# APPLICATION OF RICHMOND AGITATION SEDATION SCALE AMONG NURSES IN CRITICAL CARE UNITS AT AGA KHAN UNIVERSITY HOSPITAL, NAIROBI, KENYA.

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## DECLARATION AND APPROVAL

**Declaration by the Student**

This thesis is my original work and has not been presented for a degree in any other University or College for any academic award.

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We confirm that the work reported in this thesis was carried out by the candidate under our supervision

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## DEDICATION

To my loving dad Gerald Nzyoka for believing in my capacity to become a nurse, my mother Rose Mwelu for teaching me virtue of patience.

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## ABSTRACT

The Richmond Agitation Sedation Scale (RASS) is a useful tool used in CCU settings to determine the level of alertness or agitation. If properly applied, the tool can reduce common mortalities and morbidities as well as improve patient comfort. However, its application and determinants of its application are not well studied by previous researchers. The study sought to assess the application of the tool among the critical care unit nurses at Aga Khan University Hospital, Nairobi. A sample of 92 nurses was drawn from the target population of 106 nurses through stratified proportionate random sampling to minimize errors of precision that can occur while conducting the study without observing proper representation. Data was obtained from the participants through a checklist and self-administered questionnaires. However, a pretest involving 9 nurses at Intensive care unit of Aga Khan University Hospital which is equated to mean 10% of 92 nurses taken as the sample size was utilized to evaluate the validity and reliability of the tool to be utilized. Data coding and entry was done via SPSS version 25 which helped in the analysis and interpretation of the data. On data presentation, tables, graphs, pie charts, and histograms were utilized. The outcome was then disseminated to Mount Kenya University, presented in seminars and conferences and published in a journal made to contribute to the pool of knowledge on this field. Results were utilized to inform decisions on its application at AKUH with involvement of policy makers. The response rate was 97% and as for socio-demographic characteristics, majorities (51.7%) were aged 31-40years. The mean RASS application score was 85.6% and a standard deviation of 16. Majority (71.9%) had high RASS application level. The findings revealed that, none of the institutional factors influenced RASS application. This necessitates follow-up of nurses through support supervision and regular audits, to oversee the application of RASS. The level of application of RASS was found to be high at AKUH. This was justified by the high application mean score (85.6%) and the high application level by majority (71.6%) of the respondents. The study recommended that; the nurses in conjunction with AKUH administration should strive to increase the number of nurses attending critical care courses. Attendance of these refresher courses actually translates to better RASS application and as such, they need to be taken a bit more resolute. The institution should put in place policy and RASS guidelines.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **AKUH** | Aga khan University Hospital |
| **BIS** | Bispectral |
| **CBD** | Central Business District |
| **CCU** | Critical Care Unit |
| **CCU** | Coronary Care Unit |
| **CN** | Clinical Nurse |
| **CTICU** | Cardiothoracic Intensive Care Unit |
| **HCC** | Heart and Cancer Centre |
| **HCW** | Health Care Worker |
| **HDU** | High dependency unit |
| **ICU** | Intensive Care Unit |
| **ILO** | International Labour Organization |
| **JCI** | Joint Commission International |
| **MSAT** | Minnesota Sedation Assessment Tool |
| **RASS** | Richmond Agitation Sedation Scale |
| **RSS** | Ramsay Sedation Scale |
| **SAS** | Sedation Agitation Scale |
| **SCCM** | Society of Critical Care Medicine |
| **VICS.** | Vancouver Interaction and Calmness Scale |
| **WHO** | World Health Organization |

## OPERATIONAL DEFINITION OF TERMS

**Agitation-** Agitation is used in reference to a situation of disquiet characterized by nervous excitement and anxiety.

**Critical care-** The term is synonymous to care of life-threatening conditions. The care is specialized and often require the services rendered in intensive care departments.

**Delirium-** It is used to refer to a condition characterized by acute confusions, illusions, and restlessness.

**Mechanical ventilation-** This refers to the technique through which gas is supplied to the lungs with the aid of an external device.

**Sedation analgesia-** This is a technique applied in sedative administration to allay anxiety and pain.

**Tracheal intubation-** This is the placement of a tube through the trachea to ensure that the airway remains patent.

# CHAPTER ONE
# INTRODUCTION

## 1.1 Background to the Study

The utilization of sedatives is a common practice especially to patients on mechanical ventilation in Intensive Care Unit (ICU). Proper therapeutic level of sedatives is associated with inherent risks especially when abused or used in excess. As such, patient outcomes can be improved with the adoption of guidelines that promote safe practices. The RASS tool constitutes one of the most widely applied tools in many Critical Care Units setups. The main goal of the utilization of RASS is to enable the titration of sedative medications through structured assessments relating to sedation and agitation. According to Trivedi & Iyer (2016), the tool comprises of two phases of a 10-steps scale which ranges from +4 which implies a combative nature of the client's response to -5 which means the patient is unarousable. The use of the 10 levels of patient assessment is crucial to enhancing effectiveness of sedation efforts and substantial impact of poor sedation. As such, consequences such as self-extubation of intraluminal tubes and removal of catheters can be avoided.

Globally, the RASS scale remains the most suitable tool for monitoring patients in palliative sedation. According to Taran et al.,2019), the tool is recommended as a blueprint for assessing the degree of tranquility among clients admitted in the ICU. The study also reveals that careful application of the measures advocated by the tool could reduce chances of tracheostomy among clients on mechanical ventilation. Other additional merits include minimal time of weaning clients from ventilators, reduced stay in the unit, fewer chances of extubation as well as reduced hospitalization. Thus, it can be argued that the use of the protocol helps in better control of agitation and improves recovery. A similar observation was also made by Kerson et al., 2016) through a study done in Iran. According to the authors, the risk of giving overdose is

highly reduced with appropriate use of the tool. In addition, the total duration of staying in the ventilator is also reduced significantly. On agitation, the authors noted that patients who had history of being restrained or use of illicit substances such as alcohol and drugs had higher chances of becoming aggressive in the course of the stay in the unit.

The WHO has also set out a criterion under which the RASS tool should be utilized. The first recommendation is that in order to apply the tool, the patient must be an adult of 18 years and above. It is also useful where mechanical ventilation is expected to last more than 72 hours of patient admission to a CCU. Other considerations include fluid overload, and the absence of abdominal lesions of surgical nature. However, lactating and pregnant mothers should not be included in the assessment (WHO, 2018).

In Africa, Assefa & Sahile (2019) through a study conducted in Ethiopia notes that the emergence of acute agitation is a common phenomenon in many CCUs in Ethiopia. This leads to significant morbidity coupled with prolonged hospitalization. The cases were noted to occur more among the elderly, premedication with benzodiazepines, and among substance users.

The administration of a large dosage of sedatives to a patient to sedate him or her has been proven in tests to result in respiratory system depression in the patient. Consequently, the patient will need more time on a ventilator and for longer lengths of time as a consequence of this condition. Additional expenditures will accrue as a result of medicine dependency and respiratory infection, as well as greater inpatient costs in the end. One of the most difficult challenges in medical and nursing care is achieving a balance in the treatment of patients' anxiety and discomfort while also avoiding side effects and utilizing a medicine that does not result in respiratory depression.

Meanwhile, according to Goodwin et al. (2012), one of the most significant problems associated with injecting such medications is the lack of a specialized and precise program that can detect and reduce these side effects while also being acceptable to the general public and medical community, which is currently unavailable. At issue in this debate are the best ways to strike a balance between patient safety and comfort, as well as the best ways to predict and relieve patients' anxiety, restlessness, and discomfort without the use of excessive sedation.

In this regard, a variety of different scales have been developed and implemented. Using sedation measures and scoring systems, it has been shown in study that they may minimize the amount of time a patient spends breathing, as well as the chance of pain and hospital infections. According to Tanios M. and Dewit M., (2010) the Patients' Comfort Scale (CS) was developed in 1992 to measure patients' stimulation and response to the environment of intensive care units (ICUs) by measuring respiration, muscle tone, and other physical features, respectively. When it was originally established in 1974, the Ramsay scale was the first to evaluate patients' comfort and the first to assess just stimulation in patients, both of which were firsts in their fields. Richmond Agitation Sedation Scale (RASS) is another scale that is used to measure patient sedation. It was created in Richmond, Virginia, and has been in use since then. P. Ma and J. Liu are among those who have contributed to this work. A recent research found that RASS application is more obvious and straightforward than other scales; it takes less time; it results in patients being connected to a ventilation machine and being admitted to an intensive care unit for a shorter amount of time when compared to other scales (Torunn, 2010). Even while some studies have shown that utilizing this metric does not benefit in patients' recovery, others have found that it increases the likelihood of patients being extubated prematurely or too often, as well as the onset of post-

traumatic stress disorder (PTSD). According to Tanios and Dewit (2013), when they conducted a research study in Germany on the use of sedation to ensure that body organs function at their best, using RASS resulted in drowsiness in patients who were intubated, as well as a reduction in medication consumption and concerns such as delirium and coma. Tanios and Dewit (2013) discovered that the use of RASS resulted in higher medication intake as well as delirium-like symptoms in the participants. Payen et al. (2007) conducted a study in 44 intensive care units (ICUs) in France to discover the optimal strategy for sedating patients in the ICU who were connected to ventilators.

According to Albert and Adam (2006), the use of RASS had a lesser effect on the number of days a patient spent in the hospital, but mechanical ventilation had no discernible impact on ventilation, hospitalization duration, or the risk of a patient dying during the study period. Others who have contributed to this work include (Goodwin, 2010), and others In light of the ongoing debate over the efficacy of RASS in various studies as well as the requirement for nurses to use a variety of evaluation scales in order to improve care quality, the researchers determined that conducting the current study to investigate the efficacy of RASS and sedation in ventilator-connected patients with the cooperation of physicians and nurses was essential. It was specifically evaluated in this study for its impact on the length of artificial breathing in patients, as well as the types and amounts of sleep-inducing medications administered to them over the course of the research.

High doses of sedatives used to sedate a patient have been shown to cause respiratory system depression, resulting in the patient being hooked up to a ventilator for an extended period of time, an increase in medication costs, an increase in medication dependency, the development of a respiratory infection, and an increase in

hospitalization costs (Hawks & Brandon, 2013). Reduced drug intake might result in anxiety, hyperactivity, pain, hypertension, and tachycardia, as well as unpredictable effects on patients' ability to do daily chores.

Given the preceding, establishing a balance in the management of patients' anxiety and discomfort in order to reduce side effects while utilizing a medicine that does not cause respiratory depression is one of the most difficult medical and nursing challenges. Between these two extremes, one of the most difficult aspects of administering such pharmaceuticals is developing a specialized and exact program that can identify and mitigate these side effects while also being widely accepted. It's tough to strike a satisfying balance in this regard, and it's even more difficult to forecast and alleviate patients' worry, restlessness, and pain without sedating them (Hofhuis and Langevoort, 2012)

According to the study by Roberts de Wit M, Epstein Didomenico, and Devlin (2010). using these sedation scales and scoring systems can reduce the amount of time spent breathing, as well as the occurrence of pain and hospital infections. The patient comfort scale (CS) is a scale that measures how comfortable a patient is. The Ramsay scale was the first scale to measure patients' stimulation, and it was used to assess patients' comfort for the first time in 1974. The Richmond Agitation Sedation Scale (RASS) is another tool for determining a patient's level of sedation. Hawks & Brandon, (2013). Meanwhile, research shows that, when compared to other scales, the RASS application is more obvious and convenient, takes less time, and results in patients being linked to the ventilator for a shorter duration of time and staying in the intensive care unit for a shorter period of time. Randen I, Torunn I. (2010) The implementation of this scale, according to the findings of multiple other studies, does not result in patients' recovery,

but rather raises the risk of early and ineffective extubation, as well as the prevalence of stress disorder.

Goodwin et al. (2012) discovered that employing RASS leads in sedation of intubated patients and a reduction in drug use as well as medication-related problems such as delirium in a German study on the use of sedation to ensure that the body's organs operate optimally. Payen et al. (2007) discovered that using scales like the RASS resulted in a reduction in the need for sedatives in a study conducted in 44 intensive care units in France on the proper practice of sedating patients attached to ventilators in the ICU (43 percent vs 72 percent). According to Albert and Adam (2006), the use of RASS had a less substantial impact on both the number of days a patient remained in the hospital and the requirement for mechanical ventilation. According to Back et al. (2008), the use of RASS had no meaningful impact on ventilation, hospitalization length, or patient death in their Australian study.

Goodwin et al. (2012) In light of the ongoing debate over the efficacy of RASS in various studies and the need for nurses to use a variety of assessment tools to improve the overall quality of patient care, the researchers determined that conducting the current study with the cooperation of physicians and nurses to investigate the efficacy of RASS and sedated patients who were connected to ventilators was critical.

Another study by Owen et al., (2019) revealed that African countries had limited options on the use of sedatives ranging from the year 2010 and 2016. However, the use of propofol as sedative agent rose from 38% to 41% between this period. Nevertheless, the challenge has remained on how the number of days spent on the ventilator can be reduced. According to Hodkinson, James & Wallis (2009), through a study done in South Africa, the authors cite lack of proper literature documented across Africa on the

matter. Another observation was the fact that private facilities had better sedation procedures compared to the public facilities that are understaffed and lack equipment and well laid protocols. In addition, according to Khoza-Shangase, (2019), also revealed gaps in patient care as only 29% adopted conscious sedation practices while 38% opted for natural sleep. The authors also revealed that 83% of the respondents were not aware of the availability of a monitoring tool in sedation.

Nurses are charged with the responsibility of making neurological assessments as per the patient needs in the CCUs. More importantly, patients on mechanical ventilation require specialized monitoring as their outcomes heavily depend on effective sedation control. According to Abdar et al., (2013), nurses stand the best chance of ensuring that adherence to and proper use of sedatives is effected. This prevents abuse of the drugs and leads to better patient outcomes and comfort. Failure to adhere to such measures leads to psychological and physical distress among the patients (Ramoo et al., 2016). Effective sedation among the critically ill also leads to reduced agitation, anxiety and restlessness (Rasheed et al., 2018). Therefore, the key reason for sedation is to enhance adaptation to mechanical ventilation and intubation which has improved outcomes in ICU settings.

In Kenya, the application of RASS is recommended in standard ICU settings although its application remain poorly studied. The only published studies involved assessment of delirium by CCU nurses. This followed documented ventilator morbidity in the units. The studies also sought to assess nurse's practices and knowledge in Kenyatta National Hospital (KNH) (Malombe, 2015; Matoke, 2018). The sub-Saharan Africa has poorly focused on studying the area making the data available quite scanty. Although the RASS scale can be highly effective in preventing associated ventilator morbidities, its application and use has not attracted the attention of many scholars especially here

in Kenya. Nonetheless, the assessment involved in the implementation of the tool are quite beneficial to the patient and can be performed in any CCU to improve their outcomes. Thus, this study is shaped by the fact that there lacks data on the extent to which the RASS tool is utilized in CCU settings as well as the determinants that influence its use and the outcomes. As such, the data yielded in this area will be crucial to providing explanation on the extent of the adoption of the RASS tool.

### 1.2 Problem Statement

The utilization of RASS tool remains highly understudied in most healthcare settings. Failure to adhere to the measures RASS advocates is the cause of negative patient outcomes as well as delirium in most CCUs (Grossmann et al., 2017). The study also revealed that 7% of the patients assessed exhibited delirium while another 14.4% had dementia. However, poor sedation and assessment was the main reason behind the associated negative outcome for patients in the ICU.

On the other hand, Viglino et al., (2016) acknowledges that there is associated limitations in the use of RASS tool as it allows little modification to assess the neurological aspect of the patient. For instance, where patients present with cardiac arrest that poses the risk brain injury, it can be excluded. However, the tool is quite beneficial in preventing adverse impacts of poor sedation if used properly. Another study by Tan et al., (2019), revealed that under normal circumstances RASS was only utilized in 46.8% of the cases. In addition, instances of self-extubation remained the same despite application of different interventions. However, cases of physical restrain decreased significantly.

According to Rasheed et al., (2018) the tool remains highly underutilized by nurses as seconded by poor availability of literature. The availability of other sedation assessment tools such as the Ramsay Sedation Scale has also led to poor utilization of the RASS by

nurses in the CCUs. Bearing in mind that nurses are the only healthcare team in constant care of the patients, it is paramount that every nurse in such units gets the knowledge on how to utilize the tool as well as the determinants of its utilization (Depetris et al., 2018). This is owing to the perceived value it may have on advancing patient outcomes.

The Aga Khan University Hospital (AKUH) CCU is one of the areas where RASS tool has been adopted for utilization in the department. Nurses are primarily charged with monitoring patients by filling out the information in the chart. However, the surveillance data on the utilization of the tool in the facility is scanty due to poor surveillance practices regarding its application. In addition, the determinants of its use are not clearly highlighted as would be the case in any tool that is utilized in the healthcare system. As such, the knowledge and practices of the use of RASS among nurses is clearly understudied based on the existence of unclear guidelines in CCUs. Thus, it is of paramount need to develop informative data in this area to inform changes in practice, which will in turn improve patient outcomes.

### 1.3 Justification of the study

The RASS tool continue to be highly underutilized in many CCUs despite the associated merits in improving patient outcomes. It also helps reduce morbidities linked to poor sedation. The resultant impact is reduced hospitalization in ICU and overall days spent in a healthcare facility. Therefore, the helps to shed light on the actual data on the utilization of the tool as well as other determinants impacting its utilization. In particular, patient safety is a key concept advocated for across many healthcare organizations and this tool is at the forefront of enhancing the practices in CCUs. Exploring literature also reveals that previous studies have not focused on the

utilization of the RASS tool. Therefore, the study helps to enhancing understanding and develop knowledge on the area.

Nurses will be the key respondents as they are charged with the assessment and the overall safety of the client especially when administering sedatives. Considering that the nurse constitutes the majority of Healthcare Workers (HCWs) working in CCUs, it can only be argued that the utilization of the RASS tool can only be assessed appropriately by looking into their capacity to utilize the tool and the determinants influencing its use.

### 1.4 Significance of the Study

The priority focus of the study is on improving patient outcomes. As such, the study helps to come up with data on the utilization of the RASS tool as well as its determinants which will help shape its use in helping the patient admitted in the CCU. Through proper assessments and utilization of sedatives, morbidities as well as mortalities can be minimized or eliminated. Prolonged hospitalization always poses a huge economic burden to patients and their families and this can be best addressed by sealing some of the loopholes such as utility of the RASS tool.

The study will also be beneficial to nurses working in the CCU departments at AKUH as the outcomes will help recognize and appreciate the value attributed to the RASS. It will also raise awareness not only to nurses but also to doctors who are key partners with them in the CCUs. This will help them to clearly utilize it in bettering patient experiences and outcomes. In addition, this will help lower the incidences of under utility of sedation scales in the ICU. Moreover, communication will be enhanced bearing in mind that the tool focuses on specific areas of assessment.

To the policy makers, the study will be fundamental in helping them adopt measures that will enhance utilization of the tool in making decisions on sedation. This will go a long way in helping realize quality patient care. In addition, policy- makers in the government can take up the challenge presented by the finding to help them adopt strategies to help effect the utilization of the sedation scale and minimize patient suffering.

The hospital administration also stands to benefit from the study as the findings will help them seal the gaps in the utilization and enhance compliance to the RASS tool. Finally, the study material will be used as a reference material by other researchers exploring similar aspects on the area of interest considering that it appears to be a pace setter on this area.

## 1.5 Study objectives

### 1.5.1Broad objective

To investigate the application of Richmond Agitation-Sedation Score (RASS) among nurses in Critical Care Units at the AKUH, Nairobi, Kenya.

### 1.5.2 Specific objectives

1. To determine the level of application of RASS among CCU nurses at AKUH, Nairobi, Kenya.
2. To establish nurse related factors influencing the application of RASS at AKUH, Nairobi, Kenya.
3. To determine institutional factors influencing application of RASS at AKUH, Nairobi, Kenya.

### 1.5.3 Research Questions

1. What is the level of application of the RASS among CCU nurses at AKUH, Nairobi, Kenya?

2. What are nurse-related factors influencing application of RASS among CCU nurses at AKUH, Nairobi, Kenya?
3. What are the institutional factors influencing the application of RASS among CCU nurses at AKUH, Nairobi, Kenya?

### 1.6 Hypothesis

**$H_{01}$**: There is no statistical significance between Nurse related factors and the application of the RASS among CCU nurses at the AKUH, Nairobi.

**$H_{02}$:** There is no statistical significance between institutional factors and the application of RASS among CCU nurses at the AKUH, Nairobi.

### 1.7 Limitations of the study

Geographically, the investigation is narrowed to AKUH in Nairobi County. In terms of contextual limitations, the study focuses on the application of the RASS tool as well as the determinants surrounding its implementation. Other areas impacted by the utilization of the tool were not addressed. Moreover, only nurses are involved in the study despite the doctors being part of the team and probable users of the tool. This is because nurses are the primary care givers for the patients around the clock.

### 1.8 Delimitations

The study tried to eliminate the shortcomings through an elaborate sampling method. In this case, the study utilized stratified proportionate sampling method which ensured a representative sample is obtained from every CCU available in the hospital. Thus, the end sample size eliminated the error of precision which influenced the generalizability of the outcomes. The adoption of the final publication can therefore be said to have eliminated room for bias among the prospective respondents.

## 1.9 Theoretical Framework

Theoretical frameworks are commonly used as a foundation of a study on informed knowledge or science. Different studies are anchored on various theories that help in explaining the thematic concepts in the study. To effectively study the application of RASS and its determinants, the study borrowed the reasoning behind the Diffusion of Innovation Theory (DIT). The theory was initiated in 1962 by E.M Rogers. It explains how an idea comes to be and diffuses through a given group of people with the end result being its incorporation or adoption as part of the expected behavior (Dearing & Cox, 2018). According to DIT, the initial stages are always met with a disorganization where some people tend to be quick in accepting the application of the new idea while others are skeptical. In this case, the attitude and context of those adopting the change becomes fundamental concepts in shaping its influence. As such campaigns and motivation are needed to ensure more people get to depict the expected behavior.

The DIT suits well with this study as proper application of the RASS requires that its users who are nurses are properly equipped with the information regarding elements of measure in the tool first before the other stages follow. Secondly, the nurses need to change their attitude in the context of the application of the tool which is in the ICU. This are crucial elements that determine how well a tool can be utilized in the units. Moreover, there needs to be a motivation aspect that can be found mostly in periodic evaluations and audits of the utilization. Furthermore, institutional policies and guidelines can help cement its application in assessment of the critically ill to boost patient outcomes.

## 1.10 Conceptual Framework

**Variables**

**Independent Variables** **Dependent variables**

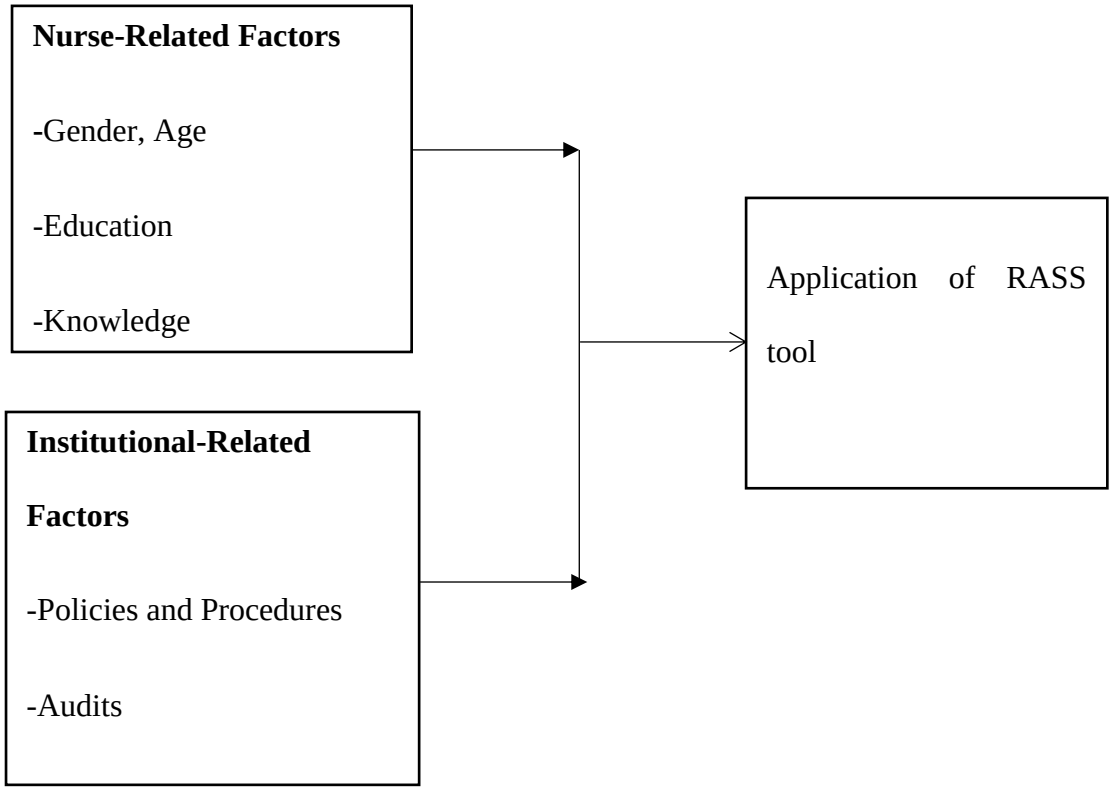


**Figure 1: Conceptual Framework**

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1. Introduction

This section covers studies revolving around the application of RASS tool as well as the key determinants influencing its use. In depth analysis aimed at exploring the main objectives is done through recent studies done in the last five years. The broad areas of review are on nurse-linked elements such as gender, age, knowledge, experience and education level, institutional factors such as policies, resources as well as audits.

## 2.2. Management of Patients in Critical Care Units

In the quest to provide comprehensive and best care to patients in the CCUs, sedation assessment and management has been a central concept among healthcare workers charged with this responsibility. This is primarily related to the problems caused by ineffective sedation, agitation, and delirium among the critically ill patients (Devlin et al., 2018). This effective sedation control and improved comfort is a fundamental concept among nurses providing care in such settings.

Agitation appears to be one of the critical adverse events in critical care settings. According to Mahmood, Mahmood, El-Menyar, Asim, & Al-Thani (2018), agitation is characterized by excessive cognitive and motor actions along with restlessness that can often lead to other related morbidities. In addition, the patient presents with deranged mental status and disorientation which can further lead to more adverse events.

Agitation and anxiety occur more often in many ICU settings especially with poor implementation of sedation assessment and monitoring tools. According to Depetris, Raineri, Pantet, & Lavrentieva (2018), the state may lead to misdiagnosis of the patient and the resulting management, which caused a client to be uncooperative with the monitoring procedures as well as therapies indicated. On the other hand, Rasheed et al.,

(2018) acknowledges that agitation leading to restlessness, aggression, and aggravated pain are among the key indicators for initiating sedation medications for those admitted in the ICUs. Therefore, it is important to keep watch of patient behaviors while in the unit to assess the effectiveness of medications administered and make the necessary adjustments where necessary.

The use of sedation is a routine practice in the ICU settings meant to permit invasive procedures such as mechanical ventilation. The main reason is to help in promoting patient comfort and safety (Richards-Belle et al., 2016). The key goal of administering sedatives is to promote adaptation and tolerance to mechanical ventilation and tracheal intubation as well as other invasive procedures. Thus, the patient becomes less anxious which promotes nursing procedures (Talsi, Kiiski Berggren, Johansson, & Winsö, 2019). In this case, the utilization of sedation scales becomes a major role of the caregivers who wish to optimize the outcomes.

In addition, according to Yousefi et al., (2015), sedation provides patient with comfort needed to promote healing. However, excessive use of sedatives on patients is often associated with negative implications. The major implication being respiratory depression, addiction to the medications, prolonged stay in the ventilators, and increased cost of healthcare. Thus, as a key determinant of the use of the drugs, it is important to ensure that the levels of the drugs are monitored closely to avoid toxic effects.

### 2.3. Sedation and Agitation assessment

Standard tools are used in monitoring and documenting sedation levels among patients. RASS tool is one of the fundamental tools recommended for assessment and monitoring of sedation levels. According to Bush et al., (2014), the tool is primarily put together by evaluating observational data by the healthcare giver responsible for the

patient. The values range from a scale of +4 which is translated to mean that the patient is highly combative to -5 which is translated to mean that the patient is unresponsive to physical and voice stimulation (Mason, Egan, O'Loghlen, & Conway, 2015). The Virginia Commonwealth University in Richmond is credited for the development of RASS tool.

A variety of factors, including the necessity for mechanical ventilation, necessitate the administration of analgosedation to critically sick patients in intensive care units. If you have a lot of medical problems and are taking many medications, it might be difficult to figure out what therapy and sedation depth to use. As a result of significant interindividual variation in pharmacokinetics, as well as insufficient monitoring, an inappropriate drug dose may be administered, causing morbidity and death. Reduced levels of analgosedation can result in hypercatabolism, immunosuppression, hypercoagulopathy, increased sympathetic activity, and inadvertent extubation, while increased levels of analgosedation can result in prolonged mechanical ventilation, a higher risk of nosocomial pneumonia, higher costs, and neuropsychological dysfunction over the long term. Because of this, analgosedation monitoring is an essential component of intensive care unit operations, as it may help to prevent excessive sedation, drug-induced delirium, and higher mortality. DAS Taskforce (2015). The present degree of analgesia, sedation, and delirium in the patient should be assessed every 8 hours, as indicated by the recommendations, using allowed monitoring techniques, as specified by the guidelines. Clinical metrics like the Richmond Agitation-Sedation Scale (RASS) Score and the Ramsay Sedation Scale Score, in combination with neurophysiological monitoring techniques like Bispectral Index (BIS) monitoring, have been proposed as a way to improve the efficacy of personalized therapies. In order to measure the degree of the sedative effect on the patient, the RASS

Score is used in concert with physiological data such as heart rate, blood pressure, imitation, gesture, lacrimation, and perspiration. (John et., al, 2013). The RASS Score has been the subject of substantial study to evaluate its reliability and validity. This study has included contributions from CN Sessler and MS Gosnell, among others (2002). This score is more precise than the Ramsay Score, which is no longer recommended by the German AWMF regulations. Among others, Taskforce DAS and Baron R (2015). The BIS index may be any value between 0 and 100, with 100 being an appropriate awake condition. The BIS index, when compared to the RASS and Ramsay Scores, has been demonstrated to have good validity and reliability when compared to these other scores, according to several research.

The Society of Critical Care Medicine (SCCM) recommends that ICU patients taking sedative drugs be examined using a sedation scale. Expert research have backed up this advice. The SCCM recommends that each patient have a sedation objective or end-point that is regularly evaluated and documented (grade C recommendation). A validated sedation evaluation measure was also highly advised (grade B recommendation). Professionals should use a sedation scale to assess patients' agitation or anxiety during therapy. Historically, fewer than half of ICU patients, have been assessed for sedation, and this tendency continues today Taskforce DAS and Baron R (2015).

A recent prospective surveillance research done in 44 critical care units in 2004 indicated that many patients using sedative drugs still do not have their sedation evaluated. The hospital claims that on the second ICU Day, just 43% of patients had a sedation evaluation. On the second day of intensive care, 72% of patients received sedatives. The statistics showed that 57 percent of the patients evaluated were severely

sedated, indicating that we failed to employ a sedation scale properly in treating them Bush et al., (2014).

Studies show that using a sedation assessment tool may enhance medication accuracy. The outcome is more suitable sedation levels and less over-sedation. Less sedative and analgesic drug usage, less mechanical ventilation, and less vasopressor medication use result. Extensive monitoring and tailored treatment have been associated to reduced agitation, shorter mechanical breathing times, and even lower nosocomial infections Taskforce DAS and Baron R (2015). A sedative scale is used in almost all patient-centered care approaches and procedures.

In addition, a number of scales, including the SAS and RASS, have been thoroughly tested with up to five raters, who included nursing staff as well as physicians and pharmacists, in research and clinical settings, in a number of hospitals, and with a variety of patient populations, before being published (with or without mechanical ventilation) Bush et al., (2014). Scales have proven to be extremely reliable in the vast majority of instances. Several areas of these instruments' validity have been demonstrated through comparisons with a variety of other instruments, including face validity, concept validity, and criterion validity for the vast majority of cases, excellent to outstanding validity can be demonstrated with relative ease. The validation of the agitation domain of the sedation-agitation scale has received far less attention than the validation of the other domains of the scale. Aside from that, certain scale ranges contain domains that are more difficult to validate than others, making certain scale ranges more difficult to use than others. Take, for example, the motor activity domain of the MSAT; there are only minor connections between the MSAT and the comparator in this domain (the Vancouver Interaction and Calmness Scale (VICS) Bush et al., (2014).

The most outstanding characteristic of RASS tool is the capacity to provide comparative changes in sedation among patients in ICU especially in consecutive days. According to Mason et al., (2015), the amount of sedatives administered is directly related to the level of agitation and delirium exhibited by the patient. However, the tool surpasses other tools used in monitoring sedation since it can offer comparative assessment of a client in consecutive days (Kerson et al., 2016). In addition, it is also simple to utilize, accurate in describing aggression characteristics of the patient within a given time frame. According to Newton, Pop, & Duvall (2013), the tool offers the most reliable way of monitoring sedation and aggression in patients admitted in ICU. A study done by Almgren, Lundmark, & Samuelson (2010) concluded that the RASS had the best reliability and could have more merits associated with its use in the ICU. According to Arevalo et al., (2012), the tool is not complicated for use meaning that it is user friendly and can be done in 30 to 60 seconds. It is also easier to learn since it is put in a logical sequence.

### 2.4. Application of Richmond Agitation Sedation Scale

The RASS lays its emphasis on sedation and agitation among those admitted in the critical care settings. With this, the healthcare giver can determine the level of agitation or alertness present in a patient (Sessler et al., 2002). Mechanically ventilated patients are the biggest beneficiaries of the tool as it ensures healthcare givers avoid over sedating patients. The use of RASS ensures that patient safety is of utmost value especially when it comes to the critically ill.

Compared to other tools such as COMFORT scale, RASS has often proved to have a higher reliability and validity (Sessler et al., 2002). According to the study, the tool had a reliability of 96% when tested among nurses in the critical care setups. In addition, HCWs such as nurses described it as user friendly, logical, and one that matched the

assessment needs for sedated patients. As such, the tool is still relevant to date owing to the rising number of ICU admissions that require constant monitoring.

One way to figure out how much sedation is in the ICU is to use the RASS, which is a good tool for Persian-speaking caregivers because it has a good agreement coefficient. Before, Ely and Sessler had shown that the RASS is both valid and reliable; it also proved that in 2009, when it was used by Iranians.

Many studies have looked at the effects of sedation on mechanical ventilation, the length of time it takes to get off the ventilator, how long it takes to stay in the ICU, how long it takes to stay in the hospital, how often the patient self-extubates and other things. In some cases, it can be easier to control a patient who is agitated if a sedation protocol is used. It can also help reduce pain, raise a patient's level of awareness, and make it easier for the nurse to control the patient. Nurses' performance in the ICU was looked at, and it was found that they don't use sedation monitoring equipment for patients who can't talk, and they don't know much about sedation control guidelines. This could hurt their ability to manage sedation Vasilevskis et al., (2011).

Based on what we know now, it's not clear how using sedatives affects the length of mechanical ventilation, how long it takes to stay in the ICU, and other things. During the last research, there were a lot of mistakes in it. For example, the sedation procedure took only 24 to 48 hours to work, and the evaluation period was only a few days long, so it was quick (e.g. each 4 or 6 hours). Researcher: For the first time we know of, the RASS has been used in an ICU protocol with long periods of monitoring (such as every hour) and short periods of monitoring the sedation state (such as every two hours). Also, it was hoped that nurses could check on the patient's level of sedation every hour for a longer period of time in the ICU, which would help non-drug treatments and cut

down on sedative overdose. Add to the knowledge already out there by extending the protocol's application time (the total length of mechanical breathing), looking at other clinical outcomes, and figuring out how much patients will have to pay for the treatment. Vasilevskis et al., (2011), A few flaws in the previous research will also be addressed at least in part in this new work.

Critical care management and assessments require constant emphasis on tools that lead to better patient outcomes. According to Vasilevskis et al., (2011), it is important to explore beyond sedation and agitation. The authors recommend that investigations are carried out to identify the etiologies of the agitation behavior. However, the scores following assessment of the patient should dictate the next course of action. For example, a client with a score of +2 to +4 on the RASS scale means that the effects of the sedatives are not strong enough as per the dose given and should be reassessed to determine their levels of delirium or even anxiety. With this in mind, treatment goals should then be focused on addressing the etiology and improving patient comfort. According to Robinson, Berube, Barr, Riker, & Gélinas (2013), the practice should be made a routine among the critically ill with emphasis laid on those on ventilation.

### 2.5. Factors influencing application of RASS

#### 2.5.1 Nurse related factors

A few factors impact on the capacity of the nurse to apply or utilize the RASS appropriately. They include experience, skills, knowledge, as well as education levels. It can be argued that nurses play the most critical and fundamental role in assessing the patients in ICU and even making appropriate interventions that go a long way in helping patients to recovery. Therefore, their role in utilizing the RASS tool is arguably the most pivotal in ensuring positive outcomes of its utilization (Salmond &

Echevarria, 2017). As such, any evaluation of the effectiveness of such a practice can only be made through their lenses.

American Association of Critical Care Nurses: 'The American Association of Critical Care Nurses says that the scope of practice in critical care nursing is based on the professional conduct of the nurse, which is a dynamic process that includes the patient, the nurse, and the care environment' (AACCN 2006).

What the nurse knows and how she acts toward a patient are important parts of providing comprehensive therapeutic nursing care, Bradley said (1976). In addition, the author says that these views are a lot of what we think because of how we've been exposed to different things, how we've been educated, and how we've had personal experiences. If you want to see better results, you need to be able to quickly and accurately assess the problem, then quickly and effectively treat it. So that you can find out if the nurse has a lot of knowledge and attitudes about how to care for the seriously ill, and also if there are any other factors that could affect their work, you need to talk to them.

It has become more difficult to give critical patients the care they need because there has been more pressure from outside sources to check the quality and appropriateness of the treatment being given (Ridley,1998). In addition, the more seriously ill the patient gets, the more vulnerable, unstable, and complicated he becomes, which means that he needs a lot of nursing care in order to get the best treatment. Every nurse must be alert and knowledgeable about the principles and standards of care that apply to the care of the acute patient, as well as other things, in order to provide good care. Critical care nursing is a subspecialty of nursing that focuses on how patients react when they are in a situation that could kill them. Those who are critically ill, or "acutely unwell,"

are patients who are very likely to get real or possible life-threatening health problems (Gupta, 2005).

In all health-care companies across the globe, nurses make up the greatest percentage of the workforce. A well-designed and high-quality nursing care program has a significant impact on how long-term customers who seek health-care services suffer as a result of this problem. However, in order for the nurse to give excellent nursing care, she must follow a scientifically proven care delivery strategy. When it comes to dealing with this in a reasonable way, one of the most significant techniques is to make effective and efficient use of the nursing process.

Patients in the intensive care unit (ICU) will be able to get the advanced treatment they need if their current health is looked at. Life-threatening illnesses require a wide range of high-level therapies that aren't known about at the time of admission to the ICU, but the effects of these therapies are unknown at the time. When nurses are providing intensive care, they pay close attention to the patient and act when necessary. They also keep the patient and his or her family clean and healthy, and they help the patient and his or her family deal with their emotions and stress (Salmond & Echevarria, 2017).

Most of the time, nurses need to be well-trained in order to do clinical treatments on patients who are very sick. Professional nursing care is also needed to make sure that the procedures and therapies that are done on the patients are safe and effective. Constant bedside monitoring is needed to keep an eye on things and spot problems as soon as possible, so they can be taken care of as soon as possible. Most patients on mechanical ventilation need to be given analgesia and sedation in order to be able to breathe through their tracheal tubes and get other treatment. The amount of sedation that is needed may be different based on the patient's condition and the severity of their

disease. It may also change quickly. There is a chance that not enough sedation and analgesia could cause the tube to become intolerant or move, and that too much sedation and analgesia could have a negative effect on blood pressure and other body functions. It's more likely for patients who have a lot of lung or airway damage to die from accidentally moving their tracheal tubes. Even if they have the right skills and equipment, it can be hard to re-insert them. Dislodged tracheal tubes are a very serious medical problem that needs to be taken care of as soon as possible when they are found (Salmond & Echevarria, 2017).

Basic procedures, in addition to the more complicated treatment and monitoring requirements, are needed to make sure the patient is clean and nourished, as well as to avoid pressure-related damage. They can be much more difficult to do in patients who are sedated, unconscious, or have their organs supported. This is because these procedures are more difficult to do in patients who are these types of patients. It is very important to pay attention to every little thing and to move patients often so that they don't get tissue pressure damage. The movement of tubes or other medical equipment as a result of mistakes made when rotating or positioning patients who don't understand what they're doing could be very bad for the patients who use them. Because the unintentional move of any critical support equipment could put the lives of seriously ill patients at risk, a lack of adequate nursing care is even more of a worry. It is very important to avoid problems that can be avoided because even the sickest patients have a good chance of living. Needleman and Hassmiller (2009),

There are many patients who are stable and get treatment in regular intensive care units. Even if their health seems to be getting better quickly, bad nursing care could have a very bad effect on them. During the patient's stay in the hospital, the nurse in the ICU is in charge of making sure the patient is healthy and safe, as well as giving important

emotional and psychological support to the patient and his or her family. Patients who are in the intensive care unit (ICU) may have long-term psychological problems, which could have a big impact on how well they can get better. Nursing care that is skilled and caring can help right away and keep going, which could help lessen the severity of these problems. ICU nurses can help in many different ways. Helping other nurses become better nurses and supporting other specialized services like specialty wards, high-dependency units, theater recovery, and critical care outreach all make a big difference in how patients feel. More advanced skills that have been learned through years of intensive care nursing play a big role in the important procedures that drive the care of very sick or complex patients, whether they are done in the intensive care unit or in the outpatient clinic Needleman and Hassmiller (2009).

According to the findings of a hospital-based research study conducted in Nigeria, the primary reasons for the slow adoption of the nursing process were a scarcity of qualified nurses, a lack of incentive to use the nursing process, and a lack of available time for nurses to practice. A study conducted at health-care institutions in Ogbomoso town (South West Nigeria) to examine the factors that influence the adoption of nursing practices came up with findings that were comparable to those found in the previous study. The goal of the study was to investigate the elements that influence the use of nursing approaches. Following analysis of the data, it was discovered that institutional characteristics had a significant influence on the adoption of the nursing process, with the nursing process having a predictive value of 0.220. (Shewangizaw & Mersha 2015).

#### 2.5.1.1 Education and training

When it comes to providing care, the nature of the work requires that a nurse remain in continuous contact with the patient. In this situation, nurses in the critical care unit (CCU) have the highest possibility of determining the usefulness of the RASS tool

while providing care for their patients. According to Needleman and Hassmiller (2009), training and education are the foundations upon which the health system is built. Pande, Kolekar, and Vidyapeeth (2013) make a similar remark, stating that particular training is necessary in order to provide the anticipated level of care as specified by the department. It has been shown that nurses in intensive care units with high levels of knowledge in the usage of the instrument have a larger likelihood of providing optimum care than nurses with low levels of knowledge in the utilization of the tool.

A continuous monitoring system for critically sick patients who are at risk of dying or who are in a life-threatening condition is the duty of the intensive care unit (ICU). Critically sick individuals are typically the victims of automotive accidents or other violent acts, such as burns, drowning, or falling, or they are patients suffering from a range of medical diseases, such as myocardial infarctions, congestive heart failure, or cerebral vascular accidents. R. Bala, S. Kaur, and L.N. Yaddanapudi are three researchers who have worked together on a research project in the recent past (2010). As a result, it is vital to stabilize critically ill patients by providing them with the most effective, quick, and professional treatment possible. This is especially true given that the more critically ill a patient is, the more likely it is that their life may be endangered or placed at risk. Members of the faculty, include Taylor Baker and Elena Lugazia, as well as their colleagues (2013) Care for critically ill patients must thus be properly planned and managed at all times, as a result of the above. Because nurses should be able to aid patients in coping with stress, discomfort, and anxiety while in the critical care unit, patient care should be of the highest quality. Their ability to support family members who are frightened of losing a loved one should transfer into good patient care as a result of their training.

Medical specialties such as intensive care units (ICUs) and cardiac catheterization laboratories (CCUs) often see patients that need highly specialized treatment and care. The role of education in this circumstance is critical in ensuring that nurses use the most up-to-date procedures that may help change the tide of the issue. For example, successful sedation and evaluation need the training of the nurse in the necessary skills with the goal of instilling the best practices. In accordance with Hetland, Guttormson, Tracy, and Chlan (2018), nursing staff are always in need of training in important areas that improve patient safety, such as the implementation of RASS. Nurses working in the two units have a better likelihood of causing sedation in a professional manner if they get proper training, compared to other healthcare workers working in the facilities. According to Kydonaki, Hanley, Huby, Antonelli, and Walsh (2019), educational gaps among nurses make it difficult for them to successfully manage patients who are under the influence of medication. The authors also note that because of the inadequacies, fewer patients are taking use of evaluation tools and associated medications. As a result, it is critical that healthcare institutions place a high premium on empowering nurses via ongoing education in a variety of areas of interest. Barr et al. (2013) also urge that interventions in education be used as a way to improve the delivery of services to the public.

#### 2.5.1.2 Skills and Knowledge

Skills and knowledge are fundamental ingredients to managing the critically ill patients. No practice of both invasive and non-invasive procedures can happen without theoretical and practical know-how. According to Varndell, Elliott, & Fry (2015), the capacity to apply and integrate the different components involved in caring for the critically ill including the use of RASS tool requires the nurses to understand comprehensive approaches and rationales for every intervention made. More

importantly, specialized skills and knowledge are fundamental to guaranteeing the safety and well-being of the critically ill especially those undergoing sedation.

In the critical care unit, the effectiveness and safety of medicines administered are significantly relied on the skill and experience of the healthcare professionals who provide the prescriptions. In accordance with Varndell and colleagues (2015), the knowledge and skills levels of the caregivers are related with the outcomes, which in turn have an influence on their decision-making capacity. The need for CCU nurses to get and maintain the highest level of training becomes more important as they gain the expertise and talents essential to work successfully in these settings. However, according to Tan et al. (2019), formal training falls short when it comes to giving the required knowledge to make correct sedation evaluations and choices in patients. The upshot of this is that regular encounters, both inside and outside of the workplace, are encouraged in order to enhance the acquisition of skills that are necessary to provide sedative assistance to clients in need of sedation.

In the opinion of specialists such as Phillips (2015), more emphasis should be made on the delivery of evidence-based treatments that are primarily concerned with patient safety. As with all other nurses, critical care unit nurses advocate on behalf of their patients throughout the course of therapy and the delivery of various types of care. In order to protect their patients at all costs, CCU nurses should use every effort within their area of practice to do all within their power to do so. Client-beneficial interventions should be encouraged, whilst interventions that are damaging to the client should be avoided. If you have the necessary knowledge and ability, you can do any of these things.

CCU nurses are also assigned with the job of conducting certain procedures on the ward while in the CCU setting. The insertion of different catheters, endotracheal intubation, and the maintenance of central venous lines are among the operations performed. Nurses often experience delays in the delivery of interventions, according to Curtis, Fry, Shaban, and Considine (2017). This is worsened by a lack of adequate competencies to perform the actions in issue, as described above. A nurse's role in the delivery of care in the intensive care unit is equally critical, especially for physicians who work in close collaboration with them in this setting. Because of their collaborative efforts in monitoring and assessment, the nursing staff on the unit is a highly skilled group of experts in the delivery of care (Graham, 2009). According to Hughes, McGrane, and Pandharipande (2012), a nurse's role at a patient's bedside is to determine whether or not sedation is sufficient for the patient's comfort. In order to get better outcomes, it is critical that this assessment be carried out correctly. It follows that getting an acceptable amount of sedation becomes important to the performance of a critical care unit nurse's responsibilities. In contrast, it is critical to underline that the major reason for sedation in the CCU is to alleviate agitation in patients, especially those who need specialist care in the CCU. Inadequate compliance is often followed by negative occurrences and difficulties (Aitken, Marshall, Elliott, & McKinley, 2009). The need for regular assessments with the purpose of finding the most effective therapy for the patient arises in such circumstances. In addition, depending on the patient's overall health, the approach may aid in determining whether or not more sedation is required for the patient. Fan, Guo, Li, and Zhu (2012). Nurses in critical care units (CCUs) must maintain high levels of alertness, professionalism, and patience during their shifts in order to offer high-quality care to patients. When dealing with certain symptoms such as anxiety, nurses working in intensive care units are frequently faced

with a difficult decision, as reported by Yousefi et al. (2017). This is due to the fact that the continued administration of certain medications used in each instance may endanger the patient's safety. A high degree of competence and knowledge are thus necessary in order to take meaningful action as a consequence of this situation.

An investigation by Rasheed et al., (2018) found that excessive use of sedatives among the critically ill was also linked to prolonged stay in the ventilators coupled with prolonged hospitalization. In addition, there is increased morbidity and associated mortality especially where self-extubation happens. This revelation calls for nurses to do their best to apply sedation scales and monitor patient reactions as titration of the medications is done as per the patient needs to improve on recovery and minimize the occurrence of other undesired outcomes. In this regard, the main duty of healthcare facilities is to ensure that critical units such as ICUs have qualified personnel, equipment and policies in place to safeguard the interest of the client who gets admitted in such units. As far as sedation is concerned, institutions should endeavor to make sure that nurses are conversant with the RASS to facilitate the work done in the unit

### 2.5.2 Institutional factors

Healthcare institutions have a primary goal of upholding the highest standards of acre available. In doing so, they should make sure that their policies supporting practices in critical settings such as ICU are implemented following the best practices available. In addition, the equipment provided in such critical settings should be efficient enough to promote service delivery.

#### 2.5.2.1 Policies on sedation

Bassett et al., (2015) argues that policies are central to change implementation in a given area. In most cases, it calls for courage, and proficient leadership with priority in care accorded as well as comprehension of clinical evidence. In this case, procedures,

policies or even guidelines that support sedation application often contribute to compliance to quality standards that mean the best for the client. Talsi et al., (2019), recommends that healthcare facilities agree on the best sedation tool to utilize as there are no universal guidelines on this area of practice.

Tan et al. (2019) discovered that patient improvement in the critical care unit and other settings may be attributed to the use of assessment and intervention scales, such as those used in the treatment of agitation. Although sedation guidelines have been established in some countries, they have not been implemented universally since most healthcare facilities prefer to employ a technique of assessment and action that has been agreed upon by the institution. Patients' results may be greatly improved despite this if a more comprehensive strategy is adopted to addressing the issue in general. It is also recommended that healthcare facilities employ consistent standards, such as those set out by the Joint Commission International (JCI), in order to make the delivery of high-quality, standardized care easier for everyone concerned (Kweon, 2011). Policies that have an impact on the use of anesthetic and sedative treatments, as a consequence, must be united in order to obtain better patient outcomes. For healthcare organizations dealing with the critically ill patient population, well defined sedation goals, activities, and procedures may be vital. The availability of process manuals that are adapted to the needs of the company, in addition, may have a substantial influence on the practice of healthcare professionals who are involved in the procedures. Because of the clearly defined structure, both the nurses who do the assessments and the physicians with whom they cooperate should find the process easier and more understood. A more critical objective is to ensure that sedation goals are consistent across the board, with a high probability of attaining outstanding patient outcomes as a consequence of doing so.

According to a study conducted by the World Health Organization (2018), the presence of proper equipment or tools in healthcare facilities may result in a dependable and efficient system capable of meeting the demands of patients in intensive care units. The quality of the instruments used, on the other hand, is a critical factor to consider while doing research. Nonetheless, in underdeveloped nations, proper equipment, particularly in intensive care units (ICUs), may prove to be a challenging task to achieve. The utilization of checklists and other items such as sedation scales becomes paramount to management of clients in CCUs.

#### 2.5.2.2 Staffing in Critical Care units.

It is the primary duty of the nurses operating in CCUs to offer the best care that enhances the efficiency and safety of service delivery. Monitoring of machines to assess the progress on individual clients thus becomes unavoidable in such settings. The critically ill rely heavily on decisions made by qualified staff such as nurses licensed to deliver services in the critical areas. Therefore, staffing becomes a crucial element in healthcare institutions providing services in critical are.

On the other hand, gaps in patient care such as missed assessments or unavailability of staff at a given timeframe could compromise the safety of the patient in ICU. According to Sneyers et al., (2014), the gaps usually exist where there is inadequate staffing or where lack of monitoring tools is evident. However, in cases where the staff are adequate, compliance with the assessment tools, guidelines, and procedures provides consistency in care delivered. In addition, training is an important concept for the staff involved as it ensures proper use and interpretation of different tools used in

the unit. Thus, it can be argued that institutions play a vital role in staffing that guarantees continuity of quality care in CCU.

### 2.6 Summary of Literature

Analysis of the above literature reveals the existing gap on the interplay between nurse linked factors and healthcare associated factors. Furthermore, the application of the tool in the settings also proves to be a major challenge since there is no universal approach to its utilization. In general, the nurse-associated factors are identified as age, education, gender, experience, and knowledge, while institutional-linked factors discussed are procedures, policies, audits and resources.

# CHAPTER THREE
# RESEARCH METHODOLOGY

## 3.1 Introduction

This section introduces the research methodology used in accomplishing the objectives of this study. It incorporates the research design, study area, populace, exclusion and inclusion criteria, data compilation methods as well as assumptions made in the study.

## 3.2 Research Design

Research design is a fundamental part of research work which clearly outlines the approach the study will take towards the realization of the objectives. Akhtar (2016) describes it as techniques employed in a study to assist in logical handling of an investigation. The study adopted descriptive cross-sectional study to help in the achievement of the task at AKUH, Nairobi County. The design is fundamental to this study as it helps assess the study participants at one point in time. It also allows the description of the subjects without interfering with their norm or nature. In research, valuable details concerning the respondents can be obtained through this method.

## 3.3 Study Area/Location

The focus of the study is on AKUH which is located along Limuru road on the third parklands avenue in Nairobi County. It can be found about 5 kilometers from the town center. Key emphasis was on the ICU settings of the hospital. It is a levels 6B tertiary private facility with a capacity of 280 beds with a bed occupancy of between 90-95%. The total nurses targeted in this case are 106 nurses. Some of the services offered include diagnostic, curative, preventive, promotive, and rehabilitative as well as in patient services. Specifically, the CCU units were the center of focus in this study can be found at the Heart and Cancer Center (HCC) at the hospital. The hospital's

catchment areas include both local and international with clients from countries such as USA, UK among others visiting Kenya being treated at AKUH.

### 3.4 Study Population

Nurses working in the CCUs comprised the study population. They include 106 nurses from HDU, ICU, CTICU, and CCU (Coronary Care Unit). This is primarily due to the fact that the departments are charged with handling the critically ill during their hospital stay. Therefore, their familiarity with the RASS tool can be considered the best compared to other nurses in other departments.

### 3.5 Eligibility criteria

#### 3.5.1 Inclusion Criteria

All permanent nurses who have worked for more than three months in HDU, ICU, CTICU, and CCU (Coronary Care Unit) at the AKUH, Nairobi.

#### 3.5.2 Exclusion Criteria

The study did not take into account nurses who are not permanent employees of AKUH and nurses who have worked for less than three months in the units.

### 3.6 Study Variables

#### 3.6.1 Independent variables

1. Nurse-related Factors

These involved elements/factors that impact the nurses' capacity to deliver quality care through application of the RASS tool. They include gender, age, education, knowledge, and experience.

2. Institutional related factors

These are comprised of elements within the healthcare facilities that impact on the use of RASS as a tool in sedation assessment. They include policies, resources, and periodic audits of the application and utilization of such tools.

### 3.6.2 Dependent variables

These refers to the outcome variable of the study which is the application of RASS tool. It is termed so as its extent of application depends heavily on the input variables or independent variables.

### 3.7 Sample Size Determination

AKUH has a total of 106 registered nurses serving in the CCUs targeted in this study. The sample size was achieved through Yamane's formula as illustrated by Mugenda & Mugenda (2003) as follows:

$$\boldsymbol{n = \frac{N}{1 + N * (e)^2}}$$

Where:

N = Total population (106) for population less than 10000.

e = Margin of error which is ±5%

n = sample size

1 is the standard coefficient

Therefore;

$n = \frac{106}{1+106(0.05*0.05)}$ $\quad n = \frac{106}{1+0.265}$

$$n = \frac{106}{1.265}$$

$$n = \mathbf{81}$$

The actual numbers was incorporate an additional 10% to cover non-response

Where n+10%(n) that is 81+10%(84)

Thus,84+8 = **92**Therefore, the sample size was 92 **Nurses**

### 3.8 Sampling Method

The investigation utilized stratified proportionate random sampling. This is to ensure a representative population that eliminates the errors of precision that could exist in such circumstances. The units (ICU, HDU, CTICU and CCU) were taken as strata from which the sample size was obtained. According to Setia (2016), the method is often associated with a higher precision level and the second characteristic is to take a proportionate sample calculated by taking a percentage of the sample size with respect to the entire population as illustrated below

(92/106)*100 = **86.79%** This means that a proportion of 86.79% of the nurses per department were taken as a representative sample.

The target numbers per each strata were then be obtained by simple random sampling among those who consented to take part in the study. Below is a proportionate sampling calculation.

**Table 1: Proportionate Sampling Frame**

| **Strata** | **Total Nurses(N)** | **Sample (86.79% of N)** |
|---|---|---|
| ICU | 42 | 36 |
| CTICU | 9 | 8 |
| CCU | 22 | 19 |
| HDU | 33 | 29 |
| Total | **106** | **92** |

### 3.9 Data collection methods and tools

The study utilized self-administered questionnaire along with an observational table (checklist). The tools were essential in obtaining information regarding nurse-linked elements as well as hospital associated factors and the application of RASS. In addition, the questionnaire was subdivided into sections to help gather data on demographic data, application of RASS tool, factors associated with the nurse, and factors within the healthcare facility (AKUH) that impede its utilization. This helped answer the questions posed in this study when the data is analyzed.

### 3.10 Validity and Reliability

Validity is described by Grove, Gray, and Burns (2015) as a determinant of accuracy or truth of a claim.

#### 3.10.1Validity

Validity is an essential component of any research study. In quantitative studies, the concept especially fundamental as it infers to the accuracy of measurement of the concepts under review. Validity in content it often applies to the tool used in the investigation and its capacity to address the variables highlighted in the study (Grove, Gray,& Burns, 2015).The capacity to make inferences as far as test scores are concerned is what is termed as construct validity. In this case, the conceptual framework was used as a benchmark to assess whether the questionnaire addresses them effectively. A pretest involving ICU nurses at Kenyatta National Hospital was conducted. 9 nurses were used as a representative of 10% of the populace of interest to test the questionnaire and help the investigator assess the accuracy of the tool and other challenges that may impact on generalizability of the outcomes.

#### 3.10.2 Reliability

Reliability also forms a crucial component in quantitative studies. According to Heale and Twycross (2015), the term can be used to refer to consistency of the results or

measure of determination. The capacity to duplicate the outcome even if the tool is completed at different times is what matters most in this case. Therefore, it is important that subjects with similar characteristics are used prior to the main study. In this study the researcher used a Cronbach alpha to test reliability of the tool. A Cronbach alpha value of 0.7 was considered appropriate.

### 3.11 Data Management and Analysis

#### 3.11.1 Data Cleaning

The introductory approach assessed data attained via the self-administered questionnaires for plenitude/completeness. Manual sorting and cleaning was utilized whereby the researcher sought to establish wholeness in the data obtained. Nevertheless, the researcher followed up on the respondents to ensure no errors of incompleteness that may alter the significance of the outcome. Data coding and entry was achieved with the help of Epi info data version 3.2. Data obtained was stored in a password protected computer and questionnaires kept in a safe for future reference or use.

#### 3.11.2 Data Analysis and Interpretation

Descriptive statistics played a major role in analyzing the data to make meaningful statistics. Further interpretation of findings was done by working out the percentages, frequencies, mean, as well as standard deviations. This was done with the aid of SPSS version 25. Presentation of the analyzed data was accomplished through tables, graphs and pie charts.

A chi-square test analysis was done to help establish and make inferences between variables. This was crucial in testing relationships between variables or relationships stated in the hypothesis.

### 3.12 Ethical considerations

Mount Kenya University's Institutional Research Board and the Aga Khan University Hospital's Ethics Committee were both requested for approval to perform the research. For further permission, the National Commission for Science, Technology, and Innovation was called (NACOSTI). This was done to ensure that the study followed the recommendations offered by each department that took part in the study.

In order to participate in the study, the respondents were requested to give informed consent. The nature of the research, as well as the expectations of individuals who took part, were expressed explicitly in the report. A checkmark was affixed to the signature to indicate that permission had been provided in its entirety. The respondents were not compelled to meet the requirements under any circumstances. Furthermore, no harm was done to the participants at any point throughout the trial. To preserve the subjects' identity, a high degree of anonymity and confidentiality was maintained. Data security was secured at all levels to protect the subjects from unwanted third parties.

### 3.13 Assumptions

The first assumption made in this study is that RASS is applied in all the CCU of the AKUH in its quest to monitor patients' conditions in the departments. This is primarily due to the fact that there is no internationally accepted sedation monitoring tool. The existence of other monitoring tools could also be a factor to consider. Hence, the study operated on the assumption of its existence.

Secondly, the study operated on the assumption that nurses working in the AKUH CCU departments have the knowledge on the application of RASS monitoring and assessment tool.

### 3.14 Outcome Dissemination Plan

The outcomes of the investigation will first be shared with the Nursing department and Mount Kenya University's School of Postgraduate studies. Following their acceptance, the outcomes will also be issued for publication in a journal for accessibility by the world of researchers. On the other hand, the outcomes will also be shared with the AKUH to facilitate action plans that will lead to better application of the RASS. Furthermore, the outcomes will also be shared in conferences and Continuous Medical Education (CMEs)

# CHAPTER FOUR
# RESULTS AND DISCUSSION

## 4.1 Introduction

In this chapter, results of the study are presented starting with the response rate, general socio-demographic characteristics of the respondents, the level of RASS application, the nurse-related factors that influenced application of RASS and the institutional factors that influenced RASS application level. Chi squared tests have been used to test the relationships between the variables of the study.

## 4.2 Response rate

A total of 92 questionnaires were distributed to the respondents, whereby every respondent filled them, but after scrutiny, 3 questionnaires did not meet the threshold for analysis. Therefore, the adjusted response rate was of 97%. This was commendable given the fact that Mugenda (2003) argues that, at least 50% response rate is adequate to do statistical analysis of data.

## 4.3 Socio-demographic characteristics of the respondents

The socio-demographic characteristics assessed included ages of the respondents, gender, marital statuses, level of education, and subsection within the CCU where one worked and the number of years worked in the respective CCU subsection.

### 4.3.1 Ages of the respondents

Most (51.7%) of the respondents were aged between 31-40 years while only 2.2% were aged above 50 years.

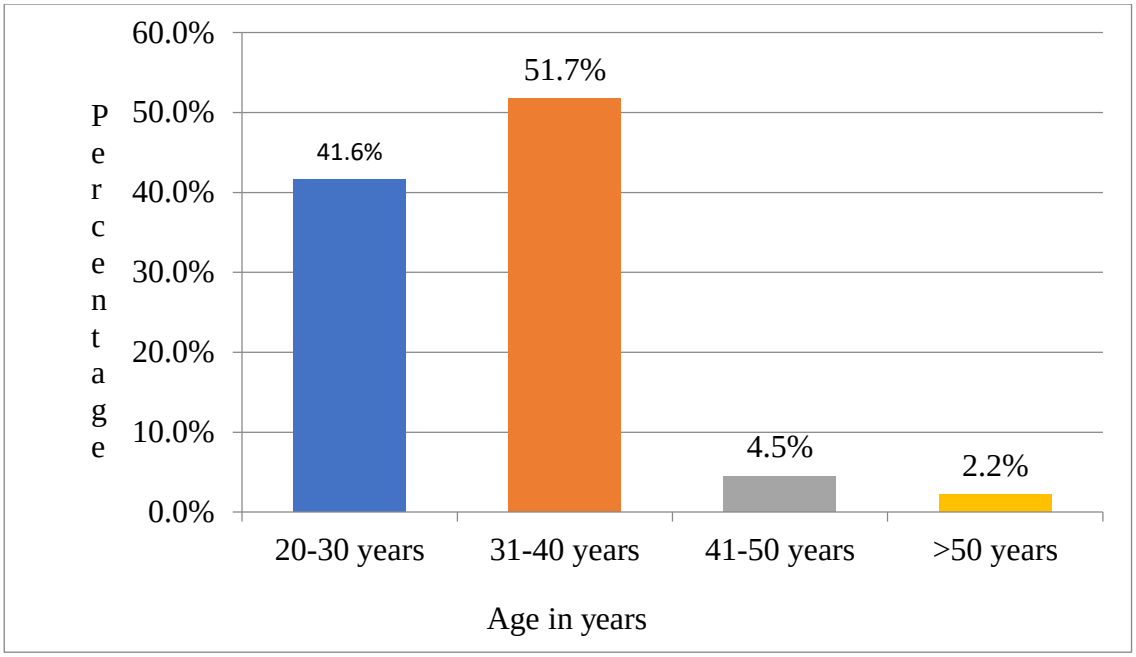


**Figure 2: Ages of the respondents**

### 4.3.2 Gender of the respondents

Majority of the respondents (69.7%) were females while 30.3% were males. This pattern was expected, because the overall enrollment of female students in nursing schools, is higher than that of their male counterparts.

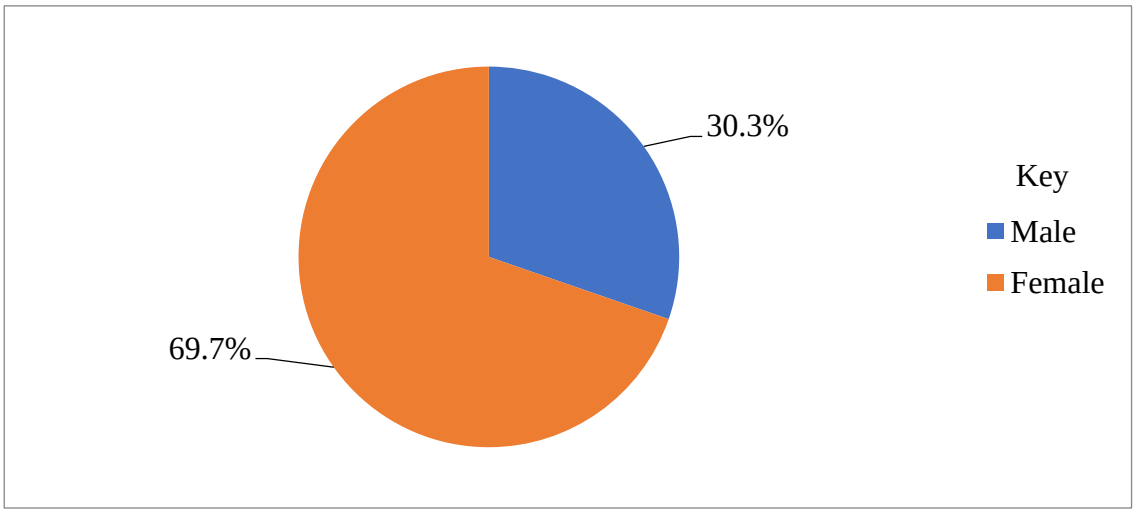


**Figure 3: Gender of the respondents**

### 4.3.3 Marital statuses of the respondents

Majority of the respondents (67.4%) were married while minority were either separated or divorced, representing 2.2%.

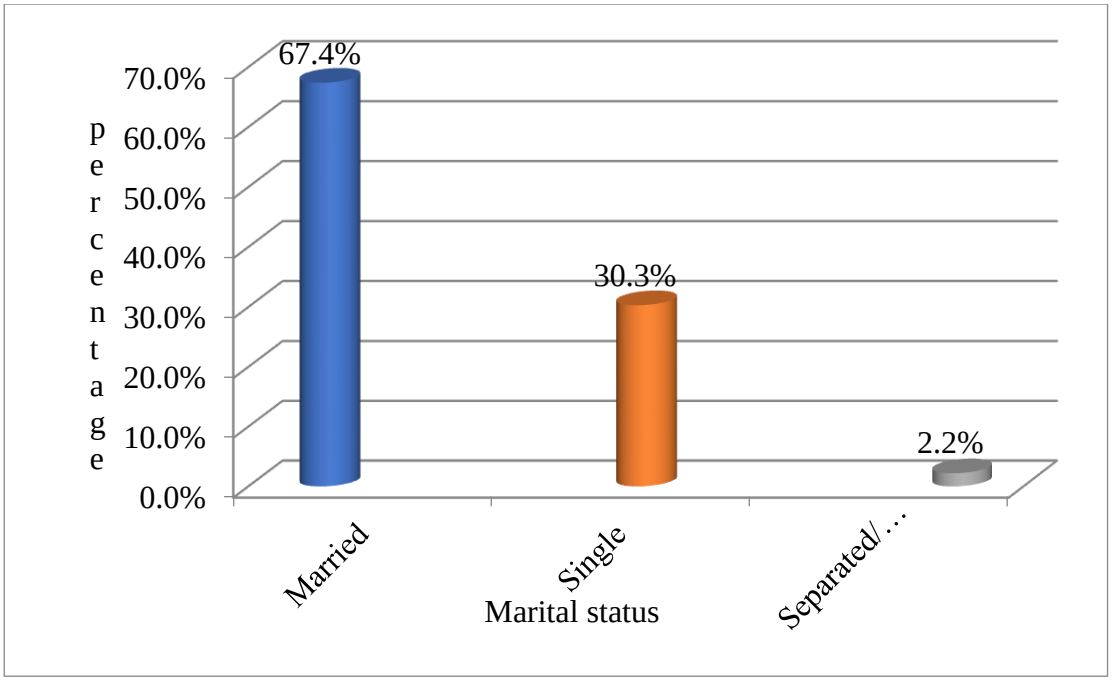


**Figure 4: Marital statuses of the respondents**

### 4.3.4 Level of education of the respondents

A good number of the respondents (61.8%) had attained college education, while 9% had post graduate education level.

**Table 2: Education levels of the respondents**

| Level | Frequency (n) | Percent (%) |
|---|---|---|
| College | 55 | 61.8 |
| Undergraduate | 26 | 29.2 |
| Postgraduate | 8 | 9.0 |
| **Total** | **89** | **100.0** |

### 4.3.5 Subsection of critical care unit where respondents worked

Most of the respondents (39.3%) were working in the ICU, and the least number of participants came from the CTICU, which represented 9%.

**Table 3: Subsection of critical care unit where respondents worked**

| Subsection worked | Frequency (n) | Percent (%) |
|---|---|---|
| Intensive care unit (ICU) | 35 | 39.3 |
| Cardiothoracic intensive care unit (CTICU) | 8 | 9.0 |
| Coronary care unit (CCU) | 18 | 20.2 |
| High dependency unit (HDU) | 28 | 31.5 |
| **Total** | **89** | **100.0** |

### 4.3.6 Number of years worked in the respective critical care unit subsections

Most of the respondents (43.8%) had worked for 3 and 5 years, while 7% had worked for more than 10 years.

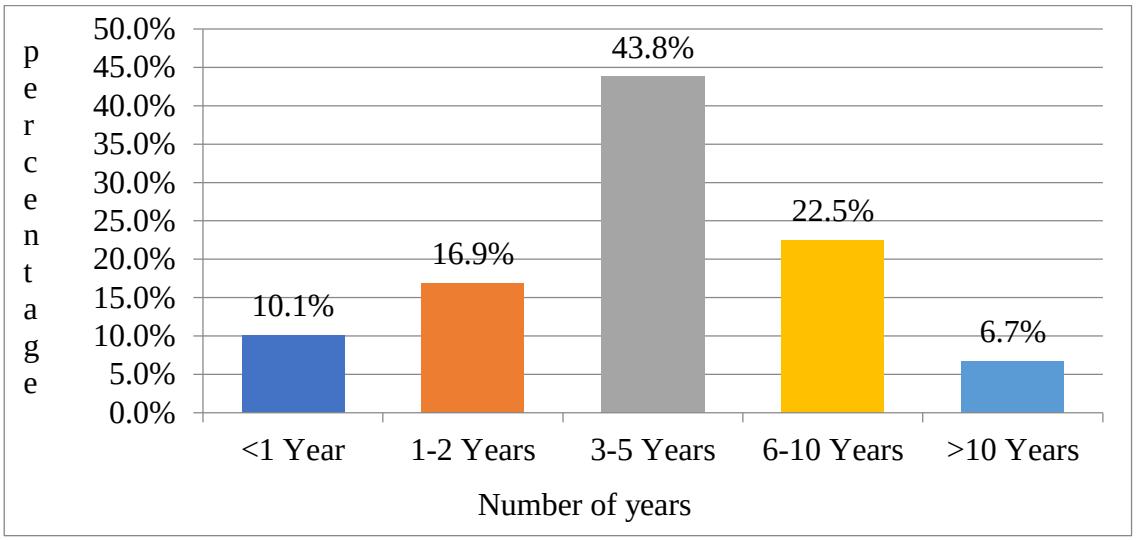


**Figure 5: Number of years worked in critical care unit**

### 4.4 Level of application of the RASS

The level of RASS application was assessed using the reported practice by the respondents, in conjunction with the corresponding observed practice. The two methods constituted a seven-point scale, which was used to rate the application level. The first two items in the scale were on reported practice while the rest were from the observed

practice. Item one was whether the respondents had ever utilized RASS, item two was the frequency of RASS utilization, item three was observing if patient was alert, agitated or restless, item four was if the nurse called out the patient by name and told them to open the eyes if not alert, item five was observing if the patient maintained eye contact and eye opening in reaction to voice, item six was physical stimulation of the patient by shaking shoulder and/or rubbing sternum when the patient did not respond to verbal stimulation, and lastly item seven was observing if the patient had any movement to physical stimulation or not.

**Table 4: RASS application**

| Application item | Frequency (n) | Percentage(%) |
|---|---|---|
| RASS utilization | | |
| Yes | 77 | 86.5 |
| No | 12 | 13.5 |
| RASS utilization frequency | | |
| Always | 37 | 41.6 |
| Not always | 52 | 58.4 |
| Observing if patient was alert, agitated or restless | 89 | 100 |
| Done | 0 | 0 |
| Not done | | |
| Calling out the patient by name if not alert | | |
| Done | 89 | 100 |
| Not done | 0 | 0 |
| Observing if patient opened eyes to voice | | |
| Done | 75 | 84.3 |
| Not done | 14 | 15.7 |
| Stimulation of the patient by shaking shoulder | 88 | 98.9 |
| Done | 1 | 1.1 |
| Not done | | |
| Observing for movement to physical stimulation | 78 | 87.6 |
| Done | 11 | 12.4 |
| Not done | | |
| | Mean | 85.6 ±16 |

Table 4 shows that respondents generally scored highly in the application of RASS, with a mean application score of 85.6% and a standard deviation of 16. These findings were congruent with those of Sessler et al., (2002), in whose study, nurses reported that RASS was user friendly, logical and matched the sedation needs of individual patients.

Application level was assessed based on the seven items above, whereby, those who practiced at least 6 items were considered as having high RASS application while those who practiced less than six items were considered as having low RASS application level. The RASS application level was the dependent variable in this study, and all other independent variables were cross-tabulated against it, in order to test for significance of associations.

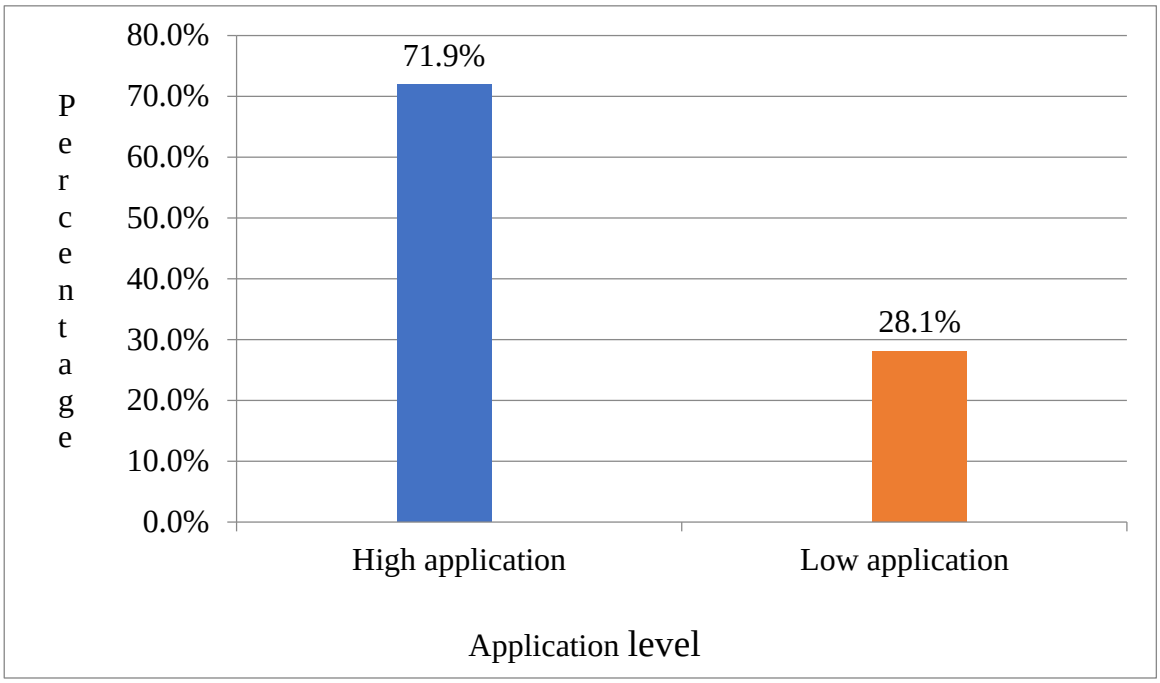


**Figure 6: RASS application level**

Figure 5 shows that majority of the respondents (71.9%, n=64) had high application of RASS while 28.1% (n=25) had low RASS application.

### 4.5 Nurse-related factors and application of RASS

The nurse related factors of interest included training and knowledge of RASS.

#### 4.5.1 Specific critical care courses done

The study revealed that majority of the respondents (53.9%, n=48) had not attended any critical care course while working at the hospital, while 46.1% (n=41) had attended at least one critical care course. Table 3 summarizes the critical care courses attended

**Table 5: Critical care courses attended**

| Course attended | Frequency(n) | Percent(%) |
|---|---|---|
| ACLS | 24 | 27.0 |
| Sedation | 2 | 2.2 |
| Renal replacement & ACLS | 1 | 1.1 |
| Africa Critical Care Chapter 2018 | 1 | 1.1 |
| ACLS & BLS | 1 | 1.1 |
| Basic | 3 | 3.4 |
| Intubation | 1 | 1.1 |
| Critical care nursing inhouse | 2 | 2.2 |
| Pediatric advanced life support | 1 | 1.1 |
| Pain management in critically ill | 1 | 1.1 |
| Critical care orientation | 2 | 2.2 |
| Infection control in ICU | 2 | 2.2 |
| Total | 89 | 100.0 |

Attendance of critical care course was significantly associated with application of RASS, whereby out of 41 respondents who attended a critical care course, 34 (82.9%) had high RASS application compared to 30 out of 48 (62.5%) among those who had not attended any critical care course. This finding agreed with Pande, Kolekar, & Vidyapeeth (2013) who stated that, for one to deliver the anticipated level of care as per the department, special training was required.

Similarly, according to Kydonaki, Hanley, Huby, Antonelli, & Walsh (2019), educational gaps among nurses made it difficult to effectively manage patients on sedation. The authors also acknowledged that the training gaps led to low utilization of assessment tools and related drugs.

Moreover, the findings of this current study revealed that, those participants who had attended a critical care course were found to be 2.9 times more likely to have high RASS application level (OR=2.904, CI=1.07-7.93). These results were statistically significant at p=<0.05 as demonstrated in table 4 below

**Table 6: Association between training in any critical care course and RASS application**

| Variable | Category | Application of RASS | | Total |
|---|---|---|---|---|
| | | High | Low | |
| Have you attended any critical care training while working at the hospital? | Yes | 34 | 7 | 41 |
| | No | 30 | 18 | 48 |
| **Total** | | **64** | **25** | **89** |

$X^2(1,N=89)=4.568$, p=0.033

### 4.5.2 Nurses' knowledge of RASS

The participants' knowledge of RASS was tested using three items, and the results are summarized in table 5 below

**Table 7: Knowledge of nurses on RASS**

| Knowledge item | Frequency (n) | Percentage (%) |
|---|---|---|
| What is the criteria for using RASS? | | |
| Correct response | 72 | 80.9 |
| Incorrect response | 17 | 19.1 |
| The 10-point scale in Richmond agitation-sedation scale represents? | | |
| Correct response | 57 | 64 |
| Incorrect response | 32 | 36 |
| How often should the RASS be used? | | |
| Correct response | 57 | 64 |
| Incorrect response | 32 | 36 |
| | **Mean score** | **69.7%±30.8** |

The knowledge mean score based on the three items was 69.7% with a standard deviation of 30.8. RASS knowledge level was categorized into two whereby, those who responded correctly to all the three items were considered as having high knowledge level, while those who responded correctly to two items and below, were considered as having high knowledge level.

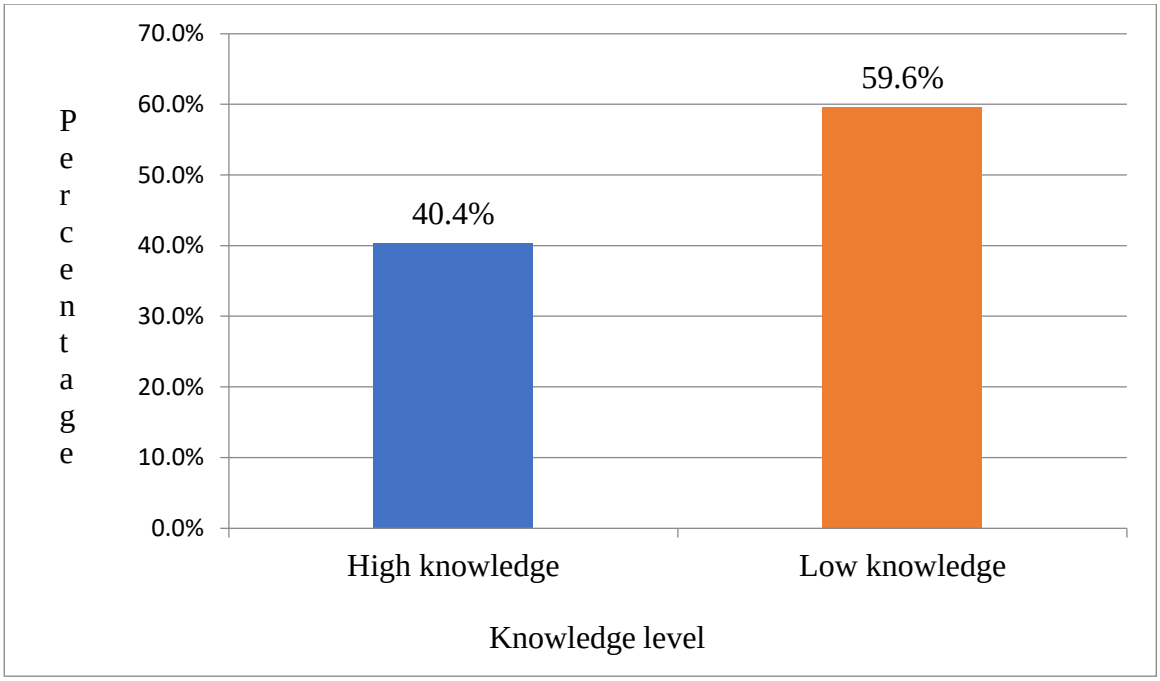


**Figure 7: Nurses knowledge level of RASS**

Figure 7 shows that majority (59.6%, n=53) had low knowledge level while 40.4% (n=36) had high knowledge level. Knowledge level was significantly associated with RASS application whereby, 86.1% (n=31) of participants who had high knowledge level also had high RASS application level compared to 62.3% (n=33) of those with low knowledge level.

This finding was congruent with other research done in the same field of critical care nursing. For instance, according to Varndell, Elliott, & Fry (2015), the capacity to apply and integrate the different components involved in caring for the critically ill including the use of RASS tool, requires the nurses to understand comprehensive approaches and rationales for every intervention made and to have specialized skills and knowledge.

The findings of the current study further revealed that, those with high knowledge level were 3.8 times more likely to have high RASS application (OR=3.758, CI=1.256-

11.241). These findings were statistically significant at p=<0.05, as demonstrated in table 6 below

**Table 8: Association between knowledge and RASS application**

| Variable | Category | Application of RASS | | Total |
|---|---|---|---|---|
| | | High | Low | |
| RASS knowledge level of the participants | High | 31 | 5 | 36 |
| | Low | 33 | 20 | 53 |
| Total | | 64 | 25 | 89 |

$X^2(1,N=89)=6.036$, p=0.014

The associations between nurse related factors and the application of RASS are summarized in table 9 below

Table 9: Association between nurse related factors and application of RASS

| Factors | | RASS Application Level | | | | Statistics |
|---|---|---|---|---|---|---|
| | | High | | Low | | |
| | | n | % | n | % | |
| Training in any critical care course | Yes | 34 | 82.9% | 7 | 17.1% | $\chi^2$ =4.568 ,df=1, p=0.033* OR=1.33, CI=1.024-1.720 |
| | No | 30 | 62.5% | 18 | 37.5% | |
| Knowledge level on RASS | High | 31 | 86.1% | 5 | 13.9% | $\chi^2$ =6.036 ,df=1, p=0.0.014* OR=1.38, CI=1.080-1.771 |
| | Low | 33 | 62.3% | 20 | 37.7% | |

* Association was significant at 95% confidence level

**4.6 Institutional factors and application of RASS**

The institutional factors of interest included policies that addressed sedation and agitation among patients, development of sedation guidelines to guide nurse

performance, provision of training programs on sedation, availability of Richmond agitation-sedation scale charts in the CCUs, and conduction of audits on the application of RASS. The association between institutional factors and application of RASS is summarized in table 7, after analysis of the individual factors below.

### 4.6.1 Institutional policy on RASS

Majority of the respondents (91%, n=81) reported that the hospital had policies which addressed sedation and agitation among patients, while 9% (n=8) reported that the researcher did know whether the policy exists.

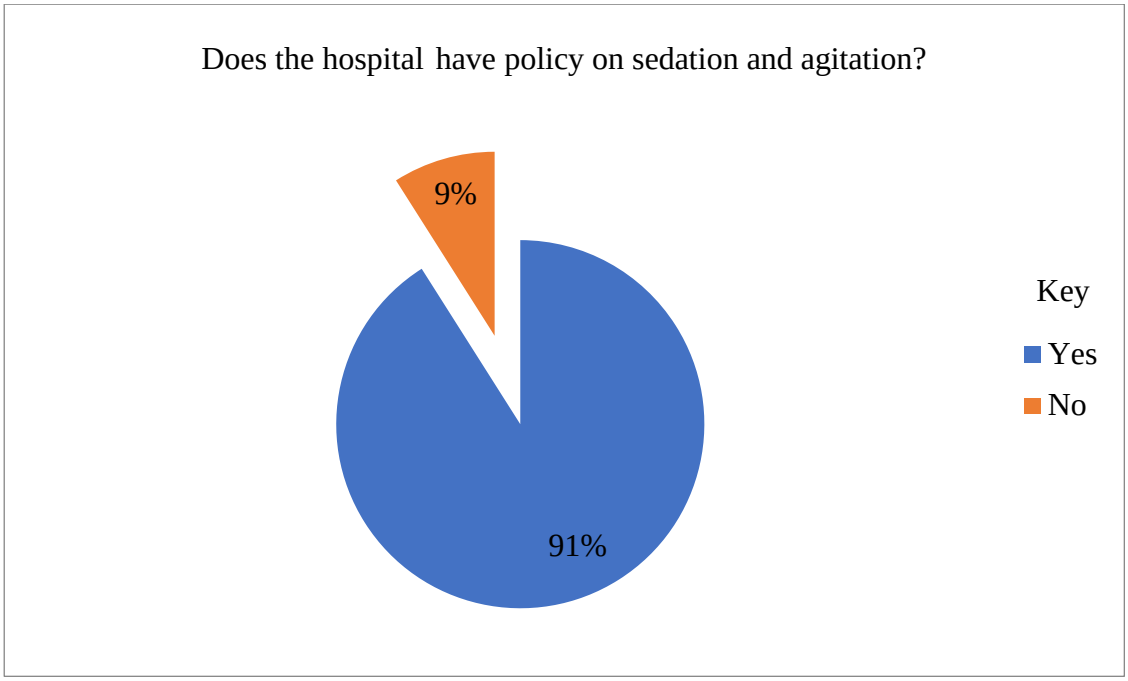


**Figure 8: Policy on sedation and agitation**

Those who reported that policy existed were found to be 1.17 times more likely to have high RASS application level (OR=1.165, CI=0.67-2.026). However, these findings were not statistically significant at p=<0.05. The findings disagreed with those of Bassett et al., (2015) who argues that, policies are central to change implementation in a given area.

### 4.6.2 Availability of Sedation guidelines

Majority of the respondents (82%, n=73) reported that the hospital had developed sedation guidelines to guide nurse's performance, while 18% (n=16) reported that that such guidelines had not been developed.

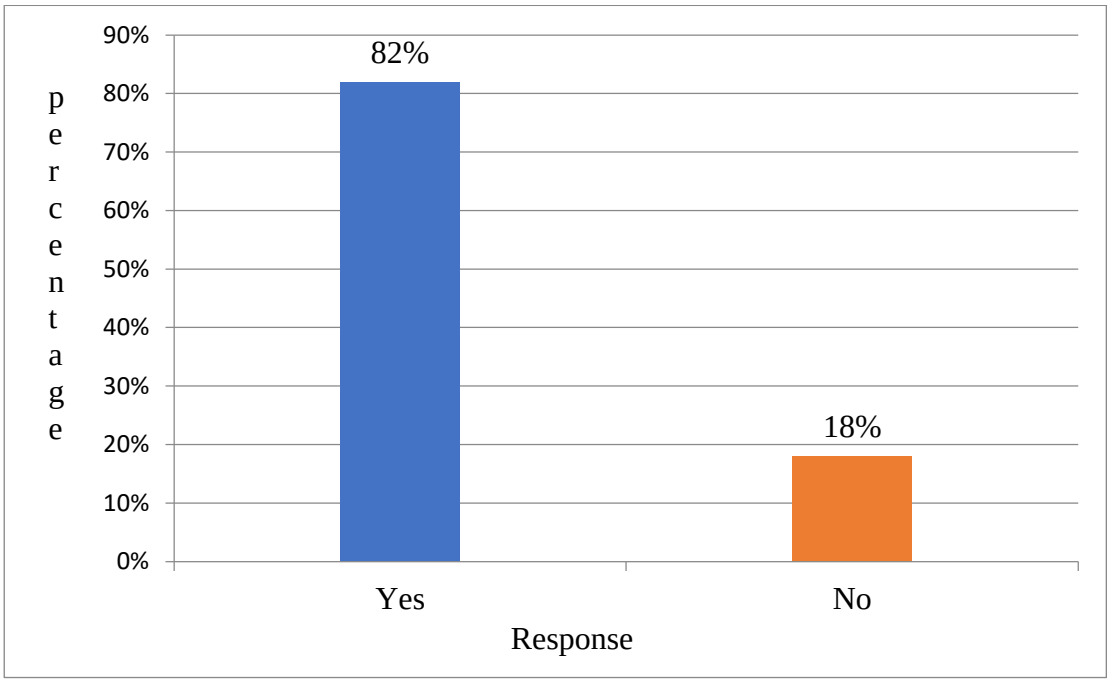


**Figure 9: Development of sedation guidelines by the hospital**

This finding supported the assertion of Tan et al., (2019), that there are not universally agreed upon guidelines for sedation assessment, and institutions normally develop their own.

Those who reported that guidelines existed were 0.95 times likely to have high RASS application (OR=0.950, CI=0.691-1.306). These findings were not statistically significant at p=<0.05.

### 4.6.3 Sedation training and application of RASS

Majority of the respondents (65.2%, n=58) reported that the hospital provided training programs on sedation, while 34.8% (n=31) reported that such training was not provided.

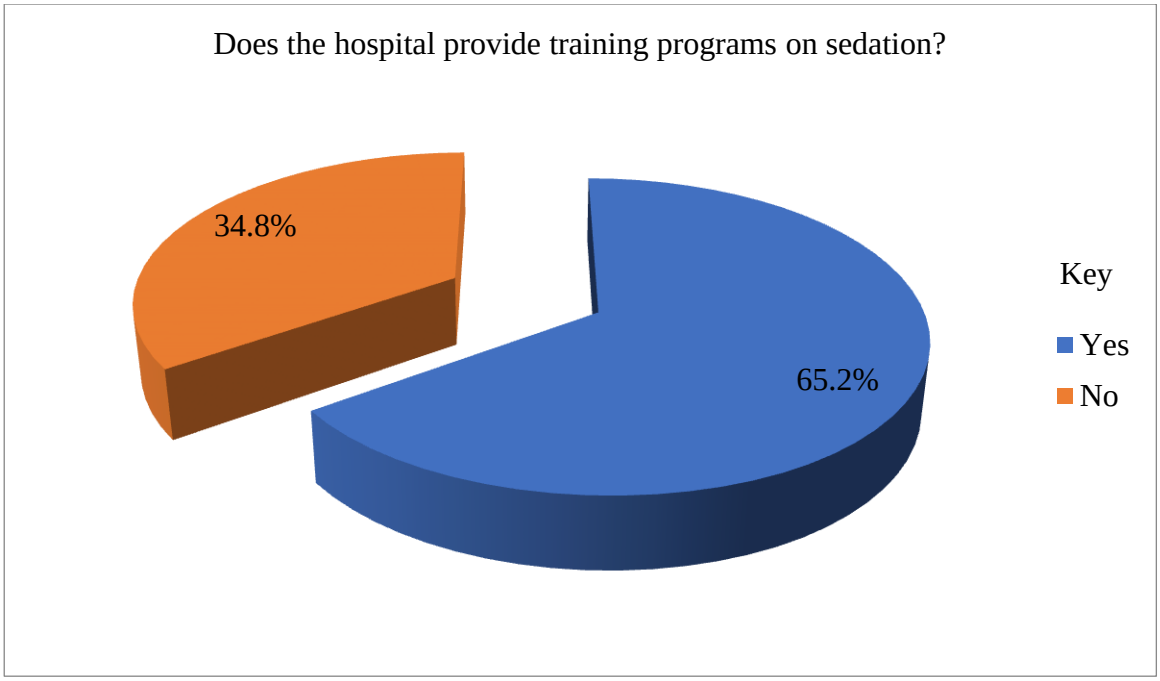


**Figure 10: Provision of sedation training by the hospital**

Those who reported that sedation training was provided, were found to be 0.95 times likely to have high RASS application level (OR=0.953, CI=0.731-1.243). These findings were not statistically significant at p=<0.05

### 4.6.4 Availability of RASS charts

Majority of the respondents (88.8%, n=79) reported that RASS charts had been availed in the critical care units, while 11.2% (n=10) reported that those charts were not available.

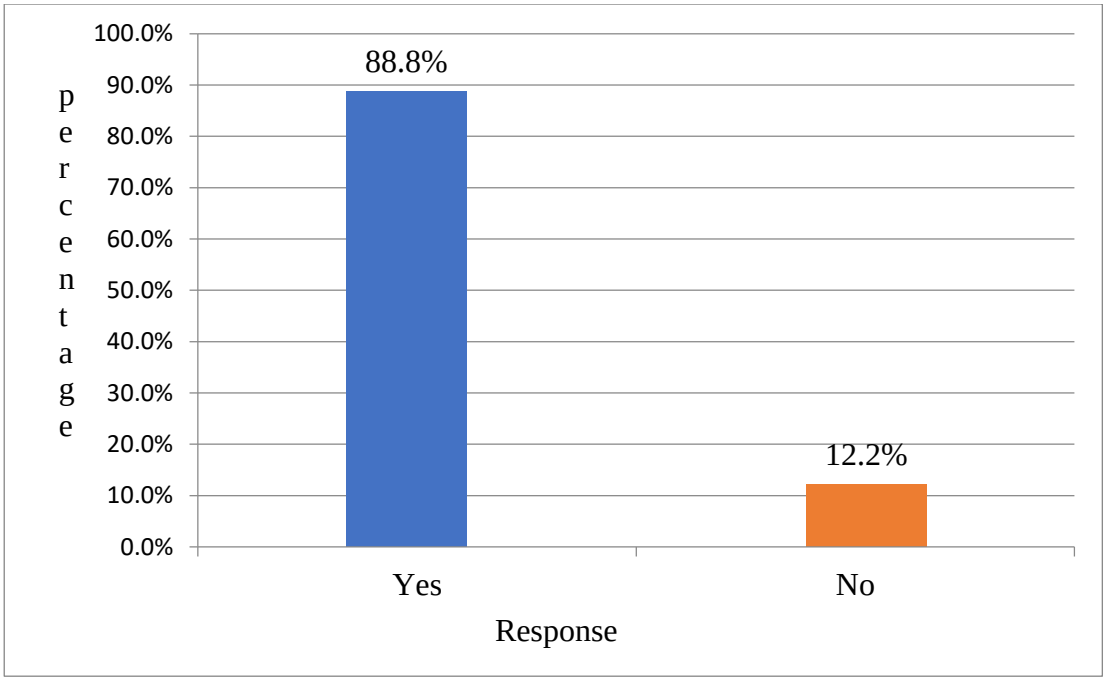


**Figure 11: Availability of RASS charts in CCUs**

Those who reported that RASS charts had been availed were found to be 0.89 times likely to have high RASS application level (OR=0.886, C1=0.630-1.246). The finding was sensible because, the mere availability of charts without corresponding sensitization of the staff on their importance, cannot guarantee their utilization. However, these findings were not statistically significant at p=<0.05

### 4.6.5 Conduction of RASS audits

Majority of the respondents (50.6%, n=45) reported that the hospital did not conduct audits on the application of RASS, while 49.4% (n=44) reported that such audits were conducted.

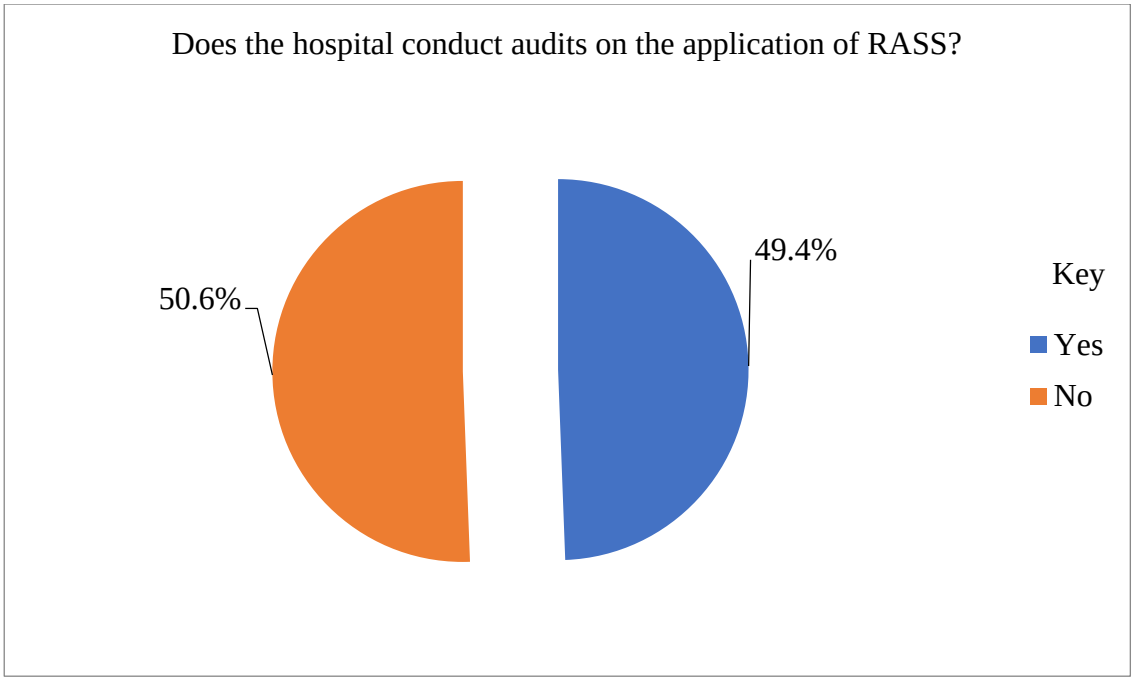


**Figure 12: Hospital audits on application of RASS**

Those who reported that audits were conducted were found to be 0.96 times likely to have high RASS application level (OR=0.961, CI=0.741-1.246). The findings were not statistically significant at p=<0.05

Out of the five institutional factors, none was found to significantly influence application of RASS among the nurses. The association between institutional factors and RASS application is summarized in table 9.

**Table 9: Institutional factors and RASS application level**

| Factors | Response category | High RASS application level | | Low RASS application level | | Statistics |
|---|---|---|---|---|---|---|
| | | N | % | n | % | |
| Policy | Yes | 59 | 72.8% | 22 | 27.2% | $\chi^2$ =0.385, df=1, p=0.535 |
| | No | 5 | 62.5% | 3 | 37.5% | |
| Sedation guidelines | Yes | 52 | 71.2% | 21 | 28.8% | $\chi^2$ =0.092, df=1 p=0.761 |
| | No | 12 | 75% | 4 | 25% | |
| Sedation training | Yes | 41 | 70.7% | 17 | 29.3% | $\chi^2$ =0.123, df=1 p=0.726 |
| | No | 23 | 74.2% | 8 | 25.8% | |
| RASS charts in CCUs | Yes | 56 | 70.9% | 23 | 29.1% | $\chi^2$=0.365, df=1, p=0.546 |
| | No | 8 | 80% | 2 | 20% | |
| Audits on RASS application | Yes | 31 | 70.5% | 13 | 29.5% | $\chi^2$=0.091, df=1, p=0.763 |
| | No | 33 | 73.3% | 12 | 26.7% | |

4.7 Regression analysis

All nurse related and institutional factors were put in a logistic regression analysis model using stepwise method, to find out the main factors that influenced application of RASS, and T-test was used to test the null hypotheses of the study.

Table 11: Regression analysis of significant factors influencing application of RASS

| Coefficients[a] | | | | | |
|---|---|---|---|---|---|
| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | B | Std. | Beta | | |

| | | | Error | | | |
|---|---|---|---|---|---|---|
| 1 | (Constant) | .900 | .158 | | 5.691 | .000 |
| | Rassknowledgelevel | .238 | .095 | .260 | 2.516 | .014 |
| 2 | (Constant) | .599 | .207 | | 2.889 | .005 |
| | Rassknowledgelevel | .235 | .093 | .256 | 2.528 | .013 |
| | Have you attended any critical care course while working in the hospital? | .200 | .091 | .222 | 2.187 | .031 |

a. Dependent Variable: Rassapplicationcategorized

Table 11 shows that the only significant factors that influenced application of RASS were whether or not nurses had attended any critical care course (t=2.187, p=0.031) and their respective knowledge levels on application of RASS (t=2.528, p=0.013). On the basis of this finding, the null hypothesis that there is no statistical significance between Nurse related factors and the application of the RASS among CCU nurses at the AKUH, Nairobi, was rejected. However, the null hypothesis that there was no statistical significance between institutional factors and the application of RASS among CCU nurses at the AKUH, Nairobi, was accepted.

# CHAPTER FIVE

# SUMMARY CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

In this chapter, the researcher gives a summary of the major findings of the study, which were used to make conclusions and recommendations to the relevant implementing agencies.

## 5.2 Summary of major findings

### 5.2.1 General socio-demographic characteristics

The response rate was 97% and as for socio-demographic characteristics, majority (51.7%) was aged 31-40years. Majority (69.7%) was females, and majority (67.4%) of the respondents was married. Education level of majority (61.8%) was college diploma, and most of them (39.3%), were working in the ICU. Most respondents (43.8%) had worked for 3-5 years in their respective units.

### 5.2.2 Level of RASS application

The mean RASS application score was 85.6% and a standard deviation of 16. Majority (71.9%) had high RASS application level.

### 5.2.3 Nurse related factors influencing application of RASS

Majority of the respondents (53.9%) had not attended any critical care course, and the main course attended was ACLS. The knowledge means score on RASS was 69.7%±30.8. Majority (59.6%) had high RASS knowledge level. Attendance of any critical care course and knowledge level of RASS, significantly affected RASS application at p=<0.05.

### 5.2.4 Institutional related factors influencing application of RASS

Majority (91%) reported that the hospital had policies on sedation and agitation. Most respondents (82%) reported that the hospital had developed sedation guidelines. A large number (62.5%) reported that the hospital provided sedation training. Many

respondents (88.8%) reported that RASS charts had been availed in the critical care unit, and (50.6%) reported that audits on RASS application were not conducted. None of these institutional factors was significantly associated with RASS application at p=<0.05

### 5.3 Conclusions

The study concluded the following;

The level of application of RASS was found to be high at AKUH. This was justified by the high application mean score (85.6%) and the high application level by majority (71.6%) of the respondents.

The nurse related factors that significantly influenced application of RASS were training ($\chi 2$ =4.568, df=1, p=0.033) and their knowledge of RASS ($\chi 2$=6.036, df=1, p=0.014)

Out of five institutional factors namely: policies that addressed sedation and agitation among patients, development of sedation guidelines to guide nurse performance, provision of training programs on sedation, availability of Richmond agitation-sedation scale charts in the CCUs, and conduction of audits on the application of RASS, none of these factors significantly influenced RASS application at p=<0.05.

### 5.4 Recommendations

The study recommends the following;

The administration of AKUH needs to work closely with nurses in critical care units, to ensure that all of them demonstrate high levels of RASS application. This is because they are handling the critically ill, and we cannot afford to take chances with patients' lives;

The nurses in conjunction with AKUH administration should strive to increase the number of nurses attending critical care courses. Attendance of these refresher courses actually translates to better RASS application and as such, they need to be taken a bit more resolutely.

Moreover, the nurse's study harder and refresh their knowledge on RASS, since their knowledge of the same was found wanting. A knowledge mean score of 69.7% for patients working in CCUs is not satisfactory, yet the same knowledge was a significant influence of RASS application

The institution should put in place policy and RASS guidelines. Apart from just availing RASS charts in the critical care units, the hospital should sensitize the staff on the same. The findings revealed that, none of the institutional factors influenced RASS application. This necessitates follow-up of nurses through support supervision and regular audits, to oversee the application of RASS. The nurses will be able to embrace RASS, not just as an institutional thing, but as a tool to improve patient outcomes.

### 5.4.1 Recommendation for further study

The researcher recommends a comparative study on effectiveness of several assessment tools such as RASS versus COMFORT etc.

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## APPENDICES

### Appendix I: Consent Form

Dear participant,

I am Angeline Wanza Nzyoka a student at Mount Kenya University pursuing a Master's Degree in Critical Care Nursing. Thank you for accepting to participate in this study. The study is performed to investigate the Application of Richmond Agitation-Sedation Scale (RASS) and its determinants among nurses in CCUs at the Aga Khan University Hospital (AKUH), Nairobi. Your involvement in this investigation is based on voluntary terms and your feedback will be highly confidential and anonymous. Hence, you name or any other details that may reveal your identity are not required in the document. The study is conducted on all nurses serving in CCUs at the facility.

**Title of the research project**: Application of RASS among Nurses in Critical Care Units at AKUH, Nairobi, Kenya.

If you have any reservations or questions involving your engagement in this investigation, please reach out to the;

**Principal investigator**: Angeline Wanza Nzyoka

**Contact:** 0733440379

**Supervisor 1:** Prof. Catherine Mwenda

**Contact:** 0723846810

**Supervisor 2:** Dr. Kyalo Mutisya

**Contact:** 0721484869

**MKU IRB Chairperson:** Mount Kenya University

P. O Box 342-01000, Thika, Kenya.

**Contact:** 0709153000

Aga Khan University, Nairobi Research Office

P.O Box 30270-00100 Nairobi

**Contact**: +254203662107/2109

**Objective of study:** To investigate the application of Richmond Agitation Sedation Scale(RASS) among nurses in CCUs at the AKUH, Nairobi, Kenya.

**Procedure**: The principle investigator will administer a questionnaire for you to complete to the best your understanding.

**Benefits**: The study offers no direct benefits to a respondent. However, the outcomes will play a fundamental role in providing useful information to AKUH, MOH, and policy makers to help advance the care of critically ill clients under sedation.

**Risks**: The study bears no foreseeable risk linked to the participation by a respondent. No medication or harmful chemical whatsoever will be administered or blood samples taken at any point.

**Confidentiality:** The information provided will be considered secret or confidential. Additionally, the data provided by a respondent will be kept anonymous and will not be distributed or shared by any other people other than my supervisors.

**Costs and Compensation to participants**: Taking part in the investigation will not lead to any direct compensation.

**Voluntary participation/ refusal/ discontinuation:** Your participation in the study calls for a comprehension of the general guidelines, involving respondents in medical studies:

i) Participation is only for those who volunteer to take part in the study.

ii) Withdrawal from the investigation is purely at the respondent's discretion.

iii) Withdrawal or failure to engage in the study will not influence the role you play in the institution whatsoever.

You are entitled to seek clarifications or make inquiries through the contacts given above.

**Participant's statement of consent**

I have gone through the information presented in this form or had the researcher explain the information to me. I have also had the opportunity to discuss the content of this study with a research guide/counselor. Furthermore, my queries have been addressed in an understandable language. Additionally, potential benefits or risks have been analyzed to me. I comprehend that my engagement in this investigation is based on voluntary terms and that I can refrain from participating at any time should I feel threatened. I freely concede to engage in this study. I also understand the confidentiality and anonymity will be upheld.

Participant signature……. Date…….…

Investigators sign……. Date…….…..

Thank you

**Appendix II: Questionnaire**

- ❖ Answer all questions accurately
- ❖ Do not indicate your name or identifier anywhere on the questionnaire
- ❖ Provide honest and factual answers

**Section A: Socio-Demographic**

1. What is your age bracket?

   20-30 years [ ]

   31- 40 years [ ]

   41- 50 years [ ]

   Over 50 years [ ]

2. What is your gender

   Male [ ]

   Female [ ]

3. What is your marital status?

   Single [ ]

   Married [ ]

   Separated/ Divorced [ ]

   Widowed [ ]

4. What is your level of education?

   College [ ]

   Under-graduate [ ]

   Post graduate [ ]

5. Which subsection do you work within Critical care unit?

   Intensive Care Unit [ ]

   Cardiothoracic Intensive Care Unit [ ]

   Coronary Care Unit [ ]

   High Dependency Unit [ ]

6. How many years have you worked in Critical Care section?

   Less than 1 year [ ]

   1 – 2 years [ ]

   3 – 5 years [ ]

   5 – 10 years [ ]

   More than 10 years [ ]

**Section B: Application**

1. Have you ever used Richmond Agitation Sedation Scale?

   Yes [ ]

   No [ ]

2. How often do you use RASS?

   Always [ ]

   Sometimes [ ]

   Rarely [ ]

3. Do you think nurses know how to use RASS?

   Yes [ ]

   No [ ]

Don't know [ ]

4. How would you rate your understanding on utilization of RASS?

   Excellent [ ]

   Good [ ]

   Fair [ ]

   Poor [ ]

5. Do you think the hospital implements RASS perfectly?

   Yes [ ]

   No [ ]

   If no, what are the changes you would suggest

_____

_____

_____

**Section C: Nurse related factors**

1. Have you attended any Critical Care Course while working in the hospital?

   Yes [ ]

   No [ ]

2. If yes when (Year)…….

3. If yes, what was the name of the course last attended.

   ……

4. Have you ever been trained in sedation among critically ill patients?

Yes [ ]

No [ ]

5. Have you attended training on sedation and use of different sedation scales?

Yes [ ]

No [ ]

6. How often do you administer Sedation among critically ill patients?

Always [ ]

Sometimes [ ]

Rarely [ ]

7. Do you know the implications of under or over-sedation?



Yes [ ]

No [ ]

8. What is the criteria for using the RASS:-

A. For routine assessment of all patients in CCU [ ]

B. It has no significant value in patient assessment [ ]

C. To assess sedation and agitation among CCU patents [ ]

D. It is limited to patients with intracranial damage [ ]

9. The 10-point scale in Richmond agitation-sedation scale represents: -

A. Four levels of anxiety or agitation, one level denoting calm and alert state, and 5 levels of sedation [ ]

B. Four levels of sedation, one level for calm and alert state, and five levels anxiety or agitation [ ]

10. How often should the RASS be used?

    A. Every 4 hours [ ]

    B. Every 2 hours [ ]

    C. Every 8 hours [ ]

    D. Every 12 hours [ ]

**Section D: Institutional Factors**

1. Are there any institution level policies in your hospital that address sedation and agitation among patients?

   Yes [ ]

   No [ ]

2. Has the hospital developed sedation guidelines to guide nurse performance?

   Yes [ ]

   No [ ]

3. Has the institution provided training programs on sedation?

   Yes [ ]

   No [ ]

4. Are there Richmond agitation-sedation scale charts available in the CCUs?

   Yes [ ]

   No [ ]

5. Does the hospital conduct audits on the application of the RASS?

   Yes [ ]

   No [ ]

6. If yes, how often are the audits done?

   Every 3 months [ ]

   Every 6 months [ ]

   Every 8 months [ ]

   Annually [ ]

   Others (Specify)…….

************Thank You***********

**Appendix III: Observational Checklist**

**RASS Observational Checklist**

| Item | Description/Actions | Done (√) | Not done (×) |
|---|---|---|---|
| 1. | Observes if patient is alert, agitated, or restless | | |
| 2. | If not alert, the nurse calls out the patient by name and tells them to open their eyes | | |
| 3. | Observes if the patient maintains eye contact and eye opening responses in reaction to voice | | |
| 4. | Physically stimulates patient by shaking shoulder and/or rubbing sternum when the patient does not respond to verbal stimulation | | |
| 5. | Observes if the patient has any movement to physical stimulation or not. | | |

**Appendix IV: Letter to Aga Khan University Hospital**

Nzyoka Wanza Angeline

P.O Box 282-00507

Nairobi.

20/07/2021

The Ethics and Research Committee

The Aga Khan University Hospital

P.O Box 30270-00100

Nairobi.

Dear Sir/Madam,

**RE: Request for Permission to Conduct Research at The Aga Khan University Hospital-Nairobi**

My name is Nzyoka Wanza Angeline.I am a student at Mount Kenya University pursuing masters of Science in Nursing (Critical Care). I am reaching out to you to kindly request for permission to carry out a study on the Application of the RASS at the Aga Khan University Hospital.

Accomplishment of this task will be crucial to helping me meet the prerequisites for the confirment of the master's honors in Critical Care Nursing.

Thank you in advance.

Yours sincerely,

Nzyoka Wanza Angeline

ID:22233073

**Appendix V: RASS tool**

## Richmond Agitation Sedation Scale (RASS) *

| Score | Term | Description | |
|---|---|---|---|
| +4 | Combative | Overtly combative, violent, immediate danger to staff | |
| +3 | Very agitated | Pulls or removes tube(s) or catheter(s); aggressive | |
| +2 | Agitated | Frequent non-purposeful movement, fights ventilator | |
| +1 | Restless | Anxious but movements not aggressive vigorous | |
| 0 | Alert and calm | | |
| -1 | Drowsy | Not fully alert, but has sustained awakening (eye-opening/eye contact) to *voice* **(≥10 seconds)** | Verbal Stimulation |
| -2 | Light sedation | Briefly awakens with eye contact to *voice* **(<10 seconds)** | Verbal Stimulation |
| -3 | Moderate sedation | Movement or eye opening to *voice* **(but no eye contact)** | Verbal Stimulation |
| -4 | Deep sedation | No response to voice, but movement or eye opening to *physical* stimulation | Physical Stimulation |
| -5 | Unarousable | No response to *voice or physical* stimulation | Physical Stimulation |

**Procedure for RASS Assessment**

1. Observe patient

   a. Patient is alert, restless, or agitated. **(score 0 to +4)**

2. If not alert, state patient's name and *say* to open eyes and look at speaker.

   b. Patient awakens with sustained eye opening and eye contact. **(score –1)**

   c. Patient awakens with eye opening and eye contact, but not sustained. **(score –2)**

   d. Patient has any movement in response to voice but no eye contact. **(score –3)**

3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.

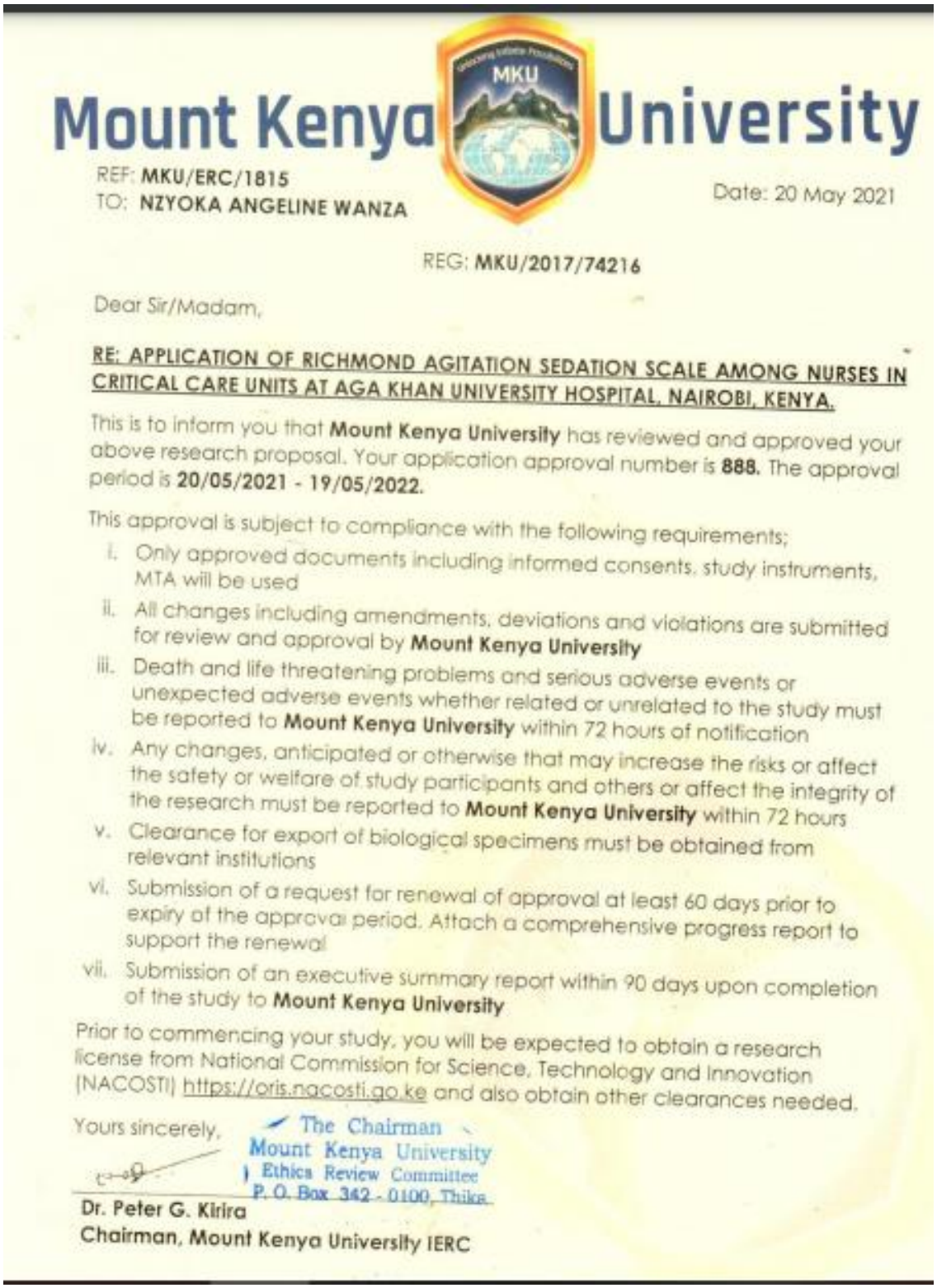
   e. Patient has any movement to physical stimulation. **(score –4)**

   f. Patient has no response to any stimulation. **(score –5)**

* Sessler CN, Gosnell M, Grap MJ, Brophy GT, O'Neal PV, Keane KA et al. The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002; 166:1338-1344.

* Ely EW, Truman B, Shintani A, Thomason JWW, Wheeler AP, Gordon S et al. Monitoring sedation status over time in ICU patients: the reliability and validity of the Richmond Agitation Sedation Scale (RASS). JAMA 2003; 289:2983-2991.

**Appendix VI: ERC Certificate from MKU**



Mount Kenya University

REF: MKU/ERC/1815
TO: NZYOKA ANGELINE WANZA

Date: 20 May 2021

REG: MKU/2017/74216

Dear Sir/Madam,

**RE: APPLICATION OF RICHMOND AGITATION SEDATION SCALE AMONG NURSES IN CRITICAL CARE UNITS AT AGA KHAN UNIVERSITY HOSPITAL, NAIROBI, KENYA.**

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **888.** The approval period is **20/05/2021 - 19/05/2022.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

**Dr. Peter G. Kirira**
**Chairman, Mount Kenya University IERC**

## Appendix VII: Research Permit from NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 709526

Date of Issue: 06/July/2021

RESEARCH LICENSE

This is to Certify that Ms. ANGELINE WANZA NZYOKA of Mount Kenya University, has been licensed to conduct research in Nairobi on the topic: APPLICATION OF RICHMOND AGITATION SEDATION SCALE AMONG NURSES IN CRITICAL CARE UNITS AT AGA KHAN UNIVERSITY HOSPITAL, NAIROBI, KENYA. for the period ending : 06/July/2022.

License No: NACOSTI/P/21/11412

709526

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

## Appendix VIII: Letter from the AGA Khan University

THE AGA KHAN UNIVERSITY

Faculty of Health Sciences
*Medical College*

Ref: 2021/IERC-133 (v2)
December 22, 2021

Dr. Catherine Mwenda - Principal Investigator,
Ms. Angeline Wanza Nzyoka - Degree of Master of Science in Nursing (Critical Care)
Mount Kenya University

Dear Dr. Catherine Mwenda / Ms. Angeline Wanza Nzyoka and team,

**Re: APPLICATION OF RICHMOND AGITATION SEDATION SCALE AMONG NURSES IN CRITICAL CARE UNITS AT AGA KHAN UNIVERSITY HOSPITAL, NAIROBI, KENYA.**

The Aga Khan University, Nairobi Institutional Ethics Review Committee (IERC), is in receipt of your protocol resubmitted to the Research Office (RO) on November 18, 2021. With reference to the IERC letter Ref: 2021/IERC-133 (v1) dated October 26, 2021, the IERC reviewed and approved this project *[as per attached official stamped protocol and attachments - version Ref: 2021/IERC-133 (v2)]*. You are authorized to conduct this study from **December 22, 2021**. This approval is valid until **December 21, 2022** and is subject to compliance with the following requirements;

1. The conduct of the study shall be governed at all times by all applicable national and international laws, rules and regulations. IERC guidelines and Aga Khan University Hospital policies shall also apply, and you should notify the committee of any changes that may affect your research project (amendments, deviations and violations)
2. Researchers desiring to initiate research activities during COVID-19 pandemic must comply with the COVID-19 SOPs for Research as well as submit to the Research Office a Request Form to Initiate, Reinstate or Continue Research During COVID-19 Pandemic.
3. **Prior** to human subjects enrolment you must obtain a research license from the National Commission for Science, Technology and Innovation (NACOSTI), *where applicable*, site approvals from the targeted external site(s) and file the copies with the RO.
4. *As applicable*, **prior** to export of biological specimens/data, ensure a Material Transfer Agreement (MTA)/Data Transfer Agreement (DTA), is in place as well as seek shipment authority/permit from the relevant government ministry. Copies of these approvals, should be submitted to the RO for records purpose.
5. All Serious Adverse Events and the interventions undertaken must be reported to the IERC as soon as they occur but not later than 48 hours. The SAE shall also be reported through the AKUHN quality monitoring mechanism(s) at Client Relations Department of the Chief of Staff's Office.
6. All consent forms must be filed in the study binder and where applicable, patient hospital record.
7. Further, you must provide an interim Progress Report Form **60 days before expiration** of the validity of this approval and request extension if additional time is required for study completion; as well as submit the completed Self-Assessment Tool -Monitoring Ethical Compliance in Research. You must advise the IERC when this study is complete or discontinued and a final report submitted to the Research Office for record purposes.
8. The hospital management should be notified of manuscripts emanating from this work.

If you have any questions, please contact Research Office at AKUKenya.ResearchOffice@aku.edu or 020-366 2148/1136.

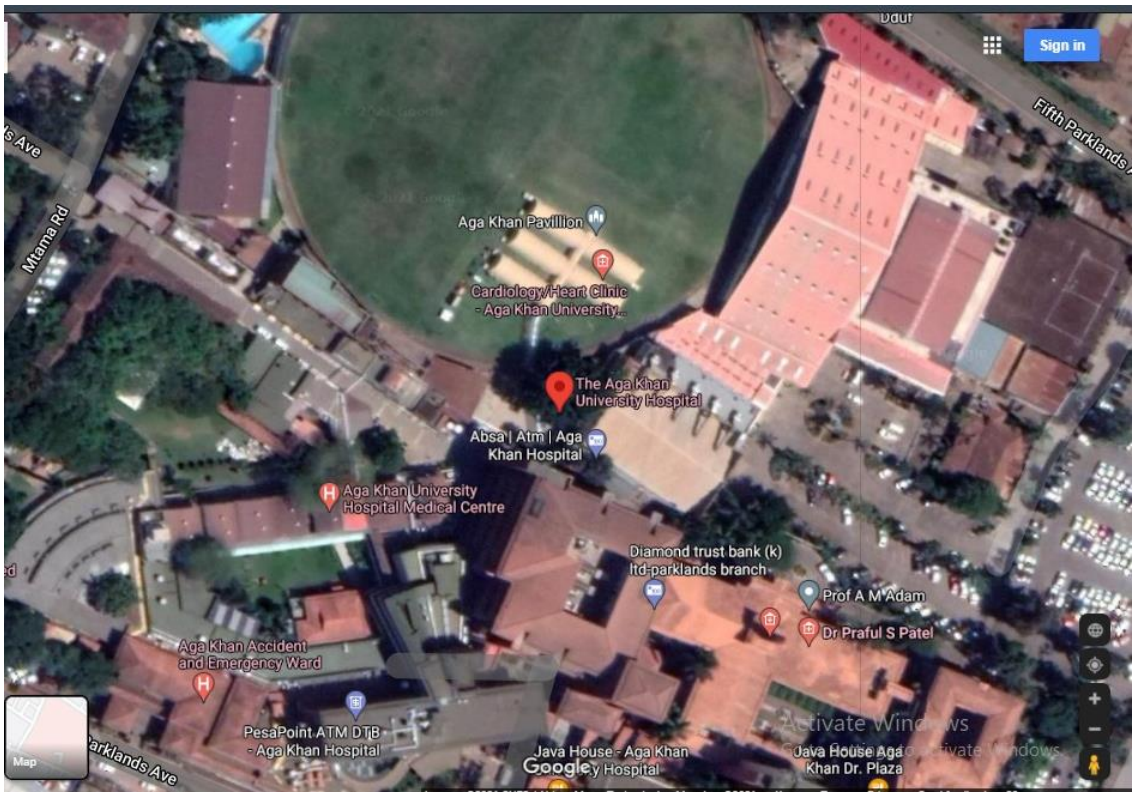
With best wishes,

Dr. Christopher Opio,
Chair - Institutional Ethics Review Committee (IERC)
**Aga Khan University, (Kenya)**

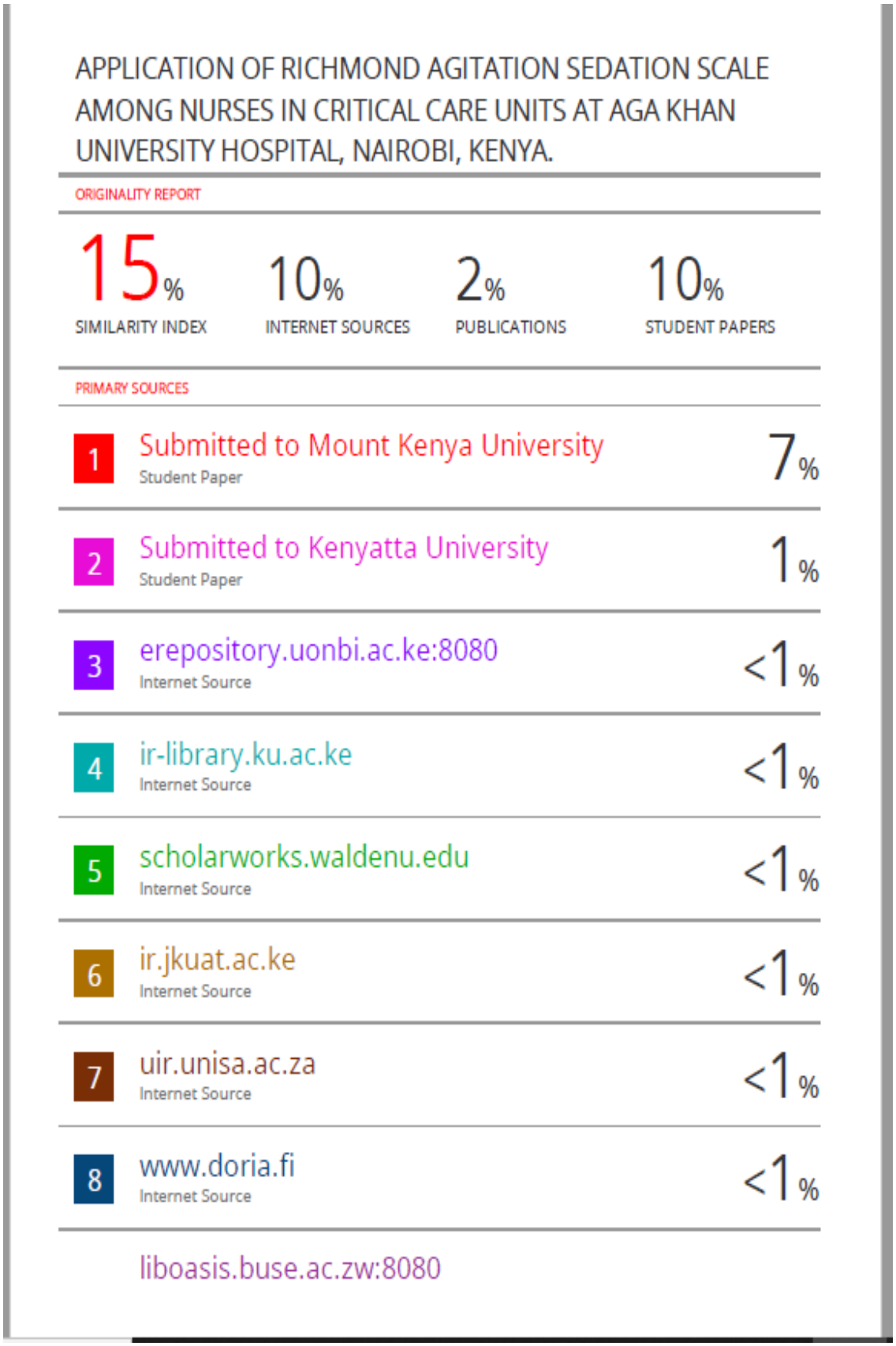
Copy: Co-Investigators
ak ro

*3rd Parklands Avenue, off Limuru Road, P. O. Box 30270, GPO 00100, Nairobi, Kenya*
*Telephone: +254 20 366 2107/2109; Fax: +254 20 374 4035*

**Appendix IX: Location Map of Aga Khan University Hospital, Nairobi, Kenya.**



**Appendix X: Similarity Index**



APPLICATION OF RICHMOND AGITATION SEDATION SCALE AMONG NURSES IN CRITICAL CARE UNITS AT AGA KHAN UNIVERSITY HOSPITAL, NAIROBI, KENYA.

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