Patient Safety Culture in Rwandan Teaching Hospital Operating Rooms

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DECLARATION

I KARONKANO Rutayisire Gilbert declare that this Dissertation contains my own work except where specifically acknowledged.

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ABSTRACT

Background: Patient safety is recognized to be an endemic concern and healthcare organization are challenged to improve it. In the aftermath of the IOM publication on magnitude of adverse events in Unites States, the field of patient safety emerged and healthcare organization were recommended to increase patient safety culture (PSC) to improve patient outcomes. Most of the available data are from developed world with very scanty data from developing and middle-income countries and no data available for Rwanda.

Aim: To explore PSC in Rwandan teaching hospital operating rooms (OR): healthcare provider perspectives.

Methods: A quantitative cross-sectional analytical study was carried out in three teaching hospitals in Kigali. 152 participants selected by stratified random sampling strategy, responded to the Hospital Survey on Patient Safety Culture; a standardized tool that measure 12 safety dimensions.

Positive responses were summed and averaged to have level of safety culture of each safety dimension and ultimately the overall PSC. Analysis of variance was performed at significance level of < .05 to check differences among groups and the contribution of each safety dimension.

Results: The overall PSC was 51.6% and teamwork within unit was the only area of strength (76.8%) while 6/12 safety dimensions had less than 50% positive perception; non-punitive response to error, staffing, handoffs and transitions, frequency of events reported, communication openness, and overall perception of patient safety; 21.7%, 34.4%, 42.4%, 42.6%, 47% and 49.5% of positive perceptions respectively.

Conclusion: The current level of PSC was recognized to be neutral with half of the safety culture dimensions reflecting negative PSC. Therefore, patient safety improvement strategies should be considered to address the areas of weaknesses.

KEY WORDS

- **Patient safety:** the freedom from accidental injury resulting from healthcare management.

- **Safety Culture:** 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 (Sexton, Helmreich, Neilands et al. 2006 p.2).

- **Operating Room:** a facility or a department within hospital in which surgical procedures are performed

- **Teaching Hospital:** a tertiary level of care in Rwandan health care system, and contribute to healthcare provider teaching.

LIST OF SYMBOLS AND ACRONYMS

<   **:** Less than

%   **:** Percent

&   **:** and

$\overline{x}$ **:** Mean

±   **:** Plus, minus

≥   **:** Higher or equal to

AE   **:** Adverse Event

AHRQ   **:** Agency for Healthcare Research and Quality

AIDS   **:** Acquired Immunodeficiency Syndrome

ANOVA   **:** Analysis of Variance

CHUK   **:** Centre Hospitalier Universitaire de Kigali

df   **:** degree of freedom

HSOPSC   **:** Hospital Survey on Patient Safety Culture

IOM   **:** Institute of Medicine

KFH, K   **:** King Faisal Hospital, Kigali

MoH   **:** Ministry of Health

OR   **:** Operating Room

PSC   **:** Patient Safety Culture

QSEN   **:** Quality and Safety Education for Nurses

RMH   **:** Rwanda Military Hospital

SAQ   **:** Safety Attitude Questionnaire

SBAR   **:** Situation, Background, Assessment and Recommendation

SD   **:** Standard deviation

Sig.   **:** Significance

WHO   **:** World Health Organization

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

Since the publication of the Institute of Medicine (IOM) report "*To Err is Human: Building a Safer Health System*" in 1999, healthcare organizations are challenged to improve health care. Thus, today healthcare delivery should be as safe as possible among other key dimensions of quality healthcare system functions (Institute of Medicine, 2001).

In this chapter will address the background on patient safety issues and a safety culture, the research problem statement, research questions, the purpose and objectives of the study and the significance of the study. The chapter conclusion will be given at the end of this section.

1.2 Background

Patient safety is a vital aspect and the ultimate objective for quality healthcare delivery and an important determinant of patient health outcome (Feng, Bobay and Weiss, 2008p.310). Despite the fact that healthcare providers strive to avoid adverse event occurring among patients under their care, adverse events remain a global challenge as no country has overcome all issues pertaining patient safety (Arabloo *et al.*, 2012p.15).

According to World Health Organization (2013 p.8) estimations, tens millions of patients suffer disabling injuries or death every year following unsafe healthcare services with nearly 10% of patients harmed subsequent to avoidable cause in developed world with likelihood to have higher prevalence in developing world considering resources limitations.

A systematic review of studies from five developed countries by de Vries *et al.* (2008 p.219), found that AEs occurs for 9.2% (4.6 - 12.4%) of hospital admissions of which 7% (6.1 - 11%) causing permanent disability and 7.4% (4.7 - 14.2%) leading to patient death. In fact, it was estimated that between 210000 - 440000 patients die yearly in United States (US) hospitals, resulting from preventable cause (James, 2013 p.127) and AEs were regarded to be the first cause of deaths; exceeding the number of death attributable to motor vehicle accidents, breast cancer or Acquired Immunodeficiency Syndrome (AIDS) (Kohn, Corrigan and Donaldson, 2000 p.26). Furthermore, non-lethal serious AEs were estimated to be 10 to 20 times higher than those leading to death, roughly two to four millions serious non-lethal AEs per year (James, 2013 p.126).

In the European Union member states, AEs were estimated to occur for 8-12% of admissions though over a quarter (26%) of Europeans responding to the Eurobarometer survey claimed that they or their family member experienced AE (TNS Opinion & Social, 2010 p.17).

The global burden of surgically treatable diseases is estimated to be 11 % and is predominantly due to injury and malignancies with the problem gradually increasing particularly in development transition countries (Kouo-ngamby *et al.*, 2015 p.2). It has been estimated that globally 234 millions of majors surgery are performed yearly, and with these estimates major surgery is done for one out of twenty five human beings every year (World Health Organization, 2009 p.2; 85).

North American Studies estimated that in every 150 admitted patients, one die from AE with two third of these resulting from surgery. There is scanty estimate about surgical AE in Africa therefore, it is difficult to estimate the burden of surgery

related AEs in Africa. However, a surgical mortality rate of 3.3 per 1000 operations was reported in Zambia and a surgical mortality rate of 1 per 3000 operations in Malawi (Andrew Howard, no date p.1).

The impact of healthcare delivery adverse events has been discussed from various angles since the publication of the report "*To Err is Human: Building a Safer Health System*" by the Institute of Medicine (IOM) in 1999 with the growing recognition of the frequency and magnitude of avoidable adverse events in healthcare giving rise to the field of patient safety (Tavena, 2010 p.2). Developing a patient safety culture was among other several recommendations laid out by the IOM (El-jardali *et al.*, 2011 p.1) in a bid to face the global challenge posed by medical errors; and there is a shared belief among many safety experts that changing the culture of patient safety should improve patient outcomes (Feng, Bobay and Weiss, 2008 p.311).

Patient safety culture is about how the patient is thought about within a healthcare facility and how the structures and processes involved for healthcare delivery support this (The Health Foundation, 2011 p.3). The concept of safety culture was first used in a report on the Chernobyl nuclear power station disaster and since then has gained worldwide recognition in several industries, especially high-risk industries, such as nuclear power and aviation before it was adopted for healthcare organizations (The Health Foundation, 2011 p.4).

The government of Rwanda recognizes the importance of a healthy population; hence, the improvement of health care system has been a major quest for the ministry of health (MoH) which embraced the journey of quality health care improvement since 1998 (Minisrty of Health, 2014 p.2). The MoH recognizing the importance of accreditation for quality health care delivery enrolled three teaching

hospitals into the Council for Health Service Accreditation of Southern Africa "Cohsasa", a health institutions accrediting body and has set quality standards to assess and accredit district hospital country wide (Minisrty of Health, 2014 p.2,5). Since then, various efforts were deployed by different hospitals in a bid to meet accreditations requirements.

Safety as a corner stone for quality health care delivery was given a particular attention with most hospital establishing a safety issues monitoring system that include incident reporting and risk assessment programs. Moreover, most of Rwandan hospital ORs embraced the use of the surgical safety checklist. Introduced and recommended by WHO in 2008, the surgical safety checklist addresses main aspects of patient safety culture in OR such communication and teamwork among others (World Health Organization, 2009).

1.3   Problem Statement

Surgical procedures as fundamental health care service provided by healthcare facilities, are intended to save lives and improve the quality of life. However, healthcare is not as safe as it ought to be and healthcare workers are not immune to the human proclivity of making errors (Bognár, 2009 p.3). Studies estimate that 1 out of every 10 patients in developed countries is injured while receiving hospital services (Abdolahzadeh, Zamanzadeh and Boroumand, 2012 p.215; Arabloo *et al.*, 2012 p.15) and surgical care in particular is a risky undertaking as it results Worldwide, in 11% of death and disability among surgically curable diseases (Maru *et al.*, 2011 p.1).

Most of the available data pertaining to patient safety are from developed countries and the burden of surgical adverse events are thought to be even more alarming in

low and middle income countries (Arabloo *et al.*, 2012 p.15). In a large multi-country retrospective patient record review, perioperative adverse events were estimated to be 18% (7% and 47%) of surgical patients across eight low and middle income countries participating in the study (Hull *et al.*, 2012 p.493). These adverse events were judged to be highly preventable in up to 83% (55% to 93%) of the cases (Wilson *et al.*, 2012 p.4).

Adverse events frequently result from poor designed system (Institute of Medicine, 2001 p.78) and organization culture was named to be one of the contributing factors resulting in these high numbers of adverse events in low and middle income countries along with other factors such as severe underfunding and lack of relevant technological sophistication within healthcare systems (Hull *et al.*, 2012 p.494). Hence, change from the traditional "*Blame and Shame*" culture to a supportive and just culture is needed in healthcare organizations to enhance learning from ever-present human errors for system improvement (Institute of Medicine, 2001 p.46, 122; Feng, Bobay and Weiss, 2008 p.311; Bognár, 2009 p.6; Arabloo *et al.*, 2012 p.16).

Considering Hull et al. (2012, p,494) findings, over 14400 (5600 to 37600) adverse events would have occurred in Rwanda as a result of over 80000 surgical procedures recorded as of 2009-2010 (Petroze *et al.*, 2012 p.440) and organization culture would have contributed. The researcher anecdotal study revealed that the level of incident reporting, risk assessment and learning from reported incidents is yet to attain a desirable level and in some instances, is still rudimental as per safety in-charges talked to and implementation of surgical safety checklist was surrounded by several irregularities.

Since most of the available data on patient safety and safety culture result from studies conducted in developed countries with very scanty data available from developing world, there is an urgent need to explore the patient safety culture in teaching hospital ORs in Rwanda, where no such study had been done before now.

1.4 Aim of the study

The aim of this study is to explore the patient safety culture in teaching hospital ORs: Healthcare providers' perspectives.

1.5 Objectives of the study

i. To assess the current patient safety culture in Rwandan teaching hospital ORs

ii. To assess perceptions of the OR healthcare providers towards patient safety culture in Rwandan teaching hospital ORs.

iii. To assess attitudes of the OR healthcare providers towards patient safety culture in Rwandan teaching hospital ORs.

iv. To explore the factors affecting patient safety culture in Rwandan teaching hospital ORs.

1.6 Research questions

i. What it is the current patient safety culture in Rwandan teaching hospital ORs?

ii. What are healthcare providers' perceptions of patient safety culture in Rwandan teaching hospital ORs?

iii. What are healthcare providers' attitudes towards patient safety culture in Rwandan teaching hospital ORs?

iv. How background information of healthcare providers affects patient safety culture in Rwandan teaching hospital ORs?

1.7 Significance of the Study

It is obvious that any effort to improve patient safety culture start with an assessment of the prevailing safety culture to provide healthcare facilities with basis for strategic implementation and evaluation of improvement interventions to reinforce it. Since there is evidence that patient safety culture is associated with patient health outcomes (Najjar *et al.*, 2015 p.7; Fan *et al.*, 2016 p.127) , assessing the patient safety culture in teaching hospital ORs will provide a reflection of what might be the patient safety culture in various ORs across the country as most of the personnel available across the country are trained in these hospitals.

The research foresees that findings of this study will highlight areas that need particular attention hence support managerial and policy makers' effort regarding strategic development and implementation of improvement intervention. The findings of this study will also allow healthcare providers to be more aware of factors affecting their safety practices with a hopeful change in their clinical reasoning and decision-making rending their practice more careful and patient safety conscience. Furthermore, the finding of this study will be profitable to educators and researchers by providing a theoretical and practical knowledge regarding patient safety.

1.8   Subdivision of the Project

This research project proposal is organized in six chapters:

i.   Chapter one: Introduction

ii. Chapter: Literature review

iii. Chapter three: Methodology

iv. Chapter four: Results

v.   Chapter five: Discussion

vi. Chapter six: Conclusion and recommendations

1.9   Conclusion

Patient safety is a vital aspect of health care delivery and healthcare providers are challenged to improve patient safety outcomes. Most patient safety data available are from developed countries with very little known for low income and middle-income countries including Rwanda. One important way to patient safety outcome improvement recommended by the IOM is improving safety culture in healthcare organizations. In this chapter, we presented the background and the problem related to patient safety and how this study was significant. The research objectives as well as research questions were also presented and finally how the work is subdivided.

CHAPTER TWO: LITERATURE REVIEW

2.1   Introduction

Protecting patient from being harmed by health care provider while receiving care, has always been a central tenet of any health care provider professions as expressed into Hippocrates oath by medical doctors (Bognár, 2009 p.4) and the Florence Nightingale warning "the very first requirement in a Hospital is that it should do the sick no harm" (Friesen, Farquhar and Hughes, no date p.3). However much of available literature emerged after patient safety was recognized to be endemic concern by the world health organization in 2004 (Abdelhai, Abdelaziz and S.Ghanem, 2012 p.227). Under part two of this proposal, we are addressing the field of patient safety culture, how patient safety culture is assessed and the conceptual framework that will guide this study.

2.2   The field of patient safety culture

Though it is been always a prime objective of health care delivery to do no harm to patient, patient safety was given the importance it deserves in 1990s, mainly following the publication of the IOM report on the magnitude of harm resulting from health care management in United States hospitals (Tavena, 2010 p.2; Ulrich and Kear, 2014 p.447).

The concept of safety culture was first used in the aftermath of the Chernobyl disaster, once it was identified that poor safety culture was at origin of this disaster. Since then, safety culture concept was adopted by various high risk organization such as aviation, nuclear power industries and of recent by health care organization as a way to reduce negative incident occurrence (Feng, Bobay and Weiss, 2008

p.311; Groves, Meisenbach and Scott-Cawiezell, 2011 p.1847; The Health Foundation, 2011 p.4; Pinheiro and Uva, 2015 p.4).

Patient safety culture is regarded to be a subset of a health organization culture and is expressed as shared attitudes, values, beliefs, perceptions and behaviors among health care organization staff, regarding their commitment to freedom of harm in patients under their care and is determined as well by the organization devotion to health and safety management (Nordin, 2015 p.18). Changing healthcare organization safety culture from traditional blame shame culture to a positive safety culture is believed to be a necessity for improved patient outcomes by many patient safety expert (Feng, Bobay and Weiss, 2008 p.311), however, Groves (2014 p.78) argue that it may empirically challenging to establish this relationship.

2.3   Patient safety culture assessment

The first step for any improvement is establishing a baseline against which improvement effort can be measured. In order to improve their safety culture, health organization should perform safety culture check regularly. In fact, several influential organizations such as the Joint Commission (formally Joint Commission for the Accreditation of Healthcare Organizations), advise healthcare organization to assess their safety culture in order to address patient safety issues (Nieva and Sorra, 2003 p.ii19; Sexton *et al.*, 2006 p.2; Chakravarty *et al.*, 2015 p.153).

The assessment of patient safety culture was found to use surveys mostly, that mainly measure the safety climate rather than safety culture as whole (Halligan and Zecevic, 2011 p.3,5). Safety climate is regarded to be a more readily accessible to measurement aspect of safety culture and is about staff attitude towards patient

safety in healthcare organization (Sexton *et al.*, 2006 p.2; The Health Foundation, 2011 p.5). Use of questionnaire allow the surveyor to appreciate the consensus among respondents' perceptions about prevailing safety culture (Sexton *et al.*, 2006).

These assessment tools do not agree on what to measure as part of safety culture, hence a quite wide range difference in safety dimensions assessed (ranging from three to twelve) with different number of questionnaire items (Halligan and Zecevic, 2011). This is disagreement on number of safety culture dimensions result from the complexity of safety culture concept which, as a new concept in health care need more understood and clearly conceptualized to avoid safety culture dimensions overlap identified in literature (Fleming, 2005; Sexton *et al.*, 2006; Halligan and Zecevic, 2011).

A large number of instruments to assess safety culture is available for used; Halligan and Zecevic (2011) in their review identified 12 different survey tools, The Health Foundation (2011), identified about 25 different survey tools and EUNetPaS (2010), identified 19 different survey tools. Of all these identified safety culture instruments, the Hospital Survey on Patient Safety Culture and Safety Attitudes Questionnaire were found to be the most commonly used (EUNetPaS, 2010; Halligan and Zecevic, 2011; The Health Foundation, 2011).

The Hospital Survey on Patient Safety Culture (HSOPSC) measures twelve dimensions (Sorra and Dyer, 2010; The Health Foundation, 2011) while the Safety Attitudes Questionnaire assess six (Sexton *et al.*, 2006; The Health Foundation, 2011). These instruments were found to address vital aspects of safety culture such as communication teamwork and management support, and they are of good

psychometric properties with a wide range of applicability (Sexton *et al.*, 2006; Sorra and Dyer, 2010).

2.4   Factors affecting patient safety culture

Patient safety culture is multifactorial. Several factors have been identified to influence the creation and or development of a positive patient safety culture, with many researchers pointing out the importance of management, individual behaviors and reporting system (Feng, Bobay and Weiss, 2008 p. 316). However, researchers are yet to reach a common agreement of what composites or dimensions encompass safety culture (Halligan and Zecevic, 2011 p. 340).

Safety culture dimensions that usually stem from factorial analysis of tools used to assess safety culture vary widely with some literature review ranging their variability from three to twelve dimensions (Halligan and Zecevic, 2011 p. 340). Sexton *et al.*, (2006 p. 2) came up with a Safety Attitude Questionnaire (SAQ) which assess 6 patient safety culture dimensions. This tool is eventually one of the most used tool to assess safety culture and was applied in many researchers such as Abdou and Saber, (2011 p. 19); Carvalho *et al.*, (2015 p. 153); Chakravarty *et al.*, (2015 p. 1043); Pinheiro and Uva, (2015 p. 3).

The Agency for Healthcare Research and Quality (AHRQ) suggested a 12 patient safety culture assessment tool that is the HSOPSC which is as well the one of the most used tool (Sorra *et al.*, 2016 p. 1). Many studies adopted this for instance (Abdelhai, Abdelaziz and S.Ghanem, 2012); (Abdolahzadeh, Zamanzadeh and Boroumand, 2012); (Al-mandhari and Al-zakwani, 2014); (Robb and Seddon, 2010). The present study will as well use the AHRQ twelve patient safety dimensions assessment.

Along with patient safety dimensions that are commonly used as part of healthcare organization safety assessment, the size of the hospital and its accreditation status (El-jardali *et al.*, 2011 p. 10); working area, education, working experience, interaction or contact direct with patient (Abdolahzadeh, Zamanzadeh and Boroumand, 2012 p. 219) influence patient safety culture.

2.5   Perceptions and attitude of healthcare providers

Healthcare providers' perceptions of patient safety culture vary widely among staff groups with managers perceiving it to be positive than their subordinates, between different professions, working experience, gender, age and depending on working area (Nordin *et al.*, 2013 p. 38).

Healthcare provider have a positive attitude in regard to patient safety culture. However, like their perceptions, their attitude towards patient safety culture varies in accordance to age, gender, working area, work experience and profession, furthermore lack of information on patient safety have a negative impact (Brasaite *et al.*, 2016 p. 5-6).

The AHRQ hospital survey on patient safety culture comparative report of march 2016 reveals that PSC is more positively perceived in small hospital than it is in larger hospital as well as in non-teaching hospital than in teaching hospital (Theresa Famolaro et al., 2016 p. 39). With regard to working area and staff position, this report is in agreement with the above researches whereby the authors of this report, account for more positive responses from rehabilitation centers than in emergency areas; however, event reporting was more positive in intensive care areas than in rehabilitation areas and participants in managerial positions had higher positive perception than their subordinates (Theresa Famolaro et al., 2016 p. 40).

Non-punitive response to error was found to be negatively perceived by respondents in most studies such as El-jardali *et al.*, (2011 p. 9); Ammouri *et al.*, (2015 p. 7), Laal *et al.*, 2016 p. 364); Azmal *et al.*, (2014 p. 3043); El-jardali *et al.*, (2014 p. 9). This can be explained by a feeling among staff that reporting will be held against them. However, blame and shame or punitive tradition is a major obstacle event reporting and hence hinder improvement through learning from reported opportunities (Azmal *et al.*, 2014 p. 366; Laal *et al.*, 2016 p. 3040). In fact, Günes, Gürlek and Sönmez, (2015 p. 4) found non-punitive response to errors had the least score followed by frequency of event reporting.

2.6   Conceptual framework

Safety expert believe that any investigation on quality of healthcare should be done within a framework that consider contextual factors involved in medical errors and adverse events (AEs) occurrence (Sexton *et al.*, 2006). This study will be guided by the reciprocal interactive theory of patient safety culture in nursing developed by Feng et al. (2008) as a result of the dimensional concept analysis of patient safety culture. According to these researchers, patient safety culture is a subset of organizational culture that specifically relating to the values and beliefs on patient safety within the healthcare organizations (Feng, Bobay and Weiss, 2008).

Feng et al. (2008) came up with four reciprocally interactive sub-dimensions regarded to be fundamental for patient safety. These sub-dimensions were synthesized as system, personal, task associated, and interactive and two philosophical perspectives of the patient safety culture concept.

The personal sub-dimension incorporates personal competence and personal commitment which are patient safety culture attributes at the personal level. Personal competence denotes the knowledge and skills required to provision of

safe health care services, while personal commitment implicates the eagerness to be part of patient safety activities (Feng, Bobay and Weiss, 2008).

The task-associated sub-dimension is about observable safety behaviors associated to the task performed or to be performed. The nature and frequency of the task determine the safety behaviors adopted. Thus, the greater the associated risk is the greater expected compliance to safety behaviors and more frequent or complex the task is, more likely safety behaviors changes occur (Feng, Bobay and Weiss, 2008)

The interactive sub-dimensions result from continuous interactions among healthcare professionals themselves and with patients within the organization system, and is based on communication and the maintenance of partnerships subsequent to shared values and attitudes. It recognizes the vital role of effective communication in achieving patient safety. Providing patient and family centered care is as well of paramount importance in patient safety culture (Feng, Bobay and Weiss, 2008).

The twelve AHRQ dimensions of safety that will measure patient safety culture in this study articulate to reflect this model, where patient safety as an outcome variable depend on these twelve dimensions otherwise, independent variables.

Figure 2.1 Conception framework [*based on the AHRQ Patient Safety Culture Composites* (Sorra *et al.*, 2016 p. 3)]

Per this conception framework, patient safety culture is viewed as multidimensional with each dimension expressing to some extent the beliefs and or attitudes of healthcare providers in regard to risks, errors and hazards that might affect the safety of patients under their care; therefore, components to measure patient safety culture.

Management support for patient safety and Manager/supervisor expectations and actions on promoting safety are critical dimensions of safety culture and are concerned with aspects of whether patient safety is a top priority for the management; which if this is the case foster working safety climate in which staff feel that they mistakes are not held against them, their efforts recognized and their suggestions towards improved patient safety are considered (Feng et al., 2008 p. 314; Sorra et al., 2016 pp. 3-4). These dimensions have an influence over others safety culture such as frequency of events reported, non-punitive response to error, organizational learning and continuous improvement.

Frequency of events reported as safety culture dimension depends on the status of non-punitive response to error dimension. Reporting of all actual or potential instances affecting patient safety can contribute to improved patient safety through organizational learning and continuous improvement dimension, which actually stems from this. Kind of reporting is regarded by ARHQ to be an indicator of strong culture of safety (Abdolahzadeh, Zamanzadeh and Boroumand, 2012 p. 216). In this study will assess both aspects of event reporting and organization learning thereof.

Staffing as safety culture dimension is concerned with the quality and the number of staff to deal with patients and is of paramount importance for patient safety. For instance research has found that high level of education of nurses was associated with mortality reduction among surgical patients (Feng, Bobay and Weiss, 2008 p. 314). Under this dimension, this study will assesses whether the available staff is enough to deal with available workload and the number of worked hours allow to safely provide healthcare (Sorra et al., 2016 p. 4).

Communication and teamwork are crucial for a culture of patient safety (El-jardali *et al.*, 2011 p. 9) and this conceptual framework approaches them from various facets. It addresses teamwork on hospital units level and as well as on within units. This study is concerned in this regard, to assessing whether multidisciplinary members of the surgical team cooperate, supports each other in a mutual respect and coordinate their efforts toward safe provision of care (Sorra et al., 2016 pp. 3-4).

Communication like teamwork has various facets that are addressed from communication openness, feedback and communication about error, and handoffs and transitions angles. It is estimated that 82% of sentinel events result from communication failure with patient care jeopardized by poor transition of care (El-jardali *et al.*, 2011 p. 9; Ammouri *et al.*, 2014 p.107) This study will assess whether staff spontaneously speak or question about issues affecting the safety of the patients and whether they are informed on issues affecting patient safety and are involved in finding and implementing patient safety issue prevention (Sorra et al., 2016 pp. 3-4).

Overall perception of patient safety evaluates the system as whole in regard to policies and procedures in place that promote medical errors prevention and eventually lack of patient safety issues (Sorra et al., 2016 p. 3).

2.7   Conclusion

In this chapter, we reviewed what different researchers' findings related to patient safety and in particular those pertaining to PSC, to include factors associated to PSC and ways PSC is assessed. The conceptual framework guiding this study was framed around the twelve safety dimensions by the AHRQ guided by the reciprocal interactive theory of PSC in nursing developed by Feng and colleagues in 2008.

CHAPTER THREE: METHODOLOGY

3.1   Introduction

This chapter presents the study design, methods used for data collection and data analysis. It also discusses the study setting; the study design; the study population and sample; the pilot study; the ethical considerations and the limitations for this study.

3.2   Study setting

The study was conducted in conveniently selected three out of five teaching hospitals located in Kigali, Rwandan capital. One of these hospitals had an internationally accreditation status while the others two are in the process of getting international accreditation. These hospitals are:

- The university teaching hospital of Kigali widely known as CHUK "*Centre Hospitalier Universitaire de Kigali*" which is the largest hospital in Rwanda with ten ORs of which six are in main OR.
- Rwanda Military Hospital (RMH) which had recently been upgraded from district hospital level to this level and have five operational ORs.
- King Faisal Hospital, Kigali (KFH, K) which is a private hospital and the only internationally accredited hospital in the country with five operational ORs.

3.3   Study design

A quantitative cross-sectional analytical study was used to assess the patient safety culture in Rwandan teaching hospital ORs according to healthcare provider perspectives.

3.4   Study Population

Approximately 255 healthcare providers utilize concerned ORs in their routine work and these people constituted the targeted population for this study. These were calculated as OR nurses (32.94%), non-physician anesthetists (28.63%), anesthesiologists (3.14), surgeons (15.29%) and post-graduate residents [both anesthesia residents (4.31%) and surgical residents (15.69%)] working or rotating in these hospitals.

3.5   Study Sample

The sample size for this study was calculated using Yamane's formula (Paul Luanglath and Rewtrakunphaiboon, 2014 p. 4) according to which $n = \frac{N}{1+N(e^2)}$ where **n** stand for the sample, **N** for the population and **e** for the error precision level. With this formula and a precision error set at 0.05 and considering our study population, a sample size of 156 subjects was calculated. A ten percent over sampling was implemented to enhance survey response.

3.6   Sampling Strategy

A multistage sampling plan was used for this study. The research deliberately selected three Rwandan teaching hospitals that had OR facilities. To account for distribution differences between selected hospitals and individual groups, stratified random sampling strategy was used. Stratified random sampling consist of subdividing the population into different subpopulations based on preset stratifying variables and then selecting indiscriminately participants either proportionally or disproportionally to enhance representation of the population (Polit and Beck, 2012 p. 281).

For this research, working category and hospital were the two preset stratification variables and proportional sampling was used. The researcher obtained the list of eligible participants from the OR managers to establish the sampling frame and then required number of participants for each segment was selected randomly using random digit numbers.

Considering proportion:

(i) 45 participants were selected from CHUK of whom 18 nurses, 9 surgeons, 15 non-physician anesthetists, 3 anesthesiologists; and 16 post-graduate residents

(ii) 51 participants were selected from RMH of whom 18 nurses, 9 surgeons, 21 non-physician anesthetists and 3 anesthesiologists; and 8 post-graduate residents

(iii) 30 participants were selected from KFH, K of whom 14 nurses, 6 surgeons, 8 non-physician anesthetists, 2 anesthesiologists and 6 post-graduate residents.

The following inclusion and exclusion criteria were considered by the researcher:

3.6.1   Inclusion criteria

i. Nurses employed as full-time by selected hospitals and work as OR nurse in main OR and were available during the survey period

ii. Anesthesia providers employed as full-time by selected hospitals, were using the OR on a regular basis and were available during the survey period

iii. Surgeons employed as full-time by selected hospitals, were working and using the OR on a regular basis and were available during the survey period

iv. Post-graduate residents who were rotating in the selected hospitals during the study period

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3.6.2   Exclusion criteria

    i. Any OR nurse, surgeon, anesthesia provider and post-graduate resident with less than six months' experience in the OR

    ii. Any OR nurse, surgeon, anesthesia provider and post-graduate resident who was away or was not working in main OR during the survey period

    iii. Any OR nurse, surgeon, anesthesia provider and post-graduate resident who were unwilling to participate in this study

3.7   Data Collection Methods and Procedures

3.7.1   Data collection tools

The researcher used the Hospital Survey on Patient Safety Culture (HSOPSC) instrument. This instrument was developed by a survey design team from Westat; a private company contracted by the United States Agency for Healthcare Research and Quality (AHRQ). The development of this instrument was based on the literature review pertaining patient safety and interviews with patient safety experts and hospital staff. The drafted survey tool was further refined through researcher and hospital administrator and Joint Commission input (Sorra and Dyer, 2010 p. 2; Sorra *et al.*, 2016 pp. 1-2).

The HSOPSC instrument was released in November 2004 with a reliability ranging between .63 to .84, after it was piloted on more than 1400 hospital employees from 21 hospitals in United States (Sorra and Dyer, 2010 p. 2; AHRQ, 2016; Sorra *et al.*, 2016 p. 2). It is one of the most used valid tool to measure safety culture in health care settings (The Health Foundation, 2011) and have been used in over 66 countries with 31 translations (AHRQ, 2016).

The HSOPSC is used to examine hospital staff viewpoint of patient safety culture and uses a 5-point Likert Scale (from strongly disagree to strongly agree) and rating of frequency (from never to always). Forty-two items related to safety culture grouped into twelve dimensions of which seven unit-level dimensions, three hospital-level dimensions and four outcomes variables are assessed.

A positive response is considered to be a score of 4 or 5 on the Likert scale for positively worded items whereas a score of 1 or 2 is considered positive for negatively worded items as the later have to be reverse coded to calculate positive responses. Therefore, Positive responses in positively worded survey items are agree or strongly agree and most of the time or always while positive responses in negatively worded items are disagree or strongly disagree and never or rarely.

The level of patient safety culture of each safety dimension is obtained by adding-up positive scores of each dimensional items over the total responses of that safety dimension, and the overall patient safety culture is calculated by adding-up all safety culture dimensions percentages of positive scores over the total number of safety culture dimensions (twelve). The level of patient safety culture is categorized positive for a score of at least 75%; a neutral safety culture a score ranging from 50% to 74% and a poor or negative safety culture a score less than 50% (Sorra and Nieva, 2004 p.34).

In addition, respondents are requested to provide their background information, grade their work area regarding safety culture and specify the number of safety events they have reported for the last 12 months (Sorra *et al.*, 2016).

3.7.2 Data collection methods

A self-administered questionnaire was used to collect views and perceptions on patient safety culture. The researcher distributed HSOPSC to study participants and did a follow-up to collect the questionnaires back. This follow-up consisted of many visits to the study sites and redistribution of questionnaire to those participants who reported to have lost the previous one once contacted by the researcher. About fifteen questionnaires were redistributed by the researcher during the follow-up process. Whenever a questionnaire was received back from the respondent, it was marked either as C for CHUK respondents, K for KFH, K respondents and R for RMH respondents immediately by the researcher. collected back by the researcher. This was done to help monitoring response and eventually to contribute to data analysis later.

3.7.3 The pilot study

Before the main study was done, a pilot study was carried out to test and verify that the questionnaire questions were properly understood and could be accurately answered to reflect the respondent's views and perceptions. A 10% of the main study sample size participants were recruited for this pilot study. These pilot study participants had no potential probability to be picked for the main study though they had enough exposure to study setting area and were mainly colleagues' students in masters.

Fifteen questionnaires; ten of English and five of French versions of the HSOPSC were distributed. Five out of fifteen respondents to both English and French versions at a separate interval which allowed the research to collect more views on the understandability and contextualization of the questionnaire.

The researcher took time with each respondent to discuss understandability and contextualization of the questionnaire and as well as receive feedback on estimated response time of 10 to 15 minutes. Most of the respondents estimated that responding to the questionnaire requires 20 minutes and that the questionnaire was clearly understood especially its English version. Areas of confusion in French version were observed on two questionnaire items and these were clarified before the main study data collection.

3.7.4   *Reliability of data collection instrument in Rwandan context*

The internal consistency of the data collection tool is commonly done by use of the Cronbach's Coefficient Alpha that take a value ranging between 0 and 1. The higher the value is, the more it is reliable. Many authors postulate that a Cronbach's Alpha of .7 or higher is acceptable (Field, 2009; Pallant, 2011; Polit and Beck, 2012). However, the developers of the HSOPSC postulate that a Cronbach's Alpha of at least .6 is acceptable (Sorra and Nieva, 2004 p. 59).

Table 3.1: Internal consistency of HSOPSC different subscales

PSC Dimension	Number of items	Cronbach's Alpha	inter-item correlation $\bar{x}$
Teamwork Within Units	4	.67	.336
Supervisor/Manager Expectations & Actions Promoting Patient Safety	4	.53	.217
Organizational Learning/Continuous Improvement	3	.55	.285
Management Support for Patient Safety	3	.69	.422
Overall Perceptions of Patient Safety	3	.29	.91
Feedback and Communication About Error	3	.69	.428
Communication Openness	3	.57	.310
Frequency of Events Reported	3	.86	.678
Teamwork Across Units	4	.62	.289
Staffing	4	.04	.009
Handoffs & Transitions	4	.72	.387
Non-punitive Response to Error	3	.53	.271

As per the above table, the English and French versions of HSOPSC proved to have an acceptable internal consistency in Rwandan context with a Cronbach's Alpha of .79. However, there was huge variability of Cronbach's Alpha values across its dimension subscales tested individually (Table 3.1). Manerikar and Manerikar, (2015, p.118) categorized internal consistence as excellent ($\alpha = .9$); good ($.7 = \alpha < .9$); acceptable ($.6 = \alpha < .7$); poor ($.5 = \alpha < .6$) and poor if $\alpha < .5$.

Pallant (2011, p.6) posit that Cronbach's Alpha value is very sensitive to the number of items making a scale or subscale; with tendencies of having lower values for few item scales. In such cases it is commendable to consider inter-item correlation with a cut-off of .2 to .4 (Pallant, 2011 p.6).

3.8   Data analysis

Once the survey questionnaires were received back from participants, they were checked for completeness. Collected data was managed and analyzed using a statistical package for social sciences (IBM-SPSS version 21) to compute both descriptive and inferential statistics on a password protected laptop.

The data analysis considered the HSOPSC user guide recommendations (Sorra *et al.*, 2016). The researcher identified items pertaining to each safety culture dimension as per HSOPSC user guide and summation of responses was done correspondingly and the percentages of positive responses were calculated for each item and patient safety culture dimension. Missing data were excluded for percentages calculation.

The descriptive statistics on background information of respondents for each safety dimensions and for the two outcomes composite were computed and presented either by frequency tables or by graphs. Moreover, data were explored for normal distribution before inferential statistical tests.

A one-way analysis of variance (ANOVA) was used to compare mean differences across the twelve safety dimensions and on the overall current patient safety culture among teaching hospitals under study.

3.9 Ethical considerations

Cognizant with the researcher's responsibility to protecting research participants, the researcher considered ethical principles as outlined in the Belmont Report (Polit and Beck, 2012 p. 152):

Protecting human dignity is very important ethical principle in research while recruiting prospective research participants. It encompasses right to self-determination and full disclosure, elements important to informed consent (Polit and Beck, 2012 p. 154). To ensure this principle, participation to this study was fully voluntary. The informed consent was sought and obtained and signed from participants before they respond to the survey questions. They were given necessary information regarding this study in writing and were allowed to ask for clarifications from the researcher. It was stressed that they can at any time, withdraw from the study without consequences.

The Beneficence and non-maleficence as an ethical principle, implies not inflicting or minimizing harm to research participants while promoting benefits (Polit and Beck, 2012 p. 152). The researcher did not envisage risks associated to responding to survey questionnaire but did expect that the outcome of this study may contribute to improved patient safety as the findings can guide improvement strategies.

The principle of justice is about ensuring research participants privacy and fair treatment (Polit and Beck, 2012 pp. 155-156). To safeguard this principle, the researcher invited both surgeons, anesthesia providers, nurses and post-graduate residents to participate in the study. Moreover, the survey was anonymous and privacy of participant responses assured.

Permission to complete this study was requested and obtained from the University of Rwanda, College of Medicine and Health Sciences Institution Review Board (IRB) and the permission to conduct the survey was as well requested and obtained from each teaching hospital relevant authority before distributing survey questionnaire to the participants.

3.10 Conclusion

In this chapter, the study design used for this research was presented as well as how participants were recruited. The present study used a standardized tool developed by AHRQ which was piloted to check its application to Rwandan context. Result of the pilot study were presented in this chapter and included the reliability results. This chapter also elaborated how data were managed and analyzed. Ethical considerations were as well discussed.

CHAPTER FOUR: RESULTS

4.1   Introduction

This chapter presents results of data collected from healthcare provider working in the ORs of CHUK, KFH, K and RMH. Background information of respondents is presented first and then descriptive and inferential results on patient safety culture to address the research questions and objectives outlined in chapter one.

4.2   Background characteristics of respondents

The HSOPSC was administered distributed to 172 healthcare providers; users of the ORs in hospitals under study and 153 questionnaires were collected back. However, one of the returned questionnaires was not fulfilling criteria recommended by the instrument developer to be included in the analysis (Sorra *et al.*, 2016 p. 27); therefore 152 questionnaire were analyzed for the purpose of this study; giving a response rate of 88%. This was a very good response rate as response rate greater than 65% is regarded to minimize the risk of bias (Polit and Beck, 2012 p. 311).

All the respondents are typically in direct interaction with the patients (Table 4.2) and their distribution is shown in table 4.1, where 59 (38.8%) respondents were from CHUK, 39 (25.7%) respondents were from KFH, K and 54 (35.5%) respondents were from RMH. OR nurses represent the biggest proportion of respondents (33.6%) followed by the non-physician anesthetist group (25.7%) with the anesthesia residents group representing the least proportion (3.9%). This is explained by the fact that nurses represent the majority of OR personnel while few residents are enrolled into anesthesia program.

Table 4.1: Respondents Employment Position and per hospital under study

Employment Position	CHUK	KFH, K	RMH	Total	%
Anesthesia Resident	3	0	3	6	**3.9**
Anesthesiologist	3	4	3	10	**6.6**
Non-Physician Anesthetist	15	8	16	39	**25.7**
Operating Room Nurse	17	15	19	51	**33.6**
Surgeon	9	5	7	21	**13.8**
Surgical Resident	12	7	6	25	**16.4**
Total	**59**	**39**	**54**	**152**	**100.0**

As per next table, most of our respondents (66.4%) report that they work between 40 to 59 hours per week which is in accordance with the Rwandan Labor law (Republic of Rwanda, 2009 p.9). Conversely, 9.9% of respondents report to work less than 40 hours per week while other 23.6% of participants report to work at least 60 hours per week (Table 4.2).

Working more than 60 hours may be explained by that fact that some of the respondents are the alone within their specialty resulting in covering calls regarding their specialty through-out and the fact that residents tend to work long hours to meet learning expectations. Those who report to work less than 40 hours might be reporting only the time they spent in their respective hospital excluding the time they either spent in teaching or in part-time employment in a different hospital.

The respondents' specialty or professional experience range predominantly between one and five years (71 respondents, representing 47% of respondents).

Table 4.2: Respondents working experience

Area	Experience	Frequency	%
In the current hospital (n = 151)	Less than 1 year	23	15.2
	1 to 5 years	52	34.4
	6 to 10 years	48	31.8
	11 to 15 years	21	13.9
	16 to 20 years	4	2.6
	21 years or more	3	2.0
In the current hospital OR (n = 152)	Less than 1 year	20	13.2
	1 to 5 years	69	45.4
	6 to 10 years	47	30.9
	11 to 15 years	12	7.9
	16 to 20 years	3	2.0
	21 years or more	1	.7
In the current specialty or profession (n = 151)	Less than 1 year	10	6.6
	1 to 5 years	71	47.0
	6 to 10 years	40	26.5
	11 to 15 years	21	13.9
	16 to 20 years	4	2.6
	21 years or more	5	3.3
Direct interaction with the patient (n = 152)	Yes	152	100
	No	0	0
Number of hours worked per week (n = 152)	Less than 20 hours	5	3.3
	20 to 39 hours	10	6.6
	40 to 59 hours	101	66.4
	60 to 79 hours	23	15.1
	80 to 99 hours	7	4.6
	100 hours or more	6	3.9

4.3 Perceptions of the OR healthcare providers concerning patient safety culture in Rwandan teaching hospital ORs.

4.3.1 Communication openness

Table 4.3: Communication Openness

Dimension items	Perceptions	Frequency	%
Staff will freely speak up if they see something that may negatively affect patient care (n = 151)	Never	4	2.6
	Rarely	18	11.9
	Sometimes	32	21.2
	Most of time	60	39.7
	Always	37	24.5
Staff feel free to question the decisions or actions of those with more authority (n = 151)	Never	11	7.3
	Rarely	42	27.8
	Sometimes	49	32.5
	Most of time	37	24.5
	Always	12	7.9
Staff are afraid to ask questions when something does not seem right* (n = 151)	Never	19	12.6
	Rarely	48	31.8
	Sometimes	44	29.1
	Most of time	32	21.2
	Always	8	5.3

* Negatively worded items that are reversed to calculate positive responses

This shows that 97 (64.2%) respondents will freely speak up if they see something that may negatively affect patient care; (most of the time and always by 39.7% and 24.5% of respondents respectively). 2.6% our respondents will never speak up while other 11.6% will rarely speak up.

Though the majority of our respondents will feel free to speak up, few will freely question actions or decisions of those with more authority (32.4%) or they are not afraid to question when something does not seem right 44.2%. A large number of

our respondents; 53 (35.1%) will never or rarely question actions or decisions of those with more authority. Therefore, respondents perceive positively this dimension at a level of 47%, the overall mean over fifteen was 9.89 (SD of ± 2.34).

4.3.2   Feedback and communication about error

Table 4.4: Feedback and communication about error

Dimension items	Perceptions	Frequency	%
We are given feedback about changes put into place based on event reports (n = 152)	Never	8	5.3
	Rarely	34	22.4
	Sometimes	49	32.2
	Most of time	44	28.9
	Always	17	11.2
We are informed about errors that happen in this unit (n = 152)	Never	5	3.3
	Rarely	16	10.5
	Sometimes	45	29.6
	Most of time	53	34.9
	Always	33	21.7
In this unit, we discuss ways to prevent errors from happening again (n = 152)	Never	1	.7
	Rarely	12	7.9
	Sometimes	33	21.7
	Most of time	66	43.4
	Always	40	26.3

As per table 4.4, respondents perceive positively this PSC dimension at 55.5%; the overall mean over fifteen was 10.66 (SD of ± 2.38) with discussing ways to prevent errors being the best positively perceived 69.7% (most of the time 43.4%; always 26.3%). Being given feedback about changes implemented based on reported events was the least positively perceived 40.1% (most of the time 28.9%; always 11.2%).

4.3.3 Hospital Handoffs and Transitions

Table 4.5: Hospital Handoffs and Transitions

Dimension items	Perceptions	Frequency	%
Things "fall between the cracks" when transferring patients from one unit to another* (n = 148)	Strongly disagree	15	10.1
	Disagree	46	31.1
	Neither	44	29.7
	Agree	40	27.0
	Strongly agree	3	2.0
Important patient care information is often lost during shift changes* (n = 152)	Strongly disagree	23	15.1
	Disagree	52	34.2
	Neither	23	15.1
	Agree	48	31.6
	Strongly agree	6	3.9
Problems often occur in the exchange of information across hospital units* (n = 152)	Strongly disagree	9	5.9
	Disagree	49	32.2
	Neither	45	29.6
	Agree	45	29.6
	Strongly agree	4	2.6
Shift changes are problematic for patients in this hospital* (n = 151)	Strongly disagree	13	8.6
	Disagree	49	32.5
	Neither	34	22.5
	Agree	41	27.2
	Strongly agree	14	9.3

Negatively worded items that are reversed to calculate positive responses

Table 4.5 shows that only 42.4 % (mean over twenty being 12.56 and SD was ± 3.18) of respondents perceive this positively; whereby 41.2% report that transferring patient does not fall between the cracks, important patient care information is not lost (49.3%), shift changes are not problematic (41.1%) and rare occurrence of problem during exchange of patient information (38.1%).

4.3.4   Hospital Management Support for Patient Safety

Responses on two positively worded items and one negatively warded item making up this PSC dimension were collected. These items are concerned with how the work climate promote patient safety and how patient safety is a priority.

Table 4.6: Hospital Management Support for Patient Safety

Dimension items	Perceptions	Frequency	%
Hospital management provides a work climate that promotes patient safety (n = 152)	Strongly disagree	3	2.0
	Disagree	14	9.2
	Neither	29	19.1
	Agree	80	52.6
	Strongly agree	26	17.1
The actions of hospital management show that patient safety is a top priority (n = 152)	Strongly disagree	3	2.0
	Disagree	18	11.8
	Neither	21	13.8
	Agree	70	46.1
	Strongly agree	40	26.3
Hospital management seems interested in patient safety only after an adverse event happens* (n = 152)	Strongly disagree	21	13.8
	Disagree	44	28.9
	Neither	30	19.7
	Agree	42	27.6
	Strongly agree	15	9.9

* Negatively worded items that are reversed to calculate positive responses

As per table 4.6 Hospital Management Support for Patient Safety was positively perceived by respondents at 61.6%, overall mean over fifteen was 9.41 (SD of ± 1.61) with actions of hospital management perceived to show that patient safety is a priority by 110 (72.4%) respondents. However, few respondents disagree with the subscale item stating that hospital management seems interested in patient

safety only after an adverse event happens 65 (42.7%). The working climate was reported to be positive by 106 (69.1%) respondents.

4.3.5   Non-punitive Response to Error

This dimension consists of three negatively worded subscale items linked to the extent that participants disagree or agree that mistakes they make are not being held against them nor kept in their personnel records.

Table 4.7: Non-punitive Response to Error

Dimension items	Perceptions	Frequency	%
Staff feel like their mistakes are held against them* (n = 147)	Strongly disagree	7	4.8
	Disagree	30	20.4
	Neither	34	23.1
	Agree	59	40.1
	Strongly agree	17	11.6
When an event is reported, it feels like the person is being written up, not the problem* (n = 150)	Strongly disagree	7	4.7
	Disagree	31	20.7
	Neither	42	28.0
	Agree	52	34.7
	Strongly agree	18	12.0
Staff worry that mistakes they make are kept in their personnel file* (n = 151)	Strongly disagree	3	2.0
	Disagree	19	12.6
	Neither	29	19.2
	Agree	67	44.4
	Strongly agree	33	21.9

* Negatively worded items that are reversed to calculate positive responses

The Non-Punitive Response to Error dimension was perceived more negatively as only 21.7% participants have a positive perception about it, the overall mean over fifteen was 7.69 (SD of ± 2.25). As per table 4.7; 76 (51.7%) respondents feel like their mistakes are held against them with 100 (66.3%) respondents worrying about

filing of their mistakes into their personal records. A feeling of being written up once an event is reported was expressed by 60 (46.7%) of the participants.

4.3.6 *Organizational Learning/Continuous Improvement*

The dimension consists of three positively worded items regarding the extent to which participants agree or disagree that positive change has resulted from reported mistakes and that effectiveness implemented change is evaluated.

Table 4.8: Organizational Learning/Continuous Improvement

Dimension items	Perceptions	Frequency	%
We are actively doing things to improve patient safety (n = 152)	Strongly disagree	0	0
	Disagree	6	3.9
	Neither	12	7.9
	Agree	101	66.4
	Strongly agree	33	21.7
Mistakes have led to positive changes here (n = 149)	Strongly disagree	7	4.7
	Disagree	17	11.4
	Neither	27	18.1
	Agree	77	51.7
	Strongly agree	21	14.1
After we make changes to improve patient safety, we evaluate their effectiveness (n = 152)	Strongly disagree	3	2.0
	Disagree	36	23.7
	Neither	29	19.0
	Agree	69	45.4
	Strongly agree	15	9.9

Table 48 indicates a positive perception by 69.7%, the overall mean over fifteen was 11.06 (SD of ± 1.96) respondents; with 134 (88.1%) respondent reporting that they are actively doing something to improve patient safety. Though effectiveness of implemented changes is perceived to be evaluated by 84 (55.3%) respondents,

the perception of that mistakes has led to positive changes is expressed by 98 (65.8%) respondents.

4.3.7   Overall Perception of safety

The overall perception of safety is a PSC dimension consisting of two positively worded and two negatively worded items on perceptions of how good available procedures and systems prevent errors and the absence of safety issues.

Table 4.9: Overall Perception of safety

Dimension items	Perceptions	Frequency	%
It is just by chance that more serious mistakes don't happen around here* (n = 148)	Strongly disagree	24	16.2
	Disagree	60	40.5
	Neither	24	16.2
	Agree	28	18.9
	Strongly agree	12	8.1
Patient safety is never sacrificed to get more work done (n = 147)	Strongly disagree	7	4.8
	Disagree	33	22.4
	Neither	27	18.4
	Agree	55	37.4
	Strongly agree	25	17.0
We have patient safety problems in this unit* (n = 152)	Strongly disagree	13	8.6
	Disagree	44	28.9
	Neither	25	16.4
	Agree	57	37.5
	Strongly agree	13	8.6
Our procedures and systems are good at preventing errors from happening (n = 152)	Strongly disagree	6	3.9
	Disagree	40	26.3
	Neither	31	20.4
	Agree	53	34.9
	Strongly agree	22	14.5

(*) Negatively worded items that are reversed to calculate positive responses

This dimension is perceived positively by 49.5% participants with an overall mean over twenty 12.99 and SD of ± 2.57; the best perceived item being the negatively worded item "It is just by chance that more serious mistakes don't happen around here" by 84 (56.7%) respondents. Moreover, 80 (54.4%) perceive that patient safety is never sacrificed to get more work done. The least positively perceived item was "we have patient safety problems in this unit"; and 75 (49%) participants feel that the available procedures and systems are good in preventing errors (table 4.9).

4.3.8   Staffing

Table 4.10: Staffing

Dimension items	Perceptions	Frequency	%
We have enough staff to handle the workload (n = 151)	Strongly disagree	13	8.6
	Disagree	65	43.0
	Neither	23	15.2
	Agree	40	26.5
	Strongly agree	10	6.6
Staff in this unit work longer hours than is best for patient care* (n = 150)	Strongly disagree	9	6.0
	Disagree	27	18.0
	Neither	26	17.3
	Agree	55	36.7
	Strongly agree	33	22.0
We use more agency/temporary staff than is best for patient care* (n = 150)	Strongly disagree	20	13.3
	Disagree	57	38.0
	Neither	32	21.3
	Agree	34	22.7
	Strongly agree	7	4.7
We work in "crisis mode" trying to do too much, too quickly* (n = 151)	Strongly disagree	7	4.6
	Disagree	37	24.5
	Neither	20	13.2
	Agree	66	43.7
	Strongly agree	21	13.9

* Negatively worded items that are reversed to calculate positive responses

As per table 4.10, staffing as a safety culture dimension was perceived positively by 34.4% respondents (overall mean over twenty was 11.19, SD of ± 2.31); with the item checking whether available staff is enough to handle the workload being perceived positively by 78 (51.6%) of respondents. Correspondingly, 77 (51.3%) respondents are in disagreement with the use of temporary staff in meeting workload requirements. Yet, 88 (58.7%) respondents feel they work longer hours than is best for patient while 87 (57.6%) report they work in a crisis mode trying to do too much, too quickly.

4.3.9   Supervisor/Manager Expectations & actions in promoting patient safety

Table 4.11: Supervisor/Manager Expectations & actions in promoting patient safety

Dimension items	Perceptions	Frequency	%
My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures (n = 149)	Strongly disagree	6	4.0
	Disagree	16	10.7
	Neither	31	20.8
	Agree	72	48.3
	Strongly agree	24	16.1
My supervisor/manager seriously considers staff suggestions for improving patient safety (n = 149)	Strongly disagree	5	3.4
	Disagree	12	8.1
	Neither	22	14.8
	Agree	88	59.1
	Strongly agree	22	14.8
Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts* (n = 149)	Strongly disagree	11	7.4
	Disagree	52	34.9
	Neither	38	25.5
	Agree	37	24.8
	Strongly agree	11	7.4
My supervisor/manager overlooks patient safety problems that happen over and over* (n = 149)	Strongly disagree	25	16.8
	Disagree	38	25.5
	Neither	30	20.1
	Agree	49	32.9
	Strongly agree	7	4.7

* Negatively worded items that are reversed to calculate positive responses

As per the above table, we can appreciate that this dimension is positively perceived by 55.7%, mean of 13.62 over 20; SD of ± 2.70. The best positive score on my supervisor/manager seriously considers staff suggestions for improving patient safety by 110 (73.9%) respondents. A positive score of 64.4% allocated to my supervisor/manager says a good word when he/she sees a job done according

to established patient safety procedures. The rest of the items had the same positive score of 42.3%.

4.3.10 Team Work Across Hospital Units

This dimension was assessed by used of two positive worded and two negative worded items regarding how different hospital units cooperate and coordinate with one another for provision of safest patient care. All the items were positively scored with the averaged positive score for this dimension being 61.9% with the overall mean over 20 of 14.21 and a SD of ± 2.54.

Table 4.12: Team Work Across Hospital Units

Dimension items	Perceptions	Frequency	%
Hospital units do not coordinate well with each other* (n = 152)	Strongly disagree	17	11.2
	Disagree	62	40.8
	Neither	31	20.4
	Agree	37	24.3
	Strongly agree	5	3.3
There is good cooperation among hospital units that need to work together (n = 150)	Strongly disagree	3	2.0
	Disagree	15	10.0
	Neither	39	26.0
	Agree	78	52.0
	Strongly agree	15	10.0
It is often unpleasant to work with staff from other hospital units* (n = 150)	Strongly disagree	14	9.3
	Disagree	73	48.7
	Neither	38	25.3
	Agree	23	15.3
	Strongly agree	2	1.3
Hospital units work well together to provide the best care for patients (n = 151)	Strongly disagree	3	2.0
	Disagree	9	6.0
	Neither	25	16.6
	Agree	88	58.3
	Strongly agree	26	17.2

Negatively worded items that are reversed to calculate positive responses

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Table 4.12 shows that 114 (75.5%) respondents concur that hospital units work well together to provide the best care for patients and correspondingly 93 (62%) of respondents report that a good cooperation among hospital units that need to work together. A disagreement with poor coordination of hospital units and with working with staff from other hospital units being unfriendly by 79 (52%) and 87 (58%) respectively.

4.3.11 Teamwork within the Unit

Table 4.13: Teamwork within the Unit

Dimension items	Perceptions	Frequency	%
People support one another in this unit (n = 152)	Strongly disagree	2	1.3
	Disagree	8	5.3
	Neither	14	9.2
	Agree	95	62.5
	Strongly agree	33	21.7
When a lot of work needs to be done quickly, we work together as a team to get the work done (n = 151)	Strongly disagree	2	1.3
	Disagree	12	7.9
	Neither	19	12.6
	Agree	90	59.6
	Strongly agree	28	18.5
In this unit, people treat each other with respect (n = 152)	Strongly disagree	2	1.3
	Disagree	9	5.9
	Neither	16	10.5
	Agree	96	63.2
	Strongly agree	29	19.1
When one area in this unit gets really busy, others help out (n = 152)	Strongly disagree	8	5.3
	Disagree	20	13.2
	Neither	29	19.1
	Agree	77	50.7
	Strongly agree	18	11.8

As per table 4.13, 128 (84.2%) respondents report that they support one another in their units and likewise, they report that others help-out whenever one area unit gets really busy 95 (62.5). Consequently, 118 (78.1) respondents report that report that they work together as a team whenever there is rise in work load that needs to be done quickly. Furthermore, positive teamwork within units is expressed by mutual respect reported by 125 (82.3) respondents. This safety dimension is positively perceived at 76.8% overall mean over twenty being 15.25 (SD of $\pm$ 2.46).

4.4   Attitudes of the OR healthcare providers concerning patient safety culture in Rwandan teaching hospital ORs

Attitudes of the healthcare provider users of OR concerning patient safety culture was assessed trough the willingness to report events that may or affect patients and as well the actual event reporting itself. The figure 4.1 reflect the reporting patterns while table 4.14 on frequency of event reporting reflect the frequency by which different events are reported.
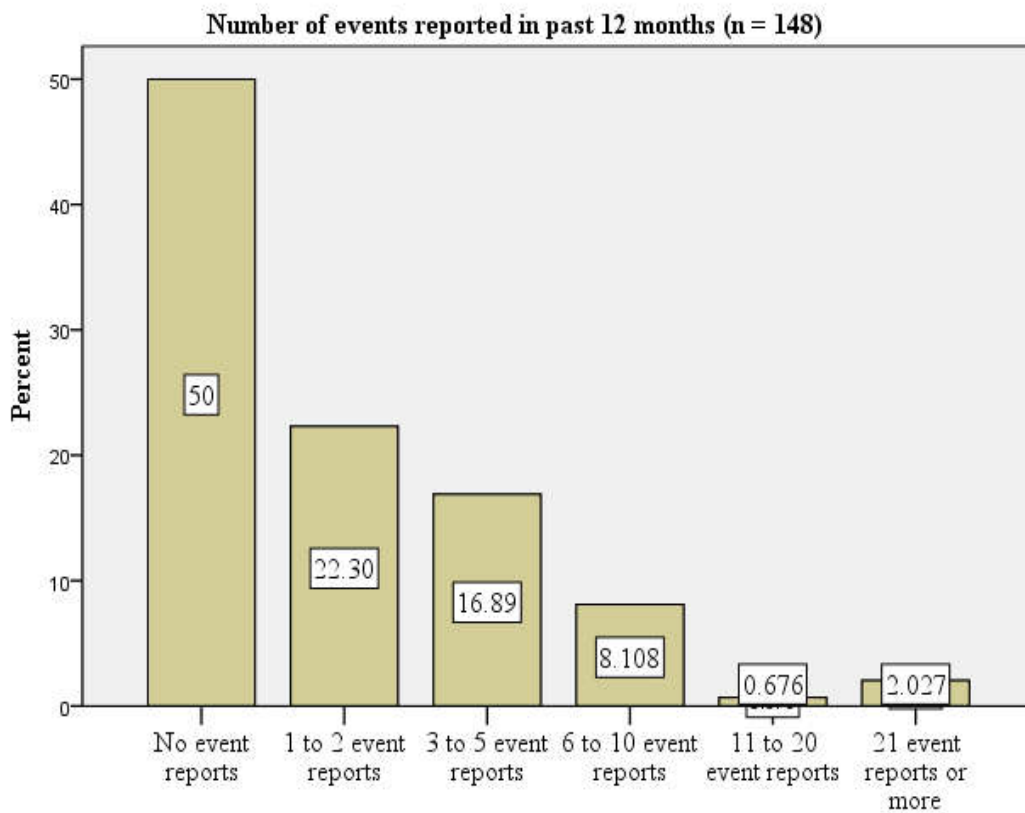
Figure 4.1 Number of Events Reported

Figure 4.1 reports the actual reporting of events in the past 12 months. Half of our respondents report to have not reported any events and very few (about 0.68%) have reported between 11 and 20 events.

Table 4.14: Frequency of Event Reporting

Dimension items	Perceptions	Frequency	%
When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? (n = 152)	Never	8	5.3
	Rarely	39	25.7
	Sometimes	37	24.3
	Most of time	41	27.0
	Always	27	17.8
When a mistake is made, but has no potential to harm the patient, how often is this reported? (n = 152)	Never	13	8.6
	Rarely	47	30.9
	Sometimes	35	23.0
	Most of time	31	20.4
	Always	26	17.1
When a mistake is made that could harm the patient, but does not, how often is this reported? (n = 152)	Never	5	3.3
	Rarely	36	23.7
	Sometimes	42	27.6
	Most of time	43	28.3
	Always	26	17.1

As per table 4.14 reporting events is negatively perceived as the overall of positive score for this PSC dimension was negatively perceived as its positive score was 42.6% overall mean over fifteen was 9.65 and a SD of ± 3.14. Those committed mistakes but have no potential to harm the patient, will not or rarely be reported in 39.9% with only these being reported most of the times or always in 37.5%.

Mistakes that are made, but caught and corrected before they harm the patient, are most of the time or always reported in 27% or 17.8% cases. Congruently, committed mistakes that could harm the patient, but does not are most of the time or always reported in 28.8% and 17.1% of cases correspondingly.

4.5 Current patient safety culture in Rwandan teaching hospital ORs

This section presents the perceived overall grade of safety given by respondents, summarizes different dimensional scores to ultimately give a score to the current PSC.

Table 4.15: Summary of current PSC dimensional scores

| Dimension of PSC	Negative	Neutral	Positive
Communication Openness	25.4%	27.6%	47.0%
Feedback and Communication About Error	16.7%	27.8%	55.5%
Frequency of Events Reported	32.5%	24.9%	42.6%
Handoffs & Transitions	33.3%	24.2%	42.4%
Management Support for Patient Safety	20.8%	17.5%	61.6%
Non-punitive Response to Error	54.9%	23.4%	21.7%
Organizational Learning/Continuous Improvement	15.2%	15.0%	69.7%
Overall Perceptions of Patient Safety	32.6%	17.9%	49.5%
Staffing	48.8%	16.8%	34.4%
Supervisor/Manager Expectations & Actions Promoting Patient Safety	24.0%	20.3%	55.7%
Teamwork Across Units	16.0%	22.1%	61.9%
Teamwork Within Unit	10.4%	12.8%	76.8%
Current PSC in Rwandan THs ORs	**27.5%**	**20.9%**	**51.6%**

As per table 4.15, six out of twelve PSC dimensions assessed in this study were positively perceived by more than half of our respondents. The best positive score was for teamwork within units (76.8%). Likewise, other six PSC dimensions are

perceived negatively by more than 50% of our respondents. The least positive score was as low as 21.7% assigned to Non-punitive response to errors dimension.

By summing aggregating percentages of positive scores of different safety culture dimensions and dividing the total with the number of safety culture dimensions, we came up with the level of current PSC which was 51.6%, overall mean over 210 being 137.83 and a SD of ± 15.97). This score is congruent with the patient safety grade assigned by respondents of this study as 50% of respondents positively graded patient safety that is as excellent and very good respectively by 10% and 40% of respondents (figure 4.2).

Patient safety was also rated to be acceptable and poor correspondingly by 39% and 11% of our respondents (figure 4.2).

Figure 4.2 Patient Safety Grade
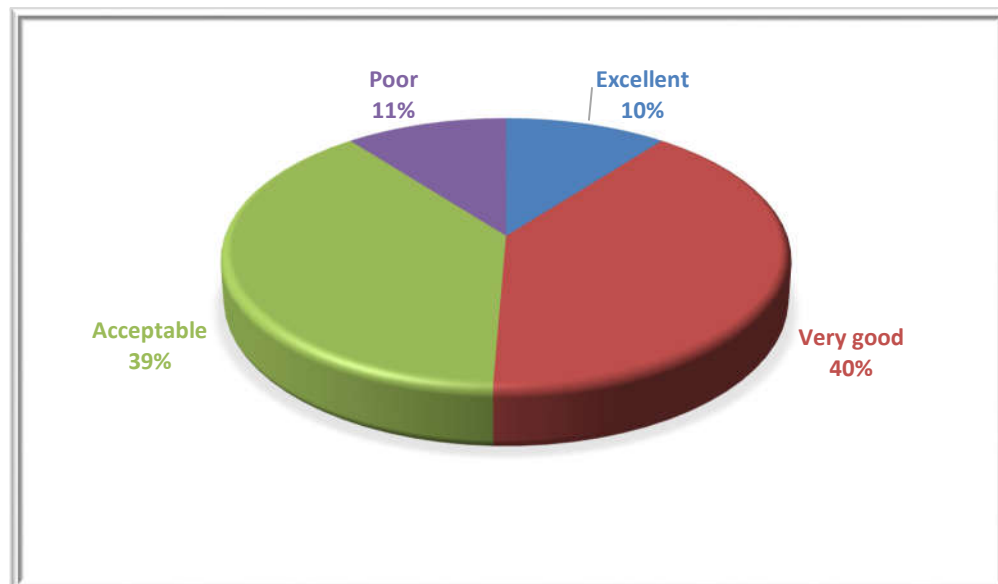
4.6 Factors affecting patient safety culture in Rwandan teaching hospital ORs

4.8.1   Respondents background of healthcare providers on the current PSC

One-way analysis of variance (ANOVA) was conducted between groups to explore the possible differences among these with regards to the current PSC. There was a statistically significant difference between the hospitals under study (p value of .000) in Robust Test of Equality of means scores for the three hospitals; F (2, 121) = 16.91. The effect size Eta Squared was calculated to be .29 which indicate a large effect. The post hoc comparison using the Tukey honest significant difference was used to the groups of significance difference with KFK, K found to be significantly different from the rest of the hospitals under study (Appendix VII). No significant difference observed between the other two hospitals under study (table 4.18).

Analysis of others background factors yield no statistical significant difference except for number of hours worked per week, for which Welch's F and Brown-Forsythe F were significant; p value of .034 and .014 respectively (table 4.17). The Welch's F and Brown-Forsythe F were considered for the tenure in the specialty or profession and number of hours worked per week as assumptions of the homogeneity of variance were not met for these factors.

Table 4.16: Observed differences among groups on current PSC

Variable	Group	N	Mean (SD)	Statistic	Sig.
Hospital	CHUK	50	133.48 (±12.89)	F(2, 121)	.000
	KFH, K	32	150.44 (±15.19)		
	RMH	42	133.40 (±15.00)		
Tenure in the hospital	< 1 year	19	135.58 (±12.95)	F(5, 117)	.854
	1 - 5 years	42	136.57 (±13.09)		
	6 - 10 years	39	140.23 (±15.69)		
	11 - 15 years	18	138.06 (±24.09)		
	16 - 20 years	3	134.67 (±18.90)		
	≥ 21 years	2	131.00 (±21.21)		
Tenure in the hospital OR room*	< 1 year	15	138.00 (±14.07)	F(5, 118)**	.477
	1 - 5 years	59	136.66 (±12.64)		
	6 - 10 years	37	138.24 (±16.76)		
	11 - 15 years	9	146.00 (±0.46)		
	16 - 20 years	3	137.67 (±10.40)		
	≥ 21 years	1	116.00		
Employment position	Anesthesia Resident	6	130.33 (±10.05)	F (5, 118)	.216
	Anesthesiologist	6	137.83 (±24.05)		
	Non-Physician Anesthetist	32	136.81 (±14.56)		
	O.R Nurse	40	142.80 (±17.76)		
	Surgeon	17	136.41 (±14.81)		
	Surgical Resident	23	133.61 (±13.13)		
Tenure in the specialty or profession*	< 1 year	8	132.87 (±8.06)	Welch's F(5,12.929)	.791
	1 - 5 years	58	137.74 (±13.63)		
	6 - 10 years	33	138.24 (±15.40)	Brown-Forsythe	.970
	11 - 15 years	16	140.00 (±26.00)		
	16 - 20 years	3	138.00 (±24.58)	F(5,14.269)	
	≥ 21 years	5	139.60 (±15.32)		
Hours worked per week*	< 20 hours	4	141.00 (±2.16)	Welch's F(5,16.086)	.034
	20 to 39 hours	7	138.57 (±8.38)		
	40 to 59 hours	83	139.59 (±17.28)	Brown-Forsythe	.014
	60 to 79 hours	19	135.26 (±13.82)		
	80 to 99 hours	7	131.29 (±10.92)	F(5,33.286)	
	≥ 100 hours	4	120.50 (±11.45)		

*Asymptotically F distributed; ** Robust tests of equality of means not calculated as at least one group has the sum of case weights less than or equal to 1*

Details on differences observed across hospitals per safety culture are given in table

4.18.

Table 4.17: Hospital differences across safety culture dimensions

Dimension items	Groups	Mean (SD)	df	F	Sig
Communication Openness	CHUK	9.63 (±2.31)	2	2.787	.065
	KFH, K	10.66 (±2.03)			
	RMH	9.63 (±2.51)			
Feedback and Communication About Error	CHUK	10.51 (±2.18)	2	7.388	.001
	KFH, K	11.82 (±2.13)			
	RMH	10.00 (±2.50)			
Frequency of Events Reported	CHUK	9.03 (±2.96)	2	16.876	.000
	KFH, K	11.92 (±2.64)			
	RMH	8.66 (±2.87)			
Handoffs & Transitions	CHUK	11.74 (±3.11)	2	10.169	.000
	KFH, K	14.46 (±3.05)			
	RMH	12.11 (±2.83)			
Management Support for Patient Safety	CHUK	9.47 (±1.55)	2	5.412	.005
	KFH, K	10.00 (±1.21)			
	RMH	8.93 (±1.79)			
Non-punitive Response to Error	CHUK	7.56 (±2.50)	2	.950	.389
	KFH, K	7.47 (±2.08)			
	RMH	8.04 (±2.09)			
Organizational Learning/Continuous Improvement	CHUK	11.07 (±1.94)	2	9.879	.000
	KFH, K	12.05 (±1.61)			
	RMH	10.31 (±1.93)			
Overall Perceptions of Patient Safety	CHUK	12.70 (±2.54)	2	7.531	.001
	KFH, K	14.32 (±2.67)			
	RMH	12.35 (±2.22)			
Staffing	CHUK	10.16 (±2.10)	2	10.941	.000
	KFH, K	11.97 (±2.19)			
	RMH	11.77 (±2.23)			
Supervisor/Manager Expectations & Actions Promoting Patient Safety	CHUK	13.48 (±2.74)	2	5.689	.004
	KFH, K	14.77 (±2.51)			
	RMH	12.92 (±2.56)			
Teamwork Across Units	CHUK	14.10 (±2.33)	2	6.281	.002
	KFH, K	15.34 (±2.22)			
	RMH	13.49 (±2.74)			
Teamwork Within Unit	CHUK	14.85 (±2.35)	2	4.786	.010
	KFH, K	16.29 (±2.05)			
	RMH	14.96 (±2.66)			

As per table 4.18, the mean score of each dimension is presented for each hospital, with KFH, K having a higher mean across most of safety dimensions. Statistically, this difference was significant for ten out of twelve assessed safety dimensions (feedback and communication about error, frequency of events reported, handoffs & transitions, management support for patient safety, organizational learning/continuous improvement, overall perceptions of patient safety, staffing, supervisor/manager expectations & actions promoting patient safety, teamwork across units, and teamwork within unit).

4.7 Conclusion

In this chapter results were presented in either tables or figures. The background information of respondent was presented first then results of each safety dimension with highlight of what safety dimension score is. The overall PSC result emanating from dimensional score was then presented before inferential analysis results were presented. The prevailing PSC was recognized as neutral and factors associated to it were highlighted.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

In this section, findings resulting from a self-administered HSOPSC questionnaire are discussed as per the current research questions and objectives. Though outline first as research objective/question, current patient safety culture in Rwandan Teaching hospital ORs, it is discussed toward the end of the discussion section as we believe in worthiness of discussing dimensional aspects first. Perceptions and attitudes of our respondents towards patient safety culture in their respective hospital ORs will be discussed first while factors associated to the current PSC and the contribution of different dimensions will be discussed last.

5.2 Healthcare providers' perceptions of PSC in Rwandan teaching hospital ORs

5.2.1 Communication openness

Healthcare providers perceive positively communication openness in only 47%. This level of perception is far from reflecting a strong patient safety culture, therefore communication openness being an area requiring to be uplifted for patient safety care delivery. The results of this study are similar with those found in Turkey where communication openness was perceived positively by 47% participants (Günes, Gürlek and Sönmez, 2015 p.4).

However, many others studies found different perceptions such as findings by Wagner and colleagues when examining similarities and differences in PSC across three different counties, where communication openness was at 68% in Netherlands; 40% in Taiwan and 62% in USA (Wagner *et al.*, 2013 p.216); at 54% in Oman (Al-mandhari and Al-zakwani, 2014 p.266); 62.1% in Sri Lanka

(Amarapathy *et al.*, 2013 p.178); 42.9% in Riyadh (El-jardali *et al.*, 2014 p.4) and 65% in China (Nie *et al.*, 2013 p.4).

Studies done in African hospital show also different findings; 60.5% in Tunisian study (Cheikh *et al.*, 2016 p.8) and 46% in the Ethiopian study (Wami *et al.*, 2016 p.8). Communication openness is regarded to be positively perceived at 64% in the Hospital Survey on Patient Safety Culture user comparative database report, (Famolaro *et al.*, 2016 p.20). These differences can be explained by a wide range of variation in countries cultural beliefs and available healthcare organization structures.

5.2.2 *Feedback and communication about error*

Ideally there should be a feedback communication about reported events so that staff are aware of what changes are implemented in reaction to reporting as this make implementation easier and might encourage reporting. This dimension was found to be perceived positively by 55.5% of our respondents. This is level of perception indicate a neutral or an average safety culture. In fact, the AHRQ consider positive score of at least 75% to be areas of strength of good patient safety culture while positive score ranging between 50% and 75% to be a neutral patient safety culture (Sorra and Nieva, 2004 p.34).

Most the study reviewed have found results falling into this category (Amarapathy *et al.*, 2013 p.178; Wagner *et al.*, 2013 p.216; Al-mandhari and Al-zakwani, 2014 p.266; El-jardali *et al.*, 2014 p.8; Günes, Gürlek and Sönmez, 2015 p.4). Likewise, feedback communication about error range in this category (68%) as per the Hospital Survey on Patient Safety Culture user comparative database report, (Famolaro *et al.*, 2016 p.20).

However, in some other study report low positive perception such as the study in Ethiopia (33%) (Wami *et al.*, 2016 p.8); 49.7% in Oman (Ammouri *et al.*, 2015 p.5); 44% in Taiwan (Wagner *et al.*, 2013 p.216) and 38% in Turkey (Arabloo *et al.*, 2012 p.19). In all these study, feedback communication about error was an area for potential improvement (Sorra and Nieva, 2004 p.34).

5.2.3 *Hospital Handoffs and Transitions*

Handoffs and transitions if poorly implemented have high potential to cause harm to the patients. Some estimates link handoffs communication and transition of care to 82% occurrence of sentinel events in healthcare (El-jardali *et al.*, 2011 p. 9; Ammouri *et al.*, 2014 p.107).

This dimension is poorly perceived as only positively perceived by only 42.4 % respondents. Quite similar results were found by (Wagner *et al.*, 2013 p.216). Correspondingly, there is need to improve handoffs and transitions management cross many different countries as the average positive score on this is 48% (Famolaro *et al.*, 2016 p.20).

Furthermore, many studies report handoffs and transitions to be poorly perceived as low as 31% in Norway (Arabloo *et al.*, 2012 p.19) and 32% at MAASTRO clinic in Netherlands (Simons *et al.*, 2015 p.2). Only few reviewed studies report neutral perception such the study by Ammouri and colleagues in Omar where 57.7% of respondents had a positive perception (Ammouri *et al.*, 2015 p.6) and by Arabloo and colleagues in turkey (54%) and in Iran (60%) (Arabloo *et al.*, 2012 p.19).

5.2.4 Hospital Management Support for Patient Safety

This safety culture dimension is perceived positively by 61.1% of our respondents which is an acceptable score though not an area of strength. In most of other studies, Hospital Management Support for Patient Safety is perceived to range in this category of neutral or acceptable safety culture (Amarapathy *et al.*, 2013 p.177; Nie *et al.*, 2013 p.8; Wagner *et al.*, 2013 p.216; Al-mandhari and Al-zakwani, 2014 p.4; El-jardali *et al.*, 2014 p.7; Günes, Gürlek and Sönmez, 2015 p.4). Congruently, a score of 72% is reported in the 2016 Hospital Survey on Patient Safety Culture user comparative database report (Famolaro *et al.*, 2016 p.20).

However, researches done in Netherlands, Tunisia and Ethiopia reveal a poor perception on this dimension; 31%; 32.7% and 42.7% correspondingly (Wagner *et al.*, 2013 p.216; Cheikh *et al.*, 2016 p.4; Wami *et al.*, 2016 p.8). Positive perceptions of this dimension were found to be very low in Muscat capital city of Omar (25.2%) (Ammouri *et al.*, 2015 p.4) while they were high (78%) in Lebanon (Al-mandhari and Al-zakwani, 2014 p.4).

5.2.5 Non-punitive Response to Error

The percentage of positive responses (21.7%) reflect that this dimension is more negatively perceived by healthcare providers. There is an agreement among respondent feelings that their mistakes are held against them (66.3%); being written up once an event is reported (46.7%) and 66.3% worry about filing of their mistakes into their personal records. This poor perception of the non-punitive response to error might signal the existence of traditional shame and blame culture.

This dimension is the worst perceived (45%) in the last year Hospital Survey on Patient Safety Culture user comparative database report (Famolaro *et al.*, 2016

p.20). Ammouri and colleagues findings (Ammouri *et al.*, 2015 p.5) are similar our results. Numerous other studies found quite similar low perception attached to this dimension (Al-mandhari and Al-zakwani, 2014 p.4; Günes, Gürlek and Sönmez, 2015 p.6; Wami *et al.*, 2016 p.5). Average safety culture results were found by (Wagner *et al.*, 2013 p.216) in Netherlands, (Cheikh *et al.*, 2016 p.8) in Tunisia, and (Nie *et al.*, 2013 p.8) in China. However, (Simons *et al.*, 2015) report very high positive perception (86%) in Netherlands.

5.2.6 Organizational Learning/Continuous Improvement

The percentage of positive responses reflect that this dimension is perceived positively at 69.7% which mirror a neutral safety culture. Relatively similar result were found in different studies (Günes, Gürlek and Sönmez, 2015 p.6;Cheikh *et al.*, 2016 p.3; Wami *et al.*, 2016 p.8). Correspondingly, the 2016 HSOPSC user comparative database report, accounts for a 73% positive perception (Famolaro *et al.*, 2016 p.20).

In most others reviewed study, this dimension is even more positively perceived (> 75%) therefore showing an area of PSC strength (Amarapathy *et al.*, 2013 p.4; Nie *et al.*, 2013 p.4; Al-mandhari and Al-zakwani, 2014 p.267; Ammouri *et al.*, 2015 p.4). However, poor perception of this dimension was reported in Netherlands (47%) (Wagner *et al.*, 2013 p.216) and a neutral perception (64%) in the same country (Simons *et al.*, 2015 p.4).

5.2.7 Overall Perception of safety

In the current study the overall perception of patient safety as a safety dimension is below the average (49.5%) therefore an area of weakness that need improvement. Likewise, a positive perception of 49% was observed in Netherlands (Wagner *et*

al., 2013 p.216). relatively similar results were reported in other study (Ammouri *et al.*, 2015 p.6; Günes, Gürlek and Sönmez, 2015 p.6; Wami *et al.*, 2016 p.5). This dimension was reported to be an area of strength (81.3) in Sri Lanka (Amarapathy *et al.*, 2013 p.6) and per the HSOPSC user report, it is positively perceived at a level of 66% (Famolaro *et al.*, 2016 p.20).

5.2.8   Staffing

The percentage of positive scores for staffing dimension reflect shows the existence of a very poor perception (34.4%). Respondents feels they work longer hours than is best for patient (58.7%) and work in a crisis mode trying to do too much, too quickly 57.6%. contrariwise, there is a 51.6% agreement among respondents about having enough to handle the workload. Such low perception of staffing mirrors the existence of staff shortage in these hospitals.

Different other studies report relatively same perception such as in Turkish study (34.8%) (Günes, Gürlek and Sönmez, 2015 p.6); in Ethiopian study (35.25%) (Wami *et al.*, 2016 p.8) and in Riyadh study (35.1%) (El-jardali *et al.*, 2014 p.4). Other studies found even more worst perception such in study done by Amarapathy and colleagues in Sri Lanka (15.7%) (Amarapathy *et al.*, 2013 p.6). A neutral perception regarding staffing was reported in Tunisia (54.7) (Cheikh *et al.*, 2016 p.8); in Netherlands (59%)   and USA (55%) (Wagner *et al.*, 2013 p.216). Congruently, the AHRQ reports a 54% perception on staffing (Famolaro *et al.*, 2016 p.20).

5.2.9   Supervisor/Manager Expectations & actions in promoting patient safety

Respondents in this study perceive Supervisor/Manager Expectations & actions in promoting patient safety as neutral (55.7%) though their managers or supervisors

seriously consider their suggestions for improving patient safety (73.9%). A neutral perception was also found in numerous others studies (Amarapathy *et al.*, 2013 p.6; Nie *et al.*, 2013 p.4; Al-mandhari and Al-zakwani, 2014 p.3; El-jardali *et al.*, 2014 p.7; Ammouri *et al.*, 2015; Simons *et al.*, 2015 p.4; Cheikh *et al.*, 2016 p.8). For all these later studies, the perception ranged between 60% and 68.88%.

Wagner and colleagues also reported a neutral perception in Netherlands (63%) and Taiwan (65%) while an area of strength (75%) in USA (Wagner *et al.*, 2013 p.216). Supervisor/Manager Expectations & actions in promoting patient safety dimension was reported to be an area of strength in the 2016 HSOPSC user comparative database report (Famolaro *et al.*, 2016 p.20). Nevertheless, Günes and colleagues study in Turkey and Wami and colleagues study in Ethiopia report a neutral perception vis-à-vis this dimension; 48% and 48.5% respectively (Günes, Gürlek and Sönmez, 2015 p.7; Wami *et al.*, 2016 p.8).

5.2.10 Team Work Across Hospital Units

The percentage of positive responses attached to this safety dimension by our respondents reveal teamwork across hospital units as neutral (61.9%) regarding patient safety. In most reviewed research articles, teamwork across hospital units is regarded to be neutral (Amarapathy *et al.*, 2013 p.7; Nie *et al.*, 2013 p.8; Wagner *et al.*, 2013 p.216; Al-mandhari and Al-zakwani, 2014 p.3; El-jardali *et al.*, 2014 p.7; Ammouri *et al.*, 2015 p.6; Wami *et al.*, 2016 p.5).

Poor perception vis-à-vis this safety dimension was however, reported in Netherlands by Wagner and colleagues and Simons and colleagues; 28% and 34% correspondingly (Wagner *et al.*, 2013 p.216; Simons *et al.*, 2015 p.4). According to the 2016 HSOPSC user comparative database report, teamwork across hospital

units accounts for a 61% positive perception (Famolaro *et al.*, 2016 p.20), quite similar to our findings.

5.2.11 Teamwork within the Unit

Teamwork within unit was the best positively perceived in this study and was recognized as the only area of strength (76.8%). Quite similar results were found by Günes in turkish study where this dimention was the only area of stength (78.5%) observed (Günes, Gürlek and Sönmez, 2015 p.4). congruently, teamwork within unit is ranked first as a positively perceived safety dimension in many studies (Amarapathy *et al.*, 2013; Nie *et al.*, 2013; Wagner *et al.*, 2013; Ammouri *et al.*, 2015; Wami *et al.*, 2016).

Teamwork within unit was recognized as a strength area for patient safety in most reviewed studies except in a study by Cheikh and colleagues in which a positive perception regarding this dimension was 58.3% (Cheikh *et al.*, 2016 p.8) and by Simons and colleagues (70%) (Simons *et al.*, 2015 p.4). The 2016 HSOPSC user comparative database report, ranked teamwork within with a positive perception of 82% (Famolaro *et al.*, 2016 p.20).

5.3   Healthcare providers' attitudes towards PSC in Rwandan teaching hospital ORs

Reporting culture is one of the major components of a safety culture along with learning culture and just culture (El-jardali *et al.*, 2011 p.9). Poor reporting of events that occur may inhibit learning and improvement processes. Respondents to the HSOPSC were assessed their attitudes while they answered three items on how often they report different category of mistakes they might make.

The percentage of positive responses regarding frequency of event reporting safety dimension reveals the existence of a weak reporting culture (42.6%). Mistakes that have no potential to harm the patient are only always reported in 17.1% cases; mistakes that are caught and corrected before they harm the patient always reported only in 17.8% cases and mistakes that could harm the patient but did not being only always reported in 17.1% cases. These results may explain why 50% of our respondents report to have not reported any event for the last 12 months. As per the 2016 HSOPSC user comparative database report, no event reported by 55% of participants during the last twelve months with positive score to frequency of event reported being 67% (Famolaro *et al.*, 2016 p.26).

The frequency of events report as a patient safety dimension was reported to be poor in a quite a number of studies and countries (Amarapathy *et al.*, 2013 p.6; Wagner *et al.*, 2013 p.216; Günes, Gürlek and Sönmez, 2015 p.6; Wami *et al.*, 2016 p.8). Some other studies reported this patient safety to be neutral (El-jardali *et al.*, 2014 p.p.8; Ammouri *et al.*, 2015 p.6; Simons *et al.*, 2015 p.4; Cheikh *et al.*, 2016 p.8). Correspondingly, a perception of 67% is reported in the 2016 HSOPSC user comparative database report (Famolaro *et al.*, 2016 p.20). Reporting was identified as an area for improvement as at least 60% of respondents did not report any event for the last twelve months in reviewed studies (Günes, Gürlek and Sönmez, 2015 p.6; Wami *et al.*, 2016 p.4).

5.4   The current patient safety culture in Rwandan teaching hospital ORs

The current patient safety culture in these hospital ORs is categorized neutral as per the recommended cutoff since perceived to be positive by only 51.6% participants with regards to safety culture dimensions which in fact is congruent

with the safety grade of 50% positive responses by our respondents. Nevertheless, only teamwork within unit was the only area of strength (76.8%) in present study.

Six out twelve dimensions were area of weakness in this study and these were non-punitive response to error (21.7%); staffing (34.4%); handoffs & transitions (42.4%); frequency of events reported (42.6%); communication openness (47%); and overall perceptions of patient safety (49.5%) therefore areas for improvement. All these dimensions except overall perception of patient safety were as well weakness area identified by Günes and colleagues in Turkey (Günes, Gürlek and Sönmez, 2015 p.4).

Five out of twelve safety dimensions that is feedback and communication about error (55.5%); supervisor/manager expectations & actions promoting patient safety (55.7%); management support for patient safety (61.6%); teamwork across units (61.9%) and organizational learning/continuous improvement (69.7%) were neutral areas with potential for improvement. Relatively results were found in the Turkish study (Günes, Gürlek and Sönmez, 2015 p.4).

5.5 Factors associated to the current PSC in Rwandan teaching hospital ORs

Background information was analyzed using ANOVA to explore any association or impact with the current patient safety culture but there was no significant correlation nor impact observed. Nevertheless, there was some significant mean different between hospitals whereby KFH, K was different from others hospital on almost all safety culture dimensions except for the non-punitive response to error (p value of .389) and communication openness (p value of .65).

The results of the current study are different from findings by Günes and colleagues where work experience had a positive impact (Günes, Gürlek and Sönmez, 2015 p.7) and findings by El-jardali and colleagues who report a negative impact of work experience and that hospital size and accreditation status have an impact on patient safety culture. Small size hospitals and accredited hospital scoring higher than large size hospitals and non-accredited hospitals correspondingly (El-jardali *et al.*, 2011 p.9-10).

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study report healthcare providers' perspective on patient safety culture in Rwandan teaching hospital ORs. The objectives were to assess the current patient safety culture in Rwandan teaching hospitals ORs, to assess perceptions and attitudes of OR healthcare providers towards patient safety culture in Rwandan teaching hospitals ORs.

It also intended to explore the factors associated with patient safety including exploration of the contribution of each safety culture to the overall patient safety culture in Rwandan teaching hospitals ORs. In this chapter, the research summaries findings, draws conclusions and gives recommendations based on the results of the current study.

6.2 Summary of findings

Patient safety culture in Rwandan teaching hospital ORs was examined by use of the HSOPSC; a self-administered questionnaire. The target population included surgeons, surgical residents, OR nurses, anesthesiologists, anesthesia residents and non-physician anesthetists working in main OR of the three teaching hospitals located in Kigali; Rwandan capital.

The level of perception of different safety dimensions by healthcare providers working in Rwandan teaching hospital ORs vary widely (21.7% - 76.8%) positive perception. Teamwork within unit was the best positively perceived dimension, which in fact was the only area of strength observed in this study. The least positive perception was for the non-punitive response to error dimension.

Six out of twelve safety dimensions had less than 50% positive perception; non-punitive response to error, staffing, handoffs & transitions, frequency of events reported, communication openness, and overall perception of patient safety; 21.7%, 34.4%, 42.4%, 42.6%, 47% and 49.5% of positive perceptions respectively.

Five out of twelve safety dimensions had a neutral patient safety culture perception; organizational learning/continuous improvement, teamwork across units, management support for patient safety, supervisor/manager expectations & actions promoting patient safety and feedback and communication about error; 69.7%, 61.9%, 61.6%, 55.7%, and 55.5% of positive perceptions respectively.

Half of our respondent have not reported any event for the last 12 months. Mistakes that have no potential to harm the patient are reported most of the times or always only by 37.5% of our participants while those mistakes that could harm the patient but did not are reported most of the times or always in 45.9% cases. Likewise, mistakes that are caught and corrected before harming the patient are reported most of the times or always by 44.8% of our respondents.

One hospital (KFH, K) was significantly different from others two hospitals on most safety culture dimension and therefore for the overall current safety culture.

6.3   Conclusions

6.3.1   *Current patient safety culture in Rwandan teaching hospital ORs*

Current patient safety in Rwandan teaching hospital ORs as reflected in our findings is recognized as a neutral culture (51.6%). Although teamwork within unit was recognized as an area of strength (76.8%), many other safety culture dimensions were found to be areas of weakness therefore, areas of concern that need to be addressed. These safety culture dimensions include non-punitive

response to error, staffing, handoffs & transitions, frequency of events reported, communication openness, and overall perception of patient safety.

Moreover, five others safety culture dimension (organizational learning/continuous improvement, teamwork across units, management support for patient safety, supervisor/manager expectations & actions promoting patient safety and feedback and communication about error), were found to be neutral therefore had potential to improve to positive safety culture, which is a pathway to desired patient safety that is above all, do no harm.

Per these findings we are responding our first research question which was "what is the current patient safety culture in Rwandan teaching hospital ORs?" and we are meeting our first research objective of assessing the current patient safety culture in Rwandan teaching hospital ORs.

6.3.2   *Healthcare provider perception of PSC in Rwandan teaching hospital ORs*

With regards to our study findings, healthcare providers working in Rwandan teaching hospital ORs perceive negatively half of assessed safety dimension and this is as well negative to patient safety outcomes. The overall perception of safety which is one of the assessed safety culture dimensions had itself a negative perception. This perception is shared among healthcare providers working in Rwandan teaching hospital ORs as there was no statically significance among healthcare provider categories that is employment position and working experience.

However, KFH, K was more positively perceived if compared to the others hospitals included in the current study. We believe that this difference has something to do with its accreditation status.

Second research question regarding healthcare providers' perceptions towards PSC was answered while meeting our second research objective as well.

6.3.3   Healthcare providers' attitudes towards patient safety culture

The third research question regarding attitudes of healthcare providers towards PSC were assessed by checking how many events they have reported for the last twelve months and how often they report mistakes they make. Answers to this research question allowed us to meet our third research objective.

Healthcare providers' attitudes towards PSC in Rwandan teaching hospital ORs is negative and we believe that hospital management have something to do with this given negative perception to non-punitive response to error. The level of reporting of evets is still low with majority of mistakes that occur passing unreported and half of the healthcare providers not actively involved in event reporting process.

6.3.4   Factors associated with PSC in Rwandan teaching hospital ORs

The fourth objective of the current study regarding factors associated to the current PSC was as well met. Factors such as working position or healthcare provider profession category and working experience which were found to be associated with PSC in many other studies were not found to be associated to the current PSC in Rwandan teaching ORs. However, variations of perceptions among hospitals and number of hours worked per week were significant.

6.4   Recommendations

6.4.1   Ministry of health

 ⬥ Continue its support toward international accreditation to these hospitals as meeting accreditation requirements enhance patient safety

 ⬥ Institute a country wide anonymous event reporting system which will help monitoring safety events and provide an insight on the magnitude of safety issues with therefore establishment and implementation of prevention strategies

 ⬥ Support hospitals in having competent staff and enough number wise; to cover available workload

6.4.2   Hospitals management

 ⬥ Promote and encourage event reporting through instauration of anonymous reporting system as well as a fair and just culture

 ⬥ Improve communication openness and feedback communication by holding frequent regular meetings with staff, operating on an open-door policy that allow to listen and respond to staff concern and suggestions while encouraging staff to actively participate in safety feedback debriefs and event root cause analysis

 ⬥ Hospital wide implementation of recommended handoffs and transition strategies such as SBAR (situation, background, assessment and recommendation)

 ⬥ Have and implement a continuous in-service education based on identified patient safety problems with emphasis on root causes and change strategies adopted for better implementation

 ⬥ Implement a self-auditing system to track changes in patient safety and monitor implemented strategies

6.4.3 *Healthcare professional educators*

♦ Emphasize the importance of non-technical skills in quality healthcare delivery and if fusible incorporate in their curriculum specific course of topic on this such as Quality and Safety Education for Nurses (QSEN).

6.4.4 *Researchers*

We hope that this study provided a valuable insight pertaining to current patient safety within the Rwandan teaching hospital ORs and we hope it will be a catalyst for more research in field of patient safety. We would therefore recommend the following for future research:

♦ Broader research that include all hospital units and categories of hospital staff to include management/administrative staff, paramedics and all cadre of support staff in order to have an adequate understanding of the issue

♦ Safety dimension specific researches that would give more in-depth understanding of hindrance or barriers to its full potential with regard to patient safety

♦ Researches that combine quantitative and qualitative methods to allow sufficient scope of the patient safety issue

♦ Develop or adopt an instrument that is in Kinyarwanda to remove any language barrier that might bias information collected from non or poorly fluent English or French participant

6.5   Problems and Limitations of the Study

Since this study used survey to assess healthcare provider point view on safety culture the actual nature of patient safety behaviors might not be well captured. Moreover, the fact that the survey was administered in foreign languages versions (French and English) might have brought some inconstancies in comprehending survey items though the participants were given option to select between the two languages.

The generalizability of the finding of this study might be affected by the fact that findings represent teaching hospitals in Kigali, which are more complex and well-staffed than the rest of the hospitals and particularly those in rule areas. However, the findings of this study might give an insight to what patient safety culture was in Rwandan context, since the study was carried out in the main teaching hospitals of the country where most healthcare providers working in Rwanda are trained.

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APPENDICES

Appendix I: Hospital Survey on Patient Safety Culture (HSOPSC)

Instructions

This survey asks for your opinions about patient safety issues, medical error, and event reporting in your hospital operating room and will take about 20 minutes to complete.

If you do not wish to answer a question, or if a question does not apply to you, you may leave your answer blank.

> 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

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

Think about the Operating Room of your hospital	Strongly Disagree ▼	Disagree ▼	Neither ▼	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 together as a team to get the work done	☐1	☐2	☐3	☐4	☐5
4. In this unit, people treat each other with respect	☐1	☐2	☐3	☐4	☐5

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. We use more agency/temporary staff than is best for patient care	□1	□2	□3	□4	□5
8. Staff feel like their mistakes are held against them	□1	□2	□3	□4	□5
9. Mistakes have led to positive changes here	□1	□2	□3	□4	□5
10. It is just by chance that more serious mistakes don't happen around here	□1	□2	□3	□4	□5
11. When one area in this unit gets really busy, others help out	□1	□2	□3	□4	□5
12. When an event is reported, it feels like the person is being written up, not the problem	□1	□2	□3	□4	□5
13. After we make changes to improve patient safety, we evaluate their effectiveness	□1	□2	□3	□4	□5
14. We work in "crisis mode" trying to do too much, too quickly	□1	□2	□3	□4	□5
15. Patient safety is never sacrificed to get more work done	□1	□2	□3	□4	□5

16. Staff worry that mistakes they make are kept in their personnel file	□1	□2	□3	□4	□5
17. We have patient safety problems in this unit	□1	□2	□3	□4	□5
18. Our procedures and systems are good at preventing errors from happening	□1	□2	□3	□4	□5

SECTION B: Your Supervisor/Manager

Please indicate your agreement or disagreement with the following statements about your immediate supervisor/manager or person to whom you directly report.

Think about the Operating Room of your hospital	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	□1	□2	□3	□4	□5
2. My supervisor/manager seriously considers staff suggestions for improving patient safety	□1	□2	□3	□4	□5
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	□1	□2	□3	□4	□5
4. My supervisor/manager overlooks patient safety problems that happen over and over	□1	□2	□3	□4	□5

SECTION C: Communications

How often do the following things happen in the Operating Room of your hospital?

Think about your Operating Room	Never ▼	Rarely ▼	Sometimes ▼	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	☐2	☐3	☐4	☐5
4. Staff feel free to question the decisions or actions of those with more authority	☐1	☐2	☐3	☐4	☐5
5. In this unit, we discuss ways to prevent errors from happening again	☐1	☐2	☐3	☐4	☐5
6. Staff are afraid to ask questions when something does not seem right	☐1	☐2	☐3	☐4	☐5

SECTION D: Frequency of Events Reported

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

Think about your Operating Room	Never ▼	Rarely ▼	Sometimes ▼	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 E: Patient Safety Grade

Please give your Hospital work area "Operating Room" an overall grade on patient safety.

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

SECTION F: Your Hospital

Please indicate your agreement or disagreement with the following statements about your hospital.

Think about your hospital	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. Hospital management provides a work climate that promotes patient safety	□1	□2	□3	□4	□5
2. Hospital units do not coordinate well with each other	□1	□2	□3	□4	□5
3. Things "fall between the cracks" when transferring patients from one unit to another	□1	□2	□3	□4	□5
4. There is good cooperation among hospital units that need to work together	□1	□2	□3	□4	□5
5. Important patient care information is often lost during shift changes	□1	□2	□3	□4	□5
6. It is often unpleasant to work with staff from other hospital units	□1	□2	□3	□4	□5
7. Problems often occur in the exchange of information across hospital units	□1	□2	□3	□4	□5
8. The actions of hospital management show that patient safety is a top priority	□1	□2	□3	□4	□5
9. Hospital management seems interested in patient safety only after an adverse event happens	□1	□2	□3	□4	□5
10. Hospital units work well together to provide the best care for patients	□1	□2	□3	□4	□5
11. Shift changes are problematic for patients in this hospital	□1	□2	□3	□4	□5

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 "Operating Room"?

☐ 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 - 39 hours per week ☐ c. 40 - 59 hours per week

☐ d. 60 to 79 hours per week   ☐ e. 80 - 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. Anesthesia Resident   ☐ b. Anesthesiologist   ☐ c. Non-Physician Anesthetist

☐ d. Operating Room Nurse ☐ e. Surgeon   ☐ f. Surgical Resident

5. In your staff position, do you typically have direct interaction or contact with patients?

☐ a. YES, I typically have direct interaction or contact with patients.

☐ b. NO, I typically do NOT have direct interaction or contact with patients.

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

☐ 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

SECTION I: Your Comments

Please feel free to write any comments about patient safety, error, or event reporting in your hospital.

THANK YOU FOR COMPLETING THIS SURVEY

Appendix II : Enquête sur la culture « Sécurité des patients » à l'hôpital (French version of HSOPSC)

Instructions

Cette enquête vis à connaître votre opinion sur les problèmes de sécurité des patients, les erreurs médicales et le signalement des incidents au sein du bloc opératoire de votre hôpital. Remplir ce questionnaire prendrait environ 10 à 15 minutes.

Si vous ne souhaitez pas répondre à une question, ou si une question ne s'applique pas à vous, laissez-la.

On désigne

- Par « **incident** » : tout type d'erreur, faute, incident, accident ou dérivé, que le patient en ait ou non subi un préjudice
- Par « **sécurité des patients** » : le fait de prévenir les incidents qui pourraient survenir au cours du processus de soins du patient

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<u>**SECTION A : Votre environnement de travail (Bloc opératoire)**</u>

Veuillez marquer votre accord ou votre désaccord avec les affirmations suivantes en indiquant par un √ le chiffre correspondant

Pensez au bloc opératoire de votre hôpital	Pas du tout d'accord ▼	Pas d'accord ▼	Neutre ▼	D'accord ▼	Tout à fait d'accord ▼
1. Les membres de l'équipe se soutiennent mutuellement	☐1	☐2	☐3	☐4	☐5
2. Nous avons suffisamment de personnel pour faire face à la charge de travail	☐1	☐2	☐3	☐4	☐5
3. Lorsqu'il y a une importante charge de travail qui doit être effectuée rapidement, nous conjuguons nos efforts en équipe	☐1	☐2	☐3	☐4	☐5

4. Les membres de l'équipe se respectent	□1	□2	□3	□4	□5
5. Les membres de notre équipe travaillent plusieurs heures qui pourraient mettre en péril la sécurité des patients	□1	□2	□3	□4	□5
6. Nous nous attachons activement à améliorer la sécurité des patients	□1	□2	□3	□4	□5
7. Nous employons plus d'intérimaires que ce qui est idéal pour les soins	□1	□2	□3	□4	□5
8. Les membres de l'équipe ont l'impression que leurs erreurs sont utilisées contre eux	□1	□2	□3	□4	□5
9. Des incidents ont entraîné des changements positifs dans notre manière de travailler	□1	□2	□3	□4	□5
10.C'est une chance que des incidents plus sérieux n'aient pas encore eu lieu	□1	□2	□3	□4	□5
11.Quand une partie de l'équipe est surchargée de travail, les autres lui viennent en aide	□1	□2	□3	□4	□5
12.Quand un incident est signalé, le coupable est recherché mais pas la cause du problème	□1	□2	□3	□4	□5

13. Si des actions sont mises en place en vue de l'amélioration de la sécurité des patients, nous vérifions leur efficacité	☐1	☐2	☐3	☐4	☐5
14. Nous travaillons en mode de crise, en essayant de faire trop de choses, trop rapidement	☐1	☐2	☐3	☐4	☐5
15. La sécurité des patients n'est jamais délaissée même s'il y a beaucoup de travail	☐1	☐2	☐3	☐4	☐5
16. Les membres de l'équipe s'inquiètent du fait que leurs erreurs puissent figurer dans leur dossier personnel	☐1	☐2	☐3	☐4	☐5
17. Nous avons des problèmes de sécurité des patients dans notre environnement de travail	☐1	☐2	☐3	☐4	☐5
18. Nos procédures et nos systèmes de sécurité sont bons et préviennent des incidents	☐1	☐2	☐3	☐4	☐5

SECTION B : L'implication de la hiérarchie en matière de sécurité des patients

Veuillez marquer votre accord ou votre désaccord avec les affirmations suivantes en indiquant par un √ le chiffre correspondant.

Pensez au bloc opératoire de votre hôpital	Pas du tout d'accord ▼	Pas d'accord ▼	Neutre ▼	D'accord ▼	Tout à fait d'accord ▼
1.Lorsque nous travaillons selon les procédures établies en matière de sécurité des patients, notre supérieur nous félicite	☐1	☐2	☐3	☐4	☐5
2. Notre supérieur prend sérieusement en considération les suggestions de l'équipe pour améliorer la sécurité des patients	☐1	☐2	☐3	☐4	☐5
3. Lorsqu'il y a surcharge de travail, notre supérieur exige que nous travaillions plus vite, même si cela implique des entorses aux procédures	☐1	☐2	☐3	☐4	☐5
4. Notre supérieur néglige les problèmes récurrents de sécurité des patients	☐1	☐2	☐3	☐4	☐5

SECTION C: La communication

Veuillez marquer, pour les affirmations suivantes, à quelle fréquence elles surviennent en indiquant par un √ le chiffre correspondant

	Jamais ▼	Rarement ▼	De temps en temps ▼	La plupart du temps ▼	Toujours ▼
1. Nous sommes informés des actions correctives mises en place suite aux incidents enregistrés	☐1	☐2	☐3	☐4	☐5
2. L'équipe peut s'exprimer librement si elle constate qu'une situation pourrait altérer la qualité des soins aux patients	☐1	☐2	☐3	☐4	☐5
3. Nous sommes informés des incidents qui surviennent dans notre environnement de travail.....	☐1	☐2	☐3	☐4	☐5
4. Les membres de l'équipe se sentent libres de débattre des décisions ou actions prises par la hiérarchie	☐1	☐2	☐3	☐4	☐5
5. Dans notre équipe, nous discutons des moyens à mettre en œuvre pour éviter la répétition d'incidents	☐1	☐2	☐3	☐4	☐5
6. L'équipe a peur de poser des questions lorsqu'une situation ne semble pas correcte	☐1	☐2	☐3	☐4	☐5

SECTION D : L'enregistrement des incidents

Lorsqu'un incident survient, à quelle fréquence est-il rapporté dans les cas suivants ?

	Jamais ▼	Rarement ▼	De temps en temps ▼	La plupart du temps ▼	Toujours ▼
1. Si cet incident a pu être détecté avant d'avoir affecté le patient	☐1	☐2	☐3	☐4	☐5
2. Si cet incident ne comportait aucun risque de nuire au patient	☐1	☐2	☐3	☐4	☐5
3. Si cet incident n'a eu aucune conséquence pour le patient même s'il avait pu nuire à sa santé	☐1	☐2	☐3	☐4	☐5

SECTION E : Le niveau de sécurité des patients

Donnez une cotation globale en matière de sécurité des patients dans votre environnement de travail (Salle d'opération).

☐	☐	☐	☐	☐
A	**B**	**C**	**D**	**E**
Excellent	Très bien	Acceptable	Médiocre	Insuffisant

SECTION F : Votre Hôpital

Veuillez marquer votre accord ou votre désaccord avec les affirmations suivantes en indiquant par un √ le chiffre correspondant.

Pensez au bloc opératoire de votre hôpital	Pas du tout d'accord ▼	Pas d'accord ▼	Neutre ▼	D'accord ▼	Tout à fait d'accord ▼
1. La direction de l'hôpital engendre un climat de travail favorable pour la sécurité des patients	☐1	☐2	☐3	☐4	☐5
2. Les services de l'hôpital ne se coordonnent pas bien les uns avec les autres	☐1	☐2	☐3	☐4	☐5
3. Lorsque des patients sont transférés d'une unité à une autre, des informations ne sont pas transmises	☐1	☐2	☐3	☐4	☐5
4. La collaboration est bonne entre les services qui doivent travailler ensemble	☐1	☐2	☐3	☐4	☐5
5. D'importantes informations concernant les soins des patients sont souvent perdues lors des changements d'équipes	☐1	☐2	☐3	☐4	☐5
6. Il est souvent déplaisant de travailler avec le personnel des autres services de l'hôpital	☐1	☐2	☐3	☐4	☐5
7. Il y a souvent des problèmes de communication entre les services de l'hôpital	☐1	☐2	☐3	☐4	☐5

8. Les actions prises par la direction de l'hôpital montrent que la sécurité du patient est une priorité absolue

☐1 ☐2 ☐3 ☐4 ☐5

9. La direction de l'hôpital ne s'intéresse à la sécurité des patients qu'après un incident

☐1 ☐2 ☐3 ☐4 ☐5

10. Les services de l'hôpital collaborent bien pour fournir les meilleurs soins aux patients

☐1 ☐2 ☐3 ☐4 ☐5

11. Les changements d'équipes sont une source de problèmes pour les patients dans cet hôpital

☐1 ☐2 ☐3 ☐4 ☐5

SECTION G : Nombre d'incidents rapportés

Au cours des 12 derniers mois, combien de rapports d'incidents avez-vous remplis et transmis ?

☐ a. Aucun   ☐ b. 1 à 2   ☐ c. 3 à 5

☐ d. 6 à 10   ☐ e. 11 à 20   ☐ f. Plus de 20

SECTION H : Informations générales

Il est important que vous répondiez à ces dernières questions, elles sont essentielles pour l'analyse des résultats

1. **Depuis combien de temps travaillez-vous dans cet hôpital ?**

☐ a. Moins de 1 an   ☐ b. 1 à 5 ans   ☐ c. 6 à 10 ans

☐ d. 11 à 15 ans   ☐ e. 16 à 20 ans   ☐ f. 21 ans ou plus

2. **Depuis combien de temps travaillez-vous au sein de cette équipe/au bloc opératoire ?**

☐ a. Moins de 1 an   ☐ b. 1 à 5 ans   ☐ c. 6 à 10 ans

☐ d. 11 à 15 ans   ☐ e. 16 à 20 ans   ☐ f. 21 ans ou plus

3. **Combien d'heures travaillez-vous réellement par semaine (en moyenne) ?**

☐ a. Moins de 20 heures   ☐ b. 20 à 39 heures   ☐ c. 40 à 59 heures

☐ d. 60 à 79 heures   ☐ e. 80 à 99 heures   ☐ f. 100 heures ou plus

4. **Vous êtes :**

☐ a. Résident en Anesthésie   ☐ b. Médecin Anesthésiste ☐ c. Anesthésiste

☐ d. Infirmier(e) du Bloc Opératoire ☐ e. Chirurgien   ☐ f. Résident en Chirurgie

5. Etes-vous directement en interaction ou en contact avec les patients ?

☐a. Oui   ☐b. Non

6. Depuis combien d'années exercez-vous votre spécialité ou profession actuelle ?

☐ a. Moins de 1 an   ☐ b. 1 à 5 ans   ☐ c. 6 à 10 ans

☐ d. 11 à 15 ans   ☐ e. 16 à 20 ans   ☐ f. 21 ans ou plus

SECTION I : Vos commentaires et suggestions

N'hésitez pas à exprimer vos commentaires et suggestions à propos de la sécurité des patients et de l'enregistrement et gestion des incidents dans votre l'hôpital.

MERCI D'AVOIR REMPLI CE QUESTIONNAIRE

Traduit par la Comité de coordination et de l'évaluation clinique et de la qualité en Aquitaine (CCECQA) avec permission de l'AHRQ (une agence Américaine du département de la santé et des services humaines) ; Rockville, Maryland USA

Appendix III: Permission to use the Hospital Survey on Patient Safety Culture (HSOPSC)

SafetyCultureSurveys@westat.com <SafetyCultureSurveys@westat.com>

<div align="right">12 September 2016 at 15:57</div>

To: karuta.gil@gmail.com
Cc: safetyculturesurveys@westat.com

Dear Gilbert Rutayisire Karonkano,

Thank you for the information. We in the Patient Safety Culture Surveys Support Group at Westat (SafetyCultureSurveys@westat.com) have been authorized to respond on behalf of the Agency for Healthcare Research and Quality (AHRQ) by Ms. Randie Siegel, Associate Director, Office of Communications and Knowledge Transfer, Publishing and Electronic Dissemination. Our group, as the Safety Culture Surveys support contractor, handles the majority of permissions for these tools and their related documents in English, notifies AHRQ of requests for permission to translate these documents, and maintains an electronic community for International users.

Based on your description of your project, AHRQ grants you permission to use the Hospital Survey on Patient Safety Culture in English for your graduate research at University of Rwanda. We understand that this research will be carried out at the University Teaching Hospital of Kigali, King Faisal Hospital, Kigali, and Rwanda Military Hospital. AHRQ requests that you note on the survey forms that the form is "reprinted/translated with permission from the Agency for Healthcare Research and Quality (an Agency of the United States Department of Health and Human Services); Rockville, Maryland USA." In any publication of the results of the survey, such as a thesis, internal report to the hospital, or professional journal article, please include a proper source citation.

The AHRQ Web site for the patient safety culture surveys is http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/index.html. The survey form and related materials can be found at this site. Be sure to read the Survey User's Guide for the appropriate survey, especially the sections on modifying or translating the survey. For technical questions, please contact us. We can also put you in touch with other non-U.S. users of the survey (go to "International Users of the Surveys on Patient Safety Culture" for more information).

If you have questions about permissions issues, or if you are interested in permissions to use or translate other AHRQ tools or documents, please feel free to contact Ms. Siegel or David Lewin, Manager of Copyrights & Permissions, Office of Communications and Knowledge Transfer.

Sincerely,

Kristi Meadows
AHRQ Surveys on Patient Safety Culture Technical Assistance
SafetyCultureSurveys@westat.com
1-888-324-9749

Sign up to receive notices about the Surveys on Patient Safety Culture at: https://subscriptions.ahrq.gov/service/multi_subscribe.html?code=USAHRQ. Check Surveys on Patient Safety Culture and the specific surveys that you are interested in.
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Appendix IV: Informed consent to participate in a research project

Please read this consent agreement carefully before you decide to participate in the study.

Title of Study: PATIENT SAFETY CULTURE IN RWANDAN TEACHING HOSPITAL OPERATING ROOMS

Purpose of the Study:

Dear operating room user, you are invited to participate in this study that aims to explore the patient safety culture in referral hospital operating rooms as perceived by healthcare providers working in operating rooms.

What is expected from you?

If you agree to take part in this study, you will spare about 20 minutes to complete the survey questionnaire about your opinions on patient safety issues, medical error, and event reporting in your hospital operating room.

Risks and Benefits:

There is no foreseen harm that will happen to you as a result of participating in this study. Though there is no direct benefit to you, the researcher envisions that findings of this study will guide patient safety improvement strategies

Confidentiality:

This study is anonymous therefore, your name is not required on the questionnaire. The returned/completed survey questionnaire will be kept strictly confidential in a locked cupboard; only the researchers will have access to them. We will not include any information in any report we may publish that would make it possible to identify you, the information will be in an aggregated form.

Right to Refuse or Withdraw:

The decision to participate in this study is entirely up to you and you can stop participating in this study at any time even if you have already given your consent. You can as well leave unanswered any single question that you do not want to answer. Refusing to participate or withdraw from this study is not associated with any repercussions.

Right to Ask Questions and Report Concerns:

You have the right to ask questions about this research study and to have those questions answered by me before, during or after the research. If you have any questions about this study, at any time feel free to contact Karonkano Rutayisire Gilbert; leading instigator at 0788897210 or via email karuta.gil@gmail.com or to contact the research supervisors Dr Donatilla Mukamana at 0788304396 or Innocent Ndateba at 0788520514.

If you have any other concerns about your rights as a research participant that have not been answered by the investigators you may contact the UR-CMHS Institutional Review Board Chairperson of at 0788 490 522 or the Deputy Chairperson at 0783 340 040.

Consent:

Your signature below indicates that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above.

You will be given a signed and dated copy of this form to keep.

I, _____ have read the contents in this form. My questions have been answered. I agree ◯ refuse ◯ to participate in this study.

Signature of participant   : _____   Date   : _____

Signature of the researcher : _____   Date   : _____

Appendix V : Consentement éclairée pour la participation dans une recherche

Veuillez lire attentivement ce formulaire de consentement avant de décider de participer dans cette étude

Titre de l'étude : « CULTURE DE LA SÉCURITÉ DES PATIENTS AU SEIN DES BLOCS OPERATOIRES DES HOPITAUX DE REFERENCES AU RWANDA »

Objectif de l'étude :

Cher(e) utilisateur (trice) du Bloc opératoire, vous êtes invités à participer à cette étude dont le but est d'explorer la culture de la sécurité des patients dans les blocs opératoires des hôpitaux de référence tel que perçu par les prestataires de soins de santé travaillant aux blocs opératoires.

Ce que l'on attend de vous :

Si vous acceptez de participer dans cette étude, il vous faut au moins 20 minutes pour remplir le questionnaire d'enquête sur vos opinions aux questions concernant la sécurité des patients, les erreurs médicales et les rapports d'événements au sein de votre bloc opératoire.

Risques et avantages :

Il n'y a aucun préjudice prévu qui vous arrivera à la suite de la participation à cette étude. Bien qu'il n'y ait aucun avantage direct pour vous, le chercheur prévoit que les résultats de cette étude orienteraient les stratégies d'amélioration de la sécurité des patients.

Confidentialité :

Cette étude est anonyme, donc, votre nom n'est pas nécessaire sur le questionnaire. Les questionnaires qu'on recevra de retour auprès de nos participant(e)s seront gardé strictement confidentiels sous clé fermé ; seuls les chercheurs y auront accès.

Nous n'inclurons aucune information dans un rapport que nous pourrions rendre publique qui permettrait de vous identifier car les informations seront regroupées pour être présentées.

Droit de refuser ou de se retirer :

La décision de participer dans cette étude repose entièrement sur vous. Vous pouvez cesser de participer dans cette étude à n'importe quel moment, même si vous aviez déjà donné votre consentement.

Vous pouvez également sauter n'importe quelle question à laquelle vous ne voulez pas répondre. Refuser de participer ou de vous retirer de cette étude n'a aucune répercussion sur vous.

Droit de poser des questions et de signaler des soucis :

Vous avez le droit de poser des questions au sujet de cette étude à tout moment et de recevoir des réponses à ces questions.

Si vous avez des questions sur cette étude, n'hésitez pas à contacter Karonkano Rutayisire Gilbert ; l'investigateur principale au 0788897210 ou par courriel électronique à karuta.gil@gmail.com ou bien contact l'un(e) des superviseurs de cette étude Dr Donatilla Mukamana au 0788304396 ou Innocent Ndateba au 0788520514.

Si vous avez d'autres soucis en tant que participant(e) de cette étude, qui ne sont pas répondus par les investigateurs de cette étude, veuillez contacter le président de la commission d'éthique de la recherche de l'UR-CMHS au 0788 490 522 ou son vice-président au 0783 340 040.

Consentement :

Votre signature ci-dessous indique que vous êtes décidé de participer à cette étude après avoir lu et comprendre les informations fournit dans ce formulaire.

Vous recevrez une copie signée et datée de ce formulaire.

Moi, _____ j'ai lu le contenu de ce formulaire et j'ai reçu des réponses aux questions posées.

J'accepte ◯ je refuse ◯ de participer à cette étude.

Signature du participant : _____ Date : _____

Signature du chercheur : _____ Date : _____

Appendix VI: Amasezerano yo kwemera kujya mu bushakashatsi

Musome mwitonze ibi bikurikira mbere yo gufata icyemezo cyo kugira uruhare muri ubu bushakashatsi.

Izina ry'ubushakashatsi: «UMUCO WO GUTANGA UBUVUZI BUTEKANYE KU BARWAYI BAVURIRWA AHO BABAGIRA HO MU BITARO BIKURU BYO MU RWANDA»

Icyo ubushakashatsi bugamije:

Twabasabaga kugira uruhare muri ubu bushakashatsi bugamije kumyenya imiterere y'umuco wo gutanga ubuvuzi butekanye ku barwayi bavurirwa aho babagira ho mu bitaro bikuru byo mu Rwanda bishingiye ku ko abatanga ubuvuzi bakorera aho babagira babibona.

Icyo musabwa muri ubu bushakashatsi:

Ni mwemera kugira uruhare muri ubu bushakashatsi, murasabwa byibura gufata byibura iminota 10 – 15 mugasubiza ibibazo by'ubu busahakashatsi bibaza uko mubona umutekano w'abarwayi, amakosa y'ubuvuzi n'uko amenyekanishwa muri serivise mukoreramo.

Ingaruka mbi cyangwa inyungu zaturuka kuri ubu bushakashatsi:

Nta ngaruka mbi nimwe ku muntu uzagira uruhare muri ubu busahakashatsi. Nta nyungu yako kanya ku muntu azagira uruhare muri ubu bushakashatsi, ariko ibyo ubu bushakashatsi buzagaragaza byafasha mu gufata ingamba ziteza imbere umutekano w'abarwayi.

Ibanga:

Amakuru azaturuka muri ubu bushakashatsi ni ibanga, ntabwo amazina akenewe ku mpapuro zisubirizwaho. Impapuro z'ibibazo zizatugarukira zizabikwa mu ibanga rikomeye mu kabati gafunze kandi zibe zabonwa gusa n'abashakashatsi b'ubu bushakashatsi. Ntamakuru namwe azajya ahagaragara yagaragaza uwayatanze kuko amakuru yose aazatangazwa imbumbe.

Uburenganzira bwo kutagira uruhare muri ubu bushakashatsi:

Kugira uruhare muri ubu bushakashatsi si agahato. Nta ngaruka nimwe byakugiraho kwanga kugira uruhare muri ubu bushakashatsi, kandi mushobora igihe icyo aricyo cyose kwikura muri ubu busahakashatsi nta ngaruka. Mushobora kandi no kudasubiza ikibazo mwumva mudashaka gusubiza.

Uburenganzira bwo kubaza/gusobanuza:

Mufite uburenganzira bwo kubaza no gusubizwa ikibazo cyose kirebana n'ubu bushakashatsi igihe icyo aricyo cyose.

Igihe mugize ikibazo kirebana n'ubu bushakashatsi, mwakibaza Karonkano Rutayisire Gilbert ; uyoboye ubu bushakashatsi kuri 0788897210 cyangwa kuri karuta.gil@gmail.com cyangwa mukakibaza Dr Donatilla Mukamana; ukurikirana ubu bushakashatsi kuri 0788304396 cyangwa Innocent Ndateba; ukurikirana ubu bushakashatsi kuri 0788520514.

Hagize ikindi kibazo mwagira kubera kugira uruhare muri ubu bushakashatsi, kibaba kitabashije gusubizwa n'abakora ubu bushakashatsi mwakibaza umuyobozi wa komisiyo ishinzwe iby'imyitwarire mu bushakashatsi ya Kaminuza y'u Rwanda, Koleji y'Ubuganga n'ubumenyi bw'ubuzima kuri 0788490522 cyangwa umwungirije kuri 0783340040.

Kwemera kugira uruhare muri ubu bushakashatsi:

Gusinya ahakurikira bivuze ko mwemeye kugira uruhare muri ubu bushakashatsi nyuma yo gusoma ibikubiye muri aya masezerano no guhabwa umwanya wo kubaza ibibazo mwari mufite bigasubizwa.

Jyewe, _____ nasomye ibikubiye muri aya masezerano kandi nsubizwa ibibazo nabajije.

Nemeye ◯ mpakanye ◯ kugira uruhare muri ubu bushakashatsi.

Isinya y'uwemeye kujya mu bushakashatsi: _____ itariki:_____

Isinya y'umushakashatsi : _____ itariki:_____

Appendix VII: Multiple Comparisons: Tukey HSD

Dependent Variable	Concerned Hospital (I)	Concerned Hospital (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Teamwork Within Unit	CHUK	KFH, K	-1.44202*	.49888	.012	-2.6231	-.2609
		RMH	-.11551	.45169	.965	-1.1849	.9539
	KFH, K	CHUK	1.44202*	.49888	.012	.2609	2.6231
		RMH	1.32651*	.50785	.027	.1242	2.5289
	RMH	CHUK	.11551	.45169	.965	-.9539	1.1849
		KFH, K	-1.32651*	.50785	.027	-2.5289	-.1242
Supervisor/Manager Expectations & Actions Promoting Patient Safety	CHUK	KFH, K	-1.28647*	.54171	.049	-2.5692	-.0038
		RMH	.55968	.49958	.503	-.6233	1.7426
	KFH, K	CHUK	1.28647*	.54171	.049	.0038	2.5692
		RMH	1.84615*	.55413	.003	.5340	3.1583
	RMH	CHUK	-.55968	.49958	.503	-1.7426	.6233
		KFH, K	-1.84615*	.55413	.003	-3.1583	-.5340

Organizational Learning - Continuous Improvement	CHUK	KFH, K	-.98232*	.38349	.031	-1.8904	-.0743
		RMH	.76127	.35367	.083	-.0762	1.5987
	KFH, K	CHUK	.98232*	.38349	.031	.0743	1.8904
		RMH	1.74359*	.39228	.000	.8147	2.6725
	RMH	CHUK	-.76127	.35367	.083	-1.5987	.0762
		KFH, K	-1.74359*	.39228	.000	-2.6725	-.8147
Management Support for Patient Safety	CHUK	KFH, K	-.52542	.32275	.237	-1.2895	.2386
		RMH	.54865	.29452	.153	-.1486	1.2459
	KFH, K	CHUK	.52542	.32275	.237	-.2386	1.2895
		RMH	1.07407*	.32864	.004	.2961	1.8521
	RMH	CHUK	-.54865	.29452	.153	-1.2459	.1486
		KFH, K	-1.07407*	.32864	.004	-1.8521	-.2961
Overall Perceptions of Patient Safety	CHUK	KFH, K	-1.62790*	.52188	.006	-2.8641	-.3917
		RMH	.34349	.47680	.752	-.7859	1.4729
	KFH, K	CHUK	1.62790*	.52188	.006	.3917	2.8641
		RMH	1.97138*	.53196	.001	.7113	3.2315
	RMH	CHUK	-.34349	.47680	.752	-1.4729	.7859
		KFH, K	-1.97138*	.53196	.001	-3.2315	-.7113

Feedback and Communication About Error	CHUK	KFH, K	-1.31204*	.47233	.017	-2.4302	-.1939
		RMH	.50847	.43103	.467	-.5119	1.5289
	KFH, K	CHUK	1.31204*	.47233	.017	.1939	2.4302
		RMH	1.82051*	.48095	.001	.6819	2.9591
	RMH	CHUK	-.50847	.43103	.467	-1.5289	.5119
		KFH, K	-1.82051*	.48095	.001	-2.9591	-.6819
Communication Openness	CHUK	KFH, K	-1.03078	.48151	.085	-2.1709	.1094
		RMH	-.00750	.44033	1.000	-1.0501	1.0351
	KFH, K	CHUK	1.03078	.48151	.085	-.1094	2.1709
		RMH	1.02328	.49405	.099	-.1466	2.1931
	RMH	CHUK	.00750	.44033	1.000	-1.0351	1.0501
		KFH, K	-1.02328	.49405	.099	-2.1931	.1466
Frequency of Events Reported	CHUK	KFH, K	-2.88918*	.58819	.000	-4.2816	-1.4967
		RMH	.34871	.53676	.793	-.9220	1.6194
	KFH, K	CHUK	2.88918*	.58819	.000	1.4967	4.2816
		RMH	3.23789*	.59893	.000	1.8200	4.6558
	RMH	CHUK	-.34871	.53676	.793	-1.6194	.9220
		KFH, K	-3.23789*	.59893	.000	-4.6558	-1.8200

Continued ...

Teamwork Across Units	CHUK	KFH, K	-1.23866*	.51260	.044	-2.4526	-.0247
		RMH	.61325	.47148	.397	-.5033	1.7298
	KFH, K	CHUK	1.23866*	.51260	.044	.0247	2.4526
		RMH	1.85191*	.52634	.002	.6054	3.0984
	RMH	CHUK	-.61325	.47148	.397	-1.7298	.5033
		KFH, K	-1.85191*	.52634	.002	-3.0984	-.6054
Staffing	CHUK	KFH, K	-1.81851*	.45256	.000	-2.8902	-.7468
		RMH	-1.61406*	.41412	.000	-2.5947	-.6334
	KFH, K	CHUK	1.81851*	.45256	.000	.7468	2.8902
		RMH	.20445	.46278	.898	-.8914	1.3003
	RMH	CHUK	1.61406*	.41412	.000	.6334	2.5947
		KFH, K	-.20445	.46278	.898	-1.3003	.8914
Handoffs & Transitions	CHUK	KFH, K	-2.72262*	.63276	.000	-4.2211	-1.2241
		RMH	-.37637	.57192	.788	-1.7308	.9780
	KFH, K	CHUK	2.72262*	.63276	.000	1.2241	4.2211
		RMH	2.34625*	.64209	.001	.8257	3.8668
	RMH	CHUK	.37637	.57192	.788	-.9780	1.7308
		KFH, K	-2.34625*	.64209	.001	-3.8668	-.8257

Continued ...

Nonpunitive Response to Error	CHUK	KFH, K	.04417	.47371	.995	-1.0778	1.1662
		RMH	-.52136	.43626	.458	-1.5547	.5120
	KFH, K	CHUK	-.04417	.47371	.995	-1.1662	1.0778
		RMH	-.56553	.48301	.473	-1.7096	.5785
	RMH	CHUK	.52136	.43626	.458	-.5120	1.5547
		KFH, K	.56553	.48301	.473	-.5785	1.7096

Appendix VIII: CHUK Review approval notice

CENTRE HOSPITALIER UNIVERSITAIRE
UNIVERSITY TEACHING HOSPITAL

Quality Health Care
Training & Research

Ethics Committee / Comité d'éthique

February 24th, 2017   Ref.: EC/CHUK/293/2016

<u>Review Approval Notice</u>

Dear Karonkano Rutayisire Gilbert,

Your research project: "*Patient safety culture in Rwandan Referral Hospital Operating Room.*"

During the meeting of the Ethics Committee of University Teaching Hospital of Kigali (CHUK) that was held on 24/02/2017 to evaluate your protocol of the above mentioned research project, we are pleased to inform you that the Ethics Committee/CHUK has approved your protocol.

You are required to present the results of your study to CHUK Ethics Committee before publication.

PS: Please note that the present approval is valid for 12 months.

Yours sincerely,

John Nyirigira
The Secretary, Ethics Committee,
University Teaching Hospital of Kigali

<<*University teaching hospital of Kigali Ethics committee operates according to standard operating procedures (Sops) which are updated on an annual basis and in compliance with GCP and Ethics guidelines and regulations*>>.

B.P. :655 Kigali- RWANDA www.chk.rw Tél. Fax : 00 (250) 576638 E-mail :chuk.hospital@chukigali.rw

Appendix IX: KFH, K Review approval letter

KING FAISAL HOSPITAL, KIGALI

Patient Centered Care

28TH March, 2017

KARONKANO, R.Gilbert

Postgraduate student, Master of Science- Nursing

School of Nursing and Midwifery

College of Medicine and Health Sciences

University of Rwanda

Phone: 0788897210

Dear Karonkano,

We acknowledge receipt of your study protocol: **"Patient safety culture in Rwandan referral hospital(s) operating Rooms"**

After a thorough review by the KFH, K Ethics-Research Committee; the reviewers consider the study important and useful, though showing some fundamentals shortfalls as outlined in the attached comments

However, it is recommended that the postgraduate student should be permitted to commence work at KFH immediately but he is expected to review the protocol with his supervisors to address the concerns of the reviewers in due course.

The response should be communicated to the Secretariat of KFH Ethics Research Committee as soon as possible.

N.B. It is a requirement that you deposit a final copy of your research in the office of Continuous Quality Improvement in King Faisal Hospital, Kigali for our records.

Best Regards

Dr. Samuel Lutalo
Chief Consultant Physician
& Chairperson KFH, K Ethics Research Committee

CC

– All KFH, K Ethics-Research Committee Members.

Appendix X: RMH Review approval notice

REPUBLIC OF RWANDA
RWANDA MILITARY HOSPITAL
Website: www.rwandamilitaryhospital.rw
P.O. Box: 3377 Kigali, Tel: (+250)252586420, Hotline: 4060
E-mail: info@rwandamilitaryhospital.rw

March 17th, 2017   Ref.: EC/ RMH/ 118/ 2017

REVIEW APPROVAL NOTICE

Dear **Karonkano Rutayisire Gilbert**
SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF MEDICINE AND HEALTH SCIENCES
UNIVERSITY OF RWANDA

Your research project: **"Patient Safety Culture in Rwandan Referral Hospital Operating Rooms".**

With respect to your application for ethical approval to conduct the above stated study at Rwanda Military Hospital, I am pleased to confirm that RMH Ethics Committee has approved your study. This approval lasts for a period of **12 months** from the date of this notice, and after which, you will be required to seek another approval if the study is not yet completed.

You are welcome to seek other support or report any other study related matter to the Research office at Rwanda Military Hospital during the period of approval.

You will be required to submit the progress report and any major changes made in the proposal during the implementation stage. In addition, you are required to present the results of your study to RMH Ethics Committee before publication.

Sincerely,

Dr. Pacifique MUGENZI
Lieutenant Colonel
Co Chair: Rwanda Military Hospital Research Ethics Committee

Email: Info@rwandamilitaryhospital.rw
Tel: 0252586420
P.o Box: 3377 RWANDA MILITARY HOSPITAL

Appendix XI: UR-CMHS IRB Ethical Clearance

UNIVERSITY OF RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 16/01/2017
Ref: CMHS/IRB/**102**/2017

KARONKANO Rutayisire Gilbert
School of Nursing and Midwifery, CMHS, UR

Dear KARONKANO Rutayisire Gilbert

RE: ETHICAL CLEARANCE

Reference is made to your application for ethical clearance for the study entitled *"Patient Safety Culture in Rwandan Referral Hospital Operating Rooms "*.

Having reviewed your protocol and found it satisfying the ethical requirements, your study is hereby granted ethical clearance. The ethical clearance is valid for one year starting from the date it is issued and shall be renewed on request. You will be required to submit the progress report and any major changes made in the proposal during the implementation stage. In addition, at the end, the IRB shall need to be given the final report of your study.

We wish you success in this important study.

Professor Kato J. NJUNWA
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:
- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate studies, UR