Journal of Current Medical Research and Opinion
Received 02-05-2024 | Revised 03-05-2024 | Accepted 26-05-2024 | Published Online 27-05-2024

DOI: https://doi.org/10.52845/CMRO/2024/7-5-34 **ISSN (O) 2589-8779 | (P) 2589-8760**

CMRO 07 (05), 2655-2660 (2024)

Original Research

Assessment of Orthopedic Nurses' Knowledge Regarding Casting Measures in Mosul Hospitals

Waadullah M. Al-Soofy[1] | Dr. Bashar J. Al-Juwary[2].

[1]M.Sc. Student, Adult Nursing, Ministry of health, Nineveh Health Directorate, Iraq,
[2]assistant Professor, Orthopedic Surgery, Department of Adult Nursing, University of Mosul, Mosul, Iraq

Abstract:

Introduction: The main purposes of casting and fracture care are to provide support to injured joints, prevent joint injury, correct and support weak or deformed extremities, prevent worsening of abnormal curves in the spine, and support specific positions during healing. The objectives of the study are to assess nurses' knowledge regarding casting and managing fractures, and to determine the relationship between their knowledge and demographic characteristics such as age, gender, level of education, work location, training sessions, and years of experience in orthopedic wards.

Methods: A Descriptive study was carried out from November 2023 to February 2024 in Mosul hospitals to achieve the above objectives. A Non-Probability Sample of 35 nurses were included in the study, collected from orthopedic wards and casting units. Data was collected using a well-designed questionnaire consisting of two parts: part I included 7 items such as age, gender, level of education, previous training session, learning casting, work location, and years of experience in orthopedic wards, and part II included 48 items such as questions about anatomy, definition, types, treatment, and general information on fractures and casting. Descriptive statistics and Simple Linear Regression Model were used to analyze the data.

Results: The mean orthopedic nurses' knowledge score concerning casting and management of fractures was poor (45.4%).

Conclusion: The majority of the studied nurses had an unsatisfactory level of knowledge regarding casting and caring for fractured patients. Therefore, it is recommended to have regular mandatory in-service training programs for orthopedic nurses.

Key words: knowledge, orthopedic nurse, fracture, casting.

Introduction:

A fracture is a complete or incomplete disruption in the of bone structure and is defined according to its type and extent. Fractures occur when the bone is subjected to stress greater than it can absorb. Fractures may be caused by direct blows, crushing forces, sudden twisting motions, and extreme muscle contractions(1).

Fracture incidence is multifactorial and often complicated by such factors as the patient's age, sex, co-morbidities, lifestyle, physiological status, and occupation(2).

Cast immobilization is an effective, time-honored, management technique for postoperative immobilization and the treatment of fractures and other conditions. Appropriate, well-placed casts are the benchmark of care for most fractures. Cast immobilization, however, is not without complications, which range from minor inconveniences to more severe complications (such as compartment syndrome)(3). Complications associated with cast placement may be due to poor techniques and practitioner inexperience with placing or removing casts(4).

Casting techniques have come a long way from ancient Egyptian methods that used bark, linen, and bandages to cutting-edge innovations(5). Nurses are responsible for the care of patients with fractures. They provide care before the casting procedure, assist in applying the cast, or offer post-casting care(6).

Objectives of the Study:

1- To assess nurses ' knowledge regarding patient with fracture and cast.

2- To find out relationships between nurses' knowledge with their demographic characteristics of age, gender, level of education and years of experience in Mosul hospitals.

Method:

Between November 2023 and February 2024, a Descriptive study was carried out to assess the knowledge of nurses regarding the casting and management of fractures. The study aimed to explore the relationship between nurses' knowledge and their demographic characteristics. Before commencing the research, the Ethical Research Committee in the Nineveh Health Directorate granted official permission for the study to proceed. The study's objectives and procedures were explained to all participants, and their oral consent was obtained. The participants' rights to self-determination, confidentiality, and anonymity were emphasized and respected.

The study assessed the knowledge of orthopedic nurses working in the casting units and orthopedic wards of Mosul hospitals in Iraq. The inclusion criteria were all orthopedic nurses working in the casting units and orthopedic wards (35 nurses). Exclusion criteria involved nurses who do not work in casting units and orthopedic wards, nurses who refused to participate in the study, and nurses who participated in the pilot study.

To collect data, two tools were used: Part one included a socio-demographic data sheet, and part two included a closed-ended questionnaire format for knowledge assessment. The instruments were conducted using a five-point Likert Scale. The rating for knowledge ranged from 1-5 as follows: Poor=1, Acceptable=2, Good=3, Very good=4, and Excellent=5. The validity of the study tools and their content were verified by presenting them to a panel of thirteen (13) experts from different specialties. The questionnaire's internal consistency was determined using the Alpha correlation coefficient, and the internal consistency of the questionnaire in this study was (r = 0.816).

The data of the present study were analyzed using the Statistical Package of Social Sciences (SPSS) version 26. Descriptive statistical data analysis and the Simple Linear Regression Model approach were used.

Results:

Table (1) Socio-Demographic characteristics of the study sample:

Socio-Demographic, and General Health Characteristics					
Variable	Group	Frequency	Percentage	$\bar{X}$	$S.D$
Age	20-30 year	**4**	**11.4%**	**2.7**	**0.968**
	31-40 year	**12**	**34.3%**		
	41-50 year	**11**	**31.4%**		
	51+ years	**8**	**22.9%**		
	Total	**35**	**100.0%**		
Gender	Male	**35**	**100.0%**	**1.0**	**0.0**
	Female	**0**	**0.0%**		
	Total	**35**	**100.0%**		
Education level	Secondary school	**16**	**45.7%**	**1.8**	**0.833**
	Institute	**10**	**28.6%**		
	College	**9**	**25.7%**		
	Master's degree	**0**	**0.0%**		
	Total	**35**	**100.0%**		
Years of experience	1-10 year	**8**	**22.9%**	**2.51**	**1.095**
	11-20 year	**9**	**25.7%**		
	21-30 year	**10**	**28.6%**		
	31-40 year	**8**	**22.8%**		
	Total	**35**	**100.0%**		
Work place	AL-Jamhoory Hospital	**14**	**40.0%**	**1.89**	**0.832**
	Salam Hospital	**11**	**31.4%**		
	Mosul Hospital	**10**	**28.6%**		
	Total	**35**	**100.0%**		
How did he learn casting	Workshop	**0**	**0.0%**	**3.0**	**0.0**
	During study	**0**	**0.0%**		
	During work	**35**	**100.0%**		
	Other	**0**	**0.0%**		
	Total	**35**	**100.0%**		
Previous workshop	Yes	**1**	**2.9%**	**1.97**	**0.169**
	No	**34**	**97.1%**		
	Total	**35**	**100.0%**		

The table (1) shows the percentages and frequencies

According to the data, the age group of 31-40 years had the highest percentage of participants at 34.3%. The average for this age group was 2.7, with a standard deviation of 0.968 for the sample. Regarding gender, all participants in the sample were male, making up 100% of the sample.

In terms of educational level, the Secondary school category had the highest percentage at 45.7%. When it comes to years of experience, the highest percentage of participants (28.6%) had 21-30 years of experience. As for the workplace, AL-Jamhoory Teaching Hospital had the highest percentage at 40%. All participants in the study sample had learned casting during work. Only 2.9% of individuals had previous training courses in casting, while the remaining 97.1% did not have any previous training courses.

The average of scores obtained from the study sample for Knowledge

	Table (2) The average response scores
Knowledge	**45.4%**

Table (4), the average score of the studied sample for knowledge was **45.4** for the sample studied.

Relationship analysis between nurses' demographic variables and their knowledge

Table (3) Relationship analysis between nurses' demographic variables and their knowledge				
Independent variable	**Dependent variable**	**Estimate**	**S.E.**	**P**
Age	The total score	-0.568	1.757	0.749
education level		2.16	1.123	0.064
Years of service		0.175	1.597	0.914
place Work		1.737	0.922	0.069

Table (3) indicates that there is no significant effect of any of the demographic variables on participant**s'** knowledge.

Discussion:

The study findings in table (1) demonstrated that the age of the participants (n= 35) was at most from 31- 40 years old (34.3%). This result disagree with Putri et al., (2022) who found that all orthopedic nurses in their study aged from 26-45 years old(7). The study result also, disagree with S. Abdelhady. et al,. (2022) Who mentioned in their study that a large proportion of participants were in their third decade(8). The results of the present study table (1) demonstrated that all of the nurses in casting units and orthopedic wards in Mosul Hospitals were male (100%). This totally agrees with Adib-Hajbaghery M& Mokhtari R,.(2018) that all nurses in casting units are males(6)**.** This also, disagrees with B. Ali, (2019) who found that(65%) of orthopedic nurses are females(1)**.** Considering the educational level of the participants, about (45.70%) hold a Secondary nursing school's degree. This result is consistent with Mohsin & H. Atiyah, 2016 that found 52% of participants hold a nursing secondary graduate's degree(9). This result also, disagree with Mohamady Mohamed et al.,(2020) that the majority of studied nurses had a diploma degree in nursing science(10).

Considering the experience of the participants, about (28.6%) of the nurses had (21-30 years) of experience. This results disagree with Zghair & Atiyah, (2021) who found that (52%) have 1-3 years of experience(11)**.** Considering learning casting, the present study shows that all of the orthopedic nurses learned casting during work not while studying nor training courses. This result agree with Abou El Enein NY., et al (2012) study results found that 97.5% of orthopedic nurses learned casting during work(12). The present study shows that (97.1%) of nurses did not participate in any training sessions concerning care of fractures. **Al-Barwari,(2006)** study finding agree this result through that (95%) of the involved nurses had no training courses in orthopedic in Duhok(13).

Regarding total score of knowledge study revealed that there was lowest percentage of total knowledge (45.4%). This finding supported by Saad ESS., et al (2020) whose result revealed that the studied sample had poor total knowledge score(14).

The study finding reveals that there was no statistically significant relationship between participants' knowledge and their age. These results demonstrated by A. M. S. Mahmoud et al., (2016)**,** on 40 participants In Egypt who mentioned that there was no statistical significant relationship between age and participants' knowledge(15). The study finding shows that there was no statistical significant difference between participants' knowledge and their level of education. These results disagree with Mahdi & Ahmed, (2018) that found there is statistically significance between participants' knowledge and their level of education(16). These results also, disagree with Peng et al., (2020) that found there is statistically significance relationship between participants' knowledge and their level of education(17). The study finding shows that there was no statistical significant relationship between participants' knowledge and their experience years. These results agree with Gourgees, (2005) in Iraq. It was found that there is no relationship between participants' knowledge and their years of experience(18). These results also agree with Khudhayer & Atiyah, (2019) that there is no relationship between participants' knowledge and their years of experience(19). The study finding shows that there was no statistical significant relationship between participants' knowledge and place of work. This results agree with Gouda et al., (2023) that there was no statistical significant relationship between participants' knowledge and place of work(20)**.**

Conclusion:

This study found that the orthopedic nurses' knowledge regarding pre-, intra-, post-casting, and post-cast removal care was inadequate or deficit. Nurses' knowledge was particularly lower in the care measures related to post-cast removal.

Recommendations:

Providing Regular and mandatory in-service workshops and training programs for orthopedic nurses are recommended to improve their knowledge regarding casting and fractures.

Ethical Approval:

This study was approved by the Scientific and Ethical Committee for Graduate Studies at the College of the Nursing/University of Mosul, the Collegiate Committee For Medical Research Ethics at the University of Mosul, and the Ethical Research Committee in the Nineveh Health Directorate.

Acknowledgement:

For all volunteered to participate in the study.

Conflict Of Interests:

Authors have declared that no conflict of interests exist.

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