KNOWLEDGE AND PRACTICE OF NEUROLOGICAL ASSESSMENT USING GLASGOW COMA SCALE AMONG CRITICAL CARE NURSES AT HOSPITAL UNIVERSITI SAINS MALAYSIA

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UNIVERSITI SAINS MALAYSIA

2024

KNOWLEDGE AND PRACTICE OF NEUROLOGICAL ASSESSMENT

USING GLASGOW COMA SCALE AMONG CRITICAL CARE

NURSES AT HOSPITAL UNIVERSITI SAINS MALAYSIA

by

SITI ZULAIKHA BINTI KHAIRUL ANUAR

Dissertation submitted in partial fulfilment

ofthe requirements of the degree of

Bachelor of Nursing with Honors

August 2024

CERTIFICATE

This is to certify that dissertation entitled "Knowledge and practice of Neurological Assessment using Glasgow Coma Scale among critical care nurses at Hospital Universiti Sains Malaysia" is the bona fide record of research work done by Siti Zulaikha Binti Khairul Anuar during the period October 2023 to July 2024 under my supervision. I have read this dissertation and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for the degree of Bachelor of Nursing (Honors).

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DECLARATION

I hereby declare that this dissertation is the result of my own investigation, except where otherwise stated and duly acknowledge. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research and promoting purpose.

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ABSTRAK

GCS adalah alat penilaian neurologi yang digunakan untuk menilai tahap kesedaran individu yang mengalami kecederaan otak. Kajian ini bertujuan untuk menilai pengetahuan dan penilaian amalan Skala Koma Glasgow (GCS) di kalangan jururawat penjagaan kritikal di Hospital Universiti Sains Malaysia (HUSM). Selain itu, kajian ini juga menyiasat hubungan antara pengetahuan dan faktor-faktor sosiodemografi terpilih (tahap pendidikan dan tahun pengalaman kerja) terhadap GCS di kalangan jururawat penjagaan kritikal di HUSM. Reka bentuk kajian lintas-sederhana digunakan dalam penyelidikan ini. Data dikumpul menggunakan borang soal selidik cetak yang diedarkan kepada responden. Data dikumpul menggunakan soal selidik yang ditadbir sendiri. Data yang dikumpul dianalisis secara statistik menggunakan perisian SPSS versi 27. Kajian menggunakan statistik deskriptif dan Ujian Chi-kuasa dua Pearson. Hasil kajian menunjukkan bahawa 70 (51.1%) peserta mempunyai tahap pengetahuan GCS yang baik dan hanya 33 (24.1%) peserta mempunyai penilaian amalan GCS yang baik. Tiada hubungan antara faktor-faktor sosiodemografi [tahap pendidikan (p = 0.221) dan tahun pengalaman (p = 0.634)] dengan tahap pengetahuan GCS. Akhir sekali, tiada hubungan antara faktor-faktor sosiodemografi [tahap pendidikan (p =0.534) dan tahun pengalaman (p = 0.942)] dengan tahap penilaian amalan GCS. Kesimpulannya, tahap pengetahuan dan amalan GCS di kalangan jururawat penjagaan kritikal perlu ditingkatkan dan dipertingkatkan serta perlu pendekatan pengajaran yang lebih terstruktur dan terperinci yang harus disertakan dengan demonstrasi.

KNOWLEDGE AND PRACTICE OF NEUROLOGICAL ASSESSMENT USING GLASGOW COMA SCALE AMONG CRITICAL CARE NURSES AT HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRACT

GCS was a neurological assessment tool utilised to evaluate the degree of consciousness in individuals suffering from brain injury. The study aims to assess knowledge and practice assessment of the Glasgow Coma Scale (GCS) among critical care nurses at Hospital Universiti Sains Malaysia (HUSM). Besides that, this study also investigates the association between knowledge and selected sociodemographic factors (level of education and years of working experience) of GCS among critical care nurses at HUSM. A cross-sectional study design was used in this research. The data was collected using a hard copy questionnaire distributed to the respondents. Data was collected using a self- administered questionnaire. Data collected were statistically analysed using the SPSS software version 27. The study used descriptive statistics and Pearson Chi-square. The findings of the study revealed that 70 (51.1%) of participants have a good level of knowledge GCS and only 33 (24.1%) of participants have a good level of practice assessment GCS. There was no association between sociodemographic factors [level of education ($p = 0.221$) and years of experience ($p = 0.634$)] and the level of knowledge GCS. Lastly, there was no association between sociodemographic factors [level of education ($p = 0.534$) and years of experience ($p = 0.942$)] and the level of practice assessment GCS. In conclusion, the level of knowledge and practice of GCS among critical care nurses must be enhanced and improved and it should be a more structured and detailed approach to teaching the skill that should go along with demonstrations.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This research proposal intended to investigate the knowledge and practice assessment of the neurological assessment using Glasgow Coma Scale (GCS) among critical care nurses at Hospital Universiti Sains Malaysia (HUSM). The initial chapter of the proposal commenced with an introduction to the study's context, identification of the research problem, formulation of research inquiries, establishment of research goals, and formulation of research hypotheses. Ultimately, the study's significance was outlined, and the key terms used in this investigation were precisely defined.

1.2 Background of the Study

GCS was a neurological assessment tool utilised to evaluate the degree of consciousness in individuals suffering from brain injury. Originating in 1974 at the University of Glasgow, this assessment tool had gained significant popularity in the field of emergency care for assessing the severity of brain injuries (Bibi et al., 2023). The scale assessed the cognitive condition of patients based on three criteria: the score of eyes-opening, motor reaction, and vocal response. The GCS score was determined by separately assessing each component and assigning a score to it. The sum of the scores for the three components was then calculated to obtain the GCS score. The highest achievable score was 15, while the lowest possible score was 3 (Alhassan et al., 2019). GCS was a neurological assessment tool utilised to evaluate the degree of consciousness in individuals suffering from brain injury. Originating in 1974 at the University of

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In critical care, nurses played a significant role in taking care of patients. One essential part of a nurse's job was to assess the level of consciousness, as easy as checking the vital signs. If they failed to assess a patient's level of consciousness accurately, especially after a head injury, it could lead to delays in diagnosis and treatment (Bibi et al., 2023). This was why the nurses in critical care had to be knowledgeable about the GCS. A study conducted in Lahore, Pakistan among 150 emergency care professionals discovered that 70.7% of the nurses had poor knowledge of the GCS (Kanwal et al., 2022).This proved that there was still a lack of knowledge about the GCS and the aim of this study was to determine the level of knowledge and practice of GCS among nurses in critical care HUSM.

1.3   Problem Statement

Despite the GCS being simple to use, the accuracy and usefulness of its scores depended on having precise knowledge of the tool and the capability to apply it in a clinical setting. Insufficient understanding of how to use this tool definitely had a severe impact on the treatment of patients with altered consciousness or in emergencies since a change in their level of consciousness status might not be promptly noticed until it worsened or led to mortality (Alhassan et al., 2019). This issue highlighted the

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prevalence of nurses' insufficient proficiency in utilizing GCS.

Despite the GCS being simple to use, the accuracy and usefulness of its scores depended on having precise knowledge of the tool and the capability to apply it in a clinical setting. Insufficient understanding of how to use this tool definitely had a severe impact on the treatment of patients with altered consciousness or in emergencies since a change in their level of consciousness status might not be promptly noticed until it worsened or led to mortality (Alhassan et al., 2019). This issue highlighted the prevalence of nurses' insufficient proficiency in utilizing GCS.

Multiple studies had shown that the application of GCS evaluation by nurses was characterized by inconsistency and inaccuracy. This had been proved by researchers from Ghana, West Africa, who examined their comprehension of fundamental theoretical concepts regarding the GCS and their familiarity with its practical implementation in clinical situations. Regarding the structured questionnaire about the fundamental theoretical ideas of the GCS, a significant majority of the participants (62.6%) had a strong understanding of these topics, achieving an accuracy rate of 80% in their responses. Nevertheless, when faced with inquiries regarding the practical application knowledge of GCS in clinical situations, a mere 5.2% of participants demonstrated the ability to accurately respond to 80% of the questions (Alhassan et al., 2019).

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Evaluating the level of awareness was the initial stage in neurological assessment within a clinical environment, and it was widely recognized as a crucial measurement of evaluation. It considered that performing a prompt and precise neurological examination would reduce the occurrence of trauma-related problems, minimize the need for needless diagnostic procedures, and ultimately lower rates of illness and death (Kanwal et al., 2022). In Malaysia, there was a low possibility of getting a study regarding knowledge and practice in using GCS. Hence, the researcher study about the assessment in using GCS. It would help us understand how this important assessment tool was currently used and understood in Malaysian healthcare. It might also help us find areas where patient care and professional training might improve better. In the long term, this could improve the quality of emergency and critical care in Malaysia.

1.4   Research Questions

The research questions for this study are as follows:

   i)   What is the level of knowledge of neurological assessment among critical care nurses in HUSM?

   ii)   What is the level of practice of neurological assessment among critical care nurses in HUSM?

   iii) Is there any an association between nurses' socio-demographic characteristics (level of education and years of experience) and the level of knowledge of

neurological assessment among critical care nurses in HUSM?

iv) Is there any an association between socio-demographic characteristics (level of education and years of experience) and the level of practice of neurological assessment among critical care nurses in HUSM?

1.5   Research Objectives

Research objectives indicated more details about the specific research topic or issues the project planned to investigate, hence paving the way in deciding the research project's design (Ryan, 2023).

1.5.1   General Objective

The general objective of this study was to determine nurses' knowledge and practice of neurological assessment in using GCS among critical care nurses at Hospital Universiti Sains Malaysia.

1.5.2   Specific Objectives

The specific objectives for this study are as follows:

i)   To determine the level of knowledge of neurological assessment among critical care nurses at HUSM.

ii) To determine the level of practice of neurological assessment among criticalcare nurses at HUSM.

iii) To examine the association between nurses' socio-demographic characteristics (level of education and years of experience) and the level of knowledge of neurological assessment among critical care nurses in HUSM.

iv) To examine the association between nurses' socio-demographic characteristic (level of education and years of experience) and the level of practice of neurological assessment among critical care nurses in HUSM.

1.6 Research Hypothesis

Hypothesis1	**(H0):**	There is no association between nurses' socio-demographic characteristic (level of education and years of experience) and the level of knowledge of neurological assessment among critical care nurses in HUSM.
	(H$_1$):	There is an association between nurses' socio-demographic characteristic (level of education and years of experience) and the level of knowledge of neurological assessment among critical care nurses in HUSM.
Hypothesis2	**(H$_0$):**	There is no association between nurses' socio-demographic characteristic (level of education and years of experience) and the level of practice of neurological assessment among critical care nurses in HUSM.
	(H$_1$):	There is an association between nurses' socio-demographic characteristic (level of education and years of experience) and the level of practice of neurological assessment among critical care nurses in HUSM.

1.7 Definitions of Operational Terms

Terms	Conceptual	Operational
Nurses	A nurse was a group who had received specific training in caring for the sick and elderly, especially in hospitals. (Merriam-Webster, 2023)	Critical care nurses with grades U29 and U32 who had worked at least 3 months were included in this study.
Knowledge	The knowledge of, or understanding of concepts, principles, theories, models, and classifications.	It referred to the level of knowledge in using GCS among critical care nurses in HUSM, Kelantan. A self-adapted questionnaire that was adopted from (Santos et al., 2016) in Section B was used to measure the level of knowledge in using GCS among critical care nurses. Twelve questions were evaluated, with scores of nine to twelve indicating a satisfactory level of knowledge.

| Glasgow Coma Scale | A method used by medical professionals to assess the loss of consciousness. Each of the components of the scale's scores could be used to describe how the nervous system functioned as well as to help healthcare professionals keep track of changes. This technique was most frequently used for determining comas and awareness of patients, especially in cases of brain injuries. (Cleveland Clinic, 2023) | In this study, the GCS was used as a medium to measure the level of knowledge and determine the specific factors that could influence the knowledge of GCS. |

Critical care	Critical care was a medical treatment for patients with conditions that represented a serious risk to their lives. It tended to occur in an intensive care unit (ICU). (National Library of Medicine, 2020)	Critical care settings in thisstudy included: - 2 Delima - ICU - 1 Kristal - 2 Kristal - Surgical ICU
Practice	The practice of engaging in a consistent and repetitive manner with the aim of enhancing one's proficiency in a particular activity. (Cambridge University Press & Assessment, 2023)	In this study, practice was assessed through a questionnaire scenario adopted from (Andualem, Beyene, Tuli, et al., 2022) in Section C.

1.8   Significance of the Study

The findings from this study determined the level of knowledge and practice of neurological assessment using GCS among critical care nurses in HUSM. This study's findings were important because accurate GCS assessments were necessary for prompt and successful treatments, and if nurses were unaware of how to use and understand the GCS properly, it could have severe consequences on patient outcomes. Therefore, it contributed to the improvement of the accuracy of GCS assessment, nursing practice, and the quality of care and patient safety. Furthermore, this study provided up-to-date information and outcomes to researchers engaged in similar studies on nurses' understanding of the GCS.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

This chapter presented the literature review of the Glasgow Coma Scale (GCS), knowledge on GCS, practice of GCS, the association between socio- demographic characteristics and level of knowledge, and the association between socio- demographic characteristics. This chapter also provided a detailed description of the conceptual framework chosen for the proposed study.

2.2   Neurological Assessment Tools

In 1974, Graham Teasdale and Bryan J. Jennett, two neurosurgery professors at the Institute of Neurological Sciences, University of Glasgow, created the GCS. This tool was designed to provide an objective measurement of coma severity in both acute medical and trauma patients (Alhassan et al., 2019). The GCS was a diagnostic instrument used to assess the level of consciousness. The GCS required the monitoring of its applicationsunder a wide range of challenging situations. The GCS was universally used as a clinical tool for assessing the level of consciousness until recently (Kanwal et al., 2022).

In Pakistan, the study stated that the GCS evaluated three components of a patient's neurological function: eye-opening, verbal response, and motor response. The response determined the score given to each category, ranging from 1 to 4 or 1 to 5. The maximum available score was 15. A higher GCS score was indicative of a better outcome for the patient. A score of 8 or lower was typically indicative of a serious brain injury, but a score ranging from 9 to 12 was classified as moderate, and a score ranging from 13 to

15 was classified as mild (Bibi et al., 2023; Yousef et al., no date).

Similarly, Hussain and Rasheed stated that the GCS had three specific indicators: the ideal eye response (E), the ideal verbal response (V), and the best motor response (M). The GCS measured the level of responses based on a grading system. The eye-opening response was graded from 1 to 4, with a score of 4 indicating the best and most spontaneous response, a score of 3 indicating a response to speech, a score of 2 indicating a response to pain, and a score of 1 indicating no response.

Despite the GCS is a simple, objective, and reliable tool for assessing LoC, it has several limitations (Thi Hien & Chae 2011). Despite its numerous benefits, the GCS has received considerable criticism in the literature during the last decade (Segatore & Way, 1992). GCS is regarded simple to use; yet, this character exposes it to misinterpretation and misapplication. Mattar et al. (2014); McLernon (2014).

Thus, the Glasgow Coma Scale is a global issue regarding nurse understanding and clinical practice. Nurses working in critical care should use awareness level assessments as easily as other routine vital sign observations, because correct neurological assessment is an important element of nursing care and critical for patient outcomes. Failure to assess GCS after a head injury is a common cause of unnecessary mortality and morbidity as a result of delays in diagnosis and treatment (Andualem et al., 2022).

2.3   Nurse knowledge of Neurological Assessment

Nurses, as primary healthcare practitioners, had vital responsibilities in evaluating and treating patients with these diseases. The precise and prompt assessment of the GCS was essential for better patient outcomes (Al-Quraan & Eid AbuRuz, 2016). According to Bibi et al., (2023), the current data revealed that only 20% of participants provided the correct answer to this question, suggesting that the majority of participants lacked a basic knowledge of the GCS's purpose. In addition, a separate study from Pakistan demonstrated that a significant number of participants lacked an adequate understanding of GCS implementation procedures, especially in the Intensive Care Unit (ICU) and emergency departments.

Based on their empirical data, it is evident that only 34.3% of nurses possess an adequate understanding of GCS implementation techniques. Conversely, another study found that 65.7% of the population lacks awareness of these techniques. In simpler terms, out of the total 51 participants, the majority demonstrated good knowledge, while nearly 99 out of 150 participants exhibited poor or insufficient knowledge regarding GCS implementation techniques (Nawaz et al., 2020).

Moreover, on East Africa, it was observed that nurses employed in the Adult ICU of federal hospitals located in Addis Ababa, Ethiopia, revealed a limited understanding (51.2%) of the basic theoretical ideas and skills related to the GCS (Andualem, Beyene, & Tuli, 2022). This study indicates that multiple studies have demonstrated a lack in understanding of critical care nurses about the utilization of the GCS. The issue of lack of understanding regarding the GCS is widespread, prompting many academics to advocate for investigating the impact of sociodemographic factors, training, and interactive educational programs on individuals' level of knowledge in this field. Hence, it is essential to determine the current level of knowledge in using the GCS among critical

care nurses at Hospital Universiti Sains Malaysia (HUSM) in the context of this research. The knowledge questionnaire GCS will be utilised based on the methodology proposed by Santos et al., (2016) and GCS Coma Scale, which had been widely used within the HUSM settings.

Figure 2.1: Glasgow Coma Scale form used at HUSM

2.4 Practice of Neurological Assessment

Lack of practice in using GCS can lead worst outcome for neurological patients. According to Andualem, Beyene, Tuli, et al., 2022 a significant amount (47.1%) of the participants showed competency in conducting GCS assessments, indicating an excellent level of adherence to suggested guidelines. This finding indicated that quite a few nurses working in critical care units did not adhere to the practice of conducting GCS assessments. This occurred in East Africa. Similarly, in Pakistan, it was stated that inconsistency in practice in using GCS assessment still existed among nurses working in the ICU. The researchers stated that quite a few nurses had challenges in effectively integrating their conceptual understanding of the GCS with the actual application in clinical settings. Hence, researchers had suggested the implementation of in-service training programs for nurses working in critical care at each hospital, specifically focusing on the utilization of the GCS (Kanwal et al., 2022).

Furthermore, a significant number of participants revealed insufficient practice in using techniques of the GCS in ICUs and emergency departments. The findings of the study indicated that a significant majority of 65.7% of the participants in the study demonstrated a lack of practice regarding GCS evaluation and interpretation. The findings suggested that the majority of nurses had inadequate skills and limited experience in conducting assessments related to the GCS (Nawaz et al., 2020). Therefore, it is important to determine the practice in using the GCS among critical care nurses at HUSM in the context of this research. Therefore, it was important to determine the practice in using the GCS among critical care nurses at HUSM in the context of this research. The questionnaire of six scenario practice assessment that was adopted from (Andualem, Beyene, Tuli, et al., 2022) would be used in this study.

2.5   Socio-demographic Characteristics

Socio-demographic characteristics such as age, gender, level of education, years of experience, area of practice, and involvement with formal training in using GCS were included in studying knowledge and practice among critical care nurses.

2.5.1   Socio-demographic Characteristics and Knowledge of Neurological Assessment

Gender had been linked to knowledge of using GCS among critical nurses. It was reported that females were statistically significantly higher than males (Albougami, 2019; Alhassan et al., 2019; Bidur & Adil, 2022).

Other than that, formal training was revealed to be statistically significant among nurses. In Nepal, the study had shown that none of the nurses with a poor level of knowledge had taken formal training on GCS (Bidur & Adil, 2022). However, the nurses in Saudi Arabia reported that those without previous formal training in the GCS scored higher than those who had previous training in the GCS (Albougami, 2019) while in Ghana, it was stated that there was no statistically significant difference in the level of knowledge between those who received formal training on GCS and those who did not (Alhassan et al., 2019).

On the level of education, nurses with master's degrees in Addis Ababa, Ethiopia reported having a higher level of knowledge compared to nurses with bachelor's degrees (Andualem, Beyene, Tuli, et al., 2022). A previous study from Saudi Arabia stated that nurses with postgraduate degrees had better knowledge of the GCS compared to nurses with a diploma and nurses with a bachelor's degree (Andualem, Beyene, Tuli, et al., 2022).In contrast, only 66.67% of nurses in Nepal with a poor level of knowledge had completed their bachelor's in nursing. Similar to this study, the

majority of nurses (89.80%) had completed postgraduate degrees in a study conducted in Brazil (Bidur & Adil, 2022).

Lastly, nurses working in ICU had a higher level of knowledge in using GCS than nurses posted in emergency departments. Reasons associated with a higher level of knowledge in using GCS among ICU nurses were the highly specialized healthcare unitsin which the majority of high-risk patients had neurological conditions. Therefore, frequent encounters with neurological assessments made the nurses familiar with the GCS (Albougami, 2019).

2.5.2 Socio-demographic Characteristics and Practice of Neurological Assessment

Previous studies showed gender, years of experience, and level of education played a role in practice assessment in using GCS. Male nurses were shown to be 2.7 times more likely than female nurses to have good clinical practice questioning skills (Andualem, Beyene, Tuli, et al., 2022) while in Riyadh, Saudi Arabia, it was indicated that male nurses reported no difference with female nurses in the level of practice (Mohammed et al., n.d.).

On the level of education, nurses with a higher level of education reported a strong statistically significant better level of practice (Mohammed et al., n.d.). This was supported by a previous study showing that Master (MSc) degree holders were found to be 10.4 times more likely than Bachelor (BSc) degree holders to have good proficiency in the clinical application of GCS assessment (Andualem, Beyene, Tuli, et al., 2022).

A previous study from Riyadh stated that less work experience tended to result in poor practice in using GCS. It showed that nurses working below 2 years in the critical care unit had 32.2% with poor practice on GCS (Andualem, Beyene, Tuli, et al., 2022). Another author from Africa supported this evidence by specifying that the more years of

experience, the better the level of practice among nurses regarding GCS assessment for unconscious patients (Mohammed et al., n.d.). Another socio-demographic factor influencing the level of practice was the area of practice. For example, nurses working in ICUs were more likely to have a good level of practice in GCS assessment than those working in other critical care units (Mohammedet al., n.d.).

Regarding received formal training, Andualem, Beyene, Tuli, et al., (2022) showed that income significantly influenced the level of practice. This could be explained by not receiving formal training in GCS disproportionately affecting the poor level of practice such inaccuracies could lead to higher rates of death.

2.6 Theoretical and Conceptual Framework

One theoretical approach to understanding GCS knowledge and practice was Dewey's Experiential Learning Theory. This model had been deemed appropriate for and had been selected as the theoretical framework for this study. Dewey's philosophical framework was the notion that all phenomena took place within a social context. The model mentioned earlier was covered by a structure that symbolized the social environment. The model began within the framework of this container, wherein the teacher arranged knowledge into logical parts of information. Additionally, it supported their participation in the subject matter following their levels of competence. The result of this particular experience was a gain of knowledge, which enhanced the mindset and understanding of the learner, hence facilitating the beginning of future academic activities (Roberts, 2003).

This model was made up of knowledge, contextual learning, learner readiness, and experience. In knowledge, Dewey believed that the process of learning needed to prioritize gaining an understanding of what was happening through experience rather than

simply focusing on optimistic training. Besides, Dewey gave an analysis of the practice of organizing knowledge and proposed that learning should be linked and applicable to real-life situations, which we call contextual learning (Votava, 2018). Both readiness and previous experience played crucial roles in the process of learning. Dewey believed that obtaining knowledge about a specific topic could be helped by having a proper mindset or mentality, which in turn led to a deeper understanding. Additionally, Dewey emphasized that years of experience also improved the learning process (Votava, 2018).
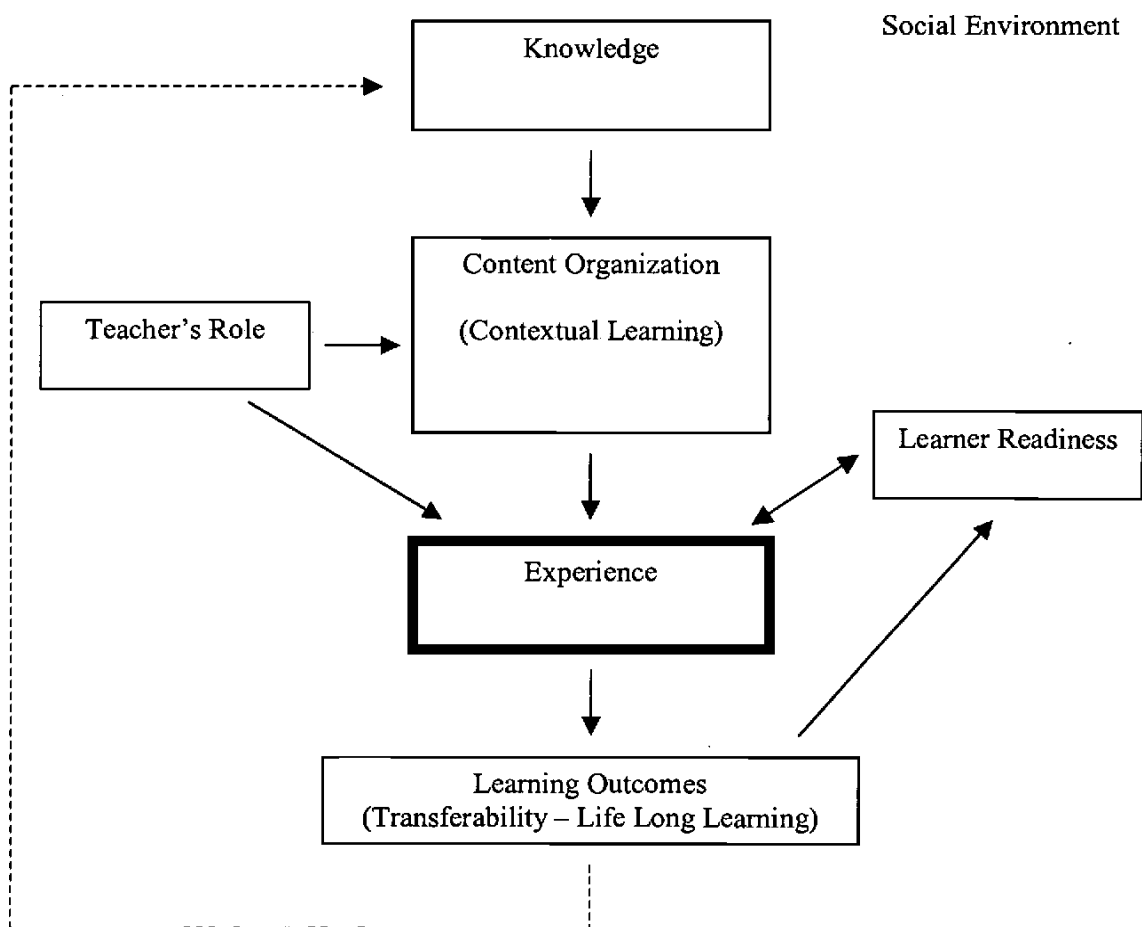
Figure 2.2: Dewey's s Experiential Learning Theory adopted from John Dewey

(Roberts, 2003)

Using Dewey's Experiential Learning Theory, this study explored modifying factors which were sociodemographic factors that included age, sex, level of education, received training, years of working experience, as well as knowledge of GCS among critical care nurses. Additionally, Dewey's Experiential Learning Theory examined if it moderated the relationship between the sociodemographic characteristics and the level of knowledge in using GCS. This exploratory study was conducted to identify knowledge and practice in using GCS among critical care nurses.

For the outcome, the participants were asked to rate their knowledge as either good or poor in using GCS. Overall, this conceptual framework was employed to determine the level of knowledge in using GCS among nurses in critical care at HUSM.
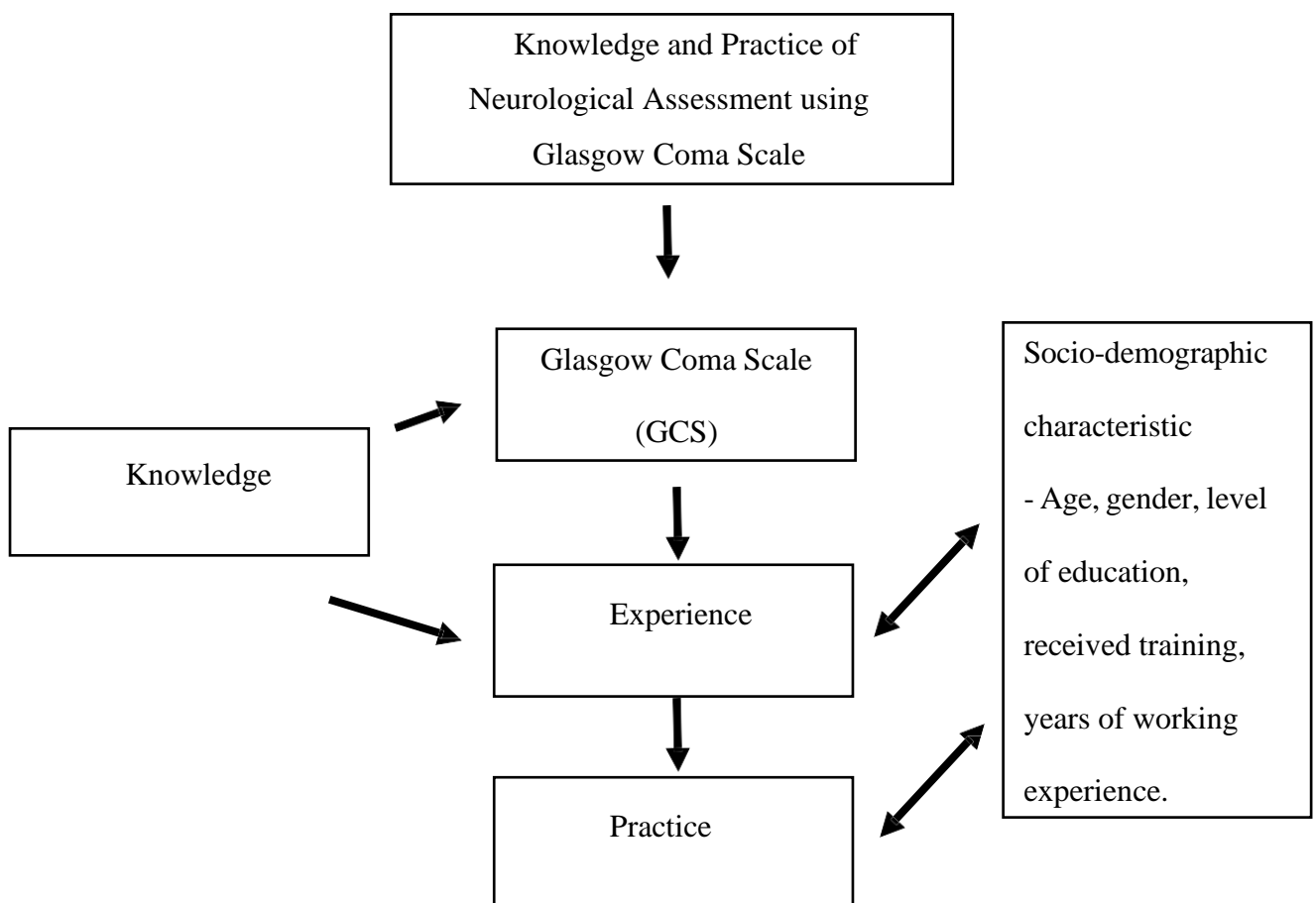

Figure 2.3: Conceptual framework of the study for knowledge and practice in using GCS

CHAPTER 3

METHODOLOGY & METHODS

3.1 Introduction

This chapter explained the approach and rationale used to support the chosen research methodology. Determining and understanding an appropriate research design was crucial for achieving the aims of the study. The chapter began with a description of a cross-sectional design and a justification for using this approach. The section was followed by a description of the study setting, population, participant selection criteria, sampling plan, sample size determination, and instrumentation, including ethical considerations right through data collection methods. This chapter also involved a section that explained the proposed statistical analyses used with the quantitative data.

3.2 Research Design

A cross-sectional study design was used in this study. The cross-sectional study design measured the outcome and the exposures of the study participants at the same time. The researcher was then able to study the association between these variables.

3.3 Study Setting and Population

The target population of this study was the staff nurses in the critical care unit of Hospital Universiti Sains Malaysia (HUSM), Kelantan. In HUSM, there were six critical care units (2 Delima, 4 Timur Depan (Medical High Dependency Unit (HDU)), Intensive Unit Therapy (ICU), 1 Kristal, 2 Kristal, and Surgical ICU).

This study was conducted among staff nurses in the critical care unit of HUSM, Kelantan. (Refer Table 3.1)

Table 3.1: List of critical care units in HUSM

Critical Care Unit	Number of Nurses
1. 2 Delima	44
2. Intensive Unit Therapy (ICU)	45
3. 4 Timur Depan (Medical HDU)	33
4. 1 Kristal	22
5. 2 Kristal	22
6. Surgical ICU	34
Total	178

3.4   Sampling Plan

Sampling applied to the methodical method of choosing a restricted number of units from a larger sample for study or analysis. The phrase mostly applied to the process of choosing participants, observations, or scenarios to be included in surveys, interviews, experiments, or other forms of research (Jeovany Martínez-Mesa, 2016). The HUSM was selected as the setting of this study. The research area was selected for investigation in the critical care units. The implementation of a sampling plan was important in ensuring that the research possessed validity and reliability, as it strived to accurately represent the population of interest. An effective sampling technique allowed researchers to accomplishtheir research objectives.

3.4.1 Inclusion and Exclusion Criteria

Specific eligibility requirements that each participant had to fulfil included the inclusion and exclusion criteria:

Inclusion Criteria	Exclusion Criteria
- Registered nurses (U29 or U32) in Hospital Universiti Sains Malaysia. - Nurses with at least 3 months' work experience.	- Nurses who were on permanent extended leave exceeding three weeks duration during the time of the study. - Nurses who are working in outpatient clinics and general wards.

3.4.2 Sample Size Estimation

The sample size was calculated for each study objective. The researcher had chosen a relatively greater number of participants at the end to fulfil the research objectives. The sample sizes were estimated using a single proportion formula for the first objective (to assess the current level of knowledge in using the GCS among nurses in critical care HUSM).

$$n = \left[\frac{Z}{\Delta}\right]^2 p\,(1\text{-}p)\,\Delta$$

Whereby,   n = Sample size

p = Anticipated population proportion

z = Value of standard normal distribution = 1.96

A = Precision = 0.05

Objective 1:

$$n = [\frac{1.96}{0.05}]^2 \, 0.49 \, (1\text{-}0.49)$$

n = 384.0

n = 384 participants

The calculated sample size was 384, and after considering a 10% drop out, the sample size was:

n = 384 + 10%

n = 384 + 38

n = 422 participants

Hence, the sample size needed for the first objective was 422 participants.

The second objective (to determine the assessment practice in using the GCS in critical care among nurses in critical care HUSM) are determined by using single proportion formula:

$$n = [\frac{Z}{\Delta}]^2 \, p \, (1\text{-}p)$$

Whereby,   n = Sample size

p = Anticipated population proportion

z = Value of standard normal distribution = 1.96

A = Precision = 0.05