بسم الله الرحمن الرحيم

Shendi University

Faculty of graduate studies and scientific research

# *The Effectiveness of Educational Program on Nurses regarding Prevention Complications of Immobility In El Mek Nimer University Hospital Shendi city-Sudan 2019*

***AThesis Submitted For the fulfillment of PhD In Medical Surgical Nursing***

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# الآيــة

## قال تعالي:

## وقل ربي زدني علما

صدق الله العظيم

سورة طه الآية (114)

# *Dedication*

*To my spirit of father*

*To my mother*

*To my husband*

*To my son and daughters*

*To my brothers & sisters*

*I dedicate this study*

# Acknowledgement

*First of all, I would like to thank my God in helping me to conduct this research.*

*It is not easy for me to do this work in this form without the kind, experienced and confident guidance*

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## مستخلص البحث

**المقدمة:**

يودي عدم الحركة إلي حدوث تأثيرات وظيفية ونفسية واجتماعية كبيرة كما يؤثر عدم الحركة على جميع أجهزة الجسم و يؤدي إلى مضاعفات ، معرفه وتقييم حركه المريض توفر معلومات موثوقة لتحسين سلامة المرضى ومنع مضاعفات عدم الحركة و يلعب التمريض دورًا رئيسيًا في تقييم ورعايه المشاكل التي تودئ الي عدم الحركة.

**الأهداف:**

هدفت هذه الدراسة إلى تقييم تأثير برنامج التدخل التمريضي على معرفة وممارسة الممرضين فيما يتعلق بمضاعفات عدم الحركة.

**المنهجية :**

هذه الدراسة شبه التجريبية التدخليه استهدفت عدد مائه من الممرضين، الذين يعملون بمستشفى المك نمر الجامعي ، وقد تم اختيارهم عن طريق أخذ العينة الشاملة ، باستخدام استبانه لجمع البيانات المنظمة وقائمه تحقق ومقياس للتنقل علي ثلاث مراحل خلال ثمانية أشهر وتم تحليل هذه البيانات ببرنامج الحزم الإحصائية للعلوم الاجتماعية إصدار 20.

**النتائج:**

توصلت الدراسة الي أن مجموعه الدراسة لديهم معرفه ضعيفة عن عدم الحركة وقد تحسنت في مرحلة ما بعد البرنامج ،بينما زاد مستوي المعرفة في مرحلة المتابعة بصوره واضحة ، هنالك علاقة ذات دلاله احصائيه معنويه فيما يخص معرفه مجموعه الدراسة حول مضاعفات عدم الحركة (P<0.00).

كما أظهرت الدراسة أن أداء مجموعه الدراسة كان ضعيفًا في مؤشرات تقييم ورعايه المريض وهي تحويل المريض على السرير ، وتطبيق الإحماء المرن على المريض واستخدام مقياس التنقل لتقييم حالة الحركة للمريض واستخدام الجوارب المطاطية بينما تحسنت ممارساتهم وأدائهم بعد البرنامج التعليمي . كما أوضحت الدراسة أن أكثر الموانع التي تؤدي لعدم تقييم ورعايه مرضي عدم الحركة هي قله عدد الممرضين (66%)،عدم القدرة علي التقييم (60%) وعدم وجود التدريب والموارد والمعدات والمبادئ التوجيهية(52%).

**الخاتمة :**

خلصت الدراسة الي كفاءة وفعالية البرامج التعليمية في زيادة المعرفة ، وتحسين الممارسة وأداء الممرضين ، وقدرة الممرضين على تقييم حاله المريض غير القادر علي الحركه وهذا يقلل من المضاعفات وتحسين جودة الرعاية الصحية.

## Abstract

**Background:**

Immobility can cause major physiological, psychological and social effects. Immobility affects all systems of the body leading to complications, utilizing a mobility assessment can provide reliable information to improve patient safety and prevent complications of immobility. Nursing play a key role in managing immobility complications.

**Objectives:**

The aims of this study to evaluate the effectiveness of educational program on nurses regarding prevention complication of immobility in elmek nimer university hospital.

**Methods:**

This quasi-experimental prospective interventional study, conducted among nurses hundred nurse were enrolled selection was done via total coverage sampling ,the knowledge and practice of nurses were assessed by structural standard questionnaire and the practice of nurses were evaluated by observational checklists and mobility scale in three phases through eight month. The collected data was analyzed by statistical package for social sciences (SPSS) version20.

**Results:**

The study showed that all most of the study group had poor knowledge about immobility improved in post test phase ,and upgraded in follow up phase also the study clarified that, all most of study group had poor practice and performance in pre test the of the about range of motion exercise, turning of patient on bed, applying elastic stocking to patient and using mobility scale to evaluate mobility status of patient.

**Conclusion:**

It was concluded that most of study group knowledge about immobility complication and preventive measure improved in post test while in follow up test upgrade , the most common barriers of mobilization were unable to assess , lack of training, resources, equipment, and guidelines and the educational programs were effective in increasing knowledge, improving practice and performance of nurses, and indicates the ability of nurses to assess of the immobile patient and this reducing the complication and improve quality of care .

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# List of abbreviations

| *Abbreviation* | *Full word* |
|---|---|
| **ABCDE** | Air way ,Breathing ,Circulation ,Disability, Exposure |
| **ADLs** | Daily living Activities |
| **APTT** | Activated Partial Thromboplastic Time |
| **BW** | Body Weight |
| **CNS** | Central Nervous System |
| **CI** | Confidence Interval |
| **CRRT** | Continuous Renal Replacement Therapy |
| **DVT** | Deep Vein Thrombosis |
| **ETT** | Endotracheal Tube |
| **FIO2** | Friction Inspired Oxygen |
| **GCS** | Graduated Compression Stocking |
| **ICUs** | Intensive Care Units |
| **I&O** | Intake And Out Put |
| **IPC** | Intermittent Pneumatic Compression |
| **Kg** | Kilogram |
| **MICU** | Medicine Intensive Care Unite |
| **MPS** | Muscle Protein Synthesis |
| **BMI** | Body Max Index |
| **NANDA** | North American Nursing Diagnosis Association |
| **OT** | Occupational Therapy |
| **OR** | Odds Ratio |
| **PEEP** | Positive End Expiratory Pressure |
| **PT** | Physical Therapist |
| **RNs** | Register Nurses |
| **ROM** | Range Of Motion |
| **SPSS** | Statistical Package of Social Science |
| **UFH** | Unfractionated Heparin |
| **VFP** | Venous Foot Pump. |
| **WHO** | World Health Organization |

# Chapter One

## Introduction
## Justifications
## Hypotheses
## Objectives

# 1. Introduction

## 1.1 Background

The human body is designed for movement and maintain the highest level of health with an active lifestyle[1].Immobility is a common pathway by which a host of disease and problems in the elderly, Produce further disability, Person who are clinically ill, aged or particularly susceptible to the adverse effects of immobility are rarely confined to only one body system. It may cause a wide Physical inactivity triggers a rapid loss of muscle .range of complication [2] mass and function in older adults. Middle-aged adults show few phenotypic signs of aging yet may be more susceptible to inactivity than younger adults [3].

Immobility can leading to complication causing serious illness, disability and death in persons of all ages. These complications not only take a tremendous toll on the health of client, but also affect the spiraling cost of health care. In US billions of dollars are spent each year for treatment and prolonged care associated with complication of immobility [1].

Immobility is a common pathway by which a host of diseases and problems in older individuals produce further disability. Immobility often cannot be prevented, but many of its adverse effects can be. Improvements in mobility are almost always possible, even in the most immobile older patients. Relatively small improvements in mobility can decrease the incidence and severity of complications, improve the patient's well-being, and make life easier for caregivers [4].

Some studies developed to determine the nursing care missed have demonstrated that walking three times per day, patient education, oral hygiene, changing the patient's position every two hours, bed bathing, skin care, appropriate surveillance and development or updating of nursing care plans are regularly omitted Care omission in practice entails different negative outcomes

for the patient, such as increased mortality rates, infections, prolonged hospital stays, pressure ulcers, patient falls , adverse events, post surgery complications and patient dissatisfaction[5].

Immobility can cause major physiological, psychological and social effects. It affects all systems of the body leading to complications such as pressure sore, deep vein thrombosis (DVT), hypostatic pneumonia, constipation, contracture, urinary tract infection, calculi and also psycho physiological problems. Approximately 50% of hospitalized individuals have impaired mobility. These individuals are most often found in intensive care units, trauma wards, orthopedic ward, neuro ward and geriatric wards of a hospital[6].

According to the study of Varghese, 2007, approximately 50% of hospitalized individuals have impaired mobility. These individuals are most often found in intensive care units, trauma wards, orthopedic ward, neurological ward and geriatric wards of a hospital .Orthopedic patients will have impairment in mobility results from prescribed restriction of movement in the form of bed rest, physical restriction of movement or impairment of motor skeletal function [7]. A movable person turns at least once in every quarter of an hour while sleeping. This only points to necessity of changing positions and even when we are unconscious we do that. Change of position helps blood to flow normally, prevents insufficient supply with blood to those parts of the body that are exposed to pressure and stimulates the transfer of body's fluids. In immobile people prolonged pressure on the exposed body parts leads to improper blood supply, blood congestion, insufficient supply with oxygen and nutrients and these body areas become more susceptible to so called pressure sores[8].

Hospitalized patients who spend an extended period of time in bed can suffer a variety of unintended consequences, including loss of muscle strength

at a rate of 20% per week of immobility, contractures, psychological disturbances, constipation, peptic ulcer development, skin breakdown, and nosocomial pneumonias .Moreover, many hospital hazards such as falls, functional decline, and pressure ulcers are predicted by low mobility, defined as being limited to bed or chair. A patient's mobility status can influence treatment, patient handling and transfer decisions, and outcomes, including fall risk. Utilizing a mobility assessment can provide reliable information to improve patient safety and prevent complications of immobility[(9)], and nurses have a unique position to identify the amount of knowledge about the complication of immobility and to help the patient to develop positive practices[(2)] .

## 1.2 The Statement of the Problem

Complications were recorded for 122 stroke survivors (mean age, 76 years; 57% male). Sixty-three (52%) had significant language impairment and of the remaining 59 who were able to complete an assessment of cognitive function, 10 (8%) were cognitively impaired. The numbers of reported complications over 12 months, in rank order, were falls, 89 (73%); contracture, 73 (60%); pain, 67 (55%); shoulder pain, 64 (52%); depression, 61 (50%); and pressure sores, 26 (22%). A negative correlation was found between Barthel Index score and the number of complications experienced (low scores on the Barthel Index correlate with a high number of complications). The highest relative percentages of complications were experienced by patients who were living in a nursing home at the time of their last completed assessment **(10).**

It is estimated that approximately 1.2 million people are suffering from bed sores at any one time in the United States alone and almost 70% of sufferers are over 65. It is reported that there are 60,000 deaths annually from complications arising from bedsores **(11)**.Immobility can be rather difficult and may additionally lead to serious complications. People who are suffering from chronic illnesses, those in terminal stages of cancer, old people and individuals who have experienced stroke and end with paralysis are bedridden for the rest of their lives. Being in bed means that these patients remain inactive unless they are helped by their family, friends or certain physiotherapy specialists. Permanent care can prevent some of the potential complications but, unfortunately, their immobility at some point results in at least one or even multiple complications **(12)**.

## 1.3 Justifications

According to the study of Varghese, 2007, approximately 50% of hospitalized individuals have impaired mobility. In terms of morbidity and mortality, the consequences of immobility are legion. Financially, prolonged immobility is very costly; consuming a large percentage of each health care dollar .

Nurses are play important role in preventing complication of immobility due to that the nurses needed to be familiar themselves with meaning of immobility in all practice setting and also nurses are member of the health care team with responsibility for mobilizing immobilized patients in order to do this successfully nurses require updated knowledge and practice related to implementation of mobilization program .

Nurses play a key role in managing immobility complications ,awareness about the significance of the issue, a positive attitude towards prevention and an adequate level of knowledge are cornerstones of effective prevention of immobility complications. Assessing and managing complication permit early identification of complication and initiation of preventive measures and decrease complication. from general observation there was no standardized polices and guide line from ministry of health and local hospital policy for nurses concerning different nursing activities especially immobility.

Up to 65% of older adults who are independent in their ability to walk will lose their ability to walk during a hospital stay. Loss of walking independence increases the length of hospital stay, the need for rehabilitation services, new nursing home placement, risk for falls both during and after discharge from the hospital, places higher demands on caregivers and increases the risk of death for older adults. Bed rest or limited walking (only sitting up in a chair) during a hospital stay causes deconditioning and is one of the primary factors for loss of

walking independence in hospitalized older adults. Older adults spend the majority of their time in bed during a hospital stay. In fact, older adults only take about 15% of steps they would normally take when at home. Loss of walking independence happens quickly. Within 48 hours of hospitalization older adults develop weakness in their legs and dizziness which affect their ability to walk. Thirty percent of older adults who lose their ability to walk independently become permanently disabled because they do not regain their ability to walk after discharge. The cost for additional medical and long term care support for newly disabled older adults in the United States is estimated to be $26 billion per year [(13)].

Glajchen, reported that involvement of family caregivers is essential for optimal treatment of patients in ensuring treatment compliance, continuity of care and social support. It is necessary to understand that caregivers play an important role in providing care to their patients and they should be aware about the complications and their preventive measures [(14)].

Prolonged bed rest and immobilization inevitably lead to complications such complications are much easier to prevent than to treat[(15)].Caregivers play a vital role in preventing the complications of immobilization. If the caregivers are knowledgeable about the potential changes of immobility and diligent in implementing preventive interventions, they will avoid lots of discomfort for the patient [(16)].

Although a patient's mobility status is recognized as important to address, especially in regards to a reduction in fall risk, nurses are not always able to assess a patient's mobility status accurately at the bedside. Existing tools for assessing patients' mobility status are limited by the time, effort, and provider level needed to conduct the assessment. Additionally, very few tools exist for conducting assessment on hospitalized patients' mobility. Valid bedside

mobility assessment tool easily administered by nurses in the acute care setting is needed to monitor a patient's progress accurately and provide appropriate care[9].

This study was being developed to improve nurse's knowledge and practice to fill the gap in knowledge and practice about immobility and it is complication and improve quality of care for immobile patients.

## 1.4 Hypotheses

**$H_0$-**There was no significant effect of the educational program on level of knowledge and practice of nurses about prevention of complication for immobile patients.

**H**1-Nurses who exposed to educational program will improve knowledge and practice of nurses about prevention of complication for immobile patients.

## 1.5 Objectives of the study

### 1.5.1 General objective:

To evaluate the effectiveness of educational program on nurses knowledge and practice regarding prevention complication of immobility in elmek nimir university hospital

### 1.5.2 Specific objectives:

1. To assess nurses knowledge in term of immobility, complication and prevention of immobility complication
2. To determine the impact of an educational training program on nurses knowledge and practice regarding prevention complication of immobility.
3. To determine the most common barrier to mobilization.
4. To determine association between study group level of knowledge and practice with selective demographic characteristic in pre test, post test and follow up.

# Chapter Two

## Literature Review

# 2. Literature Review

## 2.1Background

Mobility is regulated by the coordinated effort of the musculoskeletal and neurological systems. The major functions of the musculoskeletal system are to maintain body alignment and to facilitate mobility. Bone is the foundation of the musculoskeletal system. Joints work with muscles to provide motion and flexibility. skeletal muscles overlying the joint exert opposing forces and , therefore, cause movement. muscles are basically machines that convert energy into mechanical work. contractility is the common property among the three types of muscles: smooth, cardiac, and skeletal[(17)].

## 2.2Definition of immobility:

Immobility was defined as unable to independently move or change positions or movement is restricted for medical reasons. It is generally easier to prevent the complications than to treat or cure them[(7)]. Immobility refers to the inability to move freely or alteration in the level of physical mobility can result from prescribed restriction of movement in the form of bed rest, physical restriction of movement because of external device, voluntary restriction of movement or impairment of motor skeletal function[(6)] . Immobility can be described as a lack of, or significant decrease in, normal and activity .it can range from prolonged sitting in a wheel chair to complete bed rest. Simply immobility can define as the inability to move around freely, this is common and very serious issue for persons in hospital and long term care facilities, and in those receiving care at home[(1)].People with mobility impairments may feel helpless and burdensome to others, and their ability to work and earn a living may be compromised. Painful mobility makes coping even more difficult. Body image can be altered by paralysis, amputations, or any motor impairment. The reaction of others to impaired mobility can also alter self-esteem and body image significantly. For

those with impaired mobility, movement must be fostered to the full extent of capability to facilitate a satisfying life. For example, many individuals who have impairments or use wheelchairs participate in athletics to experience the joys of competition and fitness**.** Many individuals with paralysis can use a hand control to enter and drive adapted vans or use their mouth to manipulate a paintbrush and create art. No matter what their level of mobility they must be encouraged to breathe fully engage their abdominal muscles and move as much as possible to prevent the physical and psycho-emotional hazards of immobility[18]**.**After 36 hours, complete bed rest triggers changes in the musculoskeletal and circulatory systems followed by changes in other organ systems (respiratory, nervous, digestive, skin and urinary). Distinct pathological changes develop from 7 – 10 days[19]**.**

**2.3 Immobility levels**

Complete immobility e.g. patient in a coma, Partial immobility e.g. patients with lower limb fractures and Limited activity associated with disease e.g. patients with bronchial asthma[19] **.**

**2.4 Causes of immobility**

Many physical, psychological, and environmental factors can cause immobility in older persons. The most common causes are musculoskeletal, neurological, and cardiovascular disorders. Pain is a common pathway by which these disorders result in immobility. Musculoskeletal disorders include arthritis's, osteoporosis fractures (especially hip and femur) podiatric problems other (e.g. Paget's disease) ,neurological disorders include stroke, Parkinson's disease another (cerebella dysfunction, neuropathies). cardiovascular disease include congestive heart failure (severe),coronary artery disease (frequent angina) and peripheral vascular disease (frequent claudicating). Pulmonary disease include chronic obstructive lung disease (severe) .Sensory factors Impairment of vision fear (from instability and fear of falling).Environmental causes Forced

immobility (in hospitals and nursing homes) Inadequate aids for mobility .Acute and chronic pain Other deconditioning (after prolonged bed rest from acute illness) , malnutrition Severe systemic illness (e.g., widespread malignancy) depression and drug side effects (e.g. antipsychotic-induced rigidity)[20].

### 2.5 Factors affecting body alignment and activity

A number of factors affect an individual's body alignment, mobility, and daily activity level. These include growth and development, nutrition, personal values and attitudes, certain external factors, and prescribed limitations[18].

#### 2.5.1Growth and Development

A person's age and musculoskeletal and nervous system development affect posture, body proportions, body mass, body movements, and reflexes. In adolescence, growth spurts and behaviors such as carrying heavy book bags on one shoulder and extended computer use may result in postural changes that often persist into adulthood. Adults between 20 and 40 years of age generally have few physical changes affecting mobility, with the exception of pregnant women. Pregnancy alters the body's center of gravity and affects balance. As age advances, muscle tone and bone density decrease, joints lose flexibility, reaction time slows, and bone mass decreases, particularly in women who have osteoporosis[18].

#### 2.5.2 Nutrition

Both under nutrition and over nutrition can influence body alignment and mobility. Poorly nourished people may have muscle weakness and fatigue. Vitamin D deficiency causes bone deformity during growth. Inadequate calcium intake and vitamin D synthesis and intake increase the risk of osteoporosis. Obesity can distort movement and stress joints, adversely affecting posture, balance, and joint health[18].

### 2.5.3Personal Values and Attitudes

Whether people value regular exercises or not is often the result of family influences. In families that incorporate regular exercise into their daily routine or spend time together in activities, children learn to value physical activity. Sedentary families, on the other hand, participate in sports only as spectators, and this lifestyle is often transmitted to their children. With the increase in television, computer, and video activities, youth are increasingly sedentary with associated declines in health , values about physical appearance also influence some people's participation in regular exercise. People who value a muscular build or physical attractiveness may participate in regular exercise programs to produce the appearance they desire**.** Choice of physical activity or type of exercise is also influenced by values ,geographic location and cultural role expectations. For many, thinking of exercise more as "recreational movement," "enhancement of well-being," and "an essential part of daily self-care" may help overcome perceptions that exercise is drudgery **(18).**

### 2.5.4External Factors

Many external factors affect a person's mobility. Excessively high temperatures and high humidity discourage activity, whereas comfortable temperatures and low humidity are conducive to activity. Proper hydration needs vary according to the individual, health status, activity levels, and environment. Quality water is the best fluid to replace loss incurred through metabolic processes and exercise. Drinking 1 to 2 cups of water is usually adequate for shorter bouts of exercise. For longer bouts such as marathons, drinking 2 cups of water 2 hours prior to the event and then replacing fluids with a sports drink that contains sodium during and after can be beneficial. Prescribed limitations to movement may be medically prescribed for some health problems to promote healing devices such as casts, braces, splints, and traction are often used to immobilize body parts. Clients who are short of breath

may be advised not to walk up stairs. Bed rest may be the therapeutic choice for certain clients, for example, to relieve edema, to reduce metabolic and oxygen needs, to promote tissue repair, or to decrease pain . Nurses need to familiarize themselves with the meaning of bed rest in their practice setting. In any case, the effects of limiting activity are immediate, and therapeutic positioning is important to prevent further complications and improve client outcomes. There is rarely a need for complete bed rest[(18)].

## 2.6Risk Factor of Immobility

Immobility can often become an issue for those who suffer from disabilities, illnesses or aging; it can also lead to further problems due to prolonged inactivity. When it comes to immobility, multiple areas of the body are often affected rather than just one area in particular. The effects of immobility effect people in different way, with disabilities sometimes areas cannot be improved but sometimes although they cannot be reversed they can be minimized and this is often the case with the elderly. By making small steps to concur immobility can have a very positive effect on reducing the risk of other complications. The common risk factors of immobility in the elderly are arthritis osteoporosis ,fractures (especially hip & femur),podiatric problems ,neurological problems , stroke , Parkinson's disease , cerebellar dysfunction ,neuropathies ,heart, lung, and circulation problems ,chronic coronary heart disease ,chronic obstructive lung disease ,severe heart failure ,peripheral vascular disease ,cognitive, psychological and sensory problems dementia **,** depression ,fear and anxiety ,pain ,Impaired vision ,general weakness after prolonged bed rest ,malnutrition ,drug side effects ,severe illness of any type ,Inadequate aids for mobility[(21)].

## 2.7Mobility and Aging

Several of the physical changes associated with the aging process can impair a patient's ability to move independently. Decreased efficiency of the cardiovascular and respiratory systems can lead to movement difficulty and

weakness. Many elderly individuals have diminished muscle tone, often reflecting the result of a sedentary lifestyle. Vision and hearing impairments can make navigation around one's environment challenging. There is also a higher prevalence of chronic illnesses, painful conditions, and medication usage during the later years which can dramatically affect mobility and independence. Some of the common age-related causes of impaired movement include arthritis, osteoporosis, stroke, and Parkinson's disease. Maintaining mobility has a profound effect on the physical and psychological well-being of the elderly [(22)].

**2.8 The effects of immobility on body Systems:**

**2.8 .1The effects of immobility on body Urinary System:**

Urinary stasis and urinary infections are related to the recumbent position of the immobile person. Decreased peristalsis of the ureters leads to stasis of urine, which is the etiology of urinary calculi (stones) and infection. Bladder distention occurs due to difficult relaxation of the external sphincter and decreased intra abdominal pressure, thus causing overflow incontinence (loss of bladder control) and infection. The combination of increased urinary calcium, urinary stasis, and urinary tract infection leads to calculi formation [(17).]

**2.8.2The effects of immobility on Gastrointestinal System:**

Digestive responses to activity include increased appetite and thirst, which indicate that the body’s rate of processing nutritional intake is increased. Exercise increases metabolism with resultant absorption of nutrients and excretion of wastes .Loss of appetite is commonly related to lack of activity, negative nitrogen balance, and altered elimination patterns. Negative nitrogen balance occurs when the nitrogen output exceeds nitrogen intake. The causes of negative nitrogen balance include the increased need for protein in situations of extensive tissue damage, such as surgery and extended immobility. Extended periods of immobility cause muscle atrophy or muscle wasting; thus, there is a need for extra protein intake to provide for muscle repair[(17)].Bed rest is commonly associated with reduced taste, smell and loss appetite, leading to the

disuse of the intestinal tract, which in turn leads to mucosal atrophy and shrinkage of glandular structures .There is also a reduced sensation of thirst, which can easily evolve into dehydration. Decreased caloric demand, endocrine changes, anxiety and depression contribute to the loss of appetite. Stomach transit time is 66% slower in the supine position in comparison with standing, which contributes to reduced appetite and decreased peristalsis, which leads many patients to exhibit symptoms of gastro esophageal reflux. Another complicating factor is the difficulty in eating patients experience in the supine position, when they cannot assume the sitting position. Constipation may be the main problem of immobilization in the elderly due to decreased bowel mobility, inadequate fiber and fluid intake associated with anorexia, the development of weakness of the evacuation muscles, the inability to respond to the urgency of evacuation, and inability to assume a seated position, making evacuation a difficult process for this population[(23)].

### 2.8.3 The effects of immobility on Integumentary System:

The integumentary system benefits from activity and exercise in that increased circulation and blood flow enhance oxygenation of tissues. As a result, the turgor and luster of the skin and hair are maintained. Pressure ulcers are serious problems related to immobility. Prolonged pressure, shearing force, friction (rubbing), and moisture lead to tissue ischemia (impaired blood circulation), causing skin breakdown and pressure ulcers, moisture in the form of urine, feces, perspiration, and wound drainage can also lead to skin softening, which increases risk for pressure ulcers .Secondary factors contributing to pressure ulcer development are decreased nutrition, decreased arterial pressure, increased age, and edema[(17)].

### 2.8.4Respiratory System:

The respiratory response to activity is increased intake of oxygen, which results in increased overall respiratory capacity and easier breathing. The effects of oxygenation to the tissues are enhanced, and pooling of secretions in the bronchioles is less likely. Immobility from sitting or lying limits chest expansion which is compounded by the effects of respiratory muscle atrophy and ineffective cough. Stasis of respiratory secretions can be worsened by the use of CNS-depressant medications and dehydration and can lead to hypostatic pneumonia and atelectasis[(17)].

### 2.8.5The Effects of Immobility on the Cardiovascular System

Immobility results in decreased cardiac muscle mass and poor blood pressure regulation. Staying immobile for long periods of time can have drastic effects on health[(24)].

#### 2.8.5.1Structural Changes

Muscles that are not constantly stressed begin to get smaller and lose their strength. The loss of cardiac mass decreases the force of contraction. When a bed-rest patient attempts to regain mobility, the heart is unable to contract with enough force to fight the pull of gravity. This limits the amount of oxygen-rich blood reaching the brain and decreases the amount of blood returning to the heart from the lower body. Both of these conditions ultimately result in orthostatic intolerance when moving from lying to standing[(24)].

#### 2.8.5.2 Functional Changes

Stroke volume is the amount of blood ejected from the heart every beat and is dependent on the amount of blood that fills the ventricles before each contraction. The stronger a cardiac contraction is, the faster the muscle springs back into its normal resting position. This springing back acts as a suction to pull more blood into the ventricles for the next round of contractions. The

reduction in cardiac muscle mass and the altered contractile strength contributes to a continuous cycle of inadequate blood flow when a person moves from lying to standing[24].

### 2.8.5.3 Pressure Changes

Pressure sensors of the body are located in the carotid arteries leading to the brain, and in the section of the aorta that attaches directly to the heart. The purpose of these sensors is to regulate blood pressure throughout the body by causing blood vessels to expand or constrict. Normally, moving from lying to standing causes a quick constriction of the blood vessels in the lower body that forces blood back to the heart. Prolonged bed rest changes the sensitivity of the body's pressure sensors. This change means that a greater drop in blood pressure has to occur before the body will constrict the vessels. Readjusting the sensitivity of the pressure sensors predisposes a bed rest patient to orthostatic intolerance once mobility is regained[24].

### 2.8.6 Postural hypotension:

Postural hypotension is one of the most common cardiovascular complications of immobility[25] and can be observed after 20 hours of bed rest[26]. In a healthy and mobile person, the rapid fall in blood pressure that occurs upon standing is immediately detected by the baroreceptors, which quickly inform the cardiac center to increase the sympathetic stimulation of the heart, thus increasing cardiac output and blood pressure; and the vasomotor center, which increases sympathetic stimulus in the blood vessels of the lower limbs, resulting in partial vasoconstriction, diminishing the imprisonment of blood in the lower limbs .The response to this chain of stimuli is impaired by the decrease in blood volume, which leads to a greater fall in blood pressure when the person assumes orthostatic[25].

### 2.8.7.Impact on the musculoskeletal system

Prolonged immobility can cause serious complications if no preventive measures are taken. It may cause amyotrophic (loss of muscle mass) or increase the muscle atrophy caused by neurological conditions; muscle contractures, and abnormal postures imposed by the muscles, at the same time, immobilized tendons become weaker. It may cause joint ankylosis by the retraction of the ligaments and tendons, and the proliferation of fibrous tissue may cause compressive neurologic complications, however the mechanism is still not understood. These complications affect nerves located near the osseous structures (radial nerve for the arm, ulnar nerve for the elbow)[(27)].

#### 2.8.7.1 Contractures

Contractures are shortenings of muscle or connective tissue around the joints that prevent the normal range of movement of joints. The tightening of these muscles and tissues are due to immobility and cause deformities or joints to become bent in a fixed position that is resistant to stretching to a straight position. Contractures can occur in the finger, hand, wrist, elbow, shoulder, ankle, knee, and hip joints, including flexion contractures of the neck. Weak limbs can lead to an unending cycle of decreased range of motion, increased muscle and tissue tightness of the joints, development of contractures, further impaired mobility, resulting in more joint tightness and contractures[(28)]. During immobilization, the balance between collagen synthesis and degradation is altered, resulting in a progressive shortening of connective tissue around joints with contracture formation and loss of range of motion [(29)] Joint contracture is a limitation in the passive range of motion of a joint secondary to shortening of the articular connective tissues and muscles. Immobility plays a major role in the development of joint contractures .Indeed; patients with conditions limiting mobility are at high risk for joint contracture. Prolonged immobility from

critical illness can also be expected to predispose patients to experience joint contractures[30].

In London study was conducted on Joint contracture following prolonged stay in the intensive care unit at the time of transfer out of the ICU, at least 1 joint contracture was recorded in 61 (39%) of 155 patients; 52(34%) of the patients had joint contractures of an extent documented to impair function. Time spent in the ICU was a significant risk factor for contracture: a stay of 8 weeks or longer was associated with a significantly greater risk of any joint contracture than a stay of 2 to 3 weeks (adjusted odds ratio [OR] 7.09, 95% confidence interval (CI) 1.29–38.9; p =0.02). Among the variables tested, only the use of steroids conferred a protective effect against joint contractures (adjusted OR 0.35, 95% CI 0.14–0.83; p = 0.02). At the time of discharge to home, which occurred a median of 6.6 weeks after transfer out of intensive care, 50 (34%) of the 147 patients not lost to follow-up still had 1 or more joint contractures, and 34 (23%) of the patients had at least 1 functionally significant joint contracture [30].

### 2.8.7.2 Immobilization Osteoporosis:

The primary function of the bones is the mechanical support for the tissues of the body and the maintenance of mineral homeostasis promoting the reserves of calcium, phosphorus, and magnesium salt [31]. The process of bone formation ceases, but the activity of osteoclasts continues, resulting in loss of bone density, causing the bone to have a soft, weak structure. With a few days of rest the circulating calcium increases, and with three days there is an increase of calcium loss through the urine result in detectable demineralization[31, 32].

Each individual has a different background, and the causes and modalities used for immobilization have an important role. The image of an individual, who is immobilized in the supine position, recalls the image of

death and simultaneously refers back to images of juvenile dependency. Immobility also produces fear and feelings of anxiety resulting from the dependent condition and fear of abandonment. Combined with these factors are difficulties in establishing relational contact (seeing nothing else but the ceiling or the nostrils of one's addressees), eventual sensory isolation, difficulty in orientating oneself into time and space, etc[27].

### 2.8.8Depression

Is a normal response to progressive loss of muscle function and impaired mobility? People who are homebound because of trouble leaving their homes, or who are embarrassed about their disability, may have infrequent contact with people. As a result, they can become victims of social isolation that may compound feelings of depression. Emotional responses to immobility vary widely and may include such feelings as helplessness, despair, irritability, anger, outbursts of rage, constant sadness, frequent crying, listlessness, and social withdrawal[22].

### 2.8.9Effects of immobility on the Nervous System:

Another important problem related to bed rest and aging is the lower resistance of brain tissue to stressors related to inflammatory diseases and conditions [33].These effects on neural tissue can also lead to alterations of the static balance by alteration not only of muscular mass but also of the neuromuscular component[34].

### 2.8.9.1 Stroke:

Immobility can lead to a number of post.stroke complications such as pressure ulcers, pneumonia and contractures. Frequent turning and range of motion exer cises can decrease complications related to immobility and should be implemen ted as the patient is admitted to the intensive care unit or specialized nursing unit Occupational and physical therapy should be consulted[35].

### 2.8.10 The effects of immobility on Endocrine and Metabolic Systems:

Daily human energy need include basal metabolic activity thermo genesis of food and the activities of daily living and locomotion .It's unclear whether basal metabolism changes during immobility this uncertainty stems from inadequate scientific study on control of factor that could influence the basal metabolic rate during prolonged bed rest lean body math deceases during bed rest and equal gain in body fat maintain constant body weight .The reduced lean body math is associated with muscle atrophy and decrease metabolic activity of muscles ,diminished utilization of oxygen and glucose ,increase insulin resistance and redaction maximal oxygen consumption ,with further deterioration of functional capacity of musculoskeletal system . lack of physical activity can cause alter responsiveness of hormone and enzymes .Although they may be clinically un detected during early immobility numerous change have been demonstrated to occur in endocrine system[(36)] .

### 2.8.11.Immobility, circulatory problems and deep vein thrombosis (DVT)

Contraction of muscles is an important factor in helping to keep blood flowing through the veins, particularly in the legs. Prolonged immobility, especially when seated, can lead to pooling of blood in the legs, which in turn may cause swelling, stiffness and discomfort. It is known that immobility is one of the factors that may lead to the development of a blood clot in a deep vein – so-called "deep vein thrombosis" or DVT. Research has shown that DVT can occur as a result of prolonged immobility, for instance during long-distance travel, whether by car, bus, train or air **.**The findings of the epidemiological studies indicate that the risk of venous thromboembolism is increased 2- to 3-fold after long-haul flights (more than 4 h) and also with other forms of travel involving prolonged seated immobility. The risk increases with the duration of travel and with multiple flights within a short period. In absolute terms, an

average of 1 passenger in 6000 will suffer from venous thromboembolism after a long-haul flight [37].

Musculoskeletal complications include loss of muscle strength and endurance, contractures and soft tissue changes, disuse osteoporosis, and degenerative joint disease**.** Cardiovascular complications include an increased heart rate, decreased cardiac reserve, orthostatic hypotension, and venous thromboembolism. Respiratory complications include decreased ventilation, atelectasis, and pneumonia. Further the decreased complications like basal metabolic rate, increased dieresis, natriuresis, and nitrogen and calcium depletion affect metabolism .Genitourinary problems include renal stones and more frequent urinary tract infections. Glucose intolerance, anorexia, constipation, and pressure sores might develop. Central nervous system changes could affect balance and coordination and lead to increasing dependence on caregivers [37].

## 2.9 Assessing Problems of Immobility

When collecting data pertaining to the problems of immobility, the nurse uses the assessment methods of inspection, palpation, and auscultation; checks results of laboratory tests; and takes measurements, including body weight, fluid intake, and fluid output. Specific techniques for assessing immobility problems and abnormal assessment findings related to the complications of immobility are extremely important to obtain and record baseline assessment data soon after the client first becomes immobile. These baseline data serve as the standard against which all data collected throughout the period of immobilization are compared (18). Because a major nursing responsibility is to prevent the complications of immobility, the nurse needs to identify clients at risk of developing such complications before problems arise. Clients at risk include those who are poorly nourished, decreased sensitivity to pain, temperature, or pressure ,existing cardiovascular, pulmonary, or neuromuscular problems and an altered level of consciousness (18).

### 2.9.1Assessing Problems of Immobility:

Assessing of musculoskeletal system include measure arm and leg circumferences, palpate and observe body joints ,take goniometric measurements of joint range of motion.cardiovascular system assessment include auscultate the heart ,measure blood pressure , palpate and observe sacrum, legs, and feet ,Palpate peripheral pulses ,measure calf muscle circumferences ,observe calf muscles for redness, tenderness, and swelling.Assessing of respiratory system include observe chest movements ,auscultate chest.Assessing of metabolic system include measure height and weight, palpate skin.assessing of urinary system include measure fluid intake and output, inspect urine.and palpate urinary bladder.Assessing of Gastrointestinal system include observe stool, auscultate bowel sounds.assessing of Integumentary system by Inspect skin and assessing of Psych neurologic system by observe behaviors, affect, and cognition and monitor developmental skills in children[18 ,38].

## 2.10. Barriers and Strategies for Early Mobilization of Patients

Early mobilization of ICU patients has been associated with improved muscle strength and functional independence, as well as a shorter duration of delirium, mechanical ventilation, and ICU length of stay (3–7). Despite the safety and feasibility of early mobilization, most ICU patients remain immobilized for long periods of time. Several prior publications have reported modifiable and non modifiable barriers to early in Intensive Care Units mobilization. Understanding such barriers, and associated strategies to overcome them, is helpful for clinicians wanting to implement early mobility as part of routine clinical practice[39].Barriers were organized into one of four categories: patient-related barriers, including patient symptoms and conditions (e.g., hemodynamic instability) ,structural barriers including human and technical resources (e.g. staffing , equipment, or protocols)barriers related to ICU culture, including habits, attitudes, and context within ICUs and institutions (e.g., staff morale); and process-related

barriers, including how services are delivered and clinician functioning (e.g., unclear roles and responsibilities).In Canada the survey showed that major Institutional barriers are lack of protocols/guidelines , insufficient equipment , insufficient Staffing , no physician requests for physiotherapy consult and major Patient Barriers are medical instability ,excessive sedation ,lines and major health care provider barriers are knowledge ,skills set ,safety concerns ,delays in recognition of suitable patients[40] .

## 2.10.1Patient-related barriers to early mobilization and related strategies to overcome barriers:

| Barriers | Strategy |
|---|---|
| **Physical barriers** | |
| High severity of illness, patients “too sick” or “too well”<br>Hemodynamic instability, arrhythmias | Interprofessional meetings, PT screening of ICU patients.<br>Stepwise approach protocols safety<br>Criteria avoid mobilization until 2 h after increase in vasopressor dose , valid assessment |
| Respiratory instability/distress, ventilator asynchrony | Stepwise approach to mobility, including a safety check after each step, protocol for standardized mobilization, including safety criteria ,adjust FIO2, PEEP, or other ventilator settings for mobilization |
| Pain | Screen for pain, provide pain medication before mobilization |
| Poor nutritional status<br>Obesity (e.g., BMI >30) | Perform nutritional screening , Use protocol for standardized mobilization |
| Baseline or new immobility/weakness | Initiate mobility within 24 h of admission ,re-evaluate daily ,consult neurology |

(39)

| | |
|---|---|
| **Neuropsychological barriers** | |
| Deep sedation and/or paralysis | Perform routine assessments of sedation and Pain ,target lighter sedation goals, avoid medications with long half-lives , Interprofessional approach |
| Delirium, agitation | Delirium screening ,use of antipsychotics ,reduce benzodiazepine use |
| Patient refusal, lack of motivation, anxiety | Adjust treatment plan with patient input ,provide patient education and encouragement |
| Fatigue, need for rest, sleepiness | Safety criteria , sleep protocols to improve sleep quality |
| Palliative care | Focus treatment on patient goals for quality of life |
| **ICU devices and equipment** | |
| Hemodynamic monitoring equipment | Use portable monitors ,secure application of equipment and lines |
| CU-related devices | Stepwise approach to mobility ,secure lines/tubes/drains ,perform pre mobility Planning , interdisciplinary teamwork , define responsibilities for each discipline ,strategic choice of catheter insertion location |

(39)

## 2.10.2Structural -related barriers to early mobilization and related strategies to overcome barriers:

| Structural Barriers | Strategy |
|---|---|
| Limited staff, time constraints | Additional Physical therapy ,occupational therapy, and technician staffing , financial modeling of economic benefits to increase funds for staffing , independent mobility team |
| Lack of early mobility program/protocol(e.g., no routine delivery of PT), too many existing protocols, limited guidelines, no eligibility criteria | Development of protocols, evaluation and feedback to medical team, review of safety. |
| Inadequate staff training | Development of protocols, full-time therapists dedicated to ICU, stable Leadership education, Interprofessional Champion. |
| Limited equipment | Training on appropriate use of equipment, cost analysis and financial modeling of economic benefits. |
| Early discharge (before mobilization) | Planning and coordination of discharge |

(39)

## 2.10.3Cultural barriers to early mobilization and related strategies to overcome barriers

| cultural barriers | Strategy |
|---|---|
| Lack of mobility culture (e.g., inadequate staff buy-in, lack of multidisciplinary culture) | Interprofessional champions ,promotion of mobility programs ,multimedia Education ,assessment and orders by RNs ,goal sharing ,unit-based Services , identifying barriers. |
| Early mobility not a priority | Assessments and decisions by bedside RNs , Interprofessional champions ,screening for appropriate patients ,experience sharing |
| Lack of support or staff buy-in | Education, regular team meetings, physician support, culture promoting.<br>Quality improvement. |
| Lack of patient/family knowledge | Media engagement and education |

(39)

### 2.10.4 Cultural Barriers

In many centers, current ICU culture is an important and potentially modifiable barrier to early mobilization and rehabilitation. Insufficient coordination, timing conflicts with different procedures, and competing patient priorities are common. Overcoming these barriers requires a structured multidisciplinary effort, with clear communication and recognition of the importance of early mobilization and rehabilitation .Provision of critical care in an ICU with a culture that prioritizes early rehabilitation increases the number of patients receiving mechanical ventilation ambulating by threefold [(41)].

### 2.10.5 Sedation

The widespread use of sedation in the ICU can be a major barrier to mobilizing patients who are critically ill. Sedation minimization can be combined with early mobility via implementing the ABCDE bundle, in which all patients undergo daily coordinated spontaneous awakening trials, spontaneous breathing trials, sedation and delirium screening, and early mobility and rehabilitation .A pre-post prospective study in 296 patients showed that applying this bundle was feasible and improved patient outcomes, such as reducing delirium and increasing mobilization out of bed [(41)].

### 2.10.6 Endo tracheal Tubes

The presence of an Endo tracheal tube (ETT) is another commonly perceived barrier to assist with overcoming this barrier, one study detailed the steps undertaken to start PT and OT interventions after a median of only 1.5 days of intubation in 49 patients who had undergone Endo tracheal intubation. Patients underwent daily screening for 10 contraindications to PT and OT interventions, followed by daily interruption of sedation until they achieved wakefulness, with PT and OT interventions initiated thereafter. Initiation of PT and OT interventions was preceded by securing the ETT, removing

unnecessary non invasive devices, and disconnecting enteral feedings tubes. Rehabilitation interventions were completed on 90% of patient days .One-third of sessions involved patients who had undergone intubation moving from bed to chair and standing, and 15% involved patients who had undergone intubation ambulating. Therapy was stopped prematurely in only 4% of all sessions, mostly because of ventilator dyssynchrony[41].

### 2.10.7 Femoral Catheters

Femoral catheters are a perceived barrier to early rehabilitation because of the risk of accidental removal, bleeding, or infection .However, investigators in one study observed 101 patients in the MICU with a femoral catheter (81% venous, 29% arterial, and 6% hemodialysis) who had 253 PT sessions over 210 ICU days. Patients were able to perform in-bed exercises, supine cycle ergometry, and stand or walk on 38%, 12%, and 23% of days, respectively. There were no catheter-related adverse events .Similar results were obtained in other studies[41].

### 2.10.8 Continuous Renal Replacement Therapy

The use of continuous renal replacement therapy(CRRT) is another perceived barrier .However, a prospective single center study including 57 consecutive patients (79% receiving mechanical ventilation) who received at least one PT session while undergoing CRRT demonstrated no safety events associated with CRRT.A total of 268 PT sessions included in-bed exercises (29%), supine cycle ergometry (27%), sitting on the edge of the bed (30%), transferring to a chair (5%), and standing or marching in place (9%). Similar results were obtained in another prospective study that also demonstrated potential improved CRRT alter life with patient mobilization[41].

### 2.10.9 Costs

Increased staffing and costs associated with early rehabilitation are commonly perceived barriers. A controlled trial using a dedicated mobility team did not

result in increased overall costs after accounting for extra costs related to the mobility team, with evidence of significantly decreased risk of readmission or death in the year after ICU discharge[41].

## 2.11Treatment for immobilization:

Management of immobilization needs interdisciplinary team work cooperation, the patients and their family. The management may be commenced through a complete geriatric review, formulating functional goals and constructing therapeutic plan. Various medical conditions and external factors that may act as risk factors of immobilization as well as drugs intake that may exaggerate the immobilization should be evaluated and optimally managed. Any complication due to immobilization and other concomitant disease/condition should be recognized and managed comprehensively in order to reduce morbidity and mortality. Management of immobilization and its complications include pharmacological and non-pharmacological treatment, i.e. various mobility exercises, utilization of ambulatory device and supporting appliance for assisting patients in stand-up position, as well as the management of urinary voiding and defecation. Providing education and information to the patients and their family about the danger of prolonged bed rest, the importance of progressive exercise and early ambulation, as well as preventing patient reliance by promoting self-activation of daily living, in accordance to the patient's best ability[42].Evaluating all of drug intake; reduce the dose of drugs that may cause weakness or fatigue or if it is possible, stop it[43]. Give adequate nutrition with consideration to fluid and fiber intake, and supplementation of vitamin and mineral for patients with hypokinesia problem[42].

Perform immediate and progressive re-mobilization in hospitalized patients or patients at the elderly care center to prevent further immobilization. The training program and remobilization should be

commenced during a stable medical condition, including bedside mobility training, exercise on joint range of motion (passive, active, active with help), exercise for muscle strength (isotonic, isometric, isokinetic), exercise for coordination/balance (such as walking along a straight line), transfer with help and limited ambulant[(44)] ·Managing the risk factors of immobilization and complication due to immobilization recognizing and managing infection, malnutrition, anemia, fluid and electrolyte imbalance that probably occur in immobilization cases as well as other concomitant diseases /co morbidity. For special cases, consult the medical condition to a competent specialist [(43).]

**2.12 Nursing intervention and preventive measures:**

In general, prevention of venous thromboembolism may be performed through 2 methods, i.e. mechanical and pharmacological method; while to achieve the therapeutically goals ,use several kinds of anticoagulants.[(45)]Mechanical methods to prevent venous thromboembolism including: graduated compression stocking (GCS) by using elastic stocking, which is girded on extremities with gradual tightness from the tightest to less tight area, from distal to proximal; intermittent pneumatic compression (IPC); and venous foot pump(VFP)**.**Other available methods: exercising the extremities and joint movement, either active or passive, as tolerated by the patient; foot elevation placed at a 15-20° with knee in slight flexion position; sliding down the bed or flat bed; avoid sitting on the chair during early post-operative period; apply the anti-phlebitis elastic stocking for patients with varies or history of phlebitis; post-operative regular exercise, i.e. walking in a short time period. As prophylaxis treatment of DVT and PE, low-dose unfractionated heparin (UFH)is immediately administered (5000 unit) subcutaneous every 8 or 12 hours, until the patient is able to be mobilized adequately; while for DVT treatment, loading dose UFH is administered by bolus of 80 unit/kg BW and maintained further with 18 unit/kg BW per hour

through continuous drip. monitor the activated partial thromboplastin time (APTT), with expected APTT 1.5 to 2.0 times the control.[45]Preventing contracture/deformity due to shortening of muscle fibers resulting from immobilization in non-functional position, such as prolonged bedridden with extremities in flexed position or drop foot (the ankle in plantar flexion position). The prevention methods include [44]. Immediate progressive mobilization and proper positioning, by positioning the patients in a such way so that they can lay down on the supporting joints of the body similar to their standing up position, i.e. head, back and extremities in a straight position; while the ankle also in the position similar to the standing up position, i.e. the extremities and foot form a 90 degree angle. Static splinting (foot board, ankle foot orthosis) may also be applied in order to maintain the ankle at the functional position. When the contracture has occurred or if there is any limitation of joint movement, exercise on active and passive joint movement is recommended as well as slow stretching minimal once to twice daily in order to maintain complete range of joint movement. Diathermy ultrasound on muscles may be applied to facilitate stretching. Preventing pressure ulcer by frequent repositioning as many as possible[46] .

Repositioning the patient's back position, i.e. turning the position at the angle of 30 degree to the mattress , alternately to the left or right side, and supine position in every 2-3 hours for high-risked patients and 2-4 times daily for patients with lower risk[46] .

Using protective padding include pillows placed between extremities, lower back and arm-supporting pad to maintain the optimal position preventing contact within bony prominence, extremities or with the mattress elevating the heels of the mattress and supporting the patient on lateral side position at 30o angle. For patients who must have their head at straight position (sitting position) on their bed or for patients who are wheel chair-

bound, periodic repositioning for every 1 hour should be performed or ask the patients to reposition himself altering his weight point for every 15 minutes; however, avoid the doughnut supporting device for chair and wheel-chair and do not positioning the patient on sitting position at 30 degree angle[46].

To prevent skin maceration, keep the skin dry (using high absorbance mattress for incontinent patient) but yet lubricated by applying lubricant on it, such as emollient, the cooking oil, or cream. Apply the lubricants sparingly after bath or voiding. Protective covering, female napkins or overlay on the prominent bone (such as water-gloves on the malleolus) may also be helpful [52]. Skin care provides cleansing and conditioning to promote the optimal functioning of the skin. It consists of providing adequate nutrition, baths, perinea care, and back rubs. Excessive or abrasive skin care can damage skin and result in loss of function. Performing skin care provides an excellent opportunity for the nurse to assess skin integrity. Back rubs and massages stimulate the client's circulation, relax muscles, and relieve muscle tension as well as provide the nurse with an opportunity for skin assessment. Emollient creams and lotions are used to facilitate the rubbing and lubrication of the skin during a back rub or massage[17]. The client is positioned prone or side-lying. Nurses create friction and pressure by rubbing their hands on the client's skin. The friction creates heat, which dilates the peripheral circulation and increases the blood supply to the skin. The pressure provides manual stimulation to muscle fibers, which relaxes the muscles. Prior to performing a back rub or massage, the nurse must assess for contraindications. Caution should be exercised when massaging limbs. Massaging limbs, especially the lower limbs, could dislodge a thrombus (blood clot), creating an embolus (circulating blood clot). Bony prominences should be massaged lightly to avoid damaging underlying tissue[17].To prevent any friction, use the ankle and heel protective pad and the patients should be elevated, do not move the

patients by rubbing or pulling movement off the mattress. Use the low-pressure, low-friction, or low-stretching mattress (such as air-fluidized or high-air-loss/anti-decubitus mattresses) for patients when the repositioning technique is not adequate enough or not possible to perform[46] .When the pressure ulcer has occurred, the treatment should include systemic approach, using specialized mattress, appropriate ulcer care, surgery and experimental treatment[47].Pay attention to the patient's hydration status and manage it appropriately if there is any disorder .Provide adequate nutrition intake by considering the required mineral and vitamin. In malnourished patient with pressure ulcers, at least 30-35 calorie/kg BW/day of nutrition should be provided, in addition to protein intake of 1.25-1.5 g/kg BW/day to achieve the positive nitrogen balance. Use specialized mattress: air-fluidized bed, low-air-loss bed, or specialized mattress that can automatically change the patient positioning. Preventing orthostatic hypotension by immediate progressive mobilization, mainly performed so that the patient can sit on the bed with the leg being dangled, and evaluating the consumed medicine as well as the hydration status of the patient because orthostatic hypotension may result from consumption of antihypertensive drugs, diuretics and body fluid depletion. When the orthostatic hypotension has occurred, reconditioning exercise should be recommended by using a tilt table or by raising the headboard of the bed gradually[48].

Attempt environmental support and available device for supporting adequate mobility in patients with permanent disability. If necessary, provide and give instruction about how to use the standing-supporting device, ambulation as well as the management of maturation and defecation, including using commode or toilet to facilitate straightening of body posture[42].Early mobilization includes activities such as sitting, standing and ambulation, as well as passive exercises, like range of motion exercises and ergometry. The

term “early” has yet to be defined, since among the various studies, the onset of interventions may vary by as much as 1week[49].

## 2.13.Ant emboli Stockings:

Anti-emboli (elastic) stockings are firm elastic hose that compress the veins of the legs and thereby facilitate the return of venous blood to the heart. They also improve arterial circulation to the feet and pre-vent edema of the legs and feet. These stockings are frequently applied to surgical clients to prevent the potential postoperative problem of deep venous thrombosis (DVT).There are several types of stockings. One type extends from the foot to the knee and another from the foot to mid thigh. These stockings usually have a partial foot that exposes the heel or toes so that extremity circulation can be assessed. Elastic stockings usually come in small, medium, and large sizes [18].

## 2.14 Mobilization

Interims of physical rehabilitation are defined as .early sitting up of the patient and other procedures that allow the patient to leave the hospital bed as soon as possible[19].

### 2.14.1. Purpose of mobilization:

Use of all available means to regain the highest level of functional abilities in a patient ,prevent the development of complications , e.g. from inactivity ,maintain patient self-sufficiency movement is a fundamental (physiological) human need, and is typical in all living organisms .Physical activity in a human increases the performance of the organs, improves health and protects against disease. Mobility (physical activity) enables humans to acquire motor skills and movement patterns, navigate the environment; effectively respond to situations in their surroundings affects human self esteem by supporting a sense of independence, usefulness and need. The optimal body posture

supports lung ventilation, gut motility, renal function and the circulatory system. The upright positions also an expression of confidence , physical fitness, attractiveness and a form of non verbal communication. The purpose of correct movement is the upright position ,muscle tension and body balance. Mobility is also associated with highly specialized expressions such as speech , writing , gesticulation , laughter , crying etc[19].At the 2005–2006 north American nursing Diagnosis Association (NANDA) Conference, the diagnosis sedentary lifestyle was approved, underscoring the role of exercise and activity as an essential component of health. Many Healthy People 2020 (U.S. department of health and human services, 2013) objectives pertain to exercise and activity. Moderate exercise is identified as significant to enhancing physical fitness[18].

### 2.14.2 Exercise

Exercise reduces joint pain and stiffness and increases flexibility. Not only does exercise make bones stronger, thereby reducing the risk of osteoporosis and fractures, it also improves muscle strength, coordination and balance. As a result, overall health status is improved[17].

#### 2.14.2.1 Health benefits of exercise

Lower risk include (early death ,heart disease ,stroke ,type 2 diabetes ,high blood pressure , increased lipid levels ,colon and breast cancers) , better health function in older adults , reduced abdominal obesity ,weight maintenance after weight loss , lower risk of hip fracture , Increased bone density ,Improved sleep quality[17].

#### 2.14.2.2 Types of exercise

Exercise involves the active contraction and relaxation of muscles. Exercises can be classified according to the type of muscle contraction (isotonic, isometric, or isokinetic) and according to the source of energy

(aerobic or anaerobic).Isotonic (dynamic) exercises are those in which the muscle shortens to produce muscle contraction and active movement. Most physical conditioning exercises—running, walking, swimming, cycling, and other such activities—are isotonic, as are ADLs and active ROM exercises (those initiated by the client). Examples of isotonic bed exercises are pushing or pulling against a stationary object, using a trapeze to lift the body off the bed, lifting the buttocks off the bed by pushing with the hands against the mattress, and pushing the body to a sitting position .Isotonic exercises increase muscle tone, mass, and strength and maintain joint flexibility and circulation[(18)] .During isotonic exercise, both heart rate and cardiac output quicken to increase blood flow to all parts of the body **.** Isometric (static or setting) exercises are those in which muscle contraction occurs without moving the joint (muscle length does not change). These exercises involve exerting pressure against a solid object and are useful for strengthening abdominal, gluteal, and quadriceps muscles used in ambulation; for maintaining strength in immobilized muscles in casts or traction; and for endurance training[(18)].An example of an isometric bed exercise would be squeezing a towel or pillow between the knees while at the same time tightening the muscles in the fronts of the thighs by pressing the knees backwards and holding for several seconds. These are often called "quad sets." Isometric exercises produce a mild increase in heart rate and cardiac output, but no appreciable increase in blood flow to other parts of the body. Isokinetic (resistive) exercises involve muscle contraction or tension against resistance. During isokinetic exercises, the person tenses (isometric) against resistance. Special machines or devices provide the resistance to the movement. These exercises are used in physical conditioning and are often done to build up certain muscle groups [(18)].

### 2.14.3 Importance of positioning

One of the basic procedures health care providers in long-term care facilities perform most frequently is that of changing the patient's position. Any position, after a period of time becomes uncomfortable and then painful. Whereas the independent person has the ability to assume a great variety of positions, the dependent person may be limited. The patient who is unable to move limbs freely to change positions or who is partially or totally dependent on the nursing staff because of injury or disease must be moved at regular intervals. Changing the dependent resident's position at least every 2 hours accomplishes four things: Contributes to the comfort of the resident, Relieves pressure on affected areas, Helps prevent formation of contractures or deformities, Improves circulation. It is important to remember the amount of support required for positioning depends on the individual patient. When creating a care plan and positioning schedule for the patient, the nurse must look at the individual needs of that patient .Alignment and correct positioning is only effective if the patient is comfortable and safe. When positioning it is important to look at the resident as an individual and take into consideration all factors of the patient's care plan[(50)].

### 2.14. 3.1Key principles of positioning

patient must be positioned in correct body alignment at all times .The goal of good body alignment is to position the patient so that the movable segments of the body are aligned in such a way that there is no undue stress placed on the muscles or skeleton. Good body alignment should be maintained from side to side (laterally) as well as front to back (anterior-posterior). Points of good body alignment are head up, eyes straight ahead, neck and back straight, arms relaxed at side, chest up and out, abdomen tucked in, knees slightly flexed ,feet slightly apart, toes pointing forward. The patient's body should be

supported with positioning aids to maintain good alignment. It is important to remember that the amount of support required for positioning depends on the individual patient. When creating a care plan and positioning schedule for a patient, the nurse must look at the individual needs of that patient .In a long-term care 'home', resources are often a challenge. It is important that the caregiver understands the concept of correct body alignment and correct positioning so he/she is able to think "outside the box" be creative and utilize resources that are readily available[(50)].The position of the patient in bed must be changed at least every 2 hours. If the patient's position is not changed at least every two hours, the individual will be at risk for pain from muscle discomfort, pressure ulcers, contractures and damage to superficial nerves and blood vessels .It is not enough to just position the patient on a turning schedule and expect that the patient will stay in that position for the duration of the time. In between times, the patient should be checked to ensure proper alignment has been sustained[(50)].

### 2.14.4.Moving and Turning Clients in Bed:

Although healthy clients usually take for granted that they can change body position and go from one place to another with little effort, ill people may have difficulty moving, even in bed. How much assistance clients require depends on their own ability to move and their health status. Nurses should be sensitive to both the need of clients to function independently and their need for assistance to move. Correct body alignment for the client must also be maintained so that undue stress is not placed on the musculoskeletal system. When assisting a client to move, the nurse needs to use appropriate numbers of staff and assistive devices to avoid injury to self and client. Having enough staff and assistive devices also helps to ensure client comfort and modesty[(18).]

### 2.14.5. Range of motion:

Range of motion is the term that is used to describe the amount of movement at each joint. Every joint in the body has a "normal" range of motion. Joints maintain their normal range of motion by being moved. Range of motion (ROM) exercises is done to preserve flexibility and mobility of the joints on which they are performed. These exercises reduce stiffness and will prevent or at least slow down the freezing of joints as the disease progresses and move less often. It is therefore very important to move all joints every day. Stiff joints can cause pain and can make it hard for do normal daily activities **(51)**.

There are different kinds of ROM exercises. There are stretching exercises can do when still muscle strength to move joints through their complete ranges. These are called Active ROM exercises. There are Self-ROM exercises which involve using a stronger arm to assist a weaker arm to perform the exercises ،eliminating the need for caregiver assistance. Similarly, none of exercises should because you pain. If experience pain when exercising, stop that exercise and talk to therapist. If joints are very painful and swollen, move them gently through their range of motion. These exercises should be done slowly and steadily. It is important with ROM exercises not to force movements and to stop a movement if it causes pain. Damage to the joint space can occur if too much force is applied. Joint range of motion is done on one joint at a time. Stabilize with one hand just above the joint and place other hand below the joint to move the part through its full range of motion. Physical therapist will tell how many times to do each one **(51).**

### 2.14.6. Ongoing assessment and nursing care:

Nutritional status affects both the patient's potential for developing immobility-related complications and the patient's ability to regain mobility. Monitor the patient's food consumption and portion sizes, daily weights, intake and output (I&O) and activity level. As needed, assist the patient with meals, discuss food preferences with the patient/family ،and consult a dietitian. Monitor lab values related to nutrition, such as serum albumin, serum protein ،blood glucose, and key electrolytes such as sodium, potassium, magnesium, and calcium.Debilitated patients are more susceptible to infection, so monitor for signs such as fever and leukocytosis.[52,54].Ask the patient to report any nausea, vomiting, or abdominal pain.Because immobility can increase the risk of constipation, monitor bowel movements for regularity and characteristics. Encourage fluid intake and a high fiber diet, unless contraindicated, to help prevent constipation.When documenting I &O, note amount and characteristics of urine .Lab test results including urine osmolality and specific gravity and blood urea nitrogen, can help determine the patient's fluid volume status [53, 54].Monitor the patient's emotional status every shift, and be attuned to any behavioral or mood changes. Offer support and empathy, and allow the patient to express his or her feelings in a non judgmental manner. Any identified concerns should be reported and monitored to ensure the patient's continued psychological health [52, 54].

### 2.14.7.Patient teaching:

Adherence to recommended prevention and treatment strategies can make a significant difference in whether the patient will regain mobility or develop immobility-related complications. Educate patients and their families regarding the risks of impaired mobility and the importance of maintaining the highest level of physical activity possible. Explain the importance of

turning and repositioning to maintain skin integrity and explain that passive and active range-of-motion exercises will help the patient maintain joint flexibility ،muscle strength, and muscle mass. Explain the fall prevention techniques. For example, teach patients to change positions slowly to avoid orthostatic hypotension. Stress the importance of optimal nutrition in the healing process; the patient and family should understand that meals high in protein and nutrients are beneficial for healing .Also inform patients about the importance of adequate fluid intake to help prevent both urinary tract infections and constipation.The psychological impact due to impaired mobility and immobility can be devastating. Provide the patient and family with information about support groups and community resources as appropriate for any identified physiological, psychosocial, spiritual, and financial needs [53, 54].

# Chapter Three

## Material and Method

# 3. Materials and Methods

## 3.1 Study design:

This study was quasi experimental, prospective hospitals based study in period from December 2016 to January 2019.

## 3.2 Study area:

The study was conducted in river Nile State, in Shendi town which is 176km north to Khartoum and 110 km south to Elddamer, the capital of River Nile State; Shendi town is lies on the eastern bank of the River Nile with a total area of about 14596 $Km^2$. The total population of Shendi 'locality ' is estimated at about 197589 of whom 116713 live in rural areas and 80876 in urban centers, most of them are farmers, Shendi is the center of the jaaliin tribe and an important historic trading center .Shendi University was established in the early 1990s and stands as a landmark institution in Higher Education. There are three big hospital; Elmek Nimer university hospital, Shendi hospital teaching and military hospital.

## 3.3Setting:

The study was conducted at Elmek Nimer university hospital**.** Elmek Nimer hospital established in 2002, it including many department such as medicine, pediatric, surgery, obstetric, renal center and cardiac center, Ophthalmic, dental unit, dialysis, laboratory, pharmacies and referral clinics. Cardiac center which containing cardiac care unit which contain 8beds , intermittent cardiac care unit , stress test electrocardiogram room ,echocardiogram room ,cardiac catheterization lab with 2 room for follow up the patient after cardiac cateterization,with6-8 nurses over three shift. Intensive care unit in surgery which contains 4 beds with 4 nurses over three shifts. And intensive care units in medicine which contains 8 beds with812 nurses over three shifts.

### 3.4 Study population:

This study includes 120 nurse who work in Elmek Nimer hospital during three shifts.

### 3.4.1. Inclusion criteria:

- Registered nurse agree to participate and had bacheloria or diploma.
- Available during the study .

### 3.4.2. Exclusion criteria:

- Nurses who are not available at the time of data collection.
- Not willing and not agree to participate.
- Nurse on vocation

### 3.5 Sampling:

### 3.5.1 Sample size:

100 nurse were included.

### 3.6Data collection tools:

Data was collected using structured data collection structured questionnaire questions were developed by the researcher according to the research objectives, and the literature review .

### 3.6.1 Structured questionnaires:

**Structured questionnaire composed of 3 parts which include:**

**Part one:** The first part used to collect data about socio-demographic characteristics of the study group including age, qualification, years of experience, and previous training in prevention complication of immobility. This part included (6) closed questions .

**Part two:** The second part was developed to collect data about the women's knowledge about immobility definition ,causes , risk factor ,factor affecting immobility ,common complication of immobility on body system. This part included questions from (7-25).

**Part three:**

The Third part testing the knowledge of the study group about mobilization and exercise. This part included questions from (26-36).

**3.6.2 An observational check list:**

is used for assessing nurses practice about preventive measure each one It involved 18 steps marked to evaluate the performance of nurses at the different steps then the researcher used the following grades on assessing the performance of the nurse (Good, satisfy and poor).

- Good for the best performance of the steps is considered as (3) three.
- Satisfy for the average performance of the steps is considered as (2) two.
- Poor for those who fails to perform of the steps is considered as (1) one.

**3.6.3.Mobility scale:**

Tool use to measure mobility status of immobilized patients, elderly mobility scale (EMS) the EMS is a 20 point validated assessment tool for mobility. This graded as following done and not done.

**3.6.4.Score system:**

**Knowledge:** For each area of knowledge, the scores of the items were sum med-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score.

Knowledge was considered good if the percent score was 75% or more, satisfied if the percentage score between 40%-75% and poor if the percentage less than 40%.

Observational chick list: The total grade score in every step was considered as good if the nurse scored between > (2- 3) n where (n) is the number of steps, and considered satisfy if score > (1-2) n and considered poor if scored (1) . The total score of practice was 18 points.

Six consecutive preventive measures training sessions were carried out, in the form of lectures, group discussions, demonstration and redemonstration by using models. Three months later, the aforementioned tools were used for follow up.

**3.7 variable:**

**3.7.1 Dependent variable:**

Teaching program about prevention of immobility complication related to nurses.

**3.7.2Independent variables**

Knowledge and practice of nurse .

## 3.8 Validity and Reliability of the Questionnaire:

The questionnaire in its initial form has been presented to the supervisor who give his opinion by adding, excluding or amending some of the statements of the questionnaire. He recommended that the statements ought to cover and express the hypotheses of the study and measure them properly. To verify the validity of the study, the researcher after that presented the questionnaire to a committee of five experienced medical and nursing staff at the university of shendi, faculty of medicine and faculty nursing , to approve and reassure the validity and to what extents the questionnaire statements and phrases were clear and appropriate to the study. They all give their valuable contribution by adding, excluding or amending some of the statements of the questionnaire. So the questionnaire validity was of a high stability and an internal consistency. After the verification of the validity of the questionnaire, then questionnaire was distributed to 12 nurse in whom were not included later in the study sample.

A pilot study was carried before embarking on the actual study (data collection). It was conducted during august 2018 in order to test applicability of the tools of data collection, and to estimate the time required for filling the required forms. It was carried out on (12 nurse) to evaluate the content of tools in order to determine

whether the nurse understood the items. The reliability of the questionnaire was (0, 82). The samples of pilot study were not included in the research result.

### 3.9 Data collection technique:

Three tools were used to collect data: a socio demographic Characteristics data form, knowledge of immobility and risk factors of immobility, practice about prevention measures

I. **Pretest: -** used to collect information from the study group to be as base line. The nurse at the beginning of the study filled a pre test questionnaire. Its aim was to elicit nurse knowledge and practice about immobility and prevention measures . The assessment of nurse was done through the pre and post tests, the practical by observational chick list and mobility scale.

**II.** The programs conducted after collection of baseline data include :

- Orientation of nurses about immobility and its complication .
- Teaching nurses assessing immobility complication.
- Asking the nurses to perform preventive measure in the program sessions that will be conducted by the researcher.

**III.** Post test: - this was done after three months during which the study group go for teaching and demonstrating the required skills, using the same assessment sheets.

### 3.10 Field work:

The field work was carried out along a period of 12 months starting from august 2017 to March 2019, 1-2 days weekly. The assessment phase lasted for three months. The implementation phase of the program took eight months and post-test took three months.

Program implementation was in the form of small group sessions, the program content has been sequenced through 13 sessions (2 sessions for pre-test, 9 session for program implementation, 3 sessions for theory and 6 sessions for practice by using

observation check list and 2 session for post test). Group consisted of 10 nurse chosen from different unite . Different educational methods and media were used. Post-tests were conducted at the end of the program.

### 3.10.1 Educational programme:

Educational programme was designed and focusing designed based on actual needs of nurse to improve their knowledge and practice regarding management and prevention of complication of immobility it was in simple english language, lectures, group discussion, and demonstrations used to implement the interventional programme .The researcher used pictures, videos, and equipment for implemented the range of motion , moving of patient on bed and turning of patient .

### 3.10.2 The program implementation:

The interventional program was conducted in elmek Nimer university hospital include nurses work in these hospitals during three shifts. After intervention the researcher evaluated the nurses understanding regarding the lecture and demonstration by used questions and discussion. After three months from program post test was conducted to evaluate the effect of interventional program in improvement of nurses knowledge and practice using the same tools.

### 3.11 Data analysis:

After the data was collected, they are coded and transferred into a specially designed formats so as to be suitable for computer feeding by using, Statistical Package for Social Sciences (SPSS version 20). SPSS was used for analysis and to perform Pearson Chi square test for statistical significance (P value). The 95% confidence level and confidence intervals were used. Following data entry, checking and verification process were carried out to avoid any errors during data entry. Frequency analysis, cross tabulation, and manual revision were all used to detect any errors. The following statistical measures are used:

1. Descriptive measures include count, percentage, and arithmetic mean, standard deviation, minimum and maximum.

2. statistical test include : Chi square test was used for quantitative variables
3. Graphical presentation includes Bar graph, Pie graph.
4. The level of significance selected for this study was P value equal to or less than 0.05.

### 3.12 Limitation of study:

The limitation of study there was some difficult to gather nurses in one time and place due to patient and nurses ratio .

### 3.13 Ethical considerations:

Ethical clearance was obtain from the research and publication ethical committee of the shendi university the permission agreement to conduct the study was obtained from elmek nimir university hospital, , confidentiality was guaranteed by storing data and only the researcher was having the data, participation in this study was voluntary and details about the aim and objectives of the study was explained to the participants, verbal consent was obtained, the participants were free to withdraw at any stage without incurring any consequences.

# Chapter Four

## Results

# 4. Results

**Table (1): Demographic characteristics of study group n=100**

| *Items* | *Frequency* | *Percent* |
|---|---|---|
| ***Age*** | | |
| 20-25 years | 41 | 41% |
| 26-30 years | 33 | 33% |
| 31-35 years | 22 | 22% |
| 36-40 years | 1 | 1% |
| Above 40 years | 3 | 3% |
| ***Clinical experience*** | | |
| Less than one year | 18 | 18% |
| 1-3 years | 31 | 31% |
| More than 3 years | 51 | 51% |
| ***Last attended training and participation established by hospital*** | | |
| Never | 100 | 100% |

The above table clarified that (41%) of study group age between 20-25 years, **(51%)**of them had more than 3years of experience , **(100%)** of them were never attended in training courses and not sharing in training established by the hospital.

## PART TWO

**Table (2): knowledge of study group about definition, causes , level and factor affecting immobility pre, post and follow up test n=100**

| knowledge | Level of knowledge | Pre test | | Post test | | Follow up | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| **Definition of immobility** | Good knowledge | 1 | 1% | 54 | 54% | 56 | 56% |
| | Satisfied knowledge | 8 | 8% | 40 | 40% | 40 | 40% |
| | Poor knowledge | 91 | 91% | 6 | 6% | 4 | 4% |
| **Causes of immobility** | Good knowledge | 4 | 4% | 77 | 77% | 78 | 78% |
| | Satisfied knowledge | 21 | 21% | 19 | 19% | 18 | 18% |
| | Poor knowledge | 75 | 75% | 4 | 4% | 4 | 4% |
| **Level of immobility** | Good knowledge | 6 | 6% | 85 | 85% | 86 | 86% |
| | Satisfied knowledge | 13 | 13% | 12 | 12% | 11 | 11% |
| | Poor knowledge | 81 | 81% | 3 | 3% | 3 | 3% |
| **Factor affecting mobility** | Good knowledge | 4 | 4% | 50 | 50% | 50 | 50% |
| | Satisfied knowledge | 10 | 10% | 40 | 40% | 40 | 40% |
| | Poor knowledge | 86 | 86% | 10 | 10% | 10 | 10% |
| **Purpose of mobility** | Good knowledge | 2 | 2% | 56 | 56% | 57 | 57% |
| | Satisfied knowledge | 10 | 10% | 41 | 41% | 40 | 40% |
| | Poor knowledge | 88 | 88% | 3 | 3% | 3 | 3% |

The above table explained that (54% , 50% , 56%) of study group had good knowledge about definition of immobility ,factor affecting mobility , purpose of mobility respectively in post test and (77% , 85%) of them had good knowledge about causes and level of immobility respectively in post test.

**Table (3): knowledge of study group about complication immobility on body system pre , post and follow up test n=100**

| | Level of knowledge | Pre test | | Post test | | Follow up | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| **Muscle skeletal system** | Good knowledge | 2 | 2% | 69 | 69% | 70 | 70% |
| | Satisfied knowledge | 8 | 8% | 27 | 27% | 26 | 26% |
| | Poor knowledge | 90 | 90% | 4 | 4% | 4 | 4% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |
| **Cardiovascular system** | Good knowledge | 3 | 3% | 70 | 70% | 70 | 70% |
| | Satisfied knowledge | 6 | 6% | 26 | 26% | 26 | 26% |
| | Poor knowledge | 91 | 91% | 4 | 4% | 4 | 4% |
| | | **P1=0.000** | | **P2=0.042** | | **P3=0.359** | |
| **Respiratory system** | Good knowledge | 2 | 2% | 73 | 73% | 73 | 73% |
| | Satisfied knowledge | 8 | 8% | 25 | 25% | 25 | 25% |
| | Poor knowledge | 90 | 90% | 2 | 2% | 2 | 2% |
| | | **P1=0.000** | | **P2=0.011** | | **P3=0.041** | |
| **GIT system** | Good knowledge | 1 | 1% | 75 | 75% | 75 | 75% |
| | Satisfied knowledge | 5 | 5% | 19 | 19% | 19 | 19% |
| | Poor knowledge | 94 | 94% | 6 | 6% | 6 | 6% |
| | **P1=0.000** | **P2=0.011** | | **P3=0.041** | | | |
| **Urinary system** | Good knowledge | 1 | 1% | 85 | 85% | 85 | 85% |
| | Satisfied knowledge | 4 | 4% | 11 | 11% | 11 | 11% |
| | Poor knowledge | 95 | 95% | 4 | 4% | 4 | 4% |
| | **P1=0.000** | **P2=0.000** | | **P3=0.000** | | | |
| **Metabolic system** | Good knowledge | 1 | 1% | 70 | 70% | 70 | 70% |
| | Satisfied knowledge | 4 | 4% | 26 | 26% | 27 | 27% |
| | Poor knowledge | 95 | 95% | 4 | 4% | 3 | 3% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |

Key:P1:comparison of knowledge between pre test and post test
P2: comparison of knowledge between post test and follow up test
P3: comparison of knowledge between pre test and follow up test

The above table explained that (69%,70%, 70%, 73%) of study group had good knowledge about complication related musculoskeletal, cardiovascular, metabolic and respiratory system respectively post test (75% , 85%) of them had good knowledge about complication related to GIT and urinary system respectively post test.

**Table (4): Knowledge of study group about nursing assessment of body system pre , post and follow up test n=100**

| Knowledge | Level of knowledge | Pre test | | Post test | | Follow up | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| **Musculoskeletal system** | Good knowledge | 2 | 2% | 78 | 78% | 78 | 78% |
| | Satisfied knowledge | 9 | 9% | 19 | 19% | 19 | 19% |
| | Poor knowledge | 89 | 89% | 3 | 3% | 3 | 3% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |
| **Cardiovascular system** | Good knowledge | 4 | 4% | 71 | 71% | 71 | 71% |
| | Satisfied knowledge | 24 | 24% | 26 | 26% | 26 | 26% |
| | Poor knowledge | 72 | 72% | 3 | 3% | 3 | 3% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |
| **Respiratory system** | Good knowledge | 3 | 3% | 80 | 80% | 80 | 80% |
| | Satisfied knowledge | 20 | 20% | 18 | 18% | 18 | 18% |
| | Poor knowledge | 77 | 77% | 2 | 2% | 2 | 2% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |
| **Metabolic and gastrointestinal system** | Good knowledge | 3 | 3% | 64 | 64% | 65 | 65% |
| | Satisfied knowledge | 15 | 15% | 31 | 31% | 28 | 28% |
| | Poor knowledge | 82 | 82% | 5 | 5% | 7 | 7% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |
| **Urinary system** | Good knowledge | 3 | 3% | 60 | 60% | 60 | 60% |
| | Satisfied knowledge | 12 | 12% | 32 | 32% | 32 | 32% |
| | Poor knowledge | 85 | 85% | 8 | 8% | 8 | 8% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |

Key:
P1: comparison of knowledge between pre test and post test
P2: comparison of knowledge between post test and follow up test
P3: comparison of knowledge between pre test and follow up test

The above table showed that (78% ,80%) of study group had good knowledge about nursing assessment of musculoskeletal and respiratory system respectively post test while (71% , 65% ,60%) of them had good knowledge about nursing assessment of cardiovascular , gastrointestinal and metabolic and urinary system respectively post test .

**Table (5): Knowledge of study group about management of immobility complication and exercise pre , post and follow up test n=100**

| Knowledge | Level of knowledge | Pre test | | Post test | | Follow up | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| **Observing risk factor of immobility complication** | Good knowledge | 1 | 1% | 48 | 48% | 48 | 48% |
| | Satisfied knowledge | 4 | 4% | 46 | 46% | 46 | 46% |
| | Poor knowledge | 95 | 95% | 6 | 6% | 6 | 6% |
| **P1=0.000** | | **P2=0.002** | | **P3=0.000** | | | |
| **Management of immobility complication** | Good knowledge | 3 | 3% | 58 | 58% | 62 | 62% |
| | Satisfied knowledge | 12 | 12% | 37 | 37% | 32 | 32% |
| | Poor knowledge | 85 | 85% | 5 | 5% | 6 | 6% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |
| **Training program applied in medical condition** | Good knowledge | 1 | 1% | 54 | 54% | 54 | 54% |
| | Satisfied knowledge | 10 | 10% | 38 | 38% | 38 | 38% |
| | Poor knowledge | 89 | 89% | 8 | 8% | 8 | 8% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |
| **Type of exercise** | Good knowledge | 0% | 0% | 41 | 41% | 42 | 42% |
| | Satisfied knowledge | 6 | 6% | 51 | 51% | 48 | 48% |
| | Poor knowledge | 94 | 94% | 8 | 8% | 10 | 10% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |
| **Health benefits of exercise** | Good knowledge | 0% | 0% | 72 | 72% | 72 | 72% |
| | Satisfied knowledge | 14 | 14% | 23 | 23% | 23 | 23% |
| | Poor knowledge | 86 | 86% | 5 | 5% | 5 | 5% |
| **P1=0.000** | | **P2=0.000** | | **P3=0.000** | | | |

Key:

P1: comparison of knowledge between pre test and post test

P2: comparison of knowledge between post test and follow up test

P3: comparison of knowledge between pre test and follow up test

The above table illustrated that (72% ,69%) of study group had good knowledge about health benefit of exercise and observing risk factor respectively post test, (58% ,54% ,42%) of them had good knowledge about management of complication , training program applied and health benefit of exercise respectively post test .

**Table (6): Knowledge of study group about nursing measures to prevent complication of immobility pre , post and follow up test n=100**

| Knowledge | Level of knowledge | Pre test | | Post test | | Follow up | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| **Venous thrombosis** | Good knowledge | - | - | 55 | 55% | 55 | 55% |
| | Satisfied knowledge | 11 | 11% | 30 | 30% | 29 | 29% |
| | Poor knowledge | 89 | 89% | 15 | 15% | 16 | 16% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |
| ***Contracture*** | Good knowledge | - | - | 44 | 44% | 43 | 43% |
| | Satisfied knowledge | 6 | 6% | 48 | 48% | 49 | 49% |
| | Poor knowledge | 94 | 94% | 8 | 8% | 8 | 8% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |
| ***Pressure ulcer*** | Good knowledge | 2 | 2% | 62 | 62% | 63 | 63% |
| | Satisfied knowledge | 10 | 10% | 33 | 33% | 32 | 32% |
| | Poor knowledge | 88 | 88% | 5 | 5% | 5 | 5% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |
| ***Strok*** | Good knowledge | 1 | 1% | 60 | 60% | 61 | 61% |
| | Satisfied knowledge | 8 | 8% | 35 | 35% | 34 | 34% |
| | Poor knowledge | 91 | 91% | 5 | 5% | 5 | 5% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |
| ***Skin maceration*** | Good knowledge | 1 | 1% | 61 | 61% | 61 | 61% |
| | Satisfied knowledge | 7 | 7% | 32 | 32% | 32 | 32% |
| | Poor knowledge | 91 | 91% | 7 | 7% | 7 | 7% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |
| ***Friction*** | Good knowledge | 2 | 2% | 60 | 60% | 60 | 60% |
| | Satisfied knowledge | 8 | 8% | 31 | 31% | 31 | 31% |
| | Poor knowledge | 90 | 90% | 9 | 9% | 9 | 9% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |
| ***Importance of positioning*** | Good knowledge | 1 | 1% | 64 | 64% | 64 | 64% |
| | Satisfied knowledge | 12 | 12% | 32 | 32% | 31 | 31% |
| | Poor knowledge | 87 | 87% | 4 | 4% | 5 | 5% |
| | | **P1=0.000** | | **P2=0.000** | | **P3=0.000** | |

Key:

P1:comparison of knowledge between pre test and post test
P2: comparison of knowledge between post test and follow up test
P3: comparison of knowledge between pre test and follow up test

The above table explained that (55% , 43%) of study group had good knowledge about measure for prevent venous thrombosis and contracture respectively post test (63% ,61%, 61%,60%) of them had good knowledge about Nursing measure for prevent pressure ulcer, stroke , skin maceration and friction respectively post test .

**Table (7): Performance of study group during range of motion exercise, turning of patient and Appling stoking pre, post and follow up test n=100**

| Procedure | Level of performance | Pre test | | Post test | | Follow up | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| ***range of motion exercise*** | Good performance | - | - | 66 | 66% | 69 | 69% |
| | Satisfied performance | 5 | 5% | 29 | 29% | 29 | 29% |
| | Poor performance | 95 | 95% | 5 | 5% | 2 | 2% |
| | | | **P1= .035** | **P2=.078** | | **P3=0.036** | |
| ***Turning of patient on bed*** | Good performance | - | - | 75 | 75% | 73 | 73% |
| | Satisfied performance | 2 | 2% | 21 | 21% | 23 | 23% |
| | Poor performance | 98 | 98% | 4 | 4% | 4 | 4% |
| | | **P1=0.054** | | **P2=0.057** | | **P3=0.017** | |
| ***Applying elastic stoking*** | Good performance | - | - | 69 | 69% | 69 | 69% |
| | Satisfied performance | 2 | 2% | 29 | 29% | 29 | 29% |
| | Poor performance | 98 | 98% | 2 | 2% | 2 | 2% |
| | | **P1=0.084** | | **P2=0.074** | | **P3=0.054** | |
| ***Using mobility scale*** | Done | 1 | 1% | 98 | 98% | 97 | 97% |
| | Not done | 99 | 99% | 2 | 2% | 2 | 2% |
| | | **P1=0.075** | | **P2=0.079** | | **P3=0.001** | |

Key:

P1: comparison of knowledge between pre test and post test

P2: comparison of knowledge between post test and follow up test

P3: comparison of knowledge between pre test and follow up test

The above table clarified that (73% ,69% , 69%) of study group had good performance about Turning of patient on bed, range of motion exercise and applying elastic stoking respectively post test

**Table (8): knowledge of study group about Barriers to mobilization n=100**

| Items | Frequency | Percent |
|---|---|---|
| **Barriers to mobilization** | | |
| Short staffed | 60 | 60% |
| Lack of time | 45 | 45% |
| Unstable patient | 52 | 52% |
| Lack of training, resources, equipment, guidelines | 52 | 52% |
| Other aspects of care more important/lack of continuity | 22 | 22% |
| Lack of knowledge | 50 | 50% |
| Lack of aids | 37 | 37% |
| Unable to assess | 60 | 60% |

*Multi response taken by respondent.

## Relation between Studies Variables

### Table (9): correlation between qualification and knowledge about systemic complication of immobility pre, post and follow up test

| *Knowledge* | Pre test (sig) | Post test (sig) | Follow up (sig) |
|---|---|---|---|
| Musculoskeletal system | .050 | .938 | .873 |
| cardiovascular system | .010 | .675 | .675 |
| respiratory system | .050 | .504 | .504 |
| GIT system | .010 | .718 | .718 |
| urinary system | .002 | .736 | .736 |
| metabolic system | .000 | .675 | .603 |

*** P.V Significant = 0.0 5**
**** P.V Highly Significant <0.0 5**

### Table (10): correlation between qualification and knowledge about nursing measures for prevent complication pre, post and follow up test

| *Procedure* | Pre test (sig) | Post test (sig) | Follow up (sig) |
|---|---|---|---|
| Venous thromboembolism | .001 | .232 | .183 |
| Contracture | .002 | .590 | .574 |
| Pressure ulcer | .204 | .590 | .607 |
| Stroke | .061 | .965 | .960 |
| Skin maceration | .041 | .734 | .734 |
| Friction | .238 | .861 | .969 |

*** P.V Significant = 0.0 5**
**** P.V Highly Significant <0.0 5**

**Table (10): correlation between years of experience and level of performance pre, post and follow up test**

| *Nursing measures* | **Pre test (sig)** | **Post test (sig)** | **Follow up (sig)** |
|---|---|---|---|
| range of motion exercise | .286 | .159 | .202 |
| Turning of patient in bed | .739 | .594 | .477 |
| Apply elastic stoking | .739 | .864 | .864 |
| Using mobility scale | .616 | .739 | .365 |

*** P.V Significant = 0.0 5**
**** P.V Highly Significant <0.0 5**

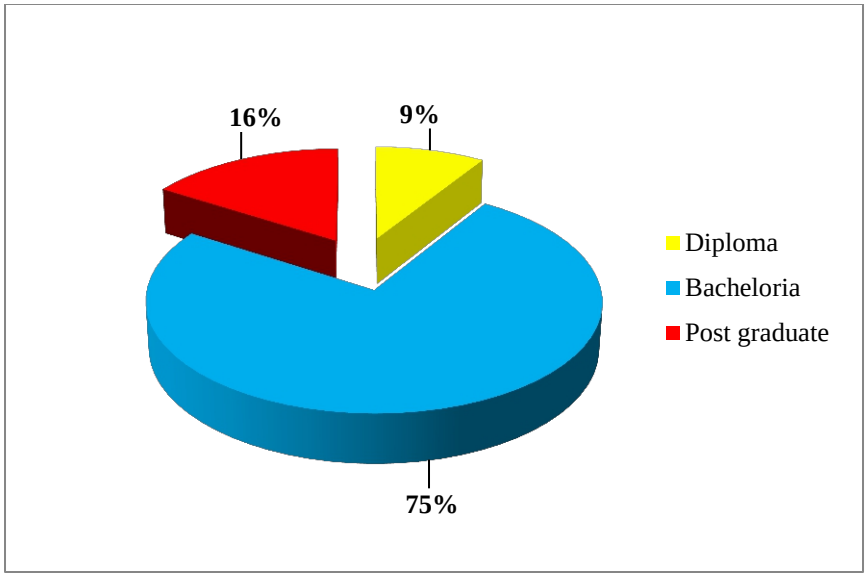


**Figure (1): Demographic characteristics of study group regarding qualification**

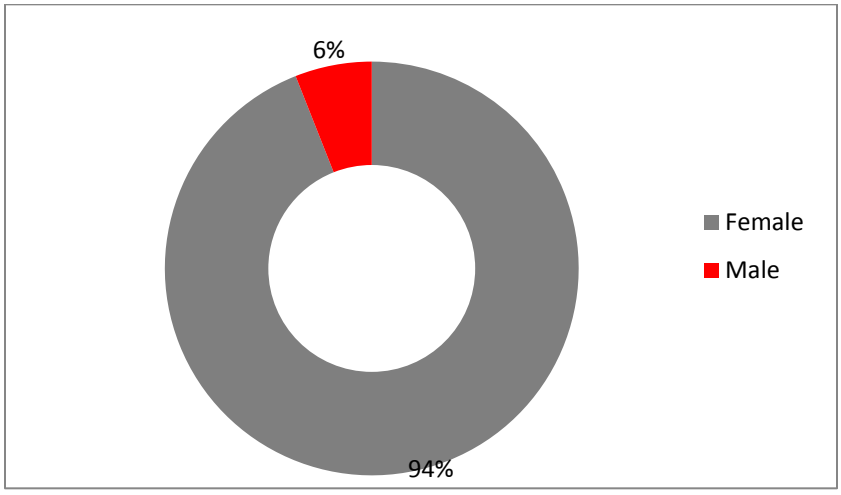


**Figure (2): Demographic characteristics of study group regarding sex**

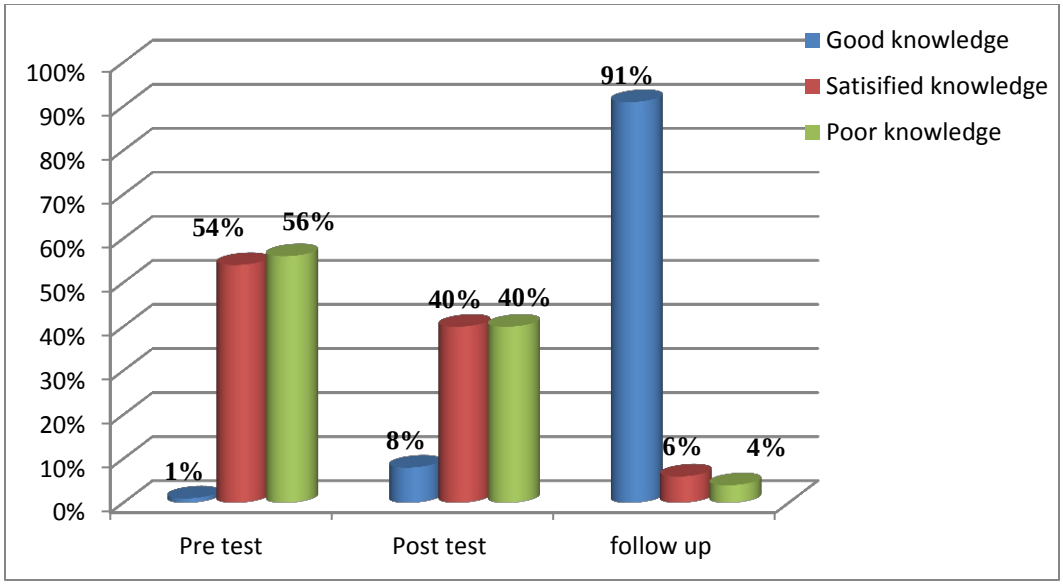


**Figure (3): knowledge of study group regarding definition of immobility in pre test and post test and follow up test**

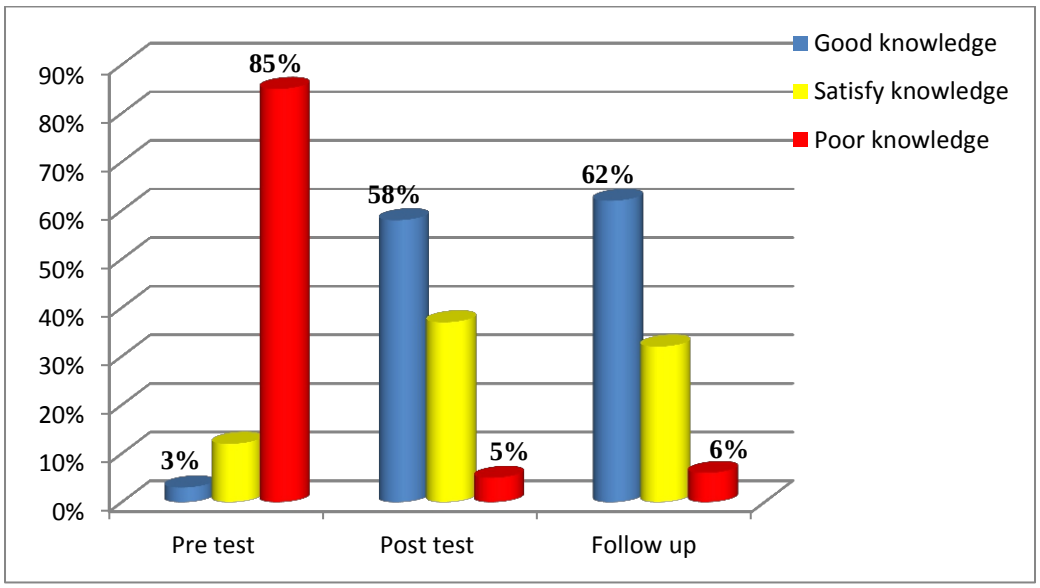


**Figure (4): knowledge of study group regarding management complication of immobility in pre test and post test and follow up test**

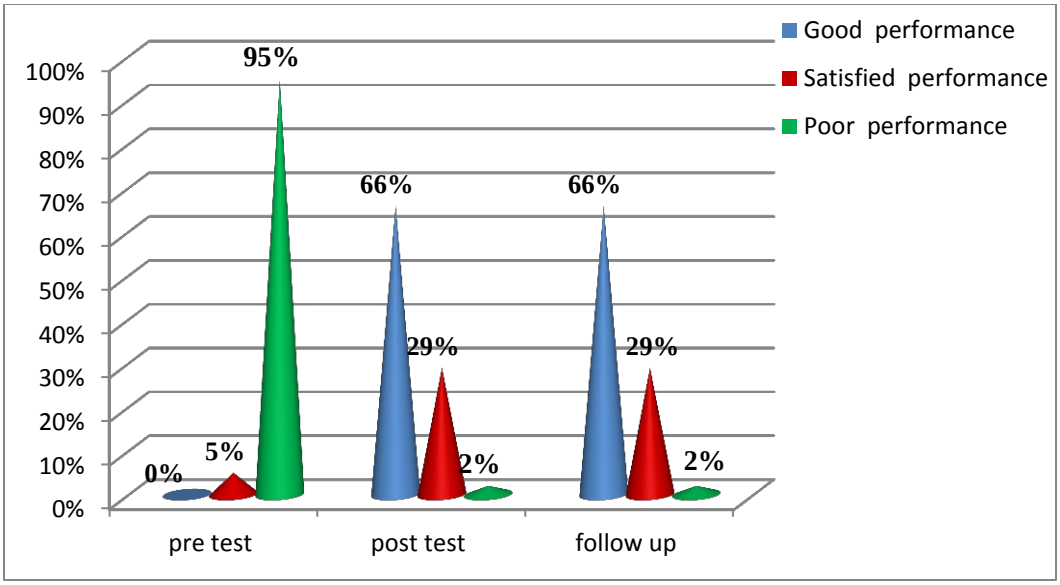


**Figure (5):performance of study group regarding management performance of range of motion in pre test and post test and follow up test**

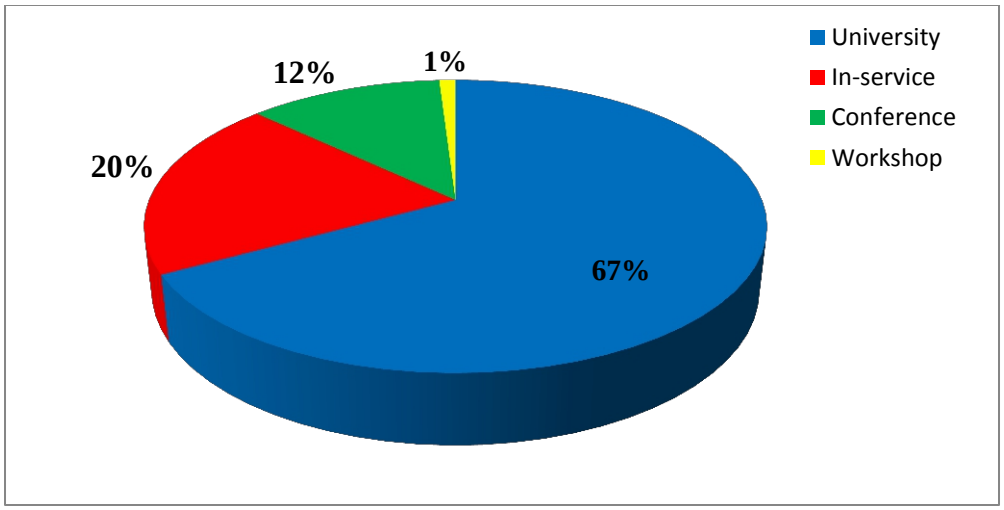


**Figure (6): Distribution of study group according to sources of knowledge about immobility complication**

# Chapter Five

## Discussion
## Conclusion
## Recommendations

## 5.1 Discussion

Nurses play a key role in managing immobility complications ,awareness about the significance of the issue, a positive attitude towards prevention and an adequate level of knowledge are cornerstones of effective prevention of immobility complications. Nurses are the main group of healthcare personnel across all healthcare settings. Accurate assessment, prompt intervention and adequate evaluation by nurses are necessary to better manage immobility complications and improve clinical outcomes for bedridden patients.

Concerning the demographic characteristics, the present study showed that less than half (41%) of them their age between 20-25 year this result may be due to migration more experience health care provider. more than tow third (75%) of them had bacheloria and all most (100%) of them were not attending training courses and not sharing in training established by the hospital this result may be no opportunity of work shop and training program .

The result of study showed that more than half(56%,56%) of study group had good knowledge about definition of immobility and purpose of mobility respectively and had been improved in the follow up test with highly significant result (**pv**= 0.000) also majority(77% , 85%) of them had good knowledge about causes and level of immobility respectively in post and follow up test , half (50%) of them had good knowledge about factor affecting mobility this result match with result of study done in Egypt which state(Regarding caregiver's knowledge in the study group about the basic concepts of immobility pre educational guidelines the study reveals that less than half of the caregiver (46.7%) their knowledge were satisfactory regarding the definition of immobility, also (44.4%) of them their knowledge were satisfactory regarding the causes of immobility. Regarding Purpose of mobility and factors affecting immobility (24.4% and 22.2%) of them their knowledge were satisfactory respectively .While there was highly statistical significant difference

between two groups regarding their knowledge about basic concepts of immobility post educational guidelines)[56].

Moreover the study represented that ,the nurse knowledge about systemic complication of immobility had been improved in post test and follow up test with highly significant result(**pv**=0.00). this finding corresponding to study done in Egypt which state (There was statistically significant improvement of caregivers' knowledge and practice regarding prevention of immobilization complications and improvement of patients' functional condition in the study group after implementation of educational guidelines )[56].also agree with another study done at Ahmadabad City which concluded (samples knowledge as well as the skill improved after implementation of planned teaching programmer on prevention of complications of immobilized orthopedic patients. It showed that the planned teaching programmer was effective in terms of improving knowledge and practice among staff nurses related to on prevention of complications of immobilized orthopedic patients [59].

The study reflected that nurses knowledge about assessment of body systems had been improved in post test and follow up test with highly significant result(**pv**=0.00).

The present study showed that there was improved in nurses knowledge about observing the risk factor of immobility, management of complication, type and benefits of exercise and importance of positioning in post test and follow up test with highly significant result (**pv**=0.00).The teaching program for nurses is highly recommended to reduce the complications of immobility.

Furthermore the study group knowledge about nursing measures was been improved in post test and follow up test .this finding similar to result of study in India which state(The study shows that group had 100% inadequate knowledge on prevention of complication of immobility during the pretest. After the intervention 55% of the study participants had adequate knowledge in the group)[2]**.** also agree

with another study carried out at US which state that (When a patient is prescribed bed rest, it is the responsibility of the care providers to be vigilant and aggressive with interventions to prevent the complications that will inevitably result from the altered homeostasis) [(51).] And agree another study done by Beckman which state(results indicated that a higher level of pressure ulcer knowledge was significantly correlated with a lower incidence of pressure ulcers. A reason for this might be that insufficient knowledge leads to misconceptions about prevention of pressure ulcers and, subsequently, to suboptimal care) [(61).]

Despite of demonstration and redemonstration for study group about range of motion exercise ,turning of patient on bed ,apply elastic stoking and using mobility scale to evaluate mobility status of patient and the study showed that more than two third(69%) of them had good performance about range of motion exercise and apply elastic stoking to patient this result agree with study in Australia Which state (Nurses can play a major role in VTE(Venous thromboembolism ) prevention if well-educated and empowered to change hospital culture. Their increased level of knowledge undoubtedly leads to an improvement in the delivery of patient care. Appropriately trained nurses are skilled in assessing the risk of VTE in their clients and ensuring prophylactic measures are in place for those clients who are particularly vulnerable to developing VTE. Even in the absence of a medical practitioner, the nurses can initiate appropriate mechanical measures.)[(62)]while two third( 66%) of them had good performance about turning of patient on bed post implementation of the program with highly significant statistical (**pv = 0, 000**) different between the practice of nurses when perform range of motion ,apply elastic stoking to patient and about turning of patient in pre and post of program intervention .Otherwise, almost(98% ) all study group had demonstrated good practice toward using mobility scale to evaluate mobility status of the patient because it is most important procedure that can reduce the prevalence of immobility complication ,If nurses follow preventive measure properly they will prevent

immobility complication and Therefore, they reduce the association between risk factor and complication .

Regarding barriers to practice early mobilization the study clarified that two third (66%)were reported short staff, less than half (45%) of them were reported lack of time , more than half (52%) of them were reported Unstable patient , more than half (52%) of them were reported Lack of training, resources, equipment, guidelines, less than one third (22%)of them were reported Other aspects of care more important/lack of continuity , half (50%)of them were reported Lack of knowledge, more than one third (37%) of them were reported Lack of aids ,near to two third of them (60%)of them were reported Unable to assess . this result is agree with study carried out at Brazil which state (The participants were aware of the benefits of early mobilization and manifested attitudes favorable to its application. However, the actual performance of early mobilization was perceived as a challenge, mainly due to the lack of professionals and time, excessive sedation, delirium, risk of musculoskeletal self-injury and excessive stress at work.)[(55)] and also agree with another study done In Canada the survey showed that Major Institutional Barriers are Lack of protocols/guidelines , Insufficient Equipment , Insufficient Staffing , No physician requests for physiotherapy consult and Major Patient Barriers are Medical instability ,Excessive sedation ,Lines and Major Health Care Provider Barriers are Knowledge ,Skills set ,Safety concerns ,Delays in Recognition of suitable patients**)**[(40)].

The study represented that there was significant relation between the study group qualification and their knowledge about complication related to musculoskeletal system in pre test (**pv** = .050) with no statistical significant (**pv** = .938,873) in post test phase follow up phase respectively, also study clarified that was significant relation between the study group qualification and their knowledge about complication related to cardiovascular system in pre test (**pv** = .010) with no statistical significant (**pv** = .675,675) in post test phase follow up

phase respectively, with statistical significant between the study group qualification and their knowledge about complication related to respiratory system in pre test (**pv** = .050) with no statistical significant (**pv** = .504,.504) in post test phase follow up phase respectively also there was significant relation between the study group qualification and their knowledge about complication related to GIT system (**pv** = .010) with no statistical significant (**pv** = .718 , .718) in post test phase follow up phase respectively. there was significant relation between the study group qualification and their knowledge about complication related to urinary system (**pv** = .002) with no statistical significant (**pv** = .736 , .736) in post test phase follow up phase respectively. This finding is disagree with results with result of study done in **china** which state (There were significant differences in nurses' knowledge by age, education level and length of employment, indicating that experience influenced knowledge.[59]

The study illustrated that was no statistical significant (**p value** = .232, .183) in post test and follow up phase and significant (**pv** =.010) in pre test phase In relation between study group qualification and nursing measure for prevent venous thrombosis, also it clarified that there was statistical significant in pre test phase between study group qualification and nursing measure for prevent contracture in pre test phase (**pv** = .002) with no statistical significant relation in post test phase and follow up phase (**pv** =.590 , .374.574 ) respectively .

The study illustrated that In relation between the study group years of experience and level of practice (range of motion exercise , turning patient on bed ,apply elastic stoking )there was no statistical significant in pre test phase , post test and follow up phase .

## 5.2 Conclusion

**Based on the study result the was concluded that**

- Most of study group knowledge about immobility complication improved in post test while in follow up test upgrade.
- Most of study group knowledge and practice about preventive measures improved in post test and follow up test
- The current study indicated that the educational programs were effective in increasing knowledge, improving practice and performance of study group, and indicated the ability of study group to assessment of the patient and reducing the complication.
- The most common barrier to practice mobilization were unstable patient , lack of training, resources, equipment, guidelines, lack of knowledge and unable to assess

## 5.3 Recommendation

**Based on conclusion of this result the study recommended that**

- Nurses should train to deal immobile patient
- Increase nurse awareness about immobility complication and preventive measures to reduce risk of complication and improve quality of care through in-services educational programs, workshops, and continuous training.
- Annuals conferences for nurse's staff about preventive measure for immobility complication to discuss their problems, exchange knowledge, and find ways to improve services provide to patients.
- Further studies should be needed about this topic .

# Annexes

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## Questionnaire

### Research educational Program

## Mobility Scale Scale

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جامعة شندي

كلية الدراسات العليا والبحث العلمي

# Questionnaire about effectiveness of nursing intervention on prevention complication of immobility

**Serial Number**……

***Part one:***

***Demographic data:***

**1. Age (years):**

A.2o-25 years ( ) b.26-30years( ) c.31-35years( )d.Above40( )

**2. Gender**: a. Female ( ) b. Male ( )

**3. Qualification:**

a. diploma( ) b. bacheloria ( ) c. Post graduate ( )

**4. clinical Experience:-**

a. Less than one years ( ) b. 1-3years ( ) c. More than3years ( )

**5. last attend training on prevention the immobility complication:-**

a. < 1year ( ) b. 1-2 year ( ) c.> 2 year ( ) d. Never ( )

**6. participation in training related to prevent immobility complication which established by hospital:**

a. Local ( ) b. Inside the country( National)( )

c. outside the country( International) ( ) d. Not sharing( )

***Part two:***

***Knowledge about immobility:***

**7. Definition of immobility:**

a. Immobility refers to the inability to move freely ( )

b. Alteration in the level of physical mobility can result from prescribed restriction of movement

c. Immobility is a common pathway by which a host of diseases and problems in older individuals produce further disability.( )

d. Being in bed means that these patients remain inactive unless they are helped by their family, friends or certain physiotherapy specialists.( )

**8. Source of immobility complication Education:-**

a. University ( ) b. In-service ( ) c. Conference ( ) d. work shop

**9. Causes of immobility:**

a. Musculoskeletal disorders . ( )

b. Neurological disorders.( )

c. Cardiovascular disorders. ( )

d. Environmental factors and pain. ( )

**10. Immobility levels:**

a. Complete immobility ()b. Partial immobility ( ) c. Limited activity associated with disease ( )

**11. Factors affecting mobility:**

a. growth and development( ) b. nutrition( ) c. personal values and attitudes( )

d. Excessively high temperatures and high humidity( )

e. prescribed limitations(such as casts, braces, splints, and traction) ( )

**12. Purpose of mobility:**

a. To regain the highest level of functional abilities in a patient. ( )

b. Prevent the development of complications. ( )

c. Maintain patient self-sufficiency.( )

d. Acquire motor skills and movement patterns.( )

**13. Common complication of immobility related to Musculoskeletal system:**
a. loss of muscle strength and endurance. ( )
b. contractures and soft tissue changes. ( )
c. osteoporosis. ( )
d. disuse, and degenerative joint disease. ( )
**14. Common complication of immobility related to cardiovascular system:**
a. an increased heart rate. ( ) b. decreased cardiac reserve. ( )
c. orthostatic hypotension. ( )d. venous thromboembolism ( )
**15. Common complication of immobility related to respiratory system:**
a. Decreased ventilation. ( ) b. Atelectasis ( )c. Hypostatic pneumonia ( )
**16. Common complication of immobility related to GIT system:**
a. Glucose intolerance. ( )b. anorexia.( )c. constipation. ( )
**17. Common complication of immobility related to urinary system:**
a. renal stones ( )b. urinary tract infections ( )
**18. Common complication of immobility related to metabolic system:**
a. Decreased basal metabolic rate.( )b. increased dieresis, natriuresis . ( )
c. nitrogen and calcium depletion( )
**19. Nursing assessment of musculoskeletal system include:**
a. Measure arm circumferences. ( ) b. Measure leg circumferences. ( )
c. Palpate and observe body joints ( ).
d. Take goniometric measurements of joint ROM( )
**20. Nursing assessment of Cardiovascular system include:**
a. Auscultate the heart. ( )
b. Measure blood pressure. ( )
c. Palpate and observe sacrum, legs, and feet. ( )
d. Palpate peripheral pulses ( ).
e. Observe calf muscles for redness, tenderness, and swelling. ( )
**21. Nursing assessment of respiratory system include:**
a. Measure respiratory character( )
b. Observe chest movements **()**
c. Auscultate chest ( )
**22. Nursing assessment of metabolic and Gastrointestinal system include:**
a. Measure height and weight ( )
b. Observe skin.( )
c. Observe stool.( )
d. Auscultate bowel sounds.( )
**23. Nursing assessment of Urinary and system include:**
a. Measure fluid intake and output( )
b. Inspect urine.( )
c. Palpate urinary bladder.( ).
**24. Management of immobility complications include :**
a. mobility exercises ( )
b. utilization of ambulatory device ( )
c. supporting appliance for assisting patients ( )
d. management of urinary voiding and defecation ( )
e. Providing education about the danger of prolonged bed rest.( )
f. Reduce the dose of drugs that may cause weakness or fatigue.( )
g. Giving adequate nutrition ( )
**25. training program should be applied during a stable medical condition, including:**
a. Bed side mobility training.( )b. exercise on joint range of motion .( )
c.exercise for muscle strength.( ) d. transfer with help and limited ambulant( )

***Part three:***

***Knowledge about mobilization and exercise:***

**26. type of exercise:**

a. Aerobic.( ) b. Strengthening.( )c.Isometric.( ) d. Isotonic( )
e.Isokinetic ( ) f. Range of motion (ROM) ( )

**27. health benefits of exercise:**

a. Reduces joint pain and stiffness and increases flexibility .( )
b. Reducing the risk of osteoporosis and fractures.( )
c. Improves muscle strength, coordination, and balance.( )
d. Improve health status.( )

**28. Managing the risk factors of immobilization include** Recognizing and managing**:**

a. Infection. ( )
b. Malnutrition. ( )
c. Anemia.( )
d. Fluid and electrolyte imbalance.( )

**29. Nursing management of venous thromboembolism including:**

a. Graduated compression stocking (GCS) by using elastic stocking.( )
b. Use several kinds of anticoagulants as order.( )
c. Exercising the extremities and joint movement.( )
d. Avoid sitting on the chair during early post-operative period.( )

**30. Nursing management and prevention of contracture:**

a. proper positioning the patients supporting joints of the body( ) b. Static splinting. .( )
c. active and passive joint movement once to twice daily.( )
d. Diathermy ultrasound on muscles may be applied to facilitate stretching.( )

**31. Importance of positioning:**

a. Contributes to the comfort of the patient ( )
b. Relieves pressure on affected areas( )
c. Helps prevent formation of contractures or deformities( )
d. Improves circulation( )

**32. Nursing measures for prevention of pressure ulcer:**

a. Repositioning the patient's.( )
b. alternately to the left or right side every 2-3 hours for high-risked patients ( )
c. Alternately to the left or right side every 2-4 times daily for lower risk patients.( )
d. Using protective padding (between extremities, lower back and arm).( )
e. Do not positioning the patient on sitting position at 30o angle. ( )

**33. Nursing measures for prevention of complication related story :**

a. Correct positioning is important to prevent contractures.( )
b. Patient's position changed every 2 hours.( )
c. Affected extremities exercised passively.( )
d. Keep the skin dry and applying lubricant after bath or voiding. ( )

**34. Nursing measures for prevention of skin maceration:**

a. Keep the skin dry and applying lubricant after bath or voiding. ( )
b. Using high absorbance mattress for incontinent patient.( )
c. Protective covering, female napkins or overlay on the prominent bone( )

**35. Nursing management and prevention of any friction:**

a. use the ankle and heel protective pad .( )
b. the patients should be elevated. ( )
c. do not move patient by rubbing or pulling movement ( )
d. Use the low-pressure, low-friction, or low-stretching mattress.( )

**36. Barriers of mobilization :-**

a. Short staffed ( ) b. Lack of time ( ) c. Unstable patient ( ) d. Lack of training, resources, equipment, guidelines () e. Other aspects of care more important/lack of continuity ( ) f. Lack of knowledge () g. Lack of aids ( ) h. Unable to assess ( )

# Research educational Program

**Educational hand book Summary**

The book was developed to provide educational information and resources to manage complication of immobility. It was designed as a reference guide to address the gaps identified in care of immobilized patient, it aims to establish evidence-based strategies to help the target Populations to prevent and manage complication of immobility.

An intense educational program designed by the researcher based on actual assessment of nurses needs to improve their practice in the light of the available researches and literature. The intervention developed in a simple English language to cover the relevant aspects of prevention of immobility complication as preventive measure , the impact of the program based on the improvement of their knowledge and practice regarding preventive measure for immobility complication to decrease the occurrence complications .

**General objective:** To provide the nurses with and educational tools necessary to provide basic care for immobilized patient.

**Specific objectives**: By the end of this book any nurses should be able to :-

1. Explain definition of immobility
2. Explain level and causes of immobility
3. Explain factor affecting mobility
4. Explain complication immobility
5. Identify nursing assessment of immobility complication
6. Describe nursing measure for preventing immobility complication
7. Perform range of motion exercise ,turning of patient apply elastic stoking and using mobility scale

## *Program:-*

**Developing nursing intervention to prevent immobility complication hand out to Prevent and manage patient:**

This is to certify that the doctoral study by Faiza Ahmed Saeed Mousa has been found to be complete and satisfactory in all respects, and that any and all revisions required by the review supervisor had been made.

## *Reviewer:*

***Dr: Higazi Mohamed Ahmed Awad***

***Dr: Metwake l Emam AwadAlkareem***

**Modules*:***

- Real objects (module, clean gloves, alcohol hand rub, elasticstocking,sheets, pillows).
- The researcher used different media showing

**Duration of the program**

The program was done in period of eight month.

**Steps of conducting the program:**

1) **Pretest**

This include structured data collection instrument which was developed by the researcher, to evaluate nurses knowledge and practice regarding prevention of immobility complication

2) **Information (Education Program)**

This section includes pictures of the slides, talking points, videos.

The intervention was implemented to small groups (3-7) ,the mode of the intervention was face-to-face ,the program were implemented in two sessions one time a week for three months( June , July ,august 2018) , Each session took about one hour and at the end of each session each nurse understood the instructions.

## *Program (Nurses)*

## Section one:

**Introduction about immobility**

| Objectives | Teaching methods &media | Contains | Evaluation |
|---|---|---|---|
| By the end of this section any client should be able to 1-define immobility | Lecture +discussion +slides show | Definitions of immobility | Nurse define immobility |
| 2-explaine level and causes of immobility | Lecture +discussion +slides show | 1- level immobility 2-causes of immobility | Nurse understand |
| 3- explain factor affect mobility | Lecture +discussion +slides show | Obtains information about factor affect mobility | Nurse understand |

## Section two:

**Complication of immobility**

| Objectives | Method & media | Contains | Evaluation |
|---|---|---|---|
| By the end of this section any client should be able to : 1-numerate complication of immobility | Lecture +discussion +slide show | Obtains information about complication of immobility | Know complication of immobility |
| 2-explain nursing assessment of complication | Lecture +slide show +discussion +booklet | Discussion about nursing assessment of complication | Know about nursing assessment of complication |

## Section three:

**Nursing measure for prevention of immobility complication**

| Objectives | Method & media | Contains | Evaluation |
|---|---|---|---|
| By the end of this section any nurse should be able to :<br>-Explain nursing measure for prevention of immobility complication | Lecture +slide show +discussion +booklet | Obtain information about nursing measure for prevention of immobility complication | Nurse understand |

## Section four:

### Practice and performance

| Objectives | Method &media | Contains | Evaluation |
|---|---|---|---|
| By the end of this section any nurse should be able to :<br><br>1- perform range of motion exercise + turning patient on bed + apply elastic stoking +using mobility scale | Lecture +Videos+ demonstration | Range of motion exercise+ turning patient on bed + apply elastic stoking +using mobility scale<br><br>Importance Range of motion exercise turning patient on bed + apply elastic stoking +using mobility scale | Nurse demonstration and remonstration |

## Check list to evaluate nurse's performance during turning a Patient in Bed

| Candidate did the following | Mark | Done correctly | Done not correctly | Not done |
|---|---|---|---|---|
| 1. Check the doctor order. | | | | |
| 2. Explain procedure to patient and/or caregiver as indicated. | | | | |
| 3. Alcohol hands Wash and don gloves. | | | | |
| 4. Raise bed to your thigh level. Place patient on back with head of bed in flat position. Lower side rails on side nearest you. Lock bed wheels. | | | | |
| 5. Position patient near far side of bed in supine position. | | | | |
| 6. Position patient's near arm across the chest. Slightly abduct the patient's far shoulder from the side of the body. Place the patient's near ankle and foot across the far ankle and foot. | | | | |
| 7. Place your hands on patient's far shoulder and hip and roll patient toward you. If draw-sheet is in place, grasp it near patient's shoulder and hip instead. | | | | |
| 8. Stand opposite patient's center with feet in wide stance and one foot ahead of the other. Tighten abdominal and gluteal muscles, and flex your knees. | | | | |
| 9. Position patient with pillows and other positioning aids; raise side rails; lower bed; remove gloves and other protective equipment; | | | | |
| 10. Raise side rails. Lower bed. | | | | |
| 11. Alcohol hands Wash | | | | |
| 12. Document the procedure | | | | |

## Check list to evaluate nurse's performance during Range-of-Motion Exercises

| Candidate did the following | Mark | Done correctly | Done not correctly | Not done |
|---|---|---|---|---|
| 1. Assessed the patient's joint mobility and activity status. | | | | |
| 2. Assessed the patient's general health status. | | | | |
| 3. Assessed the patient's ability and willingness to cooperate in ROM exercises | | | | |
| 4. Checked for any physician's orders related. | | | | |
| 5. Alcohol hands washing. | | | | |
| 6. Explained the procedure to the patient | | | | |
| 7. Raised the bed to an appropriate working position based on your height. | | | | |
| **8. Neck:**<br>(1) Flexion: position the head as if looking at the toes. | | | | |
| (2) Extension: position the head as if looking straight ahead. | | | | |
| (3) Hyperextension: position the head as if looking up at the ceiling. The elderly person should not perform this movement, which can lead to pain or cervical fractures. | | | | |
| (4) Lateral flexion: while the head is positioned looking straight ahead, tilt the head toward the shoulder, first to the left and then to the right. | | | | |
| (5) Lateral rotation: position the head so that the head is looking first toward the right and then toward the left. | | | | |
| **9. Shoulder:**<br>(1) Flexion: raise the arm forward and overhead. The elbow may be bent to avoid the head of the bed. | | | | |
| (2) Extension: return the arm to the side of the body. | | | | |
| 3) Internal rotation: swing the arm up and across the body. | | | | |
| (4) External rotation: rotate the arm out and back, keeping the elbow at a right angle. | | | | |

| | | | | |
|---|---|---|---|---|
| **10. Elbow (these movements can be performed in conjunction with the shoulder movements):**<br>(1) Flexion: bend the elbow. | | | | |
| (2) Extension: straighten the elbow. | | | | |
| (3) Pronation | | | | |
| (4) Supination | | | | |
| **11. Wrist:**<br>(1)Flexion: grasping the palm with one hand and supporting the elbow with the other hand, bend the wrist forward. | | | | |
| (2) Extension: straighten the wrist joint. | | | | |
| (3) Radial deviation: bend the wrist toward the thumb. | | | | |
| (4) Ulnar deviation: bend the wrist toward the little finger. | | | | |
| (5) Circumduction: move the wrist in a circular motion. | | | | |
| (6) Pronation: turn the hand so that the palm is downward. | | | | |
| (7) Supination: turn the hand so that the palm is upward. | | | | |
| **12. Fingers and thumb**<br>(1) Flexion: bend the fingers and thumb onto the palm. | | | | |
| (2) Extension: return them to their original position. | | | | |
| (3) Abduction: spread the fingers. | | | | |
| (4) Adduction: return the fingers to the closed position. | | | | |
| (5) Circumduction: move the thumb in a circular motion. | | | | |
| (6) Opposition: touch the end of the thumb to each of the fingers in turn. | | | | |
| **13. Hip and knee :**<br>(1) Flexion: lift the leg, bending the knee as far as possible toward the patient's head. | | | | |
| (2) Extension: return the leg to the surface of the bed and straighten. | | | | |
| (3) Abduction: with the leg flat on the bed, move the entire leg out toward the edge of the bed. | | | | |

| | | | | |
|---|---|---|---|---|
| (4) Adduction: bring the leg back toward the midline or center of the bed.<br>*Note*: Steps 3 and 4 can be performed with the knee bent. | | | | |
| (5) Internal rotation: with the leg flat on the bed, roll the entire leg inward so that the toes point in. | | | | |
| (6) External rotation: with the leg flat on the bed, roll the entire leg outward so that the toes point out. | | | | |
| **14. Ankle:**<br>(1) Dorsiflexion: cup the patient's heel with your hand, and rest the sole of the foot against your forearm. Steady the leg just above the ankle with your other hand. Put pressure against the sole of the patient's foot with your arm to flex the ankle. | | | | |
| (2) Plantar flexion: change your hand from above the ankle to the ball of the foot. Move the other arm away from the toes, keeping the hand cupped around the heel, and push the foot.downward to point the toes. | | | | |
| (3) Circumduction: rotate the foot on the ankle, moving it first in one direction and then in the other. | | | | |
| **15. Toes:**<br>(1) Flexion: bend the toes down. Avoid grasping the nails because this can be uncomfortable for the patient. | | | | |
| (2) Extension: bend the toes up. | | | | |
| **16.** Return bed to lower position for patient to get in and out. | | | | |
| 17. Alcohol hands Wash | | | | |
| 18. Document the ROM | | | | |

## Check list to evaluate nurses performance during applying elastic stoking to the patient

| Candidate did the following | Mark | Done correctly | Done not correctly | Not done |
|---|---|---|---|---|
| 1. Review the physician's orders | | | | |
| 2. Gather any positioning aids or supports, | | | | |
| 3. Wash hands and don gloves and any other personal protective equipment | | | | |
| 4. Explain procedure to patient and/or caregiver as indicated . | | | | |
| 5. Raise bed to your thigh level. Place patient on back with head of bed in flat position. Lower side rails on side nearest you. Lock bed wheels. | | | | |
| 6. Assist patient to supine position. If patient has been sitting or walking, have him or her lie down with legs and feet well elevated for at least 15 minutes before applying stockings. | | | | |
| 7. Expose legs one at a time. Wash and dry legs, if necessary. | | | | |
| 8. Stand at the foot of the bed. Place hand inside stocking and grasp heel area securely. Turn stocking inside out to the heel | | | | |
| 9. With the heel pocket down, ease the foot of stocking over foot and heel . Check that patient's heel is centered in heel pocket of stocking | | | | |
| 10. Using your fingers and thumbs, carefully grasp edge of stocking and pull it up smoothly over ankle and calf, toward the knee | | | | |
| 11. Pull forward slightly on toe section. If the stocking has a toe window, make sure it is properly positioned. | | | | |
| 12. If the stockings are knee-length, make sure each stocking top is 1 to 2 inches below the patella. Make sure the stocking does not roll down. | | | | |
| 13. If applying thigh-length stocking, continue the application. Flex the patient's leg. Stretch the stocking over the knee. | | | | |
| 14. Pull the stocking over the thigh until the top is 1 to 3 inches below the gluteal fold | | | | |
| 15. Remove equipment and return patient to a position of comfort. | | | | |
| 16. Remove your gloves. | | | | |
| 17. Raise side rails. Lower bed. | | | | |
| 18. Wash hands. | | | | |

## Scale to evaluate nurses performance during assessing immobilized patient

**Serial Number**: ……

Tool use to measured mobility status of immobilized patients, elderly mobility scale (EMS) the EMS is a 20 point validated assessment tool for mobility. For any patient in a hospital setting either on a ward or in a day hospital, EMS evaluates an individual's mobility problems through seven functional activities including bed mobility, transfers and bodily reaction to perturbation, speed of sit to stand and functional reach

| TASK | Data | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|
| Lying to Sitting | 2 Independent<br>1 Needs help of 1 person<br>0 Needs help of 2+ people | | | | |
| Sitting to Lying | 2 Independent<br>1 Needs help of 1 person<br>0 Needs help of 2+ people | | | | |
| Sitting to Standing | 3 Independent in under 3 seconds<br>2 Independent in over 3 seconds<br>1 Needs help of 1 person<br>0 Needs help of 2+ people | | | | |
| Standing | 3 Stands without support and able to reach<br>2 Stands without support but needs support to reach<br>1 Stands but needs support<br>0 Stands only with physical support of another person | | | | |
| Gait | 3 Independent (+ / - stick)<br>2 Independent with frame<br>1 Mobile with walking aid but erratic / unsafe<br>0 Needs physical help to walk or constant Supervision | | | | |
| Timed Walk (6 meters) | 3 Under 15 seconds<br>2 16 – 30 seconds<br>1 Over 30 seconds<br>0 Unable to cover 6 meters<br>Recorded time in seconds. | | | | |
| Functional Reach | 4 Over 20 cm.<br>2 10 - 20 cm.<br>0 Under 10 cm.<br>Actual reach | | | | |
| **SCORES** | | | | | |

(61)

Rating:

Scores under 10 – generally these patients are dependent in mobility manoeuvres; require help with basic ADL, such as transfers, toileting and dressing.

Scores between 10 – 13 – generally these patients are borderline in terms of safe mobility and independence in ADL i.e. they require some help with some mobility manoeuvres.

Scores over 14 – Generally these patients are able to perform mobility manoeuvres alone and safely and are independent in basic ADL[61] .