

ALICE LEE CENTRE FOR NURSING STUDIES  
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**Singapore National University Hospital (NUH)  
Centre for Evidence Based Nursing**



## **JBI Systematic Review Protocol**

**Title: A Comprehensive Systematic Review of the Factors that Impact Nurses' Performance in Conscious Level Assessment**

### **Reviewers**

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## Background

Conscious level assessment is a vital component of a nurses' skill base.<sup>1</sup> In assessing conscious level, the RN (registered nurse) detects any neurological changes in a patient and is thus able to inform the medical team to initiate prompt action that can improve patient outcomes.<sup>2</sup> It is found that majority of the body of literature regarding conscious level assessment revolves around the GCS. However, there are other instruments evaluating conscious level, most notably the Alert, Verbal, Pain & Unresponsive (AVPU) scale and the Alert, Confused, Drowsy and Unresponsive (ACDU) scale.<sup>3,4</sup>

The GCS is an instrument that is used to measure the 'depth and duration of impaired consciousness and coma' in patients with severe head injuries and other neurological pathologies.<sup>5</sup> Prior to this, no standardized scale was used to assess conscious level<sup>1</sup> and various terms were used to describe the state of consciousness<sup>6</sup> which provided vague descriptions to the patient's condition. Since its implementation, it has provided a 'common language to improve communication in reporting neurological findings among healthcare professionals'.<sup>7,8</sup>

Much of the appeal of the GCS stems from its applicability in a variety of clinical situations to assess neurological changes,<sup>9</sup> in addition to its ease of use.<sup>10</sup> However, the simplicity of the instrument leaves it open to misunderstanding and misuse.<sup>11</sup> The GCS can be used inappropriately and inconsistently by healthcare professionals and needs reinforcement.<sup>12,13,14</sup>

In 1991, Rowley and Fielding<sup>12</sup> conducted a landmark study in order to determine whether the GCS was accurate when used by inexperienced or experienced staff. The study found that the GCS was used accurately when used by experienced nurses, but was inaccurate when used by inexperienced nurses.

Crewe and Lye<sup>15</sup> found that other demographic factors such as the clinical setting of practice, age and education level determine the clinical performance in using the GCS. Shoqirat's study<sup>9</sup> supports this, stating that nursing students who work in a neurological setting had a better grasp of the GCS and ability to carry out accurate neurological assessments. Heron's<sup>16</sup> study on nurses and their use of the GCS showed that younger nurses and those with basic graduate qualifications were more likely to accurately record the GCS.

Knowledge also plays an important role when utilising the GCS.<sup>1</sup> Ingram<sup>1</sup> states that it is 'paramount that nurses have the knowledge and skills to competently carry out neurological assessment during GCS'. Waterhouse<sup>5</sup> opines that in – depth knowledge of relevant physiology enhances performance of GCS observation. Edwards<sup>6</sup> and Waterhouse<sup>5</sup> both add that continuing education is required to keep staff up to date and to maintain consistency between staff.

The bevy of factors effecting and causing variations in the performance of the GCS<sup>3</sup> thus contradicts the central edict that the GCS is a reliable tool.<sup>10</sup> This creates an issue to patient care as the GCS is an important instrument in communicating an accurate assessment of the patient's condition between clinical staff, especially in

critical situations in settings such as critical care, high – dependency units and the emergency department.<sup>9,17</sup>

The review question thus sets out to answer the following: What are the various factors that affect nurses' performance in conscious level assessment? The review question focuses on three specific areas; 'knowledge', 'attitude' and demographic factors. A review of the literature on clinical competence as well as the abovementioned research on conscious level assessment identifies these factors as the most pertinent in affecting performance.<sup>5,16,18,19,20</sup>

In conducting this systematic review, the authors hope that it will contribute to the existing and growing body of literature regarding conscious level assessment. In effect, this will result in an improvement in performing conscious level assessment and thus result in higher quality patient care.

## Review Objective

The overall aim of this review is to systematically review the various factors that affect nurses' performance in conscious level assessment. This review question will focus on three specific areas, namely, 'knowledge', 'attitude' and 'demographic factors. More specifically, 'knowledge' in the context of this systematic review refers to their understanding of the conscious level assessment and the rationale for its use, as well as neurological and physiological knowledge.<sup>5</sup> 'Attitude', refers to 'thoughts and disposition' towards the conscious level assessment and how it is used in the clinical setting.<sup>9</sup>

'Performance' will be defined as 'accuracy', 'reliability', 'consistency' and 'confidence' during the conduct of conscious level assessment. This is based on the literature review which defines these terms as the most common parameters by which 'performance' is measured.

More specifically, the review seeks to answer the following:

1. How does level of knowledge and nurses' attitude affect their performance of conscious level assessment?
2. What are, and how do demographic factors affect nurses' performance of conscious level assessment?
3. How accurate are nurses' skill in performing conscious level assessment?

## Inclusion Criteria

### Types of Studies

This review will consider any quantitative research papers that address the various factors that impact nurses' performance of conscious level assessment, such as knowledge, attitudes and demographic factors such as age, education level and years of practice. Papers of the highest level of evidence rating (levels 1 – 2) will be the primary focus of this systematic review, such as meta – analyses and

randomised controlled trials. In the absence of RCTs, other quantitative research designs, such as quasi – randomised controlled trials, cohort studies, case control studies, longitudinal studies, descriptive studies, correlational design studies will be considered for inclusion in a narrative summary.

If no research papers are found, other review papers such as discussion papers, expert opinion and reports that address these factors will be considered.

## **Types of interventions/Phenomena of Interest**

Studies that examine factors such as knowledge and attitudes, as well as demographic factors including, but not limited to, such as age, educational history, recency of practice, years of practice and clinical context and how they impact nurses' performance of the conscious level assessment will be considered for this review. The phenomena of interest will focus on nurses' assessment of conscious level.

## **Types of participants**

The review will include studies with these participants:

- Nursing staff in an acute hospital, more specifically Registered Nurses (RN), Nursing Students and Enrolled Nurses (EN)
- Working in clinical settings such as Critical Care, Emergency Medicine, Neuroscience or General Ward

The conscious level assessment scale utilised in such studies may include, but are not limited to, the GCS, the AVPU scale and the ACUDU scale.

The review will exclude studies with these participants

- Ward Managers and Advanced Practice Nurses. This population of nurses are not included as they are not engaged in bedside nursing care, and as such do not perform conscious level monitoring regularly as other nursing staff.
- Studies conducted in a paediatric and neonatal setting. Paediatric and neonatal assessment of conscious level varies according to the age range of the child, hence in order to maintain consistency in the studies selected for this systematic review, only adult patients (defined as aged above 16) will be selected.

## **Types of outcome measures/anticipated outcomes**

Outcomes of interest in this systematic review will include the following:

- The level of performance of nurses performing conscious level assessment using the GCS, ACUDU and AVPU scales.

However, 'performance' in itself is a vague term that is not commonly used in the literature. As abovementioned in the section entitled 'Review Objective', performance in this systematic review shall be defined as accuracy, reliability and consistency and

confidence. These four key outcomes are common parameters by which 'performance' is measured in the literature.

More specifically, the outcomes of interest in this study will include the following:

- The level of accuracy and interrater reliability of nurses' performance of conscious level assessment
- The consistency in nurses' performance of conscious level assessment
- Nurses' knowledge in conscious level assessment in their clinical setting, e.g. the GCS
- The confidence level of nurses in performing conscious level assessment

## Search Strategy for identification of studies

The search strategy aims to find published studies and papers using a variety of databases. The search will be limited to English language reports. However, foreign language research papers with abstracts published in English will be considered for this systematic review and extracted if relevant.

A three-step search strategy will be utilised in each component of this review. An initial limited search of MEDLINE and CINAHL will be undertaken followed by an analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. A second extensive search using all identified keywords and index terms will then be undertaken using all identified MeSH headings and keywords. Thirdly, the reference list and bibliographies of all identified reports, articles and abstracts will be retrieved for additional studies relevant to this systematic review.

The databases to be searched include:

- Medline
- CINAHL
- Cochrane Registry of Controlled Trials
- JBI Library of Systematic Reviews
- SCOPUS
- PsycINFO
- PsycARTICLES
- Complete Biomedical Collection
- Embase
- Expanded Academic Index
- APAIS Health
- Current Contents
- Digital Dissertations
- AustHealth
- EBM Reviews

The search strategy will be limited to the following years 1990 to 2009. Although logic would dictate that the review will be more comprehensive if it were dated to 1974, which was the year where the GCS was published, an initial review of the literature revealed that the earliest dates of research regarding conscious level assessment were conducted in 1990.

Initial Keywords to be used for the review will be the following (see Appendix III). During the process of conducting the search, consideration will be given to the various terminology used and the spelling of keywords as it may influence the identification of relevant studies.

All studies identified during the databases search will be assessed for relevance to the review based on the information provided in the title and abstract by two reviewers. For all papers that appear to meet the inclusion criteria a full report of the paper will be retrieved. If there is uncertainty about the degree to which an article meets the inclusion criteria, the full text of the article will be retrieved also. Once the full report of the paper is retrieved, studies will again be assessed for applicability to the inclusion criteria in order to determine the relevance to the review objective.

## Review Method

### Critical Appraisal

Identified studies that meet the inclusion criteria will be grouped into one of the following categories:

- Experimental studies
- Descriptive Studies
- Descriptive – Correlational Studies

If no research papers of the above type are found, other review papers such as discussion papers, expert opinion and reports that address these factors will be considered.

- Discussion papers
- Textual / Opinion papers

Quantitative papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using the standardised critical appraisal instruments from the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MASARI). The Critical Appraisal Checklist for Systematic Reviews will be used for the systematic reviews retrieved (see Appendix Ia), the JBI Critical Appraisal Checklist for Experimental Studies will be used for experimental studies (see Appendix Ib) and the JBI Critical Appraisal Checklist for Observational Studies will be used for descriptive survey and correlational studies (see Appendix Ic).

Any disagreements that arise between the reviewers will be resolved through discussion with a third reviewer.

### Data Extraction

Data will be extracted from quantitative papers included in the review using standardised data extraction tools from the JBI-MAStARI. The JBI Data Extraction Form for Experimental / Observational Studies was used for the Systematic Reviews of Experimental / Observational. Any disagreements that arise between the reviewers will be resolved through discussion with a third reviewer.

## **Data Synthesis**

Quantitative papers will, where possible be pooled in statistical meta-analysis using the JBI-MAStARI. Data from papers examining the same scales will be pooled together for analysis; otherwise, individual analysis will be performed. All results will be subject to double data entry. It is expected that the outcomes will be continuous data, and thus only weighted mean differences and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed using the standard Chi-square. Where statistical pooling is not possible the findings will be presented in narrative form.

## **Conflicts of Interest**

There are no conflicts of interest regarding this systematic review.

## References

1. Waterhouse C. An audit of nurses' conduct and recording of observations using the Glasgow Coma Scale. *Br J Neurosci Nurs*. 2009;4(10):492-499.
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5. Palmer R, Knight J. Assessment of altered conscious level in clinical practice. *Br J Nurs*. 2006;15(22):1255-1259.
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16. Heron R, Davie A, Gillies R, Courtney M. Interrater reliability of the Glasgow Coma Scale among nurses in sub – specialities of critical care. *Aust Crit Care*. 2001;14(3):100-105.
17. Holdgate A, Ching N, Angonese L. Variability in agreement between physicians and nurses when measuring the Glasgow Coma Scale in the emergency department limits its clinical usefulness. *Emerg Med Australas*. 2006;18:379-394
18. Dunn SV, Lawson D, Robertson S, Underwood M, Clark R, Valentine T, et al. The development of competency standards for specialist critical care nurses. *J Adv Nurs*. 2000;31(2):339-346.
19. McGaughey J. Standardizing the assessment of clinical competence: an overview of intensive care course design. *Nurs Crit Care*. 2004;9(5):238 – 246.
20. Pender FT, de Looy AE. Monitoring the development of clinical skills during training in a clinical placement. *J Hum Nutr Dietet*. 2004(17):25-34.

# Appendix

## Appendix Ia: JBI Critical Appraisal Checklist for Systematic Review

Reviewer \_\_\_\_\_ Date \_\_\_\_\_

Author \_\_\_\_\_ Year \_\_\_\_\_

Record number \_\_\_\_\_

	Unclear	Yes	No
1. Is the review question clearly and explicitly stated?			
2. Was the search strategy appropriate?			
3. Were the sources of studies adequate?			
4. Were the inclusion criteria appropriate for the review question?			
5. Were the criteria for appraising studies appropriate?			
6. Was critical appraisal conducted by two or more reviewers independently?			
7. Were there methods used to minimise error in data extraction?			
8. Were the methods used to combine studies appropriate?			
9. Were the recommendations supported by the reported data?			
10. Were the specific directives for new research appropriate?			
11. Were the specific directives for new research appropriate?			

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Overall appraisal:    Include            Exclude            Seek further info  
Comments                            (including                            reasons                            for  
exclusion) \_\_\_\_\_



**Appendix Ic: JBI Critical Appraisal Checklist for Observational Studies**

Reviewer \_\_\_\_\_

Date \_\_\_\_\_

Author \_\_\_\_\_

Year \_\_\_\_\_

Record Number \_\_\_\_\_

	N/A	Yes	No	Unclear
1. Is the study based on a random sample or pseudo-random sample?				
2. Are the criteria for inclusion in the sample clearly defined?				
3. Were outcomes assessed using objective criteria?				
4. If comparisons are being made, was there sufficient description of the groups?				
5. Was an appropriate statistical analysis used?				

Overall appraisal:      Include      Exclude      See further info

Comments (including reasons for exclusion)

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## Results

### Dichotomous Data

Outcome	Control Group number/total number	Treatment Group number/total number

### Continuous Data

Outcome	Control Group mean & SD (number)	Treatment Group mean & SD (number)

## Authors Conclusions

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## Comments

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## Appendix III Search Strategy

1. Conscious level assessment.ti,tw.
2. Nursing assessment.ti,tw.
3. Glasgow Coma scale.ti,tw.
4. GCS.ti,tw.
5. (Alert AND Verbal AND Pain AND Unresponsive).ti,tw.
6. AVPU.ti,tw.
7. (Alert AND Confused AND Drowsy and Unresponsive).ti,tw.
8. ACDU.ti,tw.
9. Conscious level.ti,tw.
10. Neuroscience.ti,tw.
11. Neurolog\$.ti,tw.
12. Head Injury.ti,tw.
13. Stroke.ti,tw.
14. Knowledge.ti,tw.
15. Attitude\$.ti,tw.
16. Skill\$.ti,tw.
17. Practice\$.ti,tw.
18. Confiden\$.ti,tw.
19. Clinical Comptenc\$.ti,tw.
20. Competence/
21. Clinical Competency/
22. Accuracy.ti,tw.
23. Reliability.ti,tw.
24. Performance.ti,tw
25. Consistency.ti,tw.
26. Confidence.ti,tw.
27. Evaluation.ti,tw.
28. Audit.ti,tw.

Using selected keywords from the above, these search strategies were obtained from the following databases:

### CINAHL

Search #1	(MH "Nurses") OR (MH "Psychomotor Performance") OR (MH "Task Performance and Analysis")
Search #2	(MH "Glasgow Coma Scale") OR (MH "Nursing Assessment")
Search #3	(MH "Nurses") OR (MH "Psychomotor Performance") OR (MH "Task Performance and Analysis") AND (MH "Glasgow Coma Scale") OR (MH "Nursing Assessment")
Search #4	(MH "Nurses") OR (MH "Psychomotor Performance") OR (MH "Task Performance and Analysis") OR (MH "Clinical Competence") OR (MH "Competency Assessment")
Search #5	(MH "Glasgow Coma Scale") OR (MH "Nursing Assessment") OR (MH "Nurses") OR (MH "Psychomotor Performance") OR (MH "Task Performance and Analysis") OR (MH "Clinical Competence") OR (MH "Competency Assessment")
Search #6	(MH "Glasgow Coma Scale") OR (MH "Nursing Assessment") OR (MH "Nurses") OR (MH "Psychomotor Performance") OR (MH "Task Performance and Analysis") OR (MH "Clinical Competence") OR (MH "Competency Assessment") AND knowledge AND attitude

### Medline

Search #1	(("Nurses"[Mesh] OR "Motor Skills"[Mesh]) OR "Psychomotor Performance"[Mesh]) OR "Task Performance and Analysis"[Mesh]
Search #2	Nurses OR Motor Skills OR Psychomotor Performance OR Task Performance and Analysis
Search #3	"Glasgow Coma Scale"[Mesh]
Search #4	Glasgow Coma Scale
Search #5	(("Nurses"[Mesh] OR "Motor Skills"[Mesh]) OR "Psychomotor Performance"[Mesh]) OR "Task Performance and Analysis"[Mesh] OR Nurses OR Motor Skills OR Psychomotor Performance

	OR Task Performance and Analysis "Glasgow Coma Scale"[Mesh] OR Glasgow Coma Scale
Search #6	(("Nurses"[Mesh] OR "Motor Skills"[Mesh]) OR "Psychomotor Performance"[Mesh]) OR "Task Performance and Analysis"[Mesh] OR Nurses OR Motor Skills OR Psychomotor Performance OR Task Performance and Analysis OR "Glasgow Coma Scale"[Mesh] OR Glasgow Coma Scale
Search #7	(("Nurses"[Mesh] OR "Motor Skills"[Mesh]) OR "Psychomotor Performance"[Mesh]) OR "Task Performance and Analysis"[Mesh] OR Nurses OR Motor Skills OR Psychomotor Performance OR Task Performance and Analysis OR "Glasgow Coma Scale"[Mesh] OR Glasgow Coma Scale Limits: <b>Humans, English</b>