Arab American University
Faculty of Graduate Studies
Department of Health Sciences
Master Program in Critical Care Nursing

Knowledge, Attitudes, and Practices of Emergency and ICU Nurses in Managing Traumatic Brain Injury in Governmental and Private Hospitals, Palestine

Roba Mohammed Ibrahem Zakarni
202212159

Supervision Committee:
Dr. Khalaf Awwad
Dr. Sajed Ghawadreh
Dr. Imad Abu Khader

This Thesis Was Submitted in Partial Fulfilment of the Requirements for the Master Degree in Critical Care Nursing

Palestine, 7/2025

© Arab American University. All rights reserved.

Arab American University

Faculty of Graduate Studies

Department of Health Sciences

Master Program in Critical Care Nursing

Thesis Approval

Knowledge, Attitudes, and Practices of Emergency and ICU Nurses in Managing Traumatic Brain Injury in Governmental and Private Hospitals, Palestine

Roba Mohammed Ibrahem Zakarni

202212159

This thesis was defended successfully on 22/7/2025 and approved by:

Thesis Committee Members:

Name	Title	Signature
1. Dr. Khalaf Awwa	Main Supervisor	
2. Dr. Sajed Ghawadreh	Members of Supervision Committee	
3. Dr. Imad Abu Khader	Members of Supervision Committee	

Palestine, 7/2025

Declaration

I declare that, except where explicit reference is made to the contribution of others, this thesis is substantially my own work and has not been submitted for any other degree at the Arab American University or any other institution.

Student Name: Roba Mohammed Zakarni

Student ID: 202212159

Signature: Roba Zakarni

Date of Submitting the Final Version of the Thesis: 23- 12- 2025

Acknowledgments

Initially, we attribute all honor to God, our ultimate source of strength, for enabling us to accomplish this significant mental and physical undertaking.

Furthermore, we are grateful to our parents for their continuous love and support throughout our educational path, giving spiritual direction and material assistance. Their sacrifices and patience have been helpful.

Acknowledgment is also extended to Dr. Khalaf Awwad for his expert guidance, meticulous scientific direction, and generous support, which created an excellent working environment.

Finally, we thank our colleagues, students, lecturers, and doctors at Arab American University for their encouragement and support.

Roba Mohammed Zakarni

Knowledge, Attitudes, and Practices of Emergency and ICU Nurses in Managing Traumatic Brain Injury in Governmental and Private Hospitals, Palestine

Roba Mohammed Zakarni
Dr. Khalaf Awwad
Dr. Sajed Ghawadreh
Dr. Imad Abu Khader

Abstract

Traumatic brain injury (TBI) is the result of external trauma causing alterations in brain function. The injury's degree, location, and features all affect how these alterations emerge. Based on variables like altered consciousness, duration of post-traumatic amnesia, and loss of consciousness, TBI is categorized as mild, moderate, or severe. Emergency and Intensive Care Unit nurses need evidence-based training in handling acute brain injuries to improve clinical care and lower sequelae from traumatic brain injury.

To assess the level of knowledge, attitudes, and practices of ER and ICU nurses in managing traumatic brain injury in governmental and private hospitals in Palestine.

A cross-sectional study was conducted in the ICU and ER Department at private and governmental Hospitals in Jenin and Nablus city in the West Bank. The target population was ICU and ER nurses in hospitals who met the inclusion criteria, where a total of participants in the study was 151 ICU and ER nurses. The survey was developed and implemented based on the literature review from different studies. There were four sections on the questionnaire.

Less than one-third of emergency and intensive care unit nurses in Palestine correctly answered critical TBI questions. The majority had never attended a formal TBI course (57.8%). Nonetheless, over 75% of nurses thought that specialized training in TBI was beneficial. Statistically significant correlations between attitude and practice ($r = 0.724$, $p < 0.01$) demonstrate that positive attitudes have a significant impact on improved clinical practices. Furthermore, knowledge was moderately associated with attitude ($r = 0.368$, $p < 0.01$) and modestly associated with practice ($r = 0.186$, $p < 0.05$), highlighting the importance of both education and attitude in improving TBI care.

The fact that more than half of the nurses lacked formal training suggests that targeted education is necessary to bridge the gaps in care theory and practice. Despite performing exceptionally well on clinical TBI markers.

Key Words: TBI, Knowledge, Attitude, Practice, ER & ICU nurse.

Table of Contents

Declaration I
Acknowledgments II
Abstract III
List of Tables VIII
List of Appendices IX
List of Definitions of Abbreviations X
Chapter One: Introduction 1
1.1 Background 1
1.2 Problem Statement 3
1.3 Significant of Study 5
1.4 Study Objective 6
1.4.1 General Objective 6
1.4.2 Specific Objectives 6
1.5 Study Questions 6
1.6 Study Hypothesis 7
1.6.1 Alternative Hypothesis 7
1.6.2 Null Hypothesis 7
1.7 Study Variables 8
1.7.1 Dependent Variables 8
1.7.2 Independent Variables. 8
1.8 Conceptual Framework 8
1.9 Conceptual Definition 9
1.10 Operational Definition 9
1.11 Summary 9
Chapter Two: Literature Review 11
2.1 Introduction 11
2.2 Search Strategy 11
2.3 Summary of search strategies 12
2.4 Summary of Search Strategy 16

2.5 Traumatic brain injury 17
2.5.1 Classification 17
2.5.2 TBI Types 18
2.5.3 Signs and Symptoms...19
2.5.4 Treatment 20
2.6 Chapter Summary 20
Chapter Three: Methodology...22
3.1 Introduction...22
3.2 Study Design..22
3.3 Study Setting..22
3.4 Study Duration...24
3.5 Study Population...24
3.6 Inclusion and Exclusion Criteria..25
3.6.1 Inclusion Criteria 25
3.6.2 Exclusion Criteria 25
3.7 Sample Size..25
3.8 Study Instruments 26
3.9 Pilot Study..27
3.9.1 Content Validity for the Questionnaire...28
3.9.2 Internal Consistency Reliability 28
3.10 Data Collection 28
3.11 Data Analysis...28
3.12 Ethical Considering...29
3.13 Chapter Summary 30
Chapter Four: Result...31
4.1 Introduction...31
4.2 Response Rate...31
4.3 Normality Test on Continuous Variables 31
4.4 Socio-Demographic Characteristics of the Emergency and ICU Nurses in Managing Traumatic Brain Injury 31

4.5 Knowledge, attitude, and skill scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury 33
4.5.1 Knowledge Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury..33
4.5.2 Attitude Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury..36
4.5.3 Practice Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury..39
4.6 Correlation Between Knowledge, Attitude, and Practice among Emergency and ICU Nurses in Managing Traumatic Brain Injury 41
4.7 Socio-demographic and Occupation Information Associated with the Knowledge, Attitude, and Practice Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury 42
4.7.1 Socio-demographic and Occupation Information Associated with the Knowledge Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury 42
4.7.2 Socio-demographic and Occupation Information Associated with the Attitude Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury...........................43
4.7.3 Socio-demographic and Occupation Information Associated with the Practice Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury...........................45
4.8 Linear regression..46
4.8.1 Socio-demographics with the Knowledge score, using linear regression 46
4.8.2 Socio-demographics with the attitudes score, using linear regression 48
4.8.3 Socio-demographics with the Practices score, using linear regression 49
4.9 KAP levels with hospital type 50
Chapter Five: Discussion 52
5.1 Introduction...52
5.2 Discussion 52
5.2.1 Knowledge Score of the ER and ICU Nurses in Managing TBI 52
5.2.2 Attitude Score of the ER and ICU Nurses in Managing TBI 53
5.2.3 Practice Score of the ER and ICU Nurses in Managing TBI 54

5.2.4 Correlation between Knowledge, Attitude, and Practice among ER and ICU Nurses in Managing TBI....55
5.2.5 Socio-demographic and Occupation Information Associated with the Knowledge Score of the ER and ICU Nurses in Managing TBI....57
5.2.6 Socio-demographic and Occupation Information Associated with the Attitude Score of the ER and ICU Nurses in Managing TBI....57
5.2.7 Socio-demographics and Occupation Information Associated with the Practice score of the ER and ICU Nurses in Managing TBI....58
5.3 Conclusion....59
5.4 Recommendation....59
5.4.1 Recommendation for Organization....59
5.4.2 Recommendations for Universities....60
5.4.3 Recommendation for Future Research....60
5.5 Strength of the Study....60
5.6 Limitation....61
References....62
Appendices....64
ملخص....70

List of Tables

Table 4.1 :Distribution of socio-demographics among Emergency and ICU Nurses in Managing Traumatic Brain Injury 32
Table 4.2 :Distribution of knowledge score on Emergency and ICU Nurses in Managing Traumatic Brain Injury 34
Table 4.3 :Distribution of Attitude Scores on Emergency and ICU Nurses in Managing Traumatic Brain Injury 37
Table 4.4 :Distribution of practice score on Emergency and ICU Nurses in Managing Traumatic Brain Injury 40
Table 4.5 :Correlation between the Knowledge, Attitude, and Practice among the Emergency and ICU Nurses in Managing Traumatic Brain Injury 41
Table 4.6 :Socio-demographic and Occupation Information Associated with the Knowledge Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury..................43
Table 4.7 :Socio-demographic and Occupation Information Associated with the Attitude Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury..................44
Table 4.8 :Socio-demographic and Occupation Information Associated with the Practice Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury..................46
Table 4.9 :Socio-demographics with the Knowledge score, using linear regression 47
Table 4.10 :Socio-demographics with the attitudes score, using linear regression 48
Table 4.11 :Socio-demographics with the Practices score, using linear regression 50
Table 4.12 :KAP levels with hospital type 51

List of Appendices

Appendix A :Study Tools 64
Appendix B :IRB Approval 68
Appendix C: تسهيل المهمة 69

List of Definitions of Abbreviations

Abbreviations	Title
AAUP	Arab American University-Palestine
CCU	cardiac care unit
CPP	cerebral perfusion pressure
CVT	deep vein thrombosis
Emergency Room	ER
$ETCO_2$	end-tidal carbon dioxide
HICs	high-income countries
ICP	intracranial pressure
ICUs	Intensive care units
IRP	Institutional Review Board
KAP	Knowledge, Attitude, and Practice
LMICs	Low and middle-income countries
mTBI	mild traumatic brain injury
PTA	post-traumatic amnesia
SAH	Specialized Arab Hospital
SPSS	Statistical Package for Social Science Program
TBI	Traumatic brain injury
WHO	World Health Organization

Chapter One: Introduction

1.1 Background

Traumatic brain injury (TBI) is the result of external trauma causing alterations in brain function (Prazak, 2024). The injury's degree, location, and features all affect how these alterations emerge (Subramaniam et al., 2021). Based on variables like altered consciousness, duration of post-traumatic amnesia, and loss of consciousness, TBI is categorized as mild (like a concussion), moderate, or severe (Mousavizadeh et al., 2024). In high-income nations, it continues to be the leading cause of mortality and disability among young adults. Due in major part to the growing usage of motor vehicles in low- and middle-income nations, the risk of TBI is rising quickly worldwide (Shehab, Ibrahim, and Abd-Elkader, 2018). According to World Health Organization (WHO) predictions, traffic accidents will account for the third largest share of worldwide disease and injury burden by 2020. The signs and symptoms of TBI can vary widely and frequently affect behavior, emotions, physical capabilities, and cognitive functioning, either permanently or temporarily (Subramaniam et al., 2021).

During the initial phase and in the ongoing treatment of patients with moderate-to-severe traumatic brain injuries, nurses are essential. Emergency and intensive care unit nurses play a pivotal role in the healthcare team by carrying out a multitude of tasks such as patient assessment, care coordination and communication, physical and technical care, treatment implementation, emotional support for patients and their families, patient advocacy, patient and family involvement in care, and patient and family education (Mousavizadeh et al., 2024). Emergency and intensive care unit nurses provide modified care plans, particularly in acute, recently acquired moderate-to-severe TBIs (Shehade, Ayed, and Harazneh, 2023).

To minimize complications such as seizures, elevated intracranial pressure, cerebral edema, and other problems that could impair the prognosis, it is necessary to follow particular rules when caring for patients with traumatic brain injuries. To ensure that the most recent clinical evidence supports their practices, nurses are expected to use the best available evidence in a variety of care domains and to stay current on research advancements. One issue facing the nursing profession is the discrepancy between graduates' clinical and theoretical training, which can have a detrimental effect on the standard of care they offer (Damkliang et al., 2015).

Evidence-based care, which emphasizes the value of incorporating the most recent scientific discoveries into practice, has been increasingly important in the healthcare industry in recent years. Making decisions about education and preserving the standard of care requires the application of scientific resources and evidence. Although there are well-established evidence-based standards in Western nations for the management of severe trauma, these guidelines frequently center on medical therapies. Consistent criteria for nursing interventions are still lacking, despite the need for evidence-based nursing practices (Shehab, Ibrahim and Abd-Elkader, 2018).

Furthermore, a lot of nurses struggle to find and assess high-quality research due to time, money, or other limitations, which makes it difficult to use evidence-based practices. Because of their heavy workloads and time constraints, emergency room nurses frequently rely on traditional care approaches, which raises the risk of mortality and secondary brain damage (Aly, Gaballah, and El Sayed, 2021).

Since evidence-based treatment is still a relatively new method for nurses and they have not received training in this area, a study conducted by Ernst et al (2016) indicated that many nurses are not familiar with the idea. It is crucial to address the difficulties nurses face in incorporating evidence-based practices into their work, as they comprise the largest professional workforce in the healthcare industry. Since the first 24 hours following an injury account for almost 40% of trauma-related deaths, emergency care should prioritize lowering mortality in these situations.

Emergency nurses need evidence-based training in handling acute brain injuries to improve clinical care and lower sequelae from traumatic brain injury. As a result, to close the knowledge gap between clinical practice and the best available evidence, emergency nurses must get continual education. Research indicates that the adoption of care packages in emergency rooms can enhance clinical results, lower death rates, and simplify patient care (Gorman and Dumire, 2019).

Because they will almost certainly treat patients with moderate-to-severe traumatic brain injuries at some point in their careers, nurses' opinions regarding how to care for these patients are important. Depending on the extent of the damage, the length of the recovery period, and other medical issues, patients with acute or chronic moderate-to-severe TBIs may get care in

different hospital units. Nevertheless, a large portion of recent research focuses on nurses' perceptions of mild TBI, which limits the relevance of these findings to the treatment of patients with moderate-to-severe TBI both domestically and abroad (Shehade, Ayed, and Harazneh, 2023).

According to available evidence, nurses frequently have false assumptions regarding the recovery from moderate traumatic brain injury. These investigations expose misconceptions regarding the function of seat belts, unconsciousness, disabilities associated with injuries, and recovery times; nevertheless, they do not investigate particular nursing care responsibilities or educational choices (Oyesanya et al., 2016).

The quality of treatment and the information that nurses give patients and their families may be impacted by these misconceptions. Nurses are frequently the source of correct recovery information for TBI families. Accurate information influences families' decision-making and psychosocial well-being by assisting them in setting reasonable expectations. Family relationships also impact recovery results, which emphasizes how crucial it is to address nurse misunderstandings (Mousavizadeh et al., 2024).

1.2 Problem Statement

Traumatic brain injury accounts for 30–40% of injury-related mortality, which is a significant contribution to global death and disability rates. Often going unreported, mild TBI is referred to as a "silent epidemic" because people may not know they have had a concussion and may not seek medical attention. According to estimates, 69 million people worldwide suffer from TBI each year, with 70–90% of instances being mild. It is estimated that TBI costs the world economy $400 billion a year (Prazak, 2024).

Traumatic brain injury is a major contributor to the worldwide injury burden and has been more common recently. With around a million trauma-related deaths each year, half of which are attributable to traumatic brain injuries, the nation has the greatest rate of trauma-related injuries. For instance, nearly 1,000 deaths are reported annually from 10,000 cases in Bangalore alone. Compared to one in 200 in industrialized nations like the US, one in six trauma patients in India pass away from their wounds. This discrepancy is frequently linked to inefficient prehospital and

hospital trauma care coordination and implementation. In India, 95% of trauma sufferers do not receive proper care during the crucial "golden hour" after an injury (Subramaniam et al., 2021).

Traumatic brain injury (TBI) ranging from moderate to severe is a major global cause of mortality, disability, and large medical expenses. Globally, there are about 200 traumatic brain injury instances for every 100,000 individual’s year, or about 15 million cases total. In underdeveloped nations, where traumatic brain injuries frequently lead to increased death rates, the frequency is very high. Because cars are used so extensively and there are many traffic accidents, Iran has roughly 20 times the global average for TBI rates. Brain injuries are widespread and frequently have bad consequences in these countries (Mousavizadeh et al., 2024).

Effective management of TBI is essential due to its high prevalence and the associated fatalities and sequelae, which account for nearly half of trauma-related deaths. It impacts not just the people but also their families, costing society a great deal of money. To avoid subsequent injuries, reduce complications, and lower mortality, healthcare teams—especially emergency nurses must be proficient in caring for patients with traumatic brain injuries (Aly, Gaballah, and El Sayed, 2021).

When it comes to treating TBI symptoms and long-term consequences, nurses play a critical role in educating and supporting patients as well as their families. Because of their crucial role in patient monitoring, nurses in critical care settings can assist in the early detection and management of TBI-related deterioration. However, research indicates that nurses continue to have a variety of inaccurate beliefs regarding evidence-based care (Varghese, Chakrabarty, and Menon, 2017).

There is a lack of research on Emergency and intensive care unit nurses’ attitudes toward treating patients with TBI, and clinical recommendations for evidence-based nursing treatment for these injuries are lacking. There is a lack of research on nurses' perspectives on treating patients with TBI, and clinical recommendations for evidence-based nursing treatment for these injuries are lacking.

The American Association of Neuroscience Nurses (2008) has published guidelines for the acute care management of TBI. These guidelines mainly address medical management during the acute stage (such as nutrition management and seizure prevention) and do not address important factors like gender differences in outcomes or cognitive impairments. Additionally,

there are no guidelines for post-injury subacute and chronic treatment. This gap implies that nurses might not have the knowledge required to care for patients with persistent TBI or severe cognitive impairments.

Moreover, it's still unclear if nurses follow the current standards for managing severe traumatic brain injuries or are aware of them. Research is needed to guide the creation of nursing education and training programs for patients with moderate-to-severe traumatic brain injuries.

According to a study by Shehade, Ayed, and Harazneh (2023) in Palestine, which found the majority of nurses, or 99 out of 165 intensive care nurses, had low-level knowledge about the care of patients with head trauma, according to the study's findings. Additionally, 69.7% of the nurses, or 115 out of 165, had a poor level of practice in this area.

There is a lack of research on Emergency and intensive care unit nurse's Knowledge, Attitude and Practice (KAP) toward treating patients with TBI, and clinical recommendations for evidence-based nursing treatment for these injuries are lacking in Palestine. There is a lack of research on nurses' perspectives on treating patients with TBI, and clinical recommendations for evidence-based nursing treatment for these injuries are lacking.

So, we need to address the KAP for Emergency and intensive care unit nurses about managing TBI patients in Palestine.

1.3 Significant of Study

The current study is crucial for hospitals, patients, and nurses working in intensive care units and emergency rooms because the findings may lead to the development of practical measures that improve nursing care and services while reducing TBI patients' death and impairment.

This research will examine the level of knowledge of Emergency and intensive care unit nurses regarding traumatic brain injuries and risk, which can contribute to improving the quality of care going forward. It can also help ascertain the true value of nursing care plans in intensive care units (ICUs) and Emergency Room (ER).

Policymakers will benefit from the study as they create well-informed, empirically supported brain injury protocols and policies. The study's conclusions will also be helpful to other academics who hope to do related research in the future.

1.4 Study Objective

1.4.1 General Objective

To assess the level of knowledge, attitudes, and practices of emergency and ICU nurses in managing traumatic brain injury in governmental and private hospitals, in Palestine

1.4.2 Specific Objectives

1. To describe the socio-demographic characteristics of managing traumatic brain injury between emergency and intensive care unit nurses in the governmental and private hospitals of Palestine.
2. To assess the level of knowledge, attitude, and practice regarding managing traumatic brain injury among emergency and intensive care unit nurses in the government hospitals of Palestine.
3. To assess the level of knowledge, attitude, and practice regarding managing traumatic brain injury among emergency and intensive care unit nurses in the private hospitals of Palestine.
4. To examine the association between the knowledge, attitude, and practice scores for emergency and intensive care unit nurses in Palestine's governmental and private hospitals.
5. To investigate the relationship between the socio-demographic characteristics of emergency and intensive care unit nurses and their knowledge, attitudes, and practice scores in managing traumatic brain injury in governmental and private hospitals in Palestine.

1.5 Study Questions

1. What are the current levels of knowledge, attitudes, and practices among emergency and intensive care unit nurses in managing traumatic brain injury in governmental hospitals in Palestine?
2. What are the current levels of knowledge, attitudes, and practices among emergency and intensive care unit nurses in managing traumatic brain injury in private hospitals in Palestine?
3. Is there an association between the knowledge, attitude, and practice scores in managing traumatic brain injury in governmental and private hospitals in Palestine?

4. Is there an association between socio-demographics and the knowledge, attitude, and practice scores in managing traumatic brain injury in governmental and private hospitals in Palestine?

1.6 Study Hypothesis

1.6.1 Alternative Hypothesis

H1: There is a significant association between knowledge and attitude scores in managing traumatic brain injury in governmental and private hospitals in Palestine.

H2: There is a significant association between knowledge and practice scores in managing traumatic brain injury in governmental and private hospitals in Palestine.

H3: There is a significant association between attitude and practice scores in managing traumatic brain injury in governmental and private hospitals in Palestine.

H4: There is a significant association between the socio-demographic characteristics with the knowledge score in managing traumatic brain injury in governmental and private hospitals in Palestine.

H5: There is a significant association between the socio-demographic characteristics with the attitude score in managing traumatic brain injury in governmental and private hospitals in Palestine.

H6: There is a significant association between the socio-demographic characteristics with the practice score in managing traumatic brain injury in governmental and private hospitals in Palestine.

1.6.2 Null Hypothesis

H0: There is no significant association between knowledge and attitude scores in managing traumatic brain injury in governmental and private hospitals in Palestine.

H0: There is no significant association between knowledge and practice scores in managing traumatic brain injury in governmental and private hospitals in Palestine.

H0: There is no significant association between attitude and practice scores in managing traumatic brain injury in governmental and private hospitals in Palestine.

H0: There is no significant association between the socio-demographic characteristics with the knowledge score in managing traumatic brain injury in governmental and private hospitals in Palestine.

H0: There is no significant association between the socio-demographic characteristics with the attitude score in managing traumatic brain injury in governmental and private hospitals in Palestine.

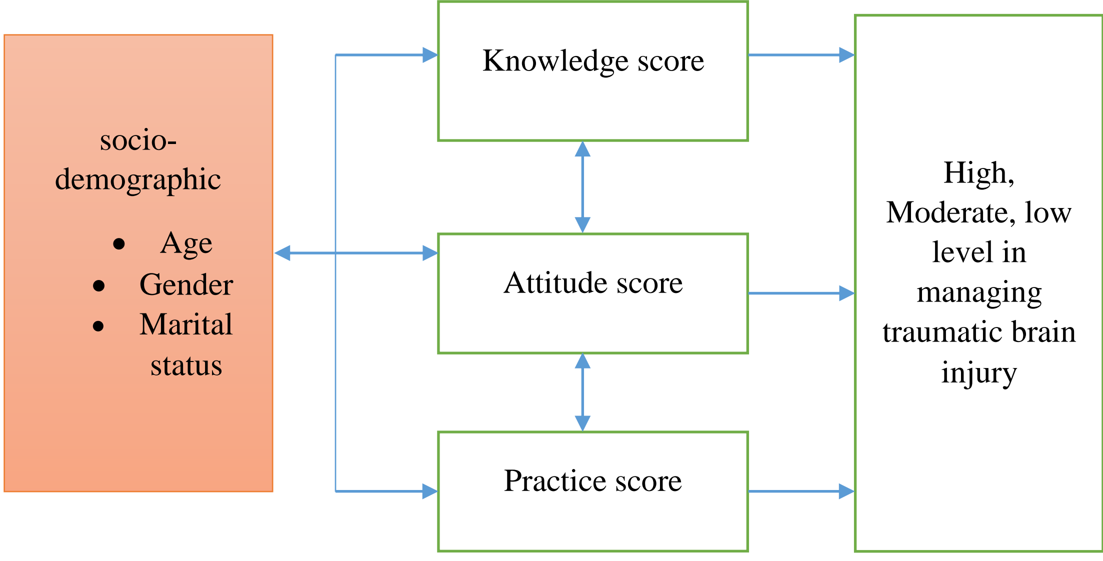
H0: There is no significant association between the socio-demographic characteristics with the practice score in managing traumatic brain injury in governmental and private hospitals in Palestine.

1.7 Study Variables

1.7.1 Dependent Variables: Emergency and ICU nurses' knowledge, attitude, and practice for the management of traumatic brain injury.

1.7.2 Independent Variables: Private hospital, Governmental Hospital, age, sex, marital status, educational level, service experience, Working experience in ER and ICU/years, Job title, Training regarding the management of TBI, a clear protocol for the management of TBI.

1.8 Conceptual Framework



1.9 Conceptual Definition

Knowledge: The expertise and understanding that emergency and intensive care unit nurses have regarding the treatment of traumatic brain injury, including evidence-based methods, clinical guidelines, and treatment protocols (Prazak, 2024).

Attitude: The perceptions that emergency room and intensive care unit nurses have about caring for patients who have suffered traumatic brain injury can affect how they behave and how willing they are to follow recommended practices (Prazak, 2024).

Practice: The behaviors and actions that emergency and intensive care unit nurses carry out by hospital and clinical protocols to manage traumatic brain injury.

1.10 Operational Definition

Knowledge: evaluated using a designed questionnaire that assessed the nurses' familiarity with treatment protocols and standards of care, recognition of TBI symptoms, and comprehension of suitable therapies. Levels of knowledge will be indicated by scores (e.g., low, moderate, high).

Attitude: assessed using a Likert-scale questionnaire that asks nurses about their perception of the significance of managing TBI. Attitudes will be categorized as low, moderate, and high based on scores.

Practice: evaluated using self-reported surveys to assess the precision and frequency of applying appropriate TBI management strategies. The scores (low, moderate, high) will show how adequate the practice is.

1.11 Summary

A major global health concern, TBI is defined by changes in brain function brought on by external trauma. Based on symptoms including forgetfulness and altered consciousness, TBI is categorized as mild, moderate, or severe. Due to rising incidence rates in low- and middle-income nations brought on by increased motor vehicle use, it continues to be a major cause of death and disability, especially among young adults. Nurses are essential to the management of TBI patients, particularly in emergency and critical care settings, where they provide assessment, treatment, and support.

Although the value of evidence-based nursing practices is stressed, many nurses find it difficult to obtain and use these practices, which can affect patient outcomes. This study emphasizes the disparity in nurses' KAP on the management of moderate-to-severe TBI,

especially in areas such as Palestine. It points out that to improve care quality and lower TBI-related consequences, better training and education are required.

The purpose of the study is to evaluate the KAP of emergency and intensive care unit nurses in Palestinian government hospitals concerning managing traumatic brain injury. It investigates the relationship between the sociodemographic traits of nurses and their KAP scores. It is anticipated that the results will improve nursing education, guide the creation of policies, and eventually lead to better TBI patient care outcomes.

Determining KAP levels, characterizing sociodemographic traits, and investigating the relationships among these variables are important study goals. With hypotheses exploring the relevance of these interactions, the study tackles important questions regarding present KAP levels and their associations. The purpose of this study is to close the gap in nursing practices for TBI care by offering evidence-based suggestions.

Chapter Two: Literature Review

2.1 Introduction

The chapter on literature review presents a summary of previous research concerning knowledge, attitude, and practice in nursing for the management of traumatic brain injury, emphasizing significant discoveries and pinpointing knowledge gaps.

This chapter aids in demonstrating the applicability of the current research and its contribution to the area by reviewing earlier investigations. In addition, it provides a framework for comprehending how earlier research influences the present investigation and highlights the necessity for more research in particular areas. In general, this chapter establishes the framework for the study and places it within the larger scholarly framework.

2.2 Search Strategy

This chapter provides a synthesis of recent research concerning knowledge, attitude, and practice in Emergency and intensive care unit nurses for the management of traumatic brain injury. Concepts that are critical to the study of this phenomenon include demographic data, clinical presentation, TBI, knowledge, and practice. Each concept is individually discussed.

The collection of literature was conducted utilizing a computerized search of databases. Databases including CINAHL, PubMed, Research Gate, and Google Scholar were used for relevant articles and journals. The studies reviewed were published from 2014 to 2024. Keywords used during the search included TBI, Nursing knowledge, attitude, and practice.

2.3 Summary of search strategies

	Topic	Author	Years	Country	Aim	Design	Sample size	Site	Result
1.	Exploring Knowledge of Traumatic Brain Injury in an Australian Nursing Context	Prazak M	2024	Australia	To investigate the frequency of false beliefs regarding traumatic brain injury (TBI) among Australian nurses and evaluate the impact of a short educational program on knowledge	Quasi-Experimental	116 Australian nurses	University of Tasmania	The study found that although general knowledge increased following the training, domain-specific knowledge increased significantly only in recovery-related areas. Interestingly, more than 25% of participants knew a lot about TBI at baseline.
2.	Knowledge of Traumatic Brain Injury among Educators	Ernst et al	2016	USA	to evaluate teachers' understanding of TBI	Cross-Sectional	94 educators	public schools of a mid-Atlantic stat	Showed a high understanding of TBI identification, socio-emotional impacts, and recovery; nevertheless, there was considerable ambiguity in situations pertaining to schools. With only four items generating wrong responses at a rate of 20% or higher, misconceptions were very rare.
3	Effect of an Educational Intervention on the Knowledge about Traumatic Brain Injury Guidelines among Clinical Nurses	Subramaniam et al	2021	India	To assess the effectiveness of an educational intervention and the clinical nurses' understanding of TBI guidelines	Preexperimental, one group pretest and posttest design	60 nurses	Multispecialty hospital in Bangalore, India.	One group pretest-posttestNurses' understanding of TBI significantly improved after the intervention (p = 0.001), especially for those with more than ten years of experience.

4	Experiences of giving and receiving care in traumatic brain injury: an integrative review	Kivunja, River and Gullick	2018	Australia	To compile research on the experiences of TBI patients, their families, and nurses in medical facilities and rehabilitation centers	Integrative literature review	31 studies reviewed	Australia	Six major themes surfaced among the participants, including pursuing personhood, handling challenging behaviors, and upholding familial obligations.
5	Bite-Sized Teaching Sessions Effects on Emergency Nurses' Knowledge and Practice Regarding Traumatic Brain Injury	Aly, Gaballah and El Sayed	2021	Egypt	To investigate the efficacy of brief educational sessions on traumatic brain injury (TBI) knowledge and practice among nurse	Quasi-experimental design	70 nurses	Emergency Department at Suez Canal University	Pre-, post-, and follow-up evaluations revealed significant increases in knowledge and care practices at 1% statistical significance.
6	Nurses 'Performance Regarding Patient with Traumatic Head Injury In Intensive care unit	AbdELstar, Gendy and Mohamed	2019	Egypt	to evaluate the Intensive Care Unit nurses' performance in providing care for patients who have suffered serious brain injuries	A descriptive exploratory study	nurses (No=40)	intensive care unit (ICU) at Ain shams University Hospital	About 75% of the nurses in the study did not possess sufficient information to care for patients with traumatic brain injuries, and 81% of the nurses in the study did not possess adequate expertise. In terms of their overall experience with traumatic brain injury, nurses had a satisfactory level, there was statistically significant correlation between overall practice and knowledge
7	Using an Evidence-Based Care Package to Improve Emergency	Mousavizadeh et al	2024	Iran	creating and implementing a brain trauma management care plan based on evidence	semi-experimental study	60 nurses	in emergency departments	The intervention group's care management scores improved by 12.3 points compared to

	Nursing Management of Patients with Traumatic Brain Injury								the control group (p<0.001). As covariates, employment status, and educational attainment were modified.
8	Understanding practice: the factors that influence management of mild traumatic brain injury in the emergency department-a qualitative study using the Theoretical Domains Framework	Tavender et al	2014	Australia	To investigate perceived barriers to the use of evidence-based techniques in the treatment of mild traumatic brain injury	Semi-structured interviews	42 participants (9 Directors, 20 doctors and 13 nurses)	emergency staff in the Australian state of Victoria	Knowledge, consequences-believing attitudes, abilities, and environmental setting were important determinants of management. These factors affected procedures including issuing discharge instructions and using CT scans.
9	Impact of an Educational Program on Nurses' Knowledge and Practice Regarding Care of Traumatic Brain İnjury Patients at Intensive Care Unit at Suez Canal University Hospital	Shehab, Ibrahim and Abd-Elkader	2018	Egypt	To assess how a training program has affected nurses' understanding of and utilization of TBI care in the intensive care unit	quasi experimental study design	30 nurse	intensive care unit at Suez canal university hospital at Ismailia city	In comparison to pre-program levels, post-program overall knowledge and practice scores showed a considerable improvement
10	Using an evidence-based care bundle to improve initial emergency nursing management of patients with severe traumatic brain injury	Damkliang et al	2015	USA	To determine if an evidence-based treatment bundle for severe traumatic brain injury is feasible in a Thai emergency room	A pretest/post-test design	45 patients with severe traumatic brain injury: 20 patients in the pretest period and 25 patients in	an emergency department	The patient monitoring (e.g., CO2, respiratory, pulse, and blood pressure monitoring) significantly improved as a result of the care package.

							the post-test period.		
11	Nurses' Knowledge of Pain Management for Patients with Combat-Related Traumatic Brain Injuries on Rehabilitation Units	Jaimes et al	2014	USA	assessing nurses' proficiency in treating combat-related traumatic brain injury patients	Non-experimental cross-sectional survey design	25 nurse	two rehabilitation units in the Pacific Northwest	Only 40% of respondents could accurately identify therapies for migraine headache in TBI patients, and 76% of respondents thought that TBI patients overreported their discomfort.
12	Nurses' Concerns about Caring for Patients with Acute and Chronic Traumatic Brain Injury	Oyesanya et al	2018	USA	Investigate nurses' worries about treating patients with moderate-to-severe traumatic brain injury	a cross-sectional, exploratory	692 nurses	across hospital departments at three hospitals	Compared to chronic-phase care, which involves recognizing changes in a patient's condition and preventing damage, nurses were more concerned with acute-phase care. The main obstacles were staffing and lack of knowledge.
13	Misconceptions about traumatic brain injury among nursing students in India: implications for nursing care and curriculum	Gurusamy et al	2019	India	To investigate nursing students' misunderstandings about TBI	a cross-sectional survey	154 nursing	Students from a nursing college of a tertiary care neuro-centre in India.	The domain with the highest prevalence of misconceptions was brain injury (81.1%). In general, there were a variety of misconceptions, and there were no notable variations in terms of sociodemographic traits.
14	Knowledge and practice of nurses regarding the care of patients with head trauma in	Shehade, Ayed and Harazneh	2023	Palestine	to investigate the Knowledge and Practice of nurses regarding the care of patients with head trauma in an intensive care unit	a cross-sectional study.	165 nurses	intensive care unit (ICU) nurses in Palestinian hospitals	Among the 165 intensive nurses, the study findings revealed the majority of nurses 99 (60.0%) have

	intensive care units in the West Bank								low level knowledge regarding Care of Patients with a head trauma, and showed that most of the nurses 115 (69.7%) have poor level practice regarding the Care of Patients with head trauma.
15	Nurses' perceptions of using an evidence-based care bundle for initial emergency nursing management of patients with severe traumatic brain injury: A qualitative study	Damkliang et al	2015	Australia	the utilization of care bundles for severe traumatic brain injury as perceived by nurses	A descriptive qualitative study	10 emergency nurses participated in Phase One, while 12 nurses participated in Phase-Two	emergency nurses	The nurses believed that by expanding their knowledge, abilities, and self-assurance, the care bundle raised the standard of care. It was especially useful in situations where resources were scarce.
16	Nurses' Beliefs About Caring for Patients With Traumatic Brain Injury	Oyesanya et al	2016	USA	To investigate nurses' opinions and preferred methods of learning about TBI care	A cross-sectional survey	513 nurses	a Midwestern hospital	The erroneous assumptions that nurses held regarding rehabilitation and the nursing profession had an impact on interventions related to education and training.

2.4 Summary of Search Strategy

Four of the evaluated research were conducted in the USA (Ernst et al., 2016; Jaimes et al., 2014; Oyesanya et al., 2018; Oyesanya et al., 2016), while six of the studies were conducted in Australia (Prazak, 2024; Kivunja et al., 2009; Tavender et al., 2014; Damkliang et al., 2015). Aly et al. (2021), AbdELstar et al. (2019), Shehab et al. (2018), two studies conducted in India (Subramaniam et al., 2021; Gurusamy et al., 2019), Mousavizadeh et al. (2024) in Iran, and Shehade et al. (2023) in Palestine were the other locations.

The number of participants in each study varied greatly; some had as few as 10 (Damkliang et al., 2015), while others had as many as 692 (Oyesanya et al., 2018). Most research employed sample sizes ranging from 25 to 165 individuals. Meanwhile, some had noticeably bigger groupings, including those by Shehade et al. (2023) and Oyesanya et al. (2018).

The majority of the research was carried out in ER and ICUs, which highlights the significance of these environments in the treatment of TBI. Several investigations were conducted in hospitals, including those conducted by Subramaniam et al. (2021) and Mousavizadeh et al. (2024), while Ernst et al. (2016) conducted their research in public schools.

Most of the studies used cross-sectional or quasi-experimental designs, and many used pretest-posttest models to gauge the effects of educational interventions on nurses' knowledge and practices.

Our study is important since it seeks to identify nursing practice, attitude, and knowledge gaps that may have an immediate effect on the standard of care given to TBI patients. The study aims to recommend standardized care, better clinical outcomes, and inform training programs and policies to improve nurse abilities in TBI management by evaluating and comparing the techniques in various hospital settings. In the end, the study improves patient outcomes and the standard of healthcare in Palestine as a whole.

2.5 Traumatic brain injury

Traumatic brain injury (TBI), the most common neurological condition, presents a serious threat to public health. Today, TBI is understood to be a chronic illness with long-term consequences, such as an elevated risk of late-onset neurodegeneration, in addition to an acute condition. The Lancet Neurology Commission underlined in 2017 that international effort was required to alleviate the burden of TBI. Since then, funding organizations have provided money for research in low- and middle-income countries (LMICs) as well as high-income countries (HICs). The WHO established the Decade for Action on Road Safety plan in 2021, and the World Health Assembly enacted resolution 73.10 in 2020 to encourage international efforts to address neurological illnesses (Maas et al., 2022).

2.5.1 Classification

The progress and continuous issues in TBI treatment, prevention, and research are described in the update on the 2017 Commission whereas falls, especially among the elderly, are

the main cause of TBI in high-income countries, traffic accidents involving vulnerable road users, such as motorcyclists and pedestrians, are the main cause in low- and middle-income countries. Clinical studies frequently do not include older persons, yet there is an urgent need for evidence to direct their care. Furthermore, the risk factors for TBI, such as alcohol abuse and fragility, offer the potential for focused preventative strategies. Age shouldn't be a factor in treatment limitations, even though older patients typically have lower outcomes. However, compared to people involved in high-energy accidents, such as traffic events, those injured in low-energy falls have a roughly 50% lower chance of receiving critical or emergency care (Shehade, Ayed, and Harazneh, 2023).

The severity of TBI can be evaluated from a variety of angles and varies according on the person conducting the assessment. Currently, biological injury measurements are not utilized to determine severity. Severity judgments are context-dependent, frequently subjective, and impacted by the assessor's experience and point of reference.

For instance, a patient with a potentially fatal TBI who survives the crucial early stages may recover to lead an independent life, exhibiting only minor impairments in the neurosurgeon's opinion but significant cognitive impairments in the neuropsychologist's, as well as significant emotional and personality changes in the family's eyes. This presents difficulties because TBI results vary greatly. While injuries deemed minor may have incapacitating effects, those deemed serious in the acute context may fully heal.

2.5.2 TBI Types

Mild, moderate, and severe TBI classifications have been established mostly based on clinical indicators, such as the degree of consciousness or the length of post-traumatic amnesia (PTA). The therapy of TBI has greatly improved since the development of CT almost 40 years ago, especially for the small minority of patients (less than 5%) who require neurosurgery procedures. Still, over 90% of TBI cases—including those called concussions—are categorized as moderate. While many people who suffer a single mild traumatic brain injury (mTBI) fully recover, others may have longer-lasting symptoms, a lower quality of life, and a higher chance of long-term consequences (Tenovuo et al., 2021).

TBI is more common in developing nations and is linked to greater fatality rates. Brain trauma is over 20 times more common globally, and it is the primary cause of this is the high frequency of traffic accidents and the extensive use of motor vehicles. Brain injuries are common and have a dismal prognosis in poorer nations (Mousavizadeh et al., 2024).

Most TBI cases in hospitals have mild TBI, defined as a Glasgow Coma Score of 13–15. In six months, almost half of persons with mild traumatic brain damage do not fully regain their pre-injury levels of health. In Europe, less than 10% of TBI patients receive follow-up care following their release from emergency rooms, underscoring the necessity of structured follow-up as a routine procedure (Mousavizadeh et al., 2021).

2.5.3 Signs and Symptoms

The severity of the damage and the immediate effects on the person determine whether the symptoms of TBI are mild, moderate, or severe. Common symptoms of mild TBI or concussions include headaches, dizziness, nausea, vomiting, confusion, blurred vision, and temporary loss of consciousness, if any. Although these symptoms usually go away in a few days to weeks, they can occasionally linger and result in post-concussion syndrome (Mousavizadeh et al., 2024).

The symptoms of moderate to severe TBI may be more severe and persistent. Prolonged unconsciousness (minutes to hours), intense headaches that don't go away, frequent nausea or vomiting, seizures, dilation of one or both pupils, clear fluids leaking from the nose or ears (which could be a sign of cerebrospinal fluid leakage), difficulty waking up from sleep, profound confusion, agitation, combativeness, slurred speech, and significant problems with balance or coordination are all possible symptoms (Prazak, 2024).

Additionally common are behavioral and cognitive problems such as mood swings, anxiety, depression, memory loss, and trouble focusing. The person's everyday life may be greatly impacted by these problems, necessitating thorough rehabilitation (Oyesanya et al., 2016). Since TBI symptoms can change over time, it's critical to monitor patients closely in the first few days after an injury to quickly manage any worsening symptoms that might indicate complications such as brain edema, hemorrhage, or elevated intracranial pressure. Improving recovery results and avoiding long-term harm require early identification and treatment (Subramaniam et al., 2021).

2.5.4 Treatment

Making the right triage decisions is essential, especially when it comes to CT scans for mild traumatic brain injuries. These scans can identify lesions that may need surgery or hospitalization. Nonetheless, 90–95% of scanned patients do not exhibit intracranial damage, indicating that present decision-making is wasteful. Blood-based biomarkers have demonstrated the potential to enhance the effectiveness of these determinations by detecting structural brain damage that is not discernible through routine CT scans. These biomarkers have consequences for litigation, TBI management, and situations where CT scans are unable to adequately explain the severity of the patient's condition (AbdELstar, Gendy, and Mohamed, 2024).

Automated blood pressure and intracranial pressure analyses are improving customized management of TBI in critical care. Positive changes in TBI care are being signaled by the increasing interest in precision medicine, which customizes care for particular patient subgroups. Research on comparative effectiveness has yielded vital information supporting optimal procedures in the treatment of traumatic brain injury patients, regardless of age (Subramaniam et al., 2023).

Moreover, attempts have been made to enhance post-traumatic brain injury outcome assessments. Important evaluation instruments are now accessible for use in clinical and research settings worldwide after being translated into several languages. The US National Academies of Sciences, Engineering, and Medicine's 2022 report recommends that outcome assessments take a multivariate approach, as traumatic brain injury impacts multiple elements of functioning (Subramaniam et al., 2023).

2.6 Chapter Summary

As part of the search strategy, studies with participant counts ranging from as few as 10 to as many as 692 were evaluated from a variety of nations, including the USA, Australia, India, Iran, and Palestine. The majority of studies were conducted in intensive care units and emergency rooms, and they used cross-sectional or quasi-experimental designs, sometimes with pretest-posttest models, to assess how educational interventions affected nurses' practices and knowledge.

With its acute and long-term effects, including a higher chance of long-term neurodegeneration, TBI is a serious public health issue. Clinical markers such as the length of

post-traumatic amnesia or consciousness levels are used to classify TBI into mild, moderate, and severe categories. While automobile accidents are more common in low- and middle-income countries, falls are the main cause of TBI in high-income countries. Traffic-related incidents frequently result in greater death rates for TBI, which is more common in underdeveloped countries.

Headaches, nausea, dizziness, and disorientation are some of the symptoms of mild TBI that usually go away in a few weeks. Prolonged unconsciousness, excruciating headaches, seizures, and cognitive or behavioral issues are examples of moderate to severe TBI symptoms that might last and necessitate thorough rehabilitation. For better diagnosis and treatment, blood-based biomarkers and accurate triage—particularly for mild TBI—are crucial. A multivariate approach to outcome assessments is becoming more popular in clinical and research settings, and developments in automated pressure analysis and precision medicine are improving TBI care.

Chapter Three: Methodology

3.1 Introduction

This chapter aims to get a holistic of the research methods used in this thesis. It covers the following sections: study design, study setting, study duration, study population, sampling, and sample size, inclusion and exclusion criteria, study instruments, validity of questionnaire, reliability of questionnaire, pilot study, data collection, ethical considerations, and data analysis.

3.2 Study Design

A cross-sectional study aimed to assess the Emergency and ICU nurses' knowledge, attitude, and practice for the management of traumatic brain injury in governmental and private Hospitals in Palestine

3.3 Study Setting

It was done in the ICU and ER Department at private and governmental Hospitals in Jenin and Nablus city in North-West Bank. (Rafidia Surgical Hospital, Khalil Suliman Hospital, Specialized Arab Hospital, Nablus Specialized Hospital, An-Najah National University Hospital, Al-Razi Hospital, Ibn Sina Hospital) which contains an ER and ICU department and treats TBI patients.

- Nablus Specialized Hospital is a private hospital in the city of Nablus, in the West Bank, established in 2000. It is considered one of the most important private Palestinian medical institutions in the northern West Bank, with a bed capacity of 54 beds. The hospital includes several departments, namely: emergency, obstetrics and gynecology, nursery, children, operations, daily cases, internal medicine, intermediate care, ICU, cardiac care unit (CCU), cardiac surgery and catheterization, outpatient clinics, neurology, nutrition, physiotherapy, radiology, laboratory, and pharmacy.
- Specialized Arab Hospital (SAH) is a private hospital in Nablus, established in 1997. It is considered one of the most important private Palestinian medical institutions in the northern West Bank, with a bed capacity of 94 beds. The hospital includes several departments, namely: emergency, radiology, maintenance department, laundry, reception, outpatient clinics, emergency, laboratory, pharmacy, cafeteria, operations, men's medical & surgical department, ICU, CCU, registration and accounting, women's medical

&surgical department, cardiology department, maternity department, kitchen, lecture hall. Al-Arabi Specialized Hospital aims to provide the highest levels of medical and therapeutic services to all members of society, as this medical edifice includes a select group of high-level doctors and consultants according to scientific branches and their precise specializations. Al-Arabi Hospital has obtained the Quality Management Certificate.

- An-Najah National University Hospital was established in 2013 in partnership with the Faculty of Medicine and Health Sciences at An-Najah National University. It is located in the northwestern mountainous region of Nablus, on the exit leading to the town of Asira al-Shamaliya . An-Najah National University began building An-Najah National University Hospital in 2008, and opened its first phase in 2014 with a capacity of 127 beds in an area of 17,000 square meters. Construction work on the second phase began in early 2018 to cover an area of 65,000 square meters. The hospital received the Joint Commission International accreditation for quality healthcare services in August 2020. The hospital provides its treatment services through its various departments, which are: Radiology, Pediatrics, Tissues, Ear, Nose and Throat, Oncology, Anesthesia, Intensive Care and Pain Management, Sterilization, Nutrition, General Surgery, Pharmacy, Preventive Medicine, Emergency, Physiotherapy, Internal and Surgical Intensive Care, Cardiology and Catheterization, Artificial Kidney, Medical Laboratories, Urology, National Institute of Heart and Lung Surgery and Transplantation , Flexible Diagnostic and Therapeutic Endoscopy, Neurosurgery, Vascular and Orthopedic Surgery, Bone Marrow Transplantation, Ophthalmology, and Cardiology. In addition, as a teaching hospital, the hospital provides educational services to university students, providing education and health care and providing space for medical research and training.
- Al-Razi Hospital is a Palestinian private hospital affiliated with the Jenin Central Zakat Committee. It is located on Nablus Street in the city of Jenin, north of the West Bank. Its bed capacity is approximately 45 beds according to the Palestinian Annual Health Report for 2022. The hospital provides its services through several departments, most notably: emergency, intensive care, obstetrics, orthopedics, radiology, laboratory, endoscopy and catheterization. In addition to eye surgery and stone crushing, which was opened in 2008.

- Ibn Sina Specialized Hospital is one of the hospitals of the Arab Specialized Medical Complex in the State of Palestine. The hospital, which was opened on October 11, 2021, is located in the city of Jenin in the northern West Bank and has a bed capacity of 55 beds.
- Rafidia Hospital was established in 1976 in Nablus to provide specialized surgical medical services. It is one of the largest health institutions in the northern West Bank and its central government hospital. The hospital's occupancy rate in 2017 was about 88%, as it provided its services through its various departments, which are: emergency, operations, general surgery, specialized surgeries in orthopedics, nerves, children, blood vessels, plastic surgery, jaw, and eyes, as well as departments, intensive care, obstetrics and gynecology, nursery, daycare, burns, radiology (including CT scan), bleeding, outpatient clinics, central laboratories and blood bank, sterilization, physiotherapy, and pharmacy.

3.4 Study Duration

The study was conducted from August- 2024 to January- 2025. The initial phase included preparation and planning, which took place from (August to the end of November -2024). Data collection occurred during December 2024. Followed by data analysis during January 2025. The study was concluded with the final reporting and review completed by January 2025.

3.5 Study Population

The study population is a collection of subjects or departments with certain traits that meet the inclusion requirements, and from whom data can be collected. (Polit& Beck 2014). In this study, the target population was ICU and ER nurses in hospitals mentioned previously who met the inclusion criteria. The accessible populations are those ICU and ER nurses on duty work at targeted hospitals while collecting data through December -2024. It was (246).

Hospital Name	ER Nurse	ICU Nurse
Khalil Suliman Hospital	18	24
Al-RAzi Hospital	11	14
Ibn Sina Hospital	12	18
Rafidi Surgical Hospital	25	24
Specialized Arab Hospital	16	20
Nablus Specialized Hospital	11	14
An-Najah National University Hospital	15	16
Total	108	138

3.6 Inclusion and Exclusion Criteria

3.6.1 Inclusion Criteria

1. Age ≥ 22
2. Both Male and Female
3. Nurses work in ICU and ER departments
4. Experience Years more than 1 year

3.6.2 Exclusion Criteria

1. Volunteer students
2. Nurses working in another department (ER, ICU).
3. Nurses who do not agree to participate in the study.

3.7 Sample Size

The calculation of the sample size was based on the formula for testing the mean between the two groups of population (Lemeshow et al., 1990; Rosner, 2015).

$n = 2\sigma^2 \times (Z\alpha/2 + Z\beta)^2$

$(d)^2$

$Z\alpha/2$: 1.96 (Hajian-Tilaki, 2011).

$Z1\text{-}\beta$ β: Beta error 20%; power desired 80%; $Z1\text{-}\beta = 0.84$ (Sathian et al., 2010).

Adjustment for the estimated response rate will be 20%

σ^2: The standard deviation of the outcome of the dependent variable. The standard deviation is found using the following formula:

$$\sigma^2 = \frac{(n1-1)\ \sigma\ 12 + (n2-1)\ \sigma\ 22}{n1+n2-2}$$

The total population was 246 ICU and ER nurses, representing the entire population of ICU and ER nurses at the study site, where the total number of participants in the study was 151 ICU and ER nurses.

3.8 Study Instruments

To achieve the aim of the study, the survey was developed and implemented based on the literature review from different studies (Shehade et al., 2023, Oyesanya et al., 2016) and with three experts (professional nursing academy with PhD degree) opinions. There were four sections on the questionnaire.

- **Section one (Demographic characteristics)**: Demographic information such as age, gender, educational level, nursing experience, and service experience.
- **Section two (Nurses' knowledge evaluation)**:18 closed-ended questions created following a thorough literature review were used in the second section to gauge expertise regarding treating patients with TBI.

  Nursing knowledge scoring system: Responses were divided into three categories: "True," "False" and "I don't know." Correct responses ("Yes") received a score of 1, whereas unclear or inaccurate responses received a score of 0. By dividing the overall score by the

highest possible score and then multiplying the result by 100, knowledge scores were transformed into percentages. Knowledge levels were categorized as low (less than 60%), moderate (60–79%), or high (80–100%) based on Bloom's cutoff criteria (Bloom, 1956).

- **Section three (Nurses' attitude evaluation)**: Nurses were asked to rate their agreement or disagreement with 17 statements on different facets of TBI care, prognosis, and recovery as part of the attitude-related issues. The impact and prognosis of TBI, care practices, gender-based differences in TBI outcomes, the nursing role and the necessity of specialized TBI training, and the significance of TBI knowledge in nursing practice were all covered in these items. With a reliability coefficient of ω = 0.92,

  Nursing attitude scoring system: To measure the responses, a 5-point Likert scale—strongly agree (5), agree (4), Neutral (3), disagree (2), and strongly disagree (1)—was used; it was divided into three levels: low attitude (17-51), moderate attitude (52-68), and high attitude (69-85).

- **Section four (Nurses' practice evaluation)**: Using eight questions graded on a five-point Likert scale, from 1 (Never) to 5 (Always), the last segment assessed critical care methods for managing traumatic brain injury.

  Nursing practice scoring system By Bloom's cutoff criteria, practice scores were also transformed into percentages and divided into three categories: bad (less than 60%), fair (60–79%), and good (80–100%).

3.9 Pilot Study

Before applying the study, the researcher conducted a pilot study with 10 nurses who met the inclusion criteria after but they were excluded from the total study sample.

3.9.1 Content Validity for the Questionnaire

Experts showed the questionnaires to Jory. The data survey was validated by including 3 nursing academic experts, and the experts were distributed to Different Universities in the West Bank. The academic experts were contacted via email, and the questionnaire, along with the study objectives, was attached for them. Comments, suggestions, and rapid actions were taken regarding the experts' comments.

3.9.2 Internal Consistency Reliability

The questionnaires were shown to a statistician to measure reliability (calculating Cronbach's Alpha coefficient). Data was tested for normality, parametric analysis was used in the analysis to test the research hypothesis and answer our research questions (alpha = 0.05).

3.10 Data Collection

Data collection begins immediately after obtaining the approval to conduct the study from the Arab American University-Palestine (AAUP) Institutional Review Board (IRB) code number (R-2025/A /6/ N), private and governmental hospital administrations. Participants was verbally asked by the researcher to agree to participate. Following their verbal agreement, they was required to sign a written consent form before completing the self-reported questionnaire.

The researcher began data collecting by introducing herself to the individuals and creating confidence with them. Participants were then given instructions and explanations about the research, its objectives, and the need to deliver actual responses. To ensure confidentiality, data collecting was conducted on offered an acceptable setting. The information collection was done at an appropriate time and adhere to all ethical principles, with a round of 10 minutes needed for each participant to fill out the questionnaire.

The researcher helped the ICU and ER nurses by providing explanations and answering their questions if needed. Data collection took place in January 2024.

3.11 Data Analysis

The data was analyzed using the Statistical Package for Social Science Program (SPSS) version 24.0 to verify and ensure no mistakes, as well as to detect missing data. Before

performing any analysis, all variables were checked for normality using the skewness and kurtosis values.

Descriptive analysis – the measure of central tendency and dispersion test using the mean values and standard deviation for continuous variables (age) and categorical variables (gender, marital status, education level, monthly income, work experience, and triage training) – will be used.

The Chi-square test was used to measure the association between the knowledge, attitude, and practice scores among the emergency and ICU nurses. Simple logistic regression was used to investigate each independent variable with the knowledge or attitude, or practice score among the emergency and ICU nurses. Then, multiple logistic regression was test the sociodemographic factors significantly associated with the knowledge attitude or practice scores.

3.12 Ethical Considering

The researcher was committed to all research ethics and general ethical principles. Ethical approval was obtained from the Arab American University Ethical Committee IRB before data collection, and then permission to conduct the study in private hospitals was taken from their administrative departments. Upon approval, a prospective ICU and ER nurse's follow-up occurs after signature in the constant form to participate in research. During the prospective follow-up, risks to ICU and ER nurses were minimal and the nurse’s identification was kept anonymous.

Personal identification was not used to protect the nurses' identity. Without the identity of names, ID numbers, or other health information, all data gathered was registered on a researcher-developed platform. All information was kept in a locked cabinet, and all information was used just for research purposes. Nurses in the study were volunteers. Participants had the right to withdraw from the study at any moment.

3.13 Chapter Summary

The research methodology used in the study is described in this chapter, along with the population, sampling, duration, setting, design, and data-gathering techniques. The knowledge, attitudes, and behaviors of emergency and ICU nurses at Palestine's government and private hospitals on the management of TBI was assessed using a cross-sectional approach. The study will be carried out in several hospitals in Nablus and Jenin City.

The population consisted of 246 ICU and ER nurses who satisfied certain inclusion requirements. Participants had to be at least 22 years old, employed in the intensive care unit or emergency room, and have more than a year of experience to be eligible. Experts evaluated the survey instrument, and the sample size will be determined to guarantee reliability.

A standardized questionnaire with four sections demographic characteristics, knowledge evaluation, attitude assessment, and practice evaluation will be used to assist in data collection. Responses were categorized using scoring systems in each component, and Cronbach's Alpha will be used to guarantee dependability. To improve the questionnaire, a group of participants participated in a pilot research.

The data analysis plan, which uses SPSS for statistical analysis and includes logistic regression, chi-square tests, and descriptive statistics, is presented at the end of the chapter. Its purpose is to investigate the relationships between the nurses' knowledge, attitudes, behaviors, and demographic characteristics. With participant’s informed consent and clearances from the appropriate ethical committees, ethical considerations will be closely followed.

Chapter Four: Result

4.1 Introduction

This chapter presents the findings of the study on the knowledge, attitudes, and practices (KAP) of emergency and intensive care unit (ICU) nurses in managing traumatic brain injury (TBI) in governmental and private hospitals in Palestine

4.2 Response Rate

Overall, the TBI questionnaire was distributed to 161 emergency and ICU nurses in the private and government hospitals in the West Bank. Seven out of 161 emergency and ICU nurses did not complete the TBI questionnaire. Hence, the response rate was 95% (154 out 161).

4.3 Normality Test on Continuous Variables

The normality of all continuous variables was assessed through the skewness and kurtosis value (Hox et al., 2017; Stevens, 2012). The total values of skewness and kurtosis for all the dependent variables were within the acceptable range of -2 to +2. In the current study, the variables (knowledge and skills) were normally distributed, and parametric tests were used.

4.4 Socio-Demographic Characteristics of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Table 4.1, in both hospital types, the distribution of nurses across departments revealed a fairly balanced representation between the ICU and ER. In private hospitals, 48.4% of participants were from the ER and 51.6% from the ICU, compared to 50.8% from the ER and 49.2% from the ICU in government hospitals. In terms of age, most nurses in both sectors fell within the age ranges of 26-30 and 31-35. Notably, governmental hospitals had no nurses under the age of 26 and only 1.7% over 40, indicating a slightly younger nursing workforce in the public sector. In contrast, private hospitals were more represented in the youngest age group (21–25 years, 8.4%) and older age brackets (above 40 years, 5.3%).

Male nurses predominated in both contexts, but they were more common in government hospitals (72.9%) than in private ones (66.3%). 33.7% of nurses in private hospitals and 27.1% of nurses in government hospitals were female. In both sectors, about two-thirds of participants were married

(67.8% governmental, 67.4% private), while the remaining participants were single. There was a slight variation in educational attainment. The majority of nurses, 61 percent in government hospitals and 53.7% in private ones, had a Bachelor of Science in Nursing. Private hospitals had a higher percentage of diploma holders (29.5%) than public hospitals (22%). A generally highly qualified nursing workforce was indicated by the nearly equal percentage of nurses with a master's degree in the two settings (16.9% governmental vs. 16.8% private).

In terms of total years of service, most nurses in both settings (49.5% private, 52.5% governmental) had 6–10 years of experience. In contrast, private hospitals employed more early-career nurses (1–5 years: 13.7%) and senior nurses with more than 20 years of experience (5.3%), while governmental hospitals employed a larger percentage of mid-career nurses with 11–15 years of experience (42.4% vs. 28.4%). Nurses with 4–7 years of service in both sectors (49.2% governmental, 53.7% private) had the most experience in the current unit (ER or ICU), followed by those with 1–3 years.

Lastly, both types of hospitals lacked training on managing Traumatic Brain Injury (TBI), but private hospitals lacked it more than public hospitals. Compared to just 32.6% of nurses in private hospitals, 42.4% of nurses in government hospitals reported having received training. This implies that professional development and specialized training, particularly in the private sector, require more attention.

Table 4.1 :Distribution of socio-demographics among Emergency and ICU Nurses in Managing Traumatic Brain Injury

		Hospital Type			
		Governmental		Privet	
		N	N %	N	N %
Your Department	ER	30	50.8%	46	48.4%
	ICU	29	49.2%	49	51.6%
Age	21-25	0	0.0%	8	8.4%
	26-30	31	52.5%	41	43.2%
	31-35	20	33.9%	26	27.4%
	36-40	7	11.9%	15	15.8%
	above 40	1	1.7%	5	5.3%
Sex	Male	43	72.9%	63	66.3%
	Female	16	27.1%	32	33.7%
Marital status	Single	19	32.2%	31	32.6%

	Married	40	67.8%	64	67.4%
Educational level	Diploma in Nursing	13	22.0%	28	29.5%
	B.Sc. in Nursing	36	61.0%	51	53.7%
	Masters of Nursing	10	16.9%	16	16.8%
Service experience	1-5 years	2	3.4%	13	13.7%
	6-10 years	31	52.5%	47	49.5%
	11-15 years	25	42.4%	27	28.4%
	16 -20 years	0	0.0%	3	3.2%
	Above 20 years	1	1.7%	5	5.3%
Working experience in this ICU or ER	1-3 years	15	25.4%	28	29.5%
	4-7 years	29	49.2%	51	53.7%
	8-12 years	10	16.9%	12	12.6%
	Above 12 years	5	8.5%	4	4.2%
Have you ever taken any training regarding TBI management	No	34	57.6%	64	67.4%
	Yes	25	42.4%	31	32.6%

ILS 1 = USD 0.30 = RM 1.3, n = number, % = percentage

4.5 Knowledge, attitude, and skill scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

4.5.1 Knowledge Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Table 4.2 shows that government hospital nurses generally showed a higher level of correct knowledge compared to those in private hospitals across the majority of the assessed items, according to the interpretation of the knowledge-based responses regarding the management of ICP and TBI. Nearly all governmental nurses (98.3%) correctly answered the question, "A severe head injury is classified as a Glasgow Coma Score of 8 and below," while private nurses (86.3%) had a slightly lower correct response rate. In a similar vein, 94.9% of government nurses correctly answered the question, "Localizing refers to movement in response to pain above the clavicle," while 78.9% of private hospital nurses did not, with 5.3% of private respondents expressing uncertainty.

Both groups did well on the "good flexion response to pain" item, but government nurses were marginally more accurate (91.5%) than private nurses (87.4%). Pupil dilatation as a sign of cerebral herniation was correctly identified by 78.9% of private nurses and 83.1% of governmental nurses, with a small percentage of the private group expressing uncertainty. 93.2% of government nurses and 80% of private nurses identified the proper signs of Cushing's response (bradycardia, widening pulse pressure, etc.); however, 4.2% of private hospital nurses chose "I

don't know." In particular, governmental (79.7%) and private (83.2%) groups gave fewer correct answers to a second similar item on Cushing's response.

The majority of nurses (79.7% governmental, 81.1% private) gave accurate answers when asked if rectal temperature is a reliable way to monitor core temperature; however, the governmental group was more likely to give incorrect answers. 81.4% of government nurses and 74.7% of private nurses provided accurate answers on hyperthermia raising ICP; once more, private hospitals provided more inaccurate and ambiguous responses. Government nurses answered the question about target PCO2 levels during intracranial hypertension more correctly (88.1%) than private hospital nurses (75.8%). In a similar vein, 87.4% of private nurses and 84.7% of governmental nurses correctly answered the question about ICP waveform monitoring, although 3.2% of the private group said they were unsure.

Government nurses had a higher understanding of cerebral perfusion pressure (CPP) calculation (93.2%) than did private nurses (80%). Both groups did well in recognizing the ICP compliance curve, with high accuracy (91.5% governmental, 88.4% private); however, private hospitals reported higher levels of uncertainty. In the first related question about brain tissue oxygenation monitoring using Licox, 86.4% of governmental nurses and 82.1% of private nurses provided accurate answers. In the repeated item, governmental nurses once again outperformed private nurses (98.3% vs. 84.2%).

Table 4.2 :Distribution of knowledge score on Emergency and ICU Nurses in Managing Traumatic Brain Injury

		Hospital Type			
		Governmental		Privet	
		Count	N %	Count	N %
“A severe head injury is classified as a Glasgow Coma Score of 8 and below”	False	1	1.7%	13	13.7%
	True	58	98.3%	82	86.3%
	I dont know	0	0.0%	0	0.0%
Localizing refers to: Patient will move hand above the clavicle after applying supra orbital pressure or pinching trapezius muscle”	False	3	5.1%	15	15.8%
	True	56	94.9%	75	78.9%
	I dont know	0	0.0%	5	5.3%
A good flexion response on	False	4	6.8%	8	8.4%

pain stimuli is characterized by flexing of the elbow, often accompanied by lifting the elbow clear body”	True	54	91.5%	83	87.4%
	I dont know	1	1.7%	4	4.2%
A dilated pupil represents cerebral edema or herniation on the same side of the dilated pupil”	False	10	16.9%	18	18.9%
	True	49	83.1%	75	78.9%
	I dont know	0	0.0%	2	2.1%
Bradycardia, widening pulse pressure, irregular respiration and rise in blood pressure are signs of Cushing’s response”	False	4	6.8%	15	15.8%
	True	55	93.2%	76	80.0%
	I dont know	0	0.0%	4	4.2%
Bradycardia, widening pulse pressure, irregular respiration and rise in blood pressure are signs of Cushing’s response”	False	7	11.9%	15	15.8%
	True	47	79.7%	79	83.2%
	I dont know	5	8.5%	1	1.1%
Rectal temperature are one of the most accurate routes of monitoring core temperatures	False	12	20.3%	16	16.8%
	True	47	79.7%	77	81.1%
	I dont know	0	0.0%	2	2.1%
Hyperthermia can increase ICP (intracranial pressure)”	False	11	18.6%	23	24.2%
	True	48	81.4%	71	74.7%
	I dont know	0	0.0%	1	1.1%
During intracranial hypertension, the target level of Partial Pressure of Carbon Dioxide (PCO2) is 4to 4.6 kpa”	False	5	8.5%	16	16.8%
	True	52	88.1%	72	75.8%
	I dont know	2	3.4%	7	7.4%
On intracranial pressure monitoring, waveforms are reflected on the monitor”	False	9	15.3%	9	9.5%
	True	50	84.7%	83	87.4%
	I dont know	0	0.0%	3	3.2%
Cerebral perfusion pressure (CPP) is calculated as, (Systolic Pressure – ICP)”	False	4	6.8%	14	14.7%
	True	55	93.2%	76	80.0%
	I dont know	0	0.0%	5	5.3%
Intracranial pressure (ICP) compliance can be described as (P1 curve is smaller than P2 and P3 curve)”	False	5	8.5%	7	7.4%
	True	54	91.5%	84	88.4%
	I dont know	0	0.0%	4	4.2%
Brain tissue monitoring (Licox) is used to monitor brain oxygenation. A value less than 20 mmHg is associated with poor outcomes of patients with traumatic brain injury”	False	7	11.9%	12	12.6%
	True	51	86.4%	78	82.1%
	I dont know	1	1.7%	5	5.3%
Brain tissue monitoring (Licox) is used to monitor brain oxygenation. A value less	False	1	1.7%	13	13.7%
	True	58	98.3%	80	84.2%
	I dont know	0	0.0%	2	2.1%

than 20 mmHg is associated with poor outcomes of patients with traumatic brain injury”					
Reverse Trendelenburg position is one fastest, least invasive ways to acutely lower intracranial pressure”	False	7	11.9%	17	17.9%
	True	52	88.1%	72	75.8%
	I dont know	0	0.0%	6	6.3%
Extra-ventricular drain (EVD) should always	False	8	13.6%	22	23.2%
	True	51	86.4%	68	71.6%
	I dont know	0	0.0%	5	5.3%

4.5.2 Attitude Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Although there are some significant differences, Table 4.3 indicates that emergency and intensive care unit nurses' attitude scores about treating TBI indicate a generally positive orientation among both public and private hospital nurses. The significance of having specialized educational materials for TBI care was agreed upon or strongly agreed upon by a large majority of both groups; government nurses were more in agreement (67.8%) than private hospital nurses (77.9%). Similarly, 71.2% of government nurses and 72.6% of private nurses agreed or strongly agreed that assessing TBI patients is difficult.

Both sectors had a high level of awareness regarding the importance of brain injury location in care planning, with 75.8% of private nurses and 69.4% of government nurses agreeing or strongly agreeing. Furthermore, both groups agreed that when creating care plans, it is important to take into account a patient's history before TBI; however, private nurses agreed slightly more (82.1%) than governmental nurses (76.2%). More than 74% of both groups agreed or strongly agreed that TBI patients have behavioral problems. Although fewer nurses strongly agreed, there was also widespread agreement that TBI affects men and women equally (64.4% of governmental vs. 68.4% of private).

Both groups tended to agree when asked if men and women similarly recover from TBI, but governmental nurses were more likely to strongly agree (27.1%) than private nurses (16.8%). Private nurses, however, were more supportive of the claim that men and women need different kinds of care following traumatic brain injury (70.5%) than were government nurses (61.1%). There is no gender difference in family involvement in post-TBI care, according to both groups; governmental nurses agreed slightly more (72.9%) than private nurses (64.2%). Nearly all nurses in both groups (84.8% governmental and 80% private) agreed or strongly agreed that TBI

recovery may take years. Additionally, both groups agreed that TBI patients differ from those with other disabilities, with private nurses agreeing more (75.8%).

Most nurses (76.3% governmental, 71.6% private) agreed that the nurse's role in TBI care is clear, and most agreed that medical labels are helpful when planning care (69.4% governmental, 71.6% private). Responses to the question of whether TBI care plans require more frequent updates varied somewhat; 56.8% of private nurses and 72.8% of governmental nurses agreed or strongly agreed. Furthermore, both groups had a generally positive opinion of their units' ability to provide TBI care, although governmental nurses' opinions were a little more ambivalent. About half of both groups agreed or strongly agreed that specialized TBI training is necessary; governmental nurses disagreed more often (13.6%) than private nurses (5.3%). Lastly, although 25.4% of government nurses disagreed with this statement, compared to 16.8% in private hospitals, both groups valued TBI knowledge for their current practice.

Table 4.3 :Distribution of Attitude Scores on Emergency and ICU Nurses in Managing Traumatic Brain Injury

		Hospital Type			
		Governmental		Privet	
		N	N %	N	N %
To assess and/or treat patients with TBI, nurses need specialized TBI educational materials.	Neutral	17	28.8%	17	17.9%
	Disagree	2	3.4%	4	4.2%
	Agree	8	13.6%	32	33.7%
	Strongly agree	32	54.2%	42	44.2%
The challenges of patients with TBI are typically more difficult to assess than the challenges of patients with other disabilities.	Neutral	17	28.8%	25	26.3%
	Disagree	0	0.0%	1	1.1%
	Agree	25	42.4%	46	48.4%
	Strongly agree	17	28.8%	23	24.2%
Knowing the location of brain damage from TBI helps in the development of nursing care plans that meet patients' needs.	Neutral	16	27.1%	21	22.1%
	Disagree	2	3.4%	2	2.1%
	Agree	30	50.8%	51	53.7%
	Strongly agree	11	18.6%	21	22.1%
Knowledge of a patient's background prior to TBI is necessary when developing a nursing care plan.	Neutral	14	23.7%	16	16.8%
	Disagree	0	0.0%	1	1.1%
	Agree	31	52.5%	56	58.9%
	Strongly agree	14	23.7%	22	23.2%
Patients with TBI often display behavior problems.	Neutral	13	22.0%	19	20.0%
	Disagree	2	3.4%	4	4.2%
	Agree	36	61.0%	57	60.0%
	Strongly agree	8	13.6%	15	15.8%
TBI is equally common in males	Neutral	17	28.8%	24	25.3%

and females.	Disagree	4	6.8%	6	6.3%
	Agree	25	42.4%	52	54.7%
	Strongly agree	13	22.0%	13	13.7%
Men and women recover in the same way after having a TBI.	Neutral	16	27.1%	28	29.5%
	Disagree	0	0.0%	2	2.1%
	Agree	27	45.8%	49	51.6%
	Strongly agree	16	27.1%	16	16.8%
Men and women require different types of care after having a TBI.	Neutral	15	25.4%	24	25.3%
	Disagree	8	13.6%	4	4.2%
	Agree	28	47.5%	59	62.1%
	Strongly agree	8	13.6%	8	8.4%
Family involvement in patient care is no different for men and women who are receiving care after having a TBI.	Neutral	15	25.4%	28	29.5%
	Disagree	1	1.7%	6	6.3%
	Agree	37	62.7%	50	52.6%
	Strongly agree	6	10.2%	11	11.6%
Recovery following TBI may continue for several years.	Neutral	8	13.6%	13	13.7%
	Disagree	1	1.7%	6	6.3%
	Agree	41	69.5%	65	68.4%
	Strongly agree	9	15.3%	11	11.6%
Greater variability exists in the population of patients with TBI than in populations of other patients with disabilities.	Neutral	17	28.8%	22	23.2%
	Disagree	0	0.0%	1	1.1%
	Agree	31	52.5%	62	65.3%
	Strongly agree	11	18.6%	10	10.5%
The role of registered nurses in regard to care of patients with TBI is clearly understood in my workplace.	Neutral	14	23.7%	21	22.1%
	Disagree	0	0.0%	6	6.3%
	Agree	38	64.4%	58	61.1%
	Strongly agree	7	11.9%	10	10.5%
Medical labels that specify TBI as mild, moderate, or severe are useful for development of nursing care plans.	Neutral	14	23.7%	25	26.3%
	Disagree	4	6.8%	2	2.1%
	Agree	30	50.8%	53	55.8%
	Strongly agree	11	18.6%	15	15.8%
Nursing care plan goals for patients with TBI may need to be revised more frequently than nursing care plan goals for patients with other types of disabilities.	Neutral	12	20.3%	36	37.9%
	Disagree	4	6.8%	5	5.3%
	Agree	30	50.8%	42	44.2%
	Strongly agree	13	22.0%	12	12.6%
Nurses on my unit do a good job when providing care to patients with moderate-to-severe TBI.	Neutral	19	32.2%	27	28.4%
	Disagree	0	0.0%	3	3.2%
	Agree	29	49.2%	45	47.4%
	Strongly agree	11	18.6%	20	21.1%
Nurses need specialized training to provide care to patients with moderate-to severe TBI.	Neutral	19	32.2%	29	30.5%
	Disagree	8	13.6%	5	5.3%
	Agree	20	33.9%	47	49.5%
	Strongly agree	12	20.3%	14	14.7%

Knowing about moderate to-severe traumatic brain injury is important to my current nursing practice.	Neutral	12	20.3%	24	25.3%
	Disagree	15	25.4%	16	16.8%
	Agree	25	42.4%	45	47.4%
	Strongly agree	7	11.9%	10	10.5%

4.5.3 Practice Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Different frequencies across various interventions were found in the distribution of practice scores among emergency and ICU nurses in managing TBI between public and private hospitals. 57.6% of government nurses and 53.7% of private nurses said they regularly maintained systolic blood pressure at 90 mmHg or higher in TBI patients, whereas 18.6% and 16.8%, respectively, said they always met this goal. In both sectors, only a small minority said they rarely or never followed this practice.

Most nurses in both types of hospitals reported frequent implementation of cerebral perfusion pressure (CPP) targeting above 60 mmHg (44.1% in governmental settings and 49.5% in private settings), with a smaller group consistently doing so (13.6% and 15.8%, respectively). A sizable percentage also reported occasional practice: 28.4% (private) and 35.6% (government). 54.2% of government nurses and 50.5% of private nurses reported regularly monitoring end-tidal carbon dioxide ($ETCO_2$), compared to 11.9% and 18.9%, respectively, who said they always do so. It was also common to practice occasionally. According to data, 45.8% of government nurses and 34.7% of private nurses regularly used hyperosmolar therapy (Mannitol) to control elevated intracranial pressure (ICP), with 42–49% occasionally using it. In both hospital types, fewer people said they always used Mannitol.

39.0% of government nurses and 44.2% of private nurses regularly used hyperventilation as a short-term strategy to lower ICP. Interestingly, 16.8% of private nurses and 27.1% of government nurses consistently used this method. 49.2% of government nurses and 44.2% of private nurses reported using propofol (Diprivan) infusion for controlling ICP frequently, whereas 33.9% and 36.8% reported using it occasionally. Compared to governmental hospitals (5.1%), rare usage was marginally more prevalent in private hospitals (9.5%). 42.4% of government nurses and 45.3% of private nurses reported that feedings were started within 24 hours after the injury. Furthermore, there were few reports of infrequent or nonexistent initiation, with 15.3% (government) and 20.0% (private) always guaranteeing early feeding.

Finally, 59.3% of government nurses and 53.7% of private nurses, respectively, reported that intermittent pneumatic compression devices were available and frequently used for DVT prophylaxis, while 18.6% and 21.1% reported that they were always used. Additionally, occasional use was noted, particularly in private hospitals (25.3%).

Table 4.4 :Distribution of practice score on Emergency and ICU Nurses in Managing Traumatic Brain Injury

		Hospital Type			
		Governmental		Privet	
		Count	N %	Count	N %
"We aim for systolic blood pressures 90mmHg and higher in traumatic brain injury patients"	Never	2	3.4%	1	1.1%
	Rare	5	8.5%	7	7.4%
	Sometimes	7	11.9%	20	21.1%
	Frequent	34	57.6%	51	53.7%
	Always	11	18.6%	16	16.8%
"We target CPP value, >60 mmHg for brain perfusion"	Never	0	0.0%	0	0.0%
	Rare	4	6.8%	6	6.3%
	Sometimes	21	35.6%	27	28.4%
	Frequent	26	44.1%	47	49.5%
	Always	8	13.6%	15	15.8%
"We monitor End tidal carbon dioxide (ETCO2) in my ICU"	Never	1	1.7%	0	0.0%
	Rare	0	0.0%	2	2.1%
	Sometimes	19	32.2%	27	28.4%
	Frequent	32	54.2%	48	50.5%
	Always	7	11.9%	18	18.9%
"Hyperosmolar therapy (Mannitol) is used to control raised ICP"	Never	0	0.0%	0	0.0%
	Rare	1	1.7%	1	1.1%
	Sometimes	25	42.4%	47	49.5%
	Frequent	27	45.8%	33	34.7%
	Always	6	10.2%	14	14.7%
""Hyperventilation is used as temporary measurement for reducing elevated ICP"	Never	0	0.0%	0	0.0%
	Rare	0	0.0%	2	2.1%
	Sometimes	20	33.9%	35	36.8%
	Frequent	23	39.0%	42	44.2%
	Always	16	27.1%	16	16.8%
""Propofol infusion (Diprivan) (anaesthetic agent) is used for control of raised ICP"	Never	0	0.0%	0	0.0%
	Rare	3	5.1%	9	9.5%
	Sometimes	20	33.9%	35	36.8%
	Frequent	29	49.2%	42	44.2%
	Always	7	11.9%	9	9.5%
"Feeding is initiated at least 24 hours post- injury"	Never	0	0.0%	0	0.0%
	Rare	2	3.4%	1	1.1%
	Sometimes	23	39.0%	32	33.7%

	Frequent	25	42.4%	43	45.3%
	Always	9	15.3%	19	20.0%
"Intermittent pneumatic cuffs for DVT prophylaxis is available to all patients"	Never	0	0.0%	0	0.0%
	Rare	1	1.7%	0	0.0%
	Sometimes	12	20.3%	24	25.3%
	Frequent	35	59.3%	51	53.7%
	Always	11	18.6%	20	21.1%

4.6 Correlation Between Knowledge, Attitude, and Practice among Emergency and ICU Nurses in Managing Traumatic Brain Injury

Table 4.5 presents the correlations between knowledge, attitude, and practices regarding the care of patients with TBI. There is a significant positive correlation between knowledge and attitude ($r = 0.368$, $p < 0.01$), as well as between knowledge and practices ($r = 0.186$, $p < 0.05$). Additionally, a strong and highly significant positive correlation exists between attitude and practices ($r = 0.724$, $p < 0.01$). These findings suggest that higher knowledge about TBI care is associated with more positive attitudes and better practices, and that attitudes are particularly strongly linked to practices in patient care.

Table 4.5 :Correlation between the Knowledge, Attitude, and Practice among the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Correlations				
		knowledge about the care of patient with TBI	Attitude regarding the Care of Patients with a TBI	Practices regarding the Care of Patients with a TBI
knowledge about the care of patient with TBI	Pearson Correlation	1	.368**	.186*
	Sig. (2-tailed)		.000	.019
Attitude regarding the Care of Patients with a TBI	Pearson Correlation	.368**	1	.724**
	Sig. (2-tailed)	.000		.000
Practices regarding the Care of Patients with a TBI	Pearson Correlation	.186*	.724**	1
	Sig. (2-tailed)	.019	.000	
*. Correlation is significant at the 0.05 level (2-tailed).				

4.7 Socio-demographic and Occupation Information Associated with the Knowledge, Attitude, and Practice Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

4.7.1 Socio-demographic and Occupation Information Associated with the Knowledge Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

The association between nurses' knowledge regarding managing TBI and different demographic and professional factors was investigated using the Pearson correlation analysis. According to the findings, hospital type and knowledge had a weakly negative correlation ($r = -0.062$), which was not statistically significant ($p = 0.444$). This implies that the type of hospital does not greatly impact nurses' understanding of TBI, whether it be public or private.

Similarly, there was a very weak positive correlation ($r = 0.060$, $p = 0.463$) that was not statistically significant with department affiliation (whether the nurse works in the ER or the intensive care unit). This suggests that nurses' knowledge levels are not significantly impacted by the particular department they work in. However, there was a statistically significant positive correlation between age and knowledge ($r = 0.253$, $p = 0.002$). According to this research, older nurses are more likely to have greater knowledge of managing TBI, possibly due to their increased exposure to clinical practice over time.

There is no discernible difference in knowledge between male and female nurses, according to the weak and non-statistically significant correlation between sex and knowledge ($r = 0.080$, $p = 0.322$). Marital status also showed a weak positive correlation ($r = 0.103$, $p = 0.203$), but this was not statistically significant either, indicating that a nurse's level of TBI knowledge is unaffected by whether they are married or not. It's interesting to note that knowledge and educational level had a weakly negative correlation ($r = -0.075$, $p = 0.355$), suggesting that in this study sample, higher education did not always translate into greater knowledge. This may suggest that experience is more important than formal education or that certain topics pertaining to TBI management may not be covered by formal education alone.

Knowledge and service experience (the total number of years of nursing experience) were positively correlated in a statistically significant way ($r = 0.254$, $p = 0.001$). This implies that nurses with more years of experience are probably more knowledgeable, perhaps as a result of their cumulative practical experience and ongoing education from actual clinical settings.

Knowledge and ICU or ER working experience had a moderately positive correlation (r = 0.144), but this relationship was not statistically significant (p = 0.075). This might point to a pattern where nurses with more experience working in critical care settings are learning more, but more research with a bigger sample size might be required to validate this.

Lastly, there was a weak and non-significant positive correlation between knowledge and prior training in TBI management (r = 0.091, p = 0.261). This finding emphasizes the significance of assessing the caliber and content of training programs to make sure they successfully increase nurses' knowledge, even though it is not statistically significant.

Table 4.6 :Socio-demographic and Occupation Information Associated with the Knowledge Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Correlations		
		knowledge
Hospital Type	Pearson Correlation	-.062
	Sig. (2-tailed)	.444
Your Department	Pearson Correlation	.060
	Sig. (2-tailed)	.463
Age	Pearson Correlation	.253
	Sig. (2-tailed)	.002
Sex	Pearson Correlation	.080
	Sig. (2-tailed)	.322
Marital status	Pearson Correlation	.103
	Sig. (2-tailed)	.203
Educational level	Pearson Correlation	-.075
	Sig. (2-tailed)	.355
Service experience	Pearson Correlation	.254
	Sig. (2-tailed)	.001
Working experience in this ICU or ER	Pearson Correlation	.144
	Sig. (2-tailed)	.075
Have you ever taken any training regarding TBI management	Pearson Correlation	.091
	Sig. (2-tailed)	.261

4.7.2 Socio-demographic and Occupation Information Associated with the Attitude Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

The relationship between sociodemographic and occupational traits and the attitude scores of emergency and ICU nurses regarding the treatment of TBI is examined in the analysis shown in Table 4.7.2. The findings suggest that a nurse's attitude toward TBI care is significantly influenced by the department in which they work (ICU or ER), with the working department showing the strongest statistically significant positive correlation with attitude scores (Pearson

correlation = 0.346, p = 0.000). This might be a result of the various departments' exposure to TBI patients and associated procedures. Additionally, there was a statistically significant positive correlation between age and TBI management (r = 0.222, p = 0.006), suggesting that older nurses may have more positive attitudes toward TBI management because of their increased maturity or clinical experience.

Likewise, there was a positive correlation between years of service experience and attitude (r = 0.185, p = 0.022), suggesting that nurses with more years of total work experience are more likely to have positive attitudes. However, there was no significant correlation between attitude and working experience in the ICU or ER (r = 0.118, p = 0.146), indicating that general service experience might have a greater impact than departmental tenure. Importantly, attitude was positively correlated with TBI management training (r = 0.191, p = 0.018), highlighting the positive effects of focused education and training on nurses' attitudes and perceptions of TBI care.

However, there were no statistically significant correlations between attitude scores and variables like hospital type (r = -0.013, p = 0.871), sex (r = -0.017, p = 0.837), marital status (r = 0.144, p = 0.074), or educational level (r = 0.148, p = 0.067). These results imply that occupational factors, especially department, experience, and training, are more important in determining nurses' attitudes toward TBI management than demographic factors, which may have some bearing.

Table 4.7 :Socio-demographic and Occupation Information Associated with the Attitude Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Correlations		
		Attitudes
Hospital Type	Pearson Correlation	-.013
	Sig. (2-tailed)	.871
Your Department	Pearson Correlation	.346
	Sig. (2-tailed)	.000
Age	Pearson Correlation	.222
	Sig. (2-tailed)	.006
Sex	Pearson Correlation	-.017
	Sig. (2-tailed)	.837
Marital status	Pearson Correlation	.144
	Sig. (2-tailed)	.074
Educational level	Pearson Correlation	.148
	Sig. (2-tailed)	.067

Service experience	Pearson Correlation	.185
	Sig. (2-tailed)	.022
Working experience in this ICU or ER	Pearson Correlation	.118
	Sig. (2-tailed)	.146
Have you ever taken any training regarding TBI management	Pearson Correlation	.191
	Sig. (2-tailed)	.018

4.7.3 Socio-demographic and Occupation Information Associated with the Practice Scores of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

To evaluate the association between nurses' professional and demographic traits and their TBI management practices, a Pearson correlation analysis was performed. The findings revealed a very weak and non-significant positive correlation between hospital type and practices ($r = 0.003$, $p = 0.966$), indicating that the nurses' clinical practices in managing traumatic brain injury are unaffected by the type of hospital they work in.

There was a statistically significant positive correlation between department affiliation (whether ICU or ER) and practices ($r = 0.185$, $p = 0.022$). This suggests that nurses' TBI-related practices are somewhat influenced by the department in which they work, with those in particular departments—possibly the intensive care unit—exhibiting marginally higher adherence to TBI practices.

Age did not appear to have a significant impact on nurses' TBI practice levels, as evidenced by the weak and non-statistically significant correlation between age and practices ($r = 0.069$, $p = 0.396$). Additionally, there was no significant difference in TBI practices between male and female nurses, as evidenced by the weak negative correlation between sex and TBI ($r = -0.129$, $p = 0.111$), which was not statistically significant. A weak positive but non-significant correlation between marital status and practices was found ($r = 0.096$, $p = 0.235$), suggesting that a nurse's marital status has no discernible impact on how well they perform in their practice. A very weak and non-significant positive correlation was also found between educational level and TBI management ($r = 0.026$, $p = 0.745$), indicating that better academic credentials are not always associated with better TBI management techniques.

A weak and non-significant positive correlation ($r = 0.088$, $p = 0.277$) was found when looking at service experience, suggesting that better TBI practices are not directly correlated with more years of experience in the field. Additionally, there was a very weak and non-significant

correlation between working experience in the ER or ICU (r = 0.013, p = 0.868), suggesting that practice levels are not significantly impacted by the length of time spent in these critical units. Additionally, it was discovered that practice and TBI management training had a statistically significant positive correlation (r = 0.181, p = 0.025). This outcome demonstrates the positive effects of focused training on enhancing nurses' practical abilities and reactions when caring for patients with traumatic brain injury. It highlights the necessity of professional development and ongoing education in this field.

Table 4.8 :Socio-demographic and Occupation Information Associated with the Practice Score of the Emergency and ICU Nurses in Managing Traumatic Brain Injury

Correlations		
		Practices
Hospital Type	Pearson Correlation	.003
	Sig. (2-tailed)	.966
Your Department	Pearson Correlation	.185
	Sig. (2-tailed)	.022
Age	Pearson Correlation	.069
	Sig. (2-tailed)	.396
Sex	Pearson Correlation	-.129
	Sig. (2-tailed)	.111
Marital status	Pearson Correlation	.096
	Sig. (2-tailed)	.235
Educational level	Pearson Correlation	.026
	Sig. (2-tailed)	.745
Service experience	Pearson Correlation	.088
	Sig. (2-tailed)	.277
Working experience in this ICU or ER	Pearson Correlation	.013
	Sig. (2-tailed)	.868
Have you ever taken any training regarding TBI management	Pearson Correlation	.181
	Sig. (2-tailed)	.025

4.8 Linear regression

4.8.1 Socio-demographics with the Knowledge score, using linear regression

Table 4.9 below presents the results of a linear regression analysis examining the relationship between socio-demographic variables and knowledge scores about the care of patients with TBI. The model indicates that the constant (baseline knowledge score) is 12.934, which is highly significant ($p < 0.001$). None of the socio-demographic variables, including hospital type, department, age, sex, marital status, educational level, service experience, working experience in

the ICU or ER, and prior training in TBI management, were found to have a statistically significant relationship with the knowledge score (all p-values > 0.05). The standardized coefficients (Beta) suggest that the variables had minimal influence on the knowledge score, with the largest but non-significant effects observed for service experience (Beta = 0.156, p = 0.249) and educational level (Beta = -0.117, p = 0.157).

The model includes predictors such as hospital type, department, age, sex, marital status, educational level, service experience, working experience in the ICU or ER, and prior training in TBI management. The R value (0.328) indicates a weak to moderate correlation between the predictors and the dependent variable. The R Square value (0.108) shows that approximately 10.8% of the variance in the dependent variable is explained by the predictors in the model. The Adjusted R Square (0.052), which accounts for the number of predictors, suggests that about 5.2% of the variance is explained when adjusted for model complexity, indicating that the predictors have limited explanatory power. The Std. Error of the Estimate (2.71176) represents the average distance between the observed values and the predicted values, providing a measure of the model's accuracy.

Table 4.9 :Socio-demographics with the Knowledge score, using linear regression

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.934	.710		18.215	.000
	Hospital Type	-.342	.459	-.060	-.744	.458
	Your Department	.574	.452	.103	1.271	.206
	Age	.383	.410	.127	.936	.351
	Sex	.453	.524	.076	.865	.388
	Marital status	-.143	.566	-.024	-.253	.800
	Educational level	-.496	.349	-.117	-1.422	.157
	Service experience	.517	.446	.156	1.158	.249
	Working experience in this ICU or ER	.123	.300	.036	.410	.683
	Have you ever taken any training regarding TBI management	.518	.461	.090	1.124	.263
a. Dependent Variable: knowledge about the care of a patient with TBI						

4.8.2 Socio-demographics with the attitudes score, using linear regression

Table 4.10 below presents the results of a linear regression analysis examining the relationship between socio-demographic variables and attitude scores regarding the care of patients with head trauma (N = 154). The model shows that the constant (baseline attitude score) is 16.181, which is highly significant ($p < 0.001$). Among the predictors, department (Beta = 0.373, $p < 0.001$) and prior training in TBI management (Beta = 0.183, $p = 0.014$) were found to have statistically significant positive associations with attitude scores. Specifically, individuals in certain departments had significantly higher attitude scores, and those who had received TBI training also demonstrated more positive attitudes. Other variables, such as hospital type, age, sex, marital status, educational level, service experience, and working experience in the ICU or ER, did not show significant relationships with attitude scores (all p-values > 0.05).

The model includes predictors such as hospital type, department, age, sex, marital status, educational level, service experience, working experience in the ICU or ER, and prior training in TBI management. The R value (0.489) indicates a moderate correlation between the predictors and the dependent variable. The R Square value (0.239) shows that approximately 23.9% of the variance in the dependent variable is explained by the predictors in the model. The Adjusted R Square (0.191), which accounts for the number of predictors, suggests that about 19.1% of the variance is explained when adjusted for model complexity. The Std. Error of the Estimate (9.54982) indicates the average distance between the observed values and the predicted values, providing a measure of the model's accuracy.

Table 4.10 :Socio-demographics with the attitudes score, using linear regression

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.181	2.501		6.471	.000
	Hospital Type	.180	1.617	.008	.111	.912
	Your Department	7.890	1.592	.373	4.958	.000
	Age	2.402	1.442	.209	1.665	.098
	Sex	-1.614	1.845	-.071	-.875	.383
	Marital status	-1.197	1.994	-.053	-.600	.549
	Educational level	2.022	1.229	.125	1.645	.102

	Service experience	1.019	1.572	.081	.648	.518
	Working experience in this ICU or ER	.159	1.057	.012	.150	.881
	Have you ever taken any training regarding TBI management	4.025	1.623	.183	2.480	.014
a. Dependent Variable: Attitude regarding the Care of Patients with a TBI						

4.8.3 Socio-demographics with the Practices score, using linear regression

The table presents the results of a linear regression analysis examining the relationship between socio-demographic variables and practices scores regarding the care of patients with head trauma (N = 154). The model indicates that the constant (baseline practices score) is 19.999, which is highly significant ($p < 0.001$). Among the predictors, department (Beta = 0.206, p = 0.012) and prior training in TBI management (Beta = 0.183, p = 0.024) were found to have statistically significant positive associations with practices scores. This suggests that individuals in certain departments and those who had received TBI training demonstrated better practices in caring for patients with head trauma. Other variables, such as hospital type, age, sex, marital status, educational level, service experience, and working experience in the ICU or ER, did not show significant relationships with practices scores (all p-values > 0.05). However, sex approached marginal significance (Beta = -0.166, p = 0.061), indicating a potential trend where sex might influence practices, though not conclusively.

The model includes predictors such as hospital type, department, age, sex, marital status, educational level, service experience, working experience in the ICU or ER, and prior training in TBI management. The R value (0.323) indicates a weak to moderate correlation between the predictors and the dependent variable. The R Square value (0.105) shows that approximately 10.5% of the variance in the dependent variable is explained by the predictors in the model. The Adjusted R Square (0.049), which accounts for the number of predictors, suggests that about 4.9% of the variance is explained when adjusted for model complexity, indicating that the predictors have limited explanatory power. The Std. Error of the Estimate (4.25699) represents the average distance between the observed values and the predicted values, providing a measure of the model's accuracy.

Table 4.11 :Socio-demographics with the Practices score, using linear regression

Co-efficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.999	1.115		17.941	.000
	Hospital Type	.317	.721	.035	.440	.660
	Your Department	1.795	.709	.206	2.530	.012
	Age	-.236	.643	-.050	-.367	.714
	Sex	-1.555	.822	-.166	-1.891	.061
	Marital status	-.266	.889	-.029	-.299	.765
	Educational level	.169	.548	.025	.308	.759
	Service experience	1.053	.701	.204	1.504	.135
	Working experience in this ICU or ER	-.175	.471	-.032	-.371	.711
	Have you ever taken any training regarding TBI management	1.654	.723	.183	2.286	.024
a. Dependent Variable: Practices regarding the Care of Patients with a TBI						

4.9 KAP levels with hospital type

Table 4.12 below shows the different levels of knowledge, attitudes, and practices based on the hospital type as follows:

Governmental Hospitals

Knowledge: Mean score = 14.53 → Converted percentage = (14.53 / 21) × 100 = 69.19% → Moderate knowledge (60–79%)

Attitude: Mean score = 28.40 → Falls within moderate attitude (18–34)

Practice: Mean score = 22.19 → Converted percentage = (22.19 / 32) × 100 = 69.34% → Fair practice (60–79%)

Private Hospitals

Knowledge: Mean score = 13.99 → Converted percentage = (13.99 / 21) × 100 = 66.62% → Moderate knowledge (60–79%)

Attitude: Mean score = 27.57 → Falls within moderate attitude (18–34)

Practice: Mean score = 22.04 → Converted percentage = (22.04 / 32) × 100 = 68.88% → Fair practice (60–79%)

We conclude that both governmental and private hospital nurses exhibit moderate knowledge, moderate attitude, and fair practice levels in managing traumatic brain injury. However, governmental hospital nurses have slightly higher knowledge and practice scores compared to their private hospital counterparts, though the differences are minimal and needs testing.

Table 4.12 :KAP levels with hospital type

	Hospital Type			
	Governmental		Privet	
	Mean	St.d	Mean	St.d
knowledge about the care of patient with head trauma	14.53	1.87	13.99	3.43
Attitude regarding the Care of Patients with a head trauma	28.40	10.75	27.57	10.67
Practices regarding the Care of Patients with a head trauma	22.19	4.08	22.04	4.58

Chapter Five: Discussion

5.1 Introduction

This chapter discusses the key findings of the study, which aimed to assess the knowledge, attitudes, and practices (KAP) of ICU and ER nurses on the managing of TBI in both governmental and private hospitals in Palestine. This discussion emphasizes how the results should be interpreted in light of recent research and theoretical frameworks. It also examines the potential implications of these findings for clinical practice, nursing education, and policy development.

The study's limitations are also covered in this chapter, along with recommendations for further research. By taking into account the weaknesses and strengths in nurses' KAP, this discussion contributes to raising the standard of care provided to TBI patients in the ICU and ER settings.

5.2 Discussion

5.2.1 Knowledge Score of the ER and ICU Nurses in Managing TBI

The results showed that government nurses were more knowledgeable in treating TBI than nurses working in private hospitals. This was consistently observed in several critical domains, including accurately interpreting the Glasgow Coma Scale (GCS), recognizing Cushing's triad symptoms, understanding intracranial pressure (ICP) waveform monitoring, computing cerebral perfusion pressure (CPP), and monitoring brain tissue oxygenation with Licox, This is consistent with studies conducted in Australia by Prazak (2024), Gorman and Dumire (2019), and Maas et al. (2022), . For example, 98.3% of government nurses correctly identified a GCS score of ≤ 8 as suggestive of a severe head injury, compared to 86.3% of private nurses. Similarly, more government nurses demonstrated a better understanding of EVD (external ventricular drain) and positioning techniques like the Reverse Trendelenburg position, were able to identify the target partial pressure of carbon dioxide (PCO_2) during intracranial hypertension, and could identify signs of cerebral herniation, These results are consistent with those of Damkliang et al. (2015) and Subramaniam et al. (2022),

The rationale for these disparities is multifaceted. Government hospitals often serve as referral or tertiary care facilities, exposing their staff to a higher volume and severity of

neurotrauma cases. This regular exposure enhances nurses' theoretical understanding and practical skills. Additionally, it has been demonstrated that public hospitals are more likely to implement structured in-service training programs, simulation-based learning opportunities, and standardized clinical procedures—all of which improve nurses' competencies. The greater proportion of inaccurate and "I don't know" answers, however, raises the possibility that private hospitals lack the resources, are less likely to see neurological patients in critical condition, and have less access to advanced neuromonitoring equipment (such as Licox and ICP monitors). Increased uncertainty and knowledge gaps may arise from these factors. This result is in agreement with the findings of Tenovuo et al. (2021) and Prazak (2024).

These findings demonstrate that public sector nurses were better equipped to handle neurocritical care due to their more extensive training and experience. The discrepancy in knowledge scores thus highlights the importance of regular, research-based training and professional development programs in private healthcare settings. Closing this knowledge gap is essential to ensuring that all nurses, regardless of hospital type, are equally prepared to manage TBI patients safely and effectively.

5.2.2 Attitude Score of the ER and ICU Nurses in Managing TBI

The results show that nurses' attitudes towards TBI care have a strong positive. Most participants agreed or strongly agreed that specialized TBI instruction materials are required (67.8% in government hospitals and 77.9% in private hospitals). This is supported by He et al. (2024) and Oyesanya et al. (2018), who emphasized the importance of targeted educational resources to help nurses manage challenging TBI cases. The high degree of agreement most likely reflects a comprehension of one's knowledge gaps and a desire to improve clinical competence.

Additionally, over 70% of respondents agreed that individualized treatment planning requires knowledge of the patient's pre-TBI history and the location of brain damage. This outcome is in contrast to AbdElstar et al. (2019), who noted that understanding a patient's neurological impairments and baseline behavior enables the development of personalized therapy, particularly in rehabilitation planning. These opinions indicate that patient-centered care approaches are becoming increasingly significant in the ER and ICU settings.

A significant percentage of nurses also agreed that TBI patients commonly exhibit behavioral challenges, which is consistent with research by He et al. (2024), who found that

behavioral abnormalities after TBI rank among the most affecting for nursing staff. This recognition demonstrates the participants' understanding of the psychological complexity of TBI situations and the need for interdisciplinary assistance.

Additionally, there were differing views on gender differences in TBI. Although more than half believed that men and women recover differently and may require different care, a significant majority remained neutral. This ambiguity may be the consequence of therapeutic recommendations and training that do not adequately incorporate research findings based on gender and sex (Oyesanya et al., 2018; AbdELstar et al., 2019). Despite increasing evidence to the contrary, the majority of nursing education programs do not currently emphasize the importance of genetic sex in TBI outcomes, leading to different views.

5.2.3 Practice Score of the ER and ICU Nurses in Managing TBI

The findings indicate that, although there were variations among hospital types and individual practices, ER and ICU nurses' overall practice score for managing traumatic brain injury was moderate. Some clinical practices performed well, while others displayed notable gaps.

For implementing patients with suspected TBI, over 85% of nurses reported adhering to recommended protocols, which include preventing severe neck rotation or flexion and maintaining the head of the bed at a 30-degree angle. According to Varghese et al. (2018) and Mousavizadeh et al. (2024), Damkliang et al. (2015) found that proper patient positioning is one of the most commonly used procedures in ICUs due to its frequent inclusion in nursing protocols and bedside checklists.

The majority of nurses also reported routinely checking vital signs, pupil size and concentration, and GCS scores, indicating a high degree of compliance with neurological observation standards. This corroborates the results of Zrelak et al. (2020), who discovered that good compliance with neurological tests among ICU nurses is a result of regular checks by clinical supervisors and ongoing exposure to neurologically ill patients.

However, major weaknesses were identified in advanced practices, such as early rehabilitation referral, psychological support, and documenting mild behavioral alterations in TBI patients. Only around 40% of nurses reported routinely documenting symptoms of moderate-to-severe TBI, like emotional instability, disorientation, or agitation. This gap is supported by

Shehade et al. (2023), who note that nurses often overlook or fail to record behavioral signals due to a lack of formal training in neurobehavioral care.

The data also showed that nurses in government hospitals generally reported utilizing evidence-based practices more often, including alerting physicians about neurological impairment and keeping monitoring out for rising ICP. This may be explained by a greater exposure to high-acuity cases and the standardized procedures needed in governmental hospital settings, according to Mousavizadeh et al. (2024); Shehab et al. (2018).

By contrast, nurses in private hospitals were more likely to report involving family members in the care process and providing emotional support. This might point to a more patient-centered or holistic approach, which is supported by reduced nurse-to-patient ratios and institutional policies. These findings are consistent with those of Shehade et al. (2023), who observed that because private hospitals in the region usually prioritize individualized treatment and service quality, nurses are encouraged to focus more on relationships with families and the emotional aspects of care.

Despite helpful practices, the survey found that less than 30% of nurses reported participating in simulation-based exercises and specialized TBI training programs in the last year. Clinical practice in trauma care is often driven more by regular practice than by formal continuing education, especially in low-resource settings, according to Varghese et al. (2018). A lack of opportunities for continuous professional development is reflected in this gap.

5.2.4 Correlation between Knowledge, Attitude, and Practice among ER and ICU Nurses in Managing TBI

The findings indicate a statistically significant positive relationship between attitude and knowledge ($r = 0.368$, $p < 0.01$), indicating that nurses with more knowledge of TBI treatment have a positive attitude about managing it. This outcome is in consistent with the KAP theory, which holds that more knowledge leads to a more knowledgeable and positive attitude. Similar findings were found in a study by He et al. (2024), which examined how critical care nurses managed neurological emergencies and found that knowledge levels strongly predicted positive attitudes toward patient-centered and evidence-based care. The relationship can be explained by

increased theoretical knowledge, which increases nurses' confidence and drive to engage in patient advocacy and best practices.

Additionally, a somewhat positive relationship between practice and knowledge was seen ($r = 0.186$, $p < 0.05$). This relationship was not as strong as the one between knowledge and attitude, even though it was statistically significant. This may suggest that knowledge only isn't always sufficient to ensure best practices, possibly due to systemic barriers like workload, limited resources, or a lack of ongoing clinical training. Shehade et al. (2023) and Shehab et al. (2018) found a modest correlation between the clinical practices of ER and ICU nurses and their knowledge TBI. They attributed the difference to a lack of hands-on training and institutional limitations. Therefore, even while information is an essential place to start, before it can be used in reality, it may need to be repeated through supervision, simulated training, and supportive hospital policies.

The relationship between attitude and practice was the most significant and significant in the current study. This study highlights that nurses who maintain a proactive and positive attitude toward TBI care are far more likely to employ effective therapeutic measures. This pattern is consistent with the findings of Wynveen et al. (2018), who discovered that positive nursing attitudes, such as considering TBI treatment as an official duty and recognizing its impact on patient recovery, were the best markers of consistent and high-quality care practices. This could be explained by the motivational factors, emotional engagement, and sense of responsibility that accompany a positive outlook, all of which are critical in high-stress environments such as the ICU and ER.

Furthermore, this important attitude-practice relationship demonstrates the significance of emotional factors like empathy, ethical commitment, and professional identity, which often have a higher impact on nurses' daily behaviors than abstract knowledge. Social pressure, workplace culture, and experiences shape attitudes, which may have a more direct impact on practical application than information, which is often gained through instructional approaches.

These findings support the necessity for thorough training treatments that include knowledge distribution together with attitude-shaping strategies like value-based training, reflective practice sessions. According to Shehab et al. (2018), these strategies significantly improve nurses' practice, feeling of ethical commitment, and professional fulfillment, especially in the context of critical care setting.

5.2.5 Socio-demographic and Occupation Information Associated with the Knowledge Score of the ER and ICU Nurses in Managing TBI

Many of professional and sociodemographic factors were found to have a significant influence on the knowledge scores of ER and ICU nurses who manage TBI. Specifically, skill scores, work experience, education level, and marital status were all statistically significant predictors, according to the final multiple linear regression model.

Married nurses scored considerably higher on knowledge assessments than their single colleagues. This may be because married people often have greater life experience and more stable professions. Similar findings were found by Prazak (2024), where married nurses showed higher decision-making abilities and knowledge scores, maybe as a result of role maturity and life experience.

Additionally, nurses with postgraduate degrees performed lower on knowledge evaluations than nurses with certificates. This surprising result might point to a gap between academic learning and specialized clinical experience in trauma circumstances. Furthermore, Subramaniam et al. (2022) stressed that formal education does not always translate into improved clinical proficiency, especially in higher degree programs where there is little to no practical, hands-on training.

Nurses with 5–7 years of experience had significantly less knowledge than those with 1–3 years. This is consistent with research by Kivunja et al. (2018), which discovered that newer nurses are often provided with more recent and updated education, especially in high-acuity situations like trauma care. It may also be a sign of a lack of ongoing education for intermediate experienced nurses who have not recently engaged in professional development activities.

More skilled nurses had higher knowledge evaluations, which supports the findings of Gorman and Dumire (2019), who found a significant relationship between clinical skill competency and enhanced cognitive knowledge in emergency care. The positive reinforcement between theoretical knowledge and practical experience is most likely what led to this finding.

5.2.6 Socio-demographic and Occupation Information Associated with the Attitude Score of the ER and ICU Nurses in Managing TBI

The results of the multiple linear regression analysis demonstrated that department unity and prior TBI training were important predictors of nursing attitudes regarding TBI management. Nurses who worked specifically in departments, such as the ER vs the ICU, had higher attitude

evaluations. Rapid, stressful settings found in ER departments can promote more assertive and aggressive approaches to trauma care. This is consistent with the findings of AbdElstar et al. (2019), who found that ER nurses tend to have higher positive attitude regarding TBI management because they are regularly exposed to them and must make decisions fast.

Positive attitudes were higher among nurses who had previously received TBI management training. This finding is well supported by the body of existing literature. For example, coordinated in-service training improves nurses' knowledge and motivation, which in turn improves their attitudes (Kivunja et al., 2018; Oyesanya et al., 2016). An improvement in attitude may emerge from greater confidence and understanding regarding TBI care procedures, guidelines, and anticipated outcomes.

Nurses' attitudes toward TBI care appear to be more influenced by departmental role and training, as seen by the lack of a significant link between attitude and other characteristics such as age, marital status, education level, and experience.

5.2.7 Socio-demographics and Occupation Information Associated with the Practice score of the ER and ICU Nurses in Managing TBI

The following factors were found to be significant predictors of TBI management practice (skills): knowledge score, work experience, prior training, and monthly income. There was a considerable correlation between higher income and better practice outcomes. This could be due to improved job roles, easier access to resources, or satisfaction with work, all of which are associated with better performance. Furthermore, income and clinical performance were found to be positively correlated by Mousavizadeh et al. (2024), which could be due to increased motivation or resource availability.

More experienced nursing staff performed better in practice, which is consistent with Shehade et al. (2023), who found that prolonged exposure to clinical settings enhances procedural competence. The increasing practical experience improves confidence as well as accuracy in critical care conditions.

Nurses' practice performance was enhanced by TBI-specific training, supporting the widely held belief that targeted training enhances learning and application. This result is in contrast to that of Shehab et al. (2018), who discovered that simulation-based and practical workshops greatly enhanced emergency nursing skills.

The strong positive connection between knowledge and practice supported the widely used KAP theory. Similar results were obtained by Shehade et al. (2023), suggesting that theoretical knowledge was a crucial component in predicting the efficacy of clinical treatments.

5.3 Conclusion

The study discovered significant knowledge gaps about managing TBI though the majority of nurses demonstrated an excellent understanding of critical clinical indicators such as the GCS, Cushing's triad, and ICP monitoring. For instance, just 28.6% correctly identified second-level triage priority, and less than 30% were aware of the appropriate timelines for treating white-coded patients.

Furthermore, a significant number of nurses (57.8%) had never completed a TBI course, which may contribute to the differences in their skills and expertise. Years of employment and departmental experience did not always translate into more knowledge, even though most nurses had bachelor's degrees. This suggests the need for ongoing, targeted professional development.

A gap between theoretical knowledge and practical management is highlighted in the study's conclusion, particularly in the early phases of TBI assessment and classification. These inadequacies could affect patient outcomes by impeding the timely and appropriate care of TBI cases.

5.4 Recommendation

5.4.1 Recommendation for Organization

1. All ER and ICU nurses should be required to participate in regular, evidence-based TBI management training sessions.
2. To increase similarity and confidence in practice, develop clinical guidelines for TBI management.
3. To improve nurses' collaboration and decision-making abilities in managing TBI, use simulation-based learning.
4. To encourage information sharing and chances for cooperative learning, ER and ICU staff members should be encouraged to collaborate and communicate with one another.
5. To make sure that managing TBI principles are being correctly applied, monitor and evaluate practice by regularly evaluating nurses' performance using audits and checklists.

5.4.2 Recommendations for Universities

1. Offer specialized nursing education courses that cover TBI management.
2. To better prepare students for actual trauma situations, provide them with more practical clinical experience in ER and ICU settings.
3. To improve evidence-based practices, encourage nursing students to conduct research on TBI.
4. Establish alliances with medical facilities to provide cooperative training programs and guarantee curriculum relevance.

5.4.3 Recommendation for Future Research

1. Perform intervention studies to investigate how particular training regimens or practices affect emergency and ICU nurses' ability to learn, practice, and behave.
2. Using qualitative methods, examine the obstacles and enablers to efficient managing TBI from the viewpoint of the ER room and ICU nurses.
3. Conduct comprehensive research to evaluate how TBI affects patient outcomes and how well knowledge and skills are retained following training.
4. Repeat the study with nurses from various departments or geographical areas to improve generalizability.

5.5 Strength of the Study

1. The study addresses a critical component of patient care by focusing on the treatment of TBI in ICUs and ERs. This directly affects reducing TBI patients' mortality and long-term impairment.
2. By assessing ICU and ER nurses' knowledge of TBI and associated risks, the study identifies any gaps and opportunities for targeted educational interventions to raise the standard of nursing care.
3. The study's findings can assist lawmakers in developing evidence-based protocols and policies for the management of TBI by promoting uniform and improved care practices among medical facilities.
4. The study provides a helpful foundation for future academic research in the area of TBI treatment and nursing practice by encouraging more research and evidence-based advancements.

5. The information gained may lead to the implementation of practical tactics that strengthen nurse care plans, improve patient outcomes, and raise the standard of care in emergency departments and intensive care units.
6. The study provides a comprehensive analysis of the KAP of ER department and ICU nurses, offering crucial insights into their readiness to treat TBI.
7. The study discovered statistically significant correlations between practice, attitude, and knowledge scores. These connections show how these domains are interdependent and offer a clear course for intervention.
8. Bivariate and multivariate regression analyses were conducted, which improved the validity of the relationships discovered.
9. This study establishes the foundation for targeted improvements in emergency treatment by being among the first to examine TBI care practices in the region.

5.6 Limitation

1. Because of the study's design, it is more challenging to establish a causal link between factors like training and improved understanding or technique.
2. Certain factors, particularly those related to skills and behaviors, were based on self-evaluation and may be biased.
3. The results may not apply to all emergency and intensive care unit nurses in other locations or establishments because they are specific to a small number of selected hospitals.
4. Difficulty of movement between Jenin and Nablus Governorates due to security checkpoints.
5. Administrative approvals from the government and private hospitals.

References

Aly, A. A., Gaballah, S., & El Sayed, H. I. (2021). Bite-Sized Teaching Sessions Effects on Emergency Nurses' Knowledge and Practice Regarding Traumatic Brain Injury. *Int J. Nov. Res Health Nurs.[Internet]*, *8*(1), 505-519.

Damkliang, J., Considine, J., Kent, B., & Street, M. (2014). Initial emergency nursing management of patients with severe traumatic brain injury: development of an evidence-based care bundle for the Thai emergency department context. *Australasian Emergency Nursing Journal*, *17*(4), 152-160.

Ebrahim AbdELstar, M., Faheem Gendy, J., & Hassan Abass Mohamed, N. (2019). Nurses' Performance Regarding Patient with Traumatic Head Injury In Intensive care unit. *Egyptian Journal of Health Care*, *10*(1), 729-743.

Ernst, W. J., Gallo, A. B., Sellers, A. L., Mulrine, J., MacNamara, L., Abrahamson, A., & Kneavel, M. (2016). Knowledge of traumatic brain injury among educators. *Exceptionality*, *24*(2), 123-136.

Gurusamy, J., Gandhi, S., Amudhan, S., Veerabhadraiah, K. B., Narayanasamy, P., Sreenivasan, S. T., & Palaniappan, M. (2019). Misconceptions about traumatic brain injury among nursing students in India: implications for nursing care and curriculum. *BMC nursing*, *18*, 1-10.

He, J., Chen, Z., Zhang, J., & Liu, X. (2024). Knowledge and attitudes toward mild traumatic brain injury among patients and family members. Frontiers in Public Health, 12, 1349169.

Jaimes, L. M., Thompson, H. J., Landis, C. A., & Warms, C. A. (2015). Nurses' knowledge of pain management for patients with combat-related traumatic brain injuries on rehabilitation units. *Rehabilitation Nursing Journal*, *40*(2), 74-83.

Kivunja, S., River, J., & Gullick, J. (2018). Experiences of giving and receiving care in traumatic brain injury: An integrative review. *Journal of clinical nursing*, *27*(7-8), 1304-1328.

Mousavizadeh, S. N., Yousefi, S., Moosavi, S., & Nasiri, M. (2024). Using an Evidence-Based Care Package to Improve Emergency Nursing Management of Patients with Traumatic Brain Injury. *Evidence Based Care*, *14*(2), 24-32.

Oyesanya, T. O., Bowers, B. J., Royer, H. R., & Turkstra, L. S. (2018). Nurses’ concerns about caring for patients with acute and chronic traumatic brain injury. *Journal of clinical nursing*, *27*(7-8), 1408-1419.

Oyesanya, T. O., Thomas, M. A., Brown, R. L., & Turkstra, L. S. (2016). Nurses’ beliefs about caring for patients with traumatic brain injury. *Western journal of nursing research*, *38*(9), 1114-1138.

Prazak, M. (2024). *Exploring knowledge of traumatic brain injury in an Australian nursing context* (Doctoral dissertation, University of Tasmania).

Shehab, M. S., Ibrahim, N. M., & Abd-Elkader, H. (2018). Impact of an educational program on nurses' knowledge and practice regarding care of traumatic brain injury patients at intensive care unit at Suez Canal University Hospital. *International Journal of Caring Sciences*, *11*(2), 1104.

Shehade, W. E., Ayed, A., & Harazneh, L. (2023). Knowledge and practice of nurses regarding the care of patients with head trauma in intensive care units in the West Bank. *Journal of Public Health Research*, *12*(4), 22799036231204336.

Subramaniam, S., Prabhakar, P., Kanagaraj, U., & Baby, P. (2022). Effect of an Educational Intervention on the Knowledge about Traumatic Brain Injury Guidelines among Clinical Nurses. *Indian Journal of Neurotrauma*, *19*(02), 127-131.

Tavender, E. J., Bosch, M., Gruen, R. L., Green, S. E., Knott, J., Francis, J. J., ... & O'Connor, D. A. (2014). Understanding practice: the factors that influence management of mild traumatic brain injury in the emergency department-a qualitative study using the Theoretical Domains Framework. *Implementation Science*, *9*, 1-10.

Wynveen, L., Gamble, M., Nabulime, J., Luggya, T., Kalanzi, J. K., & Mowafi, H. (2018). A qualitative study exploring nurses' attitudes, confidence, and perceived barriers to implementing a traumatic brain injury nursing chart in Uganda. African journal of emergency medicine, 8(2), 64-68.

Appendices

Appendix A :Study Tools
Subject No: ……………….   **Date**: …………….

The questionnaire is composed of four parts: part A, B, C and part d.

Part A: Demographic Data Profile

Please answer the following questions, give the mark (x) on the parenthesis, and fill in the blank area.

Hospital Type: ( ) Governmental   ( ) Privet

Your Department: ( ) ER   ( ) ICU

Age: ( ) 21-25   ( ) 26-30   ( ) 31-35   ( ) 36-40   ( ) above 40

Sex: Male ( )   Female ( )

Religion: Muslim ( )   Christian ( )

Marital status: Single ( )   Married ( )   Widowed ( )   Divorced ( )

Educational level: Diploma in Nursing ( )   B.Sc. in Nursing ( )

Masters of Nursing ( )   Ph.D. in Nursing ( )

Service experience: 1-5 years ( ) 6-10 years ( ) 11-15 years   ( ) 16 -20 years

( )   Above 20 years ( )

Working experience in this ICU or ER……………………years

Have you ever taken any training regarding TBI management?

No ( )   Yes ( )

Part B: “knowledge about the care of patient with head trauma”

No.	Question	Yes	No	I don’tknow
1	“A severe head injury is classified as a Glasgow Coma Score of 8 and below”			
2	“Localizing refers to: Patient will move hand above the clavicle after applying supra orbital pressure or pinching trapezius muscle”			
3	“A good flexion response on pain stimuli is characterized by flexing of the elbow, often accompanied by lifting the elbow clear of the body”			

4	"A dilated pupil represents cerebral edema or herniation on the same side of the dilated pupil"			
5	"Bradycardia, widening pulse pressure, irregular respiration and rise in blood pressure are signsof Cushing's response"			
6	"Central fever is a concept defined as a fever caused by trauma or lesion that involves the medulla oblongata and the base of the brain"			
7	"Rectal temperature are one of the most accurate routes of monitoring core temperatures			
8	Hyperthermia can increase ICP (intracranial pressure)"			
9	"During intracranial hypertension, the target level of Partial Pressure of Carbon Dioxide(PCO2) is 4to 4.6 kpa"			
10	"On intracranial pressure monitoring, waveforms are reflected on the monitor"			
11	"Cerebral perfusion pressure (CPP) is calculatedas, (Systolic Pressure – ICP)"			
12	"Intracranial pressure (ICP) compliance can be described as (P1 curve is smaller than P2 and P3 curve)"			
13	"Brain tissue monitoring (Licox) is used tomonitor brain oxygenation. A value less than 20 mmHg is associated with poor outcomes of patients with traumatic brain injury"			
14	"Patient's positioning affects an intracranial pressure reading"			
15	"Reverse Trendelenburg position is one fastest, least invasive ways to acutely lower intracranial pressure"			
16	"Extra-ventricular drain (EVD) should always			

Part C: Attitude regarding the Care of Patients with a head trauma

		Strongly disagree	Disagree	Agree	Strongly agree
1.	To assess and/or treat patients with TBI, nurses need specialized TBI educational materials.				
2.	The challenges of patients with TBI are typically more difficult to assess than the challenges of patients with other				

	disabilities.				
3.	Knowing the location of brain damage from TBI helps in the development of nursing care plans that meet patients' needs.				
4.	Knowledge of a patient's background prior to TBI is necessary when developing a nursing care plan.				
5.	Patients with TBI often display behavior problems.				
6.	TBI is equally common in males and females.				
7.	Men and women recover in the same way after having a TBI.				
8.	Men and women require different types of care after having a TBI.				
9.	Family involvement in patient care is no different for men and women who are receiving care after having a TBI.				
10.	Recovery following TBI may continue for several years.				
11.	Greater variability exists in the population of patients with TBI than in populations of other patients with disabilities.				
12.	The role of registered nurses in regard to care of patients with TBI is clearly understood in my workplace.				
13.	Medical labels that specify TBI as mild, moderate, or severe are useful for development of nursing care plans.				
14.	Nursing care plan goals for patients with TBI may need to be revised more frequently than nursing care plan goals for patients with other types of disabilities.				

15.	Nurses on my unit do a good job when providing care to patients with moderate-to-severe TBI.				
16.	Nurses need specialized training to provide care to patients with moderate-to severe TBI.				
17.	Knowing about moderate to-severe traumatic brain injury is important to my current nursing practice.				

Part D: Practices regarding the Care of Patients with a head trauma

No	**Statement**	Never	Rare	Sometimes	Frequent	Always
1	"We aim for systolic blood pressures 90mmHg and higher in traumatic brain injury patients"					
2	"We target CPP value, >60 mmHg for brain perfusion"					
3	"We monitor End tidal carbon dioxide (ETCO2) in my ICU"					
4	"Hyperosmolar therapy (Mannitol) is used to control raised ICP"					
5	"Hyperventilation is used as temporary measurement for reducing elevated ICP"					
6	"Propofol infusion (Diprivan) (anaesthetic agent) is used for control of raised ICP"					
7	"Feeding is initiated at least 24 hours post-injury"					
8	"Intermittent pneumatic cuffs for DVT prophylaxis is available to all patients"					

Appendix B :IRB Approval

Arab American University

Institutional Review Board - Ramallah

الجامعــــة العربيـــــة الأمريكيـــة

مجلس اخلاقيات البحث العلمي — رام الله

IRB Approval Letter

Study Title: "Knowledge, Attitudes, and Practices of Emergency and ICU Nurses in Managing Traumatic Brain Injury in Governmental and Private Hospitals, Palestine".

Submitted by: Roba Mohammed Zakarni

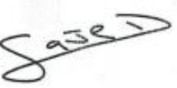
Date received: 23th January 2025

Date reviewed: 29th January 2025

Date approved: 29th January 2025

Your Study titled **"Knowledge, Attitudes, and Practices of Emergency and ICU Nurses in Managing Traumatic Brain Injury in Governmental and Private Hospitals, Palestine"** with the code number **"R-2025/A/6/N"** was reviewed by the Arab American University Institutional Review Board - Ramallah and it was approved on the 29th of January 2025.

Sajed Ghawadra, PhD
IRB-R Chairman
Arab American University of Palestine



General Conditions:

1. Valid for 6 months from the date of approval.
2. It is important to inform the IRB-R with any modification of the approved study protocol.
3. The Bord appreciates a copy of the research when accomplished.

Appendix C : تسهيل المهمة

State of Palestine Ministry of Health Education in Health and Scientific Research Unit		دولة فلسطين وزارة الصحة وحدة التعليم الصحي والبحث العلمي

Ref.: ....
Date:..................

الرقم: عحا/٨٤٢/٢٠٢٥
التاريخ: ٢٠٢٥/٤/٨

الأخ مدير عام الادارة العامة للمستشفيات المحترم،،،

تحية واحترام..

<u>الموضــوع: تسهيل مهمة بحث</u>

يرجى تسهيل مهمة الطالبة: **ربى محمد زكارنـة – ماجستير تمريض العنايـة المكثفـة**– الجامعة العربية الامريكية، لعمل بحث بعنوان:

Knowledge, Attitudes, and Practices of Emergency and ICU Nurses in Managing Traumatic Brain Injury in Governmental and Private Hospitals, Palestine

حيث ستقوم الطالبة بجمع معلومات من خلال تعبئة استبانة من الممرضين بعد اخذ موافقتهم، وذلك في:

- **مستشفى رفيديا – مستشفى جنين**

مع العلم ان مشرفة البحث: د. خلف عواد.

على ان يتم الالتزام بالمحافظة على اخلاقيات البحث العلمي وسرية المعلومات، وعدم التعرض للمعلومات التعريفية للمشاركين.

على ان يتم تزويد الوزارة بنسخة PDF من نتائج البحث، التعهد بعدم النشر لحين الحصول على موافقة وزارة الصحة.

مع الاحترام..

د. عبد الله القواسمي

رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الدراسات العليا المحترم/ الجامعة العربية الامريكية

Telfax.:09-2333901 scientificresearch.dep@gmail.com تلفاكس: 09-2333901

معرفة واتجاهات وممارسات ممرضي أقسام الطوارئ والعناية المركزة في التعامل مع إصابات الدماغ الرضّية في المستشفيات الحكومية والخاصة في فلسطين

ربا محمد ابراهيم زكارنة

د. خلف عواد

د. ساجد غوادرة

د. عماد أبو خضر

ملخص

إصابة الدماغ الرضحية (TBI) هي نتيجة صدمة خارجية تُسبب تغيرات في وظائف الدماغ. تؤثر درجة الإصابة وموقعها وخصائصها على كيفية ظهور هذه التغيرات. بناءً على متغيرات مثل تغير الوعي، ومدة فقدان الذاكرة التالي للصدمة، وفقدان الوعي، تُصنف إصابة الدماغ الرضحية إلى خفيفة أو متوسطة أو شديدة. يحتاج ممرضو وحدة الطوارئ والعناية المركزة إلى تدريب قائم على الأدلة في التعامل مع إصابات الدماغ الحادة لتحسين الرعاية السريرية وتقليل عواقب إصابة الدماغ الرضحية.

لتقييم مستوى معارف ومواقف وممارسات ممرضي الطوارئ ووحدات العناية المركزة في إدارة إصابات الدماغ الرضحية في المستشفيات الحكومية والخاصة في فلسطين.

أُجريت دراسة مقطعية في قسمي العناية المركزة والطوارئ في مستشفيات خاصة وحكومية في مدينتي جنين ونابلس بالضفة الغربية. كانت الفئة المستهدفة ممرضات العناية المركزة والطوارئ في المستشفيات التي استوفت معايير الإدراج، حيث بلغ إجمالي المشاركين في الدراسة 151 ممرضة من وحدات العناية المركزة والطوارئ. طُوِّرَت الدراسة الاستقصائية ونُفِّذَت بناءً على مراجعة الأدبيات من دراسات مختلفة. وتكوَّن الاستبيان من أربعة أقسام.

أجاب أقل من ثلث ممرضات الطوارئ ووحدات العناية المركزة في فلسطين بشكل صحيح على أسئلة (TBI). ولم يسبق لغالبيتهن حضور دورة رسمية في إصابات الدماغ الرضحية (57.8%). ومع ذلك، رأى أكثر من 75% من الممرضات أن التدريب المتخصص في إصابات الدماغ الرضحية مفيد. وتُظهر الارتباطات ذات الدلالة الإحصائية بين الموقف والممارسة ($r = 0.724$)، ($p < 0.01$) أن للمواقف الإيجابية تأثيرًا كبيرًا على تحسين الممارسات السريرية. علاوة على ذلك، ارتبطت المعرفة ارتباطًا متوسطًا بالموقف ($r = 0.368$، $p < 0.01$) وارتبطت ارتباطًا متواضعًا بالممارسة ($r = 0.186$)، ($p < 0.05$)، مما يُسلِّط

الضوء على أهمية كلٍّ من التعليم والموقف في تحسين رعاية إصابات الدماغ الرضحية. إن افتقار أكثر من نصف الممرضات للتدريب الرسمي يشير إلى ضرورة التعليم المُوجَّه لسدِّ الفجوات في نظرية الرعاية وممارستها. على الرغم من الأداء الاستثنائي في مؤشرات إصابات الدماغ الرضحية السريرية، إلا أن معظم الممرضات أظهرن معرفةً ضعيفةً بذلك.

الكلمات المفتاحية: إصابات الدماغ الرضحية، المعرفة، الموقف، الممارسة، ممرضة قسم الطوارئ ووحدة العناية المركزة