Nurses' Performance Regarding Care of Spinal Cord Injuries and Patients' Satisfaction

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Abstract

Background: Spinal cord injuries are debilitating and irreversible injuries leading to complete or incomplete loss of sensory and motor function. Knowledge, practice and attitude of nurses can significantly affect patients' satisfaction and management outcomes**.** The aim of the study was to assess nurses' performance regarding care of spinal cord injuries and patients satisfaction. **Setting:** The present study was conducted at accidents intensive care unit at Zagazig university hospitals, Sharkia governorate, Egypt. **Study subjects:** A convenience sample of (40) nurses working in the mentioned setting and a purposive sample of (40) patients who fulfilling the inclusion criteria. **Tool of data collection:** Three tools were used for collecting data. **Tool I**: A self-administrated questionnaire to assess studied nurses' knowledge and attitude. **Tool II:** An observational checklist to assess nurses' practice regarding care of patients with spinal cord injuries. **Tool III:** An interview questionnaire for patients satisfaction**. Results:** More than two thirds of studied nurses had unsatisfactory total knowledge, three fifths had unsatisfactory total practice, about two thirds had positive attitude regarding care of patients with spinal cord injuries. As well as more than half of studied patients were satisfied regarding received care. **Conclusion:** There was highly statistically significant positive correlation between total nurses' knowledge, practice and attitude. There was highly statistically significant correlation between the studied patients' satisfaction, total nurses' knowledge, practice and attitude. **Recommendation:** training programs are highly recommended to improve nurses' performance. Future studies should consider exploring variables potentially related to patients' satisfaction, specifically in SCIs patients.

Keywords: *Performance, Spinal Cord Injuries, and Patients' Satisfaction*

Introduction

Spinal cord injuries (SCIs) are serious damage to the spinal cord that can lead to lifelong disability. SCIs are destructive neurological and pathological conditions that lead to a loss of motor, sensory and autonomic functions below the injury site. The permanent or progressive disabilities it brings can have a devastating impact on individuals and a significant burden on the society **(Li, et al., 2024)**.

Mechanisms that lead to the injury can be classified as traumatic SCI or non-traumatic SCI. Non-traumatic SCI can occur due to an underlying pathology, such as autoimmune, infectious, vascular, or oncologic diseases. Traumatic SCI causes include fractures, motor vehicle accidents, acts of violence, and recreational activities. Regardless of the cause, the injury leads to motor, sensory and autonomic dysfunction below the level of the lesion, with paralysis and multiple system dysfunction being one of the most severe consequences (**Alcántar-Garibay, et al ., 2022).**

Manifestations of SCI depend on the type and level of injury. SCI is characterized by a wide range of symptoms including paralysis, paresthesia, spasticity, pain, and cardiovascular, bowel, bladder, or sexual dysfunction. It has been shown to cause substantial autonomic dysfunction, with neurogenic shock being one of the leading causes of death following traumatic SCI. The amount of disability depends on the severity and the level of spinal cord injury (**Quadri, et al., (2020).**

Spinal cord injuries can cause partial or complete loss to motor and sensory functions beneath the affected area. It is a debilitating and permanent disorder that depends on the lesion severity. When a spinal cord injury results in function loss in the cervical region, it is referred to as tetraplegia; when it results in function loss in the thoracic, lumbar, or sacral regions, it is referred to as paraplegia. In addition to disabling the victims and their families, these injuries put a burden on the healthcare system and the economy because of lost production and exorbitant medical expenses **(Burkhart., et al, 2021)**.

Radiologic examinations are an integral part of the diagnostic evaluation following SCI and play an important role in assessing the level and severity of injury. Computed tomography (CT) provides excellent visualization of osseous anatomy and fractures .conventional magnetic resonance imaging (MRI) helps to evaluate the damage to disligamentous and neural structures after SCI. It improves clinical decision-making early after trauma and facilitates finding the appropriate treatment (**Schading., et al, P.2021)**.

Caring is the essential attribute of intensive care nurses (ICNs) who play an important role in fulfilling the holistic needs of critically ill patients (CIPs) and support for their families. Critical care nurses provide and contribute to the care of critically ill patients in a variety of roles. The most prevalent role for the professional registered nurse (RN) is that of direct care provider. Nurses also interact with critical care patients, families, and the health care team to ensure appropriate, timely care and services and to promote continuity of care from one setting to another **(Urden., et al, 2017) .**

Assessment of patient`s satisfaction with nursing care is very important to evaluate whether patient`s needs are fulfilled and thus facilitate planning and implementing appropriate nursing interventions for patient. Nurses should be knowledgeable, skilled and competent to provide high quality care for patients. Also, every patients want nurses to have a good caring and human attitude, respect them and make them feel with safety and feel comfortable **(Abdelmowla, et al., 2017)**.

Patient satisfaction plays a crucial role in the healthcare system as an indicator of the quality of care. Importantly, the patient's experience of care is increasingly being used to determine hospital and physician reimbursements. The main aim of measuring patient experience and satisfaction is to understand how the patient feels about being treated, learn about his/her perceptions of the quality of care and any related constructs, and to highlight areas of practice that could be improved to achieve better health outcomes and patient loyalty**(Abidova, et al., 2020).**

Assessing patient satisfaction may provide valuable and unique insights about daily hospital care and quality. One widely accepts it as an independent dimension of care quality that includes internal aspects of hospital care. Patient satisfaction is a concept that has long been neglected and cast aside, but is becoming gradually more important. Measuring healthcare quality and satisfaction constitutes an indispensable element for adequate resource management and allows for the focus on its users' preferences, giving them a chance to construct a customized health service, better fitted to their needs and expectations **(Ferreira, et al., 2023).**

Significance of the study:

The annual incidence of traumatic SCI in the Middle-East and North-Africa (MENA) Region was 23.24/million. Globally between 250,000 and 500,000 patients each year suffer from SCIs. Most SCI cases arise from preventable causes, such as violence and MVCs. Approximately 17,000 new SCI cases in the United States occur each year, and 282,000 persons are estimated to be living with SCIs. Most sports-related SCIs occur in male patients. The age group with the highest SCI risk is 16 to 30. **(Bennett, et al., 2024).**

The quality of nursing care greatly affects the overall satisfaction with hospital care. Nurses have become more involved in the management of patients with complex health problems, such as epilepsy, stroke, meningitis, spinal cord injury, neurological deficits, disturbed level of consciousness, brain and spinal cord tumors, brain injuries, and many other related neurological complications such as dysphagia, balance disturbance, sleep apnea, and paralysis **(Dadoosh & Sadeq, 2022).**

Nurses' performance can significantly affect the outcomes of patients after severe SCIs, 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 **(Ram et al., 2021)**. Therefore this study will assess nurses' performance regarding care of spinal cord injuries in order to improve their care.

Aim of the study: Wa**s** to assess nurses' performance regarding care of spinal cord injuries and patients' satisfaction.

Research Question:

-What is the level of nurses' knowledge regarding care of patients with spinal cord injuries?

-What is the level of nurses' practice regarding care of patients with spinal cord injuries?

-What are the nurses' attitudes regarding care of spinal cord injuries?

- What is the level of patient s' satisfaction regarding nursing care of spinal cord injuries?

Research design: A descriptive research design was utilized in this study.

Setting: The study was carried out in accidents ICU at Zagazig University Hospital, Sharqia Governate, Egypt.

Subjects and methods

Subjects: A convenience sample of (40) nurses working at the previous mentioned setting and a purposive sample of (40) patients who fulfilling inclusion criteria at Zagazig university hospitals, Zagazig Governate, Egypt.

Inclusion criteria:

Patients with spinal cord injury, are able to communicate, male and female, between 18 and 60 years and agree to participate in the study.

Tools of data collection:

Tool I: Self-administered questionnaire of nurses: Composed of three parts:

Part I: Used to assess demographic characteristics as: age, gender, marital status, educational qualifications, residence, income, years of experience and attendance of any training courses (8 closed ended questions).

Part II: Used to assess nurses' knowledge regarding care of patients with SCIs including 72 multiple choice questions covering three different sections, nurses' knowledge about anatomy and physiology of the spinal cord, nurses' knowledge about SCIs, nurses' knowledge about nursing care of spinal cord injuries.. **(Urden, et al., 2021), (Srivastava., 2023),**
(Koutoukidis& Stainto., 2024).

Scoring system: The total score for the knowledge was 72 grades (100%). Each correct answer scored one grade, zero for incorrect answer. For each area of knowledge, the score of the items was summed- up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. Knowledge was considered satisfactory if the percent score was equal or above 80% and unsatisfactory if less than 80% based on statistical analysis.

Part III:Nurses' attitudes questionnaire:

It was used to assess nurses' attitudes regarding care of patients with SCIs. It was adapted from **(Ali, et al., 2022)** and modified by researcher**.** It consists of 16 statements that is reflect nurses feeling and reactions toward caring of patient with spinal cord injury and nurses' responses is grading according to Likert scale (agree, neutral and disagree).

Scoring system

It consisted of 16 statements including 14 statements reflect positive attitude and two statements reflect negative attitude, the three-point Likert scale responses was ranged 2 (agree), 1 (neutral), 0 (disagree). The score of statements were summed up and given a total score for nurses' attitude and categorized into two categories as the following; if the percentage was equal or above 80% reflect positive attitude. If less than 80% reflect negative attitude.

Tool II: Observational checklists for nurses: It was used to assess nurses' practices regarding care of patients with SCIs. Attenuated observational checklist was adopted from, **(Ahmed, et al., 2021), (Mahrous Abdelhameed Mohammed, et al., 2022),(Afify, et al.,2024)** . It consists of four parts.

Part I:Neurological assessment checklist : It is composed of four items covering , assessment of Orientation (with 5 sub-items) , assessment of GCS (with 6 sub-items), Sensory function assessment (with 4 sub-items), motor function assessment (with 6 sub-items).

Part II: Head to toe Assessment Checklist: It is composed of 7 items covering, head (5 sub-items), neck(with 3 sub-items), chest(with 5 sub-items), abdomen (with 4 sub-items),back (with 3 sub-items),genitalia (with 2 sub-items), extremities (with 6 sub-items).

Part III: General assessment: It is composed of 2 items covering, vital signs (with 4 sub-items), and general survey (with 5 sub-items).

Part IV: Nursing intervention assessment checklist: It is composed of 5 items covering, cardiac monitoring (with 9 sub-items), oxygen administration via /mask (with 15 sub-items), maintaining breathing pattern and airway clearance (with 11 sub-items), maintaining Skin integrity score (with 9 sub-items), psychological support (with 11 sub-items).

Scoring system:-

The items observed to be done correctly were scored one and the items not done or done incorrectly were scored zero. The score of the items were summed- up and the total divided by the number of the items. These scores were converted into percent score. The nurse had competent level of practice when the total score equal or above 80% and incompetent if below 80% based on statistical analysis.

Tool III: Interview Assessment Questionnaire for Patients: This questionnaire divided into two parts:

Part I: Demographic characteristics of the studied patients: Which were composed of seven closed ended questions including "patient's age, gender, marital status, educational qualification, residence, job/occupation, income".

Part II: A questionnaire to assess patient satisfaction with nursing care: This consisted of19 items. Each of them is scored by the patient on the five-point Likert type scale with the scoring: poor, satisfactory, good, very good, excellent, enabling the assessment of individualization of care, concern and caring by nurses, skill and competence of nurses, collaboration among nursing staff, provision of comfort, and responsiveness of nurses, information provided by nurses, discharge instructions and coordination of care after discharge. It was adopted from **Laschinger, et al (2005)**.

S**coring system**:-

Each item is scored by the patient on a 5-point Likert type scale with the scoring: 1-poor, 2-satisfactory, 3-good, 4-very good, 5-excellent, .The score of statements were summed up and given a total score for Patients Satisfaction and categorized into two categories as the following; if the percentage equal or above 60% reflect high satisfaction. If less than 60% reflect poor satisfaction.

Pilot study:

Was carried out in order to check and ensure the clarity, applicability, relevance and feasibility of the tools. For this study, the researcher selected four nurses and four patients (10%) randomly to participate in the pilot testing of the questionnaire and checklist from accidents intensive care unit and not excluded from the study sample because of no modifications were done in the tools.

Administrative and ethical consideration:

The necessary approvals were obtained from the dean of the Faculty of Nursing and submitted to general director of Zagazig University Hospitals. Then Permission to carry out the study was obtained from the head of mentioned setting after explaining the purpose of the study.

At the initial interview, each potential subject was informed about the nature, purpose, benefits of the study, and informed that his/her participation is voluntary. Confidentiality and anonymity of the subjects were also assured through coding of all data.

The researcher assured that the data collected, and information will be confidential and would be used only for the purpose of the study and there was no risk for study subject during application of the research.

Additionally, an informed consent was obtained from each participant prior to inclusion into the study and after a full explanation of its aim and procedures. They were informed about their rights to refuse or withdraw from the study at any time with no reason to be given or consequences.

Field work*:*

The researcher used to go to the study setting for interviewing the study subjects, each nurse was met individually, got a full explanation about the aim of the study and was invited to participate. The nurse who gave his/her verbal informed consent to participate was handed the self-administered questionnaire and was instructed during the filling. The same was done with patients. The time needed to complete the checklist varies between 30-45 minute. Once the approval was granted to progress in the study, the researcher started to organize a schedule for collecting the data. The researcher visited study setting to be familiar with work process, time of work and observe study subjects attending the study settings to a set schedule for data collection. The data were collected two days a week (Saturday and Sunday) in the morning and afternoon shifts, lasted for 6 months during the period from the beginning of August 2024 to the end of January 2025.

Content validity& Reliability:

The tools were revised by a panel of five experts from different specialties including, professors of neurology from faculty of medicine and medical surgical nursing from faculty of nursing Zagazig university reviewed the tool's content for clarity, relevance, comprehensiveness, applicability, understanding, and ease for implementation. All recommended modifications were done. Cronbach's Alpha that used to measure the internal consistency (reliability of used tool) was 0.780 for nurses' knowledge, 0.941 for nurses' practice, 0.72 for nurses' attitude, and 0.831 for patients' satisfaction.

Statistical analysis:

The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 20. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X) 2, P-value to test association between two variables, degrees of significance of results were considered as P-value > 0.05 Not significant (NS), P-value ≤ 0.05 Significant (S), P-value ≤ 0.01 Highly Significant (HS).

Results:

Table 1: Shows demographic characteristic of studied nurses. The age of studied nurses ranged from 22 to 40 years with Mean ± SD=26.7±4.4, two fifths of studied nurses (40%) had their age more than 25 years, more than half of studied nurses(55%) were females and married. Regarding nurses qualification 5.0% had nursing diploma, (70.0%) had technical institute, 25.0% had bachelor of nursing, more than three quarters had hospital experience equal or less than five years ≤ 5 years(77.5%).more than half (55.0%) had insufficient monthly income. Nearly three quarters (72.5%) were living in rural area. Furthermore; about two thirds (67.5%) of studied nurses hadn't attended training courses regarding care of patients with SCIs.

Table 2: Clarifies that the majority of studied nurses (82.5%) had unsatisfactory total knowledge regarding nursing care for patients with SCIs, followed by three quarters (75%) of studied nurses had unsatisfactory total knowledge regarding spinal cord injuries, finally three fifths (60%) had unsatisfactory total knowledge about anatomy and physiology of the spinal cord.

Table 3: Showed that three fifths (60%) of studied nurses had unsatisfactory total practice level regarding care of patients with spinal cord injuries , However only one third (40%) had satisfactory total practice level about care of patients with spinal cord injuries, with allover mean± SD 74.2±20.8 and range from 32 score to 100.

Table 4: shows that about two thirds (65.0%) of studied nurses had total positive attitude regarding care of patients with mean± SD 26.7±4.95 and range from 16 - 32.

Table 5: Reports that more than two thirds (67.5%) of studied patients had age ≤ 50 years with the mean age 43.6±11.94**,** more than two thirds (67.5%) were males, majority (85.0 %) were married, regarding their educational level , 82.5% were educated, three fifths (60,0%) were working ,more than half (55.0%) had insufficient monthly income , Additionally less than two thirds were living in urban area.

Table 6: Demonstrates that more than half (57.5%) of studied patients were satisfied about nursing care, while less than half (42.5%) were unsatisfied with allover mean± SD 56.65±11.49 and range from 39 to 71.

Table 7: Showed that there was a highly statistically positive significant correlation between studied nurses` total knowledge regarding care of patients with SCIs with total nurses' attitude, total nurses` practice and Patients satisfaction with p-value was 0.0001. Also, there was a highly statistically significant correlation between total nurses' attitude with total nurses practice and total Patients satisfaction with p-value was 0.001. On the same line there was a highly statistically significant and direct correlation between total nurses practice with patients satisfaction with p-value was 0.0001.

Table 1: Frequency and Percentage Distribution of the Studied Nurses According to Demographic Characteristics (n=40):

Demographic Characteristics	N.	%
Age (Years)		
≤25 years	24	60.0
>25 years	16	40.0
Mean ±SD	26.7±4.4	
Median(range)	25(22-40)	
Gender		
Male	18	45.0
Female	22	55.0
Educational level		
Nursing Diploma	2	5.0
Nursing technical Institute	28	70.0
Bachelor of Nursing	10	25.0
Marital status		
Married	22	55.0
Not married	18	45.0
Residence		
Rural	29	72.5
Urban	11	27.5
Monthly income		
Sufficient	18	45.0
Not sufficient	22	55.0
Experience years		
≤5 years	31	77.5
>5 years	9	22.5
Mean ±SD	4.2±3.7	
Median(range)	3(1-15)	
Attending training courses		
Yes	13	32.5
No	27	67.5
Number of training courses		
One	5	12.5
Two	7	17.5
Three	1	2.5

Table 2: Frequency and Percentage Distribution of Studied Nurses' Total Knowledge Regarding Care of Patients with Spinal Cord Injuries (n=40):

Total Nurses knowledge about spinal cord injuries	N	%
Total knowledge about anatomy and physiology of the spinal cord.		
Satisfactory ≥80%	16	40.0
Unsatisfactory <80%	24	60.0
Total knowledge about spinal cord injuries		
Satisfactory ≥80%	10	25.0
Unsatisfactory<80%	30	75.0
Total knowledge about nursing care for patients with spinal cord injuries:	7	17.5
Satisfactory ≥80%	33	82.5
Unsatisfactory<80%		

Table 3: Frequency and Percentage Distribution of studied' Nurses' Total Practice Regarding Care of Patients with Spinal Cord Injuries (n=40):

Variable	N.	%	Mean ±SD	Median (Range)
Total nurses practice regard spinal cord injuries(113)*				
Satisfactory level≥80%	16	40.0	74.2±20.8	79.5 (32-100)
Unsatisfactory level<80%	24	60.0		

Table 4: Frequency and Percentage Distribution of Studied Nurses' Total Attitude Regarding Care of Patients with Spinal Cord Injuries (n=40):

Variable	N.	%	Mean ±SD	Median (Range)
Total nurses attitude regarding care of patients with spinal cord injuries(16)*				
• Positive attitude≥80%	26	65.0	26.7±4.95	28
• Negative attitude<80%	14	35.0		(16-32)

Table 5: Frequency and Percentage Distribution of the Studied patients According to Demographic Characteristics (n=40):

Variables	N.	%
Age		
≤50 years	27	67.5
>50years	13	32.5
Mean ±Sd	43.6±11.94	
Median(range)	46(20-60)	
Gender		
Male	27	67.5
Female	13	32.5
Marital status		
Married	34	85.0
Single	6	15.0
Education		
Educated	33	82.5
Not educated	7	17.5
Work		
Working	24	60.0
Not working	16	40.0
Monthly income		
Sufficient	18	45.0
Insufficient	22	55.0
Residence		
Urban	25	62.5
Rural	15	37.5

Table 6: Frequency and Percentage Distribution of Total Studied' Patients Satisfaction Regarding Nursing Care (n=40):

Variable	N.	%	Mean ±SD	Median (Range)
Total Patients' satisfaction (95)*				
•Satisfied	23	57.5	56.65±11.49	58.5
•Unsatisfied	17	42.5		(39-71)

Table 7 : Correlation matrix between Studied Nurses Total Knowledge, Total Attitude, Total Practice, and Total Patients Satisfaction Regarding Care of Patients with Spinal Cord Injuries (n=40):

Variables	Nurses' Knowledge score		Nurses' Attitude score		Nurses' practice score	
	R	P	R	P	r	p
Nurses' Knowledge score						
Nurses' Attitude score	0.60*	0.0001				
Nurses' practice score	0.62 *	0.0001	0.73*	0.0001		
Patients satisfaction score	0.68*	0.0001	0.70*	0.0001	0.670	0.0001

Discussion:

Regarding to the age of studied nurses, the result of present study showed that three fifth of studied nurses were ≤ 25 years. This is in the same line with with **Khalil Abd-Elhameed and Amin Sayed (2018)** who reported that majority of study subjects were less than 25 years old. These results were controversy with **Alhussin, Mohamed, and Hassan (2022)** who showed that more than half of studied nurses were (25-30) years old.

As regard to gender, the current study results revealed that more than half of studied nurses were females, this may be due to those faculties and institutions of nursing in Egypt were restricted to females in previous centuries. This finding was on the same line with **AL-Gabri, et al (2020),** who showed that more than two thirds of studied nurses were female. but this was controversy with **Miriam-Therese (2019)** who showed that more than two thirds of studied nurses were male.

As regard to marital state, the current study results revealed that more than half of studied nurses were married. This finding was in the same line with **Sedghi et al (2022)** who showed that more than half of studied nurses were married. This finding was controversy with **Yousef, et al (2021)** who showed that more than half of studied nurses were single.

As regard to qualifications, the current study results revealed that more than two thirds of studied nurses had technical Institute of nursing. This finding was in the same line with **AL-Gabri et al., (2020),** who showed that more than half of studied nurses had technical Institute of nursing. This finding was controversy with **Reynolds, et al., (2016)** who studied showed that all of studied nurses had bachelor of nursing. Also this finding was controversy

with **Shehab, et al., (2018)** who showed that more than half of studied nurses had secondary diploma.

As regard to years of experience in accidents intensive care unit , the current study showed that more than three quarters of the studied nurses had experience(1-5) years because the nurses under the study were recently graduated and also due to work stress and severity of the patient's condition and occupational hazards that facing them in ICU. All of this prevent them continuing work as critical care nurse. This finding agree with **Alhussin et al. (2022)** who showed that more than three quarters of studied nurses had experience (1-5years). This finding was contrary with **Almarhabi, et al., (2023)** who revealed that majority of studied nurses had experience more than six years.

As regard to previous training courses, the present study results showed that, the majority of the nurses under study had no previous courses, this may be due to shortage of staff, work load, lack of time in intensive care unit (ICU).This results is similar to **Khalil Abd-Elhameed and Amin Sayed, (2018)** who reported that more than half of the studied subjects had no previous courses. This finding was controversy with **Ahmed, et al., (2017)** who showed that more than half of studied nurses had training courses.

As regards to nurses' knowledge regarding anatomy and physiology of spinal cord, the present result showed that three fifth of the nurses' under study had unsatisfactory level of knowledge regarding anatomy and physiology of spinal cord . This result may be due to that the majority of nurses under study had few experience years. This is controversy with **Khalil Abd-Elhameed and Amin Sayed (2018)** who reported that more than two thirds of the study subjects had satisfactory level of knowledge regarding anatomy and function of spinal cord in the pre training phase. Also this was controversy with

As regards to nurses' knowledge about spinal cord injuries. the present result showed that about three quarters of the nurses' under study had unsatisfactory level of knowledge regarding spinal cord injuries .This result is in the same line with **Ram and Avarachan (2021)** who reported that more than half of the study subjects had unsatisfactory level of knowledge regarding spinal cord injuries. While this result was disagreed with **Vorster (2023)** who revealed that majority of nurses had satisfactory knowledge.

As regards to nurses' knowledge regarding nursing care, the present result showed that nearly more than half of the nurses' under study had unsatisfactory level of knowledge regarding nursing care . This result may be due to that the majority of nurses under study had not attended training courses. This is controversy with **Mahrous Abdelhameed Mohammed, et al., (2022)** who reported that more than half of the study subjects had satisfactory level of knowledge regarding nursing care of patients with SCIs.

As regards to total knowledge of nurses about care of patients with spinal cord injuries, the study results showed that, more than two thirds of studied nurses had unsatisfactory total knowledge regarding care of patient with spinal cord injuries. This may reflect the importance of education program and training courses to enhancing and updating nurse's knowledge and performance regarding care of patients with spinal cord injuries. This finding was on the same line with **Ali et al. (2022)** who revealed that majority of studied nurses had unsatisfactory total knowledge .While this finding is contrary with **AlMarhoon, et al., (2018)** who revealed that majority had satisfactory knowledge due to their high education level.

Regarding the total level of practice, the present result showed that three fifths of the nurses' under study had unsatisfactory level of practice regarding care of patients 'with spinal cord injury. This finding was in the same line with **Ahmed et al., (2021)**, who showed that more than two thirds of studied nurses had unsatisfactory level of practice. Also, This

finding was in the same line with **Shehade et al., (2023)**,who showed that more than two thirds of studied nurses had unsatisfactory level of practice.

As regards to nurses' attitude regarding care for patients with spinal cord injuries ,the present result showed that about two thirds of the nurses' under study had positive attitude regarding care of patients 'with spinal cord injuries . This is in the same line with **Al-Othman et al.,(2018)** who showed that more than half of the nurses' under study had positive attitude. Also this result supported with **Vorster (2023)** who revealed that majority of nurses had positive attitude. This is controversy with **Afify et al., (2024)** who showed that more than half of the nurses' under study had negative attitude.

Regarding to the age of studied patients, the result of present study showed that more than two thirds of studied patients were less than 50 years with mean age 43.6years old. These results were matched with **Kim and Shin (2023)** who showed that mean age of patients was 43 years old . Also these results were matched with **Craig et al., (2017)** who showed that mean age of patients 42.6 years old. Also these results were matched with **Samuel et al., (2024)** who showed that mean age of patients 49.9 years old.

As regard to gender of patients, the current study results revealed that more than two thirds of studied patients were males. The possible reason for this is that the males are more exposed to this type of injury as the result of a car accidents or falls. This finding was on the same line with **Shalash and Mousa (2025b)** who clarified that more than half of studied patients were males. Also this finding was supported by **Kim et al.,(2021)** who clarified that more than half of studied patients were males.

As regard to marital status, results of the present study revealed that majority of patients in the study were married. This finding was on the same line with **Abu-Baker et al., (2021)** who clarified that more than half of studied patients were married. Also this finding was supported by **Yekaninejad et al., (2024)** who clarified that more than half of studied patients were married. Also this finding was supported by **Vural et al. (2020)** who reported that less than two thirds were married. This result was contrary with **Rashed AlBuwayni et al., (2021)** who revealed that more than half of studied patients were single.

As regard to residence, results of the present study revealed that more than half of patients in the study were living in urban. This finding was on the same line with **Elmadbouh et al., (2024)** who clarified that more than half of studied patients were urban. This was controversy with **Rahman et al. (2018)** who reported that less than two thirds of studied patients were rural.

As regards to educational status, results of the present study revealed that majority of patients were educated. This finding was on the same line with **Nirmala et al., (2020)** who clarified that majority of studied patients were educated.

As regards to monthly income, results of the present study revealed that more than half of patients had insufficient income. This fnding was on the same line with **Shalash and Mousa (2025a)**who clarified that more than half of studied patients had insufficient income.

As regards to patients' satisfaction regarding nursing care .The findings of the present study depicted that more than half of studied patients were satisfied. This finding is on the same line with **Sivakami and Kanitha (2021)** who revealed that majority of studied patients were satisfied. While this finding was contrary with **Dadoosh and Sadeq (2022)** who revealed that more than half of studied patients were unsatisfied.

As regards to correlation between the total knowledge and total practice ,there was a highly statistically significant positive correlation between the total knowledge and total practice scores of the studied nurses .These findings are similar to **AlMarhoon et al., (2018)** who

revealed that there was positive correlation between the total knowledge and total practice scores of the studied nurses. This was controversy with **Vorster., (2023)** who reported that there was no significant association between knowledge and practices.

As regards to correlation between the total knowledge and total attitude, there was a highly statistically significant positive correlation between the total knowledge and total attitude scores of the studied nurses .These findings are contrary to **Vorster., (2023)** who reported that there was no significant association between knowledge and attitude.

As regards to correlation between the total practice and total attitude. there was a highly statistically significant positive correlation between the total practice and total attitude scores of the studied nurses .These findings are contrary with **Tharu et al., (2022)** who reported that there was no statistically significant relation between nurses attitude and their practice.

As regards to correlations between nurses' knowledge, practice and their attitude, Results of the current study revealed that there was a statistically significant positive correlation between the total knowledge and total practice and total attitude scores of the studied nurses .These findings are similar to **Ahmed et al., (2021)** who found a statistically significant relationship between the nurses' knowledge and practice. Also this result was in the same line with **Ram and Avarachan (2021)** who revealed that there was a significant correlation among levels of knowledge, practice and their attitudes of staff nurses regarding emergency management of SCI patients.

Conclusion:

Based on the findings of the present study, it can be concluded that, there is lack of nurses' knowledge and practice regarding care for patients with spinal cord injuries. More than two thirds of studied nurses had unsatisfactory total knowledge, three fifths of nurses had unsatisfactory total practice, also less than two thirds had positive attitude regarding care of patients with spinal cord injuries. Regarding patients satisfaction, more than half of studied patients were satisfied. There was highly statistically significant positive correlation between total nurses' knowledge, total nurses' practice and total nurses' attitude. There was highly statistically significant correlation between the studied patients' satisfaction, total nurses' knowledge, total nurses' practice and total nurses' attitude.

Recommendations:

In view of the main results of the study the following recommendations were derived and suggested, training program are highly recommended to improve nurses performance regarding care of patients with spinal cord injuries, study should be replicated on large sample and in different setting in order to generalize the result.

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