A study to evaluate the effectiveness of STP on knowledge regarding prevention of complications of immobilization among caregivers of orthopedic patients at selected hospital

Tukaram B. Zagade[1], Mahadeo B. Shinde[2]

Professor[1&2] Krishna Institute of Nursing Sciences, Krishna Institute of Medical Sciences Deemed To Be University Malkapur Karad, Dist- Satara, Maharashtra, India

Author for correspondence:

Dr. Tukaram B. Zagade

Abstract

Background: Long periods of bed rest are quite harmful to the musculoskeletal system. Complications arise with immobilisation and bed rest. The purpose of this research was to assess the impact of STP on the understanding of carers of orthopaedic patients at a selected Krishna Hospital in Karad, Maharashtra, with regards to the prevention of complications of immobilisation.

Methods: An experimental strategy was used for this study's investigation. One-group pretest-posttest design was used as the research methodology for this investigation. For this research, a systematic method of sampling was employed. Fifty carers were chosen for this research. Descriptive and inferential statistics such as frequencies, percentages, means, standard deviations, chi-square values, and the t test were used to examine the data.

The **results** showed that prior to the intervention, 37 participants (74%) had an inadequate level of knowledge, 13 participants (26%) had a moderate level of knowledge, and no participants (0%) had an inadequate level of knowledge about preventing complications from immobilisation. The average score before the intervention was 12.14.00 and after it was 25.22.16, a significant improvement. The average score for the improvement was 13.1 1.85. The calculated t-value of 19.74 is statistically significant at the P0.05 level since it is larger than the corresponding value from the table. According to the study's findings, the STP successfully increased carers' awareness of how to avoid immobility-related issues.

Key words: Evaluate, Effectiveness, Knowledge, Caregivers, Prevention, Immobility,

INTRODUCTION: Immobilisation and bed rest have long been used to treat injuries and acute and chronic illnesses. The wounded area might heal more quickly if movement is limited while it rests. Pain, edoema, and muscle spasms are all things it can alleviate. Splints and casts are sometimes used following surgery to heal bones, tendons, or ligaments. This safeguards the patient and ensures they are in the right position to heal from the get-go.1Immobility is the state of being unable to move around freely. Prescribed movement restriction in the form of bed rest, physical restriction of movement due to external device, voluntary restriction of movement, or impairment of motor skeletal function can all lead to a change in the amount of physical mobility. There are significant physiological, psychological, and social consequences of inactivity.2

Bed rest, physical restraints on movement, and deterioration of motor skeletal function all contribute to mobility impairment in orthopaedic patients. The danger of skin breakdown and slowed wound healing increases in immobilised patients. Long periods of bed rest are quite harmful to the musculoskeletal system. As stated by research (Vollman, 2010) Complications arise with immobilisation and bed rest. Preventing these issues is far simpler than treating them once they occur. Loss of muscular strength and endurance, contractures and soft tissue alterations, disuse osteoporosis, and degenerative joint disease are all examples of musculoskeletal problems. Elevated heart rate and diminished cardiac reserve are two examples of the cardiovascular problems that can arise. dangers of orthostatic hypotension and venous thromboembolism. Atelectasis, pneumonia, and reduced ventilation are all respiratory problems. In addition, changes in the metabolic rate due to decreased complications, such as a lower basal metabolic rate, increased diuresis, natriuresis, and nitrogen and calcium depletion, might occur. Common genitourinary issues include kidney stones and recurrent UTIs. There is a risk of developing glucose intolerance, as well as anorexia, constipation, and pressure ulcers. Alterations to the central nervous system may impactment balance and coordination, ultimately leading to a higher dependency on caretakers.4

Orthopaedic patients who receive consistent care are less likely to experience the complications associated with immobility. Active and passive range of motion exercises performed on a regular basis help immobile individuals keep or regain their muscle strength and cardiorespiratory function. They shield the joint capsule from degeneration, alkylosis, and contracture. Other methods for reducing complications in immobilised patients include frequent position changes, elevating the leg, utilising stockings, deep breathing exercises, and proper nutrition.5

A family carer or informal carer is a member of the patient's immediate or extended family who provides uncompensated assistance with daily living activities such as bathing, dressing, medication administration, tube feeding, and ventilator care for someone with an acute or chronic condition.5

When it comes to providing complex health care services, family carers are invaluable partners. In contrast to medical professionals like doctors and nurses, informal carers like family and friends often step in to help those in need. Carer involvement is important for patients because it improves treatment adherence, continuity of care, and social support. When patients are cared for by carers, everyone benefits, even in a healthcare system with short hospital stays, disgruntled doctors, and a shortage of nurses. It's a novel concept to have carers work together as a part of the healthcare system to aid with patients' care, especially in areas like pressure ulcer prevention. One's level of preparedness to take on the role of carer depends on their level of prior experience and expertise in the field.6

DEMAND FOR RESEARCH

Half of hospitalised patients have mobility impairments. Complications arise with immobilisation and bed rest. Preventing these issues is far simpler than treating them once they occur. The involvement of carers in avoiding immobility-related problems is crucial. Carers can spare patients a great deal of distress by being well-versed in the alterations that could occur due to immobility and by taking painstakingly thorough preventive measures.7

The World Health Organisation (WHO) reports that about 70% of persons who are bedridden do so due

to orthopaedic disorders. The estimated yearly death toll from mobility-related problems is 60,000.8

It is estimated that 17% of all fractures treated in emergency rooms in India are distal radius fractures, with a female-to-male ratio of roughly 3:1. Prolonged bed rest has been linked to an increased risk of complications and poorer functional results (60% to 80%).9

In 2015, it was stated that there were almost 30 new instances of orthopaedics for every 1000 people in Maharastra. It's estimated that 40% of those in this situation can't get around without assistance. Because of their inability to move about, 35% of Maharastra residents had DVT, and 30% developed bed sores.10

In order to determine how much immobility contributes to the prevalence of venous thrombosis in orthopaedic patients, a study was done. Approximately 431 orthopaedic patients participated in this research. Thrombosis risk was found to increase during a 3-month period in patients who had undergone surgery (OR 6.6, 95% CI 3.7- 11.6), fractures (OR 12.7, 95% CI 3.7-43.7), plaster casts (OR 6.2, 95% CI 2.0-18.9), minor leg injuries (OR 1.9, 95% CI 1.1-3.3), or temporary immobilisation at home (OR 5.0, 95% CI 2.3-11.2). Both in-hospital and out-of-hospital immobility carry 27% and 15% population-attributable hazards, respectively. The results of the study show that being immobile both inside and outside of hospitals significantly increases the risk of thrombosis.11

Patients in orthopaedic wards were surveyed to determine the prevalence of pressure ulcers and the factors that increase their risk. Convenience sampling was used to pick 330 patients from the orthopaedic wards at Krishna Hospitals & Medical Research Centre, Karad who had no pressure ulcers at admission, were not mobile as a result of therapeutic procedures, or were mobile only with the aid of assistive devices. In order to gather information, a demographic questionnaire, the "National Pressure Ulcer Advisory Panel" grading scales, and the "Braden Pressure Ulcer Assessment Scale" were employed. Pressure ulcers were found in 46 (13.9%) individuals, with 76% in stage 1, 21.7% in stage 2, and 2.23% in stage 3. The sacrum (34%), the is chium (34.8%), the heels (17.4%), and the sacrum and heels (10.9%) were the most prevalent sites of ulceration. Medical diagnoses, inactivity, and inability to move around were all contributing reasons. The study concluded that the leading causes of pressure ulcers in orthopaedic patients were reduced activity and immobility.12

Prolonged immobility has been linked to joint contracture, thus researchers looked into the issue. The participants were around 155 orthopaedic patients who were bedridden. Sixty-one (39%) of the 155 patients were found to have joint contractures; of those, 52 (34%), had joint contractures severe enough to cause functional impairment. There was a significant association between the length of immobilisation time and the development of contracture: patients who were bedridden for 8 weeks or more were more likely to develop any joint contracture compared to those who were bedridden for 2 to 3 weeks (adjusted OR 7.09, 95% CI 1.29-38.9; $p = 0.02$). More than a third of patients in the research developed a functionally meaningful contracture of a major joint as a result of prolonged immobilisation.13

Spiral computed tomography scans were used in a study to evaluate the risk of pulmonary embolism in the postoperative orthopaedic patient. The characteristics that appeared to be significant predictors of a positive chest CT were identified using logistic regression models. Out of an estimated 32,854 surgically-admitted patients, 695 (2.1%), had a spiral CT performed immediately following surgery per

established protocols. Scans were positive for 27.8% of people (193/695). Scans were only positive for PE in 155 cases (22.3%). Tachcardia (56%) was the most prevalent (393/695), followed by low oxygen saturation (48%) and shortness of breath (19.6%) (336/695). Therefore, the study concluded, orthopaedic patients are at increased risk for developing pulmonary embolisms because of their reduced mobility.14 Long-term bed rest for orthopaedic conditions can increase the risk of serious complications. Carers are helping the majority of orthopaedic patients who are reliant to get through this difficult time. Therefore, it is crucial to teach carers how to avoid the pitfalls associated with immobility in orthopaedic patients. So, we're conducting this research to see how well STP educates healthcare providers in Karad about avoiding immobilisation complications for their orthopaedic patients.

STATEMENT OF THE METHODOLOGY

RESEARCH APPROACH & DESIGN The investigation was conducted by the researcher using an experimental method. The study design describes the researcher's general approach to answering the research questions, outlining the methods used to generate reliable, defensible data. The research design is the overarching plan or blueprint for completing the investigation.

Considering the problem at hand and the goals of the study, a pre-experimental one-group pre-test and post-test strategy was implemented to assess the efficacy of STP in preventing immobilization-related problems among hospital staff.

VARIABLES UNDER STUDY

Independent variable

In experimental research, the independent variable is the one that is changed (or "manipulated") to see what effect it has on the dependent variable.

The present investigation uses a systematic education plan for the avoidance of immobility problems as the independent variable.

Dependent Variable

A dependent variable is a factor about which predictions are being made. The independent variable is assumed to be the reason for any observed changes in the dependent variable. It is also known as a criteria measure or effect variable.

In the context of this research, it indicates carers' awareness of how to avoid immobility-related issues.

SETTING OF THE STUDY

Setting refers to the area where the study is conducted. It is the physical location and condition in which data collection takes place in a study.[44] Based on the geographicalproximity, feasibility and familiarity with the setting, the investigator selected Krishna Hospital, Karad Maharashtra.

POPULATION

The population is referred to as the target population, which represents the entire group or all the elements like individuals or objects that meet certain criteria for inclusion in the study.[39] The target population of the present study comprises of caregivers. The accessible population represents caregivers from selected Krishna Hospital, Karad, Maharashtra.

SAMPLE

Sample refers to the subset of a population that is selected to participate in a particular study.[44] Sample size of the present study consists of 50 caregivers from selected Krishna Hospital, Karad

Maharashtra.

SAMPLING TECHNIQUE

Sampling defines the process of selecting a group of people or other elements with which to conduct a study.[45] Purposive sampling technique was adapted to select the samples for the present study based on inclusion criteria.

Part I

It consists of demographic variables of caregivers such as age, gender, religion, educational status, occupational status, family monthly income, period of immobility, history of complication of immobility, type of complication and source of information regarding prevention of complications of immobilization.

Part II

It consists of items on knowledge related to prevention of complications of immobilization. It consists of 32 multiple choice questions having 4 responses with one right answer in the following headings.

- General information of immobility
- Complication of immobility
- Prevention of complication of immobility

SCORING AND INTERPRETATION

The knowledge regarding prevention of complications of immobilization among caregivers was measured in terms of knowledge score. Structured knowledge questionnaire is prepared to assess the knowledge and which is consisted of four responses each with one right answer. Each correct answer is given a score of one and a wrong answer had score of zero. The total attainable score in the knowledge questionnaire is 32.

The total score was converted in to percentage and the resulting score was rangedas follows;

Level of knowledge	**Scores**	**Percentage (%)**
Inadequate	Below 16	< 50
Moderate	16-24	50-75
Adequate	25-32	>75

PREPARATION OF LESSON PLAN

The process of developing lesson plan include following steps

- Reviews of literature regarding prevention of complications of immobilization
- Preparation and organization of the content of lesson plan.
- Preparation of final draft of the lesson plan.
- Editing the lesson plan.

VALIDITY OF THE TOOL AND LESSON PLAN

It refers to the degree to which an instrument measures what it is intended to measure.[45] The prepared content (lesson plan) and the tool along with the problem statement, objectives, blue print and criteria check list were submitted to 7 experts from the field of medical surgical nursing, 2 physicians and 1 statistician for establishing content validity. After validation from experts corrections were made.

10 experts validated the tool used for the study. The tool was evaluated for appropriateness, adequacy, relevance, and completeness. Comments and suggestions were invited and appropriate modifications were made accordingly. The tool was refined and finalized after establishing the validity.

SAMPLING CRITERIA

Inclusion Criteria

The study includes caregivers:
of immobilized orthopedic patients present at selected Krishna Hospital, Karad Maharashtra.
And able to write and read in Marathi or English.

Exclusive criteria:

The study excludes caregivers of orthopedic patients who:

- have participated in pilot study
- are specially challenged.
- have attended any training programme regarding prevention of complications ofimmobilization within 6 months.

TOOL FOR DATA COLLECTION

The tool used to collect the data was a structured knowledge questionnaire in order to assess the knowledge of caregivers regarding prevention of complications of immobilization. It consists of two parts. Part I and Part II.

Part I- Socio demographic data

Part II- Structured knowledge questionnaire on prevention of complications ofimmobilization.

The lesson plan on prevention of complications of immobilization was assessed by experts for its appropriateness, organization of content and language. The final draft ofthe tool contained 10 socio-demographic characteristics and 32 knowledge questions on prevention of complications of immobilization.

The recommended sample size was 50, as the period of data collection was limited to four weeks, so the study will be conducted among arbitrary 50 samples after discussion withexperts.

Results:

This chapter deals with analysis and interpretation of data collected from 50 caregivers from selected Krishna Hospital, Karad Maharashtra.

The data was collected from the respondents before and after the administration of STP. The collected information was organized, tabulated, analyzed, and interpreted using descriptive and inferential statistics. Analysis was done based on the objectives and hypotheses of the study.

PART-I

Description of socio-demographic profile of the sample

This section deals with distribution of participants according to the socio demographic characteristics. The obtained data on socio-demographic profile are described under the following sub heading which are age, gender, religion, educational status, occupational status, family monthly income, period of immobility, history of complication of immobility, type of complication and source of information regarding prevention of complications of immobilization. The data was analyzed by using descriptive statistics and are summarized in terms of frequency and percentage distribution.

SOCIO-DEMOGRAPHIC PROFILE OF SAMPLES

Table-1: Classification of sample by socio-demographic characteristics.

N=50

Characteristics	**Category**	**Respondents**	
		N	**%**
Age in Year	21-30 years	6	12
	31-40 years	26	52
	41- 50 Years	10	20
	51 years and above	8	16
Gender	Male	17	34
	Female	33	66
Religion	Hindu	32	64
	Muslim	8	16
	Christian	10	20
	Others	0	0

Educational status	Primary education	2	4
	Secondary education	9	18
	Undergraduate	24	48
	Postgraduate and above	15	30
Occupational status	Self Employee	8	16
	Private employee	24	48
	Government employee	6	12
	Dailey Wages	1	2
	Unemployee	11	22
Family monthly income	Less than Rs. 20000	11	22
	Rs. 20001-30000	20	40
	Rs. 30001-40000	10	20
	Rs. 40001 or above	9	18
Period of immobility	Less than 1 month	41	82
	1-3 months	6	12
	3-5 months	3	6
History of complication of immobility	Yes	18	36
	No	32	64
Type of complication	Constipaton	12	66.67
	Pressure Ulcer	5	27.77
	Foot drop	1	5.56
Source of information	Nil	4	8
	Mass media	15	30
	Friends or relatives	6	12
	Health Personnel	25	50

Table-1 shows that, among 50 caregivers, 26(52%) of them were between 31-40 years of age, 10(20%) of them were between 41-50 years f age, 6(12%) of them were between 21-30 years of age and 8(16%) of them were 51 years or above age.

In relation to the gender of the caregivers, 33(66%) of them were females and 17(34%) of them were males.

According to the religion of caregivers, 32(64%) of them were Hindus, 10(20%) of them were Christians and 8(16%) of them were Muslims.

It was observed that in educational status of caregivers, 24(48%) of them were undergraduates, 15(30%) were postgraduates or above, 9(18%) of them had secondary education and 2(4%) of them had primary education.

In concern to occupational status, among 50 caregivers, 24(48%) of them were private employees, 11(22%) of them were unemployees, 8(16%) of them were self employees, 6(12%) of them were Government employees and 1(2%) of them were daily wages.

In concern with family monthly income of the caregivers, 20(40%) of them had Rs. 20001-30000 of family monthly income, 11(22%) of them had Less than Rs. 20000 of family monthly income, 10(20%) of them had Rs. 30001-40000 family monthly income and 9(18%) of them had Rs. 40001 or above family monthly income.

With regard to the period of immobility, majority (41(82%) of patients were immobile for Less than 1 month, 6(12%) of them were immobile for 1-3 months and 3(6%) of them were immobile for 3-5 months.

It was recorded that, history of complication of immobility, 32(64%) of them had no history of any complication related to immobility and 18(36%) of them had history of complication related to immobility.

Among 18 patients with complication of immobility, 12(66.67%) of them had constipation related to immobility, 5(27.77%) of them had pressure ulcer and remaining 1(5.56%) of them had foot drop as complication of immobility.

The source of information shows that, among 50 caregivers, 25(50%) of them got information from health personnel, 15(30%) of them accessed information from mass media, 6(12%) of them got information from friends and family and 4(8%) of them did not get any information regarding prevention of complications of immobilization.

This study was conducted to evaluate the effectiveness of STP on knowledge regarding prevention of complications of immobilization among caregivers of orthopedic patients inselected hospitals Karad. In the present study 50 caregivers were selected by using purposive sampling technique.

The research approach adapted for this study was experimental approach with pre experimental one group pre-test post-test research design with a view to measure the pre- test knowledge level and the effectiveness associated with the post-test knowledge level following administration of STP on prevention of complications of immobilization among caregivers. A structured knowledge questionnaire was used to assess the knowledge of caregivers. The data was interpreted by using appropriate statistical methods.

The following findings were drawn from the study:

The finding of the study showed that, among 50 caregivers, 26(52%) of them were between 31-40 years of age, 33(66%) of them were females, 32(64%) of them were Hindus, 24(48%) of them were undergraduates, 24(48%) of them were private employees, 20(40%) of them had Rs. 20001-30000 of family monthly income, majority (41(82%) of patients were immobile for Less than 1 month, 32(64%) of them had no history of any complication related to immobility. Among 18 patients with complication of immobility, 12(66.67%) of them had constipation related toimmobility and 25(50%) of them got information regarding prevention of complication of immobility from health personnel.

With regard to overall pre-test knowledge scores on prevention of complications of immobilization among caregivers, 37(74%) of them had inadequate level of knowledge, 13(26%) of them had moderate level of knowledge and none of them had adequate level of knowledge regarding prevention of complications of immobilization whereas in post-test, 33(66%) of them had adequate level of knowledge, 17(34%) of them had moderate level of knowledge and none of them had inadequate knowledge regarding prevention of complications of immobilization.

In pre-test, the mean score was 12.1±4.01 whereas the mean post-test score was 25.2±2.16. The enhancement mean score was 13.1±1.85. The obtained 't' value was 19.74, which was higher than the table value 2.7 so it is highly significant at $P \leq 0.05$ level. Hence research hypothesis H_1 is accepted

The obtained chi square value for educational status and history of complication of immobility were higher values (12.51 and 8.42 respectively) when compared to the table value at $P \leq 0.05$ level of significance. Hence the research hypothesis H_2 was accepted.Collection of data is only from caregivers of orthopedic patients in selectedhospitals, Bangalore.

The finding of the study suggest

- The nurse educator should give importance for giving information to caregivers inthe community about prevention of complications of immobilization.
- Community health programme could be initiated as to impart knowledge of prevention of complications of immobilization to the public.
- Adequate knowledge of caregivers regarding prevention of complications of immobilization help to prevent the complication related to immobility among their beloveds.

Recommendations for further studies

In the light of the finding of the present study, the researcher puts forward the following recommendation for conducting further research.

A study can be done on a larger scale in different setting

Similar study can be replicated on caregivers in community area.

A cross sectional study can be conducted on knowledge, practice and attitude on prevention of complications of immobilization among caregivers.A comparative study can be done to assess the knowledge level on of prevention of complications of immobilization among caregivers in urban

and rural areas.

Summary

The primary aim of the study was to evaluate the effectiveness of STP on knowledge regarding prevention of complications of immobilization among caregivers and to find association between the knowledge of caregivers with their selected socio demographic variables.

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