

Effectiveness Of Information Booklet On Prevention Of Pin Site Infection

Susan Konda, Assistant Professor, Department of Medical-Surgical Nursing, SUM Nursing College, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India
Email: susankonda@soa.ac.in

Abstract: *Introduction: Orthopedic wards are hazardous places for the acquirement of pathogens, not only pinhole wounds will be infected with microorganisms but inadequately sterilized instruments, environment medical surfaces, and utilization of orthopedic nurses' knowledge and practice for dressing around pin external fixation without handwashing before any procedure. All of them assist in transmission infection complications from patients to another patient¹. Pin site infection is the most common complication. It is documented to be as high as 85% in the Western countries and 71.4% (including major and minor infection) in India². Objective: The main objective of this study is to assess the knowledge of nursing students before and after the intervention regarding the prevention of pin site infection with external fixators among final year nursing students. Method: A one-group quasi-experimental study design was used for this study. It includes randomization, manipulation, and no control group. The samples for this study were 60 N.D.R.K final nursing students selected through the lottery method. The data collected by using self-structured Knowledge questionnaire on the prevention of pin site infection with external fixators, before introducing the information booklet and three weeks later the post-test was given to the same group. Results: The finding of the pre-test knowledge showed that adequate knowledge in anatomy and physiology of musculoskeletal system (57.3%), moderate knowledge in External fixator (42.0%), and prevention of pin site infection (42.3%). The study related to the level of knowledge regarding prevention of pin site infection among final year b.sc nursing students showed that 61.7% have inadequate knowledge, 38.3% are having moderately adequate knowledge and none are having adequate knowledge. After administering the information booklet 83.3% had adequate knowledge and no one had inadequate knowledge. Considering overall knowledge on pre and post-test scores analyzed by using paired t-test, it showed that the information booklet was effective (0.001) with a mean difference of 12.65 among final year B.sc nursing students.*

Keywords: *Pin site, external fixator, information booklet.*

Introduction

Orthopedic wards are hazardous places for the acquirement of pathogens, not only pinhole wounds will be infected with microorganisms but inadequately sterilized instruments, environment medical surfaces, and utilization of orthopedic nurses' knowledge and practice for dressing around pin external fixation without handwashing before any procedure. All of them assist in transmission infection complications from patients to another patient.¹ It is documented to be as high as 85% in the Western countries and 71.4% (including major and minor infection) in India.² The purpose of pin external dressing to promote wound healing around the pin. Assess the healing process and prevent transmission infection of external fixation, dry, sterile, and clean dressing of pin external fixation to reduce infection of microbes. The role of pin external fixation is to firmly protect and support fracture bone and joint to correct position even prevent post-fracture complications from infection and detect moving bone while it heals. Pin external fixations were chosen according to different types of fracture, and injury of wound, external fixations device was made of either carbon or stainless and consist from three-parts pin are inserted in bone, bars connect and joint to connect pin with a bar outside of the skin to maintain of mobility to prevent loosely of external fixation even reduce of delay of bone fracture union⁴. Sterile and moist dressing, infection, loosening pin,

unsealing wound, pinhole abscess, chronic systematic diseases, tissue necrosis and other multi variables are these complications causing a delay of bone fracture site and occurs sets of signs and symptoms of inflammation, swelling, bacterial infection after an increase of white blood cells of the body.³⁻⁵ Over 70% of Staphylococcus bacterial commonly causes complication orthopedic pin tract infections in the musculoskeletal system⁶. A study was conducted to find the incidence of pin tract infection with contemporary external fixation. A total sample of 285 patients over 4 years (1997-2001) The result shows that among 285 samples of fracture, the rate of infection at the pin site is high either it may be unilateral fixators or hybrid fixators but it was found comparatively less in-ring fixator group.⁷ It is been reported globally, an emergent public health concern that healthcare-related infections affecting the majority of humans every year.⁸ Comparisons of various current studies in developed countries show that high hospital-acquired infections.⁹ Similarly, a systematic review in Africa states that healthcare-related infections much higher than other developed countries.^{8,10} Majority of the literature concluded that 30% of health-related infection cases were surgical sites.^{11, 12} Fracture is a disturbance or breaks in the progression of the bone structure. Traumatic injuries cause more fractures. A major cause of crashes are road traffic accidents, falls, prolonged standing in the form of police and nurses, disease processes like a tumor, infection, etc.³ Fracture Management has gained increasing interest over the past 30 years due to various fixator structures, larger and stronger pins, better steel, and more programming knowledge.⁴ The adhesive is a device that has many pins and outer rings or bars that hold the bone mixed during treatment. External fixators are used for very complex fractures i.e., joint or joint fractures, unstable can be controlled by simple bending, reconstruction of limb, and those where external wounds are present. The indication for external fixator is fracture stabilization, joint stabilization, and Achilles tendon tear.⁶ 71% of the population audited developed infection femoral fixators had the highest incident pin site infections. Prevention of pin site infection is one of the important factors among health care professionals. This can be achieved through the pin site care. Pin site care has been defined as any treatment or dressing applied at least twice a day to skeletal pins, either skeletal traction or external fixator pins, by nursing personnel.⁷ The main objective of this study is To assess the knowledge of nursing students before and after the intervention regarding prevention of pin site infection with external fixators among final year nursing students.

Material and method

One-group quasi-experimental study design was used for this study. It includes randomization, manipulation, and no control group. The samples for this study were 60 N.D.R.K final nursing students selected through the lottery method. The data collected by using self -structured Knowledge questionnaire on the prevention of pin site infection with external fixators, before introducing the information booklet and three weeks later the post-test was given to the same group. A Self -structured questionnaire consisting of two sections. Section A dealt with demographic data which was used to collect the characteristics of the samples. It contains 07 items. Section B consists of a self-structured questionnaire with 30 items that were constructed to assess the knowledge regarding the prevention of pin site infection.

Result

Table 1: Pre-Test knowledge score on different aspects of prevention of pin site infection with external fixators

N=60

Area of Knowledge	Max score	Mean score	SD	Mean percentage
Anatomy & physiology of the musculoskeletal system.	3	1.72	.72	57.3%

External fixator.	6	2.52	1.00	42.0%
Prevention of pin site infection with an external fixator.	21	8.88	3.19	42.3%

Table 2: Distribution of Subjects According To Pre Test Knowledge Level.

N=60

Knowledge	Number. Of students	Frequency (%)
Inadequate	37	61.7%
Moderate	23	38.3%
Adequate	0	0.0%
Total	60	100%

Table 3: Distribution of Subjects According To the Post-Test Knowledge Level.

N=60

Knowledge	Number of students	Frequency (%)
Inadequate	0	0.0%
Moderate	10	16.7%
Adequate	50	83.3%
Total	60	100%

Table 4 Difference of Pre And Post- Test Knowledge Scores Among Final Year Nursing Students.

N=60

	Knowledge score				Difference	Student's paid t-test	P-value
	Pretest		Posttest				
	Mean	SD	Mean	SD			
Anatomy and physiology of the musculoskeletal system.	1.72	.72	2.70	.62	0.98	t = 7.32	0.001
External fixator.	2.52	1.00	5.33	.77	2.82	t= 21.11	0.001
Prevention of pin site infection with an external fixator.	8.88	3.19	17.73	3.05	8.85	t = 19.05	0.001

*** significant

Table 5: COMPARISON OF OVERALL KNOWLEDGE SCORE
N=60

	Mean ± SD	Mean Difference	Student's paired t-test	P-value
Pretest	13.12±3.46	12.65	t = 24.34	0.001
posttest	25.77±3.23			

Discussion

The main objective of this study is to assess the knowledge of nursing students before and after the intervention regarding the prevention of pin site infection with external fixators among final year nursing students.¹³ The pre-test knowledge showed that adequate knowledge in anatomy and physiology of musculoskeletal system (57.3%), moderate knowledge in External fixator (42.0%), and the prevention of pin site infection (42.3%). The study related to the level of knowledge regarding prevention of pin site infection among final year b.sc nursing students showed that 61.7% have inadequate knowledge, 38.3% are having moderate knowledge and none are having adequate knowledge. A similar study was conducted among orthopedic nurses, knowledge related dressing for pin track fixation are low to moderate items of the mean score for the study group and have a low knowledge level with low mean score.¹³ A similar study was conducted by James Keane's (2011) result of the study shows that level of knowledge of surgical wound dressing was inadequate, among nursing students. The result of this study is similar to a study conducted in Ethiopia, in which only 172 (40.7%) of the nurses were having adequate knowledge of the prevention of surgical site infection.¹⁴ Another similar study was conducted in Nigeria, in which (68%) of the nurses had also reported poor knowledge regarding post-operative wound infection prevention.¹⁵ After administering the information booklet 83.3% had adequate knowledge and no one had inadequate knowledge. A similar study was conducted related to the effectiveness of educational program nurses knowledge related dressing of pin track fixation are low to moderate in pre-test they found that orthopedic nurses' knowledge has improved after the implementation of an educational program about pin track infection for external fixation.¹⁶ Considering overall knowledge of pre and post-test scores analyzed by using paired t-test, it showed that the information booklet was effective (0.001) with a mean difference of 12.65 among final year nursing students.

Conclusion.

The present study findings reveal that the level of knowledge regarding the prevention of pin site infection among final year B.Sc nursing students relatively increased after administering the information booklet. Therefore considering overall knowledge on pre and post-test scores it reveals that the information booklet was effective.¹⁷⁻²⁰

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Ethical statement: This study was approved by the institutional ethical committee and the prior consent was taken before the collection of samples.

Conflict of interest: The author declares that there is no conflict of interest.

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