COLLEGE OF HEALTH SCIENCE, SCHOOL OF MEDICINE

ASSESSMENT OF KNOWLEDGE, ATTITUDE, PRACTICE AND ASSOCIATED FACTORS TOWARDS USE OF PHYSICAL RESTRAINT AMONG NURSES WORKING IN ADULT ICU IN FEDERALLY ADMINISTERED HOSPITALS ADDIS ABABA, ETHIOPIA, 2019.

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ABBRIVATIONS AND ACRONYMS

AaBET	Addis Ababa Burn, Emergency and Trauma Unit
AA	Adds Abeba
AICU	Adult Intensive care unit
AHS	Albert Health Service
ALERT	All Africa Leprosy Rehabilitation and Training Center
AOR	Adjusted odd ratio
CSA	Central statistical agency
ED	Emergency department
HCFA	Health Care Financing Administration
ICU	Intensive care unit
JCAHO	Joint Commission on Accreditation of Health care Organization
KAP	knowledge, Attitude and Practice
MCQ	Multiple choice question
MOH	Ministry of health
NGO	Non-governmental organizations
PDCN	Professional Development Committee of Nursing Council
PR	Physical restraint
SPSS	Statistical Package for Social Sciences
UOR	Unadjusted odd ratio
US	United state
WHO	World health organization

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SUMMMERY

Background: Physical restraint is any chemical or physical involuntary method restricting an individual's movement, physical activity, or normal access to the body. Physical restraints are prescribed by the physician but the ICU nurse remains the decision maker responsible in assessing the need, application and removal of PR on patients in the ICU setting.

Objectives: This cross-sectional descriptive study was arriedout to determine the knowledge, attitudes, practices and associated factors towards use of physical restraints among nurses working in adult Intensive care unit in federally administered hospitals in Addis Abeba Ethiopia 2019.

Methods: The study was conducted in ICUs of Federal Hospitals in Addis Abeba, Ethiopia 2019. Hospital based descriptive cross sectional study design was carried out .By census a total of 126 nurse's was interviewed by structured questionnaire. The data was checked for its completeness and was entered to epidata version 4.2 and analyzed using SPSS version 25 software with 95% CI and Pearson correlation coefficient and binary logistic regression analysis was used to find association

Result: Majority of nurses was found to be aged between 21-30 years old, (62.5%) worked 2-5 years, and (83%) were degree graduates. Nurses' knowledge score was 6.1 ±2.6 (50.8%), with possible range (0- 11), attitudes score was 14.1±3.1 (64%) with possible range (0-22), and practices score was 13.9± 3.8(63.18%), with possible range (0-22). Their demographical characteristics such as gender, working year and education levels were not significantly associated with knowledge, attitudes & practices ($p>0.05$) only age significantly associated with practice and knowledge with lack of a written policy & guideline and not being trained on application of physical restraint. Also practice associated with knowledge & attitude.

Conclusion: The study revealed that, there was a poor nurses' knowledge, proper attitude and satisfactory practice toward use of physical restraints. Also there was a significant association between practice with age group & knowledge with training background and correlation between dependent variables.

Key words: attitudes, knowledge, intensive care unit, nursing, physical restraint

INTRODUCTION

1.1. Background

Critically ill patients are characterized by having life- threatening illnesses or injuries which need continuous monitoring and intensive care. As a result, they are attached to life support and monitoring equipment. Since they may harm themselves unintentionally by removing end tracheal tubes, taking out vascular access, arterial lines, or monitoring equipment, they need protection to ensure their safety (1)

One of the most common practices in the ICU to insure the paten's safety is physical restraint. Physical restraint is any chemical or physical involuntary method restricting an individual's movement, physical activity, or normal access to the body(2). According to Professional Development Committee of the Nursing Council of Hong Kong (PDCNC) definition physical restraint (PR) is any device, material or equipment attached or adjacent to an individual's body that he/she cannot easily remove, thus immobilizes or reduces the ability of the individual to move his/her body parts freely and/or to have normal access to his/her own body(3).There are four types of restraints. They are: -physical, mechanical, environmental and chemical restraint.

Physical restraint is a heavily debated procedure because of the questionable ethical and legal issues affecting autonomy and dignity of patients(4). However we use physical restraint (PR) as a last resort. When alternative measures (for example, a bed alarm, a specific chair with an angled seat or a sleeve to hide an intra-venous in an arm) and other treatments put in place by the health care team have not worked. A physical restraint is used when a patient's safety is at risk. For instance: a patient at risk of falling; hurting them self or others; pulling out tubes; or acting in an aggressive or violent way(5). Except in emergencies, individual decisions regarding restraint should be discussed within the multi-disciplinary teams, with the involvement of the individual and their family as far as possible(6). Its usage Should be based on practical considerations, such as how a patient's safety (and the safety of others) may be balanced with a patient's swift recovery(7).

There are many forms of physical restraints, including wrist, ankle, chest, and waist. A study in Portugal physical restraint application, the most commonly used materials are the bands, linen and cotton and most participants highlight the wrists and chest as parts of the body to immobilize(8). A similar study in Egypt, the most commonly used type of physical restraint involved restraining the

upper and the lower limbs, followed by bilateral wrist restraints, and then bedside restraints. Gauze and dressings were the types of restraint materials commonly used in both shifts(9). In South Africa, the commonest types of restraints used were bed rails 93% and wrist belts 12%. Restraints were used largely to protect medical devices and as protection from harm(10).

According to the guidelines, there are specific devices for physical restraint. However it is necessary to take some precautions so that their application does not compromise the patient's physical integrity. These should include the following cushioning the skin beneath the immobilizers to prevent skin injuries by ensuring a proper fit, attaching the first strips below the patient's waist and the ankle strips below the knee, remove and reapply every two hours the immobilizers during the day and every four hours during the night, change the position of the patient at least every two hours, often assess the distal zones to immobilizers to ensure that there is no neurological or sensory impairment, use chest or waist immobilizers(11).

Patients who are admitted to intensive care units generally have agitation and disorientation. Therefore safety measures must be taken. These measures include preventing patients from being alone, using easily accessible nurse call button and answering these calls promptly, lowering bed height and raising bed rails. However healthcare professional may have to use physical restraints from time to time. Especially patient can be more agitated when taken off a ventilator and in order to avoid adverse effects of long terms sedation, physical restraint can be preferred.(12)

Physical restraint use in ICUs has a long history though out the world. While European countries such as England and France reacted to physical restraint in the nineteenth century, it was widely used as an ethical and appropriate therapeutic measure in the United States. Moreover, it was used in 1980 in ICUs and medical-surgical wards. Historically, restraint was invented for ensuring patient safety. It was primarily used in nursing homes and psychiatric hospitals for preventing confused and restless patients from falling or self-harming. Previously, nurses widely used their clinical judgment skills for deciding upon physical restraint use(13).Even though there are some acceptable standards and guidelines for its use physical restraint still associated with ethical, legal, physical complications and psychological issues.

Physical restraint used when:-The patient's current behavior determines if and when a restraint is needed. The decision must be based on a current thorough medical and psychosocial nursing assessment. Also, caregivers must weigh the risks of using a restraint, which could cause physical

or psychological trauma, against the risk of not using it, which could potentially result in the patient harming him/her or others. Input from the entire care team can help the provider decide whether to use a restraint(14).

According to Joint Commission Standards on Restraint and Seclusion/Nonviolent Crisis Intervention Training Program uses restraint or seclusion only when it can be clinically justified or when warranted by patient behavior that threatens the physical safety of the patient, staff, or others. The hospital uses restraint only when less restrictive interventions are ineffective. And also the hospital uses the least restrictive form of restraint that protects the physical safety of the patient, staff, or others(15). Written policies and procedures needed that guide the use of restraint ,evaluates and reevaluates the patient who is restrained or secluded, documents the use of restraint or seclusion, trains staff to safely implement the use of restraint or seclusion,(15)(16).

Also according to 2015 Liverpool Hospital ICU Guideline nursing staff may need to restrain a patient in order to protect the patient from injury, protect themselves from unnecessary risk or harm, and prevent removals of vital treatment modalities. Therapeutic Restraints if all alternative measures have been considered and implemented and are unsuccessful, then the use of physical restraints may be considered(17). In a systematic review of 52 articles, Rose et al. (2016) found that physical restraints were used to prevent removal of endotracheal tube, as well as nasogastric tubes, urinary catheters and central lines which are needed in an ICU environment as these measures provide life-saving treatment(18)

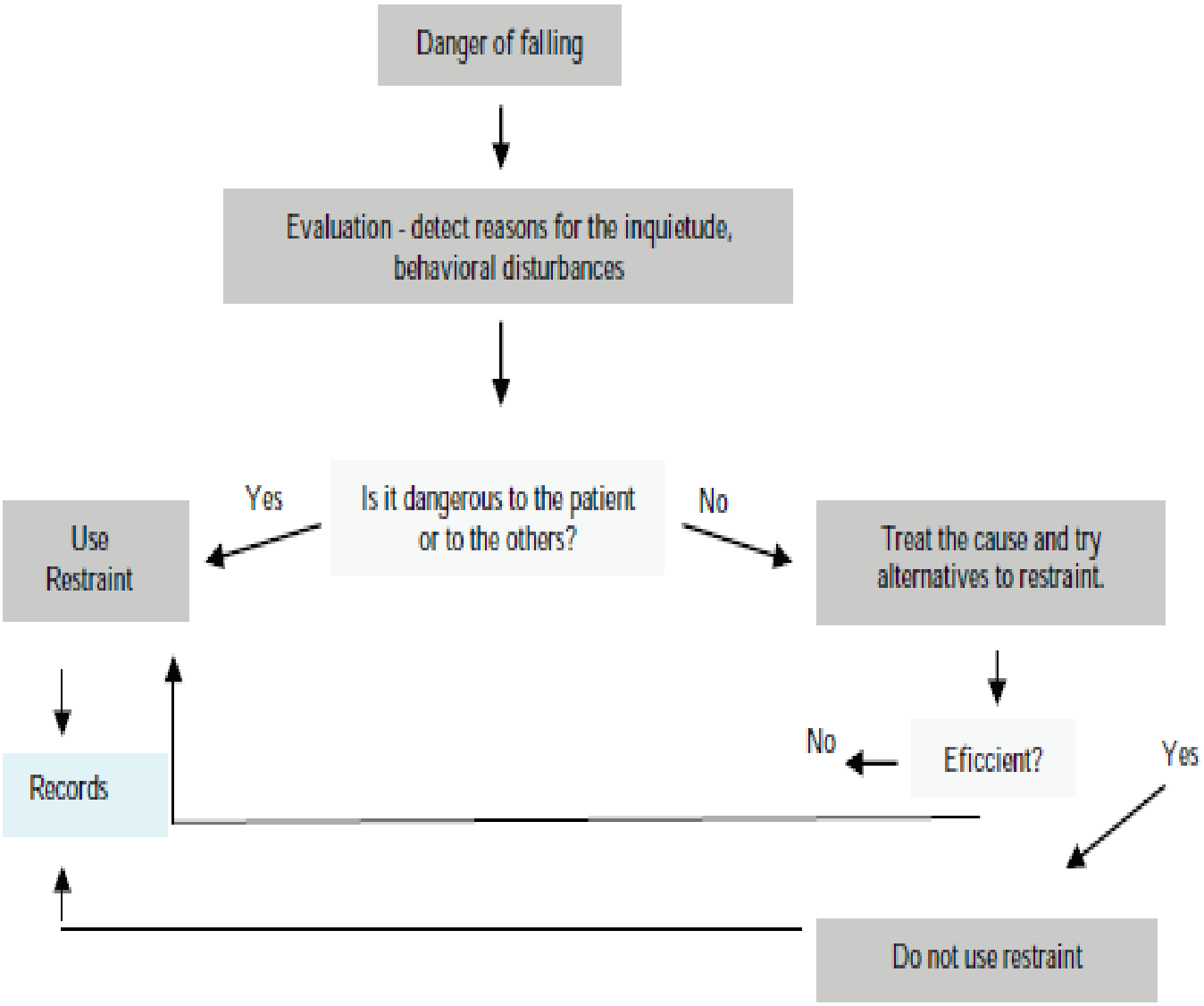

Figure 1. Decision making algorithm for physical restraint(8)

The use of restraint may have both physical and psychological sequel. No uniformly defined protocol for the management of restrained patients. A complication commonly identified by different researchers. Research has clearly established that physical restraints can be injurious both physically and mentally for inhabitants, cost more resources, and increase serious injuries.

Barriers to shortening the restraint use included: fear of patient injury, staff and resource restrictions, lack of education and information about alternatives to restraints, policy and management issues, beliefs and expectations of staff, family and patient, inadequate review practices and statement barriers(2).The availability of clear and standardized guidelines in the form

of a policy document for the professionals is therefore crucial in supporting them in such ethical and legal dilemmas(19).

1.2 Statement of the Problem

The physical and chemical restraint of patients, despite being often applied with no real scientific basis, has always been part of nursing practice in caring for patients (11). Globally, restraint prevalence ranges widely between and within countries. Countries throughout the world have varying perceptions on the acceptability of physical restraint use, which may contribute to the wide range of global prevalence rates. Some countries, like the United States, consider restraints to be acceptable practice, while other countries, like the UK and Norway, consider restraints to be unacceptable(2).

The rate of physical restraint use in ICUs is 24%–40% times more than general hospital wards (13).According to a study done in Europe the prevalence of PR is 60% (20). According to a meta-analysis study in Iran, 2017, the prevalence of physical restrains use was estimated to be 46.7% (21).

Even though different countries practice PR for ensuring patient safety, it has been reported to be associated with negative and harmful effects.

A Study in Portugal showed that patient developed pressure ulcers (82.1%), bruises (79.5 %), fear (67.3%) and half of participants had no reason for PR use (11). According to a study done in Europe Restrained patients were hospitalized twice as long as those who were not restrained, the mortality increased in those patients who were restrained (20).

Complications reported by researchers include edema and cyanosis by wrist and arm restraints, pressure ulcers, and aspiration and breathing problems caused by sheet and belt pressure on chest, head hits by angry patients on bed sides, contractures of joints, and rejecting meals. Asphyxiation is the most common cause of restraint related death.

According to a guideline in Turkey report, death occurred in approximately 12% of cases of a total of 214. One hundred deaths in the USA occur annually due to injuries by improper physical restraint practice (2).

Physical restraint may be highly associated with nurses' activity and patients may suffer by serious complications (2). Nurses play a critical role in deciding to use physical restraint. 92.2% nurses

restrain patients without doctors' instruction(4). A study in Portugal in 2016, only 46.9% of nurses had good knowledge(11), In Egypt nurses had improper attitude(1).

So assessing knowledge, attitude and practice of health workers and factors associated is necessary before developing policies and guidelines to provide quality care improvement in hospitals.

Many studies reported rate of physical restraint use in different countries, but only few countries have policies and guidelines of physical restraint practice in detail. Even though it is a common practice in Ethiopia as far as my knowledge still there is no any study done on it. This study might be the first to examine the knowledge, attitude, practice and associated factors of nurses working in the AICU on the use of restraint.

2. LITRATURE REVIEW

2.1. Introduction

Health sector is recognized, nationally and internationally, as an area of particular vulnerability, by being in direct contact with people in higher anxiety and stress situations. Physical restraint is a resource used in the body or close to an individual's body limiting their freedom of voluntary movements and preventing their independent function. Physical restraint is defined as "the restriction of the sick person's movements, in situations of psychomotor agitation, confusion or aggression/violence towards himself and/or the other and such procedures should have the unique and exclusive purpose of ensuring that the sick person exceeds safely crisis(11).

Reviewing the literature illustrated that physical restraint is an accepted practice in ICUs in countries, such as the USA, Turkey, Australia, Europe and some African countries. It was also never used in UK and Norway, and the use of chemical splinting was seen as more appropriate in the United Kingdom. However, nurses play a critical role in deciding to use physical restraint and be decision maker(22). Nurses' knowledge, attitude and practice play an important role in the healthcare settings as **a** whole.

A study done in Portugal by *Madalena Cunha*,2016 showed that 92.2%) nurses restrain patients without doctors' instruction(4). Also a cross-sectional study conducted in Malaysia by Fatemeh Eskandari, 2017 reported that many nurses stated that physical restraints does not require a physician's order. This demonstrated that physical restraint was started and removed based on the nurses' subjective clinical judgment(23).These studies showed that PR is purely nursing practice and assessing their KAP is mandatory.

2.2. Knowledge regarding use of Physical Restraint

Simply increasing the staff's knowledge about the risks associated with restraint use and introducing appropriate alternatives can change behavior (20).Users must have comprehensive knowledge about physical restraints in order to use these measures correctly and efficiently. Lack of knowledge among nurses can cause incorrect practices. In fact, in previous studies it was found that improper application of physical restraints caused several complications including suffocation and mortality and morbidity rates also increased (12).

According to exploratory study conducted in Portugal by Madalena Cunha, 2016, Physical restraint is considered by 72.4% as a medical and nursing procedure. However, most admit that it can be performed by nurses (95.5%), while 59.6% of respondents state that a medical prescription is necessary. 46.9% nurses had good knowledge and 6.2% reasonable knowledge. However, a significant group of study participants scored weak knowledge. In physical restraint practice, the most commonly used materials were the bands, linen and cotton and most participants answered the wrists and chest as parts of the body to immobilize (11).

A similar study on KAP of nurses in Turkey by Hatice Kaya, 2018, according to this study the good news was 71.1% of the nurses declared that they have a guideline on the use of physical restraints in their hospitals. This finding demonstrates that regulations have started to be made on this subject. By this study the mean knowledge score of the nurses was 7.83±1.59 so nurses working in the ICU of city center of Sakarya had a moderate level of information on the use of physical restraints, that they have insufficient information on some safe practices like jacket restraints. However this study was not a representative of Turkey because the study population consisted of only the intensive care nurses working in the city center of Sakarya. A similar study in the same year in Konya University, nurses was also found to had the following scores, 7.1 (1.7) from information subscale(22).

A study in Malaysia by *Fatemeh Eskandari, 2017*:-In this study, the mean score of knowledge was 40.48 (SD = 4.05), which is slightly above the midpoint of the possible range (15–60 points, the majority of nurses showed moderate levels of knowledge. The results showed that most of the nurses answered affirmatively to the subsequent items: physical restraint should be fitted and secured comfortably (96.4%); records of usage should be kept for each restrained patients in every shift (87.1%), and in emergencies, nurses should be allowed to restrain patients without doctors' instruction (92.2%). On the contrary, a majority of nurses demonstrated misunderstandings about physical restraint in answering the following items: physical restraint must be used when a person is not capable of supervising a patient (66.3%); no other good methods instead of physical restraint exists (71.2%), and confusion and disorientation are good reasons to use of physical restraint (82.2%). However, nurses showed certain important misunderstandings regarding physical restraint use (4). Participants demonstrated a lack of awareness regarding alternatives to physical restraint.

Alternatives to restraints have been categorized as environmental, physical, psychosocial, physiological and nursing care interventions. A cording to this study, less than half of the nurses reported that they tried a few nursing methods before using physical restraint.

Therefore, nurses are usually unaware of the various types and benefits of restraint alternatives. Thus, one of the most important topics during restraint minimization programmes would be introducing and focusing on physical restraint alternatives. Nurses' awareness of possible consequences of physical restraint use is another important issue. The risk of choking, spluttering and even death, which is a dangerous side effect of physical restraint use, was not considered by most nurses. (23).

Also there are some studies done in different African countries like Egypt, and South Africa. According to a descriptive hospital based study in Alshaab Teaching Hospital Khartoum by *Abeer El-Said Hassane El-sol, 2018* more than half of the nurses had a fair level of knowledge toward application of physical restraints among critical ill patients. That was 56.7%. Most critically ill patients may have multiple traumas, or other diagnosis can lead to the possibility of alteration in level of consciousness as confusion and agitation, which causing the observed behavioral problem.

Physical restraints may cause many adverse reactions, so the restrained patients need to equip nurses with adequate knowledge and good practice which contributing to proper attitude and enable nurses to modify their care plan toward preventing the physical restraint complications. Assessment of nurse's knowledge, attitudes, and practice regarding physical restraints is very important in gathering the information about the current and future nursing care to ensure the quality of care provided to patient and recognizing its weakness and strength(1).

2.3. Attitude regarding se of Physical Restraint

Physical restraint is a common nursing intervention in intensive care units and nurses often use it to ensure patients' safety and to prevent unexpected accidents. However, existing literature indicated that the use of physical restraint is a complex one because of inadequate rationales, the negative physical and emotional effects on patients, but the lack of perceived alternatives.

One of the elements that play an important role in transforming knowledge into practice is the person's attitude. Attitude is a predisposition with a dynamic and guiding influence.

According to a study in Turkey by *Hatice Kaya*, 2018, the attitudes of the nurses towards physical restraints were evaluated to be not at the expected level. That was, the mean score of the nurses for their attitude towards physical restraints was (30.00±4.82, 16- 48). In this section, 96.9% of the nurse reported that they agreed with applying physical restraint. It is important to apply restraints to assure legal protection for their and their organization, and 95.8% of the nurses reported that they agreed with PR decrease number of patients who fall and 81.5% of the nurses reported that they disagreed with they didn't feel guilty when restraining a patients. Also 72.1% of the nurses reported that disagreed with PR complications(12). Also another study conducted in Konya University, Turkey by Hatice Balci,2018 found that the mean attitude score was 31.8 (4.6) (22).

According to the articles by the Ministry of Health in Turkey, physical restraint can be practiced with physician's orders or approval. Yet, decision-making on using physical restraint is an important issue from nurses' point of view (22). Furthermore in the study the fact that the majority of the nurses did not agree with the statement "I believe that restraints increase the risk of strangulation" this indicated that they are not familiar with complications of PR.

Although physical restraints which were first used in the USA and Great Britain in 1950s as a treatment used according to doctors 'orders, nurses are responsible for evaluating patients' responses, monitoring patients and recording the results. In 1980s due to the increasing fall, injury and mortality rates caused by improper use of physical restraints, rules and procedures were developed on the use of physical restraints by the HCFA and JCAHO(12).

Also in India, a descriptive cross sectional survey was carried out among conveniently selected sample of nurses working in psychiatry departments at a tertiary care center. A majority of the participants hold positive attitudes towards rights of the patients. The mean score on this section was 30.8± 3.3 (ranged from 24 to 45) among persons with mental illness(24). Also another across sectional, descriptive study the country to assess the attitude of nurses towards the use of physical restraints, reveals that 76.6% staff nurses were having favorable attitude and 23.3% staff nurses were having unfavorable attitude towards the use of physical restraints on patients(25).

Similar study in Malaysia by *Fatemeh Eskandari*, 2017, the mean score of attitude was 24.13 (SD = 3.09), which was slightly below the mid- point of the possible range (10 to 40 points), may imply a moderate level of attitude. In total, 52.1% of nurses believed that the family members do not have

the right to refuse the use of PR(4). But the patient and family members have the right to refuse the use of PR even though which is important to the patient. The patient and their family should be engaged within discussions to inform them of the reason for choice of the restraint method (2).Their family members should be informed of the needs, risks and benefits of physical restraint before applying it.

In Egypt, physical restraint is a more conventional practice in ICUs without clear guidelines or hospital polices concerning application of physical restraint(26).A descriptive hospital based cross sectional study showed that nurses' attitudes towards the use of physical restraints, nurses` attitude means score was 12.23±1.86 it meant most of the nurses (83.3%), had an improper level of attitude related to the application of physical restraints among critically ill patients(1). A similar study conducted in South Africa, (74.3%; n=84) of participants agreed with the statement that by using physical restraints a patients' sedation can be reduced. The majority (53.1%; n=60) of nurse respondents indicated there was no time limit for an individual patient to be restrained in the unit(18).

In the use of physical restraint, the approach shown by nurses is of top priority and vital importance. So, it is considered that knowledge, attitude and practice of physical restraint are interrelated and may be positively or negatively affect one another. The absence of a scientific basis of an actively used procedure, demonstrates us the fact that nurses use physical restraint only on the basis of their experience and intuition(22).

2.4. Practice Regarding Physical Restraint Use

Patient care standards have been developed and regulations have been made in many countries. Yet, nurses who are expected to be careful about patients' autonomy believe in patient rights should have knowledge about these concepts in order to perform correct nursing practices.

A study in Istanbul, Turkey by *Hatice Kaya*, 2018 reported that nurses had good scores in practice. 91.8% of the nurses check the patients at least every two hours to make sure they are in the proper position and inspect the skin of the patient for abrasions or skin tears during bed bath a patient who is restrained(12).These findings are showed a good practice of nurses because monitoring patients with physical restraints is important to prevent complications. Patients need to be observed and monitored in order to decide whether to continue with the use of physical restraints.

Similarly in Konya University, Turkey a study by *Hatice Balci,* in the same year, PR was a common practice and they found that 91% of participants used physical restraint from time to time. In the study 36 nurses were detected to use physical restraint for 83% of patients at least once. By this study the negative outcome was 87.3% were found not to receive consents from families or relatives for the practice (22). In contrast, In India a vast majority of the nurses agreed that they would try alternative nursing measures before restraining the patients. (93%) of the nurses agreed that they always/sometimes try alternative nursing measures before restraining the patient(24).

Physical restraint used for different reason in different country. Still there is no uniform definition, guidelines and reasons for use. According to a study in Turkey, 44.9% participants were detected to use physical restraint in order to prevent patients from removing medical instruments(22).

Also a study in Egypt a reason for applying physical restraints was preventing patients from pulling medical devices attached to their bodies, reducing patients' resistance to care, and preventing patients from getting out of bed. According to this study the rate of physically restrained patients was higher in the neurology ICUs than in the other ICUs. By this study the most commonly used type of physical restraint was restraining the upper and the lower limbs, followed by bilateral wrist restraints, and then bedside restraints. Gauze bands and dressings were the restraint materials used in the ICUs (9).

Physical restraint products are not available because they are considered to be expensive. In the absence of policy and regulations for restraint use in the ICUs , nurses used the available resources to meet the need of patient care(9).

Also another study in 2017, only (20%) of nurses asses the site of restraint(26). According to another cross sectional study in Alshaab Teaching Hospital in 2018, it was documented that, total nurses` practice mean score regarding application of physical restraints for critically ill patients was 17.08±2.09. It was found that, about 91.7% of nurses had a satisfactory level of practice(1).

A study in Malaysia, Regarding nurses' practice towards physical restraint, the mean score of practice was 25.32 (SD = 4.81, ranging from 15–45). Only 37.5%of nurses reported that they always tried a few nursing methods before restraining the patient and 36.6% of nurses had never used alternatives before starting physical restraint. In total, 85.1% of nurses stated that before using physical restraint, they did not consider why they had to use restraint for the patients. In addition,

43.4% explained that they did not inform the patients of the reason for using the restraint device on them. However, more than half of the nurses (55.3%) always assessed the restrained patients at least every two hours during the restraint period(4).

2.5. Associated factors towards use of physical restraint

Clinical decision-making is a process of critical thinking and discriminative thinking patterns with varying influences that nurses have to face when making judgments about patient care (Banning, 2008), and influenced by different factors, such as clinical experience, education, interpersonal relationship, specialty, age, gender and environment(18).

Clinical experience is often discussed as the influential aspect in the clinical decision making process (Pretz & Folse, 2011; Ramezani-Badr et al., 2009). In a systematic review of 1317 articles, Banning (2008) found that most studies suggested clinical decision making improves with experience of nursing patients within a specific speciality and this nursing experience improves nurses clinical decision-making skills (18).

According a study in Konya Turkey, in attitude subscale scores, a negative and weak correlation was found between attitude scores, age (r=- 0.229) and the number of professional years (r=0.174), and the increase of these independent variables was detected to decrease attitude scores ($P<0.05$). Also increase of weekly working hours was determined to decrease practice scores (r=-0.243). But no significant association was found between gender, and nurses' information, attitudes and practice scores of nurses. In another study by Suen et al., it was found that a significant association was found between gender, and information, attitudes and practice scores of nurses, and information level of male nurses was higher than female nurses(22). But according to another study in Sakarya University Turkey found that their demographical characteristics such as age groups, gender, working year and education levels were not statistically significantly associated with restraint knowledge, attitudes or practices ($p>0.05$) (27).

According to a similar study in Malaysia there was an association between KAP and demographic characteristics. The results showed significant differences in knowledge scores between diploma and post-basic or degree nurses, as nurses who had post-basic or degree certification had higher knowledge scores ($p < .01$). Also, the result demonstrated a significant difference in practice scores between nurses who were aware of hospital policy and nurses who were not informed about hospital policy had higher mean practice score than others ($p < .04$). In addition, there was a

significant difference in knowledge and attitude scores between nurses who had previously studied any information source regarding physical restraint and nurses who had not; as nurses with previous knowledge had the highest mean knowledge ($p < .02$) and attitude scores ($p < .04$) towards physical restraint use(23).

Also in Egypt, a study reported that, there was statistical a positive correlation between nurses' gender and knowledge and practice only and a positive correlation between nurses' qualification and practice. Concerning to nurses' years of experience, the study documented that, there was a positive correlation between nurses' experience years and attitude and practice score(1). So this and other factors play a role for the high prevalence of physical restraint and poor nurses' knowledge, attitude and practice.

2.6. Conceptual framework of the study

The Conceptual framework of the study was developed after reviewing earlier similar studies to conceptualize the whole research process and to support as guide for tool development and analysis.

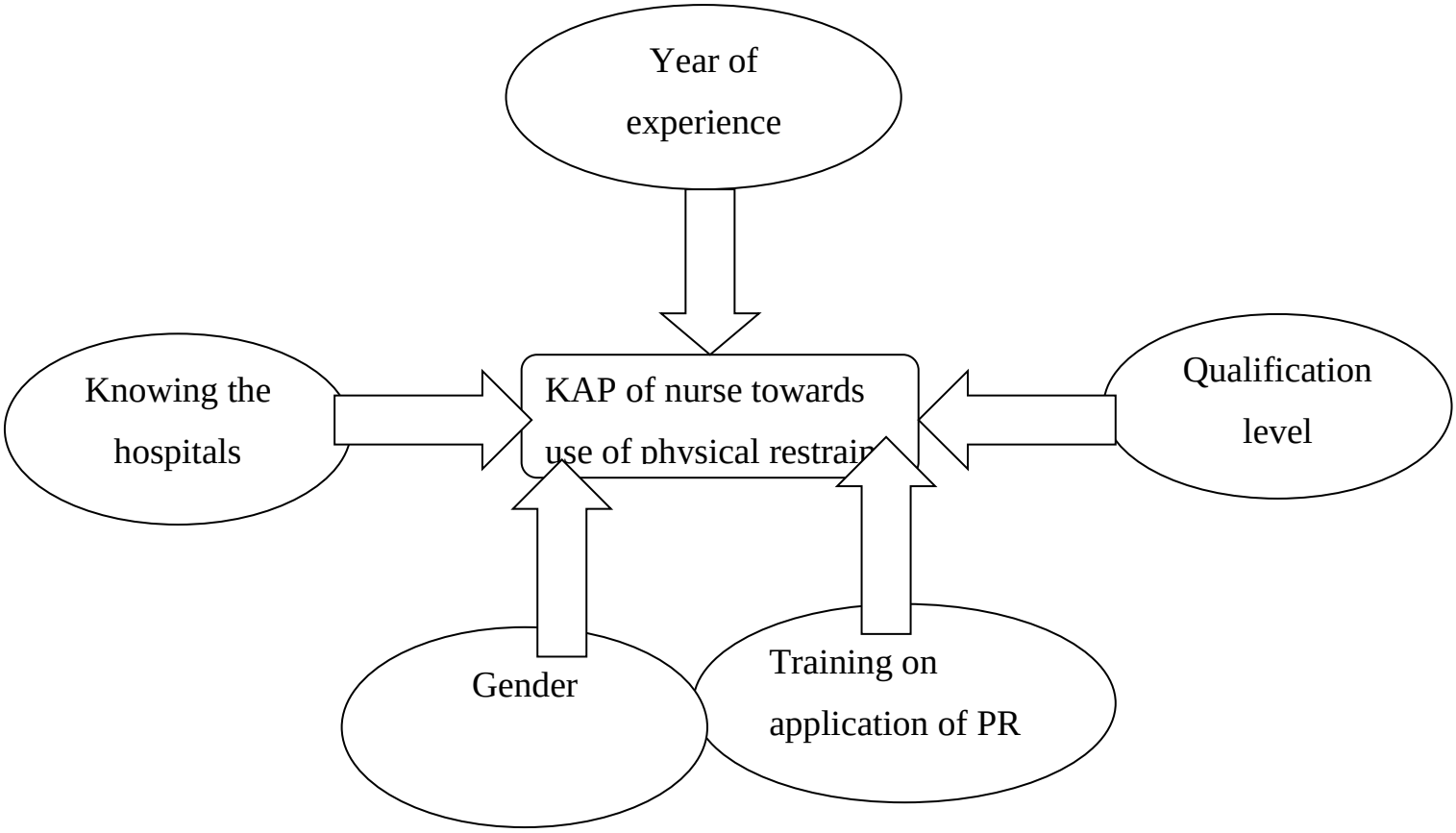

Figure 2: conceptual frame work

2.6. Research questions

1. What is the information level of nurses working in adult ICUs on using physical restraint?
2. What are the attitudes of nurses working in adult ICUs toward using physical restraint?
3. What are the physical restraint practices of nurses working in adult ICUs?
4. Are there any associations between Sociodimographic characteristics, and information, attitudes and practices related to physical restraint of nurses working in adult ICUs?

2.7. Significant of the Study

Physical Restraint is a common practice in different countries thought the world, Even though it has its own advantage and disadvantage. Only few countries have guidelines and policies regarding use of PR. Even WHO doesn't have a policy or guideline for this practice and also there is no enough research done on this area.

In Ethiopia, according to my observation physical restraint is a more conventional and common practice in ICUs, ED, Psychiatric department and at home traditionally without any guidelines or policies. For this practice still there is no any research don on it.

It is obvious that the educational needs of nurses can be revealed by an assessment of their knowledge, attitude and ongoing practices. In other words, before preparing and developing any educational programmes for nurses, we need to know about nurses' level of knowledge, attitude, intention and practice regarding physical restraints. Only then we can construct guidelines and target intervention strategies to reduce use of physical restraint or to ensure correct usage of physical restraint. So, the aims of this study was to examine knowledge, attitude and practice of nurses towards physical restraint use and to evaluate the relationship between demographic and professional data and knowledge, attitude and practice of nurses regarding physical restraint use.

Therefore, this study was very important to:-MOH to identify the need of the team nursing to education and training, and to consider legal issue for physical restraint. Health centers to prepare a guideline for physical restraint, also which is essential in preparing the qualified nurses and develop a good practice for physical restraint patients. This research also might be used as a benchmark for the next researchers to study the prevalence, complications and pattern.

3. OBLECTIVE

3.1. General objective

To assess the knowledge, attitude, practice and associated factors towards use of physical restraint among nurses working in AICUs of federally administered hospitals from March 8 to April 11, 2019 in Addis Abeba, Ethiopia.

3.2. Specific Objectives

To assess the knowledge of nurses working in adult ICU towards use of physical restraint

To determine the attitude of nurses working in adult ICU towards use of physical restraint.

To identify the practice of nurses working in adult ICU nurse towards use of physical restraint.

To explore associated factors towards use of physical restraint.

4. MATERIAL AND METHODOLOGY

4.1. Study Area and Period

The study was conducted from March, 11 to April 25, 2019 in the adult ICUs of four federally administered hospitals in Addis Abeba, Ethiopia. Addis Ababa is a capital city of Ethiopia with an attitude of 2300 m above sea level. Commonly known as capital city of Africa as a result of many head quarter of different international and regional organization such as Africa Union and UN-Economic Commission for Africa have found in the city. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Addis Ababa had a total population of 2,739,551 of whom 1,305,387 are males and 1,434,164 females. The estimated population of Addis Ababa in 2018 is 7.178 Million.

The city is divided into 10 sub cities and 99 woredas. In Addis Ababa there are 37 hospitals, two NGO, twelve governmental, and twenty three private hospitals. Out of twelve governmental hospitals ten of them have ICU. The city also has 29 Health centers, 116 private not for profit and 357 private for profit clinics. There are also three major organizations which give pre-hospital ambulance service.

There are four Federal hospitals they are, Black lion hospital, St.Paulos hospital, St Petros hospital and Alert hospital.

Black lion Specialized Hospital: - TikurAnbessa Specialized Hospital (TASH) established in 1972, the hospital was the only site for training Medical Doctors. In 1998, the TASH, the largest referral hospital in the country, with 700 beds, was transferred to the School by the Federal Ministry of Health, and it has since become a University teaching hospital. The TikurAnbessa Specialized Hospital (*Black Lion Hospital)* is now the main teaching hospital for both clinical and preclinical training of most disciplines. The TASH has 200 doctors, 379 nurses and 115 other health professionals dedicated to providing health care services.

Black Lion is a very large referral hospital and sees approximately 370,000- 400,000 patients a year but the exact number is not known. The emergency department sees around 80,000 patients a year. The hospital has 800 beds, with 169 specialists, 65 non-teaching doctors. It got eight major operating theatre rooms. The hospital is the largest teaching hospital for Addis Ababa University, School of Medicine in Ethiopia.

ALERT Medical facility: - ALERT is a medical facility on the edge of Addis Ababa, specializing in Hansen's disease, also known as "leprosy". ALERT is the continuation and expansion of the leprosy hospital originally built by Dr. Thomas Lambie in 1922. It was originally the All Africa Leprosy Rehabilitation and Training Center (hence the acronym), but the official name is now expanded to include tuberculosis: All Africa Leprosy, Tuberculosis and Rehabilitation Training Centre.

ALERT's activities focus on its hospital, rehabilitation of leprosy patients, training programs for leprosy personnel from around the world, and leprosy control (administration of the Ethiopian Ministry of Health's regional leprosy control program). From the beginning, ALERT provided leprosy training for medical students from Addis Ababa University. Also at ALERT is the Armauer Hansen Research Institute, founded in 1970, specializing in leprosy research. There is currently a 240-bed teaching hospital, which includes dermatology, ophthalmology, and surgery departments, also an orthopedic workshop, and rehabilitation program.

AaBET Hospital: is a newly established 250-bed and 12 ICU-bed teaching and public referral hospital in Addis Ababa, Ethiopia, affiliated with St. Paul's Hospital Millennium Medical College (SPHMMC). It has 36 nurses working in adult ICU.

St. Peter's TB specialized hospital: it was established in June, 1961 Gregorian Calendar (GC). It is a governmental hospital under Federal Democratic Republic of Ethiopia- Ministry of Health (FMOH). The hospital provides various services especially in tuberculosis diagnosis and treatment. It serves as a referral TB hospital in Addis Ababa, Ethiopia and has a vision to become Center of Excellence for diagnosis and treatment of TB in East Africa. There are a total of 24 nurses who are currently working in adult ICU.

4.2. Study Design

Institutional based descriptive cross-sectional study design was conducted in Federal hospitals in Addis Abeba Ethiopia in 2019.

4.3. Population

4.3.1. Source population

All nurses who are working in AICUs in Adds Abeba Governmental Hospitals.

4.3.2. Study population/ subject

All nurses who are working in adult ICU in federal hospitals in Addis Abeba Ethiopia.

4.3.3. Inclusion criteria

All nurses working in the ICU at the time of data collection

4.3.4. Exclusion criteria

Nurses on vacation, sick leave, annual leave during data collection and work experience less than six month not included in the study.

4.4. Sampling Method

4.4.1. Sampling technique

Census study was conducted in the four Federal hospitals in Addis Abeba Ethiopia.

4.4.2. Sample size determination

No need of sample size determination. Because the total population was taken. All nurses (126) in federally administered public hospitals of Addis Ababa (AaBET=36, TASH=41, ALERT=28, and St. Petro =21) were included in the study. That was 126 nurses in the ICUs of four federal hospitals.

4.5. Operational definition

Intensive Care Unit/Critical Care Unit: - This is a hospital unit where nurses, doctors, physiotherapists, occupational as well as speech therapists provide care for very ill patients needing ventilation and other devices to save their lives. Holistic care is thus provided with the use of technology.

Physical restraints: - Physical restraints are materials attached to a patient's body, which cannot be removed easily by the patient.

Critically ill patient: - Critically ill patients are characterized by having life threatening illnesses or injuries which necessitate continuous monitoring and intensive care. Furthermore, they have the possibility of developing the alteration in their level of consciousness as confusion.

Attitudes: - Refers to the nurses' opinions, perceptions as well as approaches to their patients or the way they think and feel about physical restraint. It was measured in section three of the questionnaire and it also consisted of a 3 point Likert scale. Proper Attitude represents more than 60%) score and we say improper attitude less than 60%) score.

Knowledge: - It is information or understanding of nurses about physical restraint. Poor level of knowledge score less than 50%), a fair level of knowledge it represents from50-75%) and good level of knowledge it represents (more than 75%) score.

Practice: - which represents the nurses' way of applying physical restraint. It could been defined as unsatisfactory, satisfactory and good practice scores of less than 50%, from 50 to 75% and more than 75% respectively.

But to use binary logistic regration knowledge & practice re- operationalized in to:

Knowledge: fair & poor knowledge with a cute point of 50%

Practice: good & unsatisfactory with a cute point of 75%

4.6. Variables

4.6.1. Dependent variables

Knowledge

Attitude

Practice

4.6.2. Independent variables

Age
Sex

Educational level

Year of experience

Income

Training

Hospital policy

4.7. Data collection method and instrument

The data was collected by using a self-administer semi- structured questionnaire which consists four parts:-

Part-1: Socio-demographic designed questionnaire was used to collect the demographic data related to nurses in the study.

Part-2: Structured designed questionnaire was used to collect the nurses' knowledge related to physical restraint. Which consists multiple choice questions; each question has 2 choices (Yes, I don't know or No) only one is correct.

Part-3: Structured designed questionnaire was used to collect the nurses' attitude related to physical restraint. Which consists multiple choice questions; each question has 3 choices (agree, disagree, and non-decided) only one is correct.

Part-4: Structured designed questionnaire was used to collect the nurses' practice related to physical restraint. Also which consists multiple choice questions; each question has 3 choices (always, sometimes, never) only one is correct.

The data was collected by trained Bsc nurses under supervision from March 11 to April 25/2019 at selected hospital's ICU in *Addis Abeba, Ethiopia*. Data quality was assured before, during and after data collection process.

Before data collection: objective based and standardized English version check list was prepared. Training was given for supervisor and data collectors on sampling procedures and data collection process.

During data collection: there was a close day to day supervision in the data collection process.

4.7.1. Validity and reliability of the tool

The questionnaire will be pre tested on 10% voluntary participants in the ICU's of Adama Referral Hospital to assess whether they understood the questions and how long it took to complete.

4.7.2. Scoring system

Part 2 nurses` knowledge regarding physical restraints among critical care patients

There are 13 items which include 10 correct questions 1 MCQ and 1 false question. Different responses scored as follows: 1 = Yes, 0 = I don't know & No

- The maximum score is 12 (1*12) (Respondents remained positive (i.e. Yes) to the positive statements & minimum score is 0 (0*12) (Respondents in this category remained negative (i.e. No). The knowledge was scored out of 12.
- Poor level of knowledge: (0-6 it represents (less than 50%)
- A fair level of knowledge :(7-9 it represents (from 50 to 75%)
- Good level of knowledge: (10-12 it represents (more than 75%)

Part 3 nurses` attitude regarding physical restraints among critical care patients. There are 11 items which include 9 correct questions and 2 false question scored by three point likert scale. Different responses scored as follows: 2 = Agree, 1=Non-decided & 0 = Disagree

- The maximum score is 22 (2*11) (Respondents remained positive (i.e. Agreed) to the positive statements & minimum score is 0 (0*11) (Respondents in this category remained negative (i.e. Disagreed).
- Proper Attitude: 14-22 it represents (more than 60%)
- Improper attitude: 0-13 it represents (less than 60%)

Part 4 Nurses` practice regarding physical restraints among critical care patients. There are 13 items which include 10 correct questions and 1 false question and 2 MCQ.

- **Different responses scored as follows: 2 = Always, 1=Sometimes & 0 = Never**
- The maximum score is 22 (2*11) (Respondents remained positive (i.e. Always) to the positive statements & minimum score is 0 (0*11) (Respondents in this category remained negative (i.e. Never). The practice was scored out of 11.
- Unsatisfactory practice: 0-11 it represented (less than 50%)
- Satisfactory practice: 12-16 it represented (from 50 to 75%)
- Good practice: 17-22 it represented (more than 75%)

4.8. Data analysis

The data was be checked for its completeness and was entered to epidata version 4.2 and analyzed using SPSS version 25 software with 95% CI. Frequency, percentage, means, median and standard deviation was used to describe the data using tables and figures. In addition, Pearson correlation

coefficient and binary logistic regression analysis was used to find whether knowledge, attitude, and practice might be associated with nurses' Sociodimographic charactetstics practice towards physical restraint use and association between dependent variables. Knowledge, attitude and practice (all variables with $p < 0.05$). P-value at 0.05 was used to determine significance regarding P-value > 0.05 to be statistically insignificant. P-value ≤ 0.05 to be statistically significant and P-value ≤ 0.001 to be highly statistically significant.

4.9. Ethical clearance

Ethical clearance was secured from Research Ethics Committee (REC). Letter of permission was obtained from the administration officials of the hospitals. Informed consent was obtained from selected hospital's ICU nurses prior to precede data collection from them. This was done after clear description of the objectives of the study and of its procedures. Then, each respondent was asked to check whether information provided on the purpose of the study had been adequately understood or not. Confidentiality of the information gotten from each participant was preserved. Participant had told that, there would been not expected any harm can happen to them because of joining this study.

4.9. Dissemination plan

This result of the study will be disseminated to MOH, ICU's of federal hospitals in Addis Abeba to provide information about Physical Restraint practice. In addition, it will be submitted to Addis Ababa University health science library and to department of emergency medicine. The study hopefully will be presented on seminars relating to this issue and will be published on international journals.

5. Result

5.1 Sociodemographic characteristics

Of total sample size which is126, the total number of respondents who were included in the study were112, with a response rate of 96.5%, some responses were discarded from the study because of lack of completeness others didn't include inclusion criteria.

Of nurses participating in the study, their age ranged from 21 to 60 years and mean age was 27.39 (±4.23); and, 50.9% were male, 64.3% were unmarried, and 94(83.9%) had bachelor degree. Most participants 70 (62.5%) had year of work experience 2-5 years and their average monthly income was 5098.21.

Table 1Socio-demographic characteristics of study group

Socio-demographic characteristics		Study group(n=112)	
		No.	%
Age in years	20-30	97	86.6
	31-40	14	12.5
	41-50	0	0
	>50	1	0.9
Gender	Male	57	50.9
	Female	55	49.1
Qualification	Diploma	12	10.7
	Bsc degree	94	83.9
	Msc degree	6	5.4
Work experience	Less than 5 years	90	80.4
	More than 5 years	22	19.7
Type of nursing position	Duty nurse	107	95.5
	Head nurse	2	1.8
	Unit manager	3	2.7
Monthly income in ETB	1000-5000	69	61.6
	5001-10000	42	37.5
	>10000	1	0.9
Marital states	Married	38	33.9%
	Unmarried	72	64.3%
	Divorced	2	1.8%

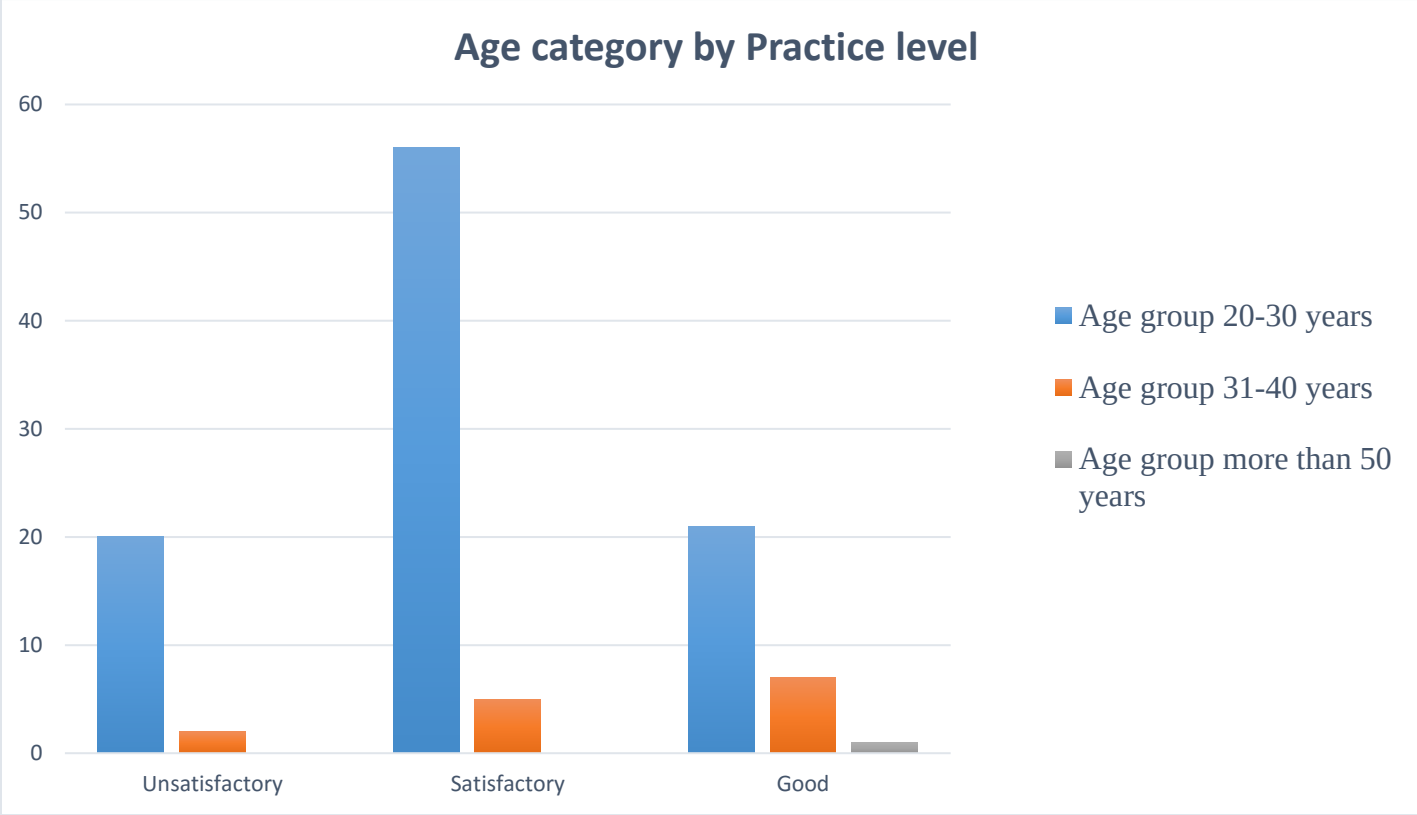

Figure 3Figure 3 Participant age group by Practice level

5.2 | Knowledge regarding physical restraint use

Total of 112 nurse 79(70.5%) use physical restraint in their unit. Among them only 34(30.4%) have a written policy and 33(29.5) reported having received training on application of physical restraint. More than half of participants knew the reason of physical restraint, 61(54.5%) answered the question "*physical restraint allowed to protect patients or others from injury*". They knew the complications of physical restraint, from the total 70(62%) answered that chocking may happen if patient restrained while lying flat in bed and 66(58%) had information on recording physical restraint. 71(63.4%) nurses knew that physical restraint is not the only option to calm patients. Sedation is the commonest alternative for physical restraint that was 47 (42%).

On the contrary, a majority of nurses answered the following items about physical restraint as follows: of total 70(62.5%) didn't know about legal punishment of inappropriate use of physical restraint, more than half, 60(53.6%) didn't have time limitation, 59(52.7%), didn't examine restrained patients fluently and 62(55%) answered that confusion and disorientation are a good reason for physical restraint.

Table 2- Selected items measuring knowledge on the use of physical restraint (N=112

Statements	Yes N (%)	No N (%)	I don't know N (%)	Mean ± SD
Do you use physical restraints in your unit	79(70.5)	33(29.5		1.29±0.458
Does your unit have a written policy on the use of physical restraint?	34(30.4)	51(45.5)	27(24.1)	1.94± 0.74
Do you have any training on how to apply a physical restraint?	33(29%)	73(65.2%)	6(5.4%)	1.76±0.54
Do you know Physical restraint is only allowed to protect patients or other people from injuries?	61(54.5%)	40(35.7%)	11(9.8%)	1.55±0.67
Do you know there may be danger of choking if a patient restrained while lying flat in bed.	70(62.5%)	28(25%)	14(12.5%)	1.5±0.71
Do you know restraints should be released every 2 hours, if the patient is awake**?**	53(47.3%)	42(37.5%)	17(15.2%)	1.7±0.73
Do you know alternatives to restraints**?**	70(634%)	41(36.6%)	5(4.5%)	1.4±0.58
Is there a limited time that an individual patient can be restrained in your unit?	52(46, 4%)	45(40.2%)	15(13.4%0	1.67±0.7
Confusions and disorientations are good reasons for the use of physical restraint	62(55.4%)	31(27.7%)	19(17%)	1.62±0.76
Nurses can be punished for threatening the patients if they use physical restraint when it is not required	42(37.5%)	49(43.8%)	21(18, 8%)	1.8±0.73
Records of usage should be kept for each patient who is restrained in every shift	66(58.9%)	26(23.2%)	20(17.9%)	1.6±0.78
Only in emergencies, nurses are allowed to use the physical restraint on patients without any doctor's instruction	60(53.6%)	40(35.7%)	12(10.7%)	1.6±0.7

There were 12 knowledge questions about PR and level of Knowledge of nurses was calculated Out of 12. The mean score and standard deviation of knowledge of the nurses working in adult ICUs on the use of physical restraints was (6.1±2.61), with possible range of (0-12) which is almost at the midpoint of the possible range (0–12 points).

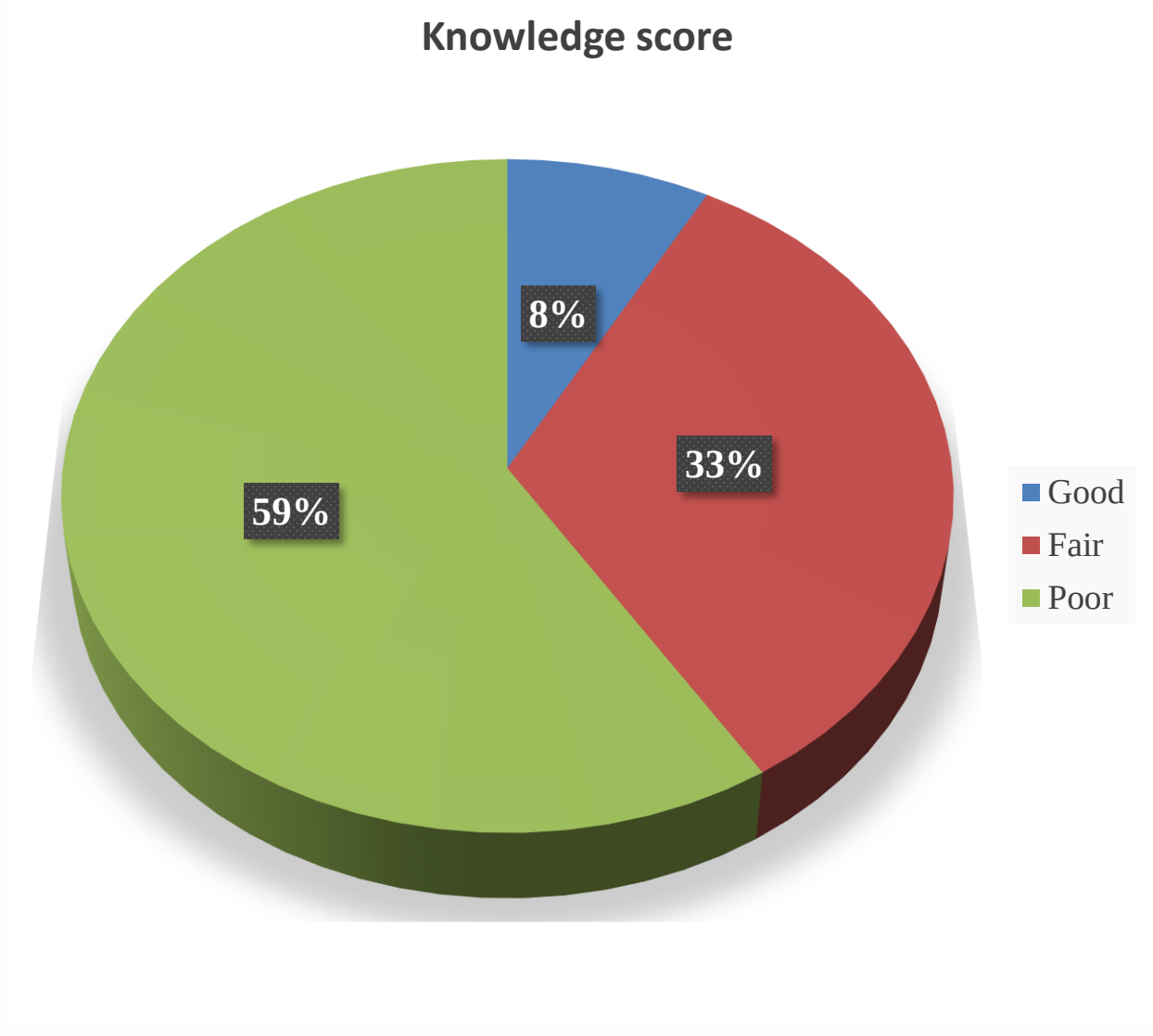

Figure 4Category of nurses' knowledge regarding physical restraint *(n=112)*

5.3 Attitude regarding physical restraint use

Regarding the attitude of nurses working in the adult ICUs towards physical restraint use, the mean score and standard deviation was 14.1± 3.(64%), which is slightly above the mid- point of the possible range (0 - 22 points). The results showed that most of the nurses answered affirmatively to the subsequent items: of total 67(59%) of nurses believed that the family members have the right to refuse the use of restraints, 68(60.7%) of nurses stated that physical restraint should be prescribed, Moreover, 60(53.6%) of participants explained that if they were patients they felt that they have the right to refuse physical restraint, 70(62.5 %) expressed feeling discomfort when they restrained patients, 66(58.9%) felt embarrassed when family members entered restrained patient's room., 75(67%) of participants believed that the hospitals are responsible to adhering to the laws of PR to ensure patients safety. 61(54.4% reported that they agreed with a question "It is important to apply restraints to assure legal protection for myself and my center", 62(55.4%) agreed with physical restraint may increase the risk of strangulation", In contrast, almost half of participants 55(49.1%) believe that physical restraint may decrease nursing care time.

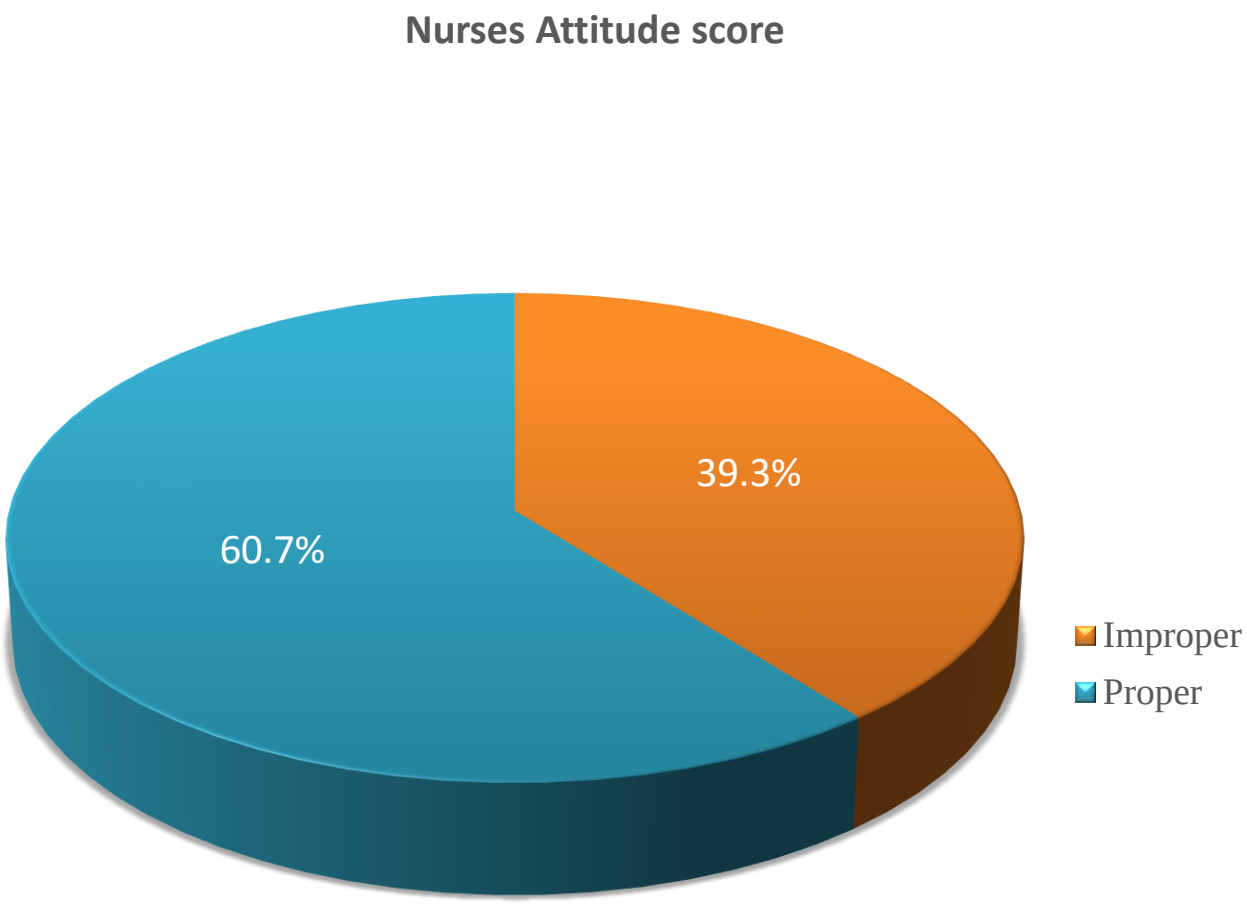

Figure 5. Category of nurses attitude regarding physical restrain (n=112)

Table 3- Selected items measuring attitude on the use of physical restraint (N=112)

Statements	Agree N (%)	Disagree N (%)	Non decided N (%)	Mean ±SD
Do you think that family members have the right to refuse the use of PR?	67(59.8%)	17(15.2%)	28(25%)	1.7±0.85
Do you think that a PR should be prescribed by a responsible body?	68(60.7%)	18(16.1%)	26(23.2)	1.63±0.84
If you were a patient, do you think that you have the right to refuse being restrained?	60(53.6%)	39(34.8%)	13(11.6%)	1.6±0.7
Do you feel discomfort when you placing a patient on restraint?	70(62.50)	27(24.1%)	15(134%)	1.51±0.72
Do you feel embarrassed when family members enter the restrained patient's room when they have not been informed?	66(58.9%)	36(32.1%)	10(8.9%)	1.5±0.66
The hospital is responsible to adhering to the laws on the use of restraints to ensure the safety of a patient.	75(67%)	21(18.8%)	16(14.3%)	1.5±0.74
Do you feel uncomfortable if a patient becomes more upset after being restrained?	74(66.1%)	31(27.7%)	7(6.3)	1.4±0.6
Do you think that placing a patient in restraints can decrease nursing care time?	55(49.1%)	50(44.6%)	7(6.3%)	1.6±0.6
Patients suffer from feeling inferior when they are restrained.	58(51.8%)	39(34.8%)	15(13.4%)	1.6±0.7
Do you think it is important to apply restraints to assure legal protection for yourself and your center?	61(54.5%)	37(33%)	14(12.5%)	1.6±0.7
Do you believe that restraints increase the risk of strangulation?	62(55.4%)	39(34.8%)	11(9.8%)	1.5±0.67

5.4. Practice regarding physical restraint use

Regarding nurses' practice towards physical restraint, the mean score and standard deviation of practice was 13.9± 3.8, ranging from 0-22). In this section 50(44.6%) of participants reported that they always tried a few nursing methods before restraining the patient and 59(52%) tried to found a reason for physical restraint. 53 (47.3%) always respond restrained patent's call for help and 48(42.9%) always examine restrained patient frequently. Almost two third of participants, 85(75.9%) restrain patients when they faced staff shortage and only 34(30.4%) of Nurses record always the type, reason and time of physical restraint use. In physical restraint application, the most commonly used materials were Gauze 72(58.1%), bed sheet 32(25.8%) and only 18(14.5%) use commercially prepared belts and most participants highlight the wrists83(50.9%), ankle 35(21,5%), chest30(18,4%) and waist 15(9.2%) as parts of the body to immobilize.

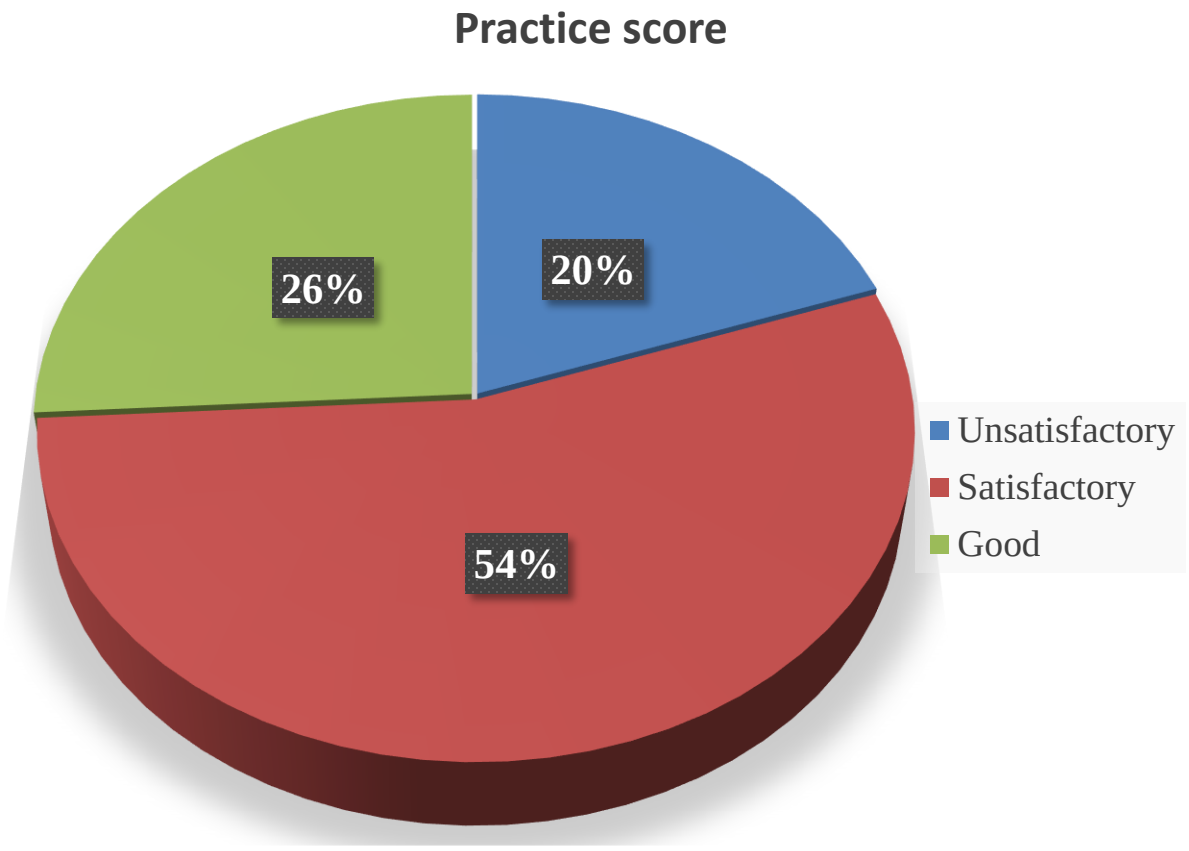

Figure 6: Categories of nurses practice regarding physical restraint (n=112)

Table 4- Selected items measuring practice on the use of physical restraint *(N=112)*

Statements	Always N (%)	Sometimes N (%)	Never N (%)	Mean ±SD
Do you try a few nursing methods before physically restraining the patient?	50(44.6%)	56(50%)	6(5.4%)	1.6±0.59
Before using the PR on the patient, do you will find out why you need to do it?	59(52.7%)	39(34.8%)	14(12.5%)	1.6±0.7
Did you respond to the patients call for help from a restrained patient immediately?	53(47.3%)	47(42%)	12(10.7%)	1.6±0.67
Did you examine restrained patients at least on a two-hour basis?	48(42.9%)	47(42%)	17(15.2%)	1.72±0.7
When giving personal care to the restrained patients, did you examine their skin to find parts, which are red or bruised?	64(57.1%)	36(32.1%)	12(10.7%)	1.54±0.68
Did you tell the patients why they are restrained?	45(40.2%)	56(50%)	11(9.8%)	1.7±0.64
Did you tell the family members/visitors why the patient is restrained?	50(44.6%)	52(46.4%)	10(8.9%)	1.64±0.64
Did you restrain patients when you faced a staff shortage?	38(33.9%)	47(42%)	27(24.1%)	1.9±0.75
Did you record the type of restraint, reason and the time on the card?	34(30.4%)	41(36.6%)	37(33%)	2±0.79
Did you assess the restrained patient frequently if the restraint should be removed?	45(40.2%)	47(42%)	20(17.9%)	1.78±0.73
Did you evaluate and record the effect of physical restraint when applied to a patient?	53(47.3%)	32(28.6%)	27(24.1%)	1.77±0.8

Table 5. Association of demographic charactetstics with knowledge, attitude & practice

Socio-demographic characteristics		No.	Knowledge score Mean ± SD	Attitude scores Mean ± SD	Practice score
Age in years	20-30	97	5.96±2.67	14.1±3.1	13.7±3.7
	31-40	14	6.78±2	14.3±2.94	15.2±4.2
	>50	1	9	16	17
Pearson' correlation coefficient(r)			0.23	0.115	0.216
P- value			0.015	0.229	0.022
Gender	Male	57	5.8±2.83	14.1±3.6	14±3.8
	Female	55	6.4±2.35	14.2±2.4	13.7±3.8
Pearson' correlation coefficient(r)			0.114	0.059	-0.038
P- value			0.23	0.53	0.6
Marital states	Married	38	6.36±2.31	13.8±3.1	14±3.76
	Unmarried	72	5.94±2.76	14.3±3	13.7±3.8
	Divorced	2	6.5±3.53	15±4.2	17
Pearson' correlation coefficient(r)			-0.064	0.031	0.007
P- value			0.49	0.75	0.9
Work experience	6month-1 year	20	5.55±2.66	14.5±3.6	13.5±3.9
	2-5 years	70	6.2±2.7	13.9±2.8	14±3.4
	6-10 years	19	6.15±2.24	14.5±3.6	13.5±4.9
	>10 years	3	7±2.64	14±2.6	14±5.2
Pearson' correlation coefficient(r)			0.09	0.026	0.033
P- value			0.34	0.78	0.73
Level of education	Diploma	12	6.16±1.94	15±3.1	14.5±3.2
	Bachelor of degree	94	6±2.73	14.1±3	13.7±3.89
	Masters of degree	6	6.8±1.7	13.3±2.4	14.5±3.9
Pearson' correlation coefficient(r)			0.031	0.06	-0.021
P- value			0.74	0.5	0.8
Presence of guideline	Yes		7.3±2.7	14.1±3.4	14.1±3.4
	No		5.5±2.4	13.9±2.8	13.7±3.9
Pearson' correlation coefficient(r)			-0.34	-0.052	-0.12
P- value			0.001	0.5	0.2
Taking training	Yes		7.6±2.4	14.7±3.4	14±3.3
	No		5.4±2.4	13.9±2.9	13.8±4
Pearson' correlation coefficient(r)			-0.34	-0.88	-0.03
P- value			0.001	0.3	0.7

Table 6: Bivariate and multivariate analysis of factors with knowledge on PR among participants

Variables		Poor knowledge	Fair knowledge	P-value	UOR(95% CI)	P-value	AOR (95% CI)
Training on PR	Trained	11	22	0.061	2	0.6	2.8
	Non trained	52	21	0.001	0.2(0.083,0.49)	0.000	0.2(0.1,0.5)
	Don't remember	3	3	0.4	0.5(0.09,2.9)	0.44	0.5(0.09,2.9)
Written policy & guideline	Have	13	21	0.17	1.62	0.2	
	Don't have	34	17	0.011	0.31(0.125,0.76)	0.1	2.5(0.8,8)
	They don't know	19	8	0.014	0.26(0.09,0.8)	0.6	1.3(0.4,3.5)

Table 7: Bivariate and Multivariate analysis of factors associated with practice on PR among study participants.

Variables		Unsatisfactory practice	Good practice	P-value	UOR	95% CI		P- value	AOR (95% CI)
						Lower	Upper		
Age in years	21-30	76	21	0.001	0.3			0.000	0.3
	31-40	7	7	0.029	3.6	1.14	11.5	0.029	3.62(1.14,11.5)
	≥41	0	1	1					

5.5. Association between knowledge, attitude and practice of nurses towards physical restraint

Pearson correlation coefficient showed there was a positive correlation between attitude (p <0 .001), r= 0.34 and practice (p < 0.001), r-0.31 with knowledge of nurses towards physical restraint. Therefore, these variables were entered into the binary logistic regression model to determine which variables are associated with nurses' practice

Table 8: Association between practice & knowledge

Variables		Unsatisfactory practice	Good practice	P-value	UOR	95% CI		P- value	AOR (95% CI)
						Lower	Upper		
knowledge category	Good	5	4	0.064	4	0.9	17.3	0.064	4(0.9,17.3
	Fair	23	14	0.019	3.04	1.2	7.7	0.019	3(1.2,7.7)
	Poor	55	11	0.000	0.2			0.000	0.2

Table 9: Association between Attitude and practice

Variables		Improper attitude	Proper attitude	P-value	UOR(crud ratio	95% CI		P- value	AOR (95% CI)
						Lower	Upper		
Practice category	Unsatisfactory	14	8	0.2	0.57			0.2	
	Satisfactory	21	40	0.02	3.3	1.2	9.2	0.02	3.3(1.2,9.2)
	Good	9	20	0.023	3.88	1.2	12.5	0.023	3.9(1.2,12.5)

6. Discussion

Most critically ill patients may have multiple traumas, or other diagnosis can lead to the possibility of alteration in level of consciousness as confusion and agitation, which lead to harming themselves and others. So application of physical restraint is helpful in order to avoid patients' treatment interference and sedation side effects. However physical restraint has its own complications if we don't apply wisely. Assessment of nurse's knowledge, attitudes, and practice regarding physical restraint is very important in gathering information about the current and future nursing care to ensure the quality of care provided to patient and recognizing its weakness and strength(1).

6.1. Regarding to socio-demographic characteristics of participants

The current study documented that male and female were evenly distributed that was 50.9% and 49.1 respectively. unlike other studies done in, Johannesburg by M.E Maleho,2018 (28) the study reported that majority of the nurse respondents were females they accounted 81.4%. Other studies, Menoufia University, Egypt by Abeer El-Said Hassane El-sol,2018 (1) and Konya,Turkey by Hatice Balci, 2018,(1) (29) they stated, most of their participants were female. Regarding to age, education level and experiences years among the respondents, the study reported that, the majority of participants were age in between 21-30 years old and had bachelor degree in nursing, and have a professional experience of 2-5 years. These findings are similar with other studies conducted with nurses in Johannesburg by *M.E Maleho,2018* (28) , in Egypt by Nahed Attia Kandeel, 2013 (9) and . in Istanbul Turkey by Hatice Kaya,2018 (12) .They stated that most participants had professional experience of 1-5 years and 2-5 years. This result indicated that young and less experienced nurses are employed in tertiary hospitals ICU. Regarding to participants marital states most of them were unmarried.

6.2. Nurses` knowledge about application of physical restraint.

In our study, in relation to physical restraint use 70.5% of participants use physical restraint in their unit. This result is lower than a study in Konya, Turkey by Hatic Balci,2018 (29), he reported that 98% of nurses use physical restraint. By current study majority of nurses not received any previous training about physical restraints, only 29.5% of participants had received a training and 30.4% reported that they had a guideline or a written policy for the use of physical restraint. These result supported by a study in Egypt by Abeer El-Said Hassane El-sol, 2018 (1), and in South Africa by

Sebastiana Z. Kalulal,2016 (19). In Egypt they reported that, only 13% of the nurses reported having received training as student on the use of physical restraint & only 39% of nurses knew of a hospital policy on the use of restraint. These implied that physical restraint is practiced without a guideline and educational background.

The present study reported that, mean of total nurses` knowledge score was (6.1±2.61) 50.8% which reflected that they had a poor level of knowledge towards application of physical restraints. These finding was lower than other studies that revealed almost moderate level of knowledge of nurses regarding physical restraint use, in Egypt, Abeer El-Said Hassane El-sol, 2018, knowledge score was 7.85±1.86 (1),. *Konya,Turkey by Hatice Balci, 2018, (29)* was 7.1 ±1.7(29), in Malaysia by *Fatemeh Eskandari,2017* the mean score was 40.48 (SD = 4.05) (4) and in Istanbul Turkey by Hatice Kaya, 2018 the mean knowledge score of the nurses was 7.83±1.59 (12). These significant difference may be due to lack of written policy and guideline for use of physical restraint and the nurses didn't take appropriate training about application of physical restraint. And a majority of nurses didn't understand about physical restraint in answering the following items: (53.6%) didn't have a time limitation for releasing restrained patients, findings from this study was similar with a study in Johannesburg by *M.E Maleho,* 2018 there was no agreement about the time that an individual patient could be restrained. The period the respondents indicated ranged from "15 minutes to days"(28). (62.5%) of participants didn't have information about legal punishment and (55.4%) answered that confusion and disorientation are good reasons to use of physical restraint (Table 5).

6.3. Attitude of nurses regarding physical restraint use

The current study showed that, the mean score of nurses' attitude regarding use of physical restraints was 14.1 (SD = 3.1), it meant most of the nurses had proper level of attitude related to the application of physical restraints. These findings are higher than the findings of *Abeer El-Said Hassane El-sol,* 2018, that was 12.23±1.86, he reported that most of the nurses had an improper level of attitude. Also he reported that, high percentage of the participant nurses in his study had a negative attitude regarding the application of physical restraints among ICUs patients. And similar with the findings of Fatemeh *Eskandari,* 2017 that was (*24.13±3.09, 10-40),* and *Hatice Kaya, 2018 that was (*30.00±4.82, 16- 48), they reported that their result represents moderate level of nurses

attitude regarding physical restraint use. But slightly lower than Hatice Balci, 2018 that was 31.8 (4.6).

In this study Most of the nurses agreed with the following statements evaluating their attitudes: 70(62.5% "*I feel guilty placing a patient in restraints*" but in the study of *Hatice Kaya, 2018* (12) only 39% of participants answer this question correctly, in *Fatemeh Eskandari 2017* (4), *25.5% of participants* answered the question. 67(59.8%) of participants answered question *" I think family members have the right to refuse physical restraint use"* , In Egypt a study by Abeer El-Said Hassane El-sol,2018 (1) only 5% of nurses answered this question in Malaysia by *Fatemeh Eskandari*, 2017, 22.7% of participants answered the question. For question*" I think physical restraint should be prescribed"* 68(60.7%) of participants answered the question. For question *" I feel PR increase the risk of strangulation"* 62(55.4%) of study participants answered.

These results indicated that the nurses had proper attitude on the use of physical restraint and they are familiar with some complications of application of physical restraint. But in Istanbul Turkey by Hatice Kaya,2018(12)(12) only 27.9% of nurses answer the question " I feel PR increase the risk of strangulation " (12).

On the contrary, a majority of nurses had improper attitude answering the following items: *" I feel application of physical restraint is important to assure legal protection of self and my center "* this finding demonstrates that the participants strongly believe that physical restraint is the only and best way to protect both patients and staff from harm. Therefore, their attitude is affected by these negative thoughts and inadequate knowledge.

6.4. Practice of nurses regarding physical restraint use

In this the total nurses` practice mean score regarding application of physical restraints was 13.9 (SD =3.8, ranging from 0-22). Which is 63.2% represented satisfactory practice level. These result is in line with studies of *Abeer El-Said Hassane El-sol,2018* (1), and *Fatemeh Eskandari 2017* (4). They reported as satisfactory or moderate level of practice score of nurses. But lower than *Hatice Kaya 2018* (12) which had a good level of practice score that was 85.7% (12). By our study, in this section more than half of participants reported that they always find a reason for physical restraint before using it and only 44% of participants always tried few nursing methods before physical restraint. Another gap identified by current study was 33% of nurses always and 42% sometimes

restrain a patient when they faced a staff shortage. Majority of participants didn't record the time and type of physical restraint on the patient card. The result showed that they practice physical restraint traditionally without considering the complications.

6.5. Association between knowledge, attitude and practice of nurses towards physical restraint

In the use of physical restraint, the approach shown by nurses is of top priority and vital importance. So, it is considered that knowledge, attitude and practice of nurses are interrelated and may be positively or negatively affect one another.

6.6. Relationship among socio-demographic characters & nurses` knowledge, attitude & practice regarding physical restraints.

The findings of the this study revealed that, there was no statistical significance between nurses' educational level and knowledge, attitude and practice these results agreed with a studies of *Abeer El-Said Hassane El-sol,2018* he reported that, there were non-significant differences in knowledge score between nurses had a diploma and bachelor degree in nursing (1). But different from a study in Malaysia by *Fatemeh Eskandari*, 2017 the result showed significant differences in knowledge scores between diploma and post-basic or degree nurses, as nurses who had post-basic or degree certification had higher knowledge scores ($p < .01$) (4).

In our study, no significant association was found between gender, educational level and knowledge, attitudes and practice scores of nurses. This result was similar with Hatice Balci, 2018 (29), but different from findings in another studies by *Abeer El-Said Hassane El-sol,2018* it was found that a significant association was found between gender, and knowledge and practice scores of nurses, and knowledge level of male nurses was higher than female (1).

By current study there was statistical significance difference between nurses' age group with practice only. From the variables associated with practice of nurses in the bivariate logistic regression; age was statistically significant to predict practice of nurses in the multivariable logistic regression. Participants with age group of 31-40 years were 3.6 times knowledgeable than age group of 21-30. While Abeer El-Said Hassane El-sol, 2018 reported that, there was no statistical significant correlation between nurses' age and practice.

Current study also found association between nurses' knowledge and absence of a written policy and lack of training on application of physical restraint. Participants those have not got previous training on PR had 2.6 times less knowledge than trained one. This result was similar with other study in Johannesburg by *M.E Maleho, 2018* he reported that *policy and guidelines on the use of physical restraints guides health practitioners in the management of patients* (28). In Malaysia by Fatemeh Eskandari, 2017, he reported that a significant difference in knowledge score between nurses who had previously studied any information source regarding physical restraint and nurses who had not; as nurses with previous knowledge had the highest mean knowledge ($p < .02$) towards physical restraint use (4).

The current study found a statistical correlation between dependent variables. In the Bivariate logistic regression analysis the variables found to be significantly associated each other.

The study revealed that nurses with a fair level of knowledge, will improve their practice level by 3 times more than those with poor level of knowledge. Between attitude and practice, nurses with a good level of practice and satisfactory practice may have 3.9 and 3.3 times more proper attitude than unsatisfactory respectively. This result is similar with Fatemeh Eskandari,2017 (4) This implied that nurses' practice level improved with proper attitude.

7. Limitation of the study

1. Trying to assess practice by interview that lead to bias. It might be better if assessed by direct observation.

2. The study period and area was crowded because many under and post graduate students were collecting data at the same time. That made respondents resistant to provide real data.

8. Conclusion

The present study concluded that, there was a poor level of nurses' knowledge, proper attitude and satisfactory practice towards physical restraints. Moreover, there was no statistical correlation between nurses' gender, educational level, year of experience and knowledge, attitude & practice. There was a positive correlation between nurses' age and practice only also knowledge with the absence of a guideline and a written policy and lack of training. Finally there was statistically a significance association between the dependent variables. That was between nurses' knowledge and practice score.

9. Recommendation

- **For nurses:**
  - ✓ It's better to nurses fill their knowledge gap on application of physical restraint and develop the feeling of empathy
- **For hospital administrators/ ICU**
  - ✓ It is better to minimize nursing workload through adequate staffing
  - ✓ It is better to provide ongoing training on physical restraint for ICU nurses
  - ✓ It's better to prepare protocols and guidelines for physical restraint in ICUS
- **For Department of emergency medicine**
  - ✓ It's better to provide ongoing training and support for nurses about physical restraint in critically ill patients in collaboration with hospitals.
- **For Federal Ministry of Health**
  - ✓ FMOH is expected to emphasize on physical restraint practice & its complication
  - ✓ It's better to revise the curriculum of undergraduate & post graduate to incorporate about physical restraint.
- **For researchers:**
  - ✓ It is better to conduct observational studies to explore practice of physical restraint
  - ✓ It's better to study the prevalence and complications of PR

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8. APPENDIX

Appendix -1. Consent form

ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE DEPERTEMENT OF EMERGENCY MEDICINE AND CRITICAL CARE

ASSESSMENT OF KNOWLEDGE, ATTITUDE, PRACTICE & ASSOCIATED FACTORS TOWARDS USE OF PHYSICAL RESRAINT AMONG NURSES WORKING IN AICU IN ADDIS ABEBA FEDERAL HOSPITALS, ETHIOPIA, 2019.

Dear respondent my name is _____. I am working as data Collector for the study being conducted in this facility by Lielt Mersha who is studying her Master degree at Addis Ababa University, College of Health Science and Department of Emergency Medicine.

I am disseminating a self-administer questionnaire to nurses working in AICU about assessing their knowledge attitude, practice and associated factors towards use of physical restraint in order to generate information necessary for quality of patient care and to provide feedback to policy makers and other researchers to draw base line finding for further investigation in the area. To attain this objective, your cooperation to be honest and genuine participant by responding to the question prepared is very important and highly appreciated.

Name of Principal investigator=Lielt Mersha

Address: Tell +251925279782

E-mail:lieltmersha@gmail.com

Name of data collector_____

Signature _____

Checked by:

Supervisor Name_____signature_____Date_____

Appendix.2. Data collection tool

This questionnaire has four parts which assess the socio-demographic or background data of the participants and level of, knowledge, attitude and practice. This is adapted from a study done in Egypt and Malaysia on the tittle and modified in our context. The language is in English version because the participants can understand the language so no need of changing into Amharic version.

Instruction: Choose and Circle the answer that seems best for you from the alternatives that give to you.

Part one I: Socio demographic characteristics

No	Variables/questions	Alternatives
1.1	Age in years	_____
1.2	Sex	1/ Male 2/ female
1.3	work experience	1/ 6month-1 year 2/ 2-5 years 3/6-10 years 4/ 11-15 years 5/ >16 years
1.4	level of education	1/ Diploma 2/ Bachelor Degree 3/ Master's Degree
1.5	Income in ETB	_____
1.6	current nursing position	1/ Duty Nurse 2/ Head nurse 3/ unit manager 3/ If others _____
1.7	Which intensive care unit do you work in	1/ Multidisciplinary 2/ Neuro -surgery 3/ Trauma 4/ Medical

Part II:-Question which assess the knowledge part

No	Variables/questions	Alternatives
2.1	Do you use physical restraints in your unit	1/ yes 2/ No
2.2	Does your unit have a written policy on the use of physical restraint?	1/ yes 2/ No 3/ I don't know
2.3	Do you have any training on how to apply a physical restraint?	1/ yes 2/ No 3/ I don't know
2.4	Do you know Physical restraint is only allowed to protect patients or other people from injuries?	1/ yes 2/ No 3/ I don't know
2.5	Do you know there may be danger of choking if a patient restrained while lying flat in bed.	1/ yes 2/ No 3/ I don't know
2.6	Do you know restraints should be released every 2 hours, if the patient is awake**?**	1/ yes 2/ No 3/ I don't know
2.7	Do you know alternatives to restraints**?**	1/ yes 2/ No 3/ I don't know
2.8	If yes, what kind of restraint do you know	1/ sedation, 2/ massaging 3/ family involvement 4/ frequent monitoring
2.9	Is there a limited time that an individual patient can be restrained in your unit?	1/ yes 2/ No 3/ I don't know
2.10	Confusions and disorientations are good reasons for the use of physical restraint	1/ yes 2/ No 3/ I don't know
2.11	Nurses can be punished for threatening the patients if they use physical restraint when it is not required	1/ yes 2/ No 3/ I don't know
2.12	Records of usage should be kept for each patient who is restrained in every shift	1/ yes 2/ No 3/ I don't know
2.13	Only in emergencies, nurses are allowed to use the physical restraint on patients without any doctor's instruction	1/ yes 2/ No 3/ I don't know

Part III: Question which assess the attitude of nurses

No	Variables/Questions	Alternatives
3.1	Do you think that family members have the right to refuse the use of physical restraints?	1/Agree 2/Non- decided 3/Disagree
3.2	Do you think that a physical restraint should be prescribed by a responsible body?	1/Agree 2/ Non- decided 3/ Disagree
3.3	If you were a patient, do you think that you have the right to refuse being restrained?	1/ Agree 2/ Disagree 3/ non decided
3.4	Do you feel discomfort when you placing a patient on restraint?	1/ Agree 2/ Disagree 3/ non decided
3.5	Do you feel embarrassed when family members enter the restrained patient's room if they have not been informed?	1/ Agree 2/ Disagree 3/ non decided
3.6	The hospital is responsible to adhering to the laws on the use of restraints to ensure the safety of a patient.	1/ Agree 2/ Disagree 3/ non decided
3.7	Do you feel uncomfortable if a patient becomes more upset after being restrained?	1/ Agree 2/ Disagree 3/ non decided
3.8	Do you feel that placing a patient in restraints can decrease nursing care time?	1/ Agree 2/ Disagree 3/ non decided
3.9	Patients suffer from feeling inferior when they are restrained.	1/ Agree 2/ Disagree 3/ non decided
3.10	Do you think it is important to apply restraints to assure legal protection for yourself and your center?	1/ Agree 2/ Disagree 3/ non decided
3.11	Do you believe that restraints increase the risk of strangulation?	1/ Agree 2/ Disagree 3/ non decided

Part IV: - Questions which assess the practice of nurses towards use of physical restraint

No	Variables/questions	Alternatives
4.1	Do you try a few nursing methods before PR the patient?	1/ Always 2/ sometimes 3/ never
4.2	Before using the physical restraint on the patient, do you will find out why you need to do it?	1/ Always 2/ sometimes 3/ never
4.3	Did you respond to the patients call for help from a restrained patient immediately?	1/ Always 2/ sometimes 3/ never
4.4	Did you examine restrained patients at least on a two-hour basis?	1/ Always 2/ sometimes 3/ never
4.5	When giving personal care to the restrained patients, did you examine their skin to find parts, which are red or bruised?	1/ Always 2/ sometimes 3/ never
4.6	Did you tell the patients why they are restrained?	1/ Always 2/ sometimes 3/ never
4.7	Did you tell the family members/visitors why the patient is restrained?	1/ Always 2/ sometimes 3/ never
4.8	Did you restrain patients when you faced a staff shortage?	1/ Always 2/ sometimes 3/ never
4.9	Did you record the type of restraint, reason and the time on card?	1/ Always 2/ sometimes 3/ never
4.10	Did you assess the restrained patient frequently if the restraint should be removed?	1/ Always 2/ sometimes 3/ never
4.11	Did you evaluate and record the effect of physical restraint when applied to a patient?	1/ Always 2/ sometimes 3/ never
4.12	Which material did you use for physical restraint?	1/ Gauze 2/ bed sheet 3/ commercially prepared belts 4/ If other____
4.13	Which part of the patient did you restraint?	1/ wrist 2/ chest 3/ waist 4/ ankle