advanced Nursing* 30, 1090–1096.

Johansson P, Oleni M & Fridlund B (2005) Nurses' assessments and patients' perceptions: development of the Night Nursing Care Instrument (NNCI), measuring nursing care at night. *International Journal of Nursing Studies* 42, 569–578.

Karasar N (1995) Bilimsel Arastirma Yontemi (Scientific research management). 7. Basim Sim Matbaasi Ankara, 147–153.

Kavuncubasi S (2000) *Hastane ve Saglik Kurumlari Yonetimi (Hospital and Health Facilities Management)*. Siyasal Kitabevi, Ankara, pp. 197–213.

Kumral A (1975) *Durumluk-Sureklik Anksiyete Postoperatif Agrı ve Hemsirelik Etkilerinin Incelenmesi (State-Trait Anxiety, Postoperative Pain and Examination of Nursing Effects)*. Yayimlanmis Docentlik Tezi Ege Universitesi, Izmir.

Leinonen T & Leino-Kilpi H (1999) Research in peri-operative nursing care. *Journal of Clinical Nursing* 8, 123–138.

Leinonen T, Leino-Kilpi H & Jouko K (1996) The quality of intraoperative nursing care: the patient's perspective. *Journal of Advanced Nursing* 24, 843–852.

Leinonen T, Leino-Kilpi H, Stahlberg MR & Lertola K (2001) The quality of perioperative care: development of a tool for the perceptions of patients. *Journal of Advanced Nursing* 35, 294–306.

Leinonen T, Leino-Kilpi H, Stahlberg MR & Lertola K (2002) *The Quality of Perioperative Care: perceptions of Nursing Staff*. Turku University, Turku.

Leinonen T, Leino-Kilpi H, Stahlberg MR & Lertola K (2003) Comparing patient and nurses perceptions of perioperative care quality. *Applied Nursing Research* 16, 29–67.

Myles PS, Williams DL, Hemdrata M, Anderson H & Weeks AM (2000) Patient satisfaction after anaesthesia and surgery: results of a prospective survey of 10811 patients. *British Journal of Anaesthesia* 84, 6–10.

Oner N (1994) Guvenirligi ve/veya Gecerligi Sinanmis Psikolojik Testler (Reliability and/or validity tested psychological tests). *Turk Psikoloji Dergisi Ozel Sayı* 9, 9–18.

Oner N (1997) *Turkiye'de Kullanilan Psikolojik Testler (Psychological Tests Used in Turkey)*. 3. Baski Bogazici Universitesi Yayinlari, Istanbul, 10–39.

Ozbayir T (2002) *Agri Yonetimi ve Hemsirelik Bakimi (Pain Management and Nursing Care)*. Ulusal Cerrahi Kongresi Cerrahi Hemsireligi Seksiyonu Panel ve Bildirileri Kongre Kitabi Ege Universitesi Basimevi, Antalya, 131–138.

Ozbayir T, Demir F, Candan Y, Coskun I & Dramali A (2003) Hastalarin Perioperatif Doneme Iliskin Izlenimlerinin Incelenmesi (Examination of patients' perioperative monitoring). Ataturk Universitesi Hemsirelik Yuksekokulu Dergisi Cilt 6 Sayi 1, 14–23.

Ozer M (2003) Saglik Hizmetlerinin Kullanimi ve Kalite (Use of health care services and quality). Hemsirelik Forum Dergisi Cilt 6 Sayi 4 Temmuz-Agustos, 42–47.

Ozguven IE (2000) *Psikolojik Testler (Psychological Tests)*. PDREM Yayinlari 4, Baski Ankara, 83–119.

Parsaie FA, Golchin M & Asvadi I (2000) A comparisan of nurse and patient perceptions of chemotherapy treatment stressors. *Cancer Nursing* 23, 371–374.

Sahin N (1994) Psikolojik Arastirmalarda Olcek Kullanimi (Instrument use in psychological research). *Turk Psikoloji Dergisi Ozel Sayı* 9, 19–26.

Savasir I (1994) Olcek Uyarlamasindaki Sorunlar ve Bazı Cozum Yollari (Problems in instrument adaptation and some methods of resolution). *Turk Psikoloji Dergisi* 9, 27–32.

Suhonen R, Valimaki M, Dassen T, Gasull M, Lemonidou C, Scott PA, Kaljonen A, Arndt M & Leino-Kilpi H (2003) Patients' autonomy in surgical care: a comparison of nurses' perceptions in five european countries, international council of nurses. *International Nursing Review* 50, 85–94.

Sumbuloglu K & Sumbuloglu V (2002) *Biyoistatistik (Biostatistics)*. 10. Baski Hatiboglu Yayinlari, Ankara, 245–267.

Taskin L (2002) Kulturlerarasi Olcek Uyarlamasi Icin Rehber (Guidelines for intercultural instrument adaptation). *Hemsirelikte Arastirma ve Gelistirme Dergisi* 4, 16–20.

Tavsancil E (2002) *Tutumlarin Olculmesi ve SPSS Ile Veri Analizi (Measuring Attitudes and Data Analysis with SPSS)*. Nobel Yayin No: 399, Ankara.

Tezbasaran A (1996) Turkiye'de Kullanilan Psikolojik Testler (Psychological tests used in Turkey). *Turk Psikoloji Bulteni Nisan* 2, 58–60.

Tezbasaran A (1997) *Likert Tipi Olcek Gelistirme Klavuzu (Likert Type Instrument Development Guidelines)*. Turk Psikologlar Dernegi Yayinlari, 2. Basim, Ankara.

Velioglu P (1999) *Hemsirelikte Kavram ve Kuramlar (Concepts and Theories in Nursing)*. Alas Ofset, Istanbul, pp. 194–203.

Von Essen L & Sjoeden P (1991) The Importance of nurse caring behaviours as perceived by Swedish Hospital patienta and nursing staff. *International Journal of Nursing Studies* 28, 267–281.

Yavuz M (1998) *Gunubirlik Cerrahide Hemsirelik Bakimi İcin Kalite Guvenligi Programi Gelistirilmesi (Quality Assurance Program Development for Nursing Care in Day Surgery)*. Ege Universitesi Saglik Bilimleri Enstitusu Yayinlanmis Doktora Tezi, Izmir.