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Nurses' Knowledge Regarding Cast Complications of Limb Fractures: A Cross-Sectional Study

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Abstract: The purpose of the cast is to hold the fractured bone in place so that it cannot move while it heals and to provide solid protection to the injured bone or joint. For their role in clinical practice, orthopedic ward nurses need to be sufficiently knowledgeable about the fundamentals of cast problems. Knowing the scientific underpinnings of cast problems is essential to providing nursing care for patients experiencing them. The objective is to identify nurses' knowledge regarding cast complications of limb fractures. A cross-sectional (descriptive) research on nurses' knowledge was carried out about cast complications of limb fractures in Al-Basrah Hospitals. Non-probability (convenience) sample was composed of (150) nurses. The study sample consists of 150 samples from five hospitals (Al-Sader Teaching Hospital, Al-Basrah Teaching Hospital, Al-Mawani Teaching Hospital, Al-Fayhaa Teaching Hospital, and Al-Shifaa Hospital) in Al-Basrah Governorate. The questions were answered self-reported by the nurses. The period of the study started from the 12th of August to the 12th of March. The results of our study showed that the largest percentage of nurses (72.6%) have good knowledge about cast complications of limb fractures, (26.6%) of nurses have moderate knowledge and only (0.6%) have poor knowledge. Most nurses have good knowledge regarding cast complications of limb fractures.

Keywords: Nurses, Knowledge, Cast Complications, Limb Fractures

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1. Introduction

Bone fractures are a major worldwide health concern that may cost people dearly on an individual, family, and community level. They can also result in diminished health, disability, worse quality of life, absenteeism, and decreased productivity [1]. According to the World Health Organization, there are 14 fractures per 10,000 people worldwide each year. Arm, lower limb, and other fractures account for 26%, 14%, and 5% of all fractures, respectively. Among all fractures, lower limb fractures are the most prevalent type [2].

For thousands of years, people have immobilized injured limbs. Before the widespread usage of contemporary casting materials, stiff molds were created using a variety of materials. Simple wooden splints have given way to plaster of Paris, fiber, and soft casts over the ages for immobilization [3]. The method for treating fractures that is most frequently employed in casting [4]. In addition to immobilizing fractures, casts are used to protect wounded limbs and reduce discomfort [5]. Casts are frequently used as a standard orthopedic therapy for a variety of musculoskeletal disorders and severe injuries. Plastering technicians, nurses, residents, and orthopedic doctors often cast and remove casts [6].

While casting is a kind of therapy, complications may arise [7]. Although they are uncommon, significant cast and splint issues can be more dangerous than many doctors realize [8].

During the application of the cast, immobilization, and cast removal, complications may arise. Deep vein thrombosis (DVT) [9], Soft-tissue injuries, venous injuries, skin injuries, including cast-saw injuries, skin rashes, compartment syndrome, thermal burns (from utilizing hot water or hot materials), and pressure sores (from inappropriate or inadequate padding) are a few of them [6]. Rarely, infections may also develop when casts and splints are applied, but if ignored, they can have a serious negative impact on morbidity and mortality [8]. By carefully examining the damaged region and, if required, removing the cast or splint, many of these consequences can be quickly detected, avoided, or treated [8]. This study aims to assess nurses' knowledge regarding cast complications of limb fractures.

2. Materials and Methods

A cross-sectional (descriptive) research on nurses' knowledge was carried out regarding cast complications of limb fractures in operating rooms, emergency departments, and orthopedic departments in five hospitals (Al-Sader Teaching Hospital, Al-Basrah Teaching Hospital, Al-Mawani Teaching Hospital, Al-Fayhaa Teaching Hospital, and Al-Shifaa Hospital) in Al-Basrah Governorate. Non-probability (convenience) sample was composed of (150) nurses. The period of the study started from the 12th of August to the 12th of March. The questionnaire contains two parts; The first part consists of 4 items related to the demographic data of nurses: age, gender, educational level, and number of years of experience. The second part of the questionnaire consisted of 20 questions related to assessing nurses' knowledge about complications of casting for extremity fractures. The researchers use a points Likert scale which ranges from 1 up to 3. Yes giving 3, Uncertain taking 2, and 1 for No. The researcher classified the level of knowledge according to the Mean Score and cutoff point (0.66), poor = 1-1.66, moderate = 1.67-2.33, and good = 2.34-3. Ten experts gave a copy of the questionnaire to determine its validity. Alpha Cronbach test was used to determine the reliability of the questionnaire ($\alpha = 0.79$).

3. Results

According to Table 1 which describes the demographic data of the nurses, the results of the present study show more than half of nurses are female with percentage (50.7%), most of the nurses are aged between 20 and 30 years (60%), more than one-third of nurses have a baccalaureate degree (38.7%), and more than one-third of nurses have more ten years of experience (36.7%).

Table 2 describes the level of nurses' knowledge regarding cast complications of limb fractures. The findings of our study showed that the largest percentage of nurses (72.6%) have good knowledge about cast complications of limb fractures, (26.6%) of nurses have moderate knowledge and only (0.6%) have poor knowledge.

Table 1. The demographic data of nurses

Variable			Frequency	Percentage
1	Gender	Male	74	49.3%
		Female	76	50.7%
		Total	150	100%
2	Age	20-30	90	60%
		30-50	60	40%
		Total	150	100%
3	Level of Education	Nursing School	37	24.6%
		Diploma	55	36.7%
		Bachelor	58	38.7%
		Total	150	100%
4	Years of Experience	Less than 5 years	51	34%
		5-10 years	44	29.3%
		More than 10 years	55	36.6%
		Total	150	100%

Table 2. Level of nurses' knowledge regarding cast complications of limb fractures

Assess	Interval	Frequency	Percent
Poor	1-1.66	1	0.6 %
Moderate	1.67-2.33	40	26.6 %
Good	2. 34-3	109	72.6 %

4. Discussion

This study aimed to identify the level of nurses' knowledge regarding cast complications of limb fractures. According to the study's objective, the structural pillars of this discussion are classified into two sections. The first section includes a discussion of the results derived from Table 1 (demographic characteristics). The second section includes a discussion of the results derived from Table 2 (nurses' knowledge regarding cast complications of limb fractures).

4.1. Demographic data of nurses

According to the results of the present study which show more than half of nurses are female. This result agreed with a study [10] which reveals most nurses are female.

According to the results of this study which stated most nurses' age are between 20 and 30 years old. This result agreed with a study [10] which stated more than one-third of nurses are between 20 and 30 years old.

The findings of the current study show more than one-third of nurses have baccalaureate degrees. This result is consistent with a study [10] which stated approximately one-third of nurses have baccalaureate degrees.

Also, the results of this study show more than one-third of nurses have more than ten years of experience. These findings are consistent with a study [4] which stated most nurses have more than ten years of experience.

4.2. Nurses' knowledge regarding cast complications of limb fractures

The results of this study showed that most of the nurses have good knowledge regarding cast complications of limb fractures.

These results are expected by the researcher due to many causes; nurses studied fracture modalities like cast, most nurses have baccalaureate degrees, and most of the nurses are young ages, so do develop and update their knowledge continuously.

This result agreed with a study [10] which showed most of the nurses have good knowledge regarding plaster cast complications.

Also, the results of this study agreed with a study [11] which stated most of the nurses have good knowledge about the cast.

5. Conclusion

Most of the nurses have good knowledge regarding cast complications of limb fractures. More than half of nurses are female. Most of the nurses' age is between 20 and 30 years old. More than one-third of nurses have baccalaureate degrees. More than one-third of nurses have more than ten years of experience.

6. Recommendation

The researcher recommended more studies about cast complications of limb fractures because there is a deficit of studies in the country. Establishing an ongoing education section within the surgical ward to support nurses in maintaining their knowledge about cast complications of limb fractures.

REFERENCES

- [1] A. M. Wu, C. Bisignano, S. L. James, G. G. Abady, and ..., "Global, regional, and national burden of bone fractures in 204 countries and territories, 1990–2019: a systematic analysis from the Global Burden of Disease ...," *The Lancet Healthy ...*, 2021, [Online]. Available: [https://www.thelancet.com/journals/lanhl/article/PIIS2666-7568\(21\)00172-0/fulltext](https://www.thelancet.com/journals/lanhl/article/PIIS2666-7568(21)00172-0/fulltext)
- [2] H. M. M. Elhapashy and ..., "Effect of Structured Teaching Program among Patients with Lower Limb Fracture regarding Self-Care of Casted Limb," *Egyptian Journal of ...*, 2021, [Online]. Available: https://journals.ekb.eg/article_209937_d98d20edba39be1dee3573f294d478bf.pdf
- [3] B. Szostakowski, P. Smitham, and ..., "Plaster of Paris–short history of casting and injured limb immobilization," *The Open Orthopaedics ...*, 2017, [Online]. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5420179/>
- [4] M. Adib-Hajbaghery and R. Mokhtari, "Quality of Care before, during, and after Casting: A Cross-sectional Study," *Archives of Trauma ...*, 2018, [Online]. Available: https://archtrauma.kaums.ac.ir/article_88283.html
- [5] P. T. Guillen, C. B. Fuller, B. B. Riedel, and M. D. Wongworawat, "A prospective randomized crossover study on the comparison of cotton versus waterproof cast liners," *Hand*, 2016, doi: 10.1177/1558944715614853.
- [6] J. B. Samora, W. P. Samora, K. Dolan, and ..., "A quality improvement initiative reduces cast complications in a pediatric hospital," *Journal of Pediatric ...*, 2018, [Online]. Available: https://journals.lww.com/pedorthopaedics/FullText/2018/02000/A_Quality_Improvement_Initiative_Reduces_Cast.6.aspx

- [7] O. Bednarek, M. O'Leary, S. Hurley, C. Cummings, R. Bird, and ..., ... *requiring major interventions for traumatic hemorrhage: a prospective study of clinical gestalt* Evaluating best practices in trauma care of older adults Between canjsurg.ca, 2021. [Online]. Available: https://www.canjsurg.ca/content/64/5_Suppl_1/S37.short
- [8] B. E. Delasobera, R. Place, J. Howell, and J. E. Davis, "Serious infectious complications related to extremity cast/splint placement in children," *The Journal of emergency ...*, 2011, [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0736467910004051>
- [9] A. S. Boyd, H. J. Benjamin, and C. Asplund, "Principles of casting and splinting," *Am Fam Physician*, 2009, [Online]. Available: <https://www.aafp.org/pubs/afp/issues/2009/0101/p16.html>
- [10] V. Komal, K. Anil, and M. Preksha, "Effectiveness of self-instructional module on knowledge regarding prevention of plaster cast complications among staff nurses working in selected hospitals of Punjab," *Baba Farid University Nursing ...*, 2018, [Online]. Available: <https://www.indianjournals.com/ijor.aspx?target=ijor:bfunj&volume=15&issue=2&article=002>
- [11] K. S. Ahmed and S. M. Faraj, *Knowledge and practices of nurses in orthopedic wards concerning cast care*. pesquisa.bvsalud.org, 2003. [Online]. Available: <https://pesquisa.bvsalud.org/portal/resource/pt/emr-64917>
- [12] S. A. Bus, "Guidelines on offloading foot ulcers in persons with diabetes (IWGDF 2019 update)," *Diabetes Metab Res Rev*, vol. 36, 2020, doi: 10.1002/dmrr.3274.
- [13] P. Sharma, "COVID-19–Associated Kidney Injury: A Case Series of Kidney Biopsy Findings," *Journal of the American Society of Nephrology*, vol. 31, no. 9, pp. 1948–1958, 2020, doi: 10.1681/ASN.2020050699.
- [14] A. Vaquero-Picado, "Developmental dysplasia of the hip: Update of management," *EFORT Open Rev*, vol. 4, no. 9, pp. 548–556, 2019, doi: 10.1302/2058-5241.4.180019.
- [15] L. M. Donini, "Obesity or BMI Paradox? Beneath the Tip of the Iceberg," *Front Nutr*, vol. 7, 2020, doi: 10.3389/fnut.2020.00053.
- [16] Y. Ochen, "Operative vs Nonoperative Treatment of Distal Radius Fractures in Adults: A Systematic Review and Meta-analysis," *JAMA Netw Open*, vol. 3, no. 4, 2020, doi: 10.1001/jamanetworkopen.2020.3497.
- [17] C. A. Hutchison, "High cutoff versus high-flux haemodialysis for myeloma cast nephropathy in patients receiving bortezomib-based chemotherapy (EuLITE): a phase 2 randomised controlled trial," *Lancet Haematol*, vol. 6, no. 4, 2019, doi: 10.1016/S2352-3026(19)30014-6.
- [18] S. Schröter, "Development of the double level osteotomy in severe varus osteoarthritis showed good outcome by preventing oblique joint line," *Arch Orthop Trauma Surg*, vol. 139, no. 4, pp. 519–527, 2019, doi: 10.1007/s00402-018-3068-9.
- [19] F. Joly, "Randall-type monoclonal immunoglobulin deposition disease: Novel insights from a nationwide cohort study," *Blood*, vol. 133, no. 6, pp. 576–587, 2019, doi: 10.1182/blood-2018-09-872028.
- [20] F. Zannad, "SGLT2 inhibitors in patients with heart failure with reduced ejection fraction: a meta-analysis of the EMPEROR-Reduced and DAPA-HF trials," *The Lancet*, vol. 396, no. 10254, pp. 819–829, 2020, doi: 10.1016/S0140-6736(20)31824-9.
- [21] K. Fizazi, "Darolutamide in nonmetastatic, castration-resistant prostate cancer," *New England Journal of Medicine*, vol. 380, no. 13, pp. 1235–1246, 2019, doi: 10.1056/NEJMoa1815671.
- [22] R. W. Bohannon, "Grip strength: An indispensable biomarker for older adults," *Clin Interv Aging*, vol. 14, pp. 1681–1691, 2019, doi: 10.2147/CIA.S194543.
- [23] G. Salles, "Tafasitamab plus lenalidomide in relapsed or refractory diffuse large B-cell lymphoma (L-MIND): a multicentre, prospective, single-arm, phase 2 study," *Lancet Oncol*, vol. 21, no. 7, pp. 978–988, 2020, doi: 10.1016/S1470-2045(20)30225-4.
- [24] D. Haffner, "Clinical practice recommendations for the diagnosis and management of X-linked hypophosphataemia," *Nat Rev Nephrol*, vol. 15, no. 7, pp. 435–455, 2019, doi: 10.1038/s41581-019-0152-5.

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- [25] C. N. Sternberg, "Enzalutamide and survival in nonmetastatic, castration-resistant prostate cancer," *New England Journal of Medicine*, vol. 382, no. 23, pp. 2197–2206, 2020, doi: 10.1056/NEJMoa2003892.
- [26] L. Wang, "Mechanical sensing protein PIEZO1 regulates bone homeostasis via osteoblast-osteoclast crosstalk," *Nat Commun*, vol. 11, no. 1, 2020, doi: 10.1038/s41467-019-14146-6.
- [27] G. Young, "A multicenter, open-label phase 3 study of emicizumab prophylaxis in children with hemophilia A with inhibitors," *Blood*, vol. 134, no. 24, pp. 2127–2138, 2019, doi: 10.1182/blood.2019001869.
- [28] D. J. Khalaf, "Optimal sequencing of enzalutamide and abiraterone acetate plus prednisone in metastatic castration-resistant prostate cancer: a multicentre, randomised, open-label, phase 2, crossover trial," *Lancet Oncol*, vol. 20, no. 12, pp. 1730–1739, 2019, doi: 10.1016/S1470-2045(19)30688-6.