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COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF ANESTHESIOLOGY

Translation and Validation of the Amsterdam Preoperative Anxiety and Information Score for evaluation of preoperative anxiety in adult surgical patients in Black Lion Hospital, Addis Ababa, Ethiopia.

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BLACK LION HOSPITAL | NOV 2019. |
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ACKNOWLEDGEMENT

First and foremost, I would like to express my deepest gratitude to the department of Anesthesiology for giving me the golden opportunity to do this research on the topic of translation and validation of the Amsterdam preoperative anxiety and information score in Black lion Hospital. I came to learn lots of new things through the process and am really thankful for the opportunity.

Second, I would like to thank my research advisor and preceptor Dr Mahlet Tadesse for her continuous guidance and support. Thank you for the good advices and for leading me to the right path.

Last but not least, I would like to thank the data collectors and the participants of this study at large for actively participating and helping me complete this research timely.

ABBREVIATION

APAIS --- Amsterdam preoperative anxiety and information scale

ASA --- American society of Anesthesiologists

ASSQ --- Anxiety Specific to Surgery Questionnaire

BSC ---- Bachelor of Science

HAD --- Hospital Anxiety and Depression Scale

MAACL ---- Multiple Affect Adjective Checklist

RMSE--- A Root mean square error of approximation

SPSS--- Statistical package for social sciences

STAI--- State Trait Anxiety Inventory

VAS ---- Visual Analogue Scale

ABSTRACT

Background: Perioperative anxiety is described as a vague, uneasy feeling, the source of which is often nonspecific and unknown to the individual. It has the potential to affect all aspects of anesthesia such as preoperative visit, induction, perioperative and recovery periods. Although the magnitude and consequences of preoperative anxiety is well documented in developed world, there are limited studies conducted in Ethiopia. The use of anxiety screening instruments that take too much time to be filled will not be applicable clinically in our set up where enough time may not be given to conduct preoperative assessments.

Objective: The primary aim of this study is to translate the APAIS into Ethiopian national language, Amharic and evaluate its validity in assessing the prevalence of preoperative anxiety in Black lion Hospital.

Methods: A forward and backward translation of the items in APAIS was performed into Amharic by a legal bilingual expert. Three hundred sixty five sampled elective adult surgical patients scheduled for surgery at Black lion hospital were interviewed from July 01 to Aug 30, 2019 using the Amharic version of the APAIS. Then, the validity of the translated version was checked by evaluating its psychometric properties of internal validity and acceptability. The results were also compared with findings of other similar studies.

Results: The reliability of the Amharic version of the APAIS was high (Cronbach's alpha of 0.87) and the data collected was a good fit (RMSEA of 0.04) In addition, the questionnaire was well accepted 100% with no missing values for each dimension of the APAIS. The mean APAIS scores for total anxiety and desire for information were 11.6 and 6.0 respectively and 58.9% of the study participants had anxiety and those patients, who had some form of formal education, came from urban areas, had previous anesthesia experience and complications and who had average or high information requirement were more likely to be anxious.

Conclusion: The Amharic version of the APAIS is a reliable and acceptable tool for measuring patients' preoperative anxiety and their need of information. It can be used routinely as a screening instrument at pre anesthesia clinics to assess patients' level of anxiety.

1. INTRODUCTION

BACKGROUND

Anxiety is the subjective unpleasant feelings of dread over something unlikely to happen, such as the feeling of imminent death. It is often accompanied by restlessness, fatigue, problems in concentration and muscular tension. Perioperative anxiety is described as a vague, uneasy feeling, the source of which is often nonspecific and unknown to the individual. (1)

The success of surgery is influenced by several somatic and medical variables, and to a certain extent, by the psychological characteristics of the patients. (2) Anxiety is particularly important, because it has the potential to affect all aspects of anesthesia such as preoperative visit, induction, perioperative and recovery periods. (3, 4) Preoperative anxiety is one of the most important problems for the patients, because it causes emotional and psychiatric problems as well as physical problems. (3)

The exact etiology of anxiety can be due to anesthesia, surgery and several other different reasons. Thus it is crucial to detect the patient's existing anxiety to assist patients. (4)

The extent of anxiety levels varies individually. It fluctuates overtime, starting prior to the surgery and persists until the late postoperative period. Preoperative anxiety level is difficult to measure accurately. However, it can be estimated indirectly by measuring blood pressure, pulse and decreased heart rate variability and patient irritability. Directly it can also be estimated by measuring the plasma cortisol and urinary level of catecholamine. At present several validated questionnaires are available and used to measure preoperative anxiety. These include Amsterdam preoperative Anxiety Information Scale (APAIS), the State Trait Anxiety Inventory (STAI), Hospital Anxiety and Depression Scale (HADS), Visual Analogue Scale (VAS), Multiple Affect Adjective Checklist (MAACL) (5) and newly developed specific instruments like the Anxiety Specific to Surgery Questionnaire ASSQ (6)

In clinical settings - in the preoperative phase - extensive questionnaires are not applicable. External ratings of the preoperative anxiety, e.g. by the attending physician, are not precise. Therefore, it is important to have applicable screening instruments to assess preoperative anxiety. (2)

One of the most used instruments for measuring preoperative anxiety is the Spielberger's State-Trait Anxiety Inventory (STAI) (7), consisting in two different scale: one for measuring "trait" anxiety, the other for measuring "state" anxiety. But even if the "state" of STAI scale is aimed to assess a situation related anxiety, it takes too much time to be fulfilled to be usable in the perioperative framework. (8)

In 1996 the Dutch group of Moermann developed the Amsterdam Preoperative Anxiety and Information Scale APAIS (9). This questionnaire consists of six items and is, therefore, an economical instrument. The APAIS correlates with the State-Anxiety-Scale (STAI) with r=0.74, r=0.67 as well as r=0.64 which is a good indicator for its validity. (3,23)

Beside anxiety, patients need for information is an important aspect that should be assessed because of its weight in the patient global experience of the perioperative period (10) But despite its importance, there was no instrument forecasted to assess patients need for information, until the Amsterdam Preoperative Anxiety and Information Scale (APAIS). (8) Moreover, it has been suggested that the APAIS may be associated with pain levels in the early postoperative period (11)

The APAIS was applied in several international studies in departments of ophthalmology, internal medicine, in parents of children before surgery or for testing preoperative psychosocial interventions. Besides the Dutch version an English version and a Japanese version of the APAIS exist with several studies proving the validity with performance properties. Further studies from research groups in, Mexico, Italy, Turkey, Korea and Thailand implementing the APAIS have been published as well.(3)

STATEMENT OF THE PROBLEM

Preparing for an invasive surgical procedure is an experience that typically generates anxiety in patients. Anxiety may be considered as a normal part of preoperative experience by the patients themselves, their care givers and even physicians. It being ordinary, however, does not mean that it should be ignored since it has obvious consequences on surgical and anesthesia outcomes.

Perioperative anxiety is found to be correlated with increased autonomic fluctuations and increased requirements of anesthetic, elevated incidence of nausea and vomiting and augmented pain during postoperative period. (12-14)As a result of these complications, it was reported that recovery period and the length of hospital stay were extended. (12)

The consequences of perioperative anxiety are major cardiac events (acute myocardial infarction, heart failure and pulmonary edema), high readmission rate, poor quality of life and high rate of cardiac mortality. (15-18) The reasons of increased morbidity in anxious patient are associated with the development of cardiovascular lesions as a consequence of health related behaviors (such as smoking, poor diet, poor compliance with treatment or an inactive lifestyle), and direct influence on the myocardial perfusion, autonomic nervous system regulation, platelet activation, increased hypothalmo- pituitary- adrenal axis activity and exaggerated inflammatory processes (19-21)

Although the magnitude and consequences of perioperative anxiety is well documented in developed world, there are limited studies conducted in African population, especially in Ethiopia. Two studies in the northwest and south west of Ethiopia have shown that the prevalence of preoperative anxiety is high in the country using the State-Trait-Anxiety-Scale (STAI). However, the magnitude of the problem in black lion Hospital, one of the referral hospitals from all parts of Ethiopia, is not well known yet. Particularly, perioperative anxiety associated with the patients' desire for information on anesthesia and surgery has not yet been investigated.

Because of the limited number of anesthesiologists and surgeons in the country, enough time may not be given to conduct thorough preoperative interviews with patients. Therefore, the use of anxiety screening instruments those take too much time to be filled, like the STAI will not be applicable in our set up. Furthermore, The APAIS has been validated in surgical patients, whereas the STAI scale was validated in the general population (7). Thus, using only six items, the APAIS may become the standard for evaluation of perioperative anxiety in our set up if it is available and validated in a national language.

Therefore, since the Ethiopian version of the APAIS has not yet been developed, the primary aim of this study was to translate the APAIS into Ethiopian national language, Amharic and evaluate its validity in assessing the prevalence of preoperative anxiety in Black lion Hospital. The secondary endpoint was to determine associated factors with patients' preoperative anxiety and identify the causes of anxiety regarding anesthesia if there are any.

LITERATURE REVIEW

The reported incidence of preoperative anxiety ranges from 60% to 92% in unselected surgical patients. A study done in Canada by Anna Perks, Sucharita Chakravarti, and Pirjo Manninen, on 100 patients scheduled for neurosurgery in 2009 revealed that the incidence of preoperative anxiety was 89%. There was a positive correlation between anxiety level and need for information. Surgical factors were seen to contribute to anxiety levels more than anesthetic factors in this group of patients. (22)

In another study in Sri Lanka, done in 2011 Anne Thushara Matthias and Dharmanbandhu Nandadeva Samarasekera, the prevalence of preoperative anxiety was found to be 76.7% when the APAIS score was 11 or more. In this same study, Females were more anxious about anesthesia than males and those who had not had previous surgery, were more anxious than the experienced patients. Awareness during anesthesia was the number one cause for anxiety and those with a high information requirement were found to be more anxious. (23)

When anxiety levels were measured in admitted patients of the Civil Hospital, Karachi, Pakistan by Masood Jawaid, Asim Mushtaq, Sabih Mukhtar and Zeeshan Khan, in 2006, most of the patients awaiting elective surgery experienced high levels of preoperative anxiety. Patients feared surgery significantly more than anesthesia. The mean score of VAS for surgery was 57.65±25.1 and for anesthesia was 38.14±26.05. the most common factor responsible for pre-operative anxiety in these population was found to be concern about family (in 89.6% patients) followed by fear of complications (87%), results of operation (82.4%) and postoperative pain (78.8%). Only 38.3% of patients were found to be anxious because of awareness during surgery. (24)

Few studies are done regarding preoperative anxiety in African population. The prevalence of preoperative anxiety was found to be high in Nigerian surgical patients according to a study conducted in fifty one adult patients scheduled for elective surgery in a tertiary public hospital in Nigeria. Fifty one percent of the patients had significant preoperative anxiety and fear of complications and result of operation were the most common factors responsible for preoperative anxiety. (25)

A cohort study was conducted by Anthony Kamau, Vitalis Mung'ayi and Gerald Yonga in Aga Khan University, Nairobi, Kenya in 2017 to determine the reduction in anxiety in patients evaluated in the clinic versus those evaluated in the ward and the principal finding was that there is a greater reduction in the anxiety scores in the patients evaluated in the clinic than those evaluated in the wards (26)

In Ethiopia, a facility based cross-sectional study was conducted in Jimma University Specialized Teaching Hospital, south west Ethiopia, from February 13 to April 13, 2012 by Seifu Nigussie and colleagues on 239 patients scheduled for surgery. The study showed two third 70.3% of preoperative patients had anxiety. The most common factors that lead to anxiety were fear of death 38.1% and fear of unknown origin 24.3%. In addition, factors which were shown to reduce anxiety were preoperative anxiety related information provision and afternoon operation. (27)

In addition, two recent institutions based cross-sectional studies conducted in Ethiopia using the STAI (State-Trait-Anxiety-Scale) showed that the prevalence of preoperative anxiety was high in

North West part of Ethiopia. Henok Mulugeta, and Colleagues assessed preoperative anxiety and associated factors among 353 adult surgical patients in Debre Markos and Felege Hiwot Referral Hospitals from February 01 to April 30, 2017, and found that 61% of patients had significant high level of preoperative anxiety. The most common reported factor responsible for preoperative anxiety was fear of complications 52.4% and there was a statistically significant high level of pre-operative anxiety among female patients and patients who lack preoperative information. (28)

In same year, Woldegerima Y.B, Fitwi G.L., Yimer H.T. and Hailekiros A.G conducted a cross sectional study on 178 willing adult patients scheduled for elective surgical operations in Gondar university referral hospital from March to June 2017 and preoperative anxiety was observed in 59.6% patients. Young age, no/low income, urban residence, fear of death, dependency, disability and family concerns were found to be the predictors of preoperative anxiety. (29)

The German version of the APAIS showed its high-quality psychometric properties in the study conducted on 72 inpatient of orthopedic department in the period between 14th of September and the 13th of December, 2005. It is well accepted by the patients and the physicians because of its brevity (assessment time is 1 minute) and the high comprehensibility of the items. Thus, the authors of this study concluded that, can be used as a screening instrument. In case of high levels of anxiety and need-for-information further instrument should be used.(3)

In 2013, F. Maurice-Szamburski and colleagues found that the French version of the APAIS is valid and reliable on 175 sampled French speaking patients who underwent various procedures, including orthopedic, hand, plastic, and abdominal surgery, in three university hospitals in southeastern France. This tool enables the evaluation of anxiety among French patients undergoing anesthesia (8)

OBJECTIVE

GENERAL OBJECTIVE

- To translate the APAIS into Ethiopian national language, Amharic and evaluate its validity by collecting data on adult surgical patients in Black lion Hospital, Addis Ababa, Ethiopia

SPECIFIC OBJECTIVES

- To translate the APAIS into Ethiopian national language, Amharic.
- To evaluate the internal validity of the APAIS by collecting data on adult surgical patients in Black lion Hospital, Addis Ababa, Ethiopia
- To determine the prevalence of preoperative anxiety and factors associated with it in Black lion Hospital using APAIS score
- To describe patients desire for information regarding anesthesia and surgery
- To explore the causes of anxiety regarding anesthesia if there are any

2. METHODS

STUDY AREA AND PERIOD

Black lion (Tikur Anbesa) specialized hospital is Ethiopia's largest general public hospital providing a tertiary level referral treatment. It is an institution where specialized clinical services that are not available in other public or private institutions are rendered to the whole nation. It is also the main teaching hospital for both clinical and preclinical training of most disciplines. It offers diagnosis and treatment for approximately 370,000-400,000 patients a year. It has 10 major operation theatre rooms, 2 orthopedics, 2 urosurgery, gynecology, pediatrics, general surgery, otolaryngology surgery, cardiothoracic and neurosurgery theatre rooms. Annually more than 6000 people are operated in the Hospital.

The study was conducted on elective adult surgical patients from 1st of July to August 30, 2019.

STUDY DESIGN

An institution based prospective cross sectional study design was conducted in Black Lion Hospital, Addis Ababa, Ethiopia.

SOURCE POPULATION

Adult patients of age > 18 years admitted to surgical wards for elective surgeries

ELIGIBLITY CRITERIA

Inclusion Criteria: ASA I-III, adult patients, > 18 years who are scheduled to undergo elective major surgery in our hospital was included in this study.

Exclusion Criteria: Emergency patients and patients who were not able to give consent, patients with mental retardation, dementia, or psychiatric disorders and patients on premedication were excluded from the study.

SAMPLE SIZE AND SAMPLING TECHNIQUE

The sample size was determined by using a single proportion for a finite population with assumption of 95% confidence interval, 5% of margin of error and the prevalence of 61%(29)

$$n = \frac{(Z\alpha/2)^2 P(1-P)}{D^2}$$

Where n= the desired sample size.

Zα/2= standard normal score, at 95% confidence level, which is 1.96

P= prevalence (61.0%)

D= degree of accuracy desired (5%)

So, $n = \frac{(1.96)^2 0.61(1-0.61)}{(0.05)^2}$

n= 365

DATA COLLECTION PROCEDURE AND INSTRUNMENTS

The validation process included two steps. The first step involved the production of an Amharic version of the APAIS that is semantically equivalent to the original version. This was done with the help of experts from legal translation services. A forward-backward translation of the items in APAIS was performed by a bilingual expert.

In the second step, the psychometric properties of the Amharic version were evaluated after collecting data using the translated version on sampled adult surgical patients admitted for elective surgery.

After an informed consent was taken from each sample patient, interviews with the patients was performed a night before their elective surgery at the time of their preoperative examination and before any premedication was given.

The interviewers were ward assigned BSC nurses who are blind to the study. They were trained on how to fill the questionnaire and two supervisors observed the process of data collection and checked for daily consistency and cleanliness of the data.

The APAIS (Amsterdam Preoperative anxiety and information scale) comprises six statements. The APAIS is a simple tool designed to be used in clinical area which consists of four questions concerning patient's anxiety about anesthesia and surgery, and two questions evaluating the need for information

The six statements in the APAIS are:

1. I am worried about the anesthetic
2. The anesthetic is on my mind continually
3. I would like to know as much as possible about the anesthetic
4. I am worried about the procedure
5. The procedure is on my mind continually
6. I would like to know as much as possible about the procedure

All questions are scored on a 1 to 5 Likert scale. (1 - Not at all, 5 - Extremely) The scores from questions 1 and 2 are added to show anesthesia related anxiety, 4 and 5 are added together to show the patients surgery related anxiety while the sum of scores from questions 1, 2, 4 and 5 show the patients total level of anxiety. In addition, scores for questions 3 and 6 are added together to identify the patent's need for information. A patient with a score of 11 or more on the anxiety scale experiences anxiety. On the information scale, patients scoring 2-4 are classified as having little or no information requirements, 5-7 as having an average information requirement and 8-10 as having high information requirements.

Patients were also asked about the cause of their anxiety regarding the anesthesia if there were any. They could select more than one cause if it is the case.

DATA QUALITY ASSURANCE

To assure the quality of data, one hour training was given to data collecting nurses prior to data collection.

Follow up and supervision was conducted by supervisors during data collection and collected data was checked for completeness and clarity on daily basis.

Records with more than 25% of the responses missing on the APAIS were rejected.

DATA PROCESSING AND ANALYSIS

Statistical analysis was made using SPSS version 24. Descriptive analysis was performed to describe the number and percentage of socio demographic characteristics and other variables. To evaluate the correlation between variables a chi square test of independence correlation analysis using p-value was used. The results are then presented in text, tables and graphs based on the types of data.

Then, psychometric evaluation of the national scaling system was done by checking its internal validity and acceptability.

Internal validity: this will include checking for reliability and adequacy of the Amharic version model of the APAIS.

The reliability of the internal consistency of each dimension was assessed using the Cronbach's alpha coefficient. Cronbach's alpha is a function of the number of items in a test, the average covariance between item pairs and the variance of the total score. That is; measuring how closely related items are as a group. For this study, a Cronbach's alpha coefficient higher than 0.7 was expected for each scale.

The adequacy of the model will also be explored using a global index that is responsive to sample size and complexity: the root mean square error of approximation (RMSEA) that is, measuring how well the data collected fits the model. An RMSEA lower than 0.08 indicates a fair fit, less than 0.06 acceptable fit and less than 0.05 a good fit.

Acceptability:

The percentage of missing answers was also used to explore the acceptability of the Amharic version among the patients. However, to ensure data quality, the validation analysis were not performed on records with more than 25% of the responses missing.

In addition, the findings of the study were compared with other similar studies done using the state trait anxiety inventory questionnaire.

ETHICAL ISSUES

The proposal was presented to Addis Ababa University, college of health sciences research and publication committee ethical review board for ethical approval.

An informed consent was taken from each patient by data collectors after explaining the purpose of the study. Confidentiality and privacy was maintained during data collection, analysis and reporting.

There was no risk for patients by participating in this study.

VARIABLES

Dependent variable: preoperative anxiety, patients' desire for information, anesthesia related concern

Independent Variables: socio demographic characteristics, type of surgical operation, previous surgery and anesthesia experience, previous surgical complication, previous anesthesia type, pre anesthesia clinic visit

OPERATIONAL DEFINITION

Adult: A person who is 18 years and above

Anxiety: A vague feeling of dread or apprehension; a patient with a score of 11 or more on the anxiety scale of APAIS experiences anxiety.

Little or no information requirements: Patients scoring 2-4 on the information scale of APAIS,

Average information requirement: Patients scoring 5-7 on the information scale of APAIS,

High information requirements: Patients scoring 8-10 on the information scale of APAIS,

Major surgery: Any surgical operation performed in the major operating rooms under regional or general anesthesia

Urban areas: Localities with 2000 or more inhabitants, all administrative capitals (regional, zonal and woreda capitals) and areas engaged in non agricultural activities

Rural areas: All areas not classified as urban (National labor force survey 2005)

3. RESULTS

3.1 TRANSLATION

A forward-backward translation of the items in APAIS was performed by a bilingual, Amharic English speaker, expert. The six items in the APAIS and the five point Likert scale ranging from 1 (“not at all”) to 5 (“extremely”) were translated to Amharic language as given below. (Table 1 and 2)

	ORIGINAL APAIS ITEMS	AMHARIC VERSION
1	Are you worried about the anesthetic?	**ስለ ማደንዘዣው አሰጣጥ በተመለከተ ጭንቀት አድርዎብዎታልን?**
2	Is the anesthetic continually on your mind?	**የማደንዘዣ መድሃኒት አሰጣጡ አሁንም ድረስ በአእምርዎ አለ?**
3	Do you like to know as much as possible about the anesthetic?	**ስለማደንዘዣው በተመለከተ በተቻለዎት መጠን ማወቅ የሚፈልጉቸው ነገሮች አሉ?**
4	Are you worried about the procedure?	**ስለሚደረግልዎት የቀዶ ጥገና ህክምና ተጨንቀዋልን?**
5	Is the procedure on my mind continually?	**ይህ የቀዶ ጥገና ህክምና አሁንም ድረስ በአእምርዎ ውስጥ አለን?**
6	Do you like to know as much as possible about the procedure?	**ስለ ቀዶ ጥገና ህክምናው በተመለከተ በተቻለዎት መጠን ማወቅ የሚፈልጉቸው ነገሮች አሉ?**

Table1. Items of the Amsterdam Preoperative Anxiety and Information Scale English and Amharic version.

	Likert scale English	Likert scale Amharic
1	Not at all	ፈጽሞ
2	Slightly	በመጠኑ
3	Moderately	መካከለኛ
4	Very	በጣም
5	Extremely	እጅግ በጣም

Table 2 Likert scale ranges English and Amharic version

3.2 RESULTS OF COLLECTED DATA

3.2.1. Socio demographic characteristics of the study participants

A total of 365 patients were incorporated in this study with 100% response rate. The study enrolled 200 (54.8%) male and 165(45.2%) female participants. Fifty three percent of the participants (194) were in the age range of 18-49, followed by 18.9% in the age range of 50-59, 15.3% in the age range of greater than or equal to 60years of age and 12.3% in 40-49 years. Concerning the educational status of the participants, 32.9% (120) were illiterate while the rest had some level of formal education. Out of the total sampled patients, 61.9% (226) had urban residence while 31.8% (139) came from rural areas of Ethiopia. (Table3)

	Range	Frequency	Percent
AGE	18-39	194	53.2
	40-49	45	12.3
	50-59	69	18.9
	>=60	57	15.6
	TOTAL	**365**	**100.0**
SEX	Male	200	54.8
	Female	165	45.2
	TOTAL	**365**	**100.0**
EDUCATIONAL STATUS	No education	120	32.9
	Grade1-8	86	23.6
	Grade 9-12	116	31.8
	University	43	11.8
	TOTAL	**365**	**100.0**
RESIDENCE	Urban	226	61.9
	Rural	139	38.1
	TOTAL	**365**	**100.0**

Table 3 Socio-demographic characteristics of elective surgical patients in Blacklion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

3.2.2. Current Surgery and Previous Experience

Around half of the study participants were admitted for urologic (30.7%) and general surgeries (17.5%), followed by orthopedic (17%) and obstetrics (9.6%) surgery. (Fig 1) One third of these patients had experience of major surgery previously (33.7%) while the rest did not have any previous major operation and anesthesia experience. Out of those patients who had surgery experience the majority (66.7%), had general anesthesia experience and 30.1% encountered surgery or anesthesia related complication in their previous surgeries. (Table 4)

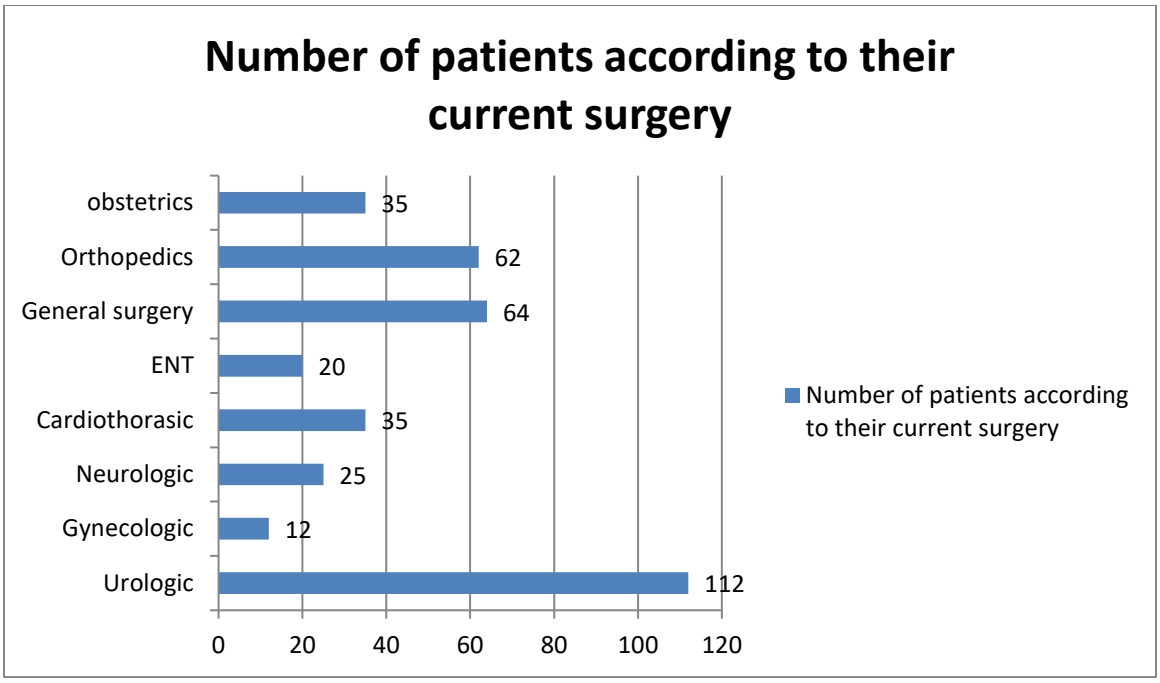

Fig 1 Type of current surgery of elective surgical patients, in Blacklion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

Previous Major Operation			**Type of Anesthesia used**		**Presence of previous complications**	
	Frequency	Percent		Freq (%)		Freq (%)
Yes	123	33.7	General	82(66.7)	Yes	37(30.1)
			Regional	41(33.3)	No	86(69.9)
No	242	66.3				
Total	365	100.0				

Table 4 Previous major operation experiences of the patients, the type of anesthesia used and presence of previous complication in elective surgical patients, in Blacklion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

Out of those patients who reported the presence of either anesthesia or surgery related complication in their previous surgeries, 40.5% had infection as a complication followed by delayed recovery(29.7%) and others(19%), which included, pain and incomplete cure (Fig 2)

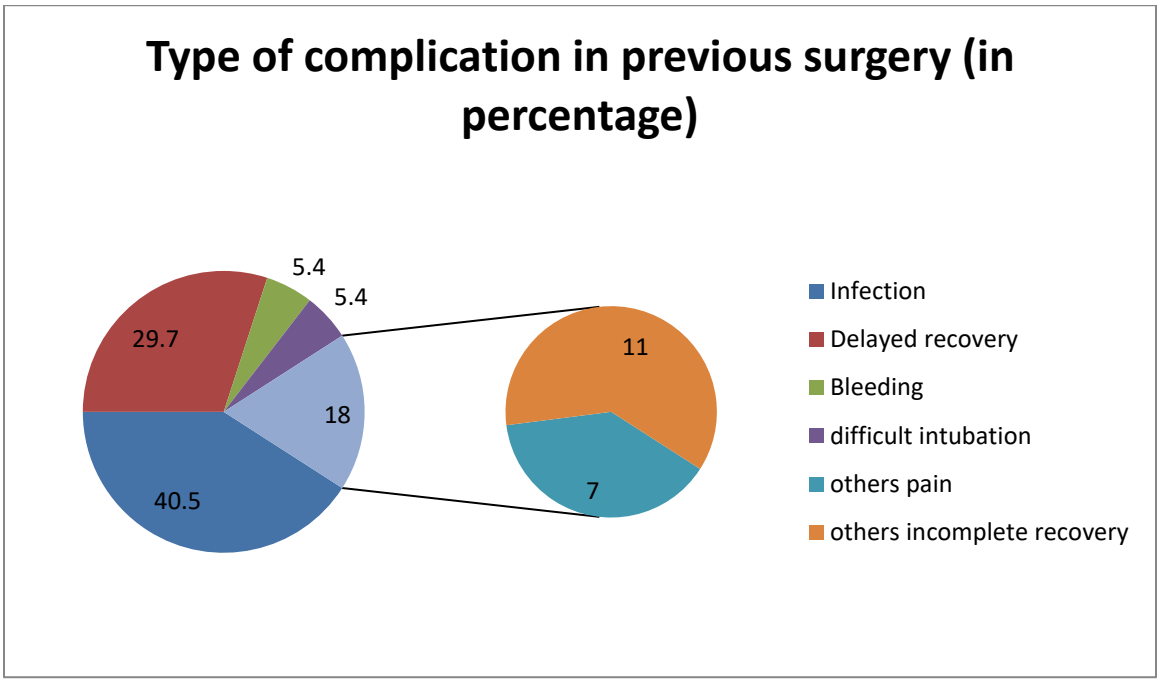

Fig 2 Type of complications patients had in previous surgery in Blacklion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

3.2.3 Results of the APAIS

The mean APAIS scores were as follows: anxiety for anesthesia (5.9 ± 2.6); anxiety for surgery (5.6 ± 2.4); total anxiety score (11.6 ± 4.6), and desire for information (6.0 ± 2.4) (Table5) In addition 58.9% of the study participants had anxiety on the APIS score, scoring 11 or more while 41.1% scored in the range of 2-11, hence no anxiety. Around three fourth of the participants had either average (37.5%) or high (35.9%) information requirement

regarding the anesthesia and surgery, while only 26.6% of the participants had little or no information requirement. (Fig 3,4)

	N	Min score	Max score	Mean	SD	Cronbach's Alpha
Anesthesia Related Anxiety	365	2	10	5.9781	2.65	0.85
Surgery related Anxiety	365	2	10	5.6000	2.45	0.842
Total anxiety Score	365	4.00	20.00	11.5973	4.63	0.87
Total need for information score	365	4.00	20.00	6.0573	2.37	0.75

Table 5. Results of the APAIS score, mean standard deviations and Cronbach's Alpha of anxiety scores and need for information scores, in Blacklion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

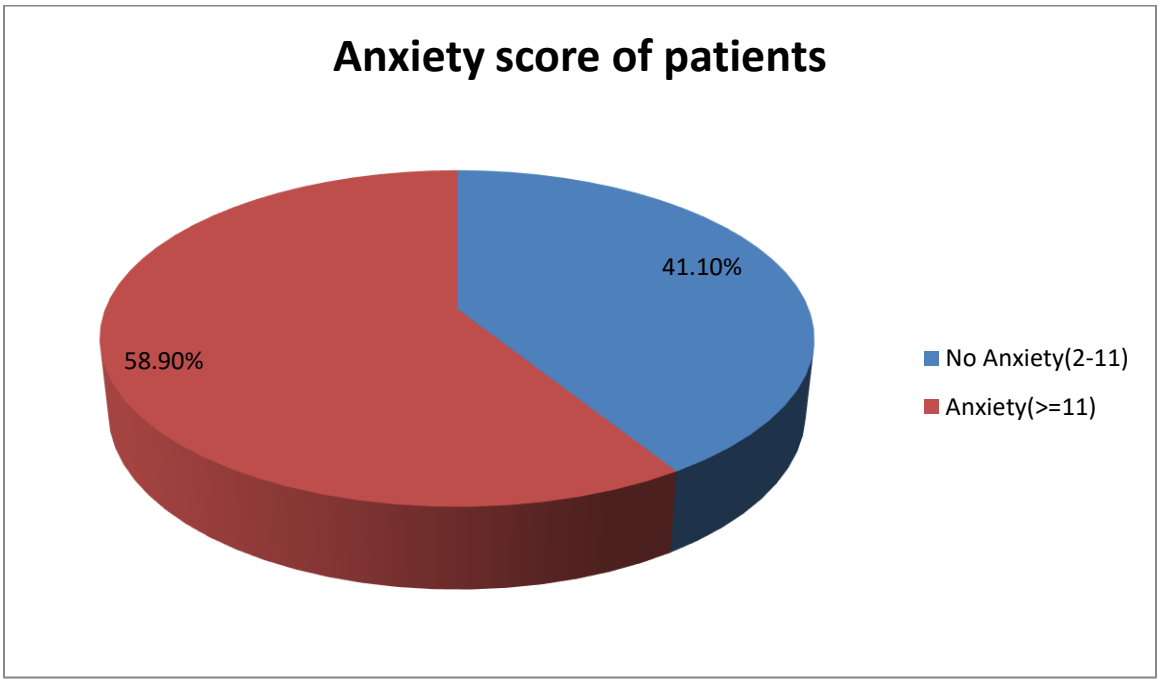

Fig 3 Anxiety score of elective surgical patients, in Black lion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

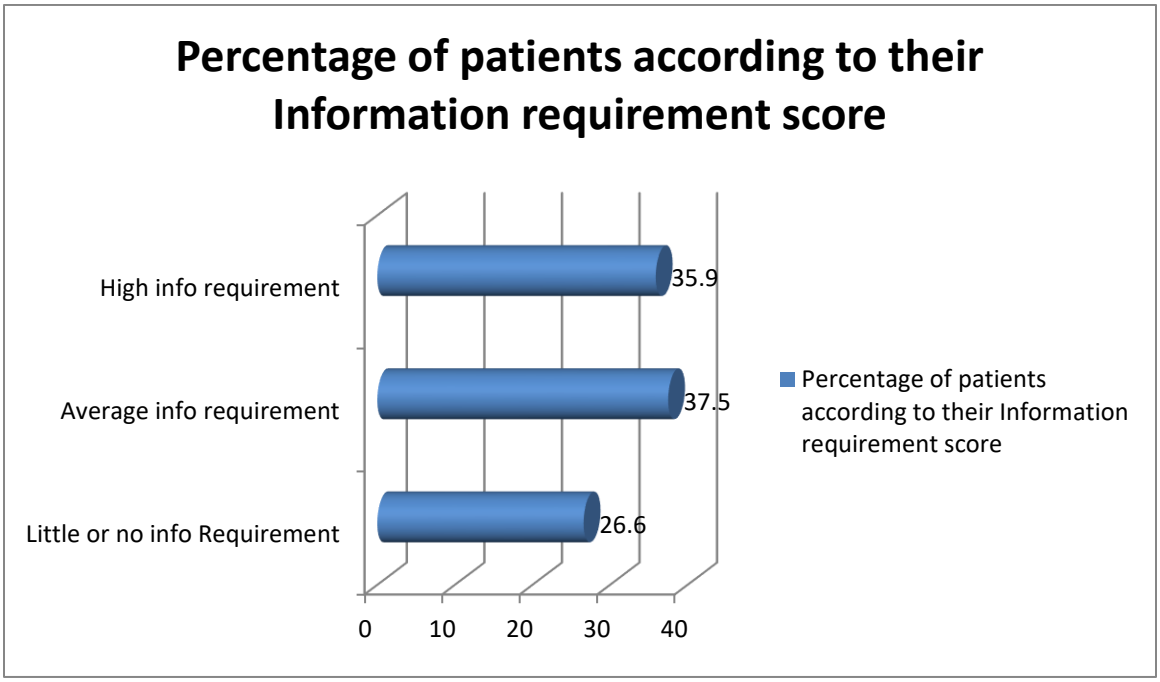

Fig 4 Need for information score of elective surgical patients on the APAIS in Black lion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

Out of the total interviewed 365 elective surgical patients, 312 patients reported at least a slight worry about the anesthesia on the first question of the APAIS. Further, these patients were asked about the reason of their worry. Unknown cause was answered by 22.4 % of them, post op pain by 21.5%, pain during surgery by 20.5% and permanent disability by 13.8% as the cause of their worry. (Fig 5)

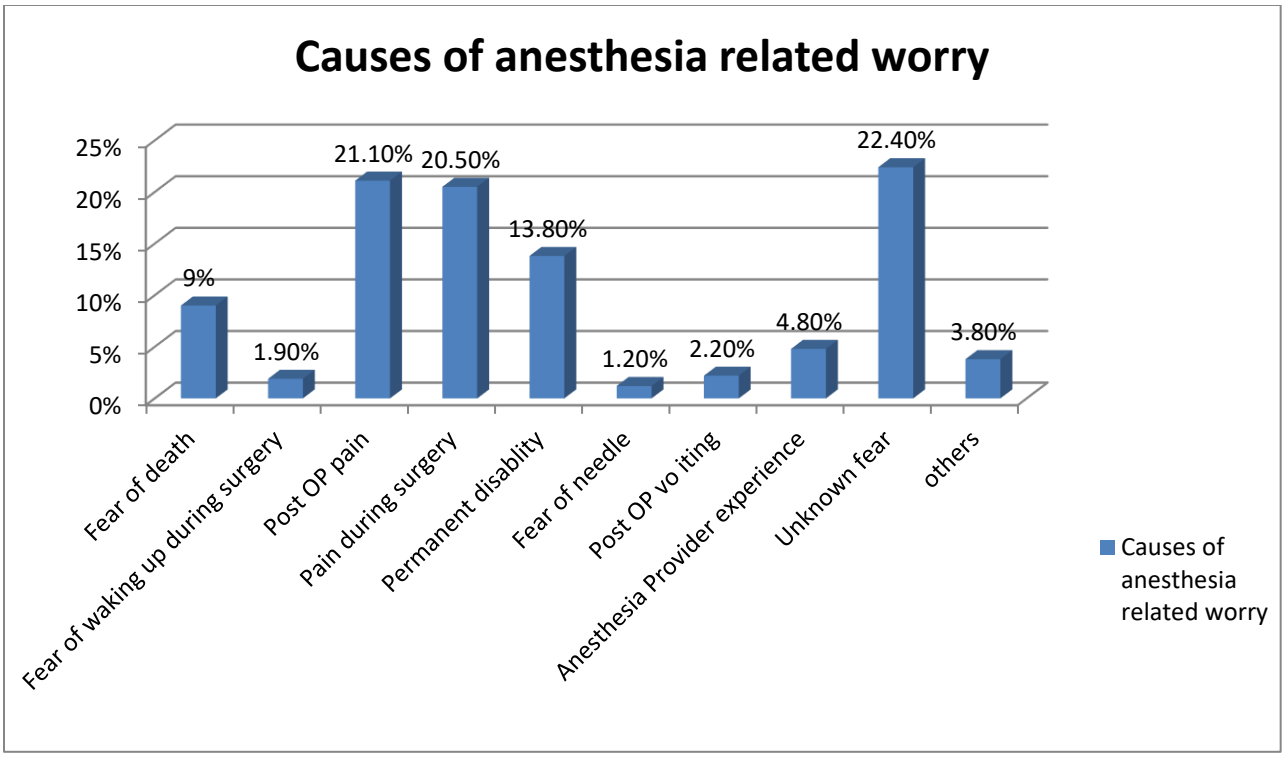

Fig 5. Causes of Anesthesia related worry of elective surgical patients in Black lion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 312)

3.2.4 Predictors of preoperative Anxiety

To evaluate the correlation between socio demographic characteristics and anxiety score as well as need for information and anxiety score, a chi square test of independence was performed to calculate p- value as seen on Table 6.

The proportion of patients who had anxiety (scored 11 or more on the APAIS) did not differ by Age and Sex. [X2(1, N=365) =8.9, p>.05] However, according to this study, it was found that those patients, who had some form of formal education, came from urban areas, had previous anesthesia experience and had previous anesthesia related complications were more likely to be anxious. (P<.05) In addition, while examining the relation between patients need for information and their anxiety score, it was found that there is a significant relationship between these variables. Those patients who had no or little information requirement regarding surgery and anesthesia were less anxious than those who had average or high information requirement (P<.05) (Table 6)

		Total Anxiety Score		Total	p-value
		No anxiety (2-11)	Anxiety(>=11)		
AGE	18-59	**128**	**180**	308	.67
	>=60	**22**	**35**	57	
Total		150	215	365	
SEX	Male	**82**	**118**	200	.96
	Female	**68**	**97**	165	
Total		150	215	365	
EDUCATIONAL STATUS	No education	**62**	**58**	120	.004
	Some education	**88**	**157**	245	
Total		150	215	365	
RESIDENCE	Urban	**79**	**147**	226	.002
	Rural	**71**	**68**	139	
Total		150	215	365	
PREVIOUS ANESTHESIA EXPERIENCE	Yes	**39**	**84**	**123**	.009
	No	**111**	**131**	**242**	
Total		150	215	365	
Previous Anesthesia or Surgery Related Complication	Yes	**7**	**30**	37	.04
	No	**32**	**54**	86	
Total		39	84	123	
Information requirement	No or little requirement	**49**	**48**	97	.03
	Average and high requirement	**101**	**167**	268	
		150	215	365	

Table 6 The relationship of APAIS scores with patient characteristics and their need of Information, in Black lion Hospital, Addis Ababa, Ethiopia. July-Aug 2019. (N- 365)

3.3 VALIDATION

Internal validity

The internal consistency reliability of the Amharic version of the APAIS was high, i.e., the Cronbach's alpha values ranged from 0.75 to 0.85. This shows an acceptable internal consistency of the desire for information scale and good internal consistency of anesthesia related anxiety, surgical related anxiety and global anxiety scores. (Table 5)

In addition, the confirmatory factor analysis indicated a good fit with root mean square error of approximation of 0.04(<.05)

Acceptability

From the collected data, it was found that there were no missing values for each dimension of the APAIS. (100% acceptability) These results indicate that the questionnaire was well accepted.

4. DISCUSSION

Psychological characteristics of patients influence the outcome of surgery. Preparing for an invasive surgery by itself is an experience that generates anxiety in patients. The anxiety level differs individually and there are different questionnaires designed to assess preoperative anxiety. The estimate made by anesthesiologists and surgeons, without the use of a standard questionnaire can lead to either an over or under estimation of anxiety. However, in clinical settings, the use of extensive questionnaires is not applicable. Therefore, it is important to have applicable instrument in our set up for early screening of anxious patients in order to improve their perioperative experience.

The APAIS has been initially designed and validated in Dutch, the construct validity was evaluated by factor analysis and external validity has also been performed. The two scales; anxiety and need-for-information, assess important constructs for anesthesia and surgery.

In this study, it was found that the reliability of the Amharic version of the APAIS was high as the internal consistency determined by the cronbach's alpha was 0.75 for total need for information score and 0.87 for total anxiety score. (A Cronbach's alpha coefficients higher than 0.7 shows acceptable internal consistency while a Cronbach's alpha coefficient higher than 0.8 shows good internal consistency.) This result is similar with other studies done in French and Srilanka where Cronbach's alpha was 0.86 for the Sinhala version and ranged from 0.76 to 0.84 for the French version. (8, 30) In addition, the data collected fits the Amharic version of the APAIS well as it is shown by the RMSEA of 0.04, which is a good fit. (<0.05) This result, when compared to the French version of the APAIS with a RMSEA result of 0.06 shows that the Amharic version has a better fit. Furthermore, the acceptability of the APAIS Amharic was 100% as there were no missing values for each of its dimensions. Therefore, it can be used as an effective tool to measure preoperative anxiety levels in Ethiopian patients.

In this study, the overall prevalence of preoperative anxiety was 58.9% when the APAIS score was 11 and more. This result is consistent with recent two studies done in Ethiopia using the gold standard STAI scale i.e., in Gondar university hospital (59.6%) and Debremarkos and Felege Hiwot Hospital (61%) (28, 29) This result was found to be higher than another study conducted in Nigeria where the prevalence of anxiety was 51 %. However, the prevalence in our study was

lower than previous study conducted in Sri Lanka using a similar tool in which the overall prevalence of preoperative anxiety was 76.7%.This could be attributed to the socio cultural differences of the two populations where our society may not have the culture to openly report about their worry regarding anesthesia and surgery out of their respect for surgeons and anesthesiologists.

In addition, the mean APAIS score for anesthesia anxiety and surgery anxiety were similar with the means of 5.9 ± 2.6 and 5.6 ± 2.4 respectively unlike the results of the study done in Pakistan where Patients feared surgery significantly more than anesthesia. (24). The total mean anxiety score was 11.6 ± 4.6 and mean desire for information score was 6.0 ± 2.4 which was higher when compared to the mean APAIS score for global anxiety (7.2 ± 3.7) and mean desire for information(5.7 ± 2.3) of that of the French version. This might be explained by the fact that enough time may not be given for providing pre anesthesia and surgery information in our set up and hence a higher mean score of anxiety.

Furthermore, out of those patients who at least reported a slight worry about the anesthesia, the top three reasons(in descending order) responsible for their anesthesia related worry were found to be unknown cause, post operative pain and pain during surgery. This is a different result from that of the Srilankan study where awareness during anesthesia was the number one cause for anxiety. However the most common causes of preoperative anxiety in other studies included concern about family, fear of complication, fear of death and fear of post operative pain.(24, 25, 27,28) Therefore, as anesthesiologists it would be important to address these causes of anesthesia related worry of patients during their preanesthetic evaluation in order to alleviate their anxiety.

Different factors can affect anxiety levels in patients which vary from country to country. In this study, the socio-demographic characteristics that were found to be significantly associated with preoperative anxiety were educational status and residence. However, our study showed lack of significant effect of age and gender on the level of preoperative anxiety. Those patients who had some form of formal education and came from urban areas were found to be more anxious than those who are illiterate and came from rural areas. This association has been explained by highly educated people have tendency to extrovert their feelings, information seeking behavior and awareness of possible complications. Also as they get incomplete information from different sources, their anxiety level will escalate. (29)

This finding is similar with a study done in Jimma, Ethiopia(using STAI scale) and Pakistan(using VAS) where level of preoperative anxiety appeared to increase with increasing level of education and opposite to the finding of North West part of Ethiopia(using STAI scale) where the level of anxiety decreases with increasing level of education. (24, 27 and 28)

In the current study, it was also found that patients who had previous surgery or anesthesia experience and had previous anesthesia related complications were more likely to be anxious than those who didn't. With the presence of previous complications, patients are more obviously to be anxious because of fear of complications happening on their current surgery as well. But, even in absence of complications, patients might have experienced stressful events like death of their neighboring patients during their last admission which can increase their level of anxiety on their current surgery. (31) This finding is however different from findings of other studies which show more experienced patients were less anxious. (23, 28)

Finally, this study also showed a high positive correlation between high information seekers and anxiety scores. That is, those patients who had average and high information requirement were more anxious than those who had no or little information requirement regarding anesthesia and surgery. This finding is in line with other studies where patients with an extremely high information requirement were anxious patients. Further it was suggested that patients with a monitoring coping style become anxious when they are not provided with as much information as they want. However, it is also important to realize that extensive information is not always useful and may even induce anxiety particularly in patients with a blunting coping style. (9, 23) Therefore, anxious patients may benefit from more information based on their information requirement.

5. CONCLUSION AND RECOMMENDATION

Testing preoperative anxiety is the first step in reducing anxiety and it can easily be done with a questionnaire such as APAIS. The Amharic version of the APAIS is a reliable and acceptable tool for measuring patients' preoperative anxiety and their need of information regarding surgery and anesthesia. It can be used as a screening instrument at pre anesthesia clinics to assess patients' level of anxiety and hence provide a platform to clarify their doubts about anesthesia and plan for the appropriate pre medications. It also allows comparing preoperative anxiety levels and need-for-information across countries.

Although, most of the findings of this study were similar with other studies done in the country using the STAI scale, the external validity should be assessed by correlating the Amharic version of the APAIS with that of the STAI and other tools on concurrent data. This could be a good subject for future study.

This study also showed that prevalence of anxiety was high and the level of anxiety was significantly associated with educational status, residence, and previous surgery experience and information requirement. Therefore, in our Hospital, the use of the Amharic version of the APAIS for routine anxiety and need for information assessment should be given due consideration. Appropriate information should also be provided to the patients according to their need of information at pre anesthesia clinics before surgery. In addition, enough time should also be given to provide pre operative information for surgical patients and address the causes of their worry accordingly.

6. LIMITATIONS OF THE STUDY

Although this study showed that the Amharic version of the APAIS is a reliable and acceptable tool in terms of internal validity, other domains of psychometric evaluations like differential item functioning and external validity were not done. In addition, this study did not study preoperative anxiety in pediatrics and emergency patients because these groups of patients are usually uncooperative. Furthermore, the level of anxiety at pre anesthesia clinics was not compared with that of the night before surgery and anxious patients were not followed intra and postoperatively to evaluate their outcomes.

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22.ANNEX

QUESTIONAIRE

I. SOCIO DEMOGRAPHIC CHARACTERSTIC

1. AGE

   □18- 39 □40-49 □50-59 □›60

2. SEX □MALE □FEMALE

3. EDUCATIONAL STATUS

   □ did not attend formal education

   □ Primary school (1-8)

   □ Secondary School (9-12, including preparatory)

   □ University

   □ Doctorate

4. RESIDENCE

   □ Urban □ Rural

II. CURRENT SURGERY AND PREVIOUS EXPERIENCE

1. TYPE OF CURRENT SURGERY

   □ Urologic □ Gynecologic □ Neurologic

   □ Cardio-thoracic □ ENT □ General surgery

2. DID YOU HAVE PREVIOUS MAJOR OPERATION EXPERIENCE?

   □ Yes □ No

   IF YES, PLESAE ANSWER Q3 TO 7

3. WHAT WAS THE ANESTHESIA USED?

   □ General □ Regional

4. WAS THERE ANY ANESTHESIA OR SURGERY RELATED COMPLICATION?

   □ Yes □ No

5. IF YES, WHAT WAS THE COMPLICATION?

□ Difficult intubation/breathing □ delayed awakening

□ low blood pressure □ allergic reaction □ intraop awareness

□ high spinal □ bleeding □ organ injury □ infection

□ delayed recovery □ other, Specify_____

III. APAIS SCORE(TICK ON APPROPRIATE ANSWER FOR EACH QUESTION)

	Not at all **ፈጽሞ**	Slightly **በመጠኑ**	Moderately **መካከለኛ**	Very **በጣም**	Extremely **እጅግ በጣም**
Are you worried about the anesthetic? **ስለ ማደንዘዣው አሰጣጥ በተመለከተ ጭንቀት አድርዎብዎታልን?**					
Is the anesthetic continually on your mind? **የማደንዘዣ መድሃኒት አሰጣጡ አሁንም ድረስ በአእምርዎ አለ?**					
Do you like to know as much as possible about the anesthetic? **ስለማደንዘዣው በተመለከተ በተቻለዎት መጠን ማወቅ የሚፈልጉቸው ነገሮች አሉ?**					
Are you worried about the procedure? **ስለሚደረግልዎት የቀዶ ጥገና ህክምና ተጨንቀዋልን?**					
Is the procedure on my mind continually? **ይህ የቀዶ ጥገና ህክምና አሁንም ድረስ በአእምርዎ ውስጥ አለን?**					
Do you like to know as much as possible about the procedure? **ስለ ቀዶ ጥገና ህክምናው በተመለከተ በተቻለዎት መጠን ማወቅ የሚፈልጉቸው ነገሮች አሉ?**					

IV. ANESTHESIA RELATED CONCERNS

(If the patient has slight to extreme worry about the anesthesia)
Could you please tell us about the cause of your worry about the anesthesia?

□ fear of death □ fear of waking up in the middle of surgery

□ postop pain □ pain during surgery □ permanent disability

□ fear of neddle □ postop vomiting □ anesthesia providers experience

□ preoperative fasting □ unknown fear

□ others specify_____