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ASPECTS ON PATIENT SAFETY IN INTENSIVE CARE UNIT

– A literature review



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PATIENT SAFETY IN INTENSIVE CARE UNIT

Ensuring patient safety is becoming increasingly important for intensive care unit practitioners. The intensive care unit is particularly prone to medical errors because of the complexity of the patients, interdependence of the practitioners, and dependence on team functioning.

The aim of this research is to find out the aspects on patient safety in the intensive care unit. After the research is complete then the results will be published in Hoitonetti as information for nurses.

A research question was set up to find out how nurses can provide patient safety in the intensive care unit through a systematic literature review. Seven articles were selected for the review process.

Workload, emotional stability, following safety precautions and lack of drug availability problems were found that lead to lack of the patients' safety in the ICU.

KEYWORDS:

Intensive care unit, Patient Safety.

CONTENT

TABLES	4
LIST OF ABBREVIATIONS	5
1 INTRODUCTION	6
2 INTENSIVE CARE	8
2.1 Intensive care unit	8
2.2 Intensive care nursing	9
2.3 Families of the patients in the ICU	10
2.4 Parents of the children in NIC	11
2.5 Nutrition in the ICU	12
3 STRESSORS IN THE ICU	13
3.1 Psychological distress during ICU treatment.	16
3.2 Diagnosis and death in the ICU	18
4 PATIENT SAFETY IN THE ICU	20
4.1 Barriers to patient safety	21
4.2 Errors in the ICU related to patient safety	23
5 PURPOSE AND AIM	27
6 LITERATURE REVIEW	27
6.1 Review Method	27
6.2 How the searches were done	28
6.3 Results of the review	31
7 DISCUSSION	39
8 SUMMARY OF THE MAIN ASPECTS	39
9 LIMITATIONS	40
9 RELIABILITY	41
10 ETHICAL CONSIDERATION	41
11 CONCLUSIONS	42

FIGURES

Figure 1. Integration of parents into the unit	12
Figure 2.Flow chart of article search	30

TABLES

Table 1. Top 10 patient's stressors perceived by patients and nurses	15
Table 2. Types of medication errors in the ICU	25
Table 3. Causes of medication errors in the ICU	26
Table 4: Results of the literature review	37

APPENDICES

Appendix 1. Database: CINAHL (EBSCO host).
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LIST OF ABBREVIATIONS

ICU	Intensive Care Unit
NIC	Neonatal Intensive Care
AMA	American Medical Association
ACP	American College of Physicians
AGS	American Geriatrics Society
SCCM	Society of Critical Care Medicine
NHS	National Health Service
NPSA	National Patient Safety Agency
HCAI	Health Care Association Infection
EN	Enteral Feeding
NCEPOD	National Confidential Enquiry into Patient Outcome and Death
DH	Department of Health.
NICE	National Institute for Health and Clinical Excellence
ME	Medical Error

1 INTRODUCTION

Safety is a fundamental and essential attribute of quality health care. Patients Association revealed that only 45 per cent of National Health Service (NHS) organizations had patient safety as their first agenda item most of the time, with an average of 28 per cent of board meetings taken up by patient safety. National Patient Safety Agency (NPSA) nursing lead Woodward says it is essential to encourage a culture where health professionals can be open about patient safety and errors. (Blakemore 2009,15.)

According to the World Health Organization 2011 report on patient safety, health care-associated infections (HCAIs) are those that the patient gets infected with when they are admitted in the intensive care unit. HCAI is one of the main issues that hinder patient safety and this can lead to the patient being admitted for a longer time than should, being disabled for a long time, strain of finances, high expenses experienced by the patients and their families and also having too many deaths.(World Health Organization, 2011.)

Errors made with medications and patient safety are the major concern in the department of health. The surroundings in the ICU may be made worse by the presence of chronic diseases. The connection between safety and communication has been known for a long time. Nurses, doctors and other staff working in the ICU should be able to work together, and communicate in an effective way. This helps in the patient spending a shorter time in the ICU and less deaths occurring. (Siegele 2009, 58-70.)

Not communicating or lack of communication leads to problems with management and making of mistakes at the team level. Providing the workers with training makes their work of a high quality and due to this the potential errors are minimized. Communication with the other members of staff that are not professionals increases the potentiality of making errors. There is a strong relationship between providing patient safety in the ICU and the working

relationship of the ICU care givers. Bad relationships lead to an increase in the errors and thus lead to bad outcome of the patients. Training of the teams using the resources available is a way to improve the relationships and thus enhancing patient safety. (Despins et al.2009, 85-92.)

Nurses believe that caring aspects for example ethical concerns, patient relationships are essential to good nursing practice but day to day these factors play a secondary role. This is probably because of the dominance of technology and cure in the practice environment. During their first professional experience, nurses compare themselves with other nurses. Interpersonal relationships undergo rapid change and individuals take on new social roles. It is important for nursing care that professional nurses strive for patients to be cured of their illnesses and can detect care problems and potential complications as well as adjust care to individual patients. (Mlinar et al. 2009, 3.)

It is not easy to know for a fact if it is necessary to have the patient admitted in the ICU, if already is in the hospital. The individual who is responsible for deciding this is the surgeon or the person giving the anesthesia, has to balance the possibility of the patient losing their life from a situation that can be avoided on the usual ward versus spending a lot of resources once the patient is admitted in the ICU unnecessarily. How well the patient is monitored during the night is what decides whether their lives will be saved or not. The staff taking any action or not, when they notice that something is not right. (World Health Organization Report 2011.)

2 INTENSIVE CARE

People with life-threatening diseases and injuries need intensive care. Intensive care which can also be referred to as critical care, involves close, constant attention by a team of trained health professionals. Problems that could need critical care treatment are like complications from surgery, accidents, infections and severe breathing problems. Equipments such as monitors, IV tubes, feeding tubes, catheters, ventilators are commonly found in critical care units. They can be used to sustain life but can also increase the risk of infection. (MedlinePlus 2011.)

Making sure that members in the ICU work together in one way of improving the patients safety. Depending on each other and communicating helps to detect errors. Good decisions are made by members who collect and share information, make good judgments, come up with solutions, think of repercussions for the decisions they make and then choose from the best. Having the teams trained makes the quality of the work done by the teams of high quality and hence lessens the errors made. Quality work of the teams results in the safety of the patient by reducing the errors made in medication and managing errors in case of any made. (Despins et al. 2009, 85.)

2.1 Intensive care unit

An intensive care unit is a specialized section of a hospital that provides comprehensive and continuous care for persons who are critically ill and who can benefit from treatment (Encyclopedia of Surgery). Intensive care or critical nursing deals with human responses to life-threatening problems. Nurses working in the ICU are responsible to ensure that this critically ill patients and families receive optimal care. Critically ill patients are those that are at high risk of life-threatening health problems. The more critical the health of the patient is, the more likely he or she is vulnerable and unstable therefore requiring intense nursing care. (American Association of Critical-Care Nurses 2011, 13.)

The ICU is an environment that causes stress more than any other environment found in a hospital setting. The patients go through their diseases and also on top of that, they are experiencing stress. This are facts like been in pain, an environment that they are not used to, lack of sleep, been afraid of death and not been able to communicate with their family and friends. Excessive stress leads to the activation of the sympathetic nervous system characterized by having an increase in the heart rate, high blood pressure and high respiratory rate, which leads to destructive anxiety syndrome. Medications are used to cure or stop the distress but cost a lot by the fact that there are complications when administering which causes high costs in the hospital. For this reason, other therapies should be used to make the costs lower and at the same time make the patients more comfortable in the ICU. The therapies that can be used are available in different forms. Listening of music was particularly found to have an effect of healing to the patient. Music was found to nurse and relieve physiological and psychological part of the patient and increase their comfort. (Chan et al. 2009, 1250-1257.)

2.2 Intensive care nursing

The intensive care team has less contact with the patient once discharged from the intensive care unit or the hospital. Long term effects or complications are not visible to the interdisciplinary team. Therefore, the awareness of intensive care workers to the long term outcome of a delirious state developed during the stay in the intensive care unit must be created. (Rompaey et al. 2009, 3349-3357.)

In the ICU, doctors always experience disruptions, alarms which causes them to have fatigue due to the alarms and thus this causes an increase in the possibility of errors. When attending to one patient, a nurse or even the doctor may not notice another patient changing in their status that will need to be attended to immediately. The tele-ICU is a set of eyes that is said to be second to the nurses' and doctors' eyes as it gives them information that they cannot

see and thus supporting them. By working together with the team that works close to the patient, the tele-ICU can help without causing any disruptions and hence give information when it is needed to save a patients' life. The tele-ICU is not a way to do away with the staff that works closely with the patient or at the patients' bedside, but to improve the safety by providing information when it is exactly needed. The tele-ICU observes the patient at a 24 hours basis, seven days a week. Tele-ICU locations have workers that are highly experienced with 15 years or even more of working with the patients at the bedside when critically ill. A number of nurses are interested with tele-ICU in order to meet the physical and emotional needs of caring for the patient at a 24 hour basis at their bedside. (Goran et al. 2010, 46.)

2.3 Families of the patients in the ICU

Admission to an ICU is recognized to be stressful for both patients and their relatives. Families may undergo a period of emotional chaos as they struggle to overcome all the emotional and social stresses that are put upon them. (Verhaeghe et al. 2005, 501.) It is argued that for families to adopt effective coping strategies for stressors encountered, they must receive adequate support and care (Lee et al. 2003, 490).

If family needs are effectively addressed, families may provide comfort and support to the patient (Al-Hassan & Hwedi 2004, 64). This reduces the risk of adjustment disorders such as post-traumatic stress. However, poor coping strategies may have a negative impact on both family well being and patient recovery. (Jones et al. 2001, 573.)

Providing holistic nursing care in the ICU is to take care for both patients and families. Families expect nurses to address their needs. Nurses are therefore responsible for caring for both parents and the family in crisis as well as dealing with the practical and technological demands of the ICU. (McVicar 2003, 633.)

2.4 Parents of the children in NIC

Parents whose babies are in the care of NIC need to have confidence that the health care professionals looking after their baby are competent and abide by high ethical and clinical standards. They also need an exceptional positive experience as there is evidence that some NIC experiences shape parents' interactions with professionals for many years into the future. (General Medical Council, 2000.)

Issues concerning control are complex because parents may be initially relieved to hand over control of their baby to the professionals. Once they were more familiar with the NIC, parents often felt they had little control of their own lives let alone of their baby. (Redshaw 1997, 109.) Parents did not always feel they were equal partners in care (Kawlik 1996, 430). Although parents were relieved to 'hand over' their baby to the expert care of NIC staff, knowing about the baby and understanding their problems was an important way of maintaining their role as parents (Redshaw 1997, 110).

Lack of bonding in neonatal units has been researched. Studies have identified family bonding as a difficult process which is interrupted by separation of parent and baby at birth and continued by the physical constraints of their complex environment. (Bialoskurski 1999, 66.) Providing 24-hour continuous bedside care puts neonatal nurses in a unique position to help parents familiarize with their baby following admission and is the first step towards initiating attachment, recognizing their unique relationship with their baby and their need to understand and be a part of what is happening to their baby. Therefore having an element of control and feeling integrated will help the parents accustom to the fact of having their baby in a strange environment. (Cescutti-butler et al. 2003, 752.) See figure1 below.

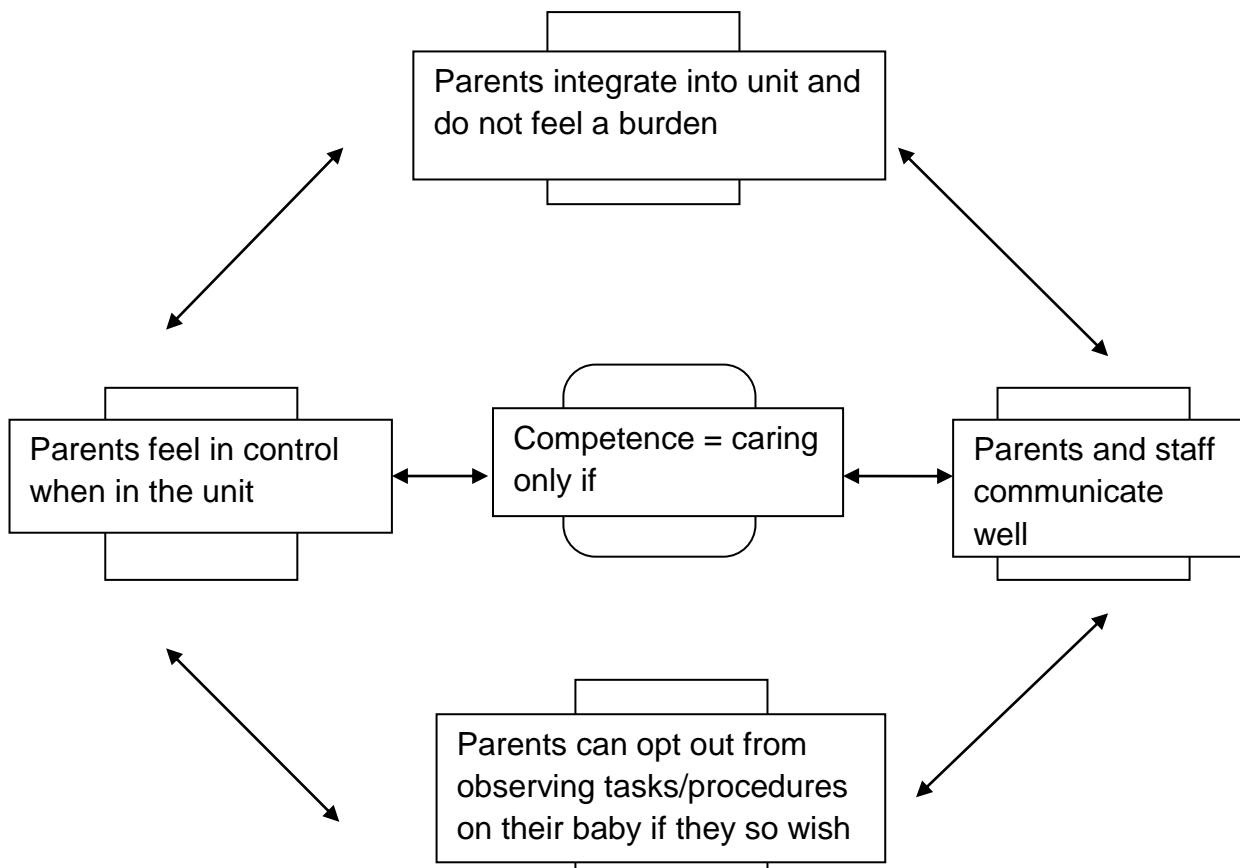


Figure 1. Integration of parents into the unit. (Cescutti-B et al. 2003, 752.)

2.5 Nutrition in the ICU

Providing effective nutritional support is important to the management of patients in the ICU especially those at risk of malnutrition (Harrington 2004, 459). Early administration of enteral nutrition restores intestinal capability and functioning, improves wound healing and decreases chances of infections. These benefits leads into the reduction of complications, reduced length of stay and decreased risk of death. (Heyland 1998, 423.)

Despite this awareness, a series of international studies has shown that in many of the ICU's, EN is not started on all the patients that require it. The administration is delayed leading to several features having an impact on delivery and this may lead to failure in individual feeding targets. (Roberts et al. 2003, 49-57.) The reported difficulties in optimizing calorific intake in critically ill

patients has led the community in the ICU to identify evidence-based guidelines to develop the standards of nutritional support and improve the outcome of the patients (Adam 2000, 283-289).

Recent recommendations for critically ill patients include the following: patients should be fed preferably through the enteral route, feeding must be done within 24-48 hours of ICU admission; delivery should be targeted to achieve calorific targets; appropriate formulations should be selected according to the patient's metabolic and immunological status (Heyland et al. 2004, 2260).

Through multi-disciplinary development of a feeding protocol, nurses can contribute to improving nutrition delivery in ICU. An evidence based feeding protocol and improved nurses' knowledge are essential to achieve optimal delivery of enteral nutrition in the critically ill patient. (Kattelman et al. 2006, 1226.) Nurses' knowledge can have a direct impact on the success of a nutritional support programme in critical care (Bourgault et al. 2007, 17).

3 STRESSORS IN THE ICU

Studies have been done on the stress experienced by the patients in the ICU but what constitutes to this stress has not yet been identified. The frightening experience in the ICU whether caused by the disease or is because of the surroundings in the ICU, will contribute to the availability of stress and thus this will have a negative impact to how the patient recovers and is rehabilitated. (So et al. 2004, 77.)

A number of studies have proved that nurses perceive the reasons that stress their patients differently from how the patients' themselves perceive the various issues (Novaes et.al 1999, 1421). This proves that the nurses are not always right when identifying what is causing stress to their patients. What this means is that, at the end of the day, the patients do not get the assistance that they need or require and hence lack of effective care. The nurse and the patient should perceive the stressors in the same way if there is to be effective care. So

it is important that the nurses focus on the factors that are of more importance to the patient, rather than their own way of seeing things. It is the work of the nurses working in the ICU to be able to identify and do all that they can to reduce the stress that the patients' are going through in the ICU. Adequate interventions can be undertaken to reduce the potential stresses and take the necessary measures to reduce or stop it. (So et al. 2004, 78-79). See figure in the next page.

Table 1. Top 10 patient's stressors perceived by patients and nurses. (So & Chan 2004, 78-79).

Patients' Order (Nurses' order)	Stressors	Nurses' order (Patients' order)	Stressors
a (a)	Afraid of dying	a (a)	Afraid of dying
b (d)	Being in a hard position to agree to treatment	b (k)	Not in a position to make decisions by themselves
c (f)	Experiencing pain	c(e)	Not in a position to express themselves
d (r)	No information on how long they are to be in the ICU	d(b)	Being in a hard position to agree to treatment
e (c)	Not in a position to express themselves	e (i)	Having rubber tubes inserted in their nose or mouth
f(y)	Afraid of been infected by diseases while in the ICU	f (c)	Experiencing pain
g(l)	Medications not explained to you	g (z)	Noises from alarms coming from the machines
h (k)	Been afraid of their finances	h (q)	Having needles put in them
i (e)	Having rubber tubes inserted in their nose or mouth	i (x)	Noticing or hearing as the monitor monitoring your heart goes off
j (p)	Noises that are not familiar and not usual	j(w)	Been surrounded by machinery that is new to you

Intensive care nurses have considerably higher stress perceptions than do the patients, in all the items. Nurses perceive the situations to be more stressing, due to the fact that they over-emphasize the stressful nature of the ICU. It could be that the nurses are projecting their feelings to the patients. The stress that they recognized to be with the patients, may actually be the stress they experienced themselves from such situations. Another possible explanation as to why the nurses scores were higher than that of the patients, is the fact that when the nurses are putting themselves in the position of the patients' they used the knowledge and experience that they had which could be a source of the information that they give from deep inside of themselves. Nurses are also human beings and also undergo stress when caring for the patients that are also experiencing stress. Nurses should in this case arm themselves with information on how to tackle stress by taking courses on stress, attending workshops and trainings on coping with stress. This will help in finding out what is stressing them and taking the necessary steps to handle this stress in the most appropriate way. (Pang et al. 2008, 2681.)

Holistically, patients in the ICU did not perceive stress as high as the nurses did. It could be that these patients may be too physically ill or too much sedated to be aware of their environment or to remember it clearly. Another possible reason why patients do not find the ICU environment stressful could be that they are trying to be 'good' patients. (Cornock 1998, 518). More to this is that patients that are from the Chinese community may find it difficult to question been afraid that they will make the doctors or the nurses upset and hence this leads them to having less or no information (Taylor et al. 2001, 79).

3.1 Psychological distress during ICU treatment.

Majority of the patients admitted into the ICU will have been unaware of their admission or the circumstances leading to it. It may be until late into their admission that they become aware of where they are and how they arrived there. This, including the stressful nature of the ICU environment may lead to a relatively high level of psychological distress. Studies have been done to examine specific aspects of the ICU treatment that are stressful for patients.

The main physiological stressors identified include; having tubes in the nose and mouth, pain, sleep disturbance, thirst and the noise from the buzzers and alarms. (Biancofiore et al. 2005, 967.)

Psychological stressors include; not being in control of the situation, not being in control of one's own body, not been able to communicate, missing family members and friends and not being given sufficient information (Van der Leur et al. 2004, 467). Overall, patients tend to rate physiological stressors as more stressful than psychological stressors (Hweidi 2007, 227).

Psychological distress is a common occurrence during ICU treatment and includes anxiety, stress, withdrawal, denial, regression, anger, depression, hallucinations and delusions (Mohta et al. 2003, 17). Those who have gone through traumatic injury will often in the short term experience periods of anxiety or worry and some will experience dissociative episodes which can involve disruption of memory and perception as well as feelings of unreality or detachment (Schnyder et al. 1998, 419).

Psychological problems are common both during and following ICU treatment. Psychological difficulties seem to be associated with a number of factors including mechanical ventilation, longer ICU stay, female gender and pre-illness psychosocial factors such as social support. Presence of hallucinations and delusions also seems to be important in predicting psychological difficulties. There is no evidence of an association between the severity of the illness and psychological difficulties, though it is perceived that the severity of the illness to be more important. Evidence for the effect of intervention strategies is small but there is evidence that both medical and psychological strategies are likely to be effective in managing, preventing and treating psychological difficulties. (Carr S et al. 2007, 95-102.)

Delirium is defined by the Diagnostic and Statistical Manual of Mental Disorders IV (DSM IV) as a disruption of been conscious with lack of attention followed by changes in cognition or problems with perception that cultivates in a short time period and keeps changing over time. Delirium is a problem that is common

with patients that are admitted in the ICU because they are critically ill, medications, different procedures and a number of risk factors. Delirium causes death in its own and predicts if the patient is going to die or not and how long they are going to be in the ICU. Due to this, the Society of Critical Care Medicine (SCCM) guidelines advice for regular check-ups for the presence of delirium in ICU patients. (Eun et al. 2011, 94-97.)

3.2 Diagnosis and death in the ICU

There are many reasons a person may need care in an intensive care unit.

a) Shock

In a shock state, the organs of the body do not get enough oxygen and blood pressure for them to function in a normal way. These can be caused by four reasons: severe dehydration or a lot of blood loss which is known as hypovolemic shock, cardiac or heart failure known as cardiogenic shock, high infection rate which could lead to organ failure which is known as septic shock and also massive trauma to the body which can be caused by for example car accidents or medical conditions like pancreatitis known as systemic inflammatory response syndrome. If a patient in any kind of shock is not treated and the shock reversed as fast as possible, the body organs will start to shut down which could lead to death. (Society of Critical Care Medicine 2010.)

b) Acute respiratory distress syndrome (ARDS)

This is a lung condition that leads to low oxygen levels in the blood. This can be a life threatening condition because the organs of the body such as the kidney or the brain need oxygen to be in the blood for them to function properly. In ARDS, a patient having infections or injuries causes the lung capillaries to leak more fluid than usual into the air sacs. This prevents the lungs from filling with air and thus no enough oxygen into the bloodstream. Some people fully recover from ARDS and others continue to have some health problems. (MedicineNet.com 2010.)

c) Traumatic brain injury

This is damage to the brain due to an injury. It usually occurs due to a hard blow to the head that causes the brain to collide with the inside of the skull. Any object that can penetrate the skull for example a bullet, also can lead to a traumatic brain injury. Mild traumatic brain injury can cause a temporary dysfunction of the cells in the brain but a more serious injury could lead to bruising, bleeding or other physical damage to the brain that can lead to long-term complication or death. (Mayo clinic.com 2009.)

Mild traumatic brain injuries usually do not require any medication other than resting and pain medication that they can buy without a prescription to treat the headaches. However, this kind of a person should be watched closely at home and with doctor's follow-up appointment in case of any worsening or new symptoms. When in an ICU care is given in making sure the person has an adequate oxygen and blood supply, maintaining blood pressure and preventing any further damage to the head or neck. At this stage the person may have complications like altered consciousness for example a coma, seizures, nerve damage, cognitive problems, communication problems, emotional changes and also sensory problems. (Mayo clinic.com 2009.)

d) Sepsis and severe sepsis

Sepsis is a severe illness in which the bloodstream is overwhelmed by bacteria (MedlinePlus 2011). The severity of these bacteria, as well as the age and medical conditions which the patient is experiencing, may put them at risk for having a high rate of inflammation in response to the infection rate or any injury that they have. Severe sepsis is when this inflammation starts to affect the functioning of the body for example renal failure and these results to the patient been very sick. (Society of Critical Care Medicine 2010.)

e) Multiple organ dysfunction syndrome(MODS)

Any of the above mentioned disease that lead the patient to be admitted in the ICU has the capability of affecting other organs in the body. These organs may not be affected at the beginning of the illness, but slowly one organ after another starts to fail. This is what is referred to as multiple organ dysfunction syndrome. There is no exact treatment for MODS, only supportive care is needed. Most of the organs to be affected by this is are the lungs and the kidneys which are affected first, followed by the brain and the immune system. When the patient starts to develop MODS, their chances of survival start to become less. The more organs that fail, the lesser the chances of the patients survival. (Society of Critical Care Medicine 2011.)

A big number of the deaths occurring in the ICU are due to the fact that a decision was made to stop or limit the life support to the patient. Most critically ill patients cannot participate in these decisions. Because of this, the patients' family generally functions as surrogate decision makers. However, those patients that are not in a position to make decisions usually do not have any other person that can act on their behalf and they had not filled any directive before they fell ill. Difficulties in making decisions for this type of patients have been documented in facilities that offer quality care, general hospital wards and intensive care units. These causes a debate on the ethical and legal aspects about who is responsible for this kind of patients and in what circumstances it is to be allowed to limit life-support treatment. (White et al. 2007, 34.)

4 PATIENT SAFETY IN THE ICU

Patient safety is the prevention of errors and adverse effects to patients associated with health care (World Health Organization 2011). The care of critically ill patients is dependent on the use of complex medical equipment. Unfortunately this equipment has the potential to develop faults, to be used incorrectly or to fail. (Thomas 2008, 1193.)

Medication errors and patient safety are the most important in the health sector. The often environment of the ICU could be caused by the increase in chronic diseases, acuity of the patient and the advancement in technology and agents in the pharmaceutical agency. (Siegele 2009, 58.) The guidelines in the professional sector are different on the way decisions should be made regarding the patient. The American Medical Association(AMA) advises the ethics committee or judicial review, whereas the American College of Physicians(ACP) recommends judicial review and the American Geriatrics Society(AGS) advises against the often involvement of the but advises that decisions be made by the doctors who are taking care of the patient. (White et al. 2007, 34.)

There is evidence that supports using of individual ways or processes to cut down on the incidences on errors in medications. Orders made through the computer by the people prescribing them has brought down the number of medication errors made in the case of failure in interpretation of the doctors' handwriting or the orders made verbally. Mistakes which involve administering of the wrong medication or giving medication to the wrong patient were brought down by 60% after the introduction of barcodes which match each and every patient's electronic orders and any other information that is related to medication. More to this strategies which are based electronically, using of pharmacies that use satellite and pharmacists that are unit-based help to improve safety by cutting down on the floor stock, which causes a possibility of causing medication errors. (Anthony et al. 2010, 21.)

4.1 Barriers to patient safety

Nursing skill and staffing decisions are widely debated and contested. Managers argue that their mandate is to recruit and retain nurses and ensure that they are sufficiently trained to provide quality care within their competence level, thus enabling set work targets to be met. (Shuldham 2004, 385.) For their part, each nurse wants good working conditions, appropriate training, a fair workload, a safe environment and collegial support (Aiken et al. 2002, 1987).

No one would openly suggest that patient care should ever be compromised at the expense of a tight budget. Yet there is a risk of 'clinical compromise' that manifests itself on a daily basis as shift leaders struggle to make nurse-staffing decisions in their clinical setting. This tension is more in the ICU with its complex clinical, operational and governance requirements; its particularly vulnerable patient population; and its one-to-one nurse-patient relationship. There is limited evidence of the systems used in the ICU's for the processes used to assess individual nurse's skills and subsequent nurse-patient allocation decisions made (often thrice daily) at operational level. (Ball et al. 2004, 62.)

Contributing factors to inappropriate and potentially hazardous care delivery include the following. Nurses working out of their scope of practice in the ICU; nurses receiving inadequate orientation and workplace training; lack of adequate clinical and educational support systems in place; lack of knowledge of critical care nursing and therapies; nurses working in an unsafe ICU physical environment and nurses lacking awareness of occupational health and safety processes. (Morrison et al. 2001, 116.)

Recognizing when a patient's condition is deteriorating is a key aspect of patient safety and the use of early warning scoring systems is integral to this. Compliance with such systems can often be poor. (Higgins et al. 2008, 35.) Observation taking is fundamental to patient care and is one of the most significant clinical skills undertaken by nurses. However, in recent years it appears to have become less of a priority for nurses and the skill is often delegated to junior nurses or support workers. It is documented nationally that recognition of deteriorating patients is poor and that the significance of ward-based observations is often overlooked. (National Confidential Enquiry into Patient Outcome and Death 2005.)

The National Patient Safety Agency (NPSA) analyzed 576 deaths that had been reported to the National Reporting and Learning System during 2005. The deaths could be interpreted as potentially avoidable and related to patient safety issues. It found that, of the 425 that occurred in acute/general hospitals, 64 were related to patient deterioration that had not been recognized or acted on.

In 14 of these cases no observations had been made for a prolonged period before death and changes in vital signs were not detected. In 30 cases, despite recordings of vital signs, there was no recognition of clinical deterioration or action taken. (NPSA 2007.)

Early warning scores were devised to assist in the early detection of deteriorating patients. The scores are based on the premise that there is a common physiological pathway for deterioration in acutely unwell patients. Accurate and timely observations and adherence to early warning scoring systems are crucial in identifying those patients at risk of deterioration. Failure to do so could have devastating consequences not only for patients but also for trusts in terms of reputation. (Higgins et al. 2008, 35.)

The Department of health has recommended the use of early warning systems as best practice for clinical observations (Department of Health 2000). National Confidential Enquiry into Patient Outcome and Death (NCEPOD) further endorsed this recommendation, emphasizing that every inpatient should have early warning score recorded (NCEPOD 2005).

National Institute for Health and Clinical Excellence (NIHCE) stated: 'Members of staff who are caring for the patients that are admitted in the critical hospital sectors should have a high standard in how they monitor, measure, interpret and act to the critically ill patient should be tested to make sure that they are able to show them (NIHCE 2007). What should entail in this measurement scale is the heart rate, respiratory rate, temperature, how conscious they are, the amount of urine they produce, systolic blood pressure and the saturation of oxygen. A score is then gotten from the seven factors. (Higgins et al. 2008, 35.)

4.2 Errors in the ICU related to patient safety

The Institute of Medicine's 1999 report, *To Err is Human: Building a Safe Health System*, brought the problem of the errors in medicine out to the public. Debate in both public and professional sectors has showed that the exact morbidity and mortality due to medical errors is still in question. Regardless of the exact impact on patients, there is still recognition that errors in patients in the

hospitals significantly increase morbidity and mortality. Although most of the hospitals have a number of policies and procedures that are in place to protect and care for patients, these policies may contain unappreciated “holes” that allow errors to slip through and also the results of interventions may not be delivered to caregivers in a timely fashion. (Major et al. 2002, 1057.)

The research done on the errors in medication and the race of having a safe administration of medication started in the 1960's in the United States of America (Flynn et al.1999, 6). Errors in medication are defined as the mistakes that occur when medication is been prescribed, dispensed or administered be it that there is an error that occurred or not, is a major problem in health care sectors in the whole world. Most errors are possible to prevent but when they occur, apart from the high cost, there could be serious harm caused to the patient which could include them dying. In the ICU, it is more likely to make an error in medication because of the fact that there are many patients that are sick critically, who have medication prescribed and cause many times stress which is experienced by the staff who are at the same time been overworked at a place that is busy. (Vos et al. 2007, 267.) In a study done by Bohomol in the year 2009 shows the types and the causes of medication errors in the ICU as shown in the tables 2 &3.

Table 2. Types of medication errors in the ICU. (Bohomol et al. 2009, 1263.)

TYPE	N (%)
Omission error	217 (71.1)
Wrong time error	35 (11.5)
Prescribing error	14 (4.6)
Improper dose error	5 (1.7)
Wrong dosage-form error	2 (0.7)
Unauthorized drug error	1 (0.3)
Monitoring error	1 (0.3)
Wrong drug preparation error	-
Wrong administration technique error	-
Deteriorated drug error	-
Compliance error	-
Other medication error	30 (9.8)
Total	305 (100.0)

Table 3. Causes of medication errors in the ICU. (Bohomol et al. 2009, 1263.)

CAUSES	N (%)
Drug not available at the institution	123 (41.0)
Problems in stock or distribution in the pharmacy	49 (16.3)
Failure in transcription of the prescription to pharmacy	33 (11.0)
Communication failure among services	24 (8.0)
Problems related to prescription	21 (7.0)
Slips, memory lapses and failure to check medication	20 (6.6)
Work overload and disruption	15 (5.0)
Others	11 (3.7)
Infusion pump problems	2 (0.7)
Failure in following protocols	2 (0.7)
Total	300 (100.0)

The involvement between safety and communicating has been noticed for some time. Health care workers do not occasionally notice that having an effective communication is the most important to have a team that advocates for having a safe environment. Challenges in communication and the doctor hierarchy still is available in the field of work. (Siegele 2009, 58.) Having a good communication is known by the fact that there is a positive outcome from a number of the people participating for example the patients, family members or health care team. (Slort 2011, 613).

5 PURPOSE AND AIM

The purpose of this project is to find out the aspects on patient safety in the intensive care unit. And the aim is to produce evidence based information to be published on Turku University of Applied Sciences' Hoitonetti.

6 LITERATURE REVIEW

6.1 Review Method

In conducting a successful unbiased review it is important to access as many relevant studies as possible. This may involve searching a wide variety of databases and internet search engines as well as hand searching which involves a manual page-by-page examination of the entire contents of a journal issue to identify all eligible reports of trials, whether in articles, abstracts, news columns, editorials, letters or other text. Inclusion and exclusion criteria must be established because these will determine the focus and limits of the review. (Bettany-Saltikov 2010, 47.)

The aim of the literature search is to generate a comprehensive list of primary studies published and unpublished. This is a crucial part of the review because the validity of the review results is directly related to the thoroughness of the search and its ability to identify all the relevant studies. (Centre for Reviews and Dissemination 2009.)

Conducting a comprehensive literature search will also help to identify current knowledge with regard to relevant concepts and contexts and what is known and unknown in a particular field. A comprehensive search strategy underlies the quality of the literature research which in turn underlies the quality of the findings for the systematic review. Any conclusions made following a review are only as good as the range and quality of the literature obtained. (Bettany-Saltikov 2010, 47.)

It is important to search widely and thoroughly because not all research is published in journals. Further, not all research published in journals is indexed in major databases and therefore may not be easily retrievable. (Bruce et al. 2008, 388.) Problems with searching include publication and language. Publication bias means that positive results tend to be published in journals more frequently than negative results. (Bruce et al. 2008, 388.) Language bias refers to the fact that positive results are more likely to be published in English. Authors were more likely to publish randomized controlled trials in an English language journal if the results were statistically significant. Researchers and students are more likely to look at research in their own language. Bias may also relate to the geographical coverage of journals and databases. (Egger et al. 1997, 326.)

There are a number of steps involved in converting the review question into a search. The first of these is to refer back to the keywords that will form the basis of the search. The use of appropriate keywords is the cornerstone of an effective search. It is possible to conduct searches using index terms and free text searching. Index terms include those used by electronic databases, which may not match the terms in the research question precisely. (Timmins et al. 2005, 41.) To ensure that a search is comprehensive and both sensitive and specific, free text searching should be used in addition to or instead of index term searching (Lahlafi 2007, 566).

6.2 How the searches were done

The goal was to have a total of 10 articles that were covering on all areas that are related to the ICU. Most of the articles talked about the ICU in general but it was not easy to find articles that specifically focused on the patient safety part. The search was more on CINAHL and MEDLINE found in the Turku University of Applied Sciences online library but the articles that were giving answers to my research, were more found in CINAHL. My search language was only in English. My results also included the inclusion and exclusion criteria as follows:

Inclusion procedure:

- I. Title and abstract
- II. Full text if talking on patient safety
- III. Full texts read and examined to select the best articles to use
- IV. In English language

Limitations:

- I. Published between the year 2000-2011

After the search was complete and a combination was made, there were a total of 850 articles, 700 from CINAHL and 150 from MEDLINE. 600 articles were cut out on the basis of full text leaving a total of 250. The full articles were then evaluated by the inclusion and exclusion criteria. 200 articles were excluded leaving a total of 50 articles. The 50 were narrowed down by the year of publication 2000-2011 leaving a total of 15. The 15 articles were all read leaving a total of 7 best articles. This presentation is shown by the figure in the next page, figure 2.

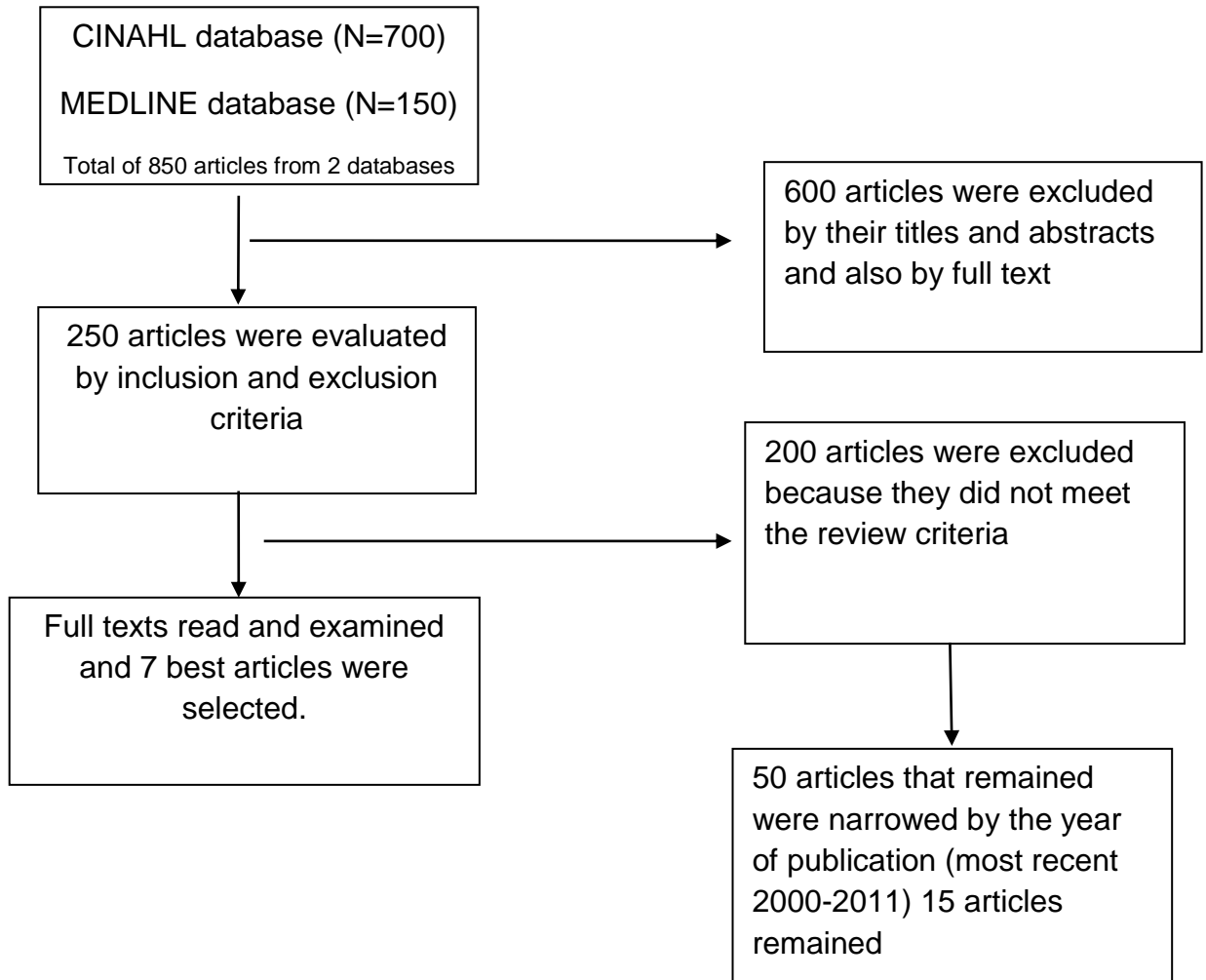


Figure 2. Flow chart of article search

6.3 Results of the review

The first article by Warburton 2010, Numeracy and patient safety: the need for regular staff assessment, shows the importance of the ability of nurses working in the ICU to perform their everyday calculations such as drug doses, body mass index and fluid balance correctly in order to take the right action required, like giving the correct dosage of medication and thus promoting patient safety. Most of the medications that are prescribed by the doctors every day are administered safely. (NPSA 2007.) The problem comes in because of the poor calculation skills that are among the nurses that lead to medication errors which could lead to the patients' severe harm or death (DH 2000).

Errors in medication caused by incorrect calculations are possible to avoid. This can be avoided by developing and implementing ways to identify, support and improve the ability of staff with poor numeracy skills. The current approaches to tackling this issue of poor numeracy among healthcare professionals are not wholly dealt with. There should be regular revision and assessment of numeracy skills. This would show a positive approach by the healthcare bodies to make sure that there is delivery of safe health that will help in reducing the risk of medication errors caused by incorrect calculation and thus promoting patient safety. (Warburton 2010, 42-44.)

The second article by Morrissey 2010, Quality vs quantity: hospitals must cut back workload of nurses to maintain patient safety targeted on nurses. This article talks about too much workload and how much it effects on the productivity of the nurses. The nurses are not able to perform as expected when they have too much work to do. The ratio of the nurses to the work they are expected to do is very little. The result of this article was that cutting down on nurses workload helps to maintain patient safety. Nurses were to be prohibited to work more than 12 hours per day and 60 hours per week and also having of an extra nurse into each shift to accommodate unanticipated increase in workload. (Morrissey 2010, 10.)

Sending of the nurses to training sessions from time to time was also found as a strategy that would lead to patient safety when the nurses skills are renewed oftenly. The organizations understanding of safety and how it acts on safety was found of essence. This is because the nurses are bound to follow their leaders and the policies set by their employers. (Morrissey 2010, 10.)

In the third article by Chang 2009, Emotional stability of nurses: impact on patient safety. Questionnaires were filled by 263 nurses aged less than 50 years nursing college graduates. Nurses' emotions while at work are important for their positive delivery. The results of this article recognize the importance of the positive contributions that the nurses make to ensure patient safety. (Chang 2009, 6.) Increasing nursing staff is not always possible therefore this study shows that there is another alternative way of improving patient safety and that is by stabilizing the nurses' emotions (Laschinger et al. 2001, 211).

First the managers should avoid the imposing of work load as this overloading contributes to the nurses having negative emotions and turnover. Stabilizing nurse emotions contributes in a positive way to patient safety. The managers should ensure that there is adequate staffing in their institutions to protect patient safety. Also more time for direct patient care increases nurse job satisfaction, stabilizing nurse emotions and thus improving patient safety. (Chang 2009, 6.)

The fourth article by Celik 2008, Nosocomical infections in neurosurgery intensive care units. It was a systematic review of 20 articles of nurses working in the ICU. These strategies dealt on how to prevent nosocomical infections in the ICU. Use of manual resuscitation bag for each patient, suction orofarangial secretions as needed, wash hands before and after procedures, use of sterile technique when using open-suctioning technique and use of plastic apron and gloves dealing with secretions from infected patients all to prevent infections in the case of aspiration and thus preventing nosocomical pneumonia. (Celik 2008, 55.)

Strategies also to prevent urinary tract infection were discussed. Avoiding unnecessary catheterization, use of appropriate diameter and length of catheter for either male or female, balloon catheter inflated with sterile solution, catheters to be removed as soon as possible and changing of drainage bag and connection tube every 1-week. Strategies to prevent surgical wound infections were also discussed. Incision covered immediately after surgery, if no drainage after 24-48 hours the incision may be opened to air, sterile technique when the wounds were dressed and also the patient's environment should be free as possible to avoid contamination from roommates and visitors, all for the patients' safety. (Celik 2008, 55.)

The fifth article by Phillips 2010, Developing a protocol for intensive care patients at high risk for pressure ulcers. It talks of the high risk of getting pressure ulcers in the ICU. Interventions of reducing pressure and friction were found in this article to prevent pressure ulcers or preventing further deterioration of the skin of these patients that are in the ICU and are at high risk of developing pressure ulcers. Acceptance of the nurses to following the procedure of reducing the ulcers was assisted by the patient care assistant. (Phillips 2010, 78.)

The patients in this unit are always lying in bed and therefore prone to having pressure ulcers. Having less barriers between the patient that is critically ill patient and the bed to make the friction less, changing the patients' position, giving of a report from one nurse to another to make sure that there is the use of the procedure to avoid the patient from getting pressure ulcers and also making use of the reverse trendelenberg position on the patients who are been ventilated mechanically were some of the factors that the nurses could take into consideration so as the patient could be safe. (Phillips 2010, 79.)

The sixth article by Beaumont 2008, Deterioration in hospital patients: early signs and appropriate actions. NPSA 2007a performed an analysis of 1804

incidents of death in the year 2005 whereby of these 576 were reported to be avoidable and related to patient safety issues. In a report by NPSA 2007a Safer Care for the Acutely Ill Patient: Learning from Serious Incidents, showed patient deterioration as the main aspect that caused the deaths as reported to National Reporting and Learning System (NRLS). Of the 64 cases reported, 61 of them were caused by:

- i) Lack of observations for a long period of time which leads to some changes in the patients vital signs which remain undetected.
- ii) Failure to recognize the significance of the change in the vital signs and no action been taken apart from recording the observations.
- iii) Delay in giving medical attention when the changes are detected.

By observing physiological changes, abnormalities can be recognized before a complicated effect takes place for example death. There are certain factors that contribute to the deterioration of the patient not been recognized as discussed below:

- i) Communication factors: Lack of communication between the staff members may prevent early detection of clinical deterioration. This happens especially during the patient handovers and transfers. Handing over of this information could be particularly difficult for inexperienced staff. Communication breakdown also occurs when a particular patient in question is been treated in a ward away from the main consultant's team whereby there occurs some confusion on who to call for medical advice when it is required. It could also be not clear which doctor they are under in the documentation. Communication between the doctors and the nurses also can cause problems. Nurses may not be able to communicate clearly and have hard time conveying information in a way that would convince the doctor of the urgency of the situation.
 - a) Team and social factors: Lack of teamwork contributes to problems in deterioration. Strong teams may lack to exist due to nursing staff turnover and the organization of the medical teams.

- b) Working conditions and environmental factors: Inadequate staff leading to heavy workload may prevent the staff from recognizing and acting on signs of patient deterioration.
- c) Education and training factors: Lack of the knowledge and training may lead to deterioration and lack of its identification in the patients.

So as to address the complex safety issues, it is important that the right people involved in the healthcare organization. Recommendation by NPSA 2007b is that:

- a) Every ICU should have a group that looks into the deterioration and prevention of adverse effects to improve the safety of the patient. This group should comprise of healthcare professionals, managers, educators and a patient representative. (Beaumont et al. 2008, 43, 45-48.)

The seventh article by Thomas 2008, Patient safety associated with equipment in critical care: a review of reports to the UK National Patient Safety Agency focuses on how much the care of critically ill patients is dependent on using complex medical equipment which unfortunately are in a position to develop faults, been used incorrectly or they could even fail. The definition of equipment in this UK study was a mechanical or electrical device that is used in caring for the patient or for transferring the critically ill patient whereby the transporting equipment is a responsibility of the ICU unit. Included also were the disposables that are attached to the equipment but are not inserted into the patient's body. Equipments including ventilators, ventilator tubing and humidifiers. (Thomas et al. 2008, 1193.)

The equipment problems were defined as faulty equipment, failure of equipment, incorrect setting or use, lack of training in using the equipment or incorrect or lack of cleaning. The results of the study show that incorrect use of equipment is as common as is equipment failure. Nursing staff have an attitude of uncertainty to medical equipment due to the fact that equipment used in the ICU are complex. (Thomas et al. 2008, 1194.)

Failure when performing generator tests would be protected by having a better protection of equipment from power cut outs. Having an improved battery back-up and using power supplies that are uninterrupted could help in reducing the damage caused by power cut offs especially when they occur in the night.

Even with advances in equipment design that could improve patient safety, existing equipment are still put in use because they are found to be functional. The incorrect use of equipment could be solved in that the staff in the ICU could be better trained on how to use these equipments. (Thomas et al. 2008, 1196-97.)

These results are summarized in the next page, Table 4.

Table 4. Results of the literature review

AUTHOR	TITLE	METHOD	SAMPLE	TARGET GROUP	FINDINGS
Warburton Paul 2010	Numeracy and patient safety: the need for regular staff assessment.	Literature review	No sample used	Nurses working in the ICU	-Developing and implementing ways to identify, support and improve the ability of staff with poor numeracy skills. -Regular revision and assessment of numeracy skills.
Morrissey J 2010	Quality vs. quantity: hospitals must cut back workload of nurses to maintain patient safety.	IOM report	No sample used	Nurses	-Hospitals must cut back workload and hours of nurses to maintain patient safety. -Send the nurses off to training sessions. - The organizations' understanding of safety and how it acts on safety.
Chang S; Hsu k; Teng C 2009	Emotional stability of nurses: impact on patient safety.	Questionnaires	263 nurses	Female, aged <50 years nursing college graduates	-Nurses' emotional stability influences patient safety. -Adequate staffing protects patient safety.
Celik SA 2008	Nosocomial infections in neurosurgery intensive care units.	A systematic review	20 articles were identified that met the requirements for methodological quality and inclusion criteria	Nurses working in the ICU	Strategies for preventing nosocomial pneumonia -Cautions during aspiration Strategies to prevent urinary tract infection -Avoid unnecessary catheterization Strategies to prevent surgical wound infections

					-Incision covered immediately after surgery
Phillips B, Racco M 2010	Developing a protocol for intensive care patients at high risk for pressure ulcers	Literature review	50 patients -Divided into 4 groups based on their ICU length of stay.	Patients admitted in the ICU	High risk for pressure ulcer protocol -Use fewer barriers between the critically ill patient and the bed to reduce friction.
Beaumont K, Luettel D, Thomson R 2008	Deterioration in hospital patients: early signs and appropriate actions	Literature review	No sample used	Nurses and doctors	-Every ICU should have a group that looks into the deterioration and prevention of adverse effects to improve the safety of the patient.
Thomas A.N, Galvin I 2008	Patient safety incidents associated with equipment in critical care: a review of reports to the UK National Patient Safety Agency.	Review of incidents	No sample used	ICU nurses	-Training of staff in the use of ICU equipment. - Having a better protection of equipment from power cut outs -Use of new equipment design to improve patient safety rather than the old designs

7 DISCUSSION

Nurses' emotional stability and adequate staffing influences, protects and can predict patient safety. Nurses have an important and positive contribution to patient safety. Managers impose on nurse workload and due to this it leads to negative emotions of the nurses and turnover. Since increasing staffing is not always possible, managers can still reduce workload per employee by simplifying and combining work processes. Managers are also advised to increase time that is available to the nurses for providing direct patient care. The managers can also reduce the nurses' administrative and non-nursing duties by employing amore administrative workforce. (Teng 2009, 6.)

There is need to promote current strategies for nosocomical infection management to ensure that ICU nurses have the knowledge and skills to care for the patients critically ill (Celik et al. 2004, 747). Nurses are also human beings and also undergo stress when they are taking care of the patients who are also at the same time undergoing stress. Nurses therefore should be prepared with ways in which to manage their stress through taking intense courses, workshops on stree management or in-house training so that they are able to recognize what causes their stress aand find ways in which to deal with them in an effective way. (Pang et al. 2008, 2686.)

8 SUMMARY OF THE MAIN ASPECTS

Medication errors are one of the faults found in the ICU that lead to the lack of patient safety. Developing and implementing ways to identify, support and improve the ability of the nurses with poor numeracy skills will help in improving their skill and thus reducing the medication errors thus leading to patient safety. (Warburton 2010, 43.) Overloading the nurses with work is another factor that leads to poor delivery of healthcare provided by the nurses. Hospitals must cut back workload and hours of nurses to maintain patient safety and also sending them off to training sessions. (Morrisey 2010, 9.) Nurses' emotional stability

also influences patient safety. Instability of their emotions is mostly caused by the work overload which can be dealt with by adequate staffing thus protecting patient safety. (Chang et al. 2009, 2088.)

Nurses should be informed on the different strategies to prevent infections and deterioration of the patient admitted in the ICU. The nurses should know how to prevent nosocomical pneumonia, prevention of urinary tract infections, preventing surgical wound infections, preventing the development of ulcers and this would improve the patients' safety. (Celik 2008, 54.) Every ICU should have a group that looks into the deterioration and prevention of adverse effects to improve the safety of the patient. Training of staff in the use of the complex ICU equipment would lead to improving of patient safety, because lack of this knowledge could lead to incorrect use of the equipment thus not delivering the expected effect. (Thomas et al. 2008, 1194.)

9 LIMITATIONS

There is potential limitation where the research was done by use of questionnaires. This is because there is a possibility of bias into the results because the respondents could give their own desirable responses. The sample population in the study did not represent the whole population that is focused on only white population but did not have any research done on the African population. This limits because they could have a different education level and thus different view of issues. (Taylor 2001, 87.)

Almost all of the articles found were researches done in developed countries. Very little was said on the developing and the underdeveloped countries. Some of the factors that were proposed that would lead to patient safety like the use of the tele-ICU, not many of the developing and may be none of the underdeveloped countries would afford to have some of this high tech machines in their ICU's. Availability of sterile equipment is not easily available in some countries and therefore the factor on sterility would really not apply. Therefore

we can say that some of the measures that can be followed to promote safety like have been focused in the researches found, can only be used mostly in the developed countries and therefore a limitation because the ICU's in the developing and underdeveloped are not considered.

9 RELIABILITY

Reliability testing examines the number of errors in the measurement technique. It is based with the concerns on dependability, consistency, accuracy and compatibility. Researchers need instruments that are reliable and provide values with only a small amount of random error. Therefore, it is important to test the reliability of an instrument before using it in a study. (Nancy 2001, 396.)

The searches were done with the major focus been the nurses the source of the provision of patient safety makes this searches reliable. Nurses voiced the issues that lead them to been stressed and then how to deal or handle this stresses was also handled. On the other hand these searches could also not be reliable due to the fact that only one geographical area was focused on and that is the western part. The countries whose economies are doing well or are favorable and are easily able to implement some of the factors mentioned like taking the nurses for seminars from time to time. Not all countries or very few countries that are not well developed could afford to offer these services in their units. Therefore the outcomes of these searches are not applicable to this kind of countries.

10 ETHICAL CONSIDERATION

The improvement of the health of the citizens of the planet, as well as that of the settings where nurses work, is the primary aim of global nursing research. An ethical framework integrates awareness of, and respect, for the cultural values, traditions and healthcare system realities of the country or region of interest. Morally committed as nurses are to the alleviation of suffering and the

promotion of health and social justice, it encourages us to adopt an approach that incorporates these values into the foundation of any research study. For example although autonomy is considered to be the primary principle of western-based ethical traditions, it can be argued that distributive justice is of greater importance when considering the implications of conducting research in developing countries. What is preferable and appropriate for the conduct of nursing research in global settings is adherence to the principles of respect for persons and communities, justice and caring. (Harrowing et al. 2010, 70.)

In the searches done in this literature review, not so much of ethical issues were tackled or considered. For example the issue of respecting cultural values was not a found to be a factor to be considered in any of the searches found. The only ethical issue found was the issue on healthcare system realities of a country or region. The fact that major focus was on the westernized countries is a breach of ethics.

11 CONCLUSION

In the ICU, nurses, doctors and the subordinate staff care for the critically ill patients. They are mostly concerned about the quality of care that they give to their patients. It is good to work as a team and have a good communication as this helps in preventing the errors and also making better the outcome of the patients' and documenting as required. The ICU Safety Reporting System funded by the Agency for Healthcare Research and Quality is a strategy that gives way to volunteering, confidentiality and anonymously giving reports on the web of adverse events and errors that were about to happen. In 2006, the Agency for Healthcare Research and Quality and the Department of teamwork and communication are responsible to make sure that patients are given safe and quality care. It is been stressed that skills on how to communicate should be identified or the ways that can help in making sure that there is teamwork and communication, promoting safety and also improving the health of the patients. (Siegele 2009,10.)

It is important for the managers to create a conducive environment that promotes the emotional stability of the nurses. This could help to improve patient safety globally by reducing the frequency of adverse events. (Teng 2009, 7.) Patient safety is referred to as a low frequency of reported and recorded adverse patient events such as patient falls, nosocomial infections, medication errors, urinary tract infections, pneumonia, mortality and failing to rescue (Aiken et al. 2003, 1617). Nurses are the key or play an important role in making sure that there is patient safety because of their strong will to report patient safety problems. Research is therefore necessary to discuss patient safety from the nurses' perspective. This is because research with this perspective is focused on improving patient safety rather than blaming nurses for hitches in patient safety. (Carayon et al. 2006, 470.)

REFERENCES

- Adam S 2000. Standardization of nutritional support: are protocols useful? *Intensive & critical care nursing*, 283-289.
- Aiken L.H, Clarke SP, Sloane DM, Sochalski J, Sibler JH, Jama 2002. Hospital nurse staffing and patient mortality, nurse burnout and job dissatisfaction. *Journal of the American Medical Association*, 1987-1993.
- Aiken L.H, Clarke SP, Cheung RB, Sloane DM & Silber JH 2003. Educational levels of hospital nurses and surgical patient mortality. *Journal of the American Medical Association*, 1617-1623.
- Al-Hassan MA & Hwedi IM 2004. The perceived needs of Jordanian families of hospitalized, critically ill patients. *International Journal of Nursing Practice*, 64-71.
- Anthony K, Wiencek C, Bauer C, Daly B, Anthony M K 2010. No interruptions please: Impact of a no interruption zone on medication safety in intensive care units. *Critical Care Nurse*, 21-29.
- Ball C, Walker G, Harper P, Sanders D, McEligott M 2004. Moving on from patient dependency and nursing workload to managing risk in critical care, *Intensive & Critical Care Nursing*, 62-68.
- Beaumont K, Luettel D, Thomson R 2008. Deterioration in hospital patients: early signs and appropriate actions. *Nursing Standard*, 43-48.
- Bettany S, Josette 2010. Learning zone. Learning to undertake a systematic review: part 2. *Nursing Standard*, Vol.24 Issue 51, 47-48.
- Bialoskurski M 1999. Factors influencing bonding in an neonatal intensive care unit, 66-77.
- Biancofiore 2005. Stress including factors in ICU's: what liver transplant recipients experience and what care givers perceive, 967-972.
- Blakemore S 2009. Why patient safety must be at the top of the agenda at every level. *Nursing Standard*, 15-21;23(45):12-3.
- Bohomol E, Ramos LH, D'Innocenzo M 2009. Medication errors in an intensive care unit. *Journal of Advanced Nursing*, 1259-1267.
- Bourgault AM, Ipe L, Weaver J, Swartz S, O'Dea PJ 2007. Development of evidence based guidelines and critical care nurses knowledge of enteral feeding. *Critical Care Nurse*, 17-29.
- Bruce N 2008. Quantitative methods for health research, 388-391.
- Carayon P, Hundt AS, Alvarado CJ, Springman SR & Ayoub P 2006. Patient safety in outpatient surgery: The viewpoint of the healthcare providers. 470-485.
- Carr S, James P 2007. Psychological consequences associated with intensive care treatment. *Trauma*, Vol 9 Issue 2, 95-102.
- Celik S, Ugras GA, Durdu S, Kubas M, Aksoy G 2008. Critical care nurses' knowledge about the care of deceased adult patients in an intensive care unit. *Australian Journal of Advanced Nursing*, 53-58.
- Celik A, Sevim A 2004. Nosocomial infections in neurosurgery intensive care units. *Journal of Clinical Nursing*, 741-747.
- Cescutti-Butler L, Galvin K 2003. Parents' perceptions of staff competency in a neonatal intensive care unit. *Journal of Clinical Nursing*, 752-761.

- Chan MF, Chung YFL, Chung SWA, Lee OKA 2009. Investigating the physiological responses of patients listening to music in the intensive care unit. *Journal of Clinical Nursing*, 1250-1257.
- Chang IT, Yu TD, Yea-Ing LS, May-Kuen W, Tsung-Lan Chu, Ying-Huang Tsai 2009. Professional commitment, patient safety and patient perceived care quality. *Journal of Nursing Scholarship*, Vol 41 Issue 3, 301-309.
- Chang SS, Teng CI, Hsu KH 2009. Emotional stability of nurses: impact on patient safety. *Journal of Advanced Nursing*, Vol 65 Issue 10, 2088-2096.
- Cornock MA 1998. Stress and the intensive care patient: perceptions of patients and nurses. *Journal of Advanced Nursing*, Vol 27 Issue 3, 518-527.
- Department of Health 2000. An organization with a memory. Report of an expert group on learning from adverse effects in the NHS. The stationery office, London.
- Despins LA 2009. Patient safety and collaboration of the intensive care unit team. *Critical Care Nurse*, Vol 29 Issue 2, 85-92.
- Egger M 1997. Language bias in randomized controlled trials published in English and German, 326-329.
- Eun YH, Byoung JL, BJH, Eun HS, Han AL, Chui GY, Young WK, Sung KH, Young SS, Sang-Min L 2011. Translation and validation of the Korean confusion assessment method for the intensive care unit. *BMC Psychiatry*, Vol 11 Issue 1, 94-97.
- Flacking R, Ewald U, Nyqvist KH, Starrin B 2006. Trustful bonds: A key to "becoming a mother" and to reciprocal breastfeeding. Stories of mothers of very preterm infants at a neonatal unit. *Social Science & Medicine*, Vol 62 Issue 1, 70-80.
- Flynn E.A & Baker K.N 1999. Medication errors research, 6-25.
- Goran T, Susan F 2010. A second set of eyes: an introduction to tele-ICU. *Critical Care Nurse*, Vol 30 Issue 4, 46-56.
- Harrowing J N, Mill J, Spiers J, Kulig J, Kipp W 2010. Culture, context and community: ethical considerations for global nursing research. *International Nursing Review*, Vol 57 Issue 1, 70-77.
- Heyland D 1998. Nutritional support in the critically ill patient, a critical review of the evidence, 423-440.
- Heyland F 2004. Validation of Canadian clinical practice guidelines for nutrition support in mechanically ventilated, critically ill adult patients: results of a prospective observational study, 2260-2266.
- Higgins Y, Maries-Tillott C, Quinton S, Richmond Jo 2008. Promoting patient safety using an early warning scoring system. *Nursing Standard*, Vol 22 Issue 44, 35-40.
- Hweidi IM 2007. Jordanian patients' perception of stressors in critical care units, 227-235.
- Johnson A 2007. The maternal experience of kangaroo holding, 568-573.
- Jones C 2001. Memories, delusions and the development of acute post-traumatic stress disorder- related symptoms after intensive care unit, 573-580.
- Kattlemann 2006. Preliminary evidence for a medical nutrition therapy protocol: enteral feedings for critically ill patients, 1226-1241.
- Kawlik L 1996. Nurses' and parents' perceptions of participation and partnership in caring for a hospitalized child, 430-434.

- Lahlafi A 2007. Conducting a literature review: how to carry out bibliographical database searches, 566-569.
- Laschinger H.K.S., Shamian J & Thomson D 2001. Impact of magnet hospital characteristics on nurses' perceptions of trust, burnout, quality of care and work satisfaction. *Nursing Economics*, Vol. 19, Issue 5, 209-219.
- Major, KS, Micheal CS 2002. Wireless clinical alerts and patient outcomes in the surgical intensive care unit. *American Surgeon*, Vol. 68, Issue 12, 1057.
- McVicar Andrew 2003. Integrative literature reviews and meta-analysis Workplace stress in nursing: a literature review. *Journal of Advanced Nursing*, Vol 44 Issue 6, 633-642.
- Mlinar S, Tusak M, Karpjuk D 2009. Self concept in intensive care nurses and control group women. *Nursing Ethics*, Vol 16 Issue 3, 328-339.
- Mohta M 2003. Psychological care in trauma patients, 17-25.
- Morrison A 2001. The effects of nursing staff inexperience on the occurrence of adverse patient experiences in ICUs, 116-121.
- Morrissey J 2010. Quality versus quantity: IOM report: hospitals must cut back workload and hours of nurses to maintain patient safety, 8-11.
- National Patient Safety Agency 2007a. Safer care for the acutely ill patient: Learning from serious incidents. NPSA London.
- National Patient Safety Agency 2007b. Recognizing and responding appropriately to early signs of deterioration in hospitalized patients. NPSA London.
- National Patient Safety Agency 2007. The fourth report from the patient safety observatory. Safety in doses: Medication safety incidents in the NHS. NPSA London.
- Novaes 1999. Stressors in ICU: perception of the patient, relatives and health care team, 1421-1426.
- Pang PSK, Suen LKP 2008. Stressors in the ICU: a comparison of patients' and nurses' perceptions. *Journal of Clinical Nursing*, Vol 17 Issue 20, 2681-2689.
- Phillip B, Racco M 2010. Developing a protocol for intensive care patients at high risk for pressure ulcers. *Critical Care Nurse*, Vol 30 Issue 3, 77-80.
- Redshaw M.E 1997. Mothers of babies requiring special care: attitudes and experience. *Journal of Reproductive & Infant Psychology*, Vol 15 Issue 2, 109-120.
- Roberts S 2003. Nutrition support on the intensive care unit: adequacy, timeliness and outcomes, 49-57.
- Rompaey BV, Schuurmans MJ, Shortridge-B, Lillie M, Truijen S, Elseviers M, Bossaert L 2009. Long term outcome after delirium in the intensive care unit. *Journal of Clinical Nursing*, Vol 18 Issue 23, 3349-3357.
- Schnyder U, Malt UF 1998. Acute stress response patterns to accidental injuries, 419-424.
- Shuldham C.M 2004. Nursing skill mix and staffing. *Journal of Nursing Management*, Vol 12 Issue 6, 385-387.
- Siegele P 2009. Enhancing outcomes in a surgical intensive care unit by implementing daily goals and tools. *Critical Care Nurse*, Vol 29 Issue 6, 58-70.

Slort W, Schweitzer BPM, Blankenstein AH, Abarshi EA, Riphagen I, Echteld MA, Aaronson NK, Der Horst HE Van, Deliens L 2011. Perceived barriers and facilitators for general practitioner-patient communication in palliative care: A systematic review. *Palliative Medicine*, Vol 25 Issue 6, 613-629.

So & Chan 2004. Perceptions of stressors by patients and nurses of clinical care units in Hong Kong, 77-84.

Taylor P, Ruth E, Molassiotis A 2001. An exploration of the relationships between uncertainty, psychological distress and type of coping strategy among Chinese men after cardiac catheterization. *Journal of Advanced Nursing*, Vol 33 Issue 1, 79-88.

Thomas A.N & Galvin I 2008. Patient safety incidences associated with equipment in critical care: a review of reports to the UK National Patient Safety Agency. *Anaesthesia*, Vol 63 Issue 11, 1193-1197.

Timmins F, McCabe C 2005. How to conduct an effective literature research, 41-47.

Van de Leur 2004. Discomfort and factual recollection in intensive care unit patients, 467-473.

Verhaeghe S, Defloor T, Van ZF, Duijnstee M, Grypdonck M 2005. The needs and experiences of family members of adult patients in an intensive care unit: a review of the literature. *Journal of Clinical Nursing*, Vol 14 Issue 4, 501-509.

Vos M 2007. Quality measurement at intensive care unit: which indicators should we use, 267-274.

Warburton Paul 2010. Numeracy and patient safety: the need for regular staff assessment. *Nursing Standard*, Vol. 24 Issue 27, 42-44.

White DB, Curtis JR, Wolf LE, Prendergast TJ, Taichman DB, Kuniyoshi G, Acerra F, Lo B, Luce JM 2007. Life support for patients without a surrogate decision maker: who decides? *Annals of Internal Medicine*, Vol. 147 Issue 1, 34.

Yin KLL, Lau YL 2003. Immediate needs of adult family members of adult intensive care patients in Hong Kong. *Journal of Clinical Nursing*, Vol. 12 Issue 4, 490-500.

BOOK

Nancy B, Susan K. Grove 2001. *The practice of nursing research: Conduct, critique & utilization*, 4th edition. USA: W.B. Saunders Company.

<http://www.enotes.com/surgery-encyclopedia/intensive-care-unit>

<http://www.nhs.uk/Conditions/Intensive-care/Pages/What-happens.aspx>

<http://www.nlm.nih.gov/medlineplus/criticalcare.html>

<http://jic.sagepub.com/content/21/4/199.short>

http://www.mycucare.org/Support_Brochures/Pages/CommonProblems.aspx

<http://www.medicinenet.com/ards/page6.htm>

<http://www.mayoclinic.com/health/traumatic-brain-injury/DS00552/DSECTION=treatments-and-drugs>

<http://www.mayoclinic.com/health/traumatic-brain-injury/DS00552>

<http://www.mayoclinic.com/health/fecal-incontinence/DS00477>

<http://www.nlm.nih.gov/medlineplus/ency/article/000666.htm>

<http://vsearch.nlm.nih.gov/vivisimo/cgi-bin/query-meta?v%3Aproject=medlineplus&query=intensive+care>

http://www.myicucare.org/Support_Brochures/Pages/CommonProblems.aspx