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Bridging the Gap: Enhancing Open Fracture Care in Emergency Nursing

Menjembatani Kesenjangan: Meningkatkan Perawatan Fraktur Terbuka dalam Keperawatan Gawat Darurat

Ali A. Ahmed Al-Iedan, ali.al_iedan@uobasrah.edu.iq, (0)

Departement Orthopaedic Surgery, College of Nursing, University of Basrah, Iraq

Mohamad A. Akber, mohammed.almayyahi@uobasrah.edu.iq, (0)

Departement Orthopaedic, College of Nursing, University of Basrah, Iraq

Sundus Baqer Dawood, Sindus.dawood@uobasera.edu.iq, (0)

College of Nursing, University of Basrah, Iraq

Ahmed Ibrahim Habib Alobaidi, Ahmed.habib@uobasrah.edu.iq, (0)

Departement Orthopaedic Surgery, Alzahraa Medical College, University of Basrah, Iraq

Sajjad S. Issa, Sajjad.issa@uobasrah.edu.iq, (0)

College of Nursing, University of Basrah, Iraq

Husham Hussain Abdul Raoof, hosham.hussan@uobasrah.edu.iq, (0)

College of Nursing, University of Basrah, Iraq

Ahmed Ziarra Khalaf, ahmed.khalaf@uobasrah.edu.iq, (0)

College of Nursing, University of Basrah, Iraq

Ali Malik Tiryag, ali.malik@uobasrah.edu.iq, (1)

Fundamentals of Nursing Departments, College of Nursing, University of Basrah, Iraq

⁽¹⁾ Corresponding author

Abstract

This study assesses the knowledge and practices of emergency department nurses regarding the care of open fractures, highlighting significant disparities in competence. Conducted across five hospitals, the descriptive, cross-sectional survey included 103 nurses, analyzed using SPSS with results expressed through frequencies, percentages, and Chi-squared tests. Findings reveal that 42.7% of nurses, predominantly females, lack adequate knowledge and care skills, whereas 57.3%, mostly males, are proficient. The study suggests an urgent need for focused training programs to standardize and elevate emergency care for open fractures, aiming to improve patient outcomes through enhanced nursing education.

Highlights:

- Discrepancy in Knowledge: Significant variations in the knowledge and care practices

for open fractures among emergency nurses, with nearly 43% lacking sufficient skills.

- **Gender Differences:** A notable gender-based disparity in knowledge, with a higher proficiency observed among male nurses compared to female nurses.
- **Need for Training:** The urgent requirement for specialized training programs to address gaps and improve overall patient care in emergency situations.

Keywords: Open Fractures, Emergency Nursing, Knowledge Gap, Nurse Training, Patient Outcomes

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Introduction

Open fracture is an injury by which the fractured bone is visible outside the skin through a traumatic violation of the soft tissue and skin. The wounded skin may lie at a location distant to the fracture and not directly over it. Therefore, any fracture that has a concomitant wound should be considered open until proven otherwise. This activity clarifies the role of the professional caring team for patients with such type of fracture [1], [2].

This type of fractures (open fracture) observed as a result of trauma. These fractures most frequently occur due to high-energy injuries, as a low-velocity injury when the skin and soft tissue pierced by piece of fractured bone. Open fractures that were resulted from high energy are often accompanied by other emergency problems due to multiple injuries [3].

An incidence of 30.7 of open fracture among adults was reported by a 15-year epidemiologic review of, reports the incidence was 30.7 per 100,000 persons per year [4]. Road traffic accidents represent the common cause of such fractures, long bones of lower limbs fractures alone responsible for 34.1% of these injuries. Crushing trauma mostly associated with open fractures, The majority of open fractures occur in a single way, although these patients may have multiple fractures at the same time [5]. Usually the group of 45.5 years were mostly encounter in this type of injuries, despite that, the incidence declined in males and increases in females with same age group. The highest incidence of open fractures in males is between ages 15 and 19 years at 54.5 per 100,000 persons per year, while the highest incidence in females is at 53 per 100,000 persons per year between the ages of 80 and 89 years [6].

Those patient with open fracture usually presented to the causality department; however, patients with closed fractures may present to emergency department as well as to the outpatient department, open fractures are often serious and require proper management [7]. The nurses who practice in the emergency unites should have full knowledge about the care and solemnity of this injury and guarantee rapid controlling and transfer to an orthopedic specialist, and surgical approach are well customary in most emergency rooms to manage such kind of fractures [8]. The goal is to abate germs impurity of the wound and speedy management in the operating theaters. The upshots of open wound do diverge contingent on the severity of the injury magnitude, degree of uncleanness, the start of treatment and patient comorbidities [9]. Internal fixation gives rise to better results in most tibial fractures but in complicated types of injuries, external fixation endures to be the suitable choice for the management . With tremendous treatment, the risk of infection and non-union have also moderated . hence, most patients with open fractures are always linked to a lengthy recovery time require that's why most patients do progress some unwanted incapacity [10].

The foremost purposes of fractures care are, lessening pain by supporting the misshapen limbs, embrace osteomyelitis , decrease risk of neurovascular injury, and avoid deteriorating of abnormal curves in the spine and support in a preferred position in quick healing. Compartmental syndrome, cast syndrome and skin ulcers were the most significant complications encountered following cast application [11].

In order to have proper orthopedic treatment the nursing staff have to be capable and have the sufficient knowledge, skills and attitudes that will allow them to efficiently meet the requests of patients who have a musculoskeletal complications [12], [13]. Different factors play an important role in the caring of orthopedic patients which must includes; casts, supports, braces, medications, surgery, and subsequent rehabilitation therapy [14]. The new modality of orthopedic devices play a valuable role in restoring energetic mobility, lessening pain feeling, and refining the quality of life for patients with variable degree of disabilities that were resulted from such kind of fractures. Fracture management methods include a wide variety of devices including wires, pins, screws, plates, spinal fixation devices and artificial ligaments [15]. Doctors often make decisions about the using of casts and splints in the treatment of musculoskeletal diseases . Nurses who serves in orthopedic wards should have high index of suspicion regarding complication of ischemia, severity of pain, swelling at the site of injury, signs and symptoms of neurological deficit [16]. The pillow are sometime needed to achieve high elevation of the leg, after improving of blood circulation and swelling controlled the evaluation of limb can be gradually reduced. Their role complements that of parents. School teachers are actually the first respondent in cases of emergencies. They must be able to deal properly with medical traumas both in normal children, and those children with special health issues [17].

Method

Descriptive Cross-Sectional study, started from October 1st, 2021 until April, 20th, 2022. The study carried out at Emergency department in five Governmental Hospitals (Al-Sadr Teaching Hospital, Basra Teaching Hospital, Al-Mwana Teaching Hospital, Al-Faiha Teaching Hospital, and Al-Shifa General Hospital) in Basra city in Basra , southern of Iraq.

1. Sample of the Study: A Non-Probability (Convenience Sample)

Sample of 103 nurses working in Emergency department in Governmental hospitals in Basra city were selected. Structured questionnaire was used for the purpose of the data collection. The questionnaire consists of three parts prepared by researchers and then displayed to faculty members in the College of Nursing/University of Basra as experts to take their opinions and advices.

First part represents the demographic characteristics (Age, gender, level of education, training courses, Number of training sessions, duration of courses). The second part was related to Evaluation of nurse's knowledge about an open fracture (fractures definition, fractures diagnosis, fractures area, nursing planning, swelling and pain control, Care for the area open fractures). The third part was to assess nurse's attitude in dealing with the open fracture (life support system, cleaning the open fracture, stopping the bleeding, examining the vessels, dressing the wounds, giving antibiotics, giving tetanus, suturing the wounds).

2. Statistical Analysis

The collected data were fed in spss program version 26, the results expressed as frequencies and percentages. Chi-squared test was used to examine the relationship between nurse's knowledge about open fractures and use antibiotics and suturing wounds of open fractures. And to examine the relationship between nurse's knowledge about open fractures and level of education. A probability of less than 0.05 was considered to be statistically significant.

Results and Discussion

A. Results

Variables	Group	Male	%	Female	%
Age	20-30 year	7	6.7	22	21.3
	30-40 year	21	20.3	14	13.5
	40-50 year	28	27	3	3
	50-60 year	5	4.8	3	3
Education	Secondary nursing	31	30	25	24.2
	Diploma nursing	30	29	13	12.6
	College of nursing	1	1	3	3

Table 1. Distribution of Sociodemographic Characteristics of the nursing staff in the emergency department

The table showed that (27%) of male nurses were in the age groups of (40-50) year and (21.3%) of female nurses were in the age groups of (20-30) year. Regarding the educational level, (30%) and (29%) of them complete secondary and diploma nursing and (24.2%) and (12.6%) of female complete secondary and diploma nursing .

Variables	Group	Male	%	Female	%
Duration of service	1-10 years	17	16.5	29	28
	10-20 years	20	19.4	8	7.7
	20-30 years	21	20.3	3	3
	30-40 years	3	3	2	2
Number of training sessions	Secondary nursing	31	30	25	24.2
	Diploma nursing	30	29	13	12.6
	College of nursing	1	1	3	3

Table 2. Distribution of staff in the emergency department according to duration of service and number of training sessions

The table showed that the highest percentage (27%) of the study sample was in the age group of males (40-50) years. The highest percentage (30%) of the study sample graduated (high school nursing) While the highest percentage of the study sample (28 %) was in the period of service. The highest percentage (30%) of the study sample were those who participated in the training courses.

Knowledge	Frequency	%	Valid Percent	Cumulative Percent
Poor	44	42.7	42.7	42.7

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Good	59	57.3	57.3	100.0
Total	103	100.0	100.0	

Table 3. Distribution of the Nursing Staff in Emergency Rooms according to the levels knowledge scores

The table showed 44 of the study sample (42.7%) had poor knowledge in caring for the open fracture, While 59 (57.3%) of the nurses had good knowledge.

Gender	Level of knowledge		Total
	Poor	Good	
Male	2642%	3558%	61
Female	1843%	2457%	42
Tota	44	59	103

Table 4. The distribution of the sample according to gender and levels of knowledge

The table showed that 42% of males had poor knowledge and 58% had good knowledge , while 43% of females had poor knowledge and 57% had good knowledge.

Giving Antibiotics to Open Fracture	Knowledge of Nursing Staff In Emergency Department			X2	df	P
	Poor	good	Total			
YES First hour	40	46	86	3.064	1	0.080
Don't know	4	13	17			
Total	44	59	103			

Table 5. The Relationship between knowledge of nursing and the possibility of giving antibiotics to open fracture wounds in the first hour

The table showed that the reason significant relationship between knowledge of nursing staff in emergency department and the possibility of giving antibiotics to open fracture wounds in the first hour ($p>0.05$).

Education of Level	Knowledge of Nursing Staff in Emergency Department		Total	X2	df	P
	poor	good				
Secondary Nursing	24	32	56	1.182	2	0.390
Nursing Diploma	17	26	43			
College of Nursing	3	1	4			

Table 6. Distribution of the sample according to knowledge of nursing staff and level of education

Table showed that there is no significant relationship between knowledge of nursing staff in emergency department and level of education ($p>0.05$).

Nurses suturing open fractures	Knowledge of Nursing Staff in Emergency Department			X2	df	P
	poor	good	Total			
YES	6	9	15	0.192	2	0.909
Don'tknow	5	8	13			
NO	33	42	75			
Total	44	59	103			

Table 7. The relationship between knowledge of nursing staff and the possibility of suturing open fractures in emergency department

The table showed that there was no relationship between knowledge of nursing staff in emergency department and the possibility of suturing open fractures in emergency department

B. Discussion

The purpose of the study was to assess the knowledge of nurses about open fractures in Basra hospitals by ask them some questions , especially with regard to fractures definition ,risk factors, diagnostic tests, complications result from fractures, treatment options . The purpose of selecting nurses work in emergency department as study participants was that they are at the highest risk for deal with patients are exposed to traffic accidents and falls Andconsidering that the nurses is the first to provide health service to the patient in these circumstances.

The findings of present study revealed that (57.3%) of nursing staff have good knowledge about open fractures. The highest percentage (30%) of the study sample graduated from secondary nursing participated in the training courses is male and (24.2 %) of female graduated from secondary nursing participated in the training courses. (27%) of male was in the age interval of 40-50 year, showed that (21.3 %) of the sample was female in the age interval of 20-30 year, Showed that (13.5 %) of the sample was female in the age interval of 40-50 year, Showed that (20.3 %) of the sample was male in the age interval of 20-30 year . the result reflects (33.9%) of males

have good knowledge about open fractures and (23.3%) for females. While the knowledge rate was (weak) for males (25.2%) and for females (17.4%). (28%) of female has (1-10) years employment in nursing and (20.3%) of male has (20-30) years employment in nursing. (19.4%) of male nurses has (10-20) years employment in nursing.

In a study conducted in (2019) by Bashar R. Mohammed Ali among nurses to assess the knowledge regarding open fractures, he found-that (75%) of the study sample were within age group (19-27). (65%) of the sample were female and (45%) were male. Also he found that (55%) of the sample are technical institute,(32.5%) were Secondary nursing school. Regarding training (62.5%) are haven't training sessions in orthopedic wards. In regards to number of training sessions, (25%) of the study sample were had one training sessions in orthopedic wards. Regarding duration of training sessions (22.5%) is between one to three day. He found that highest percentage (80.0%) at Years of experience (<=1) years and lowest percentage (2.5%) more than (7) years.(9).

ThaniA.Radhi and Dr. Narmeen B. Tawfiq in 2016 surveyed 50 orthopedic nurses (both sex) who were working in orthopedic wards found that (42%) sample were within (30-39) years. (56%) of participants were male , in regarding the level of education, the study showed that more than half of them has nursing institute graduate (64%) and majority of them had (1-5) years of employment in their job (32%). The more than half of the sample has (1-5) years of experience in orthopedic ward (52%). results showed that Sharing in training session about fracture care the major of the study sample was equally between they have not share in training courses and who have (1-2 training courses) related to nurses intervention for orthopedic care (46%).Finally, concerning duration of training course the majority of study sample (59.3%) have (1-2 weeks).(10) From the foregoing, it is clear that the number of years of service has nothing to do with the nurses' knowledge of open fractures, as well as the knowledge of male nurses more than the knowledge of female nurses, the number of training sessions related to developing the skills of nursing staff working in emergency department. Some points can affect the knowledge level of nursing staff in emergency department about open fractures and dealing with them. The results reflect there is no significant relationship between knowledge of nursing staff in emergency department and level of education.

These results are similar to an Iraqi study (2001-2002) that states irrespective of their years of employment in the hospital, nurses has presented no significant comparative difference between number of years employment in the hospital with regards to their knowledge and practices . With respect to the nurses number of years' experience at the orthopedic wards did not affect their knowledge. But the present study revealed that there was significant comparison between the nurses years experience at the orthopedic wards relative to their practices. In addition to that showed that total number of training courses in orthopedic nursing had no impact up their knowledge and practices (11).

Our study were agreed with study do by Seham A. Abd El-Hay, Afaf Abdelaziz Basal and El-Said Mohamed El-Fors (2019) Regarding level of education showed that majority (62.8%) of nurses who are deplome had poor level of knowledge pre implementation of clinical pathway program, while (65.1%) of them had good level of knowledge immediate and one month later post implementation of clinical pathway.

Conclusions

The knowledge of nurses working at Emergency department in the management of open fractures is relatively high. They had positive attitude towards emergency management of open fractures. Nurses number of years' experience at the emergency room did not affect their knowledge.

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