COLLEGE OF HEALTH SCIENCES

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DEPARTMENT OF ANESTHESIA

KNOWLEDGE, ATTITUDE, AND ASSOCIATED FACTORS TOWARDS PATIENT SAFETY AMONG ANESTHETISTS WORKING IN GOVERNMENTAL REFERRAL HOSPITALS IN ADDIS ABABA, ETHIOPIA,2021.

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THESIS SUBMITTED TO THE DEPARTMENT OF ANESTHESIA, COLLEGE OF HEALTH SCIENCE; ADDIS ABABA UNIVERSITY IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MASTER OF SCIENCE IN ADVANCED CLINICAL ANESTHESIA.

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DECLARATION

I, the undersigned, declare that this thesis entitled "Knowledge, attitude, and associated factors towards patient safety among anesthetists working in governmental hospitals in Addis Ababa, Ethiopia,2021." is my original work in partial fulfillment of the requirements for the Master of Science degree in Anesthesia. I understand that plagiarism will not be tolerated and all directly quoted material has been appropriately referenced.

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ABBREVIATIONS/ACRONYMS

CI	Confidence interval
ICU	Intensive care unit
MoH	Ministry of health
OR	Operating room
PSC	Patient safety culture
SAQ	Safety attitude questionnaires
SAQ-OR	Safety attitude questionnaires operation room version
WHO	World health organization

ABSTRACT

Background: Patient safety is an important principle of health service and now identified as a global public health concern. Despite the benefits of rapidly advancing therapeutic and diagnostic possibilities, the perioperative setting still exposes patients to significant risks of adverse events and harm. An anesthetist is in midstream of perioperative care and can make significant contributions to patient safety and patient outcomes.

Objective: This study aimed to assess the knowledge, attitude and associated factors among anesthetists towards patient safety in governmental referral Hospitals, Addis Ababa, Ethiopia 2020/202.

Method: Cross-sectional study design was conducted in 13 governmental referral hospitals of Addis Ababa from January to June 2021. All anesthetists who were available in the study period were asked to participate in the study. From 274 anesthetists 238 participated. The data were analyzed with Statistical Package for Social Sciences (SPSS) software version 24.0 and the value of the variables and their associated factors were checked its association with logistic regression. Significance was determined at P-value <0.05. Descriptive statistics were used to summarize data, tables, and figures for display results.

Result: This study demonstrated that greater than half of participants were found to have good knowledge(56.7%) and a favorable attitude (68.9%). working experience greater than or equal to 10 years [AOR=3.9.;95% CI:(1.23-12.29)], those who had information about patient safety during continuing education [AOR=4.; 95% CI:(1.99-8.07)] and those who have received training about patient safety [AOR=2.9.; 95% CI: (1.5-5.7)] showed statistical association with good knowledge. Anesthetist with good knowledge regarding patient safety [AOR =2.6. ; CI: (1.32,5.02)], and those who have received training about patient safety p (0.012) [AOR=2.; 95% CI: 1.2-3.64)] showed a statistically significant association with a positive attitude.

Conclusion: Participants had a favorable attitude and relatively good knowledge. Working experience, information about patient safety during continuing education and training were associated with participant knowledge. Participants were found to have a favorable attitude on teamwork climate, job satisfaction, and safety climate subscales while they had unfavorable attitudes on working conditions and perceptions of management. The most important predictors of a positive attitude were knowledge of patient safety, and training about patient safety.

Keywords: knowledge, attitude, patient safety, anesthetist, governmental hospital, Addis Ababa.

1. CHAPTER ONE: INTRODUCTION

1.1 Background

Patient Safety is a health care discipline that emerged with the evolving complexity in health care systems and the resulting rise of patient harm in health care facilities. It aims to prevent and reduce risks, errors, and harm that occur to patients during the provision of health care (1). The world Health Organization (WHO) defines patient safety as "the absence of preventable harm to a patient during the process of health care"(1). The Operating room settings are marked by increased use of technological devices and the presence of different occupational groups, who work long, erratic hours and cope with many problems (2,3). Due to breakdowns in teamwork and communication, these problems can potentially result in a higher number of errors. In turn, these errors that are committed in the OR can negatively impact patients, families, caregivers, and the institution itself (1–3).

The burden of patient harm not yet satisfactorily address globally over the past 15 years, despite pioneering work in some health care institution(1). According to reports, millions of patients suffer from harm because of compromised patient safety (1,4,5). Unsafe care and risks associated with the medical practice now emerging as major challenges for patient safety. Medication errors, Healthcare-associated infections, Unsafe surgical care procedures, unsafe injection practices, Unsafe transfusion practices, Radiation errors, Sepsis, Venous thromboembolism (blood clots) are the major cause of patient morbidity and mortality(1,6).

Despite the availability of advanced therapeutic and diagnostic tools, patients in the perioperative area are still exposed to significant risks of adverse events and harm. Anesthetists have a major role in perioperative care and their management is significantly linked to patient safety and patient outcomes(7). Incidences associated with adverse events and medical error significantly increase in the perioperative period. Most adverse events that occur in hospital admission are preventable(1).

During perioperative care, both surgery and anesthesia significantly contribute to patient adverse events and harm. In this sense, a shared responsibility is forward to both surgery and anesthesia for the adverse event and harm that occur in the perioperative period(7). Since an anesthetist

performs a wide spectrum of anesthetic management during the perioperative period then its impact on patient safety is invaluable.

Today the issue of patient safety gets global attention because of the increase of morbidity and mortality during health care provision and this reinforces the installation of qualified and safe health care delivery systems world wide(8). To maintain patient safety and reduce the incidence of adverse events health care providers must have a good knowledge toward patient safety to safeguard patients(9).

1.2 Statement of the problem

Patient safety in health care currently identified as serious public health concern. According to WHO publication despite, the admissible, an inadmissible number of patients suffer or die because of adverse events or errors every year(1). The increasing prevalence and magnitude of patient harm indicate the problem and burden of unsafe care. The Patient harm due to adverse events is likely to be among the 10 leading causes of death and disability worldwide(1,3,10–12). Around 50% of the are avoidable and preventable(1). This incidence is even worse in developing countries 20 times than in developed country(1). This is because most of developing country has not yet install incidence-reporting system in their health care system. This is true in the Ethiopian context.

According to reports during medical provision around 1 in 10 hospitalized patients experience harm in which most of the harm being preventable(1). The estimated number of major surgical procedures undertaken annually around the world reaches 234 million(1).

Population-based research suggests that in the United States between 44,000 and 98,000 patients die each year from preventable errors, making a medical error the eighth most common cause of death(13). The prevalence of error and adverse event may be increases in operating rooms (OR) due to being interdisciplinary, complex setting with the need for high technical skill, where ergonomics and organizational factors play an essential role(2).

Errors, mistakes, and system failures continue to plague anesthetists as well as the other healthcare fields. Death or brain damage still occurs from hypoxemia after esophageal intubation, incorrect medical gas administration, or from other easily detectable and correctable events, even when modern monitoring technologies are in place.

The most basic standards are not followed uniformly—reliable anecdotes persist of anesthetized, paralyzed, and ventilated patients being left without an anesthetist in the room, even in reputable hospitals(6,7,14).

In Ethiopia, there is no central database, which receives and registers patient harms caused by adverse events and medical or surgical errors. Even there is no trend of incident reporting among health workers. A study done in different parts of Ethiopia demonstrates this fact. A study conducted in Addis Ababa public hospitals to assess incident reporting behavior among health workers found that a low incident reporting among health care professional(15). Another study was done in Oromia region also shows poor patient safety practice and potential medical errors in the hospital(16).

A meta-analysis study was done on medication error also shows that medication errors in Ethiopia is very common(17). Generally, in Ethiopia, the real magnitude of patient harm due to adverse event and errors are not known due to various reason. A few numbers of the report were found from the federal Health Professionals Ethics committee database, all registered from the investigation of compliance. All the complaints were coming from various bodies such as police, court, patient/client, patient families. According to the data, even if the number is very small charges from medico-legal issue significantly increase(18).

1.3 Justifications

An agreement was taken from a wide range of world countries on 18-19 February 2008 a meeting lead by WHO, held in Geneva to lunch patient safety research. The main objective of patient safety research is to determine the type and magnitude of incidence caused by unsafe care and the contributing factors for those incidences. Then, establishing interventions for the purpose of prevention, reduction, or mitigation of unsafe care to reduce incidences(1).

According to the WHO resolution in (2002), it recommended countries monitor, strengthen, assess and develop patient safety culture among health care institutions to prevent patient harm as patient safety is an international priority(1,9). To enhance patient care and decreasing morbidities and mortality rate associated with unsafe care it is important to equip the health profession with attitude, skills, and knowledge(9).

To improve patient safety, the core point to be considered are improving patient safety culture or education, adequate safety management, and good practice facilities. In study done in the university of Gonder teaching hospital only less than half(48.4) of the participant nurses have good knowledge about patient safety and only half of the participant nurses have a favorable attitude about patient safety(9).

Since OR are one of the settings where medical errors are mostly observed, the data obtained as a result of determining operating room professionals' attitudes towards patient safety will provide benefits in terms of identifying risk factors for patient safety, raising awareness in institutions and serving as an information source for operating room professionals and directors to conduct a preventive action. . Assessing the level of knowledge and attitudes among anesthetists toward patient safety and identifying the contributing factors is crucial to take appropriate actions to improve quality care.

Therefore, this study was proposed to assess the knowledge, attitude and contributing factors among anesthetist working at the governmental hospital of Addis Ababa regarding patient safety.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 Patient Safety

The World Health Organization (WHO) defines patient safety as "the absence of preventable harm to a patient during the process of health care" (1), while others have similarly defined patient safety as being the freedom from accidental injury caused by medical care, which further translates to medical error . The main scope of patient safety is reporting, analysis, and prevention of medical error that often leads to patient harm(19).

Safety culture has been be defined as "the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management"(20). Patient safety culture (PSC) is a reflection of professionals' shared assumptions, values, beliefs, and practices(11). Several study and institution has been developed well validated tools for measuring healthcare providers' attitudes, skills, and knowledge about the safety culture within their organizations(3,10,11,13,20,21).

Studies from the United States, Australia and Europe suggest that one in ten hospital patients experience some sort of harm, and it has been shown that medical errors, low quality of patient care, and increased length of hospital stay can be caused by lack of attention to patient safety(3,10,11,20). Robson J. et al.,(2011) mention excess workload, lack of familiarity with the patient, lack of knowledge, inadequate training, hierarchical teams, sleep deprivation, and lack of appreciation of the importance of prescribing are related to patient incident(12). Brasaite et al., (2015) also mention factors related to error such as workload, poor skills, interruptions, lack of concentration, and insufficient knowledge(22).

Leaving sponges in the operative filed,wrong-organ transplantation, incorrect blood transfusion or wrong site operations as the most common encountered medical error and adverse effect in the OR caused by interprofessional communication and cooperation problems(3). Kristensen, S. et al.,(2015) also mentioned ventilator-associated pneumonia, blood stream infections, patient falls, medication errors, as the most encountered cause of morbidities in health care but which are preventable(11).

Most of studies done on patient safety concluded that the installation of the 'culture' of safety into healthcare organization is one aspect of patient safety that is expected to significantly contribute to improving patient safety(1,5,9–11,22). Safety culture has become a significant issue for healthcare organizations striving to improve patient safety, and some safety investigations have indicated that organizations need to change their culture to make it 'easy to do the right thing, and hard to do the wrong thing' for patient care (10,23).

2.2 Attitude of patient safety and contributing factors

Recent studies assessed the safety culture in different types of healthcare organizations and hospital safety culture has been linked to patient safety (3,10,21). Many study has been done on patient safety culture and many of them demonstrated moderate and less favorable attitude health professional toward patient safety(3,5,9,10,24). Whereas a study done in Portugal, Lisbon anesthetist and surgeon show a favorable attitude toward patient safety(2). Many of the factor which affect the attitude associated with the expectations and actions of directors, institutional learning, teamwork, interprofessional open communication, appropriate feedback, the support of hospital administration and personnel education(2,10,20,25).

Study done in UK mentioned two approach for the prevention of medical error; Person centered approaches to error prevention 'blame' personal factors, like tiredness, or inattention, whereas system based approaches acknowledge that humans make errors and aim to develop procedures where these errors are recognized and corrected, and working environments where factors such as excess load or interruptions are limited to reduce the likelihood of mistakes(12).

Clinical governance activities more and more often include measuring and improving PSC as a foundation to creating highly reliable organizations. As a result there have been a growing body of literature on developing of good questionnaire to assess the PSC. The ultimate goal of the tool is to identify cultural strengths and weaknesses to improve activities and track the change over time as well as provide benchmark data(11).

A number of instruments are used to measure this patient safety climate or culture. The Safety Attitudes Questionnaire(SAQ) is a well validated instrument, used to identify multiple factors which affect safety climate at the clinical setting and to measure attitudes regarding safety climate(2). Sexton JB. et al., (2006) mention various factors that influence clinical practice(20).

They develop a 60 item Safety Attitudes Questionnaire used to assess health worker attitudes through 6 climate scales. Each of climate scale have their own sub scales and items are answered by using a five point likert scale. They assess the composite scale reliability for the SAQ via Raykov's ρ coefficient. The ρ value for the SAQ in this sample was .90, indicating strong reliability of the SAQ. Ongun ,P .et al.,(2017) conducted a research by using descriptive, cross sectional and correlation research designs to determine multi-professionals' attitudes towards patient safety on their result they found a strong positive correlation of the safety attitude mean score with teamwork cooperation (r=0.829), job satisfaction (r=0.803), the support of management (r=0.838), safety climate (r=0.885) and working conditions (r=0.749) subscales, and a weak, positive correlation with stress level(3).

Pinheiro , J.et al.,(2017) conducted a cross-sectional study to assess the attitude of operation room professionals by using SAQ-OR version. Respondent demographic characteristics such as gender, age, professional category, professional experience, employment status were also included(2). On their study they found Working conditions and job satisfaction have the highest score with 3.8 and 3.5, respectively, and perceptions of management have the lowest score 2.8(2). Roben, TQ. et al., (2018) a study done in Spain assess the safety climate of OR nurse by using SAQ-OR. On their finding age, professional experience and operating room working experience variables showed direct correlation and similar trends. Nurses under the age of 30 (with less professional experience and less operating room working experience) and over 55 years old showed better perceptions and they suggested phenomenon might be due to factors such as trust, inexperience, awareness of the risks and motivation that might be modified over their working life(26).

Ongun, P.et al.,(2017)a study done in Turkey using descriptive, cross-sectional and correlation research designs with a sample study of 477 individuals including nurses, physicians and anesthesia technicians. Data were collected using the Socio demographic and Working Characteristics Form and the Safety Attitudes Questionnaire. On their result attitudes towards patient safety were at moderate levels. Regarding the attitude scales, teamwork obtained the highest score, whereas stress recognition obtained the lowest score. As a result of the regression analysis with P value <0.05 receiving patient safety significantly associated with professionals' safety attitudes(3).

Flota D. et al.,(2012) also ask the physician about their involvement in and perceived causes of medical errors. Respondents usually attributed medical errors to more than one causes

Among system failures, 'overwork, stress or fatigue of health professionals' was the most rated item, while 'health professionals poorly skilled or experienced' was the most rated item among causes of error related to the human factor(10). This study revealed factors that mostly contribute to medical errors are overwork, stress or fatigue which is revealed by other studies.

A study done on attitude of patient safety among nurse in northern Ethiopia by using SAQ, more than half (56.1%) (95% CI: 51.7–60) of the respondents had a favorable attitude while the remaining had an unfavorable attitude towards patient safety. Regrading to contributing factors Age, information about patient safety received during initial or continuing education, training about patient safety and knowledge of patient safety were found to have strongly association with favorable attitude at a p-value of ≤0.05(9).

2.3 Knowledge of patient safety and contributing factors

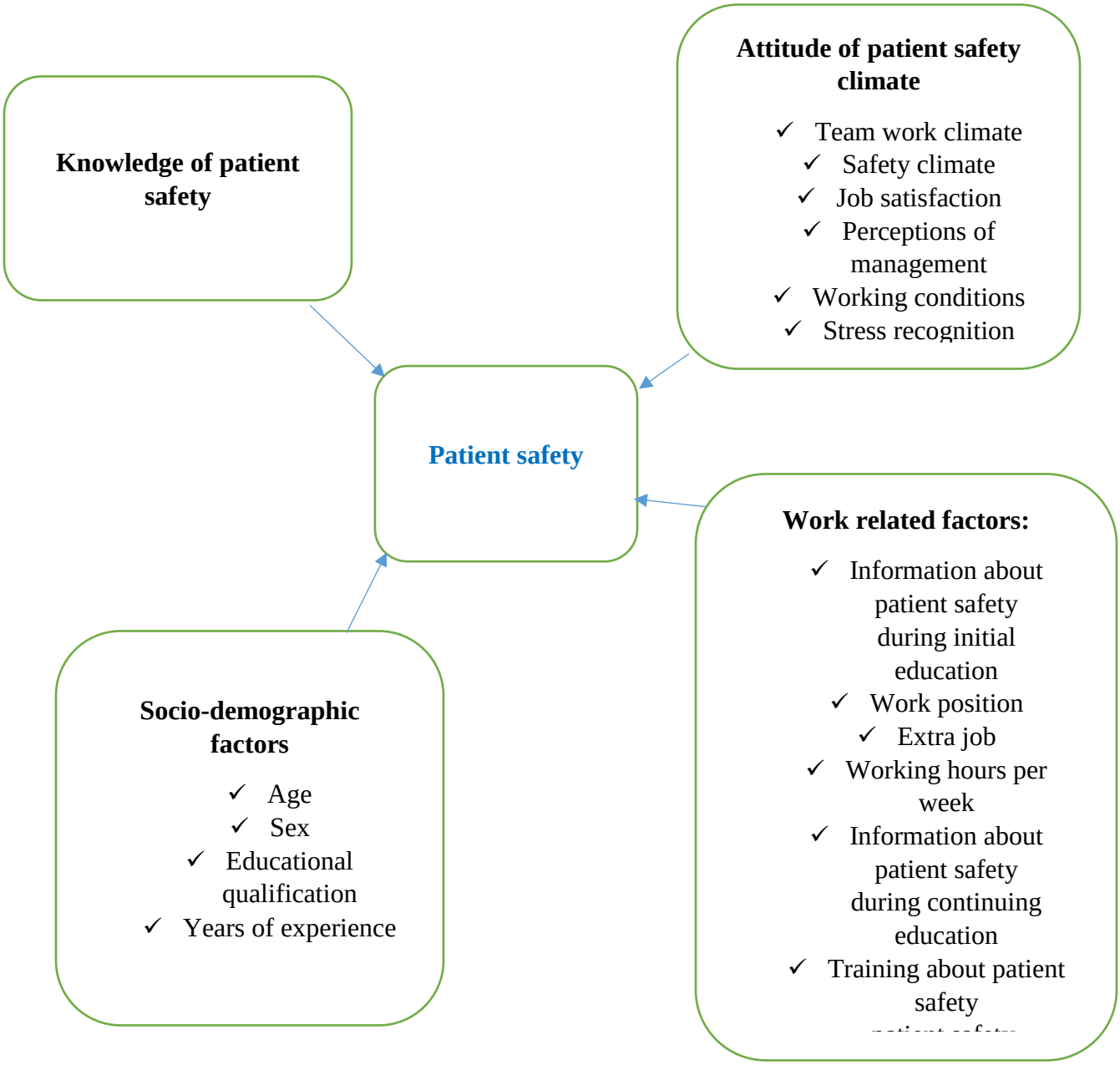
To ensure safe care for patients and prevent harm it is important to identify the gaps in the knowledge of healthcare professionals(1,10,22). Robson J. et al., (2011) conduct a research on graduate medical student about their Knowledge on patient safety principles and incidents. Most of the participant have good knowledge on contributing factors to human error, awareness on how to report patient incidence and the occurrence of patient harm in hospital during clinical care(12). Where as a study done in Lithuania to assess the knowledge of patient safety on multidisciplinary health profession a low level of safety knowledge was report, especially in regard to knowledge concerning general patient safety(23). On their result, they demonstrated that educational qualification had a significant association with knowledge's of health care workers. On this research they found several background factors which associated with knowledge's of health care worker about patient safety such as, length of work experience in general ($p < .01$).As a result they concluded that information about patient safety during their initial and continuing education significantly associated with safety knowledge(23). The same research done in Turkey, UK ,Italy and Egypt also report the same result(3,5,10,12).

An interventional study done in surgeons demonstrated that training about patient safety significantly associated with good knowledge of patient safety with a p-value less than 0.01(22). This indicated that training can help to improve knowledge deficit. Flotta et al., (2010) conducted a national wide cross-sectional survey in 40 regional and district hospital in Italy to assess level of knowledge, attitudes and behavior among Italian hospital physicians toward patient safety and

medical error(10). Questions asked to respondents were use a three-point scale ‘agree/uncertain/disagree’. On their finding they reported above 85% of the respondent were agreed on the effectiveness of counting surgical items during an invasive surgical procedure and encouraging hospitals to report medical errors voluntarily to a state agency could be effective in reducing the number of medical errors. They set at P =0.2the significance level for including and at P = 0.4 for dropping variables from the models and level of significance was set at α=0.05. In this finding the number of years elapsed since graduation was the only variable significantly associated with the knowledge of evidence based patient safety practices. Brasaite I. et al.,(2015) conducted a systemic review on the same area of study they generally found contradictory result on healthcare professionals’ knowledge levels, some studies they took reported a good knowledge level yet others identified knowledge deficits(22).

A study done in Gonder University hospital, Ethiopia from all participant nurses less than half (48.4%) were found to have good knowledge where, the rest of them(51.6) had knowledge deficit. They also identified the predicting factors of knowledge regarding patient safety as age, level of education, work experience and training about patient safety a p-value of < 0.05(9).

2.4 Conceptual framework



3. CHAPTER THREE: OBJECTIVES OF THE STUDY

3.1 General objective

To assess the level of knowledge and attitudes of anesthetist towards patient safety and the associated factors in governmental referral Hospitals, Addis Ababa, Ethiopia 2020/2021.

3.2 Specific objectives

To assess anesthetist level of knowledge towards patient safety in governmental referral Hospitals, Addis Ababa, Ethiopia.

To assess anesthetist level of attitudes towards patient safety in governmental referral Hospitals, Addis Ababa, Ethiopia.

To identify associated factors for the level of knowledge and attitudes of anesthetist towards patient safety in governmental referral Hospitals, Addis Ababa, Ethiopia.

4. CHAPTER FOUR: METHODOLOGY

4.1 Study area

This study was conducted in the governmental Hospital of Addis Ababa; Addis Ababa is the capital city of Ethiopia, It is the largest city in Ethiopia with an area of 530 km2. According to the projected population size of 2007 population census to 2012 the population of Addis Ababa is estimated to be 3,046,333. Currently, there are 13 general and referral hospitals in the city that are administered by different governmental institutions namely Addis Ababa city administration health bureau, the federal minister of health, Addis Ababa university, the federal armed force, and federal police. All have active minor and major operation theaters for various types of surgery. In each hospital, there are Bsc anesthetists, which are professional anesthesia providers where in some of the hospitals there, are Msc anesthetists (anesthesia professional specialists). According to data taken from each hospital, there are a total of 274 active anesthetists, which included diploma to master anesthetists.

4.2 Study design and study period

Across-sectional study design was used. The study was conducted from January 30, 2020 –June, 2021.

4.3 Population

4.3.1 Source population

All anesthetists who are working in Addis Ababa governmental referral Hospitals.

4.3.2 Study population

All anesthetists who are meeting the criteria of inclusion during the data collection period.

4.4 Inclusion and Exclusion criteria

4.2.1 Inclusion

All anesthetists who have been working for six months and above in Addis Ababa government referral Hospitals during the data collection period.

4.4.2 Exclusion criteria

Anesthetists on free service, academician anesthetists, and anesthesia students were excluded from this study.

4.5 Sample size determination

Since the source population size is small and it was feasible to include all participants sample size determination was not needed.

4.5.1 Sampling procedures

Every voluntary anesthetist meeting the criteria of inclusion was included in the study during the study period.

4.6 Study variables:

4.6.1 Dependent variable:

Knowledge and attitude of anesthetist towards patient safety.

4.6.2 Independent variables

Socio-demographic factors: Age, sex, educational qualification, years of experience **Work-related factors:** information about patient safety during initial education, work position, extra job, working hours per week, and information about patient safety during continuing education, training about patient safety.

4.7 Operational definitions

Good knowledge: Anesthetist, who scored above or equal to the mean score of the knowledge questions. But, those who scored below the mean were considered as having poor knowledge about patient safety (9,13).

Favorable attitude: Anesthetist, who scored above or equal to the mean score of the attitude questions. But in the those who scored below the mean score were considered as having unfavorable attitude towards patient safety(9,13).

4.8 Data collection tool

Data was collected using a structured and pre-tested self-administered questionnaire among anesthetist who fulfilled inclusion criteria during the data collection period. The questionnaire adapted and modified from several well-validated tools that are prepared previously for measuring healthcare providers' attitudes about the safety culture and knowledge about patient safety within their organizations and from the relevant review of the literature and similar studies (5,9,13,20,22,23) and it is prepared in English version.

The SAQ was developed by Bryan Sexton, Eric Thomas, and Bob Helmreichand and validated in 2006 by teamwork from The University of Texas. The SAQ is a self-administered questionnaire that allows obtaining a snapshot of the safety climate through surveys of frontline worker perceptions. It contains 34 items and is answered using a five-point Likert scale. The final score varies between 0 and 100, 100 represents the best attitude, and a positive response value considered above the mean score(25,27).The scale reliability and consistency were measured by Cronbach alpha. The Cronbach alpha value were good for all scale: for teamwork climate(r)=0.78, for safety climate(r)=0.76, for job satisfaction(r)=0.874, for perception of management(r)=0.902, for working condition(r)=0.717, for stress recognition(r)=0.806 and the overall Cronbach alpha (r)=0.918.

4.9 Data collection procedure

The questionnaire incorporated 10 questions related to the socio-demographic characteristics, 7 questions, which assess the knowledge of anesthetist about patient safety and 34 questions which assesse the attitude of anesthetist towards patient safety. 8 items were negatively worded and reverse coded so that a higher score was associated with more positive attitudes.

4.10 Data Quality Control and Assurance

To assure the quality of data, brief orientations on the assessment tools were provided for a data collector. The questionnaire was prepared in English and pretested on 5% of the source population for easiness, simple and understandable in Tikur Anbessa specialized hospital. The result of the pretest wasn't included in the final analysis. During data collection, each questioner was revised by the investigator for being complete and appropriate.

4.11 Data Processing and Analysis

Data were coded, edited, and then entered and cleaned using Epi version 7 and exported to Statistical Package for Social Sciences (SPSS) software version 24.0. Descriptive statistics were used to summarize data, tables, and figures for display results. The association among independent factors and the outcome variable was determined by bivariable and multivariable logistic regression. Variables with a p-value less than 0.2 in the bivariable logistic regression analysis were considered for multivariable analysis. After checking for multicollinearity, multivariable analyses were performed to adjust for possible confounders and to come up with significant predictors.

Odds ratios and their 95% Confidence Intervals were computed and a p-value of less than 0.05 was considered as statistically significant.

4.12 Ethical Considerations

Ethical clearance was obtained from the Ethical Review Board of Addis Ababa University. The objective of the study was explained and permission was obtained from the clinical service coordinator of the hospital. Before administration of the questioner, informed consent was taken from each participants. Participant records were coded and only accessed by the research team; hence, confidentiality of participant records and privacy of the health facility was secured.

4.13 Dissemination and Utilization of Results

The finding of the study will be submitted in a form of a thesis to AAU College of Health Science, Department of anesthesia. The result will be publicly defended following submission. Copies will be provided to relevant stakeholders. Efforts will be made to present the results in scientific conferences and to publish in reputable journals.

5 CHAPTER FIVE: RESULTS

5.5 Socio-demographic characteristics of the participants

The questionnaire was answered by 238 (86.8 %) of anesthetist surveyed the loss were due to refusal to participate (n=27) and unavailability during study period. The mean age of the participants was 31 (SD=6.94). Of them, 54.2% were between the ages of 20 and 29, 60.9% were male. The mean work experience was 8 years and they worked an average of 60 h per week

(Table 1).

Table 1: Socio demographic characteristic of Anesthetists working in governmental hospital in addis ababa from January 1, to March 30, 2021. (n=238)

Variable	Category	Frequency (%)
Age	20-29	129(54.2)
	30-39	71(29.8)
	40-49	25(10.5)
	50-59	13(5.5)
Gender	Male	145(60.9)
	Female	93(30.1)
Educational qualification	Diploma	5(2.1)
	Degree	213(89.5)
	Master	20(8.4)
Work experience	<5	93(39.1)
	5-9	97(40.8)
	10-15	28(11.80
	>15	20(8.4)
Work position	Head Anesthetist	15(6.3)
	Staff Anesthetist	223(93.7)
Working hour per week	<40	21(8.8)
	40-59	120(50.4)
	60-79	43(18.1)
	>80	54(22.7)
Extra job	Yes	52(21.8)
	No	186(78.2)

Information about patient safety during initial education	Yes	193(81.1)
	No	45(18.9)
Information about patient safety during continuing education	Yes	114(47.9)
	No	124(52.1)
Training about patient safety	Yes	115(48.3)
	No	123(51.7)

5.6 Knowledge of anesthetist regarding patient safety

The mean score was 54%. Greater than half (n=135, 56.7) of the participant was found to have good knowledge. Most of the participants were found to have a gap on three knowledge questions; one, the key dimensions of patient safety culture, two, the key to patient safety strategies, and three, I know how to formally report the incident (good knowledge was reported among 25.1%, 26.5% and 33.6% of the study participant respectively).

Table 2: Anesthetist rating in percentage about knowledge in governmental hospital of addis ababa from January 1, to March 30 (n=238)

Variable	NK (%)	LK (%)	SL (%)	K (%)	VK (%)
Contributing factor of human error	0.8	9.7	58.4	25.6	5.5
Patients can be harmed during the provision of health care	1.7	18.1	50.8	21.8	7.6
Preventable harm will occur at least one in 10 hospital patients	10.9	50.4	32.4	1.7	4.6
I know how to formally report incident	18.5	47.9	28.2	4.2	1.3
The key to patient safety strategies	24.8	48.7	23.5	2.1	0.8
The key dimensions of patient safety culture	27.3	46.6	20.6	3.4	2.1
A mistake is a failure to execute an action plan as intended or implementation of the wrong plan	2.1	13.4	16.8	52.1	15.5

Reference: NK: not knowledgeable; LK: little knowledgeable; SL: somewhat knowledgeable; K: knowledgeable: VK: very knowledgeable

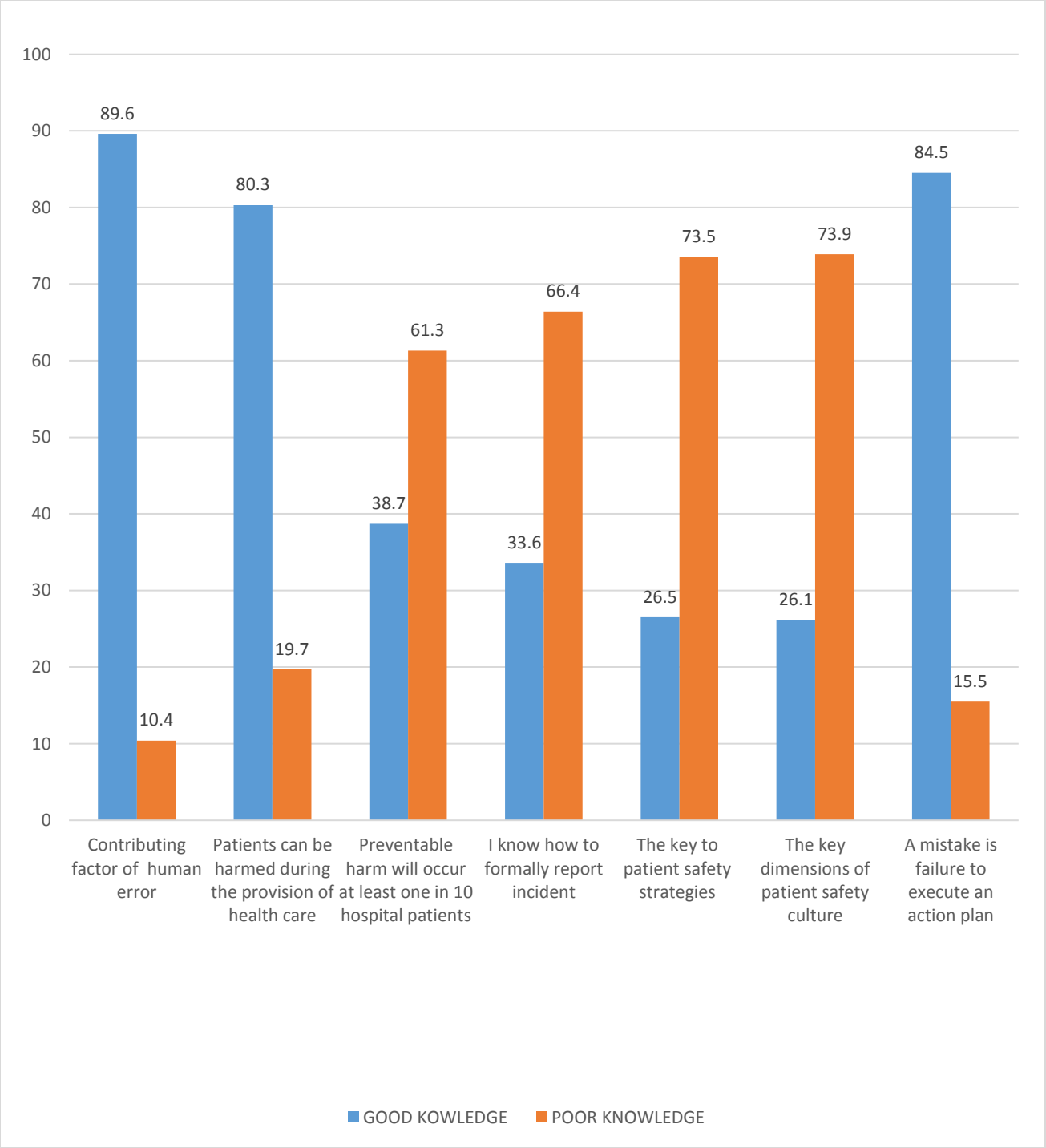


Figure 1: Percentage distribution and Level of knowledge based on anesthetist rating in governmental hospital of addis ababa from January 1, to March 30

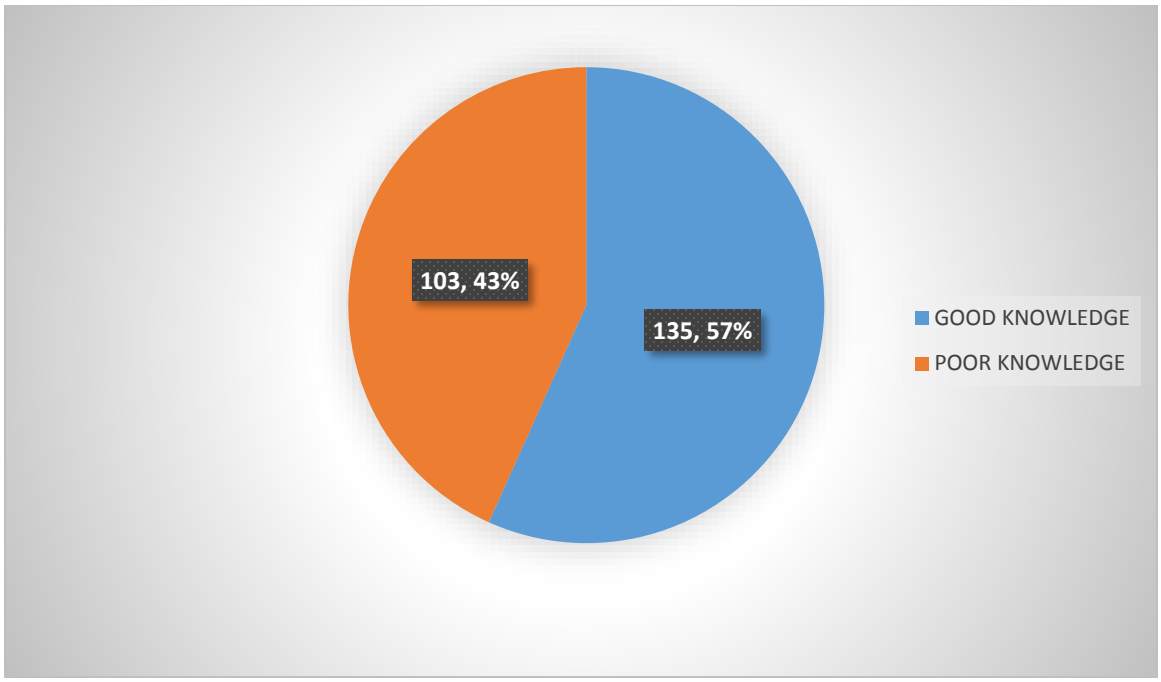


Figure 2: Overall anesthetist's level of knowledge in governmental hospital of addis ababa from January 1, to March 30

5.7 Factors associated with knowledge of Anesthetist regarding patient safety

Binomial logistic regression was performed to ascertain the effects of independent factors on the level of knowledge. On the bivariate analysis Sex, educational qualification, working hours, extra job, and information about patient safety during initial education had a p-value >0.2 and were not included in multivariate logistic regression analysis.

The most important variables were found to be work experience, information during continuing educations, and training about patient safety($p<0.05$). Working experience greater than or equal to 15 years p (0.02) [AOR=3.9.;95% CI:(1.23-12.29)] have higher odds than working experience less than or equal to 5 years. Those who had information about patient safety during continuing education p (0.001) [AOR=4.01.; 95% CI:(1.99-8.07)] have higher odds than compared to those who did not have. Those who have received training about patient safety p (0.002) [AOR=2.9.; 95% CI: (1.46-5.66)] have higher odds compared to those who did not receive training.

Table3: Factor associated with knowledge of anesthetist analyzed by bivariable and multivariable logistic regression in governmental hospital of addis ababa from January 1, to March 30 (n=238).

Variable	Category	Knowledge N (%)		COR 95% CI	P-value	AOR 95% CI	P-value
		G	P				
Age	20-29	56	72	1		1	
	30-39	43	28	1.97(1.1-3.56)	0.024*	1.82(0.887-3.871)	0.103
	40-49	20	5	5.14(1.81-14.55)	0.002*	3.69(0.96-14.21)	0.047
	50-59	10	3	4.28(1.12-16.3)	0.033*	5.01(0.863-29.77)	0.043
Gender	Male	77	67	1			
	Female	52	41	0.9(0.53-1.53)	0.712		
Educational qualification	Diploma	2	3	1		1	
	Degree	110	102	0.72(0.46-3.05)	0.72		
	Master	14	6	2.7(0.32-21.7)	0.023		0.175
Year of experience	<5 yr	32	60	1		1	
	5-9 yr	40	49	0.653(0.359-1.189)	0.164	0.59(0.309-1.128)	0.111
	10-14 yr	19	8	2.909(1.153-7.342)	0.024*	2.66(0.89-8.079)	0.083
	>15 yr	23	6	4.696(1.743-12.648)	0.002*	3.9(1.23-12.29)	0.02**
Work position	Head anesthetist	4	10				
	Staff anesthetist	125	98	0.93(2.095-4.03)	0.56		
Working hrs per week	<40hrs	10	11	1			
	40-59hrs	26	27	0.944(0.343-2.596	0.911		
	60-79hrs	68	52	1.35(0.71-2.59)	0.355		
	>80hrs	25	18	1.44(0.641-3.24)	0.376		
Information about patient safety during initial edu.	Yes	106	86	1			
	No	23	22	1.179(0.615-2.258)	0.62		
	Yes	86	28	1		4.016(1.99-8.07)	0.001**

Information about patient safety during continuing edu.	No	43	80	0.175(0.099-0.308)	0.000*	1	
Training about patient safety	Yes	79	44	1		2.87(1.46-5.66)	0.002**
	No	29	85	0.19(0.109-0.333)	0.000*	1	

*Statically significant, p<0.2 **Statically significant P<0.05 COR-crude odd ratio AOR-adjusted odd ratio G: good, P: poor

5.8 The attitude of anesthetists regarding patient safety

The overall mean score was (58%), most of them (69.3%) had a favorable attitude while the rest had an unfavorable attitude toward patient safety. Most of the respondent had a Positive safety attitude on their job satisfaction scale (mean=70%), stress recognition scale (mean=69.4%), and teamwork scale (60.5%) while less than half of the respondent had a negative attitude on their management scale (mean=48.6%) and working condition scale (mean=49.2%).

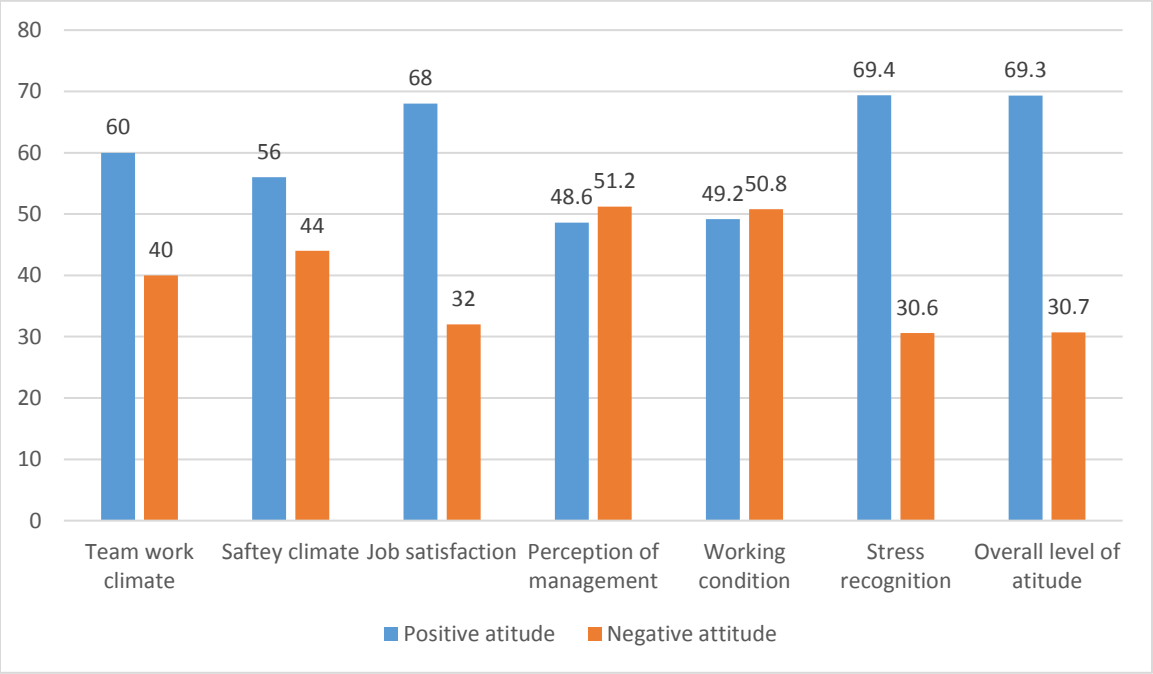


Figure 3: Percentage distribution of level of attitude toward patient safety in governmental hospital of addis ababa from January 1, to March 30

5.9 Factors associated with the attitude of Anesthetist regarding patient safety

According to the bivariate logistic regression model work position, training about patient safety, and level of knowledge were Candidates for the multivariate regression model at a p-value of <0.2. Based on multivariate logistic regression analysis level of knowledge and training about patient safety were found to be associated with the attitude of nurses towards patient safety at a p-value of <0.05.

Anesthetists with good knowledge regarding patient safety were p (0.005) [AOR =2.6.;CI: (1.32,5.02)] more likely to have a favorable attitude as compared to those who had poor knowledge. Those who have received training about patient safety p (0.012) [AOR=2.; 95% CI: 1.2-3.64)] more likely to have a favorable attitude compared to those who did not receive training.

Table: 4 Factor associated with the attitude of anesthetist analyzed by bivariable and multivariable logistic regression in governmental hospital of addis ababa from January 1, to March 30 (n=238).

Variable	**Category**	**Attitude N (%)**		**COR 95% CI**	**P-value**	**AOR 95% CI**	**P-value**
		+ve	**-ve**				
Age	20-29	82	44	1		1	
	30-39	54	17	1.81(1-4.49)	0.236		
	40-49	19	6	1.92(0.7-3.86)	0.072		
	50-59	9	4	2.41(0.4-4.42)	0.032		
Gender	Male	99	46	1			
	Female	65	28	1.1(0.7-1.9)	0.793		
Educational qualification	Diploma	2	3	1		1	
	Degree	150	63	0.6(0.07-5.31)	0.631		
	Master	11	9	0.32(0.03-3.24	0.325		
Year of experience	<5 yr	66	27	1		1	
	5-9 yr	62	35	0.72(0.4-1.4)	0.301		
	10-14 yr	21	7	1.23(0.47-3.22)	0.678		
	>15 yr	15	5	1.23(0.4-3.71)	0.717		
Work position	Head anesthetist	6	9	1			
	Staff anesthetist	158	65	3.7(1.24-10.65)	0.018*	2.98(1-8.92)	0.05

Working hrs per week	<40hrs	14	7	1			
	40-59hrs	86	34	1.26(0.47-3.4)	0.642		
	60-79hrs	29	14	1.03(0.34-3.14)	0.951		
	>80hrs	35	19	0.92(0.31-2.67)	0.921		
Extra job	Yes	40	12	1			
	No	124	62	1.66(0.8-3.4)	0.161		
Information about patient safety during initial edu.	Yes	138	55	1.8(1-3.58)	0.076		
	No	26	19		1		
Information about patient safety during continuing edu.	Yes	93	37	1.31(0.8-2.3)	0.137		
	No	71	37		1		
Training about patient safety	Yes	87	29	2.2(1.3-3.74)	0.007*	2(1.2-3.64)	0.012**
	No	71	55		1		
Level of Knowledge	Good	106	23	3.8(2.1-6.89)	0.000*	2.6(1.32-5.02)	0.005**
	Poor	59	49		1		

*Statically significant, p<0.2 **Statically significant P<0.05 COR-crude odd ratio AOR-adjusted odd ratio

6 CHAPTER SIX: DISCUSSION

Patient safety Knowledge

Our results demonstrated that greater than half (n=135, 56.7%) of the participant was found to have good knowledge. Our result is consistent with a study done in Turkey and Palestine(3,28) while a study done in the United Kingdom(UK) reported a high proportion of knowledge(>80%) among physician(12). The variation could be study population (non-physician versus Physician) and they have high dissemination of information about patient safety through various media such as patient safety curriculum in medical education. Another study was done in northern Ethiopia to assess nurses' knowledge regarding patient safety the result reported that less than half (48.4%) of the respondents were found to have good knowledge(9). This is lower than our finding the possible reason could be variation in the study population and sample size.

Most of the anesthetist was rating the lowest score on the key dimensions of patient safety culture(25.1%), the key to patient safety strategies (26.5%) and I know how to formally report incident (33.6). It is well known that maintain a patient safety culture within the institution, awareness of patient safety strategies, and incident reporting are linked positively with patient safety(22). However, most of the anesthetist in this study had a knowledge gap in those parameters the result is similar to the study done in Egypt Cairo which assess the physician knowledge about patient safety the result reported that about 50% of the physician had good knowledge about patient safety and the identified knowledge gap were ways of speaking up about errors, how to report errors, and the role of healthcare organization in reporting of error(5). The reason for those gaps could be inadequate information delivered from stakeholders such as the ministry of health, professional association, and hospital management to make aware the health worker about patient safety strategies, install incident-reporting system, and deliver orientation on how it will be report and less capacity building training program about patient safety.

In this study, working experience was associated with anesthetist's knowledge toward patient safety. Working experience greater than or equal to 10 years 4 times [AOR=3.9.;95% CI:(1.23-12.29)] more likely to have good knowledge compared to less than or equal to 5 years. This finding is in line with many studies done on different health professionals in different parts of the world(5,9,10,22,29). A study conducted in Italy to assess physician knowledge on patient safety practice working experience was significantly associated with their knowledge score(10). Another

study was done by Z Kiyancicek, et., al in Turkey which report a similar result with us(30). A study was done by Biresaw H. et.,al in the northern part of Ethiopia also agreed with our result(9). This might be explained by the fact that the older the professionals who work in an institution get, the higher the level of sense of belonging and loyalty they feel for the institution(3).

This study demonstrated that those who had information about patient safety during continuing education p (0.001)[AOR=4.; 95% CI:(1.99-8.07)] and those who have received training about patient safety p(0.002) [AOR=2.9.;95% CI: (1.46-5.66)] associated with good knowledge about patient safety. This study is in line with a study done in the northern part of Ethiopia(9). A study was done in a zonal hospital south wello Amhara region supports our result. Participants who had not taken training on incident reporting were 0.722 times (72.2%) less likely to have adequate knowledge compared with participants who had taken training on incident reporting(4).

Another study done in three regional hospitals of Western Lithuania reported a comparable result with ours. The result demonstrated that Respondents' general knowledge related to patient safety was associated with their length of work experience in general ($p < .01$) and continuing education about patient safety ($p < .01$)(22). This is explained the fact that knowledge could be acquired from a formal curriculum or job training. Getting information through work experience, continuing education, or attending training increases knowledge.

Patient safety attitude

Assessing and promoting a culture of safety is recognized as a prerequisite step towards improving patient safety. Culture assessment tools, such as SAQ, provide an avenue for understanding the existing patient safety issues. Use of the SAQ to assess the climate in clinical areas will allow valid comparisons between hospitals, patient care areas, and types of caregivers, and tracking of change over time(25).

The present study showed a positive attitude on patient safety scores. A proportion greater than half (69.3%) of the respondent scored positive attitude on patient safety culture. The result is in line with a study done in hospitals in Izmir, Turkey(30) and higher than a study done in other parts of Ethiopia university of Gonder referral hospital(56.1%), Oromia regional Jimma zone(46.7%), and Amhara regional hospitals (37.6%)(9,31). The variation for these results may be due to the setting of the study, educational qualification of the study participant, study population, sample

size, and method we used. In this study, most of the respondent had a Positive safety attitude on their job satisfaction scale (mean=70%), stress recognition scale (mean=69.4%), and teamwork scale (60.5%) while less than half of the respondent had a negative attitude on their management scale (mean=48.6%) and working condition scale (mean=49.2%).

Comparing our findings to previous studies many showed similar findings with our result on job satisfaction scale and teamwork scale while the result of this study found to be low on the perception of management scale and working condition scale(2,3,10,23). The reasons behind the variation could be the setting of developed versus developing countries. The most challenging area in the developing country is medical logistics scarcity, which affects the working conditions and managerial perception negatively. Deficit to acknowledge health workers, a low chance for further education, and low incentive are the issues that arise in a developing country, which may affect managerial perception negatively.

Based on multivariate logistic regression analysis anesthetists with good knowledge regarding patient safety were 2.6 times [AOR =2.6. ; CI:(1.32,5.02)] more likely to have a favorable attitude as compared to those who had poor knowledge. The result is in line with a study done in the northern part of Ethiopia to assess nurses attitude toward patient safety the result demonstrated that nurses who had a good knowledge regarding patient safety were strongly associated with a favorable attitude toward patient safety(9).

It was also observed in this study that, training about patient safety associated with a positive attitude toward patient safety. Those who have received training about patient safety p (0.012) [AOR=2.; 95% CI: 1.2-3.64)] more likely to have a good attitude compared to those who did not receive training. It was found to be necessarily associated in several other studies(3,10,29,31).

6.1 Strength and Limitation of the research

The strength of our study is that we permitted all-volunteer study populations to participate in this study without randomization or restriction. The main thing that we suppose as a limitation of our study is the data collection tool, which was the Likert scale, which may increase the response bias. The other thing is a shortage of study either domestically or globally done separately on anesthetists which unable us to compare the result with the same study population.

7 CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1 Conclusions

Based on the finding of our study the participant was found to have a favorable attitude and relatively good knowledge. The most important knowledge gap were the key dimensions of patient safety culture, the key to patient safety strategies set by the national program, and how to report incidence if it happened. Age, work experience, information during continuing education and training about patient safety were a predictor of knowledge of patient safety. Participants were found to have a favorable attitude on teamwork climate, job satisfaction, and safety climate subscales while they had unfavorable attitudes on working conditions and perception of management. The most important predictors of attitude were knowledge of patient safety, age, and training about patient safety.

7.2 Recommendation

Based on our finding we recommended that:

For Ministry of health, curriculum formulator and reviewer and higher educational institutions

Since patient safety teaching is relatively new for most healthcare educators, incorporating patient safety modules in the teaching curriculum is necessary. Launch medical error and incidence reporting system and encourage health workers to report whenever it happened. Encourage health institutions to assess their institution's patient safety culture frequently.

For professional association

Administer building capacity in-service training on: Patient safety strategies, the key dimensions of patient safety cultures, the benefit of incident reporting and how incident are formally reported and the prevalence and the contributing factors of medical errors

For hospital management

Improve medical logistic capacity to make the environment convenient for work is paramount, made a good recreational area to alleviate the stress of health workers is very important. Promotion, acknowledgment and reward also the other paramount things to be considered.

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9 ANNEXES

Annex I: Information and Consent Form.

Dear participant: Hello, my name is …….. , I am here on behalf of Anteneh Atle, a student at Addis Ababa University, school of medicine department of anesthesia. He is conducting a research on `Knowledge, attitude and associated factors towards patient safety among anesthetist at Addis Ababa governmental hospitals`.

The purpose of this questionnaire is to gather information on to assessing Knowledge, attitude and associated factors towards patient safety among anesthetist working in governmental hospital in Addis Ababa, Ethiopia, October –May, 2020/21. The study is aimed to improve on health planning on patient safety during health service. There will be no direct benefit by participating in this study but in the future information gathered by this study will helps Anesthesia department ,hospital managers, policy maker, programmers and researchers to give appropriate attention on issue of patient safety.

There is no risk to take part in the study, all information is confidential. Your name will not keep in the form. Moreover, this research thesis is approved by Ethical review board of AAU and college of health science, department of Anesthesia. Your correct and genuine response or answer to the questions can make the study achieve its goal. Therefore, you are kindly requested to respond voluntary with patience. The questionnaire may take 10 to 15 minutes.

I would like to assure you that your name will not be written on this form and all the Information gathered will be kept strictly confidential. Are you willing to participate in answering the questionnaire? Yes!

Go to the next page.

Code of questioner……..

Date of data collection.....

Name of data collector..... signature.....

For any questions or concerns you can contact the principal investigator:

Name: Anteneh Atle

Tel: +251936441784

E-mail: antenehatle1987l@gmail.com

Annex II. Questionnaires checklists

Part I: Questions on Socio demographic characteristics

No.	**Questions**	**Alternative**	**Remark**
1	Write your age (in year)	_____	
2	Sex	1.M 2.F	
3	Educational qualification	1. Diploma 2. Degree 3. Master	
4	Years of experience	1. < 5 years 2. 5–9 years 3. 10–14 years 4. ≥15	
5	Work position	1. Head anesthetist 2. Staff anesthetist	
6	Working hours per week	1. < 40 h 2. 40–59 h 3. 60–79 h 4.>80	
7	Extra job	1. Yes 2. No	
8	Information about patient safety during initial education	1. Yes 2. No	
9	Information about patient safety during continuing education	1. Yes 2. No	
10	Training about patient safety	1. Yes 2. No	

Part: II Questions on Knowledge of Anesthetist regarding patient safety.

Answer based on the following rating system (1 = not knowledgeable, 2 = a little knowledgeable, 3 = somewhat knowledgeable, 4 = knowledgeable, 5 = very knowledgeable.

No.	Question	Rating				
		1	2	3	4	5
1	I have good knowledge of the factors contributing to human error					
2	Hospital patients can be harmed as a result of their clinical care					
3	At least one in 10 hospital patients will experience some kind of avoidable harm					
4	If I become aware that a patient safety incident has occurred, I know how this should be formally reported					
5	The key to patient safety strategies set by the national program for patient safety					
6	The key dimensions of patient safety culture					
7	A mistake is failure to execute an action plan as intended or an implementation of the wrong plan					

Part: III Questions on attitude of anesthetists towards patient safety

Answer based on the following rating system: 1= disagree strongly, 2= disagree slightly, 3=neutral,4= agree slightly, and 5= agree strongly.

No.	Question	Rating				
Teamwork climate						
		1	**2**	**3**	**4**	**5**
1	Anesthetist input is well received in clinical area.					
2	In this clinical area, it is difficult to speak up if I perceive a problem with patient care.*					
3	Disagreements in this clinical area are resolved appropriately (i.e., not *who* is right, but *what* is best for the patient)					
4	I have the support I need from other personnel to care for patients.					
5	It is easy for personnel here to ask questions when there is something that they do not understand					
6	The physicians and nurses here work together as a well-coordinated team.					
Safety climate						
7	I would feel safe being treated here as a patient.					
8	Medical errors are handled appropriately in this clinical area.					
9	I know the proper channels to direct questions regarding patient safety in this clinical area.					
10	I receive appropriate feedback about my performance.					
11	In this clinical area, it is difficult to discuss errors*					
12	I am encouraged by my colleagues to report any patient safety concerns I may have.					

13	The culture in this clinical area makes it easy to learn from the errors of others.					
Job satisfaction						
14	I like my job					
15	Working here is like being part of a large family					
16	This is a good place to work.					
17	I am proud to work in this clinical area					
18	Morale in this clinical area is high.					
Perception of management						
19	Unit Management supports my daily efforts					
20	Hospital Management supports my daily efforts.					
21	Hospital Management doesn´t knowingly compromise pt safety.					
22	Unit Management is doing a good job.					
23	Hospital Management is doing a good job.					
24	This hospital constructively addresses problems of the clinicians in this area					
25	I get adequate, timely info about events that might affect my work, from Unit Management.					
26	I get adequate, timely info about events that might affect my work, from Hospital Management.					
Working condition						
27	The levels of staffing in this clinical area are sufficient to handle the number of patients.					
28	This hospital does a good job of training new personnel.					
29	All the necessary information for diagnostic and therapeutic decisions is routinely available to me.					
30	Trainees in my discipline are adequately supervised					

Stress recognition						
31	When my workload becomes excessive, my performance is impaired.*					
32	I am less effective at work when fatigued.*					
33	I am more likely to make errors in tense or hostile situations*					
34	Fatigue impairs my performance during emergency situations (e.g. emergency resuscitation, seizure)*					