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Effect of a Cast Training Program on Knowledge and Skill Regarding Cast Care among Nurses in UAE

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Abstract

Introduction

Physicians and nurses' competence in casting technique and in caring for a patient with casts is essential to ensure favourable outcomes, saving expenses, and preventing possible cast-related complications. Regular in-service training programs for nurses are recommended to improve their knowledge, skills, and performance in cast-application and care.

Purpose

This study aimed to evaluate the effect of a Cast Training Program on Knowledge and skill regarding cast care among nurses in in selected hospitals, UAE.

Methodology

A pre-post cohort educational intervention design, among 44 Nurses working in the Emergency. A pre & post - test survey was conducted before & after Cast Application training. The post-test skill of nurses was assessed with a checklist during return demonstration.

Results

Knowledge showed an improvement with Mean ± SD of 4.47 ±2.8 which was statistically significant at $p<0.001$. Skill was assessed with a checklist & repeated till satisfactory results, not included for analysis.

Conclusion

The cast training improved the pre, intra and post knowledge and post training skill among nurses who were trained. Study recommends Nurses must be competent in cast application and this competency must be endorsed by professional bodies for nurses and include it within the scope of practice for nurses.

Implications

Nurses working in the Emergency departments & Orthopaedic outpatient department require training and certification in cast application

Keywords – Cast Application, Cast Care, Knowledge, Skill, Nurses

INTRODUCTION

Patients of all ages present to the Emergency Department (ED) with fractures that require immobilization using a cast. Various casting materials are used, all with advantages and disadvantages and there are considerable risks associated with fracture management using cast immobilization. Casting is the most common treatment for managing limb fractures. [1] Plaster cast can be used not only for treatment of fractured bones but also supports sprained ligaments, and inflamed and infected soft tissues. Casts that are not properly provided or are not correctly cared for may hinder the healing of fractures. Various materials have been used since ancient times to help immobilise fractures. There has been a recent trend away from non-operative management of fractures, and skills in the use of plaster of Paris are declining. For the successful treatment of patients, it is important to appreciate how plaster works, how it should be used, and what can go wrong. Application of plaster of Paris requires good knowledge of anatomy and pathology that we are aiming to treat. It has to be applied with a great care that is also need in its supervision afterwards. The perfect plaster dressing must retain the limb under all conditions in the desired position with complete comfort. It must be strong yet light, effective in use but easily removed when no longer required.[2]

Orthopaedic patients and especially those with cast are also susceptible to the side effects of immobility; therefore, they need quality care to prevent or manage the side effects. Nurses are the main health-care providers and play a major role in the prevention or early diagnosis of cast complications during the patient's hospital stay. Orthopaedic nursing is a specialty area. Casting and cast care also require special skills, knowledge, and clinical judgments to provide safe care and to prevent complications. However, a study reported that due to a myriad of reasons such as departments overcrowding and lacking specialized nurses, orthopaedic patients are not usually cared for properly. A study reported that cast complications might mostly be attributable to poor casting and cast care procedures rather than the patients' condition or casting materials.[2]

Physicians and nurses' competence in casting technique and in caring for a patient with casts is essential to ensure favourable outcomes, saving expenses, and preventing possible cast-related complications.[3] Complications and improper application of casts have contributed a burden of non-emergent patients seen in emergency departments. A study investigated patients that are seen in emergency departments for problems relative to their cast and found that approximately 29% of the visits were because of a wet cast; 10%, were secondary to a damaged cast; 23%, a tight cast; 13%, a loose cast; and 10%, new or different pain. When casting has been applied correctly, it has the potential to save a significant amount of money when compared to surgical alternatives.[4]

Despite the high incidence of fractures and the widespread use of plaster casts in patients with fractures, the quality of counselling in patients with plaster casts has been neglected. Quality cast application and care is among the nursing skills which require competence, knowledge, and expertise. Casts that are not properly applied or are not properly cared for may hinder the healing of fractures and threaten the patients' safety. Regular in-service training programs for nurses are recommended to improve their knowledge, skills, and performance in cast-application and care.

A study in Canada on Surgical simulation in a low-risk learning environment with repetitive practice opportunities was offered for orthopedic residents. The purposes of this study were to develop a cast application simulator and to validate a novel method of evaluating casting skill. A module that simulates short arm cast application on a synthetic forearm model was developed. A newly developed Objective Structured Assessment of Technical Skill checklist and Modified Global Rating Scale were used. The Participants were grouped by training level (medical students, orthopedic residents, and orthopedic fellows or orthopedic technologists) and were evaluated twice. Reliability was high as shown by intraclass correlation. The inter-rater reliability was 0.85 for the Objective Structured Assessment of Technical Skill, 0.81 for the Modified Global Rating Scale performance, and 0.78 for the Modified Global Rating Scale final product; the intra-rater reliability was 0.88 for the Objective Structured Assessment of Technical Skill, 0.85 for the Modified Global Rating Scale performance, and 0.81 for the Modified Global Rating Scale final product. The Objective Structured Assessment of Technical Skill checklist scores were 9.28 points for the medical students, 17.46 points for the orthopedic residents, and 18.85 points for the orthopedic fellows or orthopedic technologists ($p< 0.05$, $F = 6.32$). The Modified Global Rating Scale performance and final product scores also reflected the level of training. Post hoc analysis showed a significant difference between the medical students and orthopedic fellows or orthopedic technologists for the Objective Structured Assessment of Technical Skill checklist and Modified Global Rating Scale. The study concluded that further work is needed to establish construct validity.[5]

A quasi-experimental study was conducted in Iran in two phases: before and after a cast-related training for nurses involved in cast application and care. In the first phase, 94 patients with a cast were assessed for pre- intra- and post-casting care quality. In the second phase, after the training program, the same number of new patients were assessed. Study data were collected using a 57-item checklist with items on; patient preparation, cast application, and post-casting care including patient education. Descriptive statistics, Fisher's exact, and independent-samples t-tests were used to analyze the data. The results showed that the mean pre-casting care score significantly increased from 1.39 ± 0.16 at baseline to 1.69 ± 0.32 after the intervention ($P = 0.001$). The mean intra-casting care score increased from 1.42 ± 0.31 at baseline to 1.52 ± 0.17 after the intervention ($P = 0.014$). However, the study intervention did

not improve the mean post-casting care score. The study recommended regular in-service training programs for nurses are recommended to improve their knowledge, skills, and performance in cast- application and care [6]

Regular in-service training programs for nurses are recommended to improve their knowledge, skills, and performance in cast- application and care. Hence this study aims to see the effect of a Cast Training Program on Knowledge and skill regarding cast care among nurses in in selected hospitals, UAE

METHODOLOGY

The study design used was a pre-post cohort educational intervention design. Forty-four Nurses working in the Emergency department at two Hospitals in Ajman, UAE, were selected who satisfied the inclusion criteria, which included minimum one year of experience and currently working as a staff nurses or head nurse in the above, mentioned setting. Total Enumeration Sampling technique and all nurses who attended the training were included in the study. The study setting was at Gulf Medical University, Ajman. Nurses were trained in 4 cohorts over a period of two months in batches of 12-13 nurses. A Knowledge pre-test was conducted before training. Nurses had a Cast Training Program which was an eight-hour training session face to face which included lectures, discussions, videos and demonstration by an Orthopaedic surgeon and Nursing faculty regarding on topics such as - over view of fracture management, cast application and removal, demonstration and return demonstrations with a checklist. Post - test Knowledge assessed after the program with a knowledge questionnaire. The post test skill of nurses was assessed with a checklist during return demonstration. Those who did not reach the required satisfactory the skill checklist score repeated the demonstration until they got the required score. The skill scores were not used for statistical Analysis as a pre assessment was not performed for skill in cast care as they had no previous training

RESULTS

The demographic variables show that out of 44, majority (27) are of the age group 31-44 years of age, 24 of them are females, 22 of them have experience of 1-10years, all of them worked in the emergency department and had no previous training.

The pre-test and post-test Knowledge shows a significant increase in the mean from 7.61 to 12.05, with an improvement of Mean ± SD of 4.47 ±2.8 which is significant at $p<0.001$

Table 1 Mean, Standard Deviation & p value of knowledge scores

Knowledge-Score	N	Mean	Std. Dev.	P-value
Pre	44	7.61	2.19	<0.001
Post	44	12.05	2.22	

Association with demographic variables show that there was no significant association between age, gender, experience or previous knowledge. However the age group of 18-30 years had a higher improvement in Knowledge with a Mean ± SD 5.0 ± 3.2 and in relation to gender males had a higher improvement in knowledge with a Mean ± SD 4.8 ± 2.7

DISCUSSION

In the present study the demographic variables show that out of 44, majority (27) are of the age group 31-44 years of age, 24 of them are females, 22 of them have experience of 1-10years, all of them worked in the emergency department and had no previous training. The pre-test and post-test Knowledge shows a significant increase in the mean from 7.61 to 12.05, with an improvement of Mean ± SD of 4.47 ±2.8 which is significant at $p<0.001$. In a study conducted in Iran, the results showed the mean pre-casting care score significantly increased from 1.39 ± 0.16 at baseline to 1.69 ± 0.32 after the intervention (P = 0.001). The mean intra-casting care score increased from 1.42 ± 0.31 at baseline to 1.52 ± 0.17 after the intervention (P = 0.014).[5]

Association with demographic variables show that there was no significant association between age, gender, experience or previous knowledge. However, the age group of 18—30 years had a higher improvement in Knowledge with a Mean ± SD 5.0 ± 3.2 and in relation to gender males had a higher improvement in knowledge with a Mean ± SD 4.8 ± 2.7.

The post-test skill of nurses was assessed with a checklist during return demonstration. Those who did not reach the required satisfactory the skill checklist score repeated the demonstration until they got the required score. The skill scores were not used for statistical Analysis as a pre assessment was not performed for skill in cast care as they had no previous training

It has been observed that in most hospital's orthopedic units, technicians are trained in cast application and develop technical skill to perform the same without a certified training. This study recommends Nurses in Emergency departments, Orthopaedic outpatient department, Orthopaedic operating room and wards, to be trained in Cast application and removal, this

will enhance cast care, decrease complications related to casts and enhance health teaching at the time of discharge. Nurses empowered with cast care training can assist in speedy process of cast care in hospitals, and can provide quality care along with the Orthopaedic Health Care Personnel. They can also perform application of cast care in the evening and night shifts as suggested by Orthopaedic Surgeons. Through this evidence based practice it is evident that graduate nurses must cultivate this competency. The initial step involves defining the competency in line with professional requirements and disseminating it to the relevant professional bodies. Once endorsed by these bodies, the competency must be embedded within the Bachelor of Science in Nursing curriculum and aligned with the learning objectives. It needs to be further delineated into students' expected level of competency and accomplishments upon program completion.

CONCLUSION

The cast training improved the pre, intra and post knowledge and post training skill among nurses who were trained. Hence regular in-service training programs for nurses are recommended to improve their knowledge, skills, and performance in cast- application and care. Nurses working in the Emergency departments, Orthopaedic outpatient department, Orthopaedic operating room and wards must be competent in cast application and this competency must be endorsed by professional bodies for nurses and include it within the scope of practice for nurses. Cast application can also be introduced as a competency within the scope of practice for nurses and introduced into the Bachelor of Science in Nursing curriculum.

CONFLICT OF INTEREST

There is no conflict of interest

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