TRANSLATION AND VALIDATION OF THE AMSTERDAM PREOPERATIVE ANXIETY AND INFORMATION SCALE (APAIS) FOR USE IN MALAYALAM SPEAKING POPULATION IN INDIA

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ABSTRACT

BACKGROUND
Preoperative anxiety, an unpleasant state of uneasiness in preoperative period is known to increase the anaesthetic requirement intraoperatively, analgesic requirement peri-operatively and duration of stay in the hospital. Various studies have found incidence of preoperative anxiety as 60-80%. Studies regarding incidence of preoperative anxiety in India are very few and so are the scales which measure pre-operative anxiety in various Indian languages. We could not find any validated scale in Malayalam language for measurement of preoperative anxiety. Here we attempt to translate Amsterdam preoperative anxiety and Information scale (APAIS) to Malayalam and evaluate its psychometric properties.

MATERIALS AND METHODS
A semantically equivalent version of preoperative Anxiety and Information scale (APAIS) was created using translation, back translation method. Its psychometric properties were assessed in patients by exploratory factor analysis.

RESULTS
Of total 101 patients, 61 (60.39%) were males and rest 40 (39.6%) were females. Factor analysis of the six items of APAIS revealed a cumulative variance of 62.36%. But, Need for information identified in the original scale could not be replicated. The mean anxiety score was 5.88 ± 3.20, however female had significant higher score of 7.38 ± 4.15 as compared to males with mean score of 4.95 ± 1.94 (P=0.0001).There was no significant difference between males (3.02 ± 1.61) and females (3.92 ± 1.99) in need for information.

CONCLUSION
Amsterdam preoperative anxiety and Information scale, a reliable and valid tool, can be used to measure preoperative anxiety in Malayalam speaking South Indian population. However, further studies are required to replicate the original APAIS.

KEYWORDS
Preoperative Anxiety, Information, APAIS, Malayalam, Validation.

BACKGROUND
Preoperative anxiety is an unpleasant state of uneasiness or tension that is secondary to a patient being worried about surgery, anaesthesia, hospitalization or unknown.[1] The exact percentage of patients anxious before surgery is not known, although various studies in literature suggest an incidence of 60 to 80%.[1-4] Higher doses of anaesthetic induction agents and analgesics are required for anxious patients.[5,6]

Increased anxiety in preoperative period shows increased signs of sympathetic stimulation such as increase in heart rate, blood pressure, pale skin and constricted veins. In some patients ventricular ectopics are seen.[7]

Preoperative anxiety depends on many factors like socio-cultural factors, educational level, personality traits and presence of psychiatric comorbidities.[8,9,10] Previous experiences with surgeries also play a major role. Berth et al observed that patients with high levels of pre-operative anxiety tend to require larger doses of anaesthetics, have, on average, a greater peri and postoperative reliance on analgesics and require longer stays in hospital.[11]

In India the prevalence of preoperative anxiety is yet to be properly investigated. There are few studies which have evaluated preoperative anxiety in India. Saini et al found 58.9% of patients posted for sports related surgeries to be significantly anxious in a study from North India.[12] However, there are no studies which have used a validated instrument. To know the exact prevalence of anxiety a validated objective instrument is required.

In western and developed countries various instruments such as Spielberger's State –Trait Anxiety Inventory (STAI-scale),[13] Hospital Anxiety and Depression Scale (HADS),[14,15] Amsterdam preoperative Anxiety and Information scale (APAIS)[16] and Anxiety Specific to Surgery Questionnaire (ASSQ) have been used to measure preoperative anxiety. In clinical settings an extensive questionnaires are not desirable. Therefore it is important to have a screening instrument which is objective, reliable, valid, brief and clinically relevant.

Moermann et al in 1996 developed Amsterdam Preoperative Anxiety and Information Scale.[16] This instrument comprises of six items and each item is rated on a five point Likert scale with end poles "not at all" and "extremely". It represents two scales, anxiety (items 1, 2, 4 and 5; Cronbach's α = 0.86) and need for information (items 3 and 6; Cronbach's α = 0.72). The APAIS has shown good correlation with STAI with r=0.74, r=0.67 and r =0.64. Besides Dutch version, an English,[17] Japanese,[18] Turkish[19] and Korean[20] have been validated.

India being a multilinguistic country with a varied socio-demographic profile poses a huge challenge in identifying preoperative anxiety. Malayalam is a language spoken by more than 40 million population, predominantly in south India. The purpose of this study was to translate the APAIS into Malayalam and to evaluate the psychometric properties of the Malayalam version of APAIS.

MATERIALS AND METHODS
This prospective observational study was carried out at P K Das institute of medical science after obtaining Institutional ethics committee approval. This study included patients above 18 years of age, posted for elective surgery, who are able to read Malayalam and gave consent to participate in study. Patients with known psychiatric disorders other than substance dependence/abuse, patients on psychotropic medication, patients posted for caesarean section or emergency surgeries were excluded from the study.

A total of 105 patients were included in the study after obtaining written informed consent. Socioeconomic data, ASA status and other clinical data were collected during pre-operative visit. On the day before surgery the Malayalam version of the APAIS were given to the patient to the patients and response was collected. The APAIS consists of six items. Anxiety related to surgery is assessed by two items, anxiety related to anaesthesia is assessed by two items and need for information is assessed by two items. Each item has a response in a five-point Likert scale ranging from 1 ('not at all") to 5 ('extremely").

Validation Process
The validation process was performed in two steps. The first step involved the semantically equivalent translation of English version of APAIS to Malayalam. The psychometric properties of the Malayalam version which includes internal consistency and reliability and differential item functioning was carried out in second step.

Malayalam version of APAIS was prepared by a bilingual translator from the original English version. To cross-validate, another Malayalam bilingual translator back-translated to English from Malayalam draft version. The items of the original English version and their Malayalam translation are shown in Table 1.

Sl. No.	English	Malayalam
1.	I am worried about the anaesthetic	എനിക്ക് മയക്കം തരാൻ ഉപയോഗിക്കുന്ന മരുന്നിനെപ്പറ്റി ആശങ്കയുണ്ട്
2.	The anaesthetic is on my mind continually	മയക്കം തരാൻ ഉപയോഗിക്കുന്ന മരുന്നിനെപ്പറ്റിയുള്ള ചിന്തതന്നെയാണ് എന്റെ മനസ്സിൽ തുടർച്ചയായി വരുന്നത്.
3.	I would like to know as much as possible about the anaesthetic	മയക്കം തരാൻ ഉപയോഗിക്കുന്ന മരുന്നിനെപ്പറ്റി എല്ലാ വിവരങ്ങളും അറിയാൻ എനിക്ക് ആഗ്രഹമുണ്ട്
4.	I am worried about the procedure	ശസ്ത്രക്രിയപ്പറ്റി എനിക്ക് ആശങ്കയുണ്ട്
5.	The procedure is on my mind continually	ശസ്ത്രക്രിയപ്പറ്റിയുള്ള ചിന്തതന്നെയാണ് എന്റെ മനസ്സിൽ തുടർച്ചയായി വരുന്നത്.
6.	I would like to know as much as possible about the procedure	ശസ്ത്രക്രിയപ്പറ്റി എല്ലാ വിവരങ്ങളും അറിയാൻ എനിക്ക് ആഗ്രഹമുണ്ട്

Table 1. Items of the Amsterdam Preoperative Anxiety and Information Scale English and Malayalam Versions

The psychometric evaluation covered exploratory factor analysis for construct validity, Cronbach's alpha for internal consistency.

Exploratory factor analysis is a statistical approach to decrease the number of variables by determining relationship between them. It helps in identifying a set of latent constructs in a battery of measured variables. Factor loadings give the relationship between variable and certain factor. Rotation is the process for interpretation of factor matrixes. Rotation helps in explaining orientation of various factors and also in simplification of structure.

Cronbach's alpha gives a measure of internal consistency. It is a measure of scale reliability. A Cronbach's alpha ≥70 was considered for reliability to be acceptable.

Student t-test was used to compare anxiety and need for information between males and females. Comparison between groups of patients with history of surgery in the

past with those undergoing surgery for the first time was done. A P value < 0.05 was considered significant.

RESULTS

A total of 105 patients were enrolled in the study after obtaining written informed consent. The data of 101 was analysed as 4 APAIS forms were incomplete and was considered as missing data. Men represented 60.33% and the mean age was 46.91 years. Previous history of surgery was present in 38.61% of patients. Co-morbidities like hypertension diabetes mellitus, chronic obstructive pulmonary disease, history of cerebrovascular accident etc., was present in 25.74% of patients. Majority of patients underwent major surgery (82.18%). Table 2.

	Total (n=101)	Males (n=61, 60.39%)	Females (n=40, 39.60%)
Age	46.91 ± 14.31	48.26 ± 14.95	44.85 ± 13.22
Previous surgery			
YES	39	26	13
NO	62	35	27
Co-morbidity			
YES	26	15	11
NO	75	46	29
Kind of Surgery			
Major	83	46	37
Minor	18	15	3
Table 2. Patients Characteristics by Whole Group and Subgroup			

The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were conducted to evaluate factorability. The KMO measure of sampling adequacy was 0.80 and the significance value of Bartlett's test of sphericity was <0.0001 indicating that the factor analysis can be applied to the data.

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Item 1	1.000	0.796	0.523	0.668	0.657	0.293
Item 2	0.796	1.000	0.574	0.640	0.721	0.324
Item 3	0.523	0.574	1.000	0.415	0.428	0.567
Item 4	0.668	0.640	0.415	1.000	0.757	0.326
Item 5	0.657	0.721	0.428	0.757	1.000	0.359
Item 6	0.293	0.324	0.567	0.326	0.359	1.000
Table 3. Correlation Coefficients of Items of APAIS						

Factor analysis of the six items of APAIS revealed a cumulative variance of 62.36% (Principal component analysis, Varimax rotation, eigenvalue >1). However, the two scales (anxiety and need for information) identified by Moermann et al could not be replicated. Extraction communalities, which are estimates of the variance in each variable accounted for by the factors in the factor solution were less for item 3 (0.52) and item 6 (0.31) of APAIS scale. Also, only one component was extracted. The scree plot showed one component to have eigenvalue 3.74 (>1). [Figure 1]
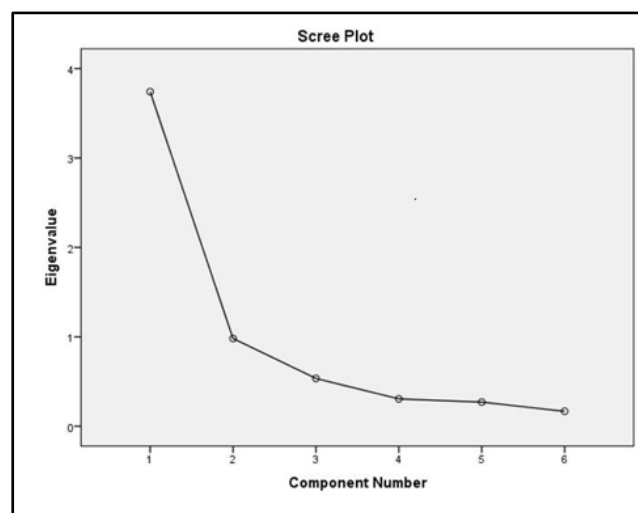

Figure 1. Cattells Scree Plot for APAIS Malayalam Version Items

Inter item correlation in factor analysis showed item 1, 2, 4 and 5 to be well correlated with values >0.65. However, item 6 of APAIS scale showed poor correlation with any of the item with value <0.35.

The internal consistency reliability and construct validity was high with Cronbach's alpha value for the four anxiety items (questions 1,2,4 and 5) was 0.90 and for need for information (questions 3 and 6) was 0.71.

Anxiety scale

The question 1, 2, 4 and 5 were on anxiety and could be scored from 1 to 5. The score of anxiety is the sum of the responses for these four questions. The mean anxiety score was 5.88 ± 3.20, however female had significant higher score of 7.38 ± 4.15 as compared to males with mean score of 4.95 ± 1.94 (P=0.0001). The mean anxiety score in patients with previous history of surgery (5.64 ± 2.94) was not statistical different from patients with no history of previous surgery (6.03 ± 3.36). However, patient with history of other co-existing disease had significantly higher anxiety score (6.96 ± 4.60) as compared to those without (5.51 ± 2.48) (p=0.04).

Need for Information Scale

The need for information scale comprises two questions (3 and 6). The scoring range is from 2 to 10. There was no significant difference between males (3.02 ± 1.61) and females (3.92 ± 1.99). History of previous surgery and history of co-existing disease did not significantly affect need for information score.

The prevalence of anxiety cases in the population with score of 11 and above is 7.9% (n=8). However, 52.47 % of patients had some form of anxiety with total anxiety score >4.

DISCUSSION

Surgery of any form Major or minor is considered stressful and is often associated with anxiety.[21]

Various objective instruments are used in western countries for measure preoperative anxiety. The Amsterdam

Preoperative Anxiety Scale was initially validated in dutch.[16] The construct validity was evaluated by factor analysis in 320 Dutch patients posted for elective surgery and external validity was done with STAI-scale in 200 patients. Since then several studies have assessed the validity among populations with different languages. In 197 English speaking Canadian patients Boker et al found good correlation of APAIS with STAI.[17] Nishimori M et al in their study on 126 patients posted for elective surgery found good correlation with STAI and concluded it to be reliable instrument for screening preoperative anxiety.[18] The German version of the APAIS was validated by Berth et al in 68 patients and showed high quality psychometric properties.

In this study, we translated APAIS to Malayalam and its psychometric properties were evaluated. The two scales of the original version of the APAIS, anxiety and need for information, could not be precisely replicated by factor analysis. The two factors, anxiety and information requirements, were not identified as separate factors in our study unlike previous studies on validation of APAIS scale. However, KMO test and Bartlett's test of sphercicity showed that the factor analysis could be applied on the data. The inter item correlation in factor analysis showed that item 1, 2, 4 and 5 which measures anxiety are well correlated with values >0.65. Thus it appears that need for information may not be a major factor for anxiety in the population studied.

The prevalence of anxiety with cut off of 11 as proposed by Moermann et al in our study is 7.8%.[16] This is similar to true positives (7.4%) in the German trial wherein Hospital Anxiety and Depression Scale (HADS) was used as standard. Also, if cut off of 5 is taken only for items related to anxiety, the prevalence of anxiety in study population is 52.47% similar to study by Saini et al.[12] There was a difference in anxiety levels between males and females. Females were more anxious then male on the anxiety scale. Patients with history of co-existing disease had more anxiety as compared to those without.

The study was limited by its sample size, it included 90% of patients who were educated below secondary school, and this might have been the reason for not identifying information requirement as separate factor. Also, in this study we did not compare the APAIS to other anxiety scale as done in other studies. Various cultural, demographic and economic factors play an important role in causing anxiety and this instrument is limited in considering these factors especially in country like India.

A multicentric cross sectional study including patients from different socio economic and educational background may identify two factors of APAIS scale. Also, there is a need to develop a valid instrument to measure preoperative anxiety of Indian patients.

CONCLUSION
Amsterdam preoperative anxiety and Information scale, a reliable and valid tool, can be used to measure preoperative anxiety in Malayalam speaking South Indian population.

However, further studies are required to replicate the original APAIS.

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