JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Title- EFFECTIVENESS OF PLANNED TEACHING PROGRAMME ON KNOWLEDGE REGARDING INFECTION PREVENTION AMONG FRACTURED PATIENTS WITH OPEN REDUCTION AND INTERNAL FIXATION ON STAFF NURSES WORKING IN SELECTED HOSPITALS

Author Information-

Ms Pooja More,[1] II MSc Nursing student, Ocean College of Nursing, Bangalore.

Mr. Swapnil Mhaske,[2] Tutor, DR.V.V.P.F. College of Nursing, Ahmednagar.

Co-Author/Guide Information-

Mr Anilkumar Jaee,[1] Associate Professor, Dept of Medical Surgical Nursing, S.N.D. College of Nursing Babhulgaon, Yeola.

Mr Anand Ghegadmal,[2] Assistant professor, S.N.D. College of Nursing Babhulgaon, Yeola.

ABSTRACT

Background: - Open Reduction and Internal Fixation is one of the greatest scientific advances and remains one of the most challenging and complex fields of modern medicine. Surgical Site Infections are the third most commonly reported nosocomial infections and accounts for 14-16 per cent of all nosocomial infections among hospital inpatients. Surgical Site Infections rate has varied from 25% to 41.9%. In India very few studies has been carried out which indicates an overall infection rate of 4.04 to 30 per cent for clean surgeries and 10.06–45% for clean contaminated surgeries[17].A retrospective review of 40 patients at the University of Louisville Hospital with both open and closed tibial plateau fractures treated with external fixation. In this study, 27.5 % of the patients experienced complications, which included superficial infection, deep infection, non-union, arthrosis, operative modification or readjustment of the frame. These results support external fixation as at least as good as internal fixation with regard to infection[18].

Methods: - A pre-experimental one-group pre-test and post-test were used to Effectiveness of Planned Teaching Programme on Infection Prevention in Fractured Patients with Open Reduction and Internal Fixation Among Staff Nurses Working In Selected Hospitals. The data was collected from 60 Staff nurse by using a simple random sampling technique. Descriptive and inferential statistics were used for the analysis.

Results: -The mean percentage knowledge score in post-test (90.47%) was higher than the mean percentage knowledge score in pre-test (58.57%). The enhancement mean percentage knowledge score (31.9%) was found to be significant at 5% ($P<0.05$) level. The findings of the pilot study revealed that the study is feasible.

Conclusions: - This study has shown a positive relationship between the planned teaching program and proved to be effective in improving knowledge of the staff nurse regarding infection prevention in fracture patient with Open Reduction and Internal Fixation.

Keywords: - *Planned teaching program, knowledge, Infection,Open reduction and internal fixation,Fracture*

I Introduction

"Infection can rarely be eliminated through early diagnosis or good treatment, but prevention can eliminate Infection."

Nursing is a science and an art that focuses on the quality of life. In the traditional sense, nurses have always been seen as ministering and soothing the sick. In the current state of medical changes, nursing also has become more technical and scientific. Nurses have had to assume increasing responsibilities involved with not only nurturing and caring, but with assessing, diagnosing and intervening with patients to treat, prevent and educate to help people cope with various health states.[1]

Infection prevention and control continues to be a point of concern in health care. Because of their proximity to patients and their pivotal role in health care delivery, nurses are in a unique position to make strides in and enforce infection control practices.[2]

An accident is a specific, unexpected, unusual and unintended external action which occurs in a particular time and place, with no apparent and deliberate cause but with marked effects. It implies a generally negative outcome like injuries which includes fractures, wounds, abrasions etc.[3]

Fracture means break in the continuity of the bone. A bone fracture can be the result of high force impact or stress, or trivial injury. Bone Healing is a natural process which will most often occurs in every individual. Bone fractures are typically treated by restoring the fractured pieces of bone to their natural positions, and maintaining those positions while the bone heals. Often, aligning the bone is called as reduction.[4]

Open reduction refers to open surgery to set bones, as it is necessary for some fractures. Internal fixation refers to fixation of screws and/or plates to enable or facilitate healing. The devices used for internal fixation are pins, plates, intramedullary rods and screws to hold the bones. Open Reduction and Internal Fixation techniques are often used in cases involving serious fractures such as comminated or displaced fractures, where rigid fixation of bones with implant prevents micro-motion across lines of fracture to enable healing.[5]

After surgery the patient remains at risk for wound infection. Excessive body cavity exposure and decreased body defence mechanisms are among the contributing factors to post operative wound infection. A wound may become infected as a result of factors intrinsic to patient, factors that delay healing, or a lapse in aseptic technique.[6]

Common complications of the orthopaedic surgeries are infection, joint stiffness, blood clots, injury to nerves or blood vessels[7]. One of the most common complications of open reduction and internal fixation is infection during the post operative period and it continues to be a cause of morbidity and mortality. Pathogens can contaminate an open fracture or may be introduced at the time of surgery or at the time of any daily activities. The bone infection is a serious threat and can lead to the loss of function and may delay the wound healing[8]. Infection is dangerous in bones, due to limited blood flow to the bones.[7]

As early as 14-37AD there is documentary evidence that Cornelius Celsus described the four principal signs of inflammation and used 'antiseptic' solutions in treating surgical wound. Another Roman physician, Claudius Galen (130-200 AD) has also advocated the same.[8]

Surgeons encounter wound infections in two major ways:

-Patients present with an infection that requires surgical treatment, like drainage of an abscess; and

-Infection complicates a surgical procedure, e.g. surgical site infections.

This problem was almost universal prior to the development of aseptic surgery in the last century and still it remains a major surgical problem even today. [8]

Before the mid-19th century, surgical patients commonly developed postoperative "Irritative fever," followed by purulent drainage from their incisions, overwhelming sepsis, and often death. It was until the late 1860s, after Joseph Lister introduced the principles of antisepsis, which substantially decreases postoperative infectious morbidity. Lister's work radically changed surgery from an activity associated with infection and death to a discipline that could eliminate suffering and prolong life.[9]

Surgical site infections have a significant impact on patients, increasing length of hospital stay, contributing to overuse of hospital stay, contributing to an overuse of antibiotics, contributing to increased associated costs, and contributing to increased morbidity and mortality. Surgical site infections are common, comprising about 12% of all hospital-acquired infections. Especially high rates are associated with contaminated surgery, such as delayed surgery to traumatic wounds or colorectal surgery etc.[10]

Bacteria are usually well controlled by our immune system. Once an infection is detected, our immune system rapidly responds, and attacks the infecting bacteria. However, implanted materials, like those found in open reduction and internal fixation, can allow infections to persist. Our immune system is unable to attack bacteria that live on these implants, and these infections can become serious problems. If an infection of an implant goes untreated, the problem can worsen, and the bacteria can gain such a foothold that they can become a systemic problem. Despite excellent antibiotics and preventative treatments, patients with a joint replacement infection often will require removal of the implanted joint in order to cure the infection.[11]

I.1 Statement of problem

A study to evaluate effectiveness of planned teaching programme on knowledge regarding infection prevention among fractured patients with open reduction and internal fixation on staff nurses working in selected hospitals

I.2 Objectives

I. To assess the existing pre-test level of knowledge of staff nurses regarding infection prevention among fractured patients with open reduction and internal fixation
II. To assess the existing post-test level of knowledge of staff nurses regarding infection prevention among fractured patients with open reduction and internal fixation
III. To evaluate effectiveness of planned teaching programme on knowledge regarding infection prevention among fractured patients with open reduction and internal fixation among staff nurses.
IV. Comparison between pre-test and post-test knowledge scores regarding infection prevention fractured patients with open reduction and internal fixation.
V. To find the association between post-test level of knowledge of staff nurses regarding infection prevention fractured patients with open reduction and internal fixation with selected socio demographic variables.

II Methodology

II.1 Research design and approach

A pre-experimental one group pretest post-test study design was used for the present study.

II.2 Setting of the study

The study was conducted in post operative Orthopaedic and surgical unit of selected hospitals of Bangalore.

II.3 Sample

Staff nurses working in post operative Orthopaedic and surgical unit of selected hospitals of Bangalore who fulfils inclusion and exclusion criteria.

II.4 Sample size

Sample size for present study was 60.

II.5 Sampling technique

Non-probability method, purposive sampling technique was used for the present study.

II.6 Sampling Procedure

Samples were screened for eligibility of inclusion and exclusion criteria. Staff nurses eligible and willing to participate were included in the study.

II.7 Inclusion and Exclusion criteria

Inclusion criteria: The nurses who are:

- Working in post operative orthopedic and surgical units.
- Able to understand English, Hindi
- Available during period of data collection
- Willing to participate
- Provide consent for participation

Exclusion criteria: The nurses who are:

- Not able to read and understand English
- Not willing to participate
- Want to withdraw from the study at any interval

II.8 Tools and techniques

Interview method was used to collect the data from the participants, which consists of following sections;

Section I: It consists of socio-demographic variables of the participants namely age, sex, education, marital status, religion, department, experience and income.

Section II: It consists of Structured questionnaire to assess knowledge regarding infection prevention fractured patients with open reduction and internal fixation among staff nurses.

Section III: Planned teaching programme on infection prevention fractured patients with open reduction and internal fixation

II. 9 Data collection procedure

Ethical aspects

a) Ethical clearance: Proposal was presented before Institutional Ethics Committee of ocean college of nursing and ethical clearance was obtained.
b) Permission from concerned authority: Written permission was obtained from Medical Superintendent of Selected hospitals of Bangalore.
c) Informed written consent: The study participants were contacted on one-on-one basis and explanation regarding study objectives, confidentiality of their data, their willingness to participate and right to withdraw from the study were provided to them. Informed written consent was obtained from participants of the study.

Data collection: After self-introduction and informed written consent the data was collected from the participants using interview method.

II.10 Data Analysis

Data was coded in the Microsoft excel sheet. Descriptive and inferential statistics were used to analyse the data according to objectives. Frequency and percentage were used to analyse the data regarding socio-demographic variables.

III Results

➢ **Assessment of pre-test knowledge scores regarding infection prevention among fracture patient with open reduction internal fixation**

N=60

Aspect wise analysis of the pre-test knowledge score	Max. score	Range	Median	Mean	SD	Mean %
Knowledge regarding anatomy and physiology of the bone	5	1-5	3	2.91	1.12	58.20
Knowledge regarding Fracture and its healing, definition, and indications open reduction and internal fixation	5	0-5	3	2.83	1.13	56.66
Knowledge regarding types of internal fixator, purpose, contraindication and complications of open reduction and internal fixation.	5	1-4	3	2.80	1.00	60.0
Knowledge regarding infection after open reduction and internal fixation and its risk factors and classifications and its effects on implants	14	4-12	8	7.18	2.25	51.28
Knowledge regarding control of infection after open reduction and internal fixation.	11	3-8	5	5.51	1.69	50.09
Overall pre-test knowledge score	40	14-31	21	21.25	4.56	53.12

➢ **Assessment of post-test knowledge scores regarding infection prevention among fracture patient with open reduction internal fixation**

N=60

Aspect wise analysis of the post-test knowledge score	Max. score	Range	Median	Mean	SD	Mean %
Knowledge regarding Anatomy and physiology of the bone	5	3-5	4	4.10	0.79	82.0
Knowledge regarding Fracture and its healing, definition, and indications open reduction and internal fixation	5	1-5	4	3.96	1.00	79.2
Knowledge regarding types of internal fixator, purpose, contraindication and complications of open reduction and internal fixation.	5	1-5	4	3.86	0.99	77.2
Knowledge regarding infection after open reduction and internal fixation and its risk	14	6-14	11	11.01	2.15	78.64

factors and classifications and its effects on implants						
Knowledge regarding control of infection after open reduction and internal fixation.	11	4-11	9	8.15	1.82	74.09
Overall post-test knowledge score	40	23-40	31	31.10	4.078	77.75

➢ **Effectiveness of planned teaching programme on knowledge regarding infection prevention among fractured patients with open reduction and internal fixation among staff nurses.**

*** Is significant; NS is not significant**

N=60

Aspect wise	Pre-test		Post-test		t-value	P-value Inference
	Mean	SD	Mean	SD		
Anatomy and physiology of the bone	2.91	1.12	4.10	0.79	7.824	<0.05*
Fracture and its healing, definition, and indications open reduction and internal fixation	2.83	1.13	3.96	1.00	8.784	<0.05*
Types of internal fixator, Purpose, Contraindication and Complications of open reduction and internal fixation	2.80	1.00	3.86	0.99	10.332	<0.05*
Infection after open reduction and internal fixation and its risk factors and classifications and its effects on implants	7.18	2.25	11.01	2.15	21.713	<0.05*
Control of infection after open reduction and internal fixation	5.51	1.69	8.15	1.82	11.490	<0.05*
Overall knowledge	21.25	4.56	31.10	4.078	48.897	<0.05*

➢ **Comparison between pre-test and post-test knowledge scores regarding infection prevention fractured patients with open reduction and internal fixation.**

N=60

Aspect wise analysis	Pre-test data				Post-test data			Percentage of enhancement
	Max. score	Mean	SD	Mean %	Mean	SD	Mean %	
natomy and physiology of the bone	5	2.91	1.12	58.20	4.10	0.79	82.0	32.8
Fracture and its healing, definition, and indications pen reduction and internal fixation	5	2.83	1.13	56.66	3.96	1.00	79.2	22.54
Types of internal fixator, Purpose, Contraindication nd Complications of open reduction and internal fixation	5	2.80	1.00	60.0	3.86	0.99	77.2	17.2
Infection after open reduction and internal ixation and its risk factors and classifications and its effects on implants	14	7.18	2.25	51.28	11.01	2.15	78.64	27.36
Control of infection after pen reduction and internal fixation	11	5.51	1.69	50.09	8.15	1.82	74.09	24
Overall knowledge	40	21.25	4.56	53.12	31.10	4.078	77.75	24.63

➢ **Association between post-test level of knowledge of staff nurses regarding infection prevention fractured patients with open reduction and internal fixation with selected socio demographic variables.**

Demographic variables	Responses	Overall post-test Knowledge			
		Median and below	Above median	Chi square & Inference	α-Value
		Frequency	Frequency		
Age in years	21 – 25	13	12	0.549^{NS} df= 2	0.760
	26 – 30	9	7		
	31 – 35	12	7		
Sex	Female	24	34		
Education	GNM	23	21	FEP=0.037* df= 1	
	B.Sc. Nursing	3	13		
Marital status	Married	19	21	$0.848a^{NS}$ df= 1	0.357
	Unmarried	7	13		
Religion	Hindu	25	19	0.002^{NS} df= 1	0.969
	Christian	9	7		
Department	Orthopaedic ward	12	12	1.876^{NS} df= 2	0.391
	Intensive care unit	7	7		

	Surgical ward	15	7		
Experience	1-5 years	17	16	0.793^{NS} df= 1	0.373
	6-10 years	17	10		
Income	<10000	26	17	0.892^{NS} df= 1	0.345
	11000 – 20000	8	9		

*** is significant; NS is not significant; FEP = Fisher's Exact Probability**

IV Discussion

The present study was undertaken to assess knowledge of staff nurses regarding infection prevention fractured patients with open reduction and internal fixation. The study reveals that majority of the staff nurses were of 21-25 years of age group, were females, were completed with GNM, were married, were of Hindu religion, were from orthopaedic ward and were having monthly income less than Rs. 10000.

Findings related to pre-test knowledge scores regarding infection prevention among fracture patient with open reduction internal fixation

In relation to knowledge regarding infection prevention among fracture patient with open reduction internal fixation was found to be with overall mean score of 21.25 with mean percentage of 53.12% with overall mean S.D. of 1.438.

Findings related to post-test knowledge scores regarding infection prevention among fracture patient with open reduction internal fixation

In relation to knowledge regarding infection prevention among fracture patient with open reduction internal fixation was found to be with overall mean score of 31.10 with mean percentage of 77.75% with overall mean S.D. of 1.35.

Findings related to effectiveness of planned teaching programme on level of knowledge of staff nurses regarding infection prevention among fracture patient with open reduction internal fixation.

The study findings predicts that the planned teaching programme was effective in improving level of knowledge among staff nurses regarding infection prevention among fracture patients with open reduction internal fixation. The overall 't' value was found out to be 48.89 stating the planned teaching programme for staff nurses was effective.

Findings related to comparison of pre-test and post-test level of knowledge regarding infection prevention among fracture patient with open reduction internal fixation.

The study findings revealed that there is a improvement in level of knowledge among staff nurses regarding infection prevention among fracture patients with open reduction internal fixation where the percentage of enhancement is 24.63%.

Findings related to association of post-test knowledge of staff nurse infection prevention among fracture patient with open reduction internal fixation with selected demographic variables.

There was no any significant association of post-test knowledge among staff nurses regarding infection prevention among fracture patients with open reduction internal fixation with selected demographic variables like age, sex, marital status, religion, department, experience and income except education where FEP Fischer's exact probability was found out to be 0.037.

V Conclusion

The study findings have shown that planned teaching programme was effective in improving knowledge of staff nurses regarding infection prevention among fracture patients with open reduction internal fixation.

Declaration by Authors

Ethical approval: The present study was approved by the Institutional Ethics Committee of Ocean college of nursing, Bangalore.

Acknowledgement: None

Sources of Fundings: None

Conflicts of Interest: The authors declare no conflict of interest.

References: -

1. Amy M. Karch. Lippincott's nursing drug guide. Lippincott Raven publishers. St. Louis. 1999; 1.

2. Joint commission international. Sited online on 20 Dec 2010. Available at http:// www.jointcommissioninternational.org/Books-and-E-books/The-Nurses-Role-in-Inf ection -Prevention-and-Control/1498/

3. Accident. Sited on 26 Nov 2010. Available at http://en.wikipedia.org/wiki/Accident

4. Accident. Sited on 26 Nov 2010. Available at http://en.wikipedia.org/wiki/ Bone_fracture

5. General Principles of Internal Fixation. URL: http://emedicine.medscape.com/article/ 1269987-overview Accessed 9 January 2010

6. Suzanne C. Smeltzer, Brenda G. Bare, Janice L. Hinkle & Kerry H. Cheevar. Text book of medical surgical nursing. 11th Ed. Vol-2. Wolters Kluwer: New Delhi. 2008. Pp: 2103-9, 18-23.

7. Complications of orthopedic surgery. Sited online on 24 Dec 2010. Available at http://www.ofc-oregon.com/assets_ofc/COMPLICATIONS_OF_ORTHOPEDIC_ SURGERY.pdf

8. Joyce M. Black, Jane Hokansen Hawks & Annabelle M. Keene. Medical Surgical Nursing. 6th Ed. Vol-2. Philadelphia: WB Saunders Company; 2001; 626, 630, 644.

9. Eriksen H, Chugulu S, Kondo S, and Lingaas E. Surgical-site infections at Kilimanjaro Christian Medical Center. Journal of Hospital Infection. 2003; 55: 14-20.

10. Marie-Pierre Tavolacci, Joël Ladner, Laurent Bailly, Véronique Merle, Isabelle Pitrou and Pierre Czernichow. Infection control and hospital epidemiology. Department of Epidemiology and Public Health, Rouen University Hospital, Rouen, France. June 12, 2008; 29(7): 1-6.

11. Jonathan Cluett. Infection of a Joint Replacement. About.com Health's Disease and Condition. April 1999; 20(4); 250-77.