ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF EMERGENCY MEDICINE

PATIENT SAFETY INCIDENT REPORTING BEHAVIOUR AND ASSOCIATED FACTORS AMONG HEALTH CARE PROFESSIONALS WORKING IN ACUTE CARE SETTINGS OF FEDERAL HOSPITALS IN ADDIS ABABA, ETHIOPIA.

BY: EYERUSALEM KALE'AB (BSc)

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE, DEPARTMENT OF EMERGENCY MEDICINE FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF SCIENCE IN EMERGENCY MEDICINE AND CRITICAL CARE NURSING

JUNE, 2020

Addis Ababa, Ethiopia

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Approval sheet

ADDIS ABABA UNIVERSITY
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This thesis by Eyerusalem Kale'ab entitled, Patient Safety Incident Reporting Behavior And Associated Factors Among Health Care Professionals Working In Acute Care Settings Of Federal Hospitals In Addis Ababa, Ethiopia, is accepted in its present form by the examiners as satisfying thesis meeting the requirement for the Degree of Masters in Emergency Medicine and Critical Care Nursing.

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Statement of declaration

I, the undersigned, declare that this thesis is my own work. I have followed all ethical principles of scholarship and Addis Ababa University's thesis writing guideline in the preparation, data collection, data analysis and document preparation of this thesis. By my signature here, I affirm that I have acknowledged all sources used in this document. Every effort has been made to avoid plagiarism by using plagiarism checker software.

This thesis is submitted in partial fulfillment of the requirement for a graduate degree from the Addis Ababa University at College of Health Sciences, School Of Medicine, Department of Emergency Medicine and Critical Care Nursing. I also sincerely declare, this paper has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

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Acronyms and Abbreviations

AE	Adverse Events
AHRQ	Agency of Health Care Research and Quality
ALERT	African Leprosy Research and Training
CI	Confidence Interval
ED	Emergency Department
FMoH	Federal Ministry of Health
GP	General Practitioner
HSPSC	Hospital Survey on Patient Safety Culture
ICU	Intensive Care Unit
PI	Principal Investigator
PSI	Patient Safety Incident
TASH	Tikur Ambessa Specialized Hospital
US	United States
WHO	World Health Organization

ABSTRACT

Back ground:- *Patient safety incident is an event that could have resulted or did result in unnecessary harm to a patient, and it is considered one of the top 10 causes of death worldwide. Emergency departments and intensive care units of hospitals are characterized by their high risk of patient safety incidents. Studies showed that six to eight point five percent of patients visiting emergency units experienced safety incidents. Intensive care units have also been found to have the highest estimate of adverse events when compared to other units of hospitals. However, around 80-90% go unreported, and barriers to reporting do vary. This study aimed to assess incidence reporting behavior and associated factors among health professionals working in acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020*

Methods:- *An institution –based cross-sectional study design was applied. Data were collected from randomly selected participants using self-administered questionnaire. The data were analyzed using SPSS version 26 analytical software. Variables with P-value less or equal to 0.25 by bivariate logistic analysis were used for multivariate logistic analysis. The associations were interpreted using odds ratio and 95% confidence interval. P <0.05 was considered as statistically significant.*

Result:-*. Overall average patient safety score was 44%. Half of the participants reported at least one incident with in a 12 months period. Those who had training and nurses in profession had higher odds of reporting incident (AOR: 2.32; 95% CI: 1.02-5.27, and AOR: 2.37; 95%CI: 1.04-5.39, respectively) than their compartment.*

Conclusion and recommendation*: Safety incident reporting culture score of participants was less than 50%. Training on patient safety and incident reporting positively affects reporting. Clear guidelines should be put on patient safety and incident reporting. Focus should be given to trainings.*

Keywords: Safety culture, reporting, acute care units

1. INTRODUCTION

1.1. Background

The health care delivery system is a system that is complex by design and prone to errors with many medical practices and risks in the system emerging as major challenges for patient safety by contributing significantly to the burden of harm due to unsafe care (1).

Patient safety is defined as the reduction of risk of unnecessary harm associated with health care to an acceptably minimum degree. Patient safety incident (PSI), on the other hand, is an event or circumstance that could have resulted, or did result in unnecessary harm to a patient through one means or another(2). Patient safety is a main and very important component of quality health care. It is considered as a component "indistinguishable" from the delivery of quality health care (3).

Patient safety culture has been explained as: a culture that exhibits the following five high-level attributes that health-care professionals strive to operationalize through the implementation of strong safety management systems; (1) a culture where all health-care workers (including front-line staff, physicians, and administrators) accept responsibility for the safety of themselves, their co-workers, patients, and visitors; (2) a culture that prioritizes safety above financial and operational goals; (3) a culture that encourages and rewards the identification, communication, and resolution of safety issues; (4) a culture that provides for organizational learning from accidents; (5) a culture that provides appropriate resources, structure, and accountability to maintain effective safety systems (2).

Safety incident may be classified into three based on the degree of harm it causes the patient as a Harmful Incident: that resulted in harm to a patient, including harm resulting when a patient did not receive his/her planned or expected treatment. The term 'Harmful Incident' covers what used to be known as an 'Adverse Event (AE)' and/or a 'Sentinel Event'. A 'No Harm Incident' is a classification of PSI that occurs but does not result in patient harm. The third classification, 'A Near Miss' PSI is an incident that did not cause harm but had the potential to do so (4).
The Emergency Department (ED) and Intensive Care Unit (ICU) have been identified as patient care settings that are prone to PSI for a variety of reasons including their chaotic nature of their

environment, high patient acuity, multiple transitions in care, ED crowding and ICU patients' critical conditions that makes them vulnerable to harm (5–7).

One of the ways to improve patient safety is reporting those incidents that already happened. An approach that is inclusive and systematic to incident reporting would help to learn from errors. Through incident reporting, various kinds of errors and safety-related incidents can be traced and discussed among health professionals so preventive mechanisms can be designed. The magnitude of underreporting, however, remains high in different countries (8,9)

1.2. Statement of the Problem

Harm due to PSI is a growing challenge the healthcare system is facing with an estimated 64 million disability-adjusted life years being lost every year because of this unsafe care worldwide. Indicating that patient harm due to adverse events is probably one of the top 10 causes of death and disability in the world (1). It estimated that up to 98,000 patients might lose their lives every year because of medical care rather than from their underlying medical conditions(10). Data from the World Health Organization (WHO) and other institutions consistently show that PSI occur in 8% to 12% of hospitalizations (11).

Data shows, in the US, PSI are the third-leading cause of death (11,12). In high-income countries in general, estimates indicate that about 1 in 10 patients is harmed while receiving hospital care. As low and middle-income countries provide health services with limited resources and work beyond their capacities, out of the total global burden of PSI these countries carry the two-third (1).

In acute care units, the risk of PSI is high as ED are fast-paced health care settings with complex communication areas and a high rate of work distractions and disruptions. In these settings, health care providers are required to manage different types of patient care with conditions of varying severity. It is reported that between 6% and 8.5% of patients at ED experience PSI. And out of these 36–71% are preventable(13,14). Similarly, ICU patient safety may be jeopardized, since critically ill patients with multiple co-morbidities, undergoing invasive procedures in a high-risk environment, are at risk of experiencing errors and incidents (5,10,12)

Management and prevention of PSI can only happen if incidents are detected in time. The WHO has had long-standing aspirations since 2004 for the failures of healthcare to be used as a learning opportunity to accelerate and expand patient safety (1). Although different mechanisms may be used to detect PSI, most PSI management systems rely on detecting incidents through reporting by health professionals even though only a small number are reported in this manner (11).

Despite the strong shreds of evidence that are indicative of positive patient safety culture in hospitals are prerequisites for incident reporting, little is known about health care provider's

reporting behavior and barriers (9). It is established by researchers that only 10 to 20 percent of errors are ever reported. Therefore the information on PSI is scanty in most establishments (11).

Even though there are many reasons for avoiding error reporting, mostly reported reasons include legal and institutional concerns as well as personal guilt and regret. Others are fear of damage to professional prestige, risk of job loss and to avoid getting reprimanded or questioned (11,15).

Considering the nature of acute care units of hospitals that makes them high risk to PSI, investigations in these units are very limited in number. This study aims to generate information about the safety nature and reporting culture in this units.

1.3. Justification and Significance of the Study

It is impossible to eliminate errors and adverse incidents in a system as complex as the health care system. The good news is, most of the harms they inflict on patients are preventable and their occurrence can be minimized through timely reporting and learning from past events.

Though understanding the barriers to safety incident reporting is crucial to establish a stronger and safer patient safety culture, the majority of investigation in low and middle-income settings focused on identifying the causes of medical errors and PSI rather than the barriers to reporting them. Reliable information on the factors contributing to underreporting is needed to design effective intervention strategies to progress towards a comprehensive prevention program.

Considering the nature of acute care units of hospitals that makes them high risk to PSI, investigations in these units are very limited in number. To the knowledge of the principal investigator (PI), no study has been conducted to assess PSI reporting and associated factors among health care professionals working in ED and ICU in Ethiopia. As a contribution to fill this gap, the finding of this study is hoped to,

1. Show the current safety culture in the acute care units of federal hospitals in Addis Ababa, Ethiopia.
2. Show the current trend/behavior of PSI reporting and factors associated with it among health professionals working in the ED and ICU (acute care units) of federal hospitals, Ethiopia. As patient safety incidence reporting and associated factors may vary across countries and regions because of different policies adopted by the institutes, this research will generate findings that are in the country's context.
3. The findings of the research will also guide the Ministry of Health and the Federal Hospitals in interventions and show areas that need further assessment.
4. It will also serve as additional data for future studies.

2. LITERATURE REVIEW

2.1. Burden of PSI

It is believed that Patient safety culture is an important measure in assessing the quality of health care. And, there is an ever growing recognition of the need to establish a culture of hospital focused on patient safety through continuous assessment and evaluation (16)

Medical errors and healthcare-related AE occur in 8% to 12% of hospitalizations.
In European Union alone, Strategies to reduce the rate of AE would lead to the prevention of more than 750 000 harmful medical errors per year, contributing to over 3.2 million fewer days of hospitalization, 260 000 fewer permanent disabilities and 95 000 fewer deaths per year (17).

In America, between 210 000 and 440 000 patients who go to the hospital for care suffer some type of preventable harm that contributes to their death yearly. This shockingly makes medical errors the third-leading cause of death in the US, right behind heart disease, which is the first, and cancer, which is the second (12).

Available evidence suggests that annually, 134 million AE due to unsafe care occur in hospitals in low- and middle-income countries. It is also said that approximately two-thirds of the global burden of AE resulting from unsafe care, including the disability-adjusted life years lost from them occurs in the low- and middle- income countries contributing to 2.6 million deaths (1,18).

A retrospective review of patients' hospital records across eight African countries estimated the frequency of patient harm at 8.2% (19).

Unlike other hospital units, emergency care providers often have to work in conditions involving disrupted sleep cycles, multiple interruptions(20), acute time constraints, crowding and must perform major medical interventions for patients with limited historical and diagnostic information (14). Hence, the ED has been identified as a hospital location where AE are highly likely to occur (6,13). Estimates of the proportion of ED AE deemed to be preventable range from 53% to 82% compared with overall estimates of 27% to 51% for hospital-based AE (14).

A study conducted on AE following ED visits in Ottawa Hospital, Canada, a level-one trauma center showed that PSI happen on 6% of all ED visits and 71% of AE were preventable (13).

The information available is little but the limited number of studies out there suggest that PSI are also common in the ICU and Patients are being harmed at a rate that is unacceptable.

A meta-analysis done on 70 studies, with over 300,000 patients revealed, the highest pooled prevalence estimate of preventable patient harm was reported in intensive care (18%) (12). serious AE happen in 17% of patients in these settings (5,21).

2.2. Reporting Culture

As a standard definition, a PSI report is "an electronic or paper document that provides a detailed, written account of the chain of events leading up to and following an unforeseen circumstance in a healthcare setting." Incident reports are usually completed by nurses or other licensed personnel. They should then be filed by the healthcare professional who witnessed the incident first hand or by the first staff member who was notified about it. Reports should be completed no more than 24 to 48 hours after the incident took place to ensure important details are remembered (22).

Ethiopian Federal Ministry of Health (FMoH) has designed strategies, procedures, and processes for patient care quality including an incident reporting system. According to the Ethiopian Hospital Reform Implementation Guideline, hospitals should assign an incident officer to receive and investigate all incident reports. The officers' responsibility would be to investigate all reports received (ideally with the team leader of the ward where the incident came from) and should assess the situation to decide whether further action is necessary. A summary report of incidents must be organized and submitted to a quality assurance committee of each hospital. Each hospital must also report to the Ministry and the Food, Medicines, and Health Care Administration Agency (23).

Considering the demand for information on the area, very little investigations are done on PSI reporting since it is a difficult issue to assess. This is because to state the proportions of incidents that are reported out of the total incidents that took place, the number of incidents that are not reported is required, which in most cases is unavailable.

According to a study by the US Department of Health and Human Services, 86 % of hospital incidents go unreported with only 10 to 20 percent of errors ever being reported (11,22).

Another data showed that 6 out of every 7 hospital-based errors, accidents, and other AE still go unreported (24).

A research was conducted in teaching hospitals affiliated with Hamadan University of Medical Sciences, in Hamadan city, Iran. The results state 50.26% of subjects had committed but had not reported medical errors (20).

National data on the occurrence of PSI and reporting culture in public health establishments is not currently available in Ethiopia. But a study conducted on Patient Safety Incident Reporting Behavior and Associated Factors Among Nurses Working in Gondar Comprehensive Hospital showed that the proportion of nurses who reported incidents was only 25.4% (25).

A cross-sectional study conducted at public hospitals in Addis Ababa confirmed that the proportion of health care professionals who reported incidents always was 30.4percent. But, 20.4% of the participants never reported an incident (9).

2.3. Factors associated to PSI Reporting

A qualitative content analysis study that assessed factors affecting reporting of nursing errors presented that factors such as error leading to harm, preserving reputation, negative organizational encounter, nurse's temporary position and lack of accountability as barriers to reporting errors(15).

A literature review on medical error reporting attitudes of healthcare personnel found that fear of individual and legal accusations among healthcare personnel as the most commonly encountered reporting barrier (26).

Fear of legal penalty and fear of loss of prestige among colleagues were significantly associated factors with the PSI reporting behavior of nurses in research done at Gondar comprehensive hospital, Ethiopia (25).

2.4. Conceptual Framework

Concepts that are directly and indirectly related to the major variables of the study adapted from reviewed literatures (15,20,25–27)

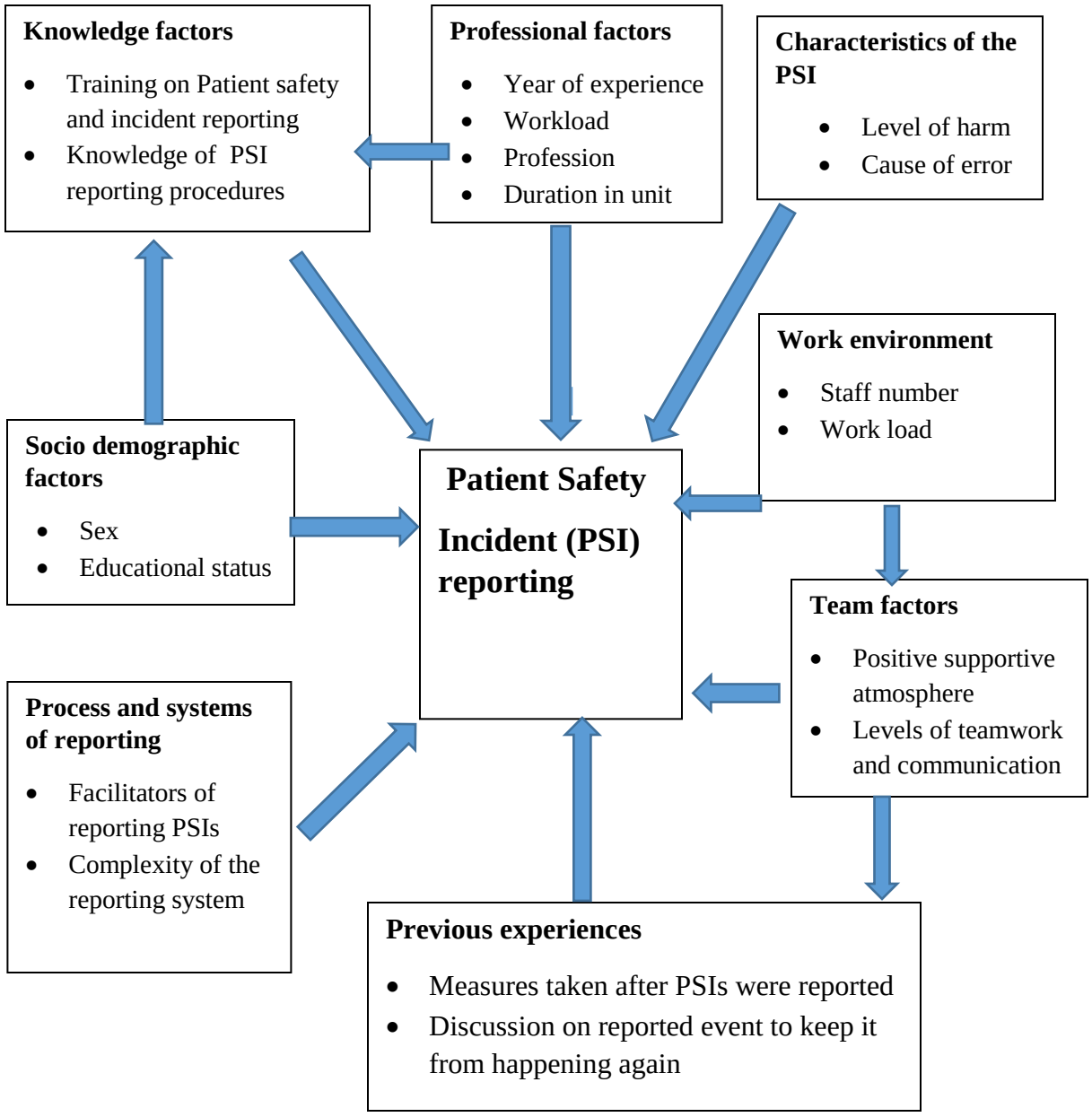

Figure 1. Conceptual framework which summarizes the relationship between dependent and independent variables.

3. OBJECTIVES

3.1. General Objective

To assess incident reporting behavior and associated factors among health professionals working in the acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.

3.2. Specific Objectives

- To assess patient safety culture dimensions in the acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.
- To assess patient safety incident reporting behavior of health professionals working in acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.
- To identify factors associated with patient safety incidents reporting among health professionals working in acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.

4. Methods and Materials

4.1. Study Area and Period

4.1.1. Study Area

The study was carried out in federal hospitals in Addis Ababa, Ethiopia. Addis Ababa is the capital city of Ethiopia, which holds 13 Government Hospitals (5 Federal, 6 under Addis Ababa Health Bureau, 1 owned by the Police Force and 1owened by Armed Force). The 5 Hospitals under federal administrations in Addis Ababa are;

Tikur Anbessa Specialized Hospital (TASH), which is the largest referral and teaching hospital in Ethiopia and sees approximately 370,000 –400,000 patients per year (8).

St Paul's Millennium Medical College (SPMMC) is the second-largest referral and teaching hospital in Ethiopia with an inpatient capacity of more than 700 beds including 14 ICU beds and sees an average of 1200 emergency and outpatient clients daily (28).

AaBET Hospital is an affiliation of SPMMC. This hospital receives all trauma, medical and burn patients. It works with 10 ICU beds.

St. Peter's Hospital is one of the main Tuberculosis hospitals in Ethiopia. Currently provides comprehensive care to the community. It has a total of 30 ICU beds.

Amanuael Mental Specialized Hospital, the only psychiatric hospital in the country, gives extensive outpatient and limited inpatient service with 361 beds, mostly dedicated to acute care (29). Amanuel Mental Specialized Hospital has no ICU. It recently opened a branch for both medical and surgical patients. It also has an ICU that has been available for service since November 2019.

African Leprosy and Research Training Center (ALERT) which was initially established as a rehabilitation center for patients with leprosy but now developed to a hospital giving comprehensive care. It is one of the distinguished trauma centers in the country. ALERT now has 240 beds including 20 beds in the ICU.

4.1.2. Study Period

The study period was from March 10- April 12, 2020.

4.2. Study Design

An institution based, quantitative cross-sectional study design was applied.

4.3. Populations

4.3.1. Source Population

All health care workers working in the federal hospitals in Addis Ababa, Ethiopia were the source population.

4.3.2. Study Population

Health care providers working in acute care units of the federal hospitals in Addis Ababa Ethiopia who had at least one year of experience and were permanent employees.

4.3.3. Study Unit

Health care providers working in acute care units of the federal hospitals in Addis Ababa Ethiopia who were randomly selected to participate in the study.

4.4. Sample Size Determination

The single population proportion formula was used to determine the sample size with the following assumptions: The estimated proportion of respondents who reported incidents always is 30.4%(9), the margin of error 5%, confidence interval (CI) 95% and non-response rate 10%. The required sample size (n) was calculated as follows:

$$n= \frac{z\left(\frac{\alpha}{2}\right)^2 * p(1-p)}{d^2}$$

Where

n- Minimum sample size

P-Estimated proportion of always reporting incidents (30.4percent)

d-the margin of sampling error tolerated (5%)

Zα/2- is the standard normal distribution at 1-α% CI (95%=1.96)

$$n= \frac{(1.96)^2 * 0.304\ (1-0.304)}{0.05^2} = 325$$

Using the correction formula

- Correction for finite population <10,000, N= 535(number of health professionals working in acute care units of federal hospitals in Addis Ababa)
  Final sample size = 202

By adding the 10% non-response rate the total sample size =222

4.5. Sampling Procedure

The estimated number of participants were proportionally recruited from the hospitals based on the respective number of physicians and nurses they have working in their acute care units. Nurses and Physicians are selected to participate in the study as they are more directly involved in patient care. The study subjects were selected by using simple random sampling technique after obtaining a list of acute care staff from each hospital.

Based on the proportional allocation formula the total sample size was allocated to the federal hospitals based on the number of physicians and nurses they have in their acute care units.

The total number of nurses in the 5 hospitals was 423 accounting79% of the total study population.

Total number of physicians was 112, which was 21% of the study population
Total sample size =222
Total sample size of nurses = 176 (79% of 222)
Total sample size of Physicians =47 (21% of 222)

For example, to calculate the number of nurses that would be sampled from ED of TASH,
Total number of nurses in TASH ED= 54

176= 423
X = 54

X=22. Out of the 54 nurses working in the ED of TASH, 22 were sampled.

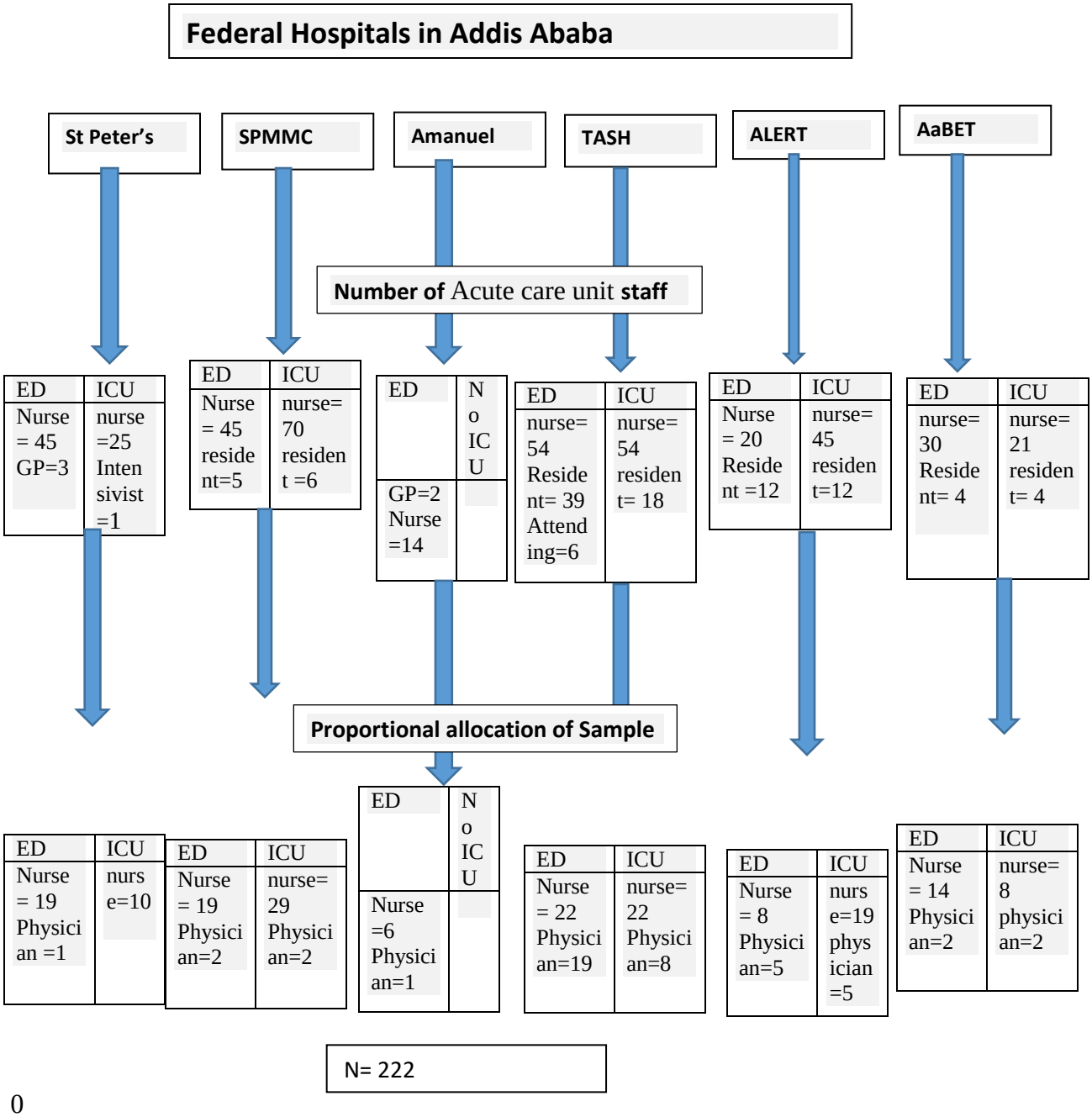

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Figure 2: Schematic representation of the sampling procedure in Addis Ababa federal hospitals, 2020.

N.B: By the time of data collection, 2 of the hospitals; St. Peter and AaBET announced that they were close for any research work. This was because of safety issues related to the Covid-19 pandemic. These hospitals had to be excluded and only 145 participants were studied.

4.6. Eligibility Criteria

Inclusion criteria

- Health care providers working in acute care units with role directly involved with patient care in the federal hospitals of Addis Ababa, Ethiopia.

Exclusion criteria

- Staff who do not usually have direct contact with patients even though their actions directly affect patients. This includes Laboratory technicians, Pharmacists, pathologists, etc.
- Health care providers working in acute care units who were attending training courses off-site during the period of the study.
- Health care providers working in the new Amanuel Hospital (Eka Kotebe General Hospital) which has been open for service only since November 2019. The hospital was excluded because the study uses a 12 months recall period for the number of PSI reports filed by participants.
- Staff with less than 12 months of work experience.
- Health science and medical students on clinical attachments except for Residents.

4.7. Variables

4.7.1. Dependent Variables

- Patient safety culture dimensions
- The patient safety incident reporting trend/ behavior.

4.7.2. Independent Variables

- Sex
- Educational status
- Years of experience in health care
- Years of experience in the current hospital unit
- Role/ Profession
- Work hours per week
- Training on patient safety
- Past experiences related to measures taken after reporting PSI
- Support from management to report PSI

4.8. Operational definition

Safety culture composite/dimension: a collection of questions that that aim to assess a specific safety related feature of a hospital (30).

Safety culture items: a single question in a composite that assesses specific safety related feature of a hospital (30).

Health care professionals: Medical doctors with different qualification; specialists, residents and general practitioners and nurses with different qualifications; with bachelor degree, master's degree and diploma were considered health professionals in this study

Acute care settings/units: intensive care units and emergency departments were considered as acute care settings/ units in this study.

Percent positive is the percentage of positive responses (Agree, Strongly agree/ Most of the time, Always) to positively worded items or, (Disagree, Strongly disagree/ Rarely, Never) to negatively worded items (30).

Area of strength: To be considered as area of strength, an item must have positive responses by at least 75 % of the respondents (30,31).

Area requiring improvement: Items which had positive responses by less than 50 % of the respondents (30,31).

4.9. Data Collection Tool, Methods and Procedures

Data were collected by a self–administered questionnaire which was adapted from the Agency of Health Care Research and Quality Hospital Survey on Patient Safety Culture /AHRQ HSOPSC/ (30). The original tool has been validated in the USA hospital setting(32). It has been widely used to assess perceptions of hospital staff about patient safety issues, medical error, and event reporting in the non-US countries including Ethiopia (31,33–35). It contains socio-demographic variables and patient safety culture dimensions. Similar tool was used for both disciplines. Reliability analysis of items on a previously done study showed satisfactory internal consistency, i.e. Cronbach's $\alpha = 0.77$ (31). However, for this study, there were some modifications made to the instrument by following the guideline and recommendation for modification placed by the AHRQ. For instance, one item that was not applicable to fit the Ethiopian context; a statement about 'Staffing' which reflects the use of agency/temporary staff for patient care was excluded in this questionnaire. Other modifications made include; Sex, Training on Patient Safety and Incident Reporting and Educational status of participants were added as items. And only 8 of the 12 culture dimensions were selected and assessed in this study.

The assessment tool uses different scales to assess the participant's perception on the safety composites. Agreement with statements was assessed with a Likert scale; 'Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree'. A scale for frequency 'Never, Rarely, Sometimes, Most of the time, Always' and grading scale of 'Excellent, Very Good, Acceptable, Poor, Failing' were used.

Before its application, the questionnaire was pretested. 10% of the sample size was used in a setting outside of the study area, Yekatit 12 hospital to assess its clarity. It revealed, it took participant's an average of 23 minutes to complete it. Following this finding, an incentive to motivate participants to take part and properly complete the questionnaires was implemented. No issues were raised about clarity of the questions.

Data collection was done by 2 data collectors (BSc nurses) and the PI. Attempts were made to minimize the nonresponse rate by making the necessary adjustments in hours of data collection to those that are relatively not busy.

4.10. Data Quality Control

The tool that is used for data collection has been used worldwide. It was first developed by AHRQ HSOPSC (30). The reliability of the tool has been assessed by researchers including those from Ethiopia (31–35). The Ethiopian study on patient safety culture in public hospitals stated that the tool was reliable with a satisfactory internal consistency, i.e. Cronbach's $\alpha = 0.77$ (31). While adapting, all modifications made were following guidelines by AHRQ.

Data collectors were trained and familiarized with the study topic so they could assist respondents in case clarifications were needed. Completeness of the instrument was checked just after its completion. Moreover, the collected data were coded, cleaned and explored before analysis.

4.11. Data management and analysis

Data were entered in to Epi data 4.2. Following the AHRQ's guideline(30), during data entry, responses for positively worded items like "when one area in this unit gets really busy, others help'' were coded as Strongly Disagree=1, Disagree=2, Neither Agree nor Disagree=3, Agree=4, Strongly Agree=5. Whereas, negatively worded questions like "it's just by chance more serious mistakes don't happen here" were reverse coded as Strongly Disagree=5, Disagree=4, Neither Agree nor Disagree=3, Agree=2, Strongly Agree=1. The same principle was followed for the frequency scale.

The data were exported to SPSS Version 26 statistical software package for cleaning and analysis. The AHRQ and other studies (30,31,36) recommend the use of 'average positive' be calculated for each item scores to make interpretation of the results easier. Percent positive is the percentage of positive responses (Agree, Strongly agree/ Most of the time, Always) to positively worded items or, (Disagree, Strongly disagree/ Rarely, Never) to negatively worded items.

Composite-level scores were computed by summation of the items within the composite scales and dividing by the number of items with non-missing values.

Descriptive statistics was used to describe participants' socio-demographic and professional characteristics, patient safety culture composites and incident reporting behavior. Socio-

demographic and professional characteristics of participants which had association with frequency of PSI reporting by bivariate analysis (scored P- value less than or equal to 0.25) were entered in to multivariable analysis and p–value of less than 0.05 in 95% CI have been considered to have statistical significance. The results are presented in the form of statements, figures, tables, graphs, and chart

4.12. Plan for Dissemination of the Finding

The findings of the study will be submitted to Addis Ababa University, College of Health Sciences Department of Emergency Medicine, Federal Ministry of Health (FMoH), hospitals that were included in the study and those who will be interested in the subject matter. Oral presentation will be made in different conferences and workshops. Since it is said that scientific work is incomplete until published, the work will also be published in peer reviewed journal.

Email addresses of participants who wanted to see the findings of the research was put on a separate circulation list. The report will be emailed to them.

4.13. Ethical Consideration

Ethical clearance and support letter was obtained from Institutional Review Board (IRB) of Addis Ababa University (AAU), College of Health Science and all other concerned institutions. Study participants got detail explanation about their right, purpose, procedure and benefit of the study and a verbal informed consent was obtained. The participants were given the right to refuse to take part in the study as well as to withdraw at any time during the study. No names or identifying information was indicated on the questionnaires, and all subjects were assured of confidentiality throughout the study.

5. RESULT

5.1. Socio-demographic and professional characteristics of participants

Out of the total 145 study participants recruited, 139 were interviewed yielding response rate of 95.8%; off them, 80(57.6%) were male and 97 (69.8%) were nurses. Majority (81.3%) of the study participants had 1-5 years of experience in the hospital, and in the current unit (73.4%) (Table 1).

Table 1. Socio-demographic and processional profile of participants

NO	Variables	Category	Frequency	Percentage
1	Main work area/unit	Many units	21	15.1
		ED	69	49.6
		ICU	49	35.3
2	Sex	Male	80	57.6
		Female	59	42.4
3	Educational status	BSc	76	54.7
		MSc	18	12.9
		Diploma	3	2.2
		Resident	34	24.5
		GP	5	3.6
		Senior specialist	3	2.2
4	Staff position	Nurse	97	69.8
		Staff Physician	8	5.8
		Resident	34	24.5
5	Work experience in the hospital in years	1 to 5	113	81.3
		6 to 10	21	15.1
		11 to 15	2	1.4
		16 to 20	2	1.4
		21 or more	1	.7
6	Work experience in the current unit in years	< 1	27	19.4
		1 to 5	102	73.4
		6 to 10	8	5.8
		21 or more	2	1.4
7	Work experience in current profession/ specialty in years	< 1	11	7.9
		1 to 5	112	88.5
		6 to 10	15	10.8
		11 to 15	1	.7
8	Work hours/week	< 20	10	7.2
		20 to 39	20	14.4
		40 to 59	46	33.1
		60 to 79	33	23.7
		80 to 99	14	10.1
		100 or more	16	11.5

5.2. Patient Safety Culture Dimensions

The percentage of positive responses for the selected 8 patient safety culture dimensions ranged from 26 to 74%. And the mean positive responses for all dimensions computed were 44%. The lowest scoring dimension were 'frequency of events reported' and 'non punitive response' scoring 26.1% and 26.3%, respectively. While, dimension 'team work within unit' scored the highest positive response rate (74%). The rest of the safety culture dimensions, except for 'organizational learning -continuous improvement' (67.6%), all had scores below 50% (Figure 3)

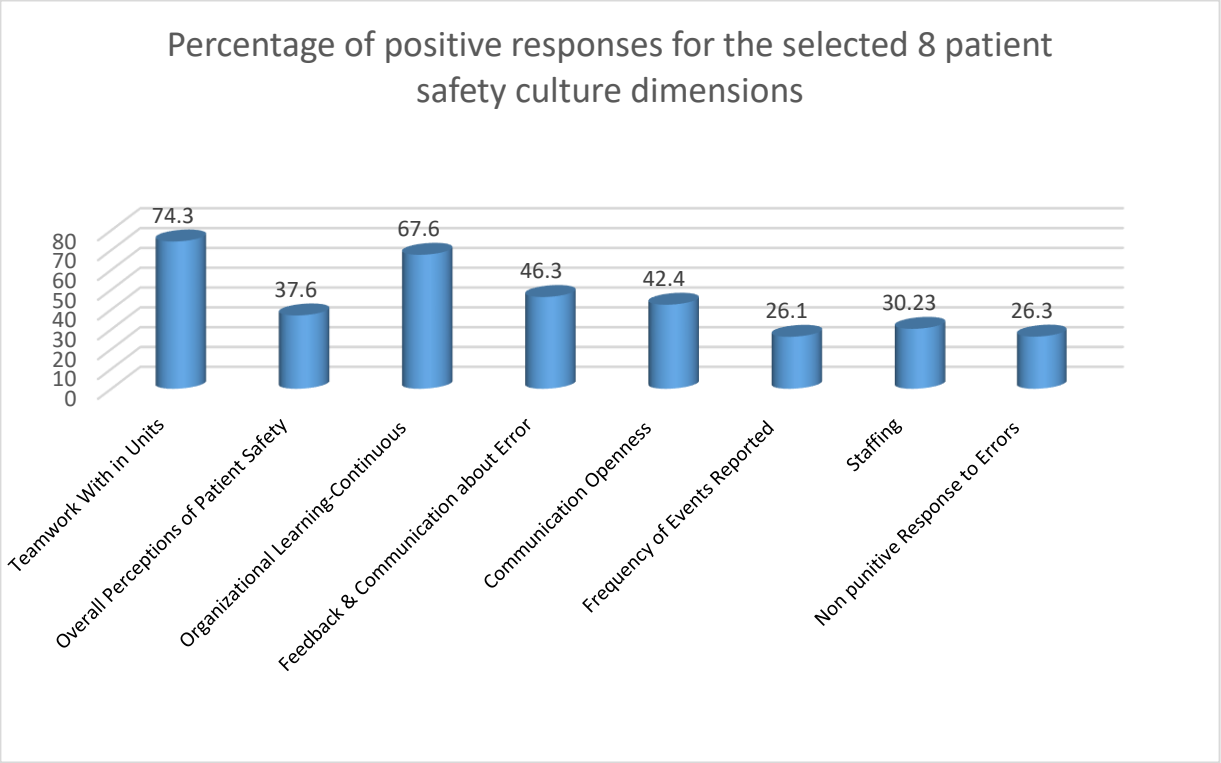

Figure 3. Percentage of positive responses scores of eight safety culture dimensions in acute care units of federal hospitals in Addis Ababa, Ethiopian, 2020

5.3. Patient safety culture items

While computing the positive response rate for each of the items of the safety culture dimensions, scores ranged from 22 to 83%. 'We are actively doing things to improve patient safety' had the highest (83%) positive response rate. Items; "We work in 'crisis mode" trying to do too much, too quickly.' And "when an event is reported, it feels like the person is being written up, not the problem." scored 22%, which makes them as items with the lowest positive response rate. In total, there were 18 safety culture items in the 26 items of the eight safety culture dimensions/composites with less than 50% average positive score (Table 2).

Table 2. Percent of average positive response for items in composite

Composite items	**Score % (a)**	**Mean(SD) (b)**
Teamwork within units		
A1. People support one another in this unit.	76.3	3.88(.989)
A3. When a lot of work needs to be done quickly, we work together as a team to get the work done.	79.1	4.01(1.063)
A4. In this unit, people treat each other with respect.	75	3.79(1.06)
A11. When one area in this unit gets really busy, others help out	67	3.66(1.171)
Organizational learning–continuous improvement		
A6. We are actively doing things to improve patient safety.	83	4.08(1)
A9. Mistakes have led to positive changes here.	53.2	3.33(1.206)
A13. After we make changes to improve patient safety, we evaluate their effectiveness.	67	3.64(1.063)
Overall perceptions of patient safety		
A15. Patient safety is never sacrificed to get more work done.	43.2	3.1(1.212)
A18. Our procedures and systems are good at preventing errors from happening.	47.5	3.08(1.204)
A10. It is just by chance that more serious mistakes don't happen around here. (R)	31.7	2.78(1.181)
A17. We have patient safety problems in this unit.	28	2.65(1.184)

Feedback and communication about error		
C1. We are given feedback about changes put into place based on event reports.	43	3.19(1.183)
C3. We are informed about errors that happen in this unit.	42	3.16(1.235)
C5. In this unit, we discuss ways to prevent errors from happening again.	53.2	3.591.218)
Communication openness		
C2. Staff will freely speak up if they see something that may negatively affect patient care.	42	3.14(1.314)
C4. Staff feel free to question the decisions or actions of those with more authority.	36.7	2.96(1.242)
C6. Staff are afraid to ask questions when something does not seem right. (R)	49	3.44(1.292)
Staffing		
A2. We have enough staff to handle the workload.	36.7	2.76(1.26)
A5. Staff in this unit work longer hours than is best for patient care (R)	32.4	2.64(1.268)
A14. We work in "crisis mode" trying to do too much, too quickly. (R)	22	2.69(1.106)
Non-punitive response to error		
A8. Staff feel like their mistakes are held against them.(R)	27.3	2.86(1.071)
A12. When an event is reported, it feels like the person is being written up, not the problem. (R)	22	2.83(1.056)
A16. Staff worry that mistakes they make are kept in their personnel file. (R)	28	2.79(1.159)
Frequency of events reported		
D1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	25.9	2.82(1.112)
D2. When a mistake is made, but has no potential to harm the patient, how often is this reported?	28.8	2.71(1.150)
D3. When a mistake is made that could harm the patient, but does not, how often is this reported?	23.7	2.68(1.245)

(a) *Percentage of positive responses calculated according to AHRQ instructions for every safety culture item in the composites.*

(b) Mean and standard deviation of responses calculated by computing the mean and standard deviation of all (both positive and negative) responses.

(R) Negatively worded items that were reverse coded.

5.4. Incident Reporting Behaviors of the Participant.

The proportion of health professionals who believed PSI were reported in all situations was 21.6%. This was done by summation of all 'Always' responses to all three situations or patient condition after error took place (Table 3).

Table 3. Frequency of events reported (in %), by health professionals in acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.

Situation	Always	Most of the time	Sometimes	Rarely	Never
D1	7.2	18.7	36.7	23.7	13.7
D2	4.3	24.5	27.3	25.9	18.0
D3	10.1	13.7	33.1	20.9	22.3

D1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?

D2. When a mistake is made, but has no potential to harm the patient, how often is this reported?

D3. When a mistake is made that could harm the patient, but does not, how often is this reported?

N.B The proportion of health care professionals who believed that incidents were reported 'Always' and 'Most of the Time' are 26.13%. This was computed by calculating the positive response rate of the three situations as shown in the table below (Table 4).

Table 4. **Average positive score for frequency of incidents reported by health professionals working in acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.**

Three Items Measuring Frequency of Events Reported	Number Of "Always' Or "Most Of The Time" Responses	Total number of Responses to Item (Excluding Missing Responses)	% Positive Response to Item
D1	**36**	**139**	$\frac{36}{139}$*100= 25.9%
D2	**40**	**139**	$\frac{40}{139}$*100=28.8%
D3	**33**	**139**	$\frac{33}{139}$*100=23.7%
	Average % positive response across the 3 items = $\frac{25.9+28.8+23.7}{3}$**=** ***26.13%***		

D1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?

D2. When a mistake is made, but has no potential to harm the patient, how often is this reported?

D3. When a mistake is made that could harm the patient, but does not, how often is this reported?

N.B: Since there is no question in the assessment tool that asks how frequently He/she (the participant) report incidents He/she is involved in or observes, a new component was added to the questionnaire that asks how often participants would say they report safety incidents they observe.Only 11% of them responded that they report incidents always. While, 7% responded never and 33% said they reported incidents sometimes.

5.5. Training on patient safety and incident reporting

Another component that was included in the study is whether or not participants ever involved in a training related to patient safety and incident reporting. Accordingly, only 28% were trained (data not shown in table)

5.6. Number of Events Reported

The 139 participants were asked the number of reports they filled and submitted to the incident officers in their work unit within the past 12 months. Sixty nine (49.6%) of the study participants said they had not reported any. Whereas, 34 (24.6%) have reported 1 to 2 PSI with in the past 12 months (Figure 4).

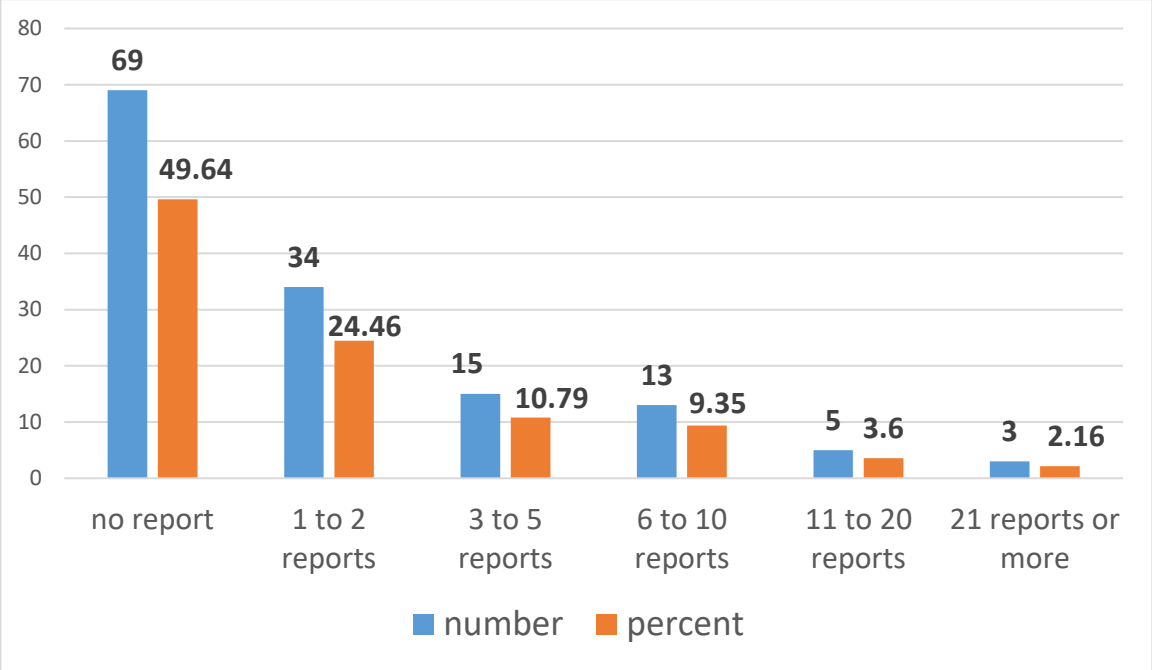

Figure 4. Number of reports submitted in the past 12 months by health professionals working in acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020

5.7. Safety grade

When asked to grade the hospital they work in with regard to patient safety, 34.5% graded the hospitals as having a poor safety. (Figure 5).

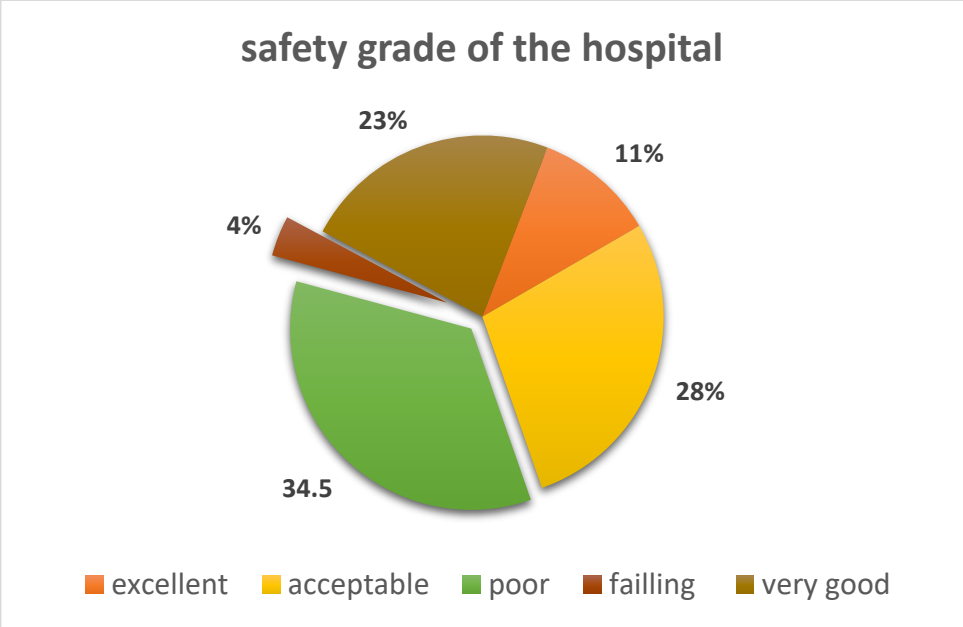

Figure 5 patient safety grade of acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.

5.8. Associated factors to reporting behavior of participants

Socio demographic and professional characteristics of participants were tested for possible association with number of incidents reported by participants. Results from the bivariate analysis have shown that having training and position of the study participants had statistically significant association with the level of patient safety incident reporting behavior (reporting at least 1 incident in the past 12 months). Although their association is not significant, study participants with female gender, main working area at acute care units, working experience in the current units 1-5 years, and greater than 5 years, and work experience in current profession/ specialty greater than 5 years had higher probability of reporting at least 1 incident compared to their compartments (Table 5).

Five variables including sex and other four variables fulfilled for the multiple logistic regression analysis using P-value 0.25 as cut point for further analysis. Two variables were retained as significantly associated factors of patient safety incident reporting behavior among participants. The results confirmed that those who had training had near to two times higher odds of reporting patient safety incident compared to those who had no training (AOR: 2.32; 95% CI: 1.02-5.27).

Similarly, nurse study participants had a 2.37 times more odd to report patient safety incident compared to physicians (AOR: 2.37; 95%CI: 1.04-5.39). However, the remaining three variables were not significantly associated with the dependent variable (Table 6).

Table 5. Bivariate analysis on factors associated with patient safety incident reporting behavior among health care professionals working in acute care units of federal hospitals in Addis Ababa Ethiopia,2020 (n = 139)

Variables	Category	PSI report status		Crude Odds Ratio (95%CI)
		No	Yes	
Sex	Female	27(45.8%)	32(54.2%)	1.31(0.67-2.51)
	Male	42(52.5%)	38(47.5%)	1.00
Main working area/unit	Many hospital areas	13(61.9%)	8(38.1%)	1.00
	ED	33(47.8%)	36(52.2%)	1.77(0.65-4.82)
	ICU	23(46.9%)	26(53.1%)	1.84(0.65-5.22)
Training	Yes	13(33.3%)	26(66.7%)	**2.55(1.17-5.52)**
	No	56(56.0%)	44(44.0%)	1.00
Experience in the current hospital in years	≤5	56(49.6%)	57(50.4%)	1.00
	>5	13(50.0%)	13(50.0%)	0.98(0.42-2.31)
Experience in the current unit in years	<1	16(59.3%)	11(40.7%)	1.00
	1 to 5	49(48.0%)	53(52.0%)	1.57(0.67-3.72)
	>5	4(40.0%)	6(60.0%)	2.18(0.50-9.58)
Working hours per week	< 40	12(40.0%)	18(60.0%)	1.15(0.41-3.20)
	40-79	44(55.7%)	35(44.3%)	0.61(0.26-1.42)
	>=80	13(43.3%)	17(56.7%)	1.00
Staff positions	Nurses	41(42.3%)	56(57.7%)	**2.73(1.28-5.83)**
	Physicians	28(66.7%)	14(33.3%)	1.00
Work experience in current profession/ specialty in years	< 1	6(54.5%)	5(45.5%)	1.00
	1 to 5	59(52.7%)	53(47.3%)	1.08(0.31-3.74)
	> 5	4(25.0%)	12(75.0%)	3.60(0.70-18.56)

Table 6. Multivariate analysis on factors associated with patient safety incident reporting behavior among health care professionals working in acute care units of federal hospitals in Addis Ababa Ethiopia,2020 (n = 139)

Variables	Category	Adjusted Odds Ratio (95%CI)
Sex	Female	0.91(0.42-1.96)
	Male	1.00
Training	Yes	**2.32(1.02-5.27)**
	No	1.00
Working hours per week	< 40	1.24(0.41-3.75)
	40-79	0.63(0.25-1.58)
	>=80	1.00
Staff positions	Nurses	**2.37(1.04-5.39)**
	Physicians	1.00
Work experience in current profession/ specialty in years	< 1	1.00
	1 to 5	1.22(0.32-4.63)
	> 5	3.94(0.69-22.39)

6. DISCUSSION

Improving patient safety culture in healthcare organization is the first step in reducing medical errors and improving patient safety (37). Tools that assess patient safety cultures, such as the HSOPSC, give a standard and solid understanding of the issues associated with patient safety. They are also being increasingly used to follow the changes in culture over time (37,38).

This study investigated the current status of patient safety culture in the acute care units in federal hospitals of Addis Ababa, with special focus on the culture of reporting patient safety incidents.

The results showed that the overall positive response rate for all dimensions of the HSOPSC survey was (44%), which is in line with the findings from other hospital based survey in the city and in the country. One of these studies assessed the patient safety culture in public hospitals of Addis Ababa and the other one in Jimma Zone. Their findings were that, the overall mean score for the positive perception of patient safety culture dimension was below 50% with 46% and 36.77%, respectively (31,39). As these studies involved all units in the hospitals, this can be an implication that, the safety culture in the acute care units of hospitals isn't significantly different from other units.

Even though the finding of this study is consistent with other studies done in the county, higher figures have been recorded in other low- and middle-income countries; China(65%), Iran(65.5%), Oman(58%), South India (58%), Saudi Arabia(61%), Taiwan(64%), And Yemen 67% (16,40–44). This can be due to the difference in safety policies adapted by countries and the socioeconomic difference between them.

As per HSOPSC's recommendation, of all the patient safety culture composites, none fit the criteria for areas of strength. Which was also the case in other hospital based study in the country (31,36). This is not surprising as past addressing the need of universal coverage, the safety and quality of health care is only a recent area of focus in the country.

This study has identified multiple areas that need change for the better. For instance, the two dimensions that received the highest positive response but yet need improvement were 'Teamwork within units' and 'Organizational learning–continuous improvement' with scores, 74.3%and 67.6% respectively. Even though these scores were the highest, they are still below

the HSOPSC's requirement to be considered as an area of strength which is at least 75%.These dimensions were also the highest rated in other studies but were areas of strength in hospitals across many countries, including China with (84% & 88%) (16), Taiwan (94% and 84%) (44).

In contrast, the dimension that had the lowest score was 'Frequency of Events Reported' (26.13%) and 'Non Punitive Response to Error' (26.2%), showing that staff is afraid to report incidents due to fear of being criticized for their errors. A study conducted in Bale zone also stated 'Non Punitive Response to Error' as one of the dimensions with lowest average scores (31.2%)(36). Similar results were also observed about 'Frequency of Events Reported' in studies conducted in Jimma zone with score (28.32%) (39) , south India (41.2%) (42), Public hospitals in Iran (23.5%) (40).

'Frequency of Events Reported' and 'Non Punitive Response to Error' were also the two dimensions with lowest average positive score on a study done in ED of Tabriz University, Iran (35.77%) (45).

Regarding safety grade the hospital they work in, 34.5 % graded the hospitals as having a poor safety, 34% rated it Excellent or Very Good. This is a close finding to a hospital based survey done in Bale zone with 29% Poor and 38.3% Very Good+Excellent ratings (36). The ratings are also consistent with a study done in public hospitals of Addis Ababa which stated 37% said their hospitals were either Excellent or Very good when it comes to patient safety (31). As these are hospital based studies, it shows, acute care units are somehow similar to other units safety wise.

An ED in Iran was also rated as excellent or very good by 34.2%(45). A study done in US however showed a different figure with a 76% rating of very good and excellent(46).

One main aim of this study was to assess incident reporting behavior and associated factors among health care professionals working in acute care units of federal hospitals in Addis Ababa. As incident reporting and learning from previous experiences takes a big part in patient safety improvement (17,30).

When asked for the number of reports they filed in the past 12 months, half of the participants said they haven't reported any incident. This is lower than a finding of a study done in public hospitals of Addis Ababa which reported two third have reported at least one incident (31). It

however, is almost equal to findings from USA in 2016 (46) And higher than the findings among emergency nurses in Iran which showed 78% didn't file any report(45).

The study identified that training on incident reporting was significantly associated with participant's likelihood to report an incident. Ideally, Physicians and nurses are trained to be transparent and ultimately responsible for the patient they are caring for including any errors that may occur. In the traditional "blame and shame" culture of medicine, errors were wrongly associated with incompetence, laziness, or something that would only happen to an irresponsible person, so physicians and other health care professionals are often devastated when errors occur(45).

Staff usually feel guilty, frustrated, and often fearful of legal consequences that follow reporting incidents. Even if most health care professionals want to talk to patients and families and report what happened, few have been trained how to disclose unanticipated outcomes or medical errors appropriately and freely. Worse yet, there are evidences showing some health care professionals continue to be trained to avoid talking about adverse events (45).

The results confirmed that those who had training had near to two times higher odds of reporting patient safety incident compared to those who had no training. It is supported by a local hospital based study done on nurses (25). Another study in japan also confirmed this (47).

There is ever increasing evidence that suggests education and trainings help improve patient safety and healthcare quality. In most areas of the world, Safety curricula are generally popular among trainees and have resulted in increased knowledge of safety and quality in the health care processes (48).

Another professional characteristic that showed a significant association with incident reporting behavior of participants was staff role/position. The study revealed, nurse were 2.37 times more likely to report patient safety incidents compared to that of staff physicians and physicians in training. Other inter disciplinary studies done in Jordan on nurses and physicians also showed that nurses were significantly more likely to know of the local reporting system and to have recently completed a report than physicians(49). The physicians were seen to be less likely to report any incident in their work units on 50% of more of occasions (49). An anonymous study on this disciplines done in six South Australian hospitals revealed that, when compared to

physicians, nurses were; two times more likely to know how to access a report, two times more likely to have ever had completed a report and more likely to know what to do with the completed report (50). Another study done in two USA hospitals on rate and type of events reported found that 89% of incidents were reported by nurses while only 1.9% were reported by physicians(51). Similar findings have been uncovered among health professionals working a general surgical department in United Kingdom. In the study, nurses were significantly more likely to know the reporting system and to have recently completed a report than doctors (52)

7. CONCLUSION

When compared with the bench mark put by the AHRQ, the overall patient safety score and all average safety culture composite scores were low. The trend of reporting adverse events or errors in acute care units of the hospitals is very poor and health professionals are afraid of the punitive response to error. There is a higher odd of reporting incident's among those who were trained on patient safety and those who were nurses.

8. LIMITATION AND STRENGTH OF THE STUDY

8.1. Limitation of the study

The study was done in four of the six federal hospitals since two of the hospitals; AaBET and St. Peter's hospital were close for research work due to the Covid-19 pandemic. This affected the sampling process.

Using English version may make the study participants to misunderstand some questions.

The study included only nurses and physicians working in the acute care units of the hospitals. It would have been more ideal to include other health care staff in these units.

A cross-sectional study design was applied making causal relationship between variables difficult to ascertain.

Finally the study was based on self-reported information that may be prone to reporting bias.

8.2. Strength of the study

To the knowledge of the PI, This is the first study by type in acute care units in Ethiopia.

A standardized assessment tool was used to collect the data. The recommendations and guides on how to use the tool and how to analyze the data was carefully followed.

9. RECOMMENDATION

Based on the findings of this paper, the following recommendations are believed to improve the reporting and patient safety culture acute care units. The recommendations are addressed for different responsible bodies.

Ethiopian Ministry of Health

Should collaborate with hospitals and develop clear guidelines for improving the work environment dimensions like staff number, work hours, etc.

Emphasis should be given to the importance of establishing interdisciplinary team training programs that incorporate proven methods for team management, such as 'crew resource management'. This has been recommended by the Institute of medicine since the 1990s.

Also, a well-designed patient safety interventions are needed to be integrated with organizational policies.

Hospitals

Should design a way for the staff to be able to report incidents in a manner free of blame, administrative sanctions and legal penalties.

Staff should be informed about the incident officer appointed in their units.

Ministry of Education

As training has showed a significant association with reporting behavior, the ministry should integrate patient safety and quality improvement issues into the curriculum for undergraduate and graduate students of medicine and health sciences.

Health professionals

Health professionals are recommended to make transparency their virtue.

Researchers

A further study on the perception of other administrative bodies on patient safety culture is highly recommended.

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11. ANNEXES

Annex I. Participant Information Sheet

1. **Research Title**: Incident reporting behavior and associated factors among health care professionals working in acute care units of federal hospitals in Addis Ababa, Ethiopia, 2020.

2. **Invitation:** you are being invited to take part in this research project. Before you decide to do so, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

3. **What is the purpose?** This research aims to investigate Patient Safety Incident Reporting Behavior And Perceived Barriers Among Health Care Professionals Working In Acute Care Units of Federal Hospitals in Addis Ababa, this topic has been investigated previously by other researchers on a hospital-level but there is no evidence that it has been conducted on the emergency and intensive care units which have been proven to be units prone to patient safety incidents

4. **Why have I been chosen?** You have been chosen because as a health professional working in acute care units of the hospital, you will have knowledge and important information about patient safety incidents and barriers to reporting them.

5. **What do I have to do?** Please answer the questions in the questionnaire. There are no other commitments or restrictions associated with participating.

6. **What are the possible disadvantages and risks of taking part?** Participating in the research is not anticipated to cause you any disadvantages or discomfort.

7. **What are the possible benefits of taking part?** A 25 Birr worth mobile card incentive will be given to you as a thank you for participating. Moreover, it is hoped that this work will have a beneficial impact on improving patient safety and quality of care through recommendations that will be submitted to responsible stakeholders based on the research findings.

8. **Will my taking part in this project be kept confidential?** All the information that we collect about you during the research will be kept strictly safe and private.

9. **Objectives?** The questionnaire will ask you about your opinions and current practices of incident reporting and perceived barriers in your work area.

10. **What will happen to the results of the research project?** The results of the research will be presented to Addis Ababa University, College of Health Sciences, Department of Emergency Medicine. Copies of the paper and recommendations will also be sent to responsible bodies. Attempts will also be made to publish on peer-reviewed journals. **If you wish to be given a copy of any reports resulting from the research, please ask us to put you on our circulation list.**

11. **Who is organizing and funding the research?** The project is a being conducted by Eyerusalem kale'ab Beyene, a 2nd-year Emergency Medicine and Critical Care Nursing Student of Addis Ababa University. Addis Ababa University funds this research project.

12. **Who has ethically reviewed the project?** This project has been ethically approved by the Ethics Review Committee of Addis Ababa University. A letter of permission obtained has been given to administrations of the federal hospitals in Addis Ababa. Verbal consent will be obtained from each study participant.

13. **Contact of the Principal investigator for further information.**

Name Eyerusalem kale'ab Beyene. Tel: +251904388005

Email: Kaleabeyerusalem2@gmail.com

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Annex II. Self-Administered Questionnaire

Hospital Survey on Patient Safety

This survey asks for your opinions about patient safety issues, medical error, and event reporting in your hospital and will take about 10 to 15 minutes to complete.

If you want not to participate in the study or withdraw from it any time you want, you have all the right to do so."

- ***An "event" is defined as any type of error, mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm.***
- ***"Patient safety" is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.***

SECTION A: Your Work Area/Unit

In this survey, think of your "unit" as the work area, department, or clinical area of the hospital where you spend *most* of your work time or provide *most* of your clinical services.

What is your primary work area or unit in this hospital? Select ONE answer.

☐ a. Many different hospital units/No specific unit

☐ b. Emergency department

☐ c. Intensive care unit (any type)

Please indicate your agreement or disagreement with the following statements about your work area/unit

Think about your hospital work area/unit	Strongly Disagree ▼	Disagree ▼	Neither Agree or Disagree ▼	Agree ▼	Strongly Agree ▼
1. People support one another in this unit.....	☐1	☐2	☐3	☐4	☐5
2. We have enough staff to handle the workload.....	☐1	☐2	☐3	☐4	☐5
3. When a lot of work needs to be done quickly, we work as a team to get the work done	☐1	☐2	☐3	☐4	☐5
4. In this unit, people treat each other with respec.....	☐1	☐2	☐3	☐4	☐5

SECTION A: Your Work Area/Unit (continued)

Think about your hospital work area/unit	Strongly Disagree ▼	Disagree ▼	Neither Agree or Disagree ▼	Agree ▼	Strongly Agree ▼
5. Staff in this unit work longer hours than is best for patient care...	☐1	☐2	☐3	☐4	☐5
6. We are actively doing things to improve patient safety.....	☐1	☐2	☐3	☐4	☐5
7. Staff feel like their mistakes are held against them	☐1	☐2	☐3	☐4	☐5
8. Mistakes have led to positive changes here	☐1	☐2	☐3	☐4	☐5
9 .It is just by chance more serious mistakes don't happen here....	☐1	☐2	☐3	☐4	☐5
10. When one area in this unit gets really busy, others help	☐1	☐2	☐3	☐4	☐5
11. When an event is reported, it feels like the person is being written up, not the problem	☐1	☐2	☐3	☐4	☐5
12. After we make changes to improve patient safety, we evaluate their effectiveness	☐1	☐2	☐3	☐4	☐5
13. We work in "crisis mode" trying to do too much, too quickly…..	☐1	☐2	☐3	☐4	☐5
14. Patient safety is never sacrificed to get more work done ……...	☐1	☐2	☐3	☐4	☐5
15. Staff worry that mistake records are kept in their personnel file..	☐1	☐2	☐3	☐4	☐5
16. We have patient safety problems in this unit.....	☐1	☐2	☐3	☐4	☐5
17. Our procedures and systems are good at preventing errors from happening	☐1	☐2	☐3	☐4	☐5

SECTION B: Communications

How often do the following things happen in your work area/unit?

Think about your hospital work area/unit…

	Never	Rarely	Some Times	Most Of The Time	Always
	▼	▼	▼	▼	▼
1. We are given feedback about changes put into place based on event reports	☐1	☐2	☐3	☐4	☐5
2. Staff will freely speak up if they see something that may negatively affect patient care	☐1	☐2	☐3	☐4	☐5
3. We are informed about errors that happen in this unit	☐1	☐	☐3	☐4	☐5
4. Staff feel free to question the decisions or actions of those with more authority	☐1	☐2	☐3	☐4	☐5
5.we discuss ways to prevent errors from happening again	☐1	☐2	☐3	☐4	☐5
6.Staff are afraid to ask questions when something seems wrong...	☐1	☐2	☐3	☐4	☐5

SECTION C: Frequency of Events Reported

In your hospital work area/unit, when the following mistakes happen, *how often are they reported?*

	Never	Rarely	Some Times	Most Of The Time	Always
	▼	▼	▼	▼	▼
1. When a mistake is made, but is *caught and corrected before affecting the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
2. When a mistake is made, but has *no potential to harm the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
3. When a mistake is made that *could harm the patient*, but does not, how often is this reported?	☐1	☐2	☐3	☐4	☐5

SECTION D: Patient Safety Grade

Please give your work area/unit in this hospital an overall grade on patient safety.

☐	☐	☐	☐	☐
A	**B**	**C**	**D**	**E**
Excellent	Very Good	Acceptable	Poor	Failing

SECTION E: Reporting Grade

Please state how often you would say you report patient safety incidents you observe?

☐	☐	☐	☐	☐
A	**B**	**C**	**D**	**E**
Always	Most of the Time	Sometimes	Rarely	Never

SECTION F: Training and updates

Please answer if you ever participated on training related to patient safety and incident reporting?

☐	☐
A	**B**
Yes	No

SECTION G: Number of Events Reported

In the past 12 months, how many event reports have you filled out and submitted?

☐ a. No event reports

☐ b. 1 to 2 event reports

☐ c. 3 to 5 event reports

☐ d. 6 to 10 event reports

☐ e. 11 to 20 event reports

☐ f. 21 event reports or more

SECTION H: Background Information

This information will help in the analysis of the survey results.

1. How long have you worked in this hospital?

☐ a. Less than 1 year
☐ b. 1 to 5 years
☐ c. 6 to 10 years
☐ d. 11 to 15 years
☐ e. 16 to 20 years
☐ f. 21 years or more

2. How long have you worked in your current hospital work area/unit?

☐ a. Less than 1 year
☐ b. 1 to 5 years
☐ c. 6 to 10 years
☐ d. 11 to 15 years
☐ e. 16 to 20 years
☐ f. 21 years or more

3. Typically, how many hours per week do you work in this hospital?

☐ a. Less than 20 hours per week
☐ b. 20 to 39 hours per week
☐ c. 40 to 59 hours per week
☐ d. 60 to 79 hours per week
☐ e. 80 to 99 hours per week
☐ f. 100 hours per week or more

4. What is your staff position in this hospital? Select ONE answer that best describes your staff position.

☐ a. Nurse
☐ b. Attending/Staff Physician:
☐ c. Medical Intern
☐ d. Dietician
☐ e. Respiratory Therapist
☐ f. Intensivist
☐ g. Resident Physician/Physician in Training
☐ h. Anesthesiologist

☐ Other; Please Specify _____

SECTION H: Background Information (continued)

5. How long have you worked in your current specialty or profession?

☐ a. Less than 1 year ☐ d. 11 to 15 years

☐ b. 1 to 5 years ☐ e. 16 to 20 years

☐ c. 6 to 10 years ☐ f. 21 years or more

6. What is your current Educational Status?

7. sex

☐ a. Female

☐ b. Male

Thank you for taking part in the study.

Data collector name _____signature _____Date_____

Hospital Name _____ Questionnaire code_____