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# Glasgow Coma Scale Technique: Effect of Theoretical and Practical Educational Program on Nurses' Compliance

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***Abstract:*** *Despite the Glasgow Coma Scale is widely used in Egypt as in other countries in the world to assess the level of patient consciousness, it has been noted that there is a lack of interest in the use of neurological assessments by nurses. The present study aimed to effect of theoretical and practical educational intervention on nurses' professionals' compliance. A quasi experimental design was used. Setting: the study was conducted at the Neurological Intensive care Unit, stroke ICU and neurosurgical ICU at Ain Shams University Hospitals Cairo, Egypt. A purposive sample consisted of (37) nurses. Two tools used to collect data. (1) Structured self-administer questionnaire sheet: It will divided into three parts: a) characteristics of the studied sample; b) to evaluate nurses' knowledge concerning GCS (pre and post educational program and c) Indicator of theoretical and practical educational intervention success . (2) The Evaluation Form of GCS technique. The Results revealed that: statistical significant differences were found between pre/post and follow-up after educational program regarding level of nurse's competence knowledge and practice also, there was highly significant correlation between total competent levels (knowledge & practice) r= 0.626 & r=0743 p<0.001 respectively. As well, the study noticed an increase number of performed neurological assessments over time by the nurse & interpretation Score correctly after educational program implemented 83.78% &64.86% respectively. Conclusion: educational program program was confirmed to improvement the competence of nurses' performance (knowledge and practice) concerning GCS technique and there was also a positive correlation between levels of nurses' knowledge as regards their practice. The study Recommended that Educational program should be provided to all nurses caring for unconscious patient concerning GCS, establishing and distributing a manual procedure book to all nurses who were working in critical care units and neurological wards including standard of GCS technique.*

***Keywords****: Nurse-Nurse collaboration, missed nursing care, intensive care unit*

## I. Introduction

Traumatic brain injury (TBI) is one of the most common cause of death and disability and worldwide .Every year, millions of people succumb to traumatic brain injuries most of them products of car crashes. It is unfortunate that Egypt occupies first place worldwide in the incidence of road accidents at a rate of 60 victims per day and that are based on latest statistics carried out by the Egyptian Central Agency for Mobilization and Statistic, 2016. [1]. For patient with a traumatic brain injury, the assessment of consciousness level is essential action of all health providers. There are several tools used for assessing and monitoring the neurological status of patients in critical units. The Glasgow Coma Scale (GCS) is one of the most effective and prevalent scoring technique to describe the level of consciousness and help to note trends in a patient response to stimuli. [2] The Glasgow Coma Scale (GCS) is a neurological assessment scale which aims to give a reliable, objective way of recording the conscious state of a person, for initial as well as subsequent assessment. In addition, it is use to identify those in need of acute intervention as early as possible and thus prevent secondary brain injury and reduce both rate of patient's mortality and morbidity. So it is the most sensitive and reliable indicator of all neurological patient's. [3,4] The GSC evaluates three parameters of behavior that most closely reflect activity in the higher centers of the brain: eye opening, verbal response and motor response. It uses numeric system to minimize variation and subjectivity in clinical assessment. The total score of GCS ranges from 3(indicating deep unconsciousness) to 15(indicating fully awareness). It is important note that the scale is intended to assess level of consciousness and is not designed for following neurological deficits. So the scoring will detect early deterioration in such patients. [5] The challenge for the critical nurse includes the quick decision of acute events to ensure high levels of patient safety. It is therefore important that nursing staff, those working in critical care setting should be competent to have efficient assessment and evaluation skills to deal and manage their patient especially those with disturbed level of consciousness. That cannot be done without well-qualified interpret correctly these numerical values [6,7]. Because a proper neurological assessment is the essential part of nursing care, and nurses working in critical care should use assessment of consciousness level as easily as other routine observation of vital signs, it is paramount that nurses have the knowledge, skills and qualification to competently carry out neurological assessment using GCS technique. [8] Despite, this tool is used worldwide

universally accepted tool for neurological assessment of level of consciousness in nursing practice and the simplicity of using it, but a lot of health care practitioners have used it in an inappropriate way without careful referring to its instructions. Previous studies discovered that a variety of health care givers used GCS technique inaccurately with misinterpret the numerical values in their clinical practice. It is recognizing that education and training is requiring ensuring that the technique is apply as a valid indicator of patient status. [9, 10, 11] Finally, the competent nurse in the interpretation of the GCS numerical value leading to develop a proper nursing plan based on the actual needs of the patient, helping in the early detection of potential health problems, and prevents serious complications which contribute to improve the quality of nursing care which reflects positively on patient outcome. [5]

**1.1. Significance of the study:** Despite the Glasgow Coma Scale is widely used in Egypt as in other countries in the world to assess the level of patient consciousness, it has been noted that there is a lack of interest in the use of neurological assessments by nurses, in addition to not being professionally trained to use it which leading to misinterpretation Score. This is because these nurses have not received any training programs on the Glasgow scale since graduation. Therefore, the need to develop educational training program for nurses about competence using GCS will be suggested and based on the assumption that learning occurs when learners decide what they need to learn; not on researches view. So the aim of present study was to examine the effect of theoretical and practical educational intervention on of nurses' competence.

**1.2. Aim of the study:** The present study aimed to examined the effect of theoretical and practical educational program on nurses compliance regarding GCS technique through the following:

1.2.1 Assessing nurses' competence (knowledge and practice) level concerning GCS technique

1.1.1. Developing and implementing theoretical and practical educational program concerning GCS technique

1.1.2. Examining the effect of theoretical and practical educational program on nurses' compliance.

**1.3. Research Hypotheses**

1.3.1 Post implemented the theoretical and practical educational program, the nurses' competence (knowledge and practice) concerning GCS significantly will be higher than the pre implemented.

1.3.2 There will be positive relation between nurses' knowledge and practice

1.3.3 There will be an increase number of performed neurological assessments over time & interpretation Score Correctly

## II. Subjects And Methods

**2.1 Research design**: A quasi experimental design was utilized to achieve the aim of the current study Dependent variable was the level of nurses' competence (Knowledge, practice & positive change in nurses' interest towards the use of the Glasgow scale) and Independent variable was theoretical and practical educational program

**2.2 Setting:** The present study was conducted at the Neurological & stroke Intensive care Unit, and Neurosurgical ICU at Ain Shams University Hospitals Cairo, Egypt.

**2.3 Sample:** Sample size was calculated using a simplified formula (n=N/1+N(e)2 which provided by Yamane [22] to be 37 nurses providing direct care to neurological patient in the above mentioned areas. The inclusion criteria for this study sample include; the nurses who are present at the time of data collection, and willing to participant in the study.

**2.4 Tools of data collection:** two tools were used for data collection.

2.4.1 Tool I: Structured self-administer questionnaire sheet: It will divided into three parts; A) it was include items related socio-demographic characteristics of the studied sample (age, gender, qualification, years of experience in critical care unit, are of work, and previous attendance educational program concerning GCS technique. B) It was adapted from (12) to evaluate nurses' knowledge concerning GCS (pre and post educational program). It was include (9) questions regarding GCS knowledge tested general knowledge (definition, indication & importance), number of components, name and score of each component and minimum and maximum values. Scoring system: The responses were given "1"for a correct answer and "0" for incorrect one to each question. The range of possible is 0 to 8.these scores were converted into a percent score. Total score of 80% and more was considered competency in knowledge while less than 80% was considered incompetency. C) Indicator of theoretical and practical educational intervention success (pre and follow-up tests). It used to assess number of performed neurological assessments over time, interpretation Score correctly & detecting the

2.4.2. Tool II: The Evaluation Form of GCS Technique: It used to evaluate the competency level of nurses' practice (pre, posttest) educational training program. It includes 3 components, eye opening, verbal response and motor response. The data collection did not depend on the traditional way of evaluation (observation checklist) but, both the studied nurses and the researchers are to assess the consciousness

level of the patients at the same time by used the evaluation form of GCS performance. And then are compared between the results of the measurement compared to the Glasgow Score. This method was chosen from the researchers to assess and evaluate the studied nurses on the practical part, believing them that this method will contribute to providing valid and reliable results and also help increase the confidence of the nurses themselves.

**2.5 Field work:** The study was implemented during the period from the February 2016 to the end of January 2017

The study tools were adapted and designed by the researchers after reviewing the relevant recent literatures. Content validity and reliability test were done before starting data collection process.

The data collection, pre / post and two month after educational training program were done by the researchers.

2.5.1 **Validity of the tool**: Validity test was done by 5 experts from Medical surgical nursing specialty and 2 from neurological consultants. The nurses' knowledge questionnaire sheet reliability were confirmed by Cronbach's alpha coefficient (alpha= 0.86for nurses' knowledge questionnaire & alpha=0.83 for patient outcome sheet)

2.5.2 **Pilot study**: A pilot study was carried out on 10% of the total study sample to test the clarity, feasibility and applicability of the tools of the study. Pilot subjects were later included in the study as there was no radical modifications in the study tools.

2.5.3 **Administrative and ethical considerations**: The researchers explained the purposed of the study and their rights as a study participant, including anonymity and confidentiality, their rights to withdraw from the study at any time. Informed consent was obtained from the nurses participated in the current study.

2.5.4 **Educational program intervention:**

2.5.4.1Assessment phase: The researchers were keen to assess nurses' knowledge concerning GCS technique as a pretest before the evaluation of their practice, so as not to affect the content of knowledge questions on the pre nurses' practice test. The researchers interviewed each nurse individually according their available time and asked them to answer and fill the self-administer questionnaire sheet about their knowledge concerning GCS and also asking them write what they wanted and needed to know in relation to neurological assessment; which involve the learners in the planning of the program and encouraging them to formulate their learning goals, which provides a flexible teaching focus on the learner's demands and not on the teacher's view of what the learners need to know. Evaluate their practice by used GCS form and compared their results to the score given by the researchers.

2.5.4.2 Planning phase: theoretical and practical educational program was developed according to predetermine actual nurses need (pretest). It consisted of two parts (theoretical & practical) as follows: Theoretical part: it contains the following items; General knowledge regarding GCS (definition, indication & importance), GCS components, Scores for each component and minimum & maximum scores of GCS technique. Practical part: demonstration and re-demonstration concerning GCS technique. Method of teaching used was presentation & discussion by data show (computer) &Handout.

2.5.4.3 Implementation phase: Through eight weeks in the morning and afternoon shifts and according the studied nurses readiness, the nurses were divided in four groups according to their working areas. The theoretical content was one session for each group; it was duration 50–60 minutes. The content of theoretical part was given for all the studied nurses at the end of the last session.

2.5.4.4. Evaluation phase: Examining the theoretical and practical educational program on studied nurses was started immediately after implementation the educational intervention (posttest1) end during the follow-up periods (posttest 2) were done using the same tools of the pretest. Then a comparison between the pre/post and follow-up tests was done.

**2.6 Statistical design:** Statistical analysis was done using IBM SPSS 20 statistical software package. Cleaning of data was done to be sure that there is no missing or abnormal data by running frequencies and descriptive statistics. Data was presented using descriptive statistics in the form of frequencies and percentages for categorical variables, means and standard deviations for continuous variables paired t-test, and chi-square. Pearson correlation analysis was used for assessment of the inter-relationships among quantitative variables. The significant level of all statistical analysis was at $< 0.001$ & $<0.05$ (P-value).

## III. Results

Concerning the demographic characteristics of the studied nurses it was observed that, the total number of the nurses included in the current study was 37 nurses with mean age 33.2± 4.5; the female nurses constitute 86.5% of the sample. Concerning their qualification, 56.8% & 18.9% of them hold a diploma and technical institute respectively, while only 24.3% were had bachelor degree. As regards the nurses' years of experience, 37.8% of studied nurses had less than 5 years & 32.4% of them had less than 10 years, while 29.7% had more than 10 years. The mean years of experience equal 8.5±3.6. in relation to nurses' work unit, the present study

revealed that, they work in 3 different units presentation as the follows: Neurological ICU 27%, internal Medicine, 32.5% and Neurosurgical ICU 40.5%. Finally the current study discovered that most of studied sample 81.1% did not receive any training programs concerning to GCS, and all of them agreed that there was no manual booklet for GCS that could be used during practical technique.

**Table (1):** Presentation of competent level of nurses' knowledge concerning Glasgow Coms Scale technique pre, post & two month later the educational program (n=37)

| **Knowledge items** | **Pre** | | **Post** | | **Follow up** | | **Chi-square** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | **Pre & post** | | **Pre & Follow up** | | **Post & Follow up** | |
| | **N** | **%** | **N** | **%** | **N** | **%** | **$X_2$** | **P** | **$X_2$** | **P** | **$X_2$** | **P** |
| Definition of GCS | 12 | 32.4 | 33 | 89.2 | 31 | 83.8 | 25.007 | <0.001** | 20.041 | <0.001** | 0.463 | 0.496 |
| Indications of GCS | 10 | 27 | 33 | 89.2 | 26 | 70.3 | 29.367 | <0.001** | 13.848 | <0.001** | 4.097 | 0.043* |
| Importance of GCS | 8 | 21.6 | 35 | 94.6 | 29 | 78.4 | 40.470 | <0.001** | 23.838 | <0.001** | 4.163 | 0.041* |
| Number of GCS components | 11 | 29.7 | 34 | 91.9 | 32 | 86.5 | 29.997 | <0.001** | 24.482 | <0.001** | 0.561 | 0.454 |
| Eye response | 5 | 13.5 | 30 | 81.1 | 25 | 67.6 | 33.883 | <0.001** | 22.424 | <0.001** | 1.770 | 0.183 |
| Verbal response | 6 | 16.2 | 29 | 78.4 | 26 | 70.3 | 28.678 | <0.001** | 22.024 | <0.001** | 0.637 | 0.425 |
| Motor response | 5 | 13.5 | 31 | 83.8 | 24 | 64.9 | 36.567 | <0.001** | 20.470 | <0.001** | 3.470 | 0.062 |
| interpretation of scores of GCS | 4 | 10.8 | 30 | 81.1 | 27 | 73 | 36.782 | <0.001** | 29.367 | <0.001** | 0.687 | 0.407 |

Table (1) clarifies competency level of nurses' knowledge regarding GCS technique (pre, post & two month later the educational training program, there highly statistically significant improvement all items of the questionnaire sheet in the posttest with a P value= <0.001 the most improved items were importance of GCS, number of GCS components and definition & indication of GCS with a percent score of 94.6%, 91.9%, and 89.2% respectively.

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**Table (2):** Mean scores of competent level of nurses' practice concerning Coms Scale technique (pre, post & two month later implementing the educational program (n=37)

| **practice items** | **pre** | **post** | **follow-up** | **t-test** | | | |
|---|---|---|---|---|---|---|---|
| | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** | **$t_1$** | **$P_1$** | **$t_2$** | **$P_2$** |
| 1- Assessment of eye opening response | 39.08±7.06 | 91.06±12.2 | 76.19±1.3 | 26.5 | p<0.001 | 19.6 | p<0.05 |
| 2- Assessment of motor response | 39.91± 4.08 | 87.04±11.8 | 75.03±2.4 | 31.4 | p<0.001 | 18.8 | p<0.05 |
| 3- Assessment of verbal response | 40.5±6.09 | 90.32±3.1 | 79.16±4.5 | 32.1 | p<0.001 | 21.5 | p<0.05 |
| 4- Scoring all three components | 43.47±3.42 | 83.57±7.8 | 87.69±7.5 | 35.6 | p<0.001 | 23.1 | p<0.05 |
| 5- Recording of GCS Sores | 34.10±9.12 | 89.07±10.9 | 80.12±5.8 | 47.3 | p<0.001 | 25.7 | p<0.05 |
| 6- Reporting of GCS abnormalities | 38.04±10.11 | 82.41±12.5 | 77.56±8.8 | 34.8 | p<0.001 | 17.4 | p<0.01 |

**Table (2)**: illustrates competent level of practice observed among studied nurses in different steps of GCS technique pre, post and two month later after implementing the educational training program. It was appears that there were highly statistically significant differences between pre/post taste (p<0.001.). Also, there was statistically significant difference between post/follow up test (p=0.05). The most obvious increase in the mean practice scores was observed between pre/posttest regarding the Assessment of eye opening response, Assessment of verbal response and recording as the mean scores were (91.06±12.2, 90.32±3.1& 89.07±10.9) respectively..

**Table (3:** Comparison of total Mean Scores of practice among studied Nurses versus the researchers concerning Coms Scale technique pre/post & two month later the educational program (no=37)

| **practice items** | **pre** | **post** | **follow-up** |
|---|---|---|---|
| | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** |
| Studied nurses | 6. 4±2.67 | 9.84±1.37 | 8.72±1.98 |
| The researchers | 10.28±2.1 | 9.88±1.92 | 9.27±1.62 |
| test ($x_2$) | 2.619 | 0.645 | 1.263 |
| P-value | 0.001 | 0.521 | 0.210 |

**Table (3)**: It is obvious from table 4 there was a statistically difference between total mean GCS technique score assessed by nurses and when assessed by research investigator in pre-program stage as $x_2$ = 2.619 at p=0.001, but there were no statistically significant differences between total mean GCS scores assessed by nurses and assessed by researchers investigator in both post and follow up phases ($x_2$=0.645 at p=.0.521, $x_2$= 1.263, at p=.0.210 respectively).

**Table (4):** Correlation between total competent level of knowledge and total competent level of practice among studied nurses (no=37)

| **Practice** | **Knowledge** | |
|---|---|---|
| | **r** | **P-value** |
| - Pre-test | 0.190 | 0.260 |
| - Posttest | 0.626 | <0.001** |
| - Follow up test | 0.743 | <0.001** |

Studying the relationship between total level of competent of missed nursing care reported by studied nurses were related to inadequate nursing, number and knowledge & practice scores of the studied nurses, **table (4)** revealed that pre theoretical and practical educational intervention no correlation was found between both competent level (r= 190 P 0.260. While immediately post & follow-up theoretical and practical educational program implemented the table declared a highly significant correlation between total competent levels (knowledge & practice) r= 0.626 & r=0743 p<0.001 respectively.

**Table (5)** Number and distribution of studied nurses as regards success indicators (pre & two month later the educational program (n=37)

| items | pre stage | | follow-up stage | |
|---|---|---|---|---|
| | no | % | no | % |
| Total Number of performed neurological assessments over time | 11 | 29.72 | 31 | 83.78 |
| Interpretation GCS Score Correctly | 7 | 18.91 | 24 | 64.86 |

**Table (5):** As regard percentage distribution of the studied nurses as regards the indicators of educational program success pre and follow up stage. It was noticed that 83.78%, and 64.86% of the studied nurses had increased Total Number of performed neurological assessments over time and Interpretation GCS technique score correctly health care in the follow up period respectively

## IV. Discussion

Glasgow Coma Scale (GCS) is a reproducible tool used by nurses in almost every healthcare facility to assess level of consciousness in a patient with a neurological problem. It is important to have the skill and knowledge when assessing and applying critical thinking to interpret the findings. Results of the previous studies revealed that competent of nurses' knowledge and practice concerning Glasgow coma scale were unsatisfactory and recommended education of the nurses to apply through neurological assessment [7]. In our country, in addition to the unsatisfactory performance of nurses during the Glasgow evaluation, there was negative interest towards the number of cases that the nurse measured [6]. Therefore the researchers have chosen this study to examine the effect of theoretical and practical educational program on of nurse compliance

Concerning demographic characteristics of the studied nurses, the results of the current study revealed that, the mean age of the nurses under the study was (X=33.2 ±4.5), while the majority of them were females. It was found that mean years of their experience was (4.5 ± 3.6) years. This result is consistent with, [13] who found that most of nurses included in the study were women, mean age 31.18 years. Also, the present study revealed that the majority of the studied nurses didn't attend any training courses related to GCS .However; all nurses under study emphasized no presence of manual booklet for Glasgow coma scale use. This is consistent with [14, 15] in their studies who reported that none of the studied nurses received further training on GCS.

Concerning competent level of nurses' knowledge regarding GCS technique, the present finding revealed that there highly statistical significant improvement in the posttest compared to the pretest at all items. While comparing the level of competent knowledge in the post and follow-up test the difference noticed was statistically significant improvement but less than pre/posttest. This result was supported by what was reported by [4, 16] as they found in their studies, that all nurses' have almost inadequate knowledge concerning application GCS pre implemented the training programs. Also, [17] reported in their study, that the mean posttest knowledge score of the participants is higher than the mean pretest knowledge score regarding monitoring Glasgow Coma Scale as evident from level of significance after their exposure to planned teaching program

This result can be explained from point of view of research investigators could be as a result of insufficient of an ongoing learning environment in providing continuous nursing education, in addition to three fourths of nurses under the study were diploma nurses (diploma & technical diploma and their knowledge during school study years might be insufficient for such a specialized care. Add to the above, unavailability of hospital manual procedure booklet regarding GCS. This explanation was supported by[6, 14] who interpreted Unsatisfactory pretest nurses' knowledge about GCS due to the majority of nurses their level of education only diploma, lack of training educational programs for staff nurses, lack of responsibility of nursing director and management staff in providing such training programs for staff nurses the previous settings. This finding could

support the first hypothesis of the current study which assumed that the education program contributes to improving the competent level of nurses' knowledge. Some previous studies differed slightly from the current study, the results [8] who revealed that, during the pre-test three quarters of their sample have had average knowledge and one quarter had poor knowledge, however, after the administration of the self-instructional module the post-test result shows that (69.09%) of the nurses had good knowledge and (30.91%) had average knowledge.

As regard the total competency level of nurses' practice about different steps GCS pre/post & follow up the educational program. The current study discovered that there is a highly statistical significant improvement in competent level of nurses' practice regarding GCS; this was noticed immediately after educational program implementation in comparison to pre-test. In another hand, the follow-up test their competent practice level was slightly decreased compared with the post-test, which was noticed especially in the reporting of GCS abnormalities. It is in agreement with [7] who reported that that many nurses having many difficulties while practicing and using GCS in assessment of unconscious patients and [5] emphasized that, the nurses who work in areas that care for these patients need to be competent in assessing GCS because the scoring correctly will detect early deterioration in such patients.

Also [17] in similar study found that the posttest mean score of practice on monitoring Glasgow Coma Scale among staff nurses is higher than mean pretest practice score ,so it can be interpreted that, after the planned teaching program the posttest practice of the nurses was increased indicating the effectiveness of the planned teaching program. From point of view of research investigators this indicate readiness of nurses under study to learn more and their interest in learning new skills for improving their skills regarding care of patients and also reflects the positive effect of educational program in improving skills of nurses regarding application of GCS technique.

One of the noticeable results of the current study there was a statistically significant difference between total mean GCS score assessed by nurses under study and when assessed by research investigators in pre-implementation phase. But there no statistically significant differences between total mean GCS scores assessed by nurses and assessed by research investigators in both post and follow up phases. From point of view of research investigators this reflects the success of training program in enhancing skills of nurses in accurate application of GCS. In the same line, [18] in earlier study reported that many staff nurses are not aware enough or knowledgeable about the neurological assessment using the GCS and had not been confident in practical use of the GCS; they would want to improve their practical skills. He concluded that a short training course would be needed to make sure that nurses are able to use the GCS effectively while minimizing errors for improving the care of the patients in the critical care units.

It is obvious from the above results that the level of nurses' competence (knowledge and practice) regarding GCS significantly increased after implementing the educational program .This improvement was noticed at post-implementation and follow up phases as compared to pre-implementation phase which reflect effectiveness of educational program in improving competency of nurses regarding application of GCS. The present study it congruent with [6, 1] who reported that, knowledge and practice level of nurses significantly improved after the teaching program. In this respect, [8, 11] suggested in their studies that a well-developed GCS training program should be delivered to the nurses to contain accuracy of assessment of the consciousness level using GCS, which ultimately results in improving the quality of nursing care. This finding has supported the first hypothesis of the current study.

In addition, the present study showed no statistically significant correlation between the studied nurses' total knowledge and practice at pre-implementation phase, while, there were statistically significant positive correlations between total competent level of knowledge and practice at post-and follow up phases. This might be due to the training program improved level of nurses' knowledge which affecting positively on their practice regarding application of GCS. [14]explained similar results as if nurses have knowledge and this knowledge well understood, nurses are being able to apply it as possible and vice versa.

In the same context, previous studies [8, 20] emphasize the teaching of the necessary skills to conduct gassing through the theoretical and practical courses of nursing. Also, [20,21]Findings demonstrate that educational intervention effectively increased nurses' knowledge and confidence in applying content into practice. In this result, the second hypothesis of the study is achieved.

In connection with the indicators of program success, the present study revealed that there is an obvious improvement in the follow up test compared to the pretest. From the researchers' point of view, this may be due to the increased self-confidence of the nurses following the implementation of the educational program as a result of increased competent level of knowledge and practice. This result is consistent with the (6) who confirmed in a similar study that improved nurse information leads to improved performance and increases self-confidence, which contribute to the quality of care and also ensured that the continuous professional development of nurses is ultimately reflected in the best care of patient outcome. From the previous conclusion it is clear that the third hypothesis has been achieved

With this result, the success of the training program is confirmed. In summary, the results of this study revealed that, to produce competent and knowledgeable nurse, should be focus on development of nursing staff knowledge and skills through update information, learning resources, and continuous educational opportunities which help in proper assessment and management of patient.

## V. Conclusion

In the light of the present study, it was concluded that, the theoretical and practical educational program had a positive effect in improving nurses' competence knowledge and practice concerning GCS technique. There was also a positive correlation between levels of nurses' knowledge as regards their practice. Finally, there were an increase number of performed neurological assessments over time & interpretation Score Correctly. Thus, this finding confirmed the study hypotheses.

## VI. Recommendations

Nurse's managers and educators should develop educational programs provided to all nurses caring for unconscious patient to increase and update their knowledge and skills concerning GCS technique. Nursing educators should Establishing and distributing a manual procedure book to all nurses who were working in critical care units and neurological wards including standard of GCS technique that must be applied and followed. Replication the study on different settings to be generalizes the results of current study.

## VII. Limitation

Difficulty collecting the study sample due to lack of time with a large number of patients, also lack of nurses' self-confidence during the application of the Glasgow technique.

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