

Amsterdam Preoperative Anxiety and Knowledge Scale: Turkish Validity and Reliability Study

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Summary

Objective: In patients who will undergo surgical intervention; Anxiety can be seen before, during and after surgery. We see that hospitalization, waiting for surgical intervention, and various medical practices trigger anxiety. Studies show that anxious patients may be at higher risk of complications in the preoperative period. With this study, it was aimed to make the validity and reliability analysis of the scale by adapting the “Amsterdam Pre-operative Anxiety and Knowledge Scale” developed by Moerman et al.

Material and Method: The population of the study consisted of 9901 patients over the age of 18 who had undergone surgery in the surgical clinics of a training and research hospital operating in the province of Van. This methodological research was carried out between July and September 2019. By considering the number of items in the scale, the number of samples was determined by G-power analysis, which would be five to ten times the number of items. In the study, 335 sampling scales determined for the scale with 6 items were applied, but 310 participants who volunteered to participate in the study constituted the sample of the study. “Personal Information Form” and “Pre-operative Anxiety and Knowledge Scale” developed by the researchers were used to collect the data. Study; linguistic equivalence of the scale, content validity for expert evaluation, correlation between items for internal consistency / reliability, and calculation of Cronbach Alpha values, confirmatory and exploratory factor analyzes for construct validity. In addition, pretest and posttest were performed on the sample group consisting of 50 patients 15 days apart. IBM SPSS Statistics 25 program was used for the statistical evaluation of the data.

Results: As a result of the expert evaluation, the content validity index of the scale is 0.82. Kaiser-Meyer Olkin (KMO) coefficient of 0.746, Chronbach alpha = 0.876 and Barlett test result $X^2 = 1531.030$; $p = 0.000$ ($p < 0.001$). The total variance of this scale, which was determined by factor analysis, was 63.829%. It was determined that the item load values of 6 items in the scale were between 0,694 and 0,876. Pearson correlation value was found to be 0,508 ($p = 0,00$) in the analysis performed by test repetition.

Conclusion: It is thought that the Turkish form of the Amsterdam Pre-operative Anxiety and Knowledge Scale is a valid and reliable measurement tool, it can be used in similar studies and can be used to measure the pre-operative anxiety status in institutions providing health care services.

Keywords: Surgery, preoperative anxiety, health care

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INTRODUCTION

Surgery is a form of treatment applied in the form of controlled trauma associated with

bleeding, pain, morbidity and risk of death^{1,2,3}. In patients who will undergo surgical

intervention; Anxiety may develop before, during and after surgery. It is observed that 60-80% of patients who will undergo surgery have preoperative anxiety^{4,5,6}. Anxiety is defined as an unpleasant state of emotion that causes life-threatening and uncomfortable tension, restlessness and fear. This experienced mood disorder causes an increase in parasympathetic and endocrine stimuli, causing physiological and psychological problems. In the literature, when these two conditions are evaluated together for the patient, it is stated that hospitalization, waiting for surgical intervention and various medical practices trigger anxiety. Along with the surgery; lack of information, complications that may arise, fear of death, family separation, pain, interruption of daily work, loss of control are among the other causes that cause anxiety^{2,6}

Anxiety experienced in the preoperative period; Although it varies depending on anxiety, fear and personality characteristics; It is also affected by many factors such as gender, age, type of anesthesia, not being able to wake up from anesthesia, experience of previous surgery, type of hospitalization, and type of surgery³. In addition, the patient has pathophysiological problems, increasing the heart rate, blood pressure and body temperature; It causes physical problems such as dizziness, nausea and headache⁷. Studies show that anxious patients may be at higher risk of complications in the preoperative period. Intense anxiety; It increases the anesthetic dose required during the operation and the analgesic dose needed after the operation, and causes the cognitive functions to be adversely affected. Pre-operative patient assessment reduces the anxiety of patients with anxiety by appropriate nursing interventions; It enables patients to complete the postoperative period and discharge process smoothly and quickly^{5,6}. Applying the psychosocial aspects of nursing care to patients who will undergo surgery clinically, eliminating information gaps

can contribute to the development of patient care quality by playing a key role in reducing anxiety in the preoperative period. However, standard, valid and reliable tools are needed to determine and evaluate the level of knowledge and anxiety of patients before surgical intervention. In national literature studies, it was determined that preoperative patients needed to measure anxiety and knowledge levels. With this requirement, this research Moerman et al. (1996) and firstly Çetinkaya et al. (2019)^{5,7} was carried out to make validity and reliability analyzes of the scale by adapting the Amsterdam Preoperative Anxiety and Knowledge Scale (APAIS) to Turkish, which assesses the anxiety and knowledge needs of patients before surgery, which was applied to the Turkish community. With this study, it is predicted that this scale, which is suitable for the structure of the Turkish society and that can measure the level of preoperative anxiety and knowledge that can be applied to all patients who will undergo surgical intervention, can fill this gap in the literature.

MATERIALS AND METHODS

Aim

The purpose of this study is Moerman et al. (1996) and firstly Çetinkaya et al. (2019) to adapt the Amsterdam Preoperative Anxiety and Knowledge Scale (APAIS) (Moerman et al., 1996) to Turkish, which evaluates the anxiety and knowledge needs of pre-operative patients applied to the Turkish community, and to make validity and reliability analyzes of the scale.

The Universe and Sample of the Research

The population of the study consisted of 9901 patients over 18 years old who had been operated in surgical clinics in the last year of a public hospital in Van city. This methodological research was carried out between July and September 2019. By considering the number of items in the scale, the number of samples was determined by G-power analysis, which would

be five to ten times the number of items²⁰. In the study, 335 sampling scales determined for the scale with 6 items were applied. However, 310 participants constituted the sample of the research due to reasons such as not being able to fully answer the questions in scale, not being reached, and not agreeing to participate in the study on a voluntary basis. 25 questionnaires with personal information form used and unanswered questions in the scale were excluded. For the preliminary evaluation of the research and repetition of the test, 50 participants were re-administered between April 1-30, 2019 after a 14-day break.

Data Collection Tools and Data Collection

In the collection of the data, "Individual Information Form" created by the researchers by scanning the literature and "Amsterdam Pre-operative Anxiety and Knowledge Scale" (APAIS) "were used.

Individual Information Form: Age, gender, marital status, educational status, place of residence, working status, presence of chronic disease, previous surgical intervention, emergency status of the surgical intervention, hospitalization time, home care service status, discharge status There were a total of 12 questions for evaluation.

Amsterdam Pre-operative anxiety and information scale; (APAIS) "Moerman et al. (1996) and firstly Çetinkaya et al. (2019) is a 5-point Likert type scale consisting of 2 dimensions and 5 items applied to the Turkish society. The sub-dimensions of the scale consist of preoperative anxiety 4 items (1,2,4,5) and preoperative information 2 items (3,6). Çetinkaya et al. (2019) stated that the internal consistency reliability for the total score of the clinics of a public hospital in the city of Van in 2019 and the data related to the items of the scale.

Ethical Aspect of the Research

scale is 0, 87 and all sub-dimensions of Cronbach's α value varies between 0.75 and 0.91. Scoring of items in the scale is done as 1 = Not at all, 2 = A little 3 = Moderate 4 = A little too much, 5 = A lot. As a result of the application of the scale, the lowest 6 and the highest 30 points are obtained. If the anxiety score is 1,2,4,5 items, the anxiety score is ≥ 11 and the individual is considered anxious. It was determined that when the items 3 and 6 were collected for the information score, the score obtained was 2-4, little or no information was required, an average of 5-7 knowledge required, and a high level of 8-10 knowledge required. In this study, for the validity of the Turkish form of the scale, language equivalence was done first, then Lawshe method was used for expert opinions for scope validity. Analysis of the items for the scale was assessed by internal consistency and reapplication of the scale. Turkish adaptation of the scale was tested by confirmatory factor analysis and exploratory factor analysis. Re-application of the scale was performed with 30 people and 14 days intervals.

Data Analysis

The evaluation of the obtained data was done in SPSS 25.0 program. Frequency and percentage calculations were made in evaluating the questions about individual characteristics. Cronbach Alpha, Spearman-Brown correlation and factor analysis tests, KMO, Bartlett Test, were used for the validity and reliability of the scale. Content validity analysis was performed to determine whether the number of items in the scale would be reduced.

Limitations of the Study

The research is limited to the evaluations of 310 participants who were operated in the surgical First of all, ethical approval (ethical approval number: 20292139-050.01.04) was obtained from the ethics committee of a foundation university and written approval from the hospital

administration where the research was conducted. In addition, written and verbal consent was obtained from the participants on a voluntary basis. The research was carried out in accordance with the Helsinki Declaration Principles.

RESULTS

Linguistic Equivalence

Permission was obtained from the authors who developed the scale before adapting it to the Turkish language. For the linguistic equivalence of the scale, the scale was first translated from English to Turkish. The form prepared by translating it into Turkish was translated back to English and was examined by two people in the field for the compatibility of the items in the scale with the original scale items and meaning and grammar. After the experts approved the similarity fit for both forms, the scale was finalized. After translating to Turkish and then to English, statistical analyzes were made for linguistic equivalence. To perform these analyzes, the scale was applied to 35 students studying English at a foundation university, where researchers were employed, with a bilingual group pattern. Correlation analysis was performed for linguistic equivalence and as a result of the analysis, Amsterdam Pre-Surgery Anxiety and Knowledge Scale was significantly positive between the Turkish form (= 2.97, $ss = 32$) and the original form (= 3.18, $ss = 24$). A relationship ($r = .88$, $p < .01$) was determined.

Findings Regarding Individual Characteristics of Participants

42.3% of the study is women and 57.7% is men. The marital status of the participants is 71.3% married and 28.7% single. 7.7% of them live in villages and towns, 31.6% in towns and 60.6% in towns. As of working status, 35.2% work actively, 64.8% do not work. 30% of the patients are literate, 31% are primary education, 22.9% are high school and 16.1% are university

graduates. Chronic disease is present in 26.5% of the patients. When the urgency of the surgical intervention was evaluated, it was determined that 98.7% of it was planned and only 1.3% of it was performed urgently. The length of hospitalization of the patients before the operation is 98.4% between 0-4 days and 1.6% between 5-9 days. While the patients who had undergone surgical intervention were 53.5%, the rate of patients without surgical intervention was 46.5% (Table 1).

Table 1: Introductory characteristics of the participants (n = 310)

Introductory Features		Number	%
Gender	Female	131	42,3
	Male	179	57,7
Marital status	Married	221	71,3
	Single	89	28,7
Education status	literate	93	30
	Primary education	96	31
	High school	71	22,9
	University	50	16,1
Place of residence	Villages and towns	24	7,7
	County	98	31,6
	Town	188	60,6
Working status	Working	201	64,8
	Not working	109	35,2
Chronic disease state	Yes	82	26,5
	No	228	73,5
Urgency of Surgical Intervention	Planned	306	98,7
	Unplanned	4	1,3
Previous surgical intervention	Yes	166	53,5
	No	144	46,5
Number of days hospitalized	0-4 days	305	98,4
	5-9 days	5	1,6
	10 days and over	-	-
Total		310	100

When the average of the participants' Amsterdam Preoperative Anxiety and Knowledge Scale items were examined, "I am anxious about anesthesia" 1.81 ± 1.22 (Min = 1.25; Max = 5) "Anesthesia is always on my mind" 1.83 ± 1.65

(Min = 1.4 ; Max = 5), “I want to know as much as possible about anesthesia” 1,40 ± ,97 (Min = 1; Max = 4,67), “I am worried about the operation” 2,09 ± 1,27 (Min = 2 ; Max = 5), “Surgery is on average in my mind” 2.05 ± 1.27 (Min = 1.00; Max = 4.35), “I want to know as much as possible about the surgery” 1.62 ± 1.13 (Min = 1.25; Max = 5), “Amsterdam Anxiety and Knowledge Scale before Surgery Total” mean was found to be 3,377 ± 0,514 (Min = 1.9; Max = 4.45) (Table 2).

Table 2. Amsterdam Preoperative Anxiety and Knowledge Scale Items Scores

	N	Ort±Ss	Min.	Max.	Ölçek Ranjı
I am worried about anesthesia	310	1,81±1,22	1,25	5,00	1-5
Anesthesia is always on my mind	310	1,83±1,65	1,40	5,00	1-5
I want to know as much as possible about anesthesia	310	1,40±,97	1,00	4,67	1-5
I am worried about the surgery	310	2,09±1,27	2,00	5,00	1-5
Surgery is always on my mind	310	2,05±1,27	1,00	4,35	1-5
I want to know as much as possible about the surgery	310	1,62±1,13	1,00	5,00	1-5
Amsterdam Preoperative Anxiety and Knowledge Scale Total Score Avg.	310	10,84±6,00	6	30	1-5
Anxiety Level Avg.	310	7,8±4,50	4	30	1-5
Knowledge Level Avg.	310	3,0±1,87	2	10	1-5

Avg: average, Ss: Standard deviation

Scope Validity of the Scale

Lawshe method was applied for scope validity. For this application, the 27-item scale was received from 4 faculty members of the Nursing Department, 4 faculty members from the Health Sciences Institute, 2 health professionals working in the field, and 1 measurement and evaluation specialist. Forms for expert

evaluations were prepared. The experts submitted the electronic form as (a) "Each item measures the targeted structure", (b) "The item is related to the structure but unnecessary", (c) "The item does not measure the targeted structure". Scope validity index was calculated by taking the opinions of the experts for all items⁸. With the analysis of the data obtained, the KGI value was found to be high as 0.82. According to this finding, it can be said that the scale has good content validity. Questions that were not understood in the pilot application were rearranged.

Findings Related to Construct Validity Analysis

Factor analysis was performed to determine the construct validity and factor structure of the scale. However, due to the aggregation of the items in the factor structure determined by the scale in Çetinkaya et al. (2019) under one factor, confirmatory factor analysis was performed for the existing two-factor structure instead of exploratory factor analysis. Goodness of fit indices were calculated in the study (Figure 1).

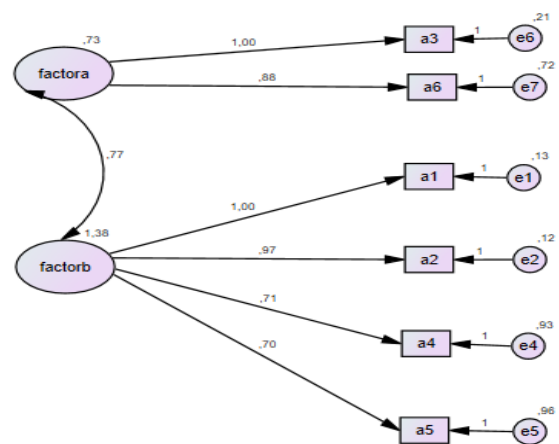


Figure 1. Amsterdam Pre-operative Anxiety and Knowledge Scale Confirmatory Factor Analysis Diagram

The fit indices of the scale are CFI = 0.68; NNFI = 0.60; RMR = 0.24 and RMSEA = 0.55, AGFI = 0.85, GFI = 0.65. As a result of confirmatory

factor analyzes, Çetinkaya et al. (2019) was found to be incompatible with the factor structure consisting of 2 items with 5 items applied to the Turkish society (Table 2). Exploratory factor analysis was applied to determine the construct validity and factor structure of the scale.

Table 3. Health Professionals Intercultural Competency Scale Confirmatory Factor Analysis Index Values

Index	Normal Value *	Acceptable Value **	Scale
χ^2/sd	<2	<5	3,64
GFI	>0.95	>0.90	0.65
AGFI	>0.95	>0.90	0.85
CFI	>0.95	>0.90	0.68
RMSEA	<0.05	<0.08	0.55
RMR	<0.05	<0.08	0.24

*, ** 8,9,10,11,12 numbered sources.

The Kaiser-Meyer Olkin coefficient, which shows the adequacy of the sample size before the construct validity for the Amsterdam Preoperative Anxiety and Knowledge Scale, was examined. Kaiser-Meyer Olkin (KMO) coefficient of 0.746 and Barlett test result $X^2 = 1531.030$; $p = 0.000$ ($p < 0.001$). According to the KMO value exceeding 0.50 and the Barlett test results, it was determined that the data were related and suitable for factor analysis^{5,14}.

Table 4. Values in the Transformed Components Matrix After Factor Analysis.

Kaiser-Meyer-Olkin Sample Measurement Adequacy	,746
Bartlett Test Result-P Value	,000
Total Variance Announced	82,053%
Chi-square Test Value	1531,030
Degree of Freedom	15

Descriptive factor analysis was performed to test the structural validity of the scale. Principal Components Analysis was used for factor analysis. Firstly, it was determined that 6 items were distributed to one sub-dimension. In the literature, it is stated that if the number of

samples is 350, loads over 0.3 can be considered meaningful, this number should be 0.4 when it is 200, and 0.5 when it is 120 and it should be 0.6 when it is 85¹⁴. When the eigenvalue line graph (Screeplot) of the factors of the scale was examined, the curve of the graph decreased at the point where the first factor was located and the number of factors was determined as one (Figure 2).



Figure 2. Screeplot graph

The total variance of this scale, which was determined by factor analysis, was 63.829%. The lowest item load value of the item, whose eigenvalue in the scale is greater than 1, is 6 in the factor where 6 items are distributed; Since the highest item load value is 0.876 and these values are within normal limits and the factor loads of all items exceed 0.30, no item of the scale has been removed. Items that entered each factor were examined and the scale; It was determined to consist of one factor (Table 5).

Table 5. Single Factor Item Loads

SUBSTANCES	Factor Load	Cronbach Alpha
I am worried about anesthesia	0.822	0.844
Anesthesia is always on my mind	0.694	0.884
I want to know as much as possible about anesthesia	0.729	0.867
I am worried about the surgery	0.873	0.837
Surgery is always on my mind	0.876	0.837
I want to know as much as possible about the surgery	0.782	0.859

Internal Consistency Analysis for Reliability

Internal consistency and homogeneity of the scale's reliability were tested and Chronbach Alpha values were checked. The overall reliability of the scale was found to be $\alpha = 0.876$. The loads of items 1, 2, 4 and 5 in the anxiety scale ranged from 0.876 to 0.694, and the loads of items 3 and 6 in the information requirement subscale ranged from 0.729 to 0.782. Spearman-Brown correlation analysis technique was used to analyze the relationship between the items of the scale, and a statistically significant ($p < 0.001$ and $p < 0.005$) positive relationship was found between the total score and the scores of all items (Table 6).

Table 6. Correlation Analysis of Scale Items Cronbach Alpha Values

SUBSTANCES	1	2	3	4	5	6
I am worried about anesthesia	1,000	,670	,630	,610	,584	,456
Anesthesia is always on my mind	,670	1,000	,463	,448	,444	,377
I want to know as much as possible about anesthesia	,630	,463	1,000	,423	,454	,582
I am worried about the surgery	,610	,448	,423	1,000	,960	,652
Surgery is always on my mind	,584	,444	,454	,960	1,000	,667
I want to know as much as possible about the surgery	,456	,377	,582	,652	,667	1,000
Cronbach Alpha Reliability Coefficient	0.84	0,88	0,86	0,83	0,83	0,85

** $p < 0.001$, ** $p < 0.005$

For test-retest reliability, at least 30 retries must be performed. In the study, 50 patients were studied for the reliability of the test and it was found that Pearson correlation value was found to be statistically significant as 0,508 ($p = 0,00$) in the analysis made by repeating the test ($P < 0.05$).

DISCUSSION

Within the scope of this research, current studies were reviewed by making an in-depth literature review. As a result of the examinations, it was concluded that a special scale measuring the level of anxiety and knowledge before surgery is needed in our country. For this purpose, a research was carried out on a sample of patients before surgery. With this developed scale, it is thought that it will be a guiding resource for determining the anxiety and knowledge levels of individuals before surgery and paying attention to the factors that will adversely affect their health behavior. The scales used in the research have two important criteria; they are valid and reliable. Validity; the degree of measurement and the condition or feature desired to be measured are suitable for the measurement tool. Reliability, on the other hand, is consistently consistent with the answers given by those who answer the same measurement degree or scale. Thus, if we can correctly measure the feature required by the measurement tool, the measurement tool can be considered valid. In this study, for the validity of the Turkish form of the scale, language equivalence was done first, then Lawshe method was used for expert opinions for scope validity. The draft items were reviewed by 8 faculty members, 2 health professionals and 1 measurement and evaluation specialist. The scope validity index of the technique was accepted as 0,80¹⁸. Corrections were made in line with the experts' suggestions. KGI values were found to be quite high as 82. According to this finding, it can be said that the scale has good content validity. For the

reliability of the scale, the items were analyzed, internal consistency and time invariance tests were performed. For test-retest reliability, at least 30 retries must be performed. In our study, 50 patients were studied for the reliability of the test and Pearson correlation value was found to be statistically significant as 0.508 ($p = 0.00$) in the analysis performed with the test repetition ($P < 0.05$).

Turkish adaptation of the scale was tested by confirmatory factor analysis and exploratory factor analysis. Repetition of the test was applied to 50 participants twice with an interval of 15 days. Factor analysis was performed to determine the construct validity and factor structure for the scale. However, due to the scattering of the items in the factor structure determined by the scale in Çetinkaya et al. (2019), confirmatory factor analysis was performed for the existing two-factor structure instead of exploratory factor analysis. Goodness of fit indices were used in the study.

The fit indices of the scale are CFI = 0.68; NNFI = 0.60; RMR = 0.24 and RMSEA = 0.55, AGFI = 0.85, GFI = 0.65. The results of the analysis revealed that the compliance statistics calculated by confirmatory factor analysis did not match the scale's predetermined factor structure. Exploratory factor analysis was applied to determine the construct validity of the scale. While evaluating internal consistency with this analysis, item-total score correlation and Cronbach Alpha values were taken into consideration. The relationship between the total score of the draft scale and the scores of the items in the scale is determined by item-total correlation. If the score obtained from one item of the scale and the score obtained from all of them show a positive value and a high correlation score, the items are taken into the scale by accepting that these items are similar to each other^{13,15}. Item-total score correlation values of the scale were between $r = 0.69-0.87$

for 6 items. In the literature, it is emphasized that this value should be $r = 0.30$ and above^{11,13,14}. Since the values are within normal limits and the factor loads of all items exceed 0.30, no item of the scale was removed. If the Cronbach alpha coefficient is high, the scale will also have high reliability, so if the Cronbach alpha coefficient is between 0.60 and 0.80, the scale is reliable and if it is between 0.80-1.00, it is stated that it has high reliability^{11,15,16}. In our study, the overall reliability value of the scale was found to be $\alpha = 0.87$. The Kaiser-Meyer Olkin coefficient, which shows the adequacy of the sample size before the construct validity for the Amsterdam Preoperative Anxiety and Knowledge Scale, was examined. Kaiser-Meyer Olkin (KMO) coefficient of 0.746 and Barlett test result $X^2 = 1531.030$; $p = 0.000$ ($p < 0.001$). According to the KMO value exceeding 0.50 and the Barlett test result, it was determined that the data were related and suitable for factor analysis^{5,14}. This result shows that the scale is highly reliable.

CONCLUSION AND SUGGESTION

Reducing and eliminating the anxiety of the surgical patient has a great importance for recovery. Therefore, the presence of anxiety and information need should be determined and evaluated in patients who will undergo surgery. Amsterdam Preoperative Anxiety and Knowledge Scale (APAIS), which is thought to be a useful and alternative tool to measure preoperative anxiety, can also be applied quite simply and quickly. In our study, it is considered that APAIS is a scale that can be applied to all patients who will undergo surgical intervention during the preoperative care and suitable for the Turkish community structure. It is thought that the Turkish form of APAIS is a valid and reliable measurement tool, it can be used in similar studies and can be used to measure the pre-operative anxiety situation in institutions providing health care services.

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