Journal of Current Medical Research and Opinion
Received 08-05-2024 | Revised 09-05-2024 | Accepted 04-06-2024 | Published Online 02-06-2024

DOI: https://doi.org/10.52845/CMRO/2024/7-6-2 ISSN (O) 2589-8779 | (P) 2589-8760

CMRO 07 (06), 2706-2714 (2024)

Original Research

Nurse's Management about Cast Care in Pediatric Hospital

Zead Qasem Mohamad, MSsN[*,1] | Dr. prof, Khatam M. Al-Musawi[2]

[1]Pediatric Nursing Department, College of Nursing, University of Baghdad
E-mail: Zeyed.qasem2204m@conursing.uobaghdad.edu.iq

[2]Dr.prof, Pediatric Nursing Department, College of Nursing, University of Baghdad,
E-mail: Khitam.mutashar@conursing.uobaghdad.edu.iq

Abstract:

Objectives: To determine the relationship between the management of nurses and their demographic characteristics, and to evaluate the performance of nurses in the emergency department regarding splint care for children.

Methodology: Use a descriptive approach, to determine the relationship between nurses' management and their demographic characteristics, the management of nurses in the emergency department regarding splint care for children was evaluated.

Non-probability (purposive) sampling was applied to 50 nurses to select the research sample from three hospitals (emergency department) units for the period from January 1 to March 1. Data were collected using a pre-developed questionnaire and formal consent was obtained from the original author for the use of the study questionnaire. Data were analyzed using the descriptive statistical package for the social sciences.

Results: The results showed that there is a statistically significant relationship between the nurses' performance and their participation in training courses at P = .023, while there is no relationship between the nurses' performance and their qualifications, ages, marital status, and years of service in nursing. The results also showed the nurses' performance regarding nursing care for splint application.

Conclusions: Adherence to Protocols, some nurses are not adherent to established protocols and guidelines for the application and care of splints in pediatric patients.

Recommendations: The study recommended involving nurses working in emergency units in courses on fractures and splint care, and building a periodic evaluation form for the nursing staff working in emergency units.

Keywords: nurses, management, cast care, children.

Copyright: ©2024 The Authors. Published by Publisher. This is an open access article under the CC BY-NC-ND license (https://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction:

The cast is a common orthopedic procedure used to fix and hold anatomical components, notably a broken bone in place until healing is confirmed, in place. It is often made of either a moist roll of plaster of pairs or fiberglass materials (1).

Casts are used to maintain the alignment and safety of the bones and soft tissues as they heal. A cast that completely encircles the arm or leg and is made especially for the patient. Only a skilled cast saw can get rid of it. Casts can aid in ensuring the safety of surgical wounds as they recover. For the hard, immovable element, fiberglass or plaster are typically used to create custom castings (2).

The cast is softened opened or valued in scenarios where posttraumatic edema is predicted in an effort to reduce probable side effects of an extremely tight cast, with compartment syndrome being the most clinically severe (3).

The early detection of cast complications during patients' stays in hospitals with fractures is the responsibility of nurses, who play a significant part in their prevention. She should check the patient's skin for any significant issues and advise them to obtain all necessary measurements to avoid cast-related concerns (4).

Skin breakdown, pressure sores, discomfort or pain at the cast site, skin inflammation, edema, and joint stiffness are the most frequent cast-related problems in children. Loss of range of motion (ROM), muscular atrophy, and decreased circulation are some hazards connected with casting. Casts are applied as part of treatment, and mothers are encouraged to check the casts regularly in order to spot problems before they become serious and care for their infants at home (5)

Interview of cast:

Casts are used to keep the bones and soft tissues lined up and protected while they are healing. A cast wraps completely around the arm or leg and is custom-made for the patient. It can only be taken off with a specialized cast saw. Casts also protect wounds after surgery while it heals. The hard, immobile part of most custom made casts is made from plaster or fiberglass (5).

Since plaster of Paris bandages were originally used in the 19th century, their properties have remained largely unchanged. Plaster is still very common since it is affordable, non-irritating, and simple to use. According to AJ Steele's 1893 article on the application of plaster of Paris in orthopedics, "Plaster's value is derived from its rapid hardening property once it becomes wet." It also has advantages in terms of affordability and ease of use; it is always ready, simple to prepare, and easy to use. (6)

One tool for immobilization is a cast. Plaster of Paris, fiberglass, and plastic are examples of cast materials. They are all packaged in rolls that are applied similarly to how an Ace bandage is. Casts made of plaster are bulky, dry slowly, and break easily if they become wet. Although casts made of fiberglass and plastic are inexpensive and have the potential to macerate underlying flesh, they are lightweight, dry rapidly, and may be submerged in water and dried again. Typically, a physician oversees and directs a certified orthopedic expert who applies casts (7).

A nurse maintains a record of patient treatment through a procedure known as nursing documentation. The use of precise, specified nursing documentation as evidence of the scope and standard of care that nurses should give the results of that care, as well as any therapy and training, is important in the field of nursing. (8).

Even in diabetic individuals with chronic neuropathy, most fractures are painful and only very rarely are they painless. The majority of these fractures are in the Charcot and occasionally in the Lis franc joints of the feet. (9)

Compartment syndrome is a serious complication brought on by a cast that is either tight or too hard that squeezes a swollen limb. When the cast's internal pressure increases, it can cause harm to the cast-covered area's muscles, nerves, or blood vessels. If proper care is not taken with the treatment options, some complications may occur, including a problem with the circulation system (not enough blood is circulating and there is also nerve impairment), the lengthy drying time (24–48 hours), its weight, the development of pressure sores inside the cast as a result of subpar casting procedures, and cracking of the edges (5).

They can be particularly helpful for family doctors working in emergency rooms, for temporary management in the field, or in any situation where It is necessary to have safe transportation for decisive therapy (10).

nurses are regarded as the primary healthcare professionals, they have a significant impact on preventing serious plaster casting issues, encouraging quick recovery, and assuring patient safety (11).

Despite the high rate of fractures and the widespread use of casting in fracture patients, little research has been done on cast care, and the quality of cast treatment has been overlooked. Excellence. There are several studies on the standard of treatment provided to patients with traction-related infection problems linked to the implantation of casts or splints in children. (12)

Risk Factors for cast:

Children frequently suffer displaced distal radius fractures, which are frequently reduced if necessary and immobilized in a cast. Nevertheless, fracture displacement happens often. Fixing fracture fragments with K-wires can prevent this, although there are currently no established protocols for primary K-wire fixation treatment. The goal of this meta-analysis was to determine Children's displaced distal radius fractures risk factors for displacement reduction and cast immobilization, and identifying which ones will most benefit from main supplementary K-wire fixation. (13)

Method:

Design of the Study: A descriptive study design was carried out in order to achieve the objectives of the study.

The Sample of the Study: A non-probability (purposive) sample of (50) nurses were selected from emergency department in a Tarmiya General Hospital, Al-Karkh General Hospital, and Al-Karama Teaching Hospital

Ethical considerations:

Prior to collecting data, participants signed a consent form, which was approved ethically by the Scientific Research Ethical Committee at the University of Baghdad College of Nursing.

Data collection: Data were collected through the use of a questionnaire by means indirect interview with nurses from the December 14th, 2023, until the April 5th, 2024.

The Study Instrument: A questionnaire demographic data prepared previously by (Ahmad et ai.,2016). was utilized after obtaining the official authors' permission.

The validity and reliability of study instrument A group of 18 experts, each possessing over five years of experience in their respective fields, deliberated on the validity questioner. of the questionnaire was. which was acceptable to be used in this research. This part is a checklist scale consisting of (29) items that include the nurse's performance on pediatric cast care. Items included related to child care during casting, immediate nursing management, and follow-up care to prevent complications from being observed. This scale was modified from (the World Health Organization standard in 2010), which recorded sufficient validity and reliability. Domain permission was obtained from previous data collection by the World Health Organization and Scribd location(https://www.scribd.com)

Statistical data analysis: Descriptive statistics and SPSS were used to examine the data.

Results of the Study:

Table (3-1): Distribution of Nurses according to their Socio-demographic Characteristics

List	Characteristics		f	%
1	Nursing qualification	Secondary school	5	10
		Nursing school	8	16
		Diploma	23	46
		Bachelor	14	28
		Total	*50*	*100*
2	Age (year)	20 – less than 30	22	44

	M±SD= 35.5 ± 10	**30 – less than 40**	**12**	**24**
		40 – less than 50	**9**	**18**
		50 and more	**7**	**14**
		Total	***50***	***100***
3	**Marital status**	**Unmarried**	**18**	**36**
		Married	**32**	**64**
		Total	***50***	***100***
List	**Characteristics**		**f**	**%**
4	**Years of service in nursing**	**1 – less than 6**	**14**	**28**
		6 – less than 11	**12**	**24**
		11 – less than 16	**8**	**16**
		16 – less than 21	**4**	**8**
		21 and more	**12**	**24**
		Total	***50***	***100***
5	**Participation in training courses**	**No**	**27**	**54**
		Yes	**23**	**46**
		Total	***50***	***100***

***f:* Frequency, %: Percentage, M: Mean, SD: Standard deviation**

The analysis in table 3-1 shows that 46% of nurses are graduated with diploma degree in nursing while 28% of them are graduated with bachelor degree in nursing. The average age for nurses refers to 35.5± 10 years, in which that 44% of them are seen with age group of 20 – less than 30 years. The marital status reveals that 64% of nurses are married and 36% of them are still unmarried. The years of service in nursing refer 1-less than 6 years among highest percentage of nurses (28%) and 24% with 6-less than 11 years of service in nursing. Regarding participation training in courses about cast care, 46% of nurses are reported that they participated in training cources.

Table (3-2a): Evaluation of Nurses' management about "Preparation Equipment for Cast Care" (N=50)

List	**Content Preparation**	**Observation (3)**		
		M	**SD**	**Eval.**
1	**Explain the purpose and steps of procedure to the child patient**	**1.32**	**.683**	**Fair**
2	**Prepare the needed materials and equipment.**			
a	**casting materials**	**3.00**	**.000**	**Good**
b	**plaster rolls**	**3.00**	**.000**	**Good**
c	**tubular stockinet**	**3.00**	**.000**	**Good**
d	**plaster splints**	**3.00**	**.000**	**Good**
e	**bucket of water**	**3.00**	**.000**	**Good**
f	**rubber pad**	**3.00**	**.000**	**Good**
g	**wadding sheet**	**3.00**	**.000**	**Good**
h	**elastic bandage /gauze**	**3.00**	**.000**	**Good**

M: Mean (Poor = 0 – 1, Fair = 1.1 – 2, Good = 2.1 – 3), SD: Standard Deviation, Eval: Evaluation

This table presents the nurses' management regarding preparation content and equipment for cast care; the findings indicate that nurses show good performance regarding preparation equipment during three observations.

Table (3-2b): Evaluation of Nurses' management about "Preparation Equipment for Cast Care" during Three Observations

Level	f	%	M	S.D	Eval.
Poor	0	0	25.32	.683	Good
Fair	0	0			
Good	50	100			
Total	*50*	*100*			

f: Frequency, %: Percentage, M: Mean of total score, SD Standard deviation of total score, Eval: Evaluation, Poor= 0 – 9, Fair= 9.1 – 18, Good= 18.1 – 27

This table presents nurses' management about content preparation for cast care; the findings reveal that nurses show good level of performance over three observations (100%)

Table (3-3a): Evaluation of Nurses' management about "Nursing Care for Cast Application" during Three Observations (N=50)

List	Content Preparation	Observation (3)		
		M	SD	Eval.
1	When applying a cast for children or preschoolers, use dolls or puppets to demonstrate and explain to the child the reason why he is being placed on a cast.	.66	.479	Poor
2	Assess the extremity for lesions, wounds, etc.	2.08	.695	Good
3	Make sure the stockinet is well fitted over the wrist for petalling.	2.00	.857	Fair
4	The water should be lukewarm, because cold water when applied hardens the cast quickly and warm water when applied burns the skin of the client.	.40	.495	Poor
5	Ensure that there are no bubbles.	1.42	.758	Fair
6	Squeeze the excess water.	2.50	.505	Good
7	Pull over the cast the stockinette. This prevents crumbling and protects the skin against the edge of the cast.	2.44	.501	Good
8	Smoothen the last layer	1.82	.523	Fair
9	Use the palms of the hands to handle the cast because the fingers cause indentations that can lead to acute Compartment syndrome.	1.88	.799	Fair
10	Place the cast over a pillow with pillow case. Never place it on a table or chair because it can cause acute Compartment syndrome.	.48	.505	Poor

M: Mean (Poor = 0 – 1, Fair = 1.1 – 2, Good = 2.1 – 3), SD: Standard Deviation, Eval: Evaluation

The table 3-3a presents the nurses' management regarding nursing care for cast application; the findings indicate that nurses show fair to good performance regarding nursing care for cast application of three observations.

Table (3-3b): Evaluation of Nurses' management about "Nursing Care for Cast Application" during Three Observations

Level	f	%	M	S.D	Eval.
Poor	**1**	**2**	**15.68**	**2.132**	**Fair**
Fair	**49**	**98**			
Good	**0**	**0**			
Total	***50***	***100***			

f: Frequency, %: Percentage, M: Mean of total score, SD Standard deviation of total score, Eval: Evaluation Poor= 0 – 10, Fair= 10.1 – 20, Good= 20.1 – 30

This table presents nurses' management about nursing care for cast application; the findings reveal that nurses show fair level of performance regarding nursing care for cast application over three observations (98%).

Table (3-4a): Evaluation of Nurses' management about "Nursing Assessment for Client with Cast" during Three Observations (N=50)

List	Nursing Assessment for Client with Cast	Observations (3)		
		M	SD	Eval.
1	**Check the color (should be pinkish), Temperature (should be warm), movement, and sensation of all toes or fingers exposed from the cast at least two times a day. If infection is present you can observe unpleasant odor, pain, and the skin is febrile. Teach the Client on the use of assistive devices like cane or crutches.**	**2.10**	**.678**	**Good**
2	**Neurovascular Checks. The nurse shall perform neurovascular checks as ordered by the physician or as dictated per unit policy, but no less than every four hours. Appropriate documentation shall be recorded on the Neurovascular Flow Sheet (SN 1059) 0r Unit Specific Flowsheet. Including: Sensation, Temperature Movement, and Distal perfusion**	**.50**	**.505**	**Poor**
3	**Remove scaly dead skin carefully by soaking and do not scrub.**	**2.02**	**.654**	**Good**
4	**Move the extremity carefully, except: Discomfort, weakness, decreased Range of Motion.**	**1.80**	**.728**	**Fair**
5	**Support the extremity with pillows or orthotic device until strength and movement return.**	**1.62**	**.830**	**Fair**

M**: Mean (Poor = 0 – 1, Fair = 1.1 – 2, Good = 2.1 – 3), SD: Standard Deviation, Eval: Evaluation**

The table 3-4a presents the nurses' management regarding nursing assessment for client with cast; the findings indicate that nurses show fair to good performance regarding nursing assessment for client with cast of three observations.

Table (3-4b): Evaluation of Nurses' management about "Nursing Assessment for Client with Cast" during Three Observations

	Test 1				
Level	**f**	**%**	**M**	**S.D**	**Eval.**
Poor	**2**	**4**	**8.04**	**1.324**	**Fair**
Fair	**48**	**96**			
Good	**0**	**0**			
Total	***50***	***100***			

f: Frequency, %: Percentage, M: Mean of total score, SD Standard deviation of total score, Eval: Evaluation Poor= 0 – 5, Fair= 5.1 – 10, Good= 10.1 – 15

This table presents nurses' management about nursing assessment for client with cast; the findings reveal that nurses show fair level of performance regarding nursing assessment for client with cast over observations (96%).

Table (3-5a): Evaluation of Nurses' management about "Discharge Teaching for Client with Cast" during Three Observations (N=50)

List	**Discharge Teaching for Client with Cast**	**Observations (3)**		
		M	**SD**	**Eval.**
1	**Elevate the casted Extremity.**	**1.66**	**.593**	**Fair**
2	**If the Client is experiencing itchiness, never place or use ball pens to scratch the itchy part. Instead, use ice pack for itchiness.**	**.54**	**.503**	**Poor**
3	**Use damp cloth to wipe the cast if it is dirty**	**.50**	**.503**	**Poor**
4	**Wrap the cast with plastic if bathing or it is raining**	**2.32**	**.593**	**Good**

M: Mean (Poor = 0 – 1, Fair = 1.1 – 2, Good = 2.1 – 3), SD: Standard Deviation, Eval: Evaluation

This table presents the nurses' management regarding discharge teaching for client with cast; the findings indicate that nurses show poor to fair performance regarding discharge teaching for client during three observations.

Table (3-5b): Evaluation of Nurses' management about "Discharge Teaching for Client with Cast"

Level	**f**	**%**	**M**	**S.D**	**Eval.**
Poor	**16**	**32**	**5.02**	**1.115**	**Fair**
Fair	**34**	**68**			
Good	**0**	**0**			
Total	***50***	***100***			

during Three Observations

f: Frequency, %: Percentage, M: Mean of total score, SD Standard deviation of total score, Eval: Evaluation

Poor= 0 – 4, Fair= 4.1 – 8, Good= 8.1 – 12

This table presents nurses' management about discharge teaching for client with cast; the findings reveal that nurses show fair level of performance regarding discharge teaching over three observations (Observations)

Discussion:

Table (1) results showed that the study sample's (nurses') mean age was35.5± 10 years, this finding is consistent with another study which found that the nurses' mean age was (26 + 4.056) years (7.). In a descriptive study conducted at Mosul Teaching Hospitals to evaluate nurses' expertise in caring for children receiving ventricular peritoneal shunt treatment, the findings indicate that nearly (14). The research sample's marital status was marital for 64% of the participants. In order to ascertain the perceived intensive care unit nurses, have in relation to pressure ulcer prevention, a descriptive cross-sectional study design on 89 nurses in trauma intensive care units. The results of this study showed that 48.7% of the nurses were single (15). however, 46% of those surveyed in this study hold a diploma degree in nursing. This conclusion is corroborated by a previous study, which reports that 64% of the participants completed their nursing diploma (16). In relation to the experience of nurses, the current study found that their average years of nursing experience was 5.1 years, and their average years ER experience was 3.03 years. The findings of the subsequent studies support this conclusion: This result was supported by a pre-experimental study design conducted in the emergency department of Hospitals in Baghdad city. Of the participants, 43.8% had one to five years of experience, and 87.5% had experience (17). Moreover 40 nurses who work at Misan Children's Hospital participated in a descriptive cross-sectional study. Of the study participants, 55% had between one and five years of experience in the nursing field (18). This result similar to that found in other study applied in Iraq the majority of the nurses' participants in the present study on both study and control groups are in the age group from (20 -29) years in Iraq (19).

Conclusion:

1. Adherence to Protocols: Some nurses are not adherent to established protocols and guidelines for the application and care of splints in pediatric patients.
2. Efficiency and skill: Most nurses did not properly apply splint casting techniques and monitor immediate complications.
3. Communication with patients and their families: Communication was ineffective with children and their families regarding splint care instructions, potential complications, and follow-up appointments.
4. Pain management: The use of appropriate measures to relieve pain is not adequate, including the use of toys to relieve stress in children undergoing orthopedic procedures.
5. Teamwork and cooperation: Lack of cooperation with other specialties, such as doctors, physical therapists, and child life specialists, which leads to not providing comprehensive care for children who undergo orthopedic procedures.
6. Recommendations: The study recommended involving nurses working in emergency units in courses on fractures and splint care, and building a periodic evaluation form for the nursing staff working in emergency units.

References:

1. Ahmed AM, Hussein HA. Nurses knowledge toward cast complications in orthopedic ward at Al-Najaf AL-Ashraf hospitals. Int J Sci Res Publ. 2016;6(7):94-100.
2. Alnaser H. Evaluation of Job Satisfaction among Nurses Working at Primary Health Care Centers in Samawa City. Iraqi National Journal of Nursing Specialties. 2023;35(2):1–7.
3. Kad m, H. (2012). Evaluation of nurses' practices toward orthopaedic wound infection. Iraqi national Journal of nursing Specialties, 25(3), 58-70. Hi

4. Burhan MH, Hattab KM. Effectiveness of Health Educational Program on Nurses' Knowledge Concerning of Developmental Hip Dysplasia at Al-Wasiti Teaching Hospital in Baghdad City. Indian Journal of Public Health Research & Development [Internet]. 2019;10(10):1835. Available from: http://www.indianjournals.com/ijor.aspx?target=ijor:ijphrd&volume=10&issue=10&article=357
5. Radhi TA, Tawfiq NB. Assessment of Postoperative Nurses' practices Concerning Care of Fracture Treated by External Fixation. Kufa Journal for Nursing Sciences. 2016;6(1):24–32
6. DeMaio, M., McHale, K., Lenhart, M., Garland, J., McIlvaine, C., & Rhode, M. (2012). Plaster: our orthopaedic heritage: AAOS exhibit selection. JBJS, 94(20), e152.
7. Mirshekari L, Tirgari B, Forouzi MA. Intensive care unit nurses' perceived barriers towards pressure ulcer prevention in South East Iran. Journal of Wound care. 2017 Mar 2;26(3):145-51.x
7. Isam SR. Nurses' knowledge concerning the management of bleeding in patients with leukemia. Indian Journal of Forensic Medicine and Toxicology. 2020;14(3):907–12.
8. Tuoma N. Evaluation of Quality of Nursing Care Services Provided to Children under Five Years Based on Integrated Management of Child Health at Primary Health Care Centers in Baquba City. Iraqi National Journal of Nursing Specialties. 2021;34(1):1–10.
9. Thompson, D., Leach, M., Smith, C., Fereday, J., & May, E. (2020). How nurses and other health professionals use learning principles in parent education practice: A scoping review of the literature. Heliyon, 6(3).
10. Resham AK, Qassem WJ, Mohammad WJ. Evaluation Nurses' Knowledge and Attitudes about the Prevention of the Coronavirus Disease 2019 at Emergency Units in Government Hospitals in Baghdad city / Iraq. Kufa Journal for Nursing Sciences. 2021;11(2):17–29.
11. LEAL, Soraya Coelho; RIBEIRO, Ana Paula Dias; FRENCKEN, Jo E. Caries Assessment Spectrum and Treatment (CAST): a novel epidemiological instrument. Caries research, 2017, 51.5: 500-506.
12. Difazio RL, Harris M, Feldman L, Mahan ST. Reducing the incidence of cast-related skin complications in children treated with cast immobilization. Journal of Pediatric Orthopaedics. 2017 Dec 1;37(8):526-31.
13. Majeed HM, Hassan AF, Jasim AH, Al-Ganmi AHA. Evaluation of Nurses' Practices and Perceived Barriers Related to Pain Assessment in Critically Ill Patients at Baghdad Teaching Hospitals. Azerbaijan Pharmaceutical and Pharmacotherapy Journal. 2023;22(1):64–9.
14. Naji BA, Jasim AH, Moussa AM. Nurses' knowledge regarding prevention of surgical site infections at baghdad cardiac centers and hospitals. Indian Journal of Forensic Medicine and Toxicology. 2020;14(2):1461–6.
15. Fadhil SN, Fadhel SN. Evaluation of Baghdad University Females Student's Knowledge about Cervical Cancer and Effect of Antioxidants Vitamins on its Occurrence. AIP Conference Proceedings. 2023;2414(February).
16. Upadhyaya, R., & Barman, H. (2020). Effectiveness of Structured Teaching Programme on self-care of Plaster of paris casted limb among patients with Lower Limb Fracture. Asian Journal of Nursing Education and Research, 10(4), 439-444.
17. Haitham I, Faris H, Baker H. Evaluation of Nurses Practices Concerning Sterile Techniques Critical Care Units in Al-Najaf AL-Ashraff City Hos. International Journal of Scientific and Research Publications [Internet]. 2016;6(6):694. Available from: www.ijsrp.org