Assessment of Nurses' Performance Regarding Care of Patients with Spinal Cord Injury

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ABSTRACT

Background: Spinal cord injury is a debilitating and irreversible injury leading to complete or incomplete loss of sensory and motor function. Knowledge, practice and attitude of nurses can significantly affect the outcomes of patients.
Objective: This study aimed to assess nurses' performance regarding care of patients with spinal cord injury.
Patients and methods: Design: A descriptive exploratory design was utilized. **Setting:** The study was conducted at Neurosurgical Intensive Care Unit and Neurology Care Department at Fayoum University Hospital. **Sample:** A convenient sample of all available nurses (90 nurses). **Tools:** Three tools were used: I) Self-administered questionnaire. It included two parts: demographic characteristics of the studied nurses and nurses' knowledge. II) Nurses' practices observational checklist. and III) Nurses' attitude regarding care of patients with spinal cord injury.
Results: Demonstrated that the majority and the most of the studied nurses had unsatisfactory level of knowledge and incompetent practices regarding care of patients with spinal cord injury respectively. While, the most of them had positive attitude.
Conclusion: The current study concluded that there was a statistically significant positive correlation between total knowledge scores of the studied nurses and their practices.
Recommendation: Providing a well-organized training program to improve nurses' knowledge and practices regarding care of patient with spinal cord injury.
Keywords: Care, Nurses, Performance and Spinal cord injury.

INTRODUCTION

Depending on the severity of the injury, a spinal cord injury (SCI) is a crippling and irreversible condition that results in the entire or partial loss of sensory and motor function underneath the injured area. Tetraplegia is defined as SCI with loss of function in the cervical region; paraplegia is defined as SCI with loss of function in the thoracic, lumbar, or sacral regions. Such injuries not only leave victims and their families with disabilities but also place a strain on healthcare systems and economies due to lost productivity and excessive medical costs [1, 2].

The etiology of SCI can be classified as traumatic or non-traumatic. Traumatic injuries are often result of motor vehicle accidents, sport-related incidences, falls or violence leading to crushing, shearing or penetration of the spinal cord. Non-traumatic injuries have a wide range of etiologies including infections, cancer and vascular disorders. The level and severity of injury determine the extent of paralysis and sensorimotor loss [3].

The resulting damage leads to a multitude of sequel including bowel, bladder and sexual dysfunction, pressure ulcers, neuropathic pain, pulmonary and cardiovascular disease and osteoporosis. Strategies to enhance neurorecovery are paramount to increase function and independence, reduce secondary complications as pressure injuries and urinary tract infections (UTI), improve quality of life and reduce strain on the health care system [4].

The immediate care given to SCI patients can have a big impact on their long-term neurological and functional outcomes, as well as their quality of life.

Early intervention seeks to restore physiological balance, reduce secondary injury, watch for signs of developing neurologic impairments, and maintain neurologic function [5].

The greatest outcomes for patients should be promoted by nurses working as a multidisciplinary team to deliver effective nursing care that can stop or lessen future SCI. In addition to providing medical care, promoting patients' psychological well-being, implementing nursing plans based on scientific nursing theory and evidence-based practice, delivering education, and evaluating appropriate medical services for patients and their caregivers, nurses also play an important role in patient education [6].

The nurse helps patients with SCI adjust to a new way of life and develops and implements self-care strategies to support their physical, psychological, and spiritual well-being. With the help of these activities, patients will be better able to accept their limitations, return to their families and communities, and face the future with optimism [7].

Significance of the study:

Patients with spinal cord injuries have severe impairment. A SCI affects more than 500.000 persons annually worldwide. Traumatic reasons account for up to 90% of these cases. According to a recent estimate, there are around 17,810 new cases of SCI per year in the United States, and there are currently an estimated 294,000 people living with the condition. Less than 1% of patients had fully recovered neurologically by the time they were discharged from the hospital. The first year following an injury has much higher mortality rates

than the following years, especially for people with the most severe neurological impairments [8, 9].

The most frequent causes of traumatic spinal cord injury (TSCI), which also include traffic accidents, falls, and violence, involve trauma to the spinal cord from an external force. The majority of spinal cord injuries in the United States—about 36.6%—are caused by automobile accidents. The second most frequent cause, falls (22.5%), is followed by violence, primarily from gunshot wounds and sports. Falls are the leading cause of spinal cord injuries in the elderly (51.9%) in those 61 to 75 years old and (65.7%) in those 76 years and beyond [3].

In Egypt, falls are the main causes of traumatic spinal cord injury among people living in Egypt with higher incidence to cervical lesion. Concerning gender, men have significantly higher rate of injury compared to women especially the young adult population. According to the statistical center of Fayoum University hospital, it was reported that 68 cases with spinal cord injury were admitted in 2020 [10].

Knowledge, practice and attitude of health care team can significantly affect the outcomes of patients after severe SCI, nurses must be knowledgeable and passionate about the holistic care they provide to these highly physically dependent individuals. Consequently, knowledge of needs and care outcomes is very important as the nurses are helping this person to live the rest of his/her life, while, satisfying their rehabilitation needs [11].

The aim of this study was to assess nurses' performance regarding care of patients with spinal cord injury.

This aim was achieved through the following objectives: **(1)** Assess the level of nurses' knowledge regarding care of patients with spinal cord injury. **(2)** Assess the level of nurses' practices regarding care of patients with spinal cord injury. **(3)** Assess nurses' attitude regarding care of patients with spinal cord injury.

Operational definition:
Performance: refer to nurses' knowledge, practices and attitude regarding care of patients with spinal cord injury.

SUBJECTS AND METHODS
I- Technical item:
The technical item includes research design, setting, subjects and tools for data collection.
Research design:
A descriptive exploratory research design was utilized to achieve the aim of this study. Descriptive design involves direct exploration, analysis and description of a particular phenomenon. Exploratory design doesn't aim to provide the final and conclusive answers to the research questions, but merely explores the research topic with varying levels of depth [12]. An exploratory descriptive design helps the researcher to

describe and document aspects of a situation as it naturally occurs, as well, it helps to establish a database for future research [13].

Setting:
This study was conducted at neurosurgical intensive care unit and neurology care department affiliated to El-Fayoum University hospitals. Neurosurgical intensive care unit is located at the second floor of the hospital and it consists of one unit which containing 25 beds, the numbers of occupied beds from18-22 beds and the number of nurses is 44 bedside nurses and 4 head nurses. Neurology care department is located at the fourth floor of the hospital. It consists of 2 units; each unit containing 20 beds, the numbers of occupied beds from 18-20 beds and the number of nurses is 20 bedside nurses and 1 head nurses.

Subjects:
A convenient sample of all available nurses (90 nurses) working at neurological intensive care units and neurology care department were included in this study.

Tools for data collection:
Data were collected using the following three tools:

Tool I: Self-administered questionnaire:
This tool was developed by the investigator in simple Arabic language based on reviewing the related literatures **Taha** [14] **and Hills** [15] included the following two parts:

Part I: Demographic characteristics of nurses:
It was used to assess nurses' demographic data including gender, age, marital status, qualification and years of experience and attending programs related to care of patients with spinal cord injury.
Part II: **Nurses' level of knowledge regarding care of patient with spinal cord injury:**
This tool was developed by the investigator after reviewing literature **Taha** [14] **and Hills** [15] to assess nurses' knowledge level about spinal cord injuries. It included 28 multiple choice questions with 5 main categories: Anatomy and function of vertebral column and spinal cord (5 items), risk factors and causes of SCI (3 items), signs, symptoms and complication of SCI (7 items), medical treatment of patient with SCI (3 items) and nursing care of patient with SCI (10 items).

Scoring system for nurses' level of knowledge:
Each correct answer had score 1 and the incorrect answer had score zero. Total scores of knowledge ranged from 0 to 28 degrees and were categorized as:
- Satisfactory if the total score is 75% or more.
- Unsatisfactory if the total score less than 75% [11].

Tool II: Nurses' practices observational checklist:

This tool was adapted from **Taha** [14] to assess nurses' practice regarding care of patients with spinal cord injury. It included 57 items of practices with 7 main categories: Assessment of patient with spinal cord injury (19 items), maintaining breathing pattern and airway clearance (8 items), maintaining adequate cardiac output (3 items), management of bowel elimination (6 items), maintaining urinary elimination (7 items), maintaining skin integrity (7 items) and psychosocial support (7 items).

The investigator added some modification on the tool.

Scoring system for nurses' practices observational checklist:

Each step that had been done had 1 score and not done step had score zero. Total practice scores ranged from 0 to 57 degrees and were categorized as:
- Competent if the total score is 85% or more.
- Incompetent if the total score is less than 85% [11].

Tool III: Nurses' attitudes regarding care of patient with SCI:

This tool was developed by the investigator after reviewing literature **Taha** [14] **and Al-Othman et al.** [16] to assess nurses' attitude regarding care of patients with spinal cord injury, it included 23 items.

Scoring system for nurses' attitude regarding care of patient with SCI:

The tool consists of positively and negatively worded statements, items were scored on 3 point Likert scale from (0= disagree), (1=somewhat) and (2=agree). Total scores ranged from 0 to 46 degrees and were categorized as:
- Positive attitude if the total score is 75% or more.
- Negative attitude if the total scores less than 75% [11].

Negatively worded statements were negatively scored. They were 6 items (avoiding telling patient the truth of his injury is comfortable in dealing with him, paraplegic or quadriplegic patient is a living dead person, feeling upset and angry when patient's treatment period is prolonged, feeling bored when listening to complaint of patient repeatedly, it's alright to leave the patient when he refuses to take them treatment, being more nervous than usual after caring for patients with (SCI).

Validity:

The study tools were tested for validity (face and content validity). It was measured by a jury of 5 experts, three assistant professors and two lecturers of medical surgical nursing at faculty of nursing, Helwan University and El-Fayoum University. The experts reviewed the tool for clarity, relevance, accuracy, comprehensiveness, simplicity and applicability and minor modifications were done.

Reliability:

Cronbach's Alpha was used to determine the internal reliability of the adapted tools. Reliability of the tools was tested to determine the extent to which the questionnaire items are related to each other. Cronbach's alpha reliability coefficient normally ranges between 0 and 1 with higher values (more than 0.7) denote acceptable reliability. The tools showed good reliability, it was (0.716) for nurses' knowledge regarding care of patients with SCI, (0.720) for nurses' practices observational checklist, (0.819) for nurses' attitude regarding care of patients with SCI.

Ethical considerations:

An official permission to conduct the proposed study was obtained from the scientific research ethics committee Faculty of Nursing, Helwan and El-Fayoum University. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where they weren't accessed by any other party. Ethics, values, culture and beliefs were respected.

II- Operational item:
Preparatory phase:

It included reviewing of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

Pilot study:

The pilot study was done on 10% of the sample (9 nurses) to examine the clarity of questions and time needed to complete the study tools. Subjects included in the pilot study weren't excluded from the study sample as minor modifications were done.

Field Work:

Data were collected within 6 months in the period from the beginning of October 2021 to the end of March 2022. The investigator visited the neurosurgical care unit and neurology care department two days per week during the morning shifts (8:00 am to 2:00 pm). Each day the investigator interviewed 1 or 2 nurses. Data were collected through interviewing nurses to fill data collection tools. At the beginning of the interview, the aim of the study was explained to nurses. The investigator obtained the nurses' consent for participating in the study. The study tools were completed and filled in by the nurses within an average time of 35-50 minutes as following: structured interview questionnaire for collecting data regarding demographic characteristics of nurses; it took about 5-10 minutes as well nurses' knowledge questionnaire took about 15-20 minutes, and nurses' attitude questionnaire took about 15-20 minutes. Each nurse was

observed individually by the investigator to assess his/her practices during providing care for patients with SCI. It took about 1-1.5 hour.

III-Administrative item:

After explanation of the study aim and objectives, an official permission was obtained from the dean of faculty of nursing and the director of Fayoum University Hospital asking for cooperation and permission for data collection.

IV-Statistical Item:

Upon completion of data collection, collected data were organized, tabulated and analyzed using Statistical Package for the Social Science (SPSS), version 24 for analysis. For quantitative data, mean, and standard deviation (SD) were used to describe the results. For qualitative data which describe a categorical set of data, frequency and percentage of each category were calculated. Appropriate significance was adopted at P < 0.05 for interpretation of results. The observed associated differences were considered as not significant if p > 0.05 and significant if p <0.05. Appropriate inferential statistics such as Pearson correlation "r" test was used as well.

RESULTS

Table **(1)** shows that 81.1% of the studied nurses aged from 20 to less than 30 years with a mean age 26.96 ± 3.64, 71.1% of them were female and 70% of the nurses were married, as well, 74.5% had technical institute qualification.

Table (1): Frequency and percentage distribution of the studied nurses according to their demographic characteristics (N=90).

Nurses' Characteristics		No.	%
Age (in years)	20 > 30	73	**81.1**
	30 > 40	17	18.9
Mean ± SD	26.96 ± 3.64		
Gender	Male	26	28.9
	Female	64	**71.1**
Marital status	Single	26	28.9
	Married	63	**70.0**
	Divorced	1	1.1
	Technical institute	67	**74.5**
	Nursing bacculrate	22	24.4
	Post graduate	1	1.1

Figure **(1)** illustrates that 72.2% of the studied nurses had experience of less than 5 years at neurological unit.
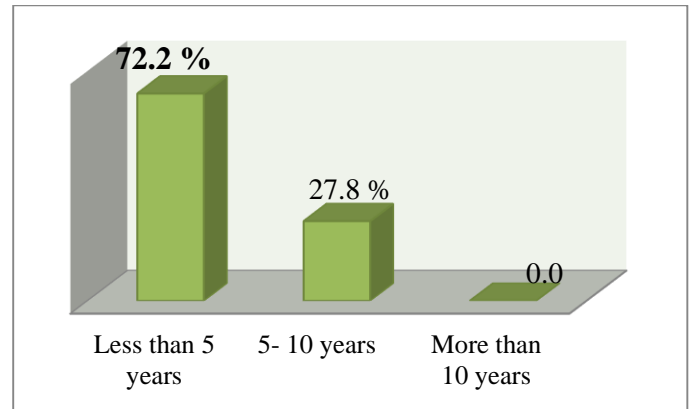

Figure (1): Percentage distribution of the studied nurses according to years of experience at neurological unit (N=90).

Figure **(2)** shows that 95.6% of them didn't attend training programs regarding care of patients with spinal cord injury.
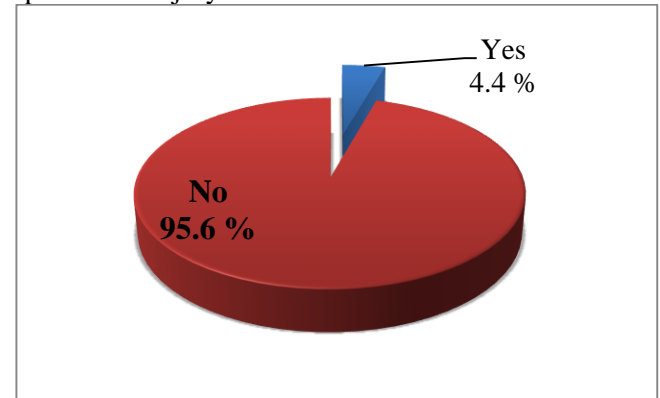

Figure (2): Percentage distribution of the studied nurses according to attending training programs related to care of patients with SCI (N=90).

Figure **(3)** shows that 81.1% of the studied nurses had total unsatisfactory level of knowledge regarding care of patients with spinal cord injury.
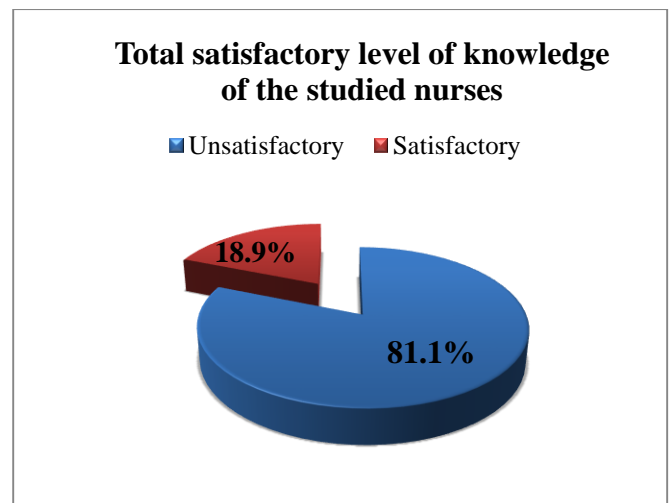

Figure (3): Percentage distribution of the studied nurses according to their total satisfactory level of knowledge (N=90).

Figure **(4)** shows that 91.1% of the studied nurses had total incompetent level of practices regarding care of patients with spinal cord injury.
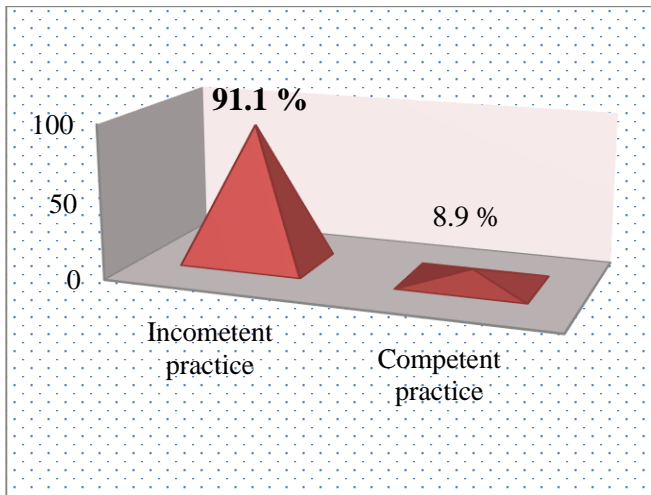
Figure (4): Percentage distribution of the studied nurses according to their total competent level of practices (N=90).

Figure **(5)** illustrates that 91.1% of the studied nurses had total positive attitude scores regarding care of patients with spinal cord injury.
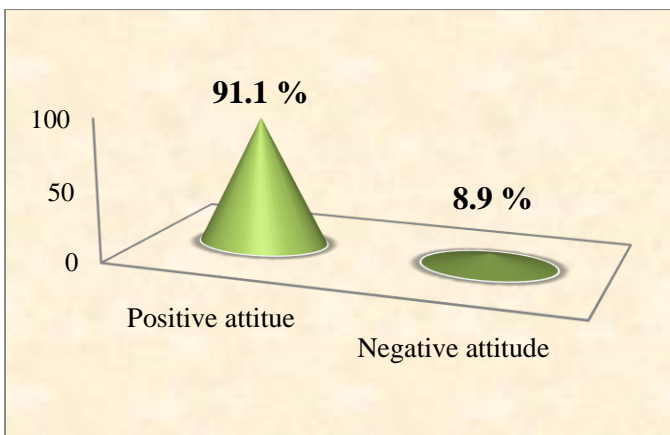

Figure (5): Percentage distribution of the studied nurses according to their total attitude scores (N=90).

Table **(2)** demonstrates that there was a statistically significant positive correlation between total knowledge scores of the studied nurses and their practices at (p value 0.016).

Table (2): Correlation between total satisfactory knowledge of the studied nurses, practices and their attitude (N=90)

Items	Correlation coefficient	P value
Total knowledge and practices	0.149	0.016 *
Total knowledge and attitude	0.151	0.156
Total practices and attitude	0.177	0.095

* Significant (S) p ≤ 0.05

DISCUSSION

Spinal cord injuries (SCI) can have a devastating effect on the motor and cognitive status of individuals. A spinal cord injury is a disease that requires appropriate nursing and rehabilitative practices to provide optimal care, an improvement of patient's outcome will have a considerable effect on the patients' level of disability, independent functioning and consequently their lifestyle [17].

Regarding the demographic characteristics of the nurses, the results revealed that the majority of the studied nurses' age was between 20 to less than 30 years. This can be explained by the most of the nurses were newly graduated. This is consistent with **Tirgari et al.** [18] in their study showed that about two thirds of the nurses were less than 30 years.

The present study revealed that more than two thirds of the studied nurses were female and married. This result disagrees with **El-Aqoul et al.** [19] in their study reported that more than half of the studied nurses were male. While, this finding is congruent with **Wang et al.** [6] in their study reported that majority of nurses were married.

In relation to studied nurses' educational level, this study results indicated that more than two thirds of nurses had technical institute and had experience of less than 5 years at ICU. This can be explained by the age of the majority of nurses was less than 30 years reflecting that they were newly graduated. This result disagrees with **Ram et al.** [11] who assessed knowledge and practice of staff nurses on emergency management of spinal cord injury and mentioned that about half of studied nurses had baccalaureate nursing degree. While, this finding agrees with **Eid et al.** [20] who conducted a study found that more than half of nurses had less than 5 years of experience.

As regard to attending previous training programs, the present results showed that the most of the nurses had no previous training courses; this may be due to shortage of nursing staff and work load at ICU. This results is similar to **Abd-Elhameed and Sayed** [21] in their study revealed that more than half of the studied nurses did not receive any previous training regarding rehabilitation, while this result is dissimilar to **Eid et al.** [20] who revealed that about three quarters of studied nurses had training course about trauma patients.

As regards to nurses' total satisfactory level of knowledge, the present result showed that the majority of the studied nurses had total unsatisfactory level of knowledge regarding care of patients with SCI. from investigator's point of view, this result may be due to that the majority of nurses were recently graduated and didn't attend training courses related to care of patient with SCI. This is consistent with **Khalil et al.** [22] whose study revealed that most of the studied nurses had low level of knowledge regarding care for patients with SCI.

In relation to total competent level of practices of the studied nurses, the most of the studied nurses had total incompetent level of practices regarding care of

patients with spinal cord injury. This finding is consistent with **Ahmed et al.** [23] who reported that more than half of the studied nurses had incompetent level of practice regarding care of patients with spinal cord injury. This could be attributed to many reason as more than two thirds of the nurses had technical institute, they were newly graduated, as well, they had inadequate experience at ICU and didn't received any training regarding care of patient with SCI.

Concerning to nurses' total scores of attitude, the most of the studied nurses had total positive attitude scores regarding care of patients with spinal cord injury. This finding is similar to **Al-Othman et al.** [16], in their study reported that most of the subjects had a compensation attitude toward SCI patients, the majority of them had positive attitude toward helping people after accidents and providing the treatment of SCI.

As regards to correlations between nurses' knowledge, practice and their attitude, the present study finding demonstrated that there was a statistically significant positive correlation of total knowledge scores of the studied nurses and their practices regarding care of patients with SCI. this study result agree with **Ram et al.** [11] who reported that there was a significant correlation among levels of knowledge, practice and their attitudes of staff nurses regarding emergency management of SCI patients, while, result disagrees with **AlMarhoon et al.** [24] who illustrated positive attitude and level of practices were adequate among most of the nurses which was associated with their high knowledge.

CONCLUSION

Based on finding of the present study, it can be concluded that the present study showed that majority of the studied nurse unsatisfactory level of knowledge and the most of them had incompetent level of practices, while, the most of nurses had positive attitude regarding care of patients with spinal cord injury. There were no statistically significant relations between total level of knowledge, practices and total attitude scores of the studied nurses and their demographic characteristics except for attending training programs related to care of patients with spinal cord injury and total attitude scores. While, there was statistically significant positive correlation between total knowledge scores of the studied nurses and their practices.

RECOMMENDATIONS

Based on the findings of the present study, the following recommendations were suggested:
- Providing a well-organized training program to improve nurses' knowledge and practices regarding care of patient with spinal cord injury.
- Procedure book should be available at neurosurgical care unit as a reference for all nurses.
- Replication of the study on larger sample to generalize the study findings.

- Further research should be conducted to study relations between nurses' knowledge, practices and their demographic characteristics.

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