



**Metropolia**

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# Effects of stress on patient safety in acute care nursing - A Descriptive Literature Review

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<p>Working with healthcare experts on a daily basis could be one of the most rewarding experiences a person can have. Gaining new information and having positive interactions with experts might be considered positive outcomes. The purpose of this thesis was to describe how stress experienced by nurses affects patient safety in acute care nursing settings in hospitals. The aim of this review was to produce new knowledge on how stress affects patient safety in acute care settings that could be used or utilized in improving the quality of patient care and patient safety.</p> <p>Data was collected by using CINAHL, PubMed and Medline databases. There were 9 articles selected by using inclusion and exclusion criteria. Inductive content analysis was used to analyze the data collected. In the content analysis two main categories and several generic categories which were produced by using the two study questions.</p> <p>Results showed that how stress experienced by nurses affect patient safety in acute care settings as well as how patient safety incidents related to stress experienced by nurses could be prevented. There were many stress causing factors found which made an impact on patient safety. There were some preventive measures found in order to overcome the stress of the nurses.</p> <p>In conclusion, this study's findings demonstrated the impacts of stress and how it could possibly be prevented. By outlining the impacts of stress and how it may be avoided, nurses and hospital administrators can gain a better understanding of how to reduce its occurrence. Furthermore, it is the obligation of the organization to make the required modifications to the working environment and regulations.</p>	
Key Words	nurse, stress, patient safety, acute care setting, burnout

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## 1 Introduction

Working with healthcare professionals on a daily basis could be one of the best moments a person would experience, as there are both positive and negative facts. As positive effects, gaining new knowledge and having good experiences with professionals could be taken. However, there could be negative impacts such as safety issues, communication issues, and sometimes technological issues which could affect patient care. Therefore, it would be important to consider more on the human factors in healthcare settings. The quality of medical services is mostly determined by the personal characteristics of the physician, nurse, and patient. (Mosadeghrad AM 2014.)

There have been many human factors affecting people in their workspace and directly for the performance of a person. Basically, human factors could be defined as the most important and common factors that would affect a person's abilities in their own workspace. Human factors determine how to interact with each other in teams and technology. In workspaces, people are going through a lot of human factors that could lead to stress which is vital to recognize the causes for those situations and take action against them. Most of the time stress is caused by many factors in the workspace. (Carayon 2008.)

As the general population ages, there is more need for nurses. The population is expected to grow by a huge amount in upcoming years, but the over-65 group, which has larger healthcare demands, is expected to grow by half of the population. There is a lack of sufficient nurses to meet current demand, and it is expected that as demand grows in the future and nursing school enrolment drops, the shortage will worsen. Those who continue to work during a nurse shortage will have an excessive workload. This was done in response to escalating healthcare costs since the 1990s. Escalating financial pressure compelled healthcare companies to shorten patients' stays. As a result, hospital nurses must care for more sick patients than in the past, making their jobs more difficult. (Carayon 2008.)

Stress could be viewed as a blockade to developing the culture of patient safety, necessitating the arrangement of suitable stress management precautions among nurses. A patient safety culture is essential for healthcare institutions seeking to enhance patient safety and treatment quality. (Habib et al. 2017.)

This review's aim is mainly to produce new knowledge based on how stress affects patient safety in acute care settings that could be used or utilized in developing the quality of patient care and patient safety. Moreover, the purpose of this review is to describe how stress experienced by nurses has affected patient safety in acute care settings in hospitals. In this review, it may provide most of the important factors about stress-causing factors, patient safety incidents, and preventive measures on how to prevent patient safety incidents.

## **2 Background**

### **2.1 Key terms**

The key terms are the most essential terms that can be used in defining the title of an article or the whole article. Using the key terms makes it convenient for the reader, and researcher to find out the exact article that they need. In this thesis work the key terms that have been used are nurse, stress, patient safety, acute care setting, and burnout.

The stress key term could be explained as a state of concern or mental tension caused by a difficult situation. Stress is recognized as a natural human response that motivates us to confront difficulties and hazards in our lives. It is incredibly difficult to define the word "stress." The term "stress" has historically been used to describe a variety of ideas, such as the unpleasant stimuli to which a person is subjected, the physiological and behavioral coping reactions to those stimuli, and the overstimulation of the coping responses that lead to disease. Here, the terms "stressor" and "stress response" relate to unpleasant stimuli, respectively, whereas "chronic stress" is used to describe prolonged overstimulation of coping mechanisms. The majority of the review focuses on brief-lived acute stressors (such as predator assaults, dominance disputes, and storms) that, if they continue, might become chronic stressors (Romero 2004.)

The key term nurse could be defined as a trained healthcare worker who takes care of sick people. Nursing is specialized in the autonomous and collaborative care of individuals of all ages, families, groups, and communities, whether they are sick or well, and in all settings. Nursing includes the promotion of health, the prevention of illness, and the care of the sick, disabled, and dying. Nursing activities include advocacy, the promotion of a safe environment, research, participation in establishing health policy and the management of patients and health systems, and education. (ICN 2002.)

The key term patient safety could be described as "the absence of preventable harm to a patient and the reduction to an acceptable level of risk of unnecessary harm associated with health care. Patient safety is defined as a healthcare profession's specialization that uses safety science approaches to establish a trustworthy system for providing healthcare. Patient safety is also a characteristic of healthcare systems that minimizes the occurrence and impact of adverse events while increasing recovery from such occurrences. Patient safety is now recognized in many countries, with the World Health Organization's World Alliance for Patient Safety encouraging global awareness. Nonetheless, implementing patient safety policies and practices continues to pose significant challenges. (Emanuel et al.2009.)

The acute care key term could be defined as when someone needs immediate medical attention for an illness or injury, acute care would help to make their condition more stable. Acute care is a form of medical care in which an individual receives treatment for a brief yet severe illness, problems induced by disease or trauma, or while recuperating from surgery. Acute care is frequently provided in a hospital by a variety of clinical personnel who make use of specialized technology, medications, and medical equipment. According to the Connecticut public health law, which regulates hospitals, an acute care hospital is defined as a short-term hospital that offers facilities, medical personnel, and all necessary persons to give diagnosis, care, and treatment of a wide range of acute conditions, including injuries. (Hirshon et al. 2013.)

The key term burnout is identified as an extended period of stress that feels as though it cannot be ameliorated. Burnout is a physiological condition that develops over time as a result of continuous interpersonal job stress. This response includes three major components: intense exhaustion, emotions of cynicism and alienation from the work, and a sense of ineffectiveness and lack of accomplishment. This three-dimensional model is crucial because it clearly places the individual's stress experience within a social context and encompasses the individual's perception of both themselves and others.(Maslach & Leiter 2016.)

## 2.2 Human factors theory

Human factors theory is an analysis of how people function and how they interact with equipment, systems, and processes inside an organization in order to improve performance, increase safety, and increase user happiness. Human factors theory is the study of human performance and interaction with equipment, systems, and

processes inside an organization in order to improve performance, increase safety, and increase user happiness. (Milligan 2007.)

According to the (NHS 2013.), developing clinical performance by realizing the consequence of teamwork, tasks, equipment, workspace, culture, and organization on human habits and abilities, and then applying that skill in clinical settings is known as the human factor theory in health care settings.

Human Factors are regularly referred to as ergonomics, which is a firmly established scientific topic that is used in a variety of different safety-critical industries. Human Factors approaches are important to current patient safety and quality improvement research, offering a comprehensive, evidence-based, and coherent strategy for patient safety, quality enhancement, and outstanding clinical care (NHS 2013.)

Human Factors concepts and practices aim to improve human performance by better understanding individuals' behavior, relationships with others, and interactions with their environment. Human Factors offers techniques to minimize and ameliorate human frailties, hence lowering medical mistakes and its effects by accepting human limits. The system-wide adoption of these principles provides a once-in-a-lifetime chance to foster cultural transformation and empower the NHS to prioritize patient safety and clinical quality. Human Factors ideas may be utilized to recognize, evaluate, and deal with patient safety threats, and also to analyze events to identify learning and corrective solutions.

Human Factors knowledge and techniques in general may be used to lead quality improvement in teams and services, assist with change management, and help to underline the importance of designing equipment, processes, and procedures (NHS 2013.)

Human Factors is a broad, scientific, evidence-based decision- subject that may help people solve a variety of problems they face on a daily basis. Understanding Human Factors in the design, implementation, and evaluation of the devices or equipment that are used, as well as the way people work, individually and collaboratively, will lead to more resilient, beneficial connected, and environmentally friendly structures and ways of working. Human Factors separates itself from other approaches to enhancement by using a people-centered, systems-based approach that has been proven to consistently and sustainably result in better safety, long-term cost savings, and higher quality outputs. (Health Education England 2019.)

### 2.3 Patient safety issues in acute care

Heavy workloads, behavioural and health difficulties with clients, and a lack of professional autonomy have all been identified as important stresses in direct care jobs. These pressures, if not managed properly, can lead to burnout and impair the efficacy of care delivery. (Skirrow & Hatton 2007.)

Despite the fact that the system has made several steps to lower excessive nurse workloads, there were still too few nurses, particularly in critical care settings, as a result of inadequate prioritization of critical care. Therefore, it has been critical to comprehend how a heavy nurse workload affects the intensive care unit. (ICU). In the Intensive care unit, nurses who work full-time were among the participants. According to the study's findings, nurses were aware of the detrimental consequences that an excessive workload in nursing had on patient safety. The study (Banda et al. 2022) shows that additional ICU nurses are required in order to lessen nurse workloads, and policymakers and nurse management must establish measures to control nurse workloads and their consequences on patient care. (Banda et al. 2022.)

Patient safety is vital in medicine, especially in time-sensitive operations such as acute stroke therapy with critically ill patients and the involvement of multidisciplinary, multi-professional teams. The increased use of endovascular treatment in acute stroke care maintains this trend and creates new challenges for local stroke teams on a regular basis. As a result, current treatment recommendations for acute ischemic stroke encourage the construction of specialist multidisciplinary stroke teams, as well as the development of education programs stressing team performance and patient safety. (Bohmann et al. 2021.)

According to safety principles improved in high-risk, non-medical situations, patient safety is mostly dependent on human variables and also organizational variables. It is frequently getting challenged at departmental interfaces like handovers, which raise the fear of possible mistakes. In emergency medicine, the culture of safety is reviewed as the foundation for maintaining the safety of the patient via favorable team performance. (Bohmann et al. 2021.)

## 2.4 Stress and patient safety

Building a safer healthcare system may improve the quality of treatment without affecting nurse job outcomes, a concern that is shared globally. The majority of the available information has come from cross-sectional research carried out in Western nations, which restricts generalization and causal conclusions. The aims of this study were to look at alterations in unfinished nursing care in acute hospitals in terms of quality of care, nurse job outcomes, nursing work environment, non-professional tasks, and nursing care that were left incomplete. The Nursing Work Index's Practice Environment Scale was used to evaluate the workplace. A seven-item scale was used to evaluate the performance and amount of time spent on non-professional activity. Enhancing the working environment for nurses and encouraging them to do professional, direct treatment of patients, as opposed to non-professional labor, has the potential to improve nurse work outcomes and increase healthcare quality. (Liu et al.2021.)

Based on the study done by (Liu et al. 2021.) Nurses' efforts are critical to providing high-quality healthcare services, particularly in intensive care units. (ICU). ICU patients are more prone to have problems and adverse events, and they require more focus and nursing care. The majority of research in this field has focused on the influence of staff and their link to patient satisfaction and security.

Previous study had revealed that pneumonia development in ICU patients who required more nursing care was substantially correlated with decreasing nursing staffing. Nosocomial infections have a much higher incidence rate when there is an increase in nursing efforts. Previous research also has supported the connection between increasing incidence rates of death in ICU patients and greater nursing effort. According to earlier studies, the ratio of nurses to patients has previously been used to analyze the link between patient safety and nursing workload. According to a previous study, the nursing workload was a more complicated relationship that could not be determined by a simple ratio like the nurse-to-patient ratio. According to the statistics, patients in the ICU may have had a number of unfavorable outcomes as a result of insufficient nursing care, including increased death, a longer hospital stay, and catching in-hospital infections. To emphasize the influence of nurse workload on patient outcomes and safety in the intensive care unit, the study has analyzed the findings from earlier studies in the current study. (Holden et al.2011.)

### **3 Purpose, aim, and research questions**

In this thesis the main purpose is to describe how stress experienced by nurses affects patient safety in acute care nursing settings in hospitals.

This study mainly aims to produce new knowledge on how stress affects patient safety in acute care settings that could be used or utilized to improve the quality of patient care and patient safety.

Research Questions of this study are as follows.

1. How does stress experienced by nurses affect patient safety in acute care settings?
2. How patient safety incidents related to stress experienced by nurses could be prevented?

### **4 Methodology and Methods**

#### **4.1 Descriptive literature review**

This descriptive literature review's main purpose is to evaluate if there is any identifiable pattern or trend in a research topic's body of knowledge, in relation to existing propositions, theories, methodologies, or findings. On the other hand, when it comes to descriptive reviews, they adhere to a structured and easily understandable process, which involves conducting thorough searches, evaluating, and sorting studies. Certainly, to generate a sample that correctly represents a wider collection of published items, structured search approaches are used.

Webster and Watson (2002) agreed that literature reviews could be used to suggest topics for further investigation. They also claim that they can lay the groundwork for furthering knowledge and facilitating theory development. Wolfswinkel, Furtmueller, and Wilderom (2013) developed a unique strategy for performing thorough, descriptive literature reviews. The fundamental goal of a descriptive review is to assess the extent to which a body of material in a certain research field exhibits any interpretable pattern or trend in connection to pre-existing concepts, theories, methodologies, or discoveries.

In contrast to narrative reviews, descriptive reviews use a rigorous and transparent approach to research that involves searching, filtering, and classifying. In fact, structured search methods are used to generate a representative sample of a larger range of published publications. Furthermore, writers of descriptive reviews utilize frequency analysis to identify particular features of relevance from each study, such as publication year, research methodology, data gathering procedures, and research aim or strength. (Sylvester et al. 2013.)

In a descriptive review, each study serves as the unit of evaluation, and the published literature as a whole serves as a database from which the authors attempt to identify any interpretable trends or draw overall conclusions about the merits of existing conceptualizations, propositions, methods, or findings. A descriptive review may claim that its findings represent the state of the art in a particular field. (Pare et al. 2015.)

Additionally, the writers of descriptive reviews collect particular facts from each study, such as the year it was published, the research methodologies utilized, data gathering techniques used, and the scope or significance of the research findings. These characteristics are then analyzed through frequency analysis to generate quantitative results. Basically, in a descriptive review, each study is analyzed separately, and all the published literature is used as a source of information.

The writers attempt to find any discernible trends or draw broad generalizations regarding the efficacy of current concepts, ideas, techniques, or results. By doing this, a detailed review can assert that its discoveries reflect the latest advancements in a specific field. (Lau & Kuziemy 2019.)

## 4.2 Data Search and Selection

The Initial article searches were conducted by using the following databases, such as PubMed and CINAHL (EBSCO). The search words used were nurse, nursing, stress, heavy workload, and patient safety. Nowadays, looking for literature is often done using computers and databases. Computer databases in a given field of specialty recommend a large quantity of information that may be obtained more quickly and easily than searching manually. Some of the nursing databases included in this review were from the Cumulative Index of Nursing and Allied Health Literature (CINAHL), a database that contains journals and papers about nursing and health. PUBMED, on the other hand, is a service of the National Library of Medicine that includes more life

science periodicals. The data for this research was acquired from two major databases, CINAHL and PUBMED.

In the review, data was collected through a systematic search. A literature review is a summary and evaluation of a body of publications on a given topic. Such evaluations are not limited to graduate students; academic experts routinely conduct such appraisals throughout their research careers. Even seasoned researchers may find it challenging to conduct a literature review in an age where the Internet has multiplied the quantity of potentially relevant sources. (Jeffrey, 2006.)

### **Facet Analysis**

The facet analysis basically means that it is used to create some classifications for the physical arrangement of a thesis. It is so accessible to gain some key terms to gather some of the research articles by using the PEO method. Basically in this method, (P) population was the set of people who experienced the relevant incident or the problem and (E) exposure was the main cause and the (O) outcome was the main incident that happened due to the exposure of the selected participants.(VCU 2023.) In this study, the PEO method was used to assess the two research questions to obtain search terms.

In this study the study questions are as follows; “How does stress experienced by nurses affect patient safety in acute care settings?” and “How patient safety incidents related to stress experienced by nurses could be prevented?”

Table 1. PEO keywords

Population	Nurses
Exposure	Stress
Outcome	Patient safety

Some of the terms were chosen by using the PEO method according to the research questions. Those key terms played a major role in finding articles through the databases that have been used. The above table mentioned what the main population

related to this review was and what was the main cause which affected that selected population. In the outcome, it mentioned what was the main effect because of the exposure of the selected population. The following table explains the key terms that have been selected (table 2).

Table 2. PEO framework

<b>Population</b>	<b>AND</b>	<b>Exposure</b>	<b>AND</b>	<b>Outcome</b>
Nurses		Stress		Patient Safety
OR		OR		OR
Acute care Nurse		Burnout		
OR		OR		OR
Registered nurse		pressure		

In this study the Boolean technique was used to obtain and select articles in CINAHL, Pubmed and Medline. In search of data boolean connectors were used together with the search terms in order to obtain the exact research articles. The boolean connectors were "OR" and "AND" that have been used. The MESH technique was used to find out some of the search terms. The total number of 370 articles from CINAHL, a total number of 207 articles from Pubmed, and a total number of 106 articles were found from Medline as the total number of citations. A total number of 171 articles were found after searching based on the relevant title. 53 Articles were found based on the abstract of the articles. Information about the data search is mentioned in the following table. (Table 3)

Table 3. Database searches

<b>Data-base/ Date/ Limits</b>	<b>Search Phrase</b>	<b>Total Number of Hits/ Citations</b>	<b>Papers/records included based on title</b>	<b>Papers/records included based on abstract</b>	<b>Papers/records included based on Full text</b>
CI-NAHL  16th of May 2023  Abstracts from 2018 to 2023	(nurse or nurses or nursing or nursing staff or nursing care ) AND ( acute care or acute care settings or intensive care unit or emergency department ) AND ( patient safety or patient outcomes ) AND ( stress or pressure or burnout )	370	53	18	4
PUB-MED  16th of May 2023  Abstracts from 2013 to 2023	((Acute care nurse or nurse or nursing staff) AND (Acute care or acute care setting or intensive care unit or emergency department)) AND (patient safety)) AND (stress or pressure or burn-out)	207	34	14	3
MED-LINE  17th May 2023  Abstracts from 2013 to 2023	(Nurse or nursing or nurses) AND (stress or pressure or burn-out) AND (patient safety) AND (acute care or acute care settings)	106	15	6	2
Records in Total		683	102	38	9

In the data collection process there have been used the inclusion criteria and the exclusion criteria to accomplish the exact articles. Our inclusion criteria and exclusion criteria were utilized during the initial search phases. It was used in the abstract reviewing phase as well. In this review selection criteria mainly consist of language, year of publication, database, and relevance to the study. The studies that were not related to inclusion criteria were not selected and removed.

Table 4. Inclusion and exclusion criteria

<b>Selection Criteria</b>	<b>Inclusion Criteria</b>	<b>Exclusion Criteria</b>
<b>Year of Publication</b>	Studies published within the last ten years. From 2013 to 2023.	Studies published before 2013.
<b>Language</b>	English language studies	Studies from other languages and Translations
<b>Database</b>	Peer-reviewed articles. / Research sources from academic databases	Non-peer-reviewed articles/ Research sources, which do not form academic databases.
<b>Relevance</b>	Studies which are related to stress and patient safety.	Studies which are not related to stress and patient safety.

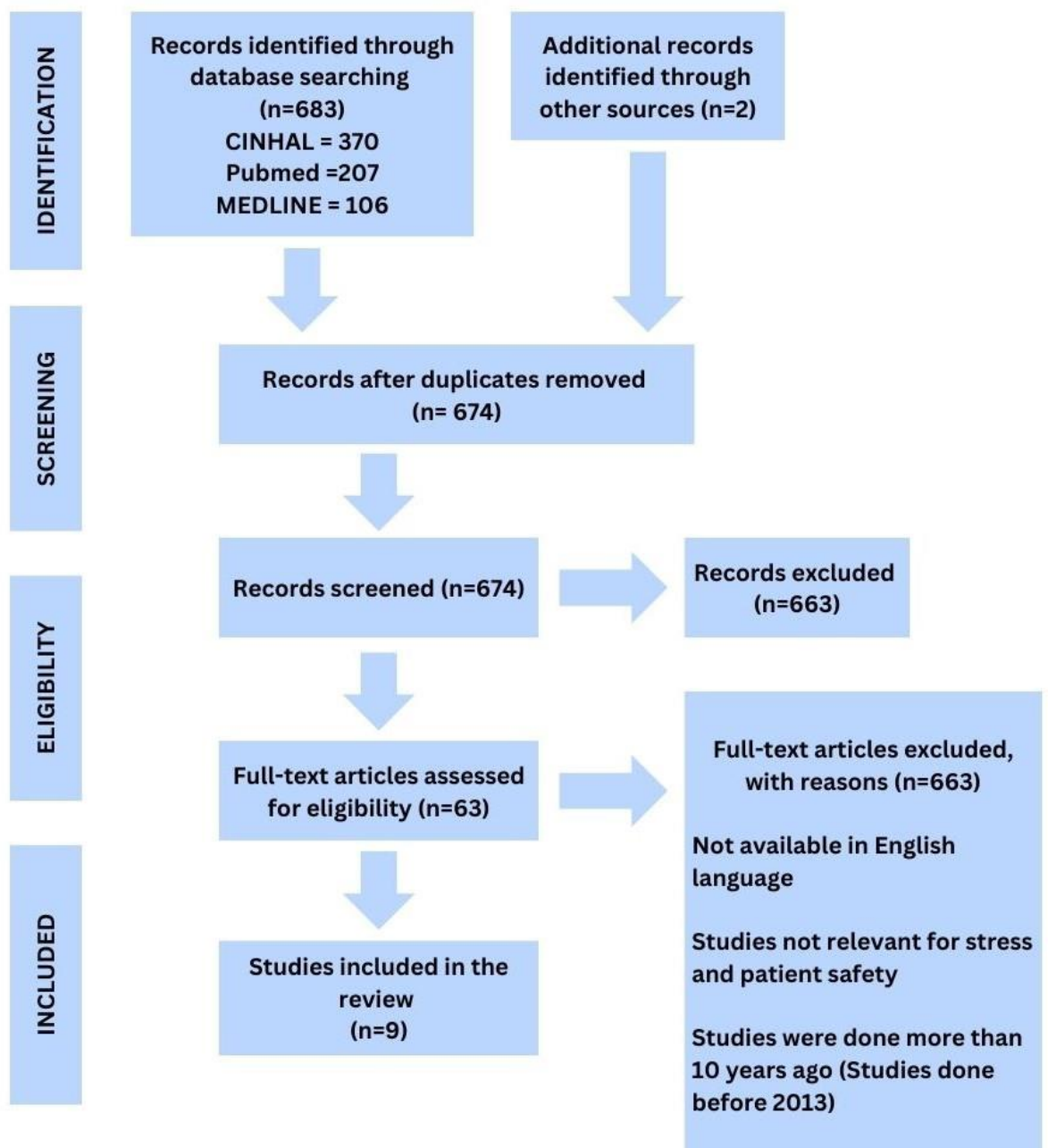
PRISMA diagram, which is an evidence-based checklist that provides guidelines for the reporting of all systematic reviews and meta-analyses. Basically, PRISMA is the abbreviated form Preferred Reported Items for Systematic Reviews. PRISMA diagram was developed to improve the transparency and quality of reporting in these types of studies and to ensure that critical details are included, allowing readers to assess the validity and applicability of the findings. PRISMA includes a flow diagram that outlines the study selection process. By following PRISMA guidelines, researchers can provide clear, complete, and transparent reporting of systematic reviews and meta-analyses. (Page et al, 2021.)

The method used in the PRISMA has four main stages such as identification, screening, eligibility, and inclusion. In the identification stage, 683 articles were selected based on records identified through database searching. Those selected articles were screened through as it was the next stage and duplicates were removed. 674 articles were

screened in total to the eligibility stage after duplications were removed. There were 63 articles selected based on the full-text studies. Those studies were evaluated for eligibility, and 611 publications were rejected due to several reasons. The reasons were articles that were not available in the English language, studies not relevant to stress and patient safety, and studies that were done more than ten years ago (before 2013.) Finally, 9 articles were selected and added to this review. (Figure 1)

Figure 1. PRISMA Flow diagram

### Prisma Flow Diagram



### 4.3 Data Analysis Method

This review was done by using the Inductive content analysis method to analyze data, which will define a qualitative method used to develop content based on research findings, research from articles, and verbal content. Content analysis is a research method that allows qualitative data collected in research to be methodically and reliably assessed in order to create generalizations about the categories of interest to the researcher. (Haggarty 2009.)

This strategy was used with open or semi-structured data. This method was used for unstructured or semi-structured data. In the abstraction process, inductive content analysis was used to reduce and categorize data so that researchers could answer study questions using concepts, categories, or subjects. Following the selection of a unit of analysis, the researcher analyzes the data for open codes, which are then combined with other open codes that include equivalent information to produce sub-concepts, -categories, and -themes.

These sub ideas, categories, and themes are integrated into concepts, the categories, and for the themes. It could be then further arranged into some primary concepts, some categories, and some themes, as in the previous stage. The content analysis findings will be reported using the identified ideas, categories, and themes (or main concepts, categories, and themes). Because this sort of analysis is data-sensitive, the researcher should return to the original data multiple times throughout the analytical process to verify that the results have a strong relationship to the examined data (Kyngas 2019).

Table 5. Inductive content analysis example

<b>Meaning Unit</b>	<b>Coding</b>	<b>Sub Category</b>	<b>Generic Category</b>	<b>Main Category</b>
“Increased provider-level anxiety was perceived to be the second most common contributor to patient safety events.” (Guise J, et al 2017)	Anxiety was perceived to be the second most common contributor.	Anxiety of Nurses	Stress-causing factors	Stress experienced by nurses affects patient safety in acute care settings

## 5 Results

### 5.1 Summary of the data used

There were nine studies included in this descriptive literature review. The article selection criteria were determined by year of publication, language, data, base, and connection with the articles through inclusion criteria (Table 4). The chosen studies were published in the English language. In the article selection criteria, the articles that were published within the last ten years were selected (Table 5). Peer-reviewed articles and research sources from academic databases such as CINAHL, Pubmed, and Medline were used. Participants included intensive care units and emergency room nurses from various nations.

The data were collected from cross-sectional studies such as (Wijn et al. 2019 & Tawfik DS et al. 2017 & Kakemam et al.2019 & Ahmed et al.2023). There were some of the other articles that were selected that had used mixed methods. In those mixed methods cross-sectional surveys, semi-structured interviews, and qualitative analysis methods have been used. The selected mixed methods articles were (Bogaert et al. 2017 & Guise J, et al 2017 & Bergman et al. 2021). However, there was one macro-data analysis study that was used (Chang et al. 2017). There was one narrative inquiry with a thematic analysis study used (McKenzie et al.2021). The most relevant and the most popular article that was selected (Bergman et al. 2021).

In the chosen studies, there were articles from different continents. They were from Europe, Asia, and Australia. There were articles from the United Kingdom, Belgium, Australia, Iran, United Arab Emirates, Netherlands, Taiwan, and the United States of America. The article from the United Kingdom (Bergman et al. 2021) had 282 participants who were from intensive care units and the article from Belgium (Bogaert et al. 2017) had participants from intensive care units as well as operating theaters. An article from the Netherlands (Wijn et al. 2019), which is also from Europe had 692 emergency care department nurses in the study. From the articles selected, there were two articles from the United States of America (Tawfik DS et al. 2017) that had registered nurses from NICUs and the other article (Guise et al. 2017) had 753 emergency department nurses. An article conducted in Australia (McKenzie et al.2021) had eight newly qualified registered graduate nurses from NICUs. There were three articles conducted in Asia, which are from Iran (Kakemam et al.2019), the United Arab Emirates (Ahmed et al.2023), and Taiwan (Chang et al. 2017).

## 5.2 Analysis of the collected data

Throughout the review data analysis was conducted by using an Inductive content analysis method. The collected data were categorized into two main categories followed by the research questions. “How does stress experienced by nurses affect patient safety in acute care settings?” and “How patient safety incidents related to stress experienced by nurses could be prevented?”. As an inductive data analysis method has been used the data was categorized into smaller categories from main categories. Those generic categories were then subdivided into smaller groups known as subcategories. This content analysis process is illustrated as mentioned in the below table. (Table 6)

Table 6. Data analysis categories

<b>Main Categories</b>	<b>Generic Categories</b>
Stress experienced by nurses affect patient safety in acute care settings	Stress causing factors
	Patient safety incidents
	Nurse’s related factors
Preventive measures for patient safety incidents caused by stress	Hospital-based Preventive measures
	Patient-based preventive measures

All the 9 articles which were selected have been divided into two main categories based on the study questions. They were “stress experienced by nurses affect patient safety in acute care settings” and “patient safety incidents related to stress experienced by nurses be prevented”. The main categories were divided into more generic categories. The main categories and generic categories were selected and clearly answered the study questions of this review.

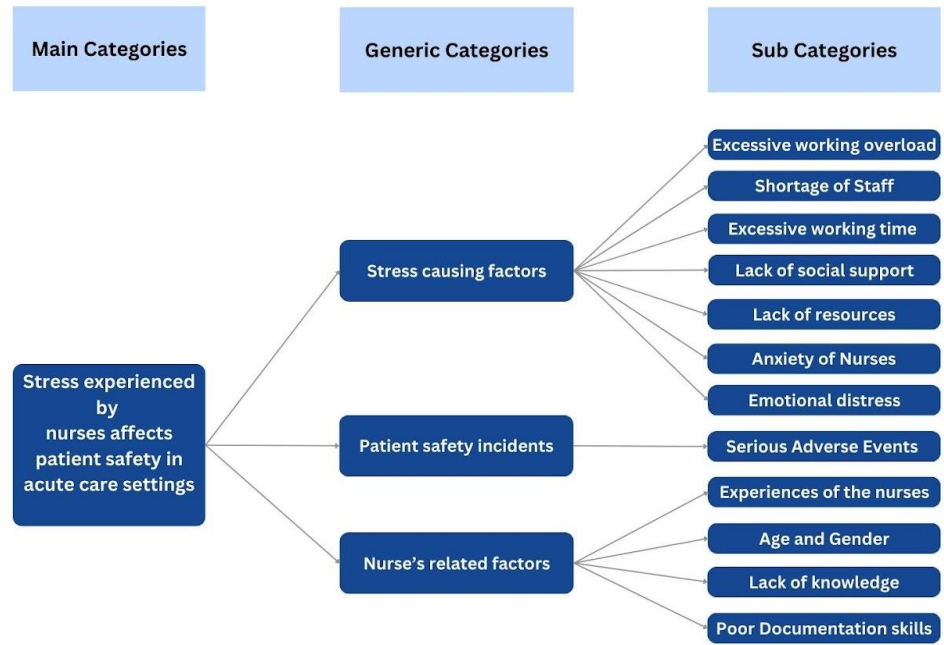


Figure 2. Results of Content Analysis

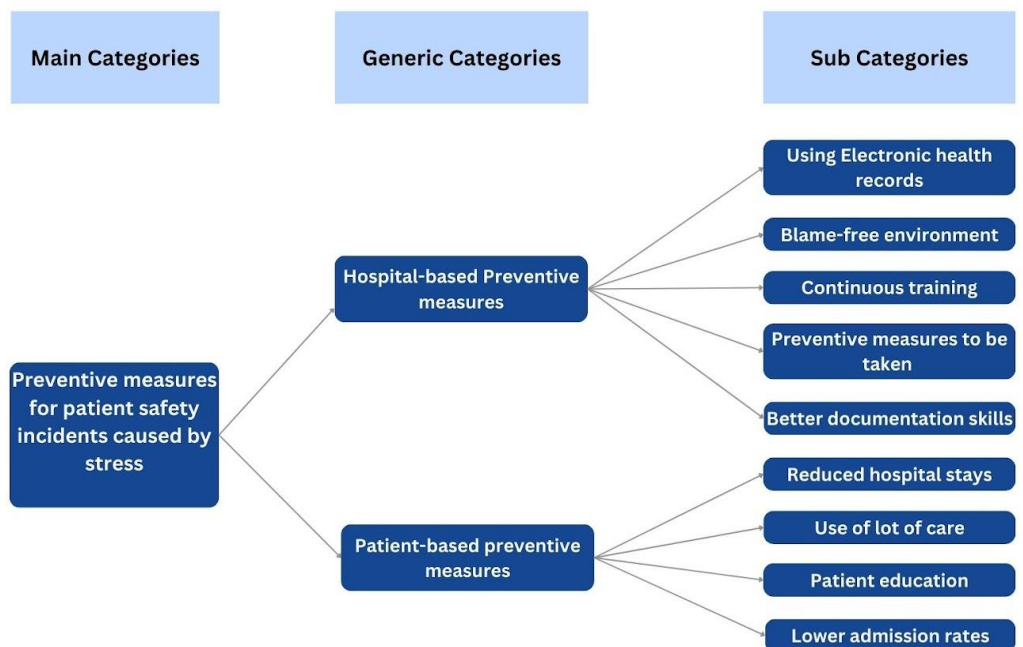


Figure 3. Results of Content Analysis

### 5.3 Stress experienced by nurses affects patient safety

There were many stress-causing factors found in the selected articles. In some of the articles, stress-causing factors had a direct link with patient safety incidents in acute care settings. There were many stress-causing factors such as excessive working overload, shortage of staff, excessive working time, lack of social support, lack of resources, the anxiety of the nurses, and emotional distress found in most of the articles.

#### 5.3.1 Excessive work overload causing stress

In a few of the articles it is mentioned that excessive job overload would result in patient safety situations in acute care settings. It has been identified as one of the most common sources of stress for nurses working in acute care settings. In one study done by Tawfik, (2017) it has mentioned that it affected the patient's safety because of the average number of daily admissions leading to nursing excessive workload. The same study mentioned that new admissions may be underappreciated because of the workload. In the same study, it has mentioned that excessive nursing workload will lead to burnout of the nurses. It will be the most common reason and the contributing factor for the burnout of the nurses. The excessive number of working hours for a patient may increase the workload of the nurses which will finally lead to excessive workload (Tawfik et al 2017). A study done in 2021 by Bergman mentioned that there was an excessive workload for the nurses because they had so much work to do which is not what they usually do. One of the participants has mentioned in the interview that they did not have enough time to do the things that they were usually intended to do. In this study it has mentioned that higher admission rates were linked with burnout prevalence of the nurses in the acute care settings. The increased number of beds in the acute care settings had led to an excessive workload in those wards. In another study done in 2021 by Mckenzie it has mentioned that unrealistic workloads made a possible stress on nurses to have an effect on patient safety. (McKenzie et al. 2021.)

In the study (Bogaert et al. 2017.) a participant has mentioned that there were a lot of admissions throughout the day that had made a possible effect on the workload they had. This study had clearly mentioned that higher admission rates lead to having excessive workload.

### 5.3.2 Excessive working time causing stress

The next most common and the important stress causing factor was excessive working time. The study by Tawfik done in 2017 has mentioned that the increased number of hours per patient that properly lead to the increased stress of the nurses (Tawfik et al 2017). Not only this study but there was another study that mentioned that increased number of hours in the acute care settings will lead to an increased level of stress among the nurses. The total number of working hours of the nurses were increased. Therefore the working time of nurses which led to stress of the acute care nurses (Chang et al. 2017). There was another article (Kakemam et al. 2019) that mentioned that the excessive work time of the nurses will lead to stress among the acute care nurses. It was linked with adverse events among the nurses who had worked overtime that they had increased stress. As a result of stress among the nurses, there were increased adverse events in the acute care settings (Kakemam et al. 2019).

### 5.3.3 Anxiety causing stress

Anxiety of the nurses had played another major role in increasing the stress of the nurses. In the following four articles (Guise J, et al. 2017; Bergman et al. 2021; Ahmed et al.2023; Kakemam et al. 2019 ) had mentioned that anxiety of the nurses will lead to stress which will affect the patient's safety. The study (Guise J, et al 2017) has mentioned that anxiety was the second most important contributing factor for the patient safety events in acute care settings. Also, this study has mentioned that the anxiety of the nurses will have an effect on patient safety events such as having trauma, respiratory distress, and cardiac issues. In the study (Bergman et al. 2021) has mentioned that nurses will express their concerns about the consequences of limited resources which basically will lead to the anxiety of the nurses. In the same study, it was mentioned that anxiety of the nurses was increased because of the psychological aspects of using the personal protective equipment and the fear of getting infected. The reason nurses get anxious is because they are afraid of getting sick. In the study (Ahmed et al. 2023) mentioned that high fatigue and poor quality of levels will lead to high anxiety levels of the nurses. It was mentioned that anxiety was a significant factor in pediatric care, especially in NICUs (Guise, et al 2017).

In acute care settings, the degree of occupational stress among nurses who reported adverse occurrences was much greater. The anxiety of the nurses leads to increased occupational stress among the nurses (Kakemam et al. 2019). The work time demands

and having stress-related incidents directly linked to anxiety of the nurses which will finally lead to stress of the nurses (Wijn et al. 2019).

#### 5.3.4 Shortage of staff and Lack of social support

Another main factor for the stress caused by nurses was that, having less staff. Shortage of staff had a greater impact on patient safety incidents in acute care settings. The potential understaffing may have an impact on the situations in patient safety. (Tawfik et al. 2017.) In a study that has mentioned that the shortage of staff is associated with workload of the acute care units. The study mentioned that the shortage of staff led to overall unit functioning. (Tawfik et al. 2017.) There was a possible increase in patient safety events because of the fewer staff members they had and also it caused a lot of work for the nurses. The understaffing will always have an impact on patient safety because of the heavy workload a nurse will have. The heavy workload led to stress of the nurses and it could lead to possible patient safety incidents.

In the acute care settings having less social support can lead to increased stress of the nurses. Job satisfaction and teamwork and the support given by the co-workers will highly impact on the stress of the nurses (Ahmed et al. 2023). In three studies selected (Ahmed et al. 2023 & McKenzie et al. 2021 & Tawfik et al. 2017) mentioned that lack of social support eventually led to stress of the nurses. In one of those studies (McKenzie et al. 2021) mentioned that there were nurses who had left the profession. The reason that they had mentioned was the stress came up due to lack of social support. There could be less interpersonal interactions among the nurses who were working in the larger NICUs and it led to poor social support from the coworkers and it could increase the stress of the nurses.(Tawfik et al. 2017)

#### 5.3.5 Lack of resources and Emotional Distress

The stress of the nurses could be increased because of the lack of resources in the acute care settings. The lack of resources had a possible impact on patient safety incidents because of the stress experienced by the nurses in acute care settings. The study (Bergman et al. 2021) mentioned that they had to prioritize the patients because of the limited and lack of resources in the hospital settings. It mentioned that lack of resources were linked with short term and long term consequences such as patient safety incidents. The number of beds in an acute care setting could be taken for the fact that there were lack of resources in acute care settings and that led to increased

stress of the nurses (Tawfik et al. 2017). Overall there were two articles (Bergman et al. 2021 & Tawfik et al. 2017) mentioned about the lack of resources that had increased the stress of the nurse which finally led to safety incidents of patients.

Emotional distress has become one of the main factors that contributed to increasing the stress of the nurses. The two articles (Bogaert et al. 2017 & Ahmed et al. 2023.) which were selected mentioned about the emotional distress of the nurses led to increased stress which finally caused patient safety incidents. Job satisfaction and working conditions in the acute care settings highly impacted the nurses job role (Ahmed et al. 2023). In the acute care settings there could be busy working conditions because of the severity of the care they are given. Therefore there could be a possible increase of stress due to emotional distress of the nurses. The study (Bogaert et al. 2017.) mentioned that insufficient communication and the lack of exchange in information between the coworkers had made an impact on nurses having increased stress.

#### 5.3.6 Patient safety incidents

The Main challenges for patient safety situations were caused by the stress of the nurses in acute care settings. The articles selected have mentioned that there were different patient safety incidents due to stress experienced by the nurses in the acute care settings. Two of the articles (Guise et al. 2017; & Kakemam et al. 2019.) showed a direct link between patient safety incidents and stress in acute care settings.

There could be possible contributing factors for patient safety incidents. The factors could be anxiety, heavy workload, lack of resources, knowledge, and staff. Those adverse patient safety incidents could have occurred due to the increased stress of nurses. One of the articles (Guise et al. 2017.) has mentioned that anxiety has been a common contributor to safety incidents in patients. In a study that was selected, clearly mentioned that trauma and child abuse as serious patient safety incidents that have been reported due to the anxiety that experienced by nurses and the paramedics. (Guise et al. 2017.)

Another article has stated that more patient safety incidents such as serious adverse events have occurred due to stress, work hours, and due to certain demographics (Kakemam et al. 2019.) whereas the same article has mentioned that critical care nurses have reported more adverse events than the normal ward nurses.

### 5.3.7 Nurse's related factors

Few of the studies demonstrated nurses-related factors which show many components that were linked under the effects of stress. Experiences of the nurses, Age and Gender, Lack of knowledge and poor documentation skills were the most prominent factors that were addressed.

Many participants have expressed how they have lacked the knowledge and competence whereas they have felt insecure and alone and have made sure they were working with well experienced personnel in case they needed assistance. And also new experiences and competency of new colleagues in critical care settings have meant to be another stress for senior nurses as they had to make sure that all the patients in the ward have received proper quality treatment (Bergman et al. 2021.) Moreover, participants stated that psychological and physical stress had an impact on their ability to give better treatment as they do not have much professional knowledge or experience in the care that has to be provided.

Additionally, lack of clinical assistance, unreasonable job overload that exceeds capacities of nurses in the critical care settings with clinical failures have made the professionals exhausted and frustrated which has led to leaving their profession that has increased the workload among other staff members. (McKenzie et al.2021.) Age and gender has been addressed as another factor under nurse related factors as the results of an article has shown that adverse events of patients are much higher among male nurses than female nurses. Moreover, It has stated that there were outstanding connection between the nurse's marital status, their professional experience, working hours of nurses, the employment status of the nurses and teaching status towards adverse events in the acute care settings. Also there is has stated that single nurses have experience more adverse events in patients than married nurses (Kakemam et al. 2019).

## 5.4 Preventive measures for patient safety incidents caused by stress

### 5.4.1 Hospital-based preventive measures

There are many preventive measures that can be taken to prevent patient safety incidents by nurses caused by stress and several factors in acute care settings. Basically, there are many hospital-based preventive measures that can be considered. There

have been several studies selected that have mentioned, there was a connection between hospital-based preventive measures and safety incidents of patients due to nurse stress. The studies (Bergman et al. 2021; & Tawfik et al 2017; & Bogaert et al. 2017.) mentioned the preventive measures that can be taken.

In one of these studies (Bergman et al. 2021.) mentioned that many nurses felt insecure due to a lack of competence and experience but were promised to collaborate with experienced intensive care nurses for necessary assistance. Those factors such as insecurity, lack of competence, and experience could be prevented if the nurses had the necessary assistance from the hospital. As a result of preventive measures taken, there could be a possibility in avoiding the patient safety incidents in the acute care settings.

According to one of these studies, the increased understanding of corporate responsibility to address burnout has resulted in the development of health-care-system-based initiatives. Moreover, this article stated that in promoting the overall well-being of patient care there were provider wellness programs aimed to enhance practice efficiency, provide some personal resilience tools, and foster a wellness culture to support healthcare providers in acute care. Not only that but also one study explained that using electronic health records use is linked to higher burnout rates, especially in NICUs with the most extensive use of electronic health records systems, and this study found that admission rates, licensed beds, average stay lengths, electronic health records use, and regional CCS level significantly influence burnout prevalence. Further, this study found that units with over two years of electronic health records used in NICUs experience higher burnout rates compared to those without electronic health records. (Tawfik et al 2017.)

Also, one study mentioned that staff nurses must prioritize care delivery, utilizing their experience and competencies to effectively manage their workload. (Bogaert et al. 2017.)

#### 5.4.2 Patient-based preventive measures

The amount of impression that a patient getting medical care has about patient safety is referred to as patient safety perception. The study (Tawfik et al 2017.) has shown that patients are an essential source of information that aids in the improvement of healthcare by eliminating the damage that may be avoided. Through patient safety

measurement, patients may proactively identify possible dangers to their safety in hospital settings. As a result, in order to improve the quality of medical treatment by preventing patient safety incidents, patient-centered patient safety awareness must be increased.

Some of the studies mentioned that there was a connection within patients based preventive measures and patient safety incidents related to stress. One of the articles has shown that the study examines the correlation between average lengths of stay and the use of electronic health records and the prevalence of burnout. Furthermore, this study has mentioned the overall health and well-being of the healthcare organization and its patient care. (Tawfik et al 2017.)

## **6 Discussion**

### **6.1 Ethics**

Legal rules govern behavior in most cultures as well, while ethical norms are usually less formal and more expensive than legal ones. While most cultures use laws to enforce widely accepted moral standards and ethical and legal rules have similar concepts, ethics, and law are not the same. A behavior can be morally righteous and criminal at the same time, Furthermore, we can evaluate, recommend, and interpret laws using ethical principles and ideas. In actuality, a great deal of social reformers in the 20th century pushed individuals to break the laws they saw as unjust or immoral. A moral method to challenge laws or express political views is through unlawful civil disobedience.

It is imperative to adhere to ethical norms when doing research for several reasons. Norms serve to further the goals of research, which include truth, knowledge, and error prevention. Legislation prohibiting the fabrication, falsification, or inaccurate presentation of research findings, for example, promotes accuracy and lessens error.

Trust, accountability, respect for others, fairness, and other characteristics essential to collaborative work are fostered by ethical principles since research often involves extensive collaboration and coordination between numerous individuals from diverse organizations and fields. To protect intellectual property rights while encouraging collaboration, for example, a number of ethical standards in research have been developed, including authorship standards, copyright and patenting laws, data sharing legislation,

and peer review confidentiality requirements. The majority of scientists do not want their ideas hijacked or made public too soon and want credit for their efforts to be given.

The public can hold researchers responsible for their actions thanks to a number of ethical guidelines. The public's support for research is bolstered by ethical norms in the field. People are more inclined to support research if they have confidence in its quality and objectivity.

## 6.2 Validity

Validity in qualitative research is indicated by the "appropriateness" of the instruments, procedures, and data. A methodology must be appropriate, the design must be valid for the methodology, the sampling and data analysis must be valid for the methodology, and the conclusions and results must be valid for the sample and context in order to address a research topic.

The difficulty in ascertaining the validity of qualitative research may originate from the ontology and epistemology of the subject matter being studied. For example, the differing philosophical perspectives of positivists and humanistic psychologists over the concept of the "individual" In contrast to humanistic psychologists who maintain that the "individual" is the product of social interaction and existential awareness, positive psychologists maintain that the "individual" coexists with the growth of any human being.

Numerous paths will lead a qualitative study concerning an individual's well-being to a variety of conclusions with varying degrees of validity. A methodology needs to be able to recognize discoveries or occurrences in the appropriate context, accounting for contextual and cultural quirks, in order to be considered valid. Sample procedures and methods must be appropriate for the research paradigm and distinguish between purposeful, systematic, and theoretical sampling, where the latter often has a specific goal or framework, the former is shaped by the ongoing process of data collection and theory in evolution, and the former has no preconceived notions. In order to strengthen the validity of the data, a variety of procedures were utilized for data extraction and analysis, such as respondent verification, multidimensional analysis that was concept- or case-oriented, and thoroughly documented audit trails of materials and processes. (Leung, L. 2015.)

We ensure the quality and the integrity of our research. We will seek informed consent and will ensure the confidentiality and the anonymity of the data, as we will not disclose any of the collected data and the participant's responses.

### 6.3 Discussion of the results

The objective of this thesis was to examine the impact of stress on patient safety in acute care nursing and how patient safety issues may be avoided. The chosen studies provided how stress experienced by nurses affects patient safety in acute care settings that could be divided into three generic categories which were factors that caused stress, patient safety incidents, and nurses-related factors. There are a lot of contributing factors that are related to those factors were mentioned in the following studies chosen (Guise J, et al 2017; Kakemam et al. 2019; Bergman et al. 2021; McKenzie et al. 2021; Tawfik et al 2017; Ahmed et al. 2023; Chang et al. 2017; Van Bogaert, P et al. 2017; Wijn et al. 2019.)

The stress causing factors had a direct link with the patient safety incidents in acute care settings. Stress-causing factors are mainly because of the excessive working overload, shortage of staff, excessive working time, lack of social support, lack of resources, the anxiety of the nurses, and emotional distress found in most of the articles.

Excessive working overload will lead to safety incidents of patients in acute settings as has become one of the main reasons for stress for the nurses in the acute care settings. A study that has been selected mentioned that it affected the patient's safety because of the average number of daily admissions leading to nursing excessive workload in acute care settings. New admissions may be underappreciated because of the workload. The article selected has mentioned that excessive nursing workload will lead to burnout of the nurses. (Tawfik et al 2017.) The study (Tawfik et al 2017.) clearly mentioned that the excessive number of working hours for a patient might increase the workload of the nurses. In the end, it will lead to excessive workload.

A study mentioned that there was an excessive workload for the nurses because they had so much work to do which is not what they usually do. Higher admission rates were basically linked with the burnout prevalence of the nurses in the acute care settings. The increased number of beds in the acute care settings, unrealistic workloads made a possible stress on nurses to have an effect on patient safety. (McKenzie et al. 2021.)

The most common and the most important stress-causing factor after the excessive workload was excessive working time. A study has mentioned that the increased number of hours per patient, direct nursing hours, and total nursing hours (Chang et al. 2017) will properly lead to the increased stress of the nurses (Tawfik et al 2017.) These articles (Kakemam et al. 2019; Chang et al. 2017; Tawfik et al 2017) had the same results that excessive work time of the nurses will lead to stress among the acute care nurses. It will directly lead to increased adverse events because of the nurses having overtime during their work in acute care settings. (Kakemam et al. 2019).

Nurses' anxiety had also played a significant part in boosting their stress. The following four publications (Guise J, et al. 2017; Bergman et al. 2021; Ahmed et al. 2023; Kakemam et al. 2019) noted that nursing worry leads to stress, which affects patient safety. According to the study (Guise J, et al 2017), anxiety is the second most prevalent contributing factor for patient safety incidents. That research also stated that nurse worry has an influence on the safety events of patients. As for the examples, trauma, respiratory distress, and cardiac difficulties were mentioned.

According to the study (Bergman et al. 2021), nurses would voice their concerns about the repercussions of insufficient resources, which will cause them distress. According to the same study, nurses' anxiety was enhanced due to the psychological components of using personal protection equipment and the fear of becoming infected. Nurses have anxiety because they are terrified of being ill. According to the study (Ahmed et al. 2023), excessive tiredness and low quality of levels would lead to high anxiety levels in nurses. Anxiety was recognized as an important issue in pediatric treatment, particularly in NICUs (Guise J, et al 2017).

In acute care settings, the adverse occurrences were much greater in the degree of occupational stress among the nurses who had been eliminated. Nurses' anxiety contributes to greater occupational stress (Kakemam et al. 2019). Worktime demands and stress-related occurrences are closely connected to anxiety in nurses, which eventually leads to stress (Wijn et al. 2019).

Trauma and child abuse have been the most common patient safety incidents that have been reported in acute care settings (Guise J et al 2017) But in a study which has been done in 2019 was mentioned that most of the adverse events that was occurred in the acute care setting has been due to stress and work hours. Moreover, it has been mentioned that critical nurses experience more adverse events than normal ward nurses.(Kakemam et al. 2019)

Many of the studies showed how professional experiences, age and gender of the professional, lack of knowledge of the personnel, and poor documentation skills led to stress and how it has affected the safety of the patients. (Kakemam et al. 2019; Bergman et al. 2021; McKenzie et al.2021) Most of the factors linked with each are from the means of stress. A higher number of safety incidents have been reported from the acute care settings than in normal wards and most of them are mainly associated with stress and work overload.

## 6.4 Conclusions and Recommendations

In general, the findings in this thesis showed effects of stress and how it can be prevented. This review included patient safety preventive measures and possible stressors (Ahmed et al.2023; Bergman et al. 2021; Bogaert et al. 2017; Chang et al. 2017; Guise J, et al 2017; Kakemam et al.2019 ; McKenzie et al.2021; Tawfik DS et al. 2017; Wijn et al. 2019). Utilization of this thesis aimed at healthcare professionals in acute care settings to further develop and increase the quality of patient care and safety of the patients. safety. By describing, effects caused by stress along with how it can be prevented, awareness among nurses and hospital managements of how the prevalence could be done. Furthermore, it is the organizational responsibility to do the necessary changes on the working environment and policies.

Improved patient safety might result in many advantages in the long run such as short term hospital stay, improved quality of care, decreased adverse effects, and decreased workload. Moreover, the organizations should develop new policies for the well being of its staff to deliver quality care for the patients.

In this thesis, the information and the knowledge that has been collected would be much beneficial for the nurses in the acute care settings to prevent any kind of patient safety incidents. The authors of this thesis have benefited by gaining knowledge regarding stress-related factors as well as patient safety preventive measures. As an example, the patient safety incidents that happened due to nurses who had less experience can be prevented by giving them proper knowledge regarding the relevant field according to the (Bergman et al. 2021) study. The authors of this study suggest that all the organizations should take their staff's quality of life into consideration in order to promote better, quality care for their clients and to promote patient safety. This could be fulfilled by recruiting more staff as possible, and revising its own policies regarding staff workload, working hours, and other benefits.

The authors of this review found that this thesis process and the main problem that has been taken into consideration, could be much more academic and instructive. There has been a lot of information collected during the whole thesis process that can be utilized by the authors of this thesis as well as the researchers and anyone who could be made use of in the field of nursing. The information collected in this descriptive literature review regarding the stress causing factors as well as the preventive measures for preventing patient safety incidents caused by the stress of the nurses in acute care settings will be beneficial to solve any challenges that will straighten up in the future.

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VCU Libraries, 2023. How to Conduct a Literature Review (Health Sciences and Beyond) Developing a Research questions, PEO methods.

## Appendix 1 : Database search table

Table 1. Articles table

	<b>Authors, Years, Coun- try</b>	<b>Topic</b>	<b>Methodology &amp; Methods</b>	<b>Participants/sam- ple</b>	<b>Main outcomes</b>
1.	Ahmed et al.2023  United Arab Emirates	Quality of life as a mediating factor in the relationship between fatigue and perception of safety among critical care nurses in the United Arab Emirates	Cross-sectional study	Intensive care unit nurses from three large hospitals  n = 250	Of the 250 nurses who took part in the study, 76.8% reported poor quality of life. There was a statistically significant relationship between nurses' Quality of Life and tiredness levels. In all, 52.8% of the sample reported excessive weariness and 49.6% showed poor safety standards.
2.	Bergman et al. 2021  England	Registered nurses' experiences of working in the intensive care unit during the COVID-19 pandemic	Mixed method survey  Internet surveys.	Nurses who were working in the ICU during the COVID-19 outbreak.  n=282	During the pandemic, participating nurses indicated that patient safety and quality of treatment were significantly jeopardized.

3.	Bogaert et al. 2017,  Belgium.	Predictors of burn-out, work engagement and nurse reported job outcomes and quality of care: a mixed method study	Mixed method  Cross-sectional survey  Semi-structured interviews	All participants were staff nurses working in direct care in either medical, surgical, obstetric, and geriatric or intensive care units and operating theaters including adult and pediatric care units.	Burnout and involvement had a less direct influence on treatment quality, and the qualitative analysis showed several themes. Such as daily practice structure and work circumstances; personal qualities and abilities of staff nurses; patient centeredness, quality, and patient safety.
4.	Chang et al. 2017  Taiwan	The Relationship Between Nursing Workload, Quality of Care, and Nursing Payment in Intensive Care Units	Macro-data analysis study	This macro data analysis study retrieved data from the existing ICU patient classification system.	Nursing workload has been demonstrated to be highly linked with care quality, according to data from a patient categorization database and a quality monitoring database.

5.	<p>Guise J, et al 2017</p> <p>United States America</p>	<p>Emergency medical services respondents' perceptions of the effect of stress and anxiety on patient safety in the out-of-hospital emergency care of children: a qualitative study</p>	<p>Qualitative analysis</p> <p>Mixed method</p>	<p>A total of 753 eligible EMS professionals, including emergency department physicians, and nurses</p> <p>n=753</p>	<p>Trauma, respiratory distress, and cardiac difficulties were indicated as clinical settings where stress was more likely to contribute to juvenile patient safety incidents by emergency medical service personnel. Caring for pediatric crises places particular demands on clinicians, which may jeopardize patient safety.</p>
6.	<p>Kakemam et al.2019</p> <p>Iran</p>	<p>Occupational stress and cognitive failure of nurses and associations with self-reported adverse events: A national cross-sectional survey</p>	<p>Cross-sectional survey</p>	<p>The study was conducted in tertiary-level public hospitals from 13 provinces in Iran were recruited and 2,895 nurses surveyed.</p> <p>n = 2895</p>	<p>According to the findings of this survey, 29.1% of nurses had encountered adverse occurrences in the previous six months. 'Role stressors,' 'Interpersonal relations stressors,' and 'Action' were significant predictors of reported adverse events using logistic regression, whereas 'Working environment stressors' was protective for reported bad events.</p>

7.	McKenzie et al.2021  Australia	Transition experiences of newly qualified registered graduate nurses employed in a Neonatal Intensive Care Unit.	Narrative inquiry with thematic analysis	Newly qualified registered graduate nurses.  n = 8	Participants experienced excessive stress, mental exhaustion, fear about patient safety, and for others, dread of early career burnout.
8.	Tawfik DS et al. 2017,  United States of America	Factors Associated With Provider Burnout in the NICU	Cross-sectional study	Nurse practitioners, physicians, registered nurses, and respiratory therapists in NICUs.  n=1934	In multivariable modeling, nursing burnout was found to be more sensitive to organizational differences than physician burnout, and it was associated with late transfer proportion, average daily admissions, nursing hours per patient day, and mortality per 1000 infants, all of which lead to poor patient safety.
9.	Wijn et al. 2019  Netherlands	Patient-related stressful situations and stress-related outcomes in emergency nurses: A cross-sectional study on the role of work factors and recovery during leisure time	cross-sectional study	Nurses working in the emergency departments  n=692	To address stress-related outcomes in emergency nurses, this study emphasizes the necessity of decreasing work-time expectations and improving resources at work.

