ASSESS EFFECTIVENESS OF MULTIDIMENSIONAL EXERCISE

ON MUSCLE STRENGTH AMONG POISONED PATIENT AT

DHANVANTHRI CRITICAL CARE CENTRE

ERODE, TAMILNADU

A DISSERTATION SUBMITTED TO THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF AWARD OF

MASTER OF SCIENCE IN NURSING

MEDICAL SURGICAL NURSING (Critical care nursing)

BY

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EXAMINERS,

1. ……..

2. ……..

CHAPTER I

INTRODUCTION

"Exercise is the best triumph over life.

Habituate yourself to prolong the pathway"

"Poisoning is most prevalent in the present days. In India high incidence of mortality and morbidity is found due to poisoning. Poisoning is purposeful, occupational or environmental. It is more prevalent in rural areas due to their agricultural profession. Due to poisoning effect accumulation of exogenous chemicals enter in to the body .Skeletal muscles are commonly been affected due to the chemical reactions from poisoned substances. It results in progressive muscle weakness, tissue necrosis and paralysis begins within 48-96 hours after intoxication, **(Shinson 2001)**

National Poisons Information Centre Newdelhi, showed a total of 500,000 calls over a period of one year (April 2009-November 2010). The data were analyzed with respect to age, sex, mode and type of poisoning. The agents belonged to various groups: household products, agricultural pesticides, industrial chemicals, drugs, plants, miscellaneous and unknown groups respectively. The age ranged from less than 1 to 70 years, with the highest incidence in the range of 14-29 years, with males (57%) outnumbering females (43%). The most common mode of poisoning was suicidal (53%), followed by accidental (47%). The route of exposure was mainly oral (88%). Dermal (5%), inhalation and ocular exposure

contributed 7% to the total. The highest incidence of poisoning was due to household agents (44.1%) followed by drugs (18.8%), agricultural pesticides (12.8%), industrial chemicals (8.9%), animals bites and stings (4.7%), plants (1.7%), unknown (2.9%) and miscellaneous groups (5.6. Drugs implicated included benzodiazepines, anticonvulsants, analgesics, antihistamines, tricyclic antidepressants, thyroid hormones and oral contraceptives. Among the agricultural pesticides, aluminium phosphide was the most commonly consumed followed by organochlorines, organophosphates, herbicides and fungicides. Copper sulphate and nitrobenzene were common among industrial chemicals.. An alarming feature of the study was the high incidence of poisoning in young (36.5%). The age ranged from 15 to 35 years and the most vulnerable age group. Accidental mode was the most common (79.7%). Intentional attempts were also noticed (20.2%) in the age group above 15 years. The present data give an exact picture of the incidence of poisoning in India, and represents the trend in our country.

An epidemiology study of poisoning was done in a geographically defined areas in Tamilnadu,.The incidence of poisoning was 75 per 100 000 population and the death rate was very high (22 per 100 000 population). Both were highest in the age group 15–34 and there were significant ethnic differences in the incidence of poisoning. In this population 67% of patients were developed major complication such as neurological seizures in 23%,respiratory failure in 37% patients,21% in various muscular deficits and others 29% of patients. Agrochemicals were responsible for 59% of all poisonings. Parquet was the

commonest poisoning agent with a high fatality rate of 68 %,(**Chadhurvedi 2008)**

Poison substance can be absorbed from mouth, skin, conjunctiva, gastrointestinal tract and respiratorytract.signs and symptoms of acute toxicity generally occur within 12-24 hours after exposure. Acute toxicity is caused by excess acetylcholine at neural endplate due to inhibition of AChE.Accetylcholine is present as a neurotransmitter in the terminal aspect of all postganglionic parasympathetic nerves, at myoneural junction and in pre ganglionic parasympathetic and sympathetic nervous system**.(Haward 2009)**

Common manifestation of poisoning includes muscle weakness,bluredvision,nausea,vomiting,headache,abdominal pain and dizziness. Common signs include miosis(85%),vomiting(58%),execessive salivation(58%),respiratory distress(48%),abdominal pain(42%) and muscle fasciculation(40%) in some times tachycardia occurred more often than brady.Broncho-constriction, excess secretion, muscle weakness and altered mental status all increase risk of respiratory failure, **(D B Harvinder,2008)**

Muscle contractures can be present among patients with heavy metal poisoning .When certain heavy metal accumulates within the tissue of an individual, it becomes weak and unable to accommodate changes in bone length .As a result there will be a shortening of the soft tissue of either a muscle tendon leading to deformity. Early physical therapy treatment may reduce or even prevent muscle contractures. Strengthening exercise for both upper and lower extremities

is applied, along with bridging balancing, and weight transfer exercises**,(Russell, 2003)**

Organophosphorus having severe action on skeletal muscle .it produce muscle weakness by three different mechanisms. .The first occurs during the cholinergic phase.Fusciculaton progress to paralysis due to depolarization and desensitization blocks at the neuromuscular junction**, (Karallda and Henry, 1998)**

Muscle weakness may be demyelination of nerves due to poisoning effects. This begins 2 to 3 weeks after intoxication and spares the muscle of respiration .Recovery may not be complete during this period and require clinical validation and passive and active movements, **(Mathew J Ellenhorn, 2001)**

Intubation provides a patent airway when the patient is having respiratory distress that cannot be treated with simpler methods. It is the method of choice in emergency care. Intubation is a means of providing an airway for patients who cannot maintain an adequate airway on their own like comatose patients, patients with upper airway obstruction for patients needing mechanical ventilation, and for suctioning secretions from the pulmonary tree, **(Hudak, 2005).**

Every day, 30,000 to 40,000 patients are put on mechanical ventilation. Mechanical ventilation is a life saving and frequently used treatment modality for a variety of medical diagnoses in the Intensive Care Unit (ICU) such as respiratory

disorders, neurological problems, cardiac dysfunctions, metabolic conditions and poisoning. Physical activities are already limited, cognitive decline is a major additional threat to quality of life in mechanically ventilated patients .Despite this fact, mechanical ventilation may be a distressing experience for the patient, and may result in a decrease in comfort, **(Wong, Lopez-Nahas, 2010).**

Complication may occur early or late in the course of mechanical ventilator management. They may even occur years after the tube has been removed. Early complications include bleeding, pneumothorax, air embolism, aspiration, subcutaneous or meditational emphysema, recurrent laryngeal damage and posterior tracheal wall penetration. Long term complications include airway obstruction from accumulation of secretions or protrusion of the cuff over the opening of the tube, infection, rupture of the artery, dysphagia, tracheoesophageal fistula, tracheal dilation, and tracheal ischemia and necrosis. Tracheal stenosis may develop after the tube is removed, **(Atul P. Kulkarni, 2008).**

The respiratory muscles become weak or atrophied after just a few days mechanical ventilation and may be catabolised for energy, especially if nutrition is inadequate. Because the metabolism of fat produces less carbon dioxide than the metabolism of carbohydrate, a high fat diet may assist patients with respiratory failure, both during mechanical ventilation and weaning period, **(Baudouin and Evans, 2009).**

Common clinical conditions associated with mechanical ventilation include neuromuscular diseases, such as myasthenia gravis, ascending polyradiculopathy, and myopathies, and diseases that cause respiratory muscle fatigue due to increased workload, such as asthma, chronic obstructive pulmonary disease, and restrictive lung disease,**(Edward P. Ingenito, Jeffrey M. Drazen,(2005)**

Successful weaning from the ventilator is supplemented by intensive pulmonary care. The following methods are used, oxygen therapy, arterial blood gas analysis, pulse oxmetry, bronchodilator therapy, chest physiotherapy, adequate nutrition, hydration, humidification and incentive spirometry. These patients still have borderline pulmonary function and need vigorous supportive therapy before their status returns to a level that supports activities of daily living, (**Goris, Vermeeren, Wouters, et.al., 2003).**

Many forms of exercise increase muscle strength. All involve progressively increased resistance. When a muscle is very weak, movement against gravity alone is sufficient. As muscle strength increases, resistance is gradually increased by using stretchy bands or weights. In this way, muscle size (mass) and strength are increased, and endurance improves,**(Romulus W Hitacker,2011)**

Breathing is instinctive, but the urge to breathe is increased in many lung disease patients, causing hyperventilation. Breathing exercise focuses on a

technique called the control pause, which encourages patients to hold their breath after exhaling for as long as in comfortably possible**, (Konstantin,2009).**

Acute Organophosphorus (OP) pesticide poisoning is a major clinical problem in the developing world. Textbooks ascribe most deaths to respiratory failure occurring in one of two distinct clinical syndromes acute cholinergic respiratory failure or the intermediate syndrome. Lack of muscle strength is more common in Sulphar poisoning (68%),54% in Organophosphorus and others 28%. Delayed failure appears to be due to respiratory muscle weakness**, (Ericsson, 2009)**

The aerobic exercise aerates the lungs inflating the alveoli and maintaining respiratory function .Aerobic breathing exercise stimulates the production of surfactant a lipoprotein produce by alveolar tissue providing more uniform distribution of air in the alveoli, where as breathing interferes with release of surfactant and hence retains secretions. The regular use of breathing exercise had been shown to decrease the incidence of pulmonary complication from approximately 30% to 10 %**, (Vaikus PT,2007)**

Physical therapy involves exercising and manipulating the body. It can improve joint and muscle function, helping people stand, balance, walk, and climb stairs better. Techniques include range-of-motion exercises, muscle-strengthening exercises, coordination and balance exercises, ambulation (walking) exercises,

general conditioning exercises, transfer training, and use of a tilt table**, (Livingston,2011)**

Dumbbell exercises form an integral part of most strength training programs. They can be used to develop the various different elements of strength such as maximal strength, hypertrophy or muscle mass, explosive power and strength endurance**. (White,2011)**

NEED FOR STUDY

Poisoning is a significant global public health problem. According to WHO data in 2009 an estimated one million people affected due to poisoning. Poisoning is the 6th most common cause of death in India at the age group of 15-29 years of young adults. Approximately 600,000 people affected due to the after effect of poisoning, **(WHO 2009)**

About 5 million poison exposures occur in the Asia each year. Most are acute, accidental, involve a single agent, occur in the home, result in minor or no toxicity, and involve children less than 6 years of age. Pharmaceuticals are involved in 47% of exposures and 84% of serious or fatal poisonings. Organophosphorus pesticides (56%)were commonly using for self ingestion . Accidental exposures can result from the improper use of chemicals at work or play; product mislabeling; label misreading; mistaken identification of unlabeled chemicals; uninformed self-medication; and dosing errors by nurses, parents,

pharmacists, physicians, and the elderly. Excluding the recreational use of ethanol, attempted suicide is the most common reason for intentional exposure. Unintended poisonings may result from the intentional use of drugs for psychotropic effects (abuse) or excessive self-dosing (misuse), **(Alexander Von , 2007)**

Poisoning is an important health problem in every country of the world. Occupational exposures to industrial chemicals and pesticides ,accidental and intentional exposures to household and pharmaceutical products, all contribute to mortality and morbidity .However the magnitude of the problem ,the circumstances of exposure ,and the type of poisoning vary from the country to country. Acute poisoning is an important clinical emergency, and contributor to morbidity and mortality, **(Sahi MH, 2007)**

In 2008, the national capital centre for poisoning provided a survey report on common poisoning in sub-urban areas in India. It reveals 59% of peoples using pesticides such as Organophosphorus, parquet .in the age group of 15-45 years. Death rate approximately 61 in 100,000 poppulation.15% of peoples using various medicines, 14% of peoples using certain chemicals and below 1% using various plants. Majority of patients have been developed multiple complications in that 61% of patients developed long term complications, 39% of patients fall on certain neurological deficits, major respiratory and, cardio vascular problems.

Poisoning, though common has remained a largely neglected area of research in India. In 2009, 25,447 deaths and 4,987 serious injuries were reported

across the country. In the same year, there were 9619 deaths in Karnataka, 8567 deaths in Andrapradesh, 12356 deaths in Tamilnadu and 10584 deaths in Kerala. Underreporting and misclassifications are extremely common and actual numbers could be much higher **,(Nimhans,2007)**

Stehan rogers (2006) conducted a retrospective study on initial symptoms of poisoning .Abnormalities such as dyskinesia, dystonia, fasciculations, myoclonus, rigidity, tremors were the early stage of acute toxicity.. Focal neurologic findings are common in poisoning, and their presence should prompt evaluation for a structural central nervous system lesion. Examination of the eyes (for nystagmus, pupil size and reactivity), abdomen (for bowel activity and bladder size), and skin (for burns, bullae, color, warmth, moisture, pressure sores, and puncture marks) may reveal findings of diagnostic value.

Acute Organophosphorus (OP) pesticide self-poisoning is a major global problem. Although pesticide-poisoned patients make high demands on intensive care facilities in industrialized countries, it is in the developing world that practically all deaths occur. Many deaths occur within hours of pesticide ingestion during the acute cholinergic crisis, either before or soon after reaching medical care. Most result from acute respiratory failure due to central respiratory depression, respiratory muscle weakness, and/or direct pulmonary effects (bronchospasm and bronchorrhoea). Complications of pre-hospital respiratory

arrest and unconsciousness, such as aspiration and anoxic brain damage, cause further illness during the in-patient stay, **(Global burden of disease ,2010)**

Wadia,(2010) described the neurological features of OP poisoning, including the respiratory failure. He differentiated these features into those that occurred within 24 hour (type I paralysis) and those that occurred after 24 hour (type II paralysis). Senanayake and spelt Karalliedde subsequently reported a series of patients with a syndrome of delayed neuromuscular weakness and respiratory failure, calling it the 'intermediate syndrome'. The late neurological syndrome was defined as 'paralytic signs that appear about 24 h after admission and after atropine has already been given in large doses', or 'muscle weakness with an acute onset within 24 to 96 hours after the poisoning affecting conscious patients without fasciculations or other cholinergic manifestations, with or without respiratory muscle failure'.

Karalliede and Henry have studied the effects of poisoning on skeletal muscles among 820 ingested poisoned patients, which showed that muscle weakness occurs in about 67% of cases. Results shows 38% 0f patients were loose the muscle strength in the early stage of admission, 27% of patients had moderate complication in muscular activity 7% of patients died during the treatment period. (**Karalliede and Henry,2006)**

In a prospective study of mechanically ventilated poisoned patients a total of 5183 patients received mechanical ventilation for a mean duration of 7 days. The mean length of stay in the intensive care unit was 11 days. Overall 73% of patient's loses intercostals muscle function due to prolong ventilation. The main conditions independently associated with increased mortality were (1) factors present at the start of mechanical ventilation, (2) factors related to patient management and (3) developments occurring over the course of mechanical ventilation**, (Esteban, Anzueto, Alia, Arroliga, Tobin, 2008)**

Jean-Francois,(2006) conducted a study to assess the mechanically ventilated poisoned patients, where 85% of them were stiffness in body muscles and unable to console, who required longer ICU stay too. Among them 75% of them had hemodynamic instability where there were alterations in vital parameters. Mechanically ventilated patients become restless, difficulty in oxygen uptake, and inadequacy in respiratory rhythm . They need supportive measures to reduce the consequence of such irritability and discomfort to calm down the patients.

Pulmonary complications are an important form of morbidity after extubation. It was found that deep breathing exercises significantly decreases pulmonary complications. Breathing exercise that provides visual feedback to encourage patient to inhale slowly and deeply to maximize lung inflation and to prevent or reduce pulmonary complications. It remains widely used technique for

the prophylaxis and treatment of pulmonary complications in extubated patients**,(Modern chest medicines, 2008)**

Most post extubation complication develops due to poisoning as a result of changes in lung volumes that occurs in response to dysfunction of respiratory muscles and other changes in chest wall mechanics. Intubation of tube in to trachea cause large reduction of vital capacity and affect the normal respiratory function due to the laryngospasm and prolongation of artificial ventilation**, (Paster, W,2006).**

Various dimensional health exercise programme has an important role in mechanically ventilated patients. Medical team to assist in resolving chronic lung diseases and physical alteration of body stability. These critical problems include increased secretion volume, difficult breathing or dyspnea, ineffective coughing, inability to be weaned off a ventilator, and physical deterioration resulting from low aerobic capacity, endurance after prolonged bed rest and huge level of muscle wasting. The inability to be weaned off a ventilator does not only result from secretion production or muscle weakness, but other conditions including chest stiffness or immobility. The procedure to increase chest mobility includes specific chest stretching and mobilization. These exercises were given to the patient as a regular daily program along with postural drainage, percussion, breathing exercise and gradual physical stability exercises. The expired tidal

volume, dyspnea level, and chest expansion were evaluated and clinical efficiency was analyzed during exercise. The results showed a significant clinical improvement of expired tidal volume, reduction in dyspnea level, increase in chest expansion**,** and effective muscular efficiency **(Bodyw Ther, J,2009).**

Breathing exercise is designed to retain the muscles of respiration and improve gas exchange and oxygenation. Active range of motion exercise of trunk helps to expand the chest, facilitate deep breathing and often stimulate cough reflex. The primary post extubation goal is to improve the respiratory function, **(Kisner, 2006).**

People with chronic obstructive pulmonary disease of all stages benefit from exercise training programs, which result in increased exercise tolerance and decreased dyspnea and fatigue. Physical condition technique includes breathing exercise and general exercises intended with conserve energy and increase pulmonary ventilation. There is a close relationship between physical fitness and respiratory fitness, **(Covey and Larson, 2004).**

The most recent trail, conducted in Canada 2008, took 129 patients with asthma and randomized them to receive multidimensional exercise programmes. In this method .baseline to 79% at 6 months. This improvement was associated with a statistically significant reduction in the average dose inhaled steroid, **(Dr. Konstatin, 2008).**

Regularly performed physical exercise programmes during the rehabilitation of poisoning induce a number of physiological adaptations in skeletal muscle. One of the most important adaptations to occur to increase in the capacity of the oxidative pathways, reflected by increase mitochondrial density, and and increase in the maximal activities of a number of mitochondrial enzymes. Exercise at a given oxygen uptake after training ,results in less of decrease in high energy phosphate, and a smaller increase in creatinine level and $ADP^{3.}$ it promotes increase the reliance of fat catabolism during physical exercise,**(Meites ,2006)**

It conclude that ,poisoning is leading cause of morbidity in developing countries .data related to poisoning shown the long term complication leads to alterations in physical efficiency and respiratory comfort due to muscle weakness. It was found that various exercises programs significantly decreases complications and change the capacity of wellbeing. Multidimensional exercise program is a combined form of breathing exercise and extremity muscle strengthening that provides visual feedback to encourage patient to inhale slowly and deeply to maximize the intercostals muscle strengthening and develop physical efficacy of extremities . It remains widely used technique for the prophylaxis and treatment of poisoning patients. So the investigator felt a need for conducting a study to assess the effectiveness of multidimensional exercise on muscle strength among poisoned patient at Dhanvanthri Critical Care Centre, Erode, Tamilnadu.

STATEMENT OF THE PROBLEM

"Effectiveness of Multidimensional exercise on muscle strength among poisoned patients at Dhanvantri Critical Care Centre, Erode."

OBJECTIVES

- To assess the level of muscle strength among poisoned patient before and after Multidimensional exercise

- To determine the effectiveness of Multidimensional exercise on muscle strength among poisoned patients.

- To find out the association between post test scores of muscle strength among poisoned patients with their demographic variables.

OPERATIONAL DEFINITIONS

Effectiveness

It refers to the improvement in respiratory muscle strength and, upper and lower extremities muscle strength among poisoned patients as determined by significant difference in post test scores than pre test scores.

Multidimensional exercise

It is a group of exercises which includes Aerobic breathing exercise and Resistant exercise.

I) Aerobic breathing exercise

It refers to inhale air through the nose by the mental count of 6 and hold the breath for mental count of 8 and slowly exhale through the pursed lips by the mental count of 7 and repeat it for 10 minutes twice a day for 5 days.

II) Resistant exercise

It is a type of exercises which means giving resistance to upper extremities by using 2 kg of dumbbell and lower extremities by using one kg of sand bag tied over ankle region and hold it over 30 seconds.

This exercise consists of four steps.

Step 1- Holding the dumbbell in the right hand and slowly flex and extent the arm. Repeat it for 5 times.

Step 2- Holding the dumbbell in the left hand and slowly flex and extend the arm. Repeat it for 5 times.

Step-3- Holding the right leg at 45 degree angle with 1kg of sand bag tied over the ankle region. Repeat it for 5 times.

Step-4-Holding the left leg at 45 angle with 1kg of sand bag tied over the ankle region. Repeat it for 5 times.

The duration of each cycle varies depending upon the ability of patient.

Muscle strength

Muscle strength refers to respiratory muscle strength, upper and lower extremities muscles strength which is measured by extremity muscle strength and respiratory muscle strength assessment scale.

Poisoned patients

It refers to the patient diagnosed as poisoning and extubated from mechanical ventilation.

HYPOTHESIS

H_1: There is a significant level of pre test and post test scores on muscle strength among poisoned patients before and after Multidimensional exercise.

H_2: There is a significant effectiveness of Multidimensional exercise on muscle strength among poisoned patients.

H_3: There is a significant association between the post test scores on muscle strength among poisoned patients with their demographic variables.

DELIMITATION

The study was delimited to

1 Assess the effectiveness of Multidimensional exercises.

2 Identify the changes in respiratory muscle strength function.

3 Identify the changes in extremity muscle strength function.

4 Poisoned patients.

5 Dhanvanthri Critical Care Centre, Erode,

CONCEPTUAL FRAMEWORK

Conceptual frame work provides clear description of variable suggesting ways or method to conduct the study and guiding the interpretation, evaluation and integration of study findings**, (Polit and Hungler, 2002)**

The conceptual model selected for this study is based in modification made on "**Virginia Henderson's Need Theory (1966)"**.

Definition of the Unique Function of Nursing

Defined Nursing: **"**Assisting the individual, sick or well, in the performance of those activities contributing to health or it's recovery (or to peaceful death) that an individual would perform unaided if he had the necessary strength, will or knowledge".

The theory consists of 14 basic needs

Identified 14 basic needs:

1. Breathing normally
2. Eating and drinking adequately
3. Eliminating body wastes
4. Moving and maintaining desirable position
5. Sleeping and resting
6. Selecting suitable clothes
7. Maintaining body temperature within normal range
8. Keeping the body clean and well-groomed
9. Avoiding dangers in the environment
10. Communicating with others
11. Worshipping according to one's faith
12. Working in such a way that one feels a sense of accomplishment
13. Playing/participating in various forms of recreation
14. Learning, discovering or satisfying the curiosity that leads to normal development and health and using available health facilities.

The first 9 components are physiological. The tenth and fourteenth are psychological aspects of communicating and learning the eleventh component is spiritual and moral. The twelfth and thirteenth components are sociologically oriented to occupation and recreation

In this study **First&Fourth** basic needs are applicable.

1. First basic need is breath normally
    - In the study the researcher investigated breathing pattern in terms of severe respiratory muscle exertion with restlessness, mild respiratory muscle exertion with experience discomfort, normal respiratory muscle exertion with comfort.
    - In poisoned patients respiratory muscle strength was assessed by modified respiratory muscle assessment scale. The components of this scale were level of dyspnea, Respiratory rate, Oxygen saturation, Incentive spirometric assessment. After that aerobic breathing exercise was implemented.
2. Fourth basic need is desirable movement and position.
    - In this study the researcher investigated muscle strength and movement of both extremity .so it is graded in to Minimal movement with gravity eliminated, Movement against, Normal power.

- In poisoned patients the extremity muscle strength was assessed by extremity muscle strength assessment scale. It is graded in to palpable contraction, no visible movements (grade-1), movement but only gravity eliminated (grade-2), movement against the gravity (grade-3),Movement against the gravity but weaker than normal(grade-4), Normal power(grade-5. After that resistant exercise was implemented to both extremities by using dumbbell and sand bag.

CHAPTER II

REVIEW OF LITERATURE

The review of literature is a broad, comprehensive, in depth, systematic and critical review of scholarly publication, unpublished scholarly print materials, and audiovisual materials and personal communication, **(Polit and hungler, 2005).**

A review of literature is a written summary of the state of existing knowledge on a research problem. The task of reviewing research literature involves the identification, selection, critical analysis and written description of existing information on a topic, **(Polit and hungler, 2003).**

The review of literature in this study is organized and divided into four under the following headings.

- Studies related to Multidimensional exercise.
- Studies related to Muscle strength among poisoned patients.
- Studies related to alternative therapies among poisoned patients
- Studies related to Multidimensional exercises on muscle strength among poisoned patients.

1 Studies related to Multidimensional exercises

John w, (2007), conducted a study to estimate the pulmonary comfort , physical efficacy, and health benefits of a multidimensional exercise program for stroke patients.Strokes patients frequently experience considerable loss of physical capacity and general wellbeing when diagnosed and treated for their disease. The aim of this study was to evaluate the pulmonary comfort, physical efficacy, and health benefits of a Multidimensional exercise program for stroke patients after discharge from the hospital. The supervised program included high- and low-intensity activities (physical exercise, relaxation, breathing, massage, and body-awareness training). A total of 34 patients between 55 and 80 years of age (median 72 years) participated in ten groups for 4 h weekly for 6 weeks. Physical efficacy in terms of repetition maximum (RM) and increased oxygen uptake (VO_2max), physical activity level and psychosocial wellbeing were compared by using structured interview and MRC scale after completion of the program. The program was safe and well tolerated. The completion rate was 85.2%. Highly significant increases in physical capacity (1RM, VO_2max) and an improved level of physical activity were achieved. It is concluded that an exercise program, which combines high- and low-intensity physical activities, may be used to prevent and minimize physical inactivity, fatigue, and muscle wasting and energy loss in stroke patients.

Shumway-Cook A, Gruber W, Baldwin M, Liao S.(2006), conducted a prospective clinical investigation examined in northwest hospital,USA to assess

the effects of a multidimensional exercise program on balance, mobility, and risk for falls in community-dwelling older adults with a history of falling. Factors used to predict adherence and a successful response to exercise were identified. A total of 105 community-dwelling older adults (> or = 65 years of age) with a history of two or more falls in the previous 6 months (no neurologic diagnosis) participated. They were classified into (1) a control group of fallers (n = 21), (2) a fully adherent exercise group (n = 52), and (3) a partially adherent exercise group (n = 32). Following evaluation, each patient received an individualized exercise program addressing the impairments and functional disabilities identified during the assessment. The control group received no intervention. Changes in performance on five clinical tests of balance and mobility and fall risk were compared among groups. Both exercise groups scored better than the control group on all measures of balance and mobility. Although both exercise groups showed a reduction in fall risk compared with the control group, the greatest reduction was found in the fully adherent exercise group. Factors associated with successful response to exercise included degree of adherence to exercise program and pre test score on the Tinetti Mobility Assessment. Exercise can improve balance and mobility function and reduce the likelihood for falls among community-dwelling older adults with a history of falling. The amount of exercise needed to achieve these results, however, could not be determined from this study.

Hinrichs T, Bucchi C, Brach M, Wilm S(2003), conducted a study related to physical activity programmes can help to prevent functional decline in the elderly at Bochum, Germany. Until now, such programmes use to target either on healthy community-dwelling seniors or on elderly living in special residences or care institutions. Sedentary or frail people, however, are difficult to reach when they live in their own homes. We conceptualized a multidimensional home-based exercise programme that shall be delivered to the target group through cooperation between GPs and exercise therapists. In order to prepare a randomized controlled trial (RCT), a feasibility study is being conducted. The study is designed as a single arm interventional trial. We plan to recruit 90 patients aged 70 years and above through their GPs. The intervention lasts 12 weeks and consists of physical activity counseling, a home-exercise programme, and exercise consultations provided by an exercise therapist in the GP's practice and via telephone. The exercise programme consists of two main components: 1. a combination of home-exercises to improve strength, flexibility and balance, 2. walking for exercise to improve aerobic capacity. PRISCUS-Physical Activity Questionnaire, Short Form-8 Health Survey, three month recall of frequency of falls, Falls Efficacy Scale), appraisal by participant, exercise performance, focus group discussion. Data analyses will focus on: 1. decision-making concerning the conduction of a RCT, 2. estimation of the effects of the programme, detection of shortcomings and identification of subgroups with contrary results, 3. feedback to participants and to GPs. A new cooperation between GPs and exercise therapists to approach

community-dwelling seniors and to deliver a home-exercise programme is object of research with regard to feasibility and acceptance. In case of success, an RCT should examine the effects of the programme. A future implementation within primary medical care may take advantage from the flexibility of the programme.

Kim H, Suzuki T, Yoshida Y, Yoshida H(2006), conduct a study to evaluate the effectiveness of Multidimensional exercises (pelvic floor muscle (PFM) and fitness exercises) in reducing urine leakage in elderly women with stress urinary incontinence (UI).Randomized, crossover, follow-up trial at urban community in Japan. Seventy women aged 70 and older who reported urine leakage one or more times per month; 35 were randomly assigned to intervention and the other 35 to control. The intervention group attended an exercise class aimed at enhancing PFMs and fitness. Duration of the exercise was 60 minutes per session twice a week for 3 months. After 3 months of exercise, the intervention group was followed for 1 year. Body mass index (BMI), urine leakage, walking speed, and muscle strength were measured at baseline, after the intervention, and at follow-up.In the intervention group, maximum walking speed and adductor muscle strength increased significantly after the intervention; there were no significant changes in the control group. After 3 months of exercise, 54.5% of the intervention group and 9.4% of the control group reported being continent. Within the cured group of UI, a significantly higher proportion had decreased their BMI at 3 months (P=.03) and increased walking speed at 3 (P=.04) and 12 (P=.047)

months. Decrease in BMI and increase in walking speed may contribute to the treatment of UI, although the data do not support a positive correlation between strengthening of adductor muscle and improvement of UI, which needs more research.

Delbaere K, Bourgois J, Van Den Noortgate N(2003), conducted a study to investigate the efficacy of a guided and graded home-based Multidimensional exercise program for improving a range of physical outcomes in older people. Designed by Controlled clinical trial of 16 weeks at two geographical areas in Gent, Belgium.66 independent-living older people (age: 71-98) with a history of falls and moderate physical impairment. Twenty-four 30-minute training sessions were given by a trained physiotherapist over a period of 16 weeks in the participant's home. Different types of exercises on balance, aerobic performance, flexibility, and muscle strength were provided. Muscle strength, static and dynamic balance, aerobic performance, activities in daily living, fear of falling and avoidance of daily activities were assessed at baseline and after 16 weeks intervention. At baseline, there were no significant differences in the measured variables between exercise and control groups. After 16 weeks, the exercise group showed significantly improved ankle muscle strength, balance performance and aerobic capacity, and decreased fear of falling, dependency in daily activities and avoidance of daily activities compared to the control group. The improvements in knee muscle strength, timed chair stands, and functional reach were not significant. The home-based, individualized exercise program was

effective in reducing several physical factors associated with falls in community-dwelling older people with moderate physical impairment. The decrease in fear of falling and other behavioral variables needs to be considered with care and needs further investigation.

Kluding P, McGinnis PQ(2000), conducted a study to assess the effectiveness on Multidimensional exercise for people with Parkinson's disease: a case report at Rutgers University, USA. The primary impairments associated with Parkinson's disease occur in combination with the secondary, preventable effects of immobility. Two 66-year-old males, both community ambulators and in early or middle stages of Parkinson's disease, participated in 3 months of various physical activities. Group balance classes were held twice weekly during the first month, participants joined a fitness center and self-directed their exercise program during the second month, and group Tai Chi classes were held twice weekly during the third month. At conclusion of the program, participants were given suggestions for continued physical fitness activities. After the 3-month program, improvements were noted for both individuals in functional reach, Timed Up and Go, and Berg Balance scores. Both participants continued to exercise regularly for at least 8 months following the program. Two individuals with Parkinson's disease demonstrated improvement in their balance test performance over a 3-month period. Perhaps most importantly, these participants independently continued exercising after completing this program.

Adamsen L, Quist M, Midtgaard J, Andersen C(2003), Conducted a study to assess the effect of a multidimensional exercise intervention on physical capacity, well-being and quality of life in cancer patients undergoing chemotherapy at the University Hospitals Centre for Nursing and Care Research, Department 7331, Copenhagen, Denmark. The aim of the present study was to investigate the impact of a multidimensional exercise intervention focusing on physical capacity; one-repetition maximum (1RM) and maximum oxygen uptake (VO2Max), activity level, general well-being and quality of life in cancer patients undergoing chemotherapy. The intervention comprised resistance and fitness training, massage, relaxation and body-awareness training. Eighty-two cancer patients, with or without evidence of residual disease, were included: 66 patients with 13 different types of solid tumours and 16 patients with 6 types of haematological malignancies. The patients trained in mixed groups for 9 h weekly for 6 weeks. Physical capacity, physical activity level and psychosocial well-being as measured by the Medical Outcomes Study 36-item Short-Form Health Survey and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire C30 were assessed pre- and post-intervention. Highly significant increases were achieved in muscular strength ($p<0.001$), physical fitness ($p<0.001$) and physical activity levels ($p<0.001$). The patients reported significant reduction in treatment-related symptoms, i.e., fatigue ($p=0.006$) and pain ($p=0.03$). Highly significant improvements were observed in physical functioning ($p<0.001$) and role functioning ($p<0.001$). Even patients with

advanced disease were able to improve their results after 6 weeks. It is concluded that a multidimensional exercise intervention, including resistance training, may be beneficial for cancer patients undergoing chemotherapy. This study indicates significant clinical meaningful improvements. The exact role of the intervention has to be defined in a randomized controlled design. A clinically controlled trial including 250 patients is currently being carried out.

Mutsumi Abiru, Chizuru Nakano, (2009) conducted a study to assess the effects of multidimensional exercise on Gait Disturbance of Patients with Cerebellar Ataxia at Mihara Memorial Hospital, Japan. Seven patients with cerebellar ataxia. The type of stroke was 2 cerebral hemorrhages and 5 cerebral infarctions. The cadence, stride length, step length (affected/unaffected side), velocity, and stride width were measured by 3-dimentional-motion analysis before and after RAS intervention. As an immediate effect, right after the rhythmic stimulation, cadence, stride length, affected side of step length; velocity and single support phase were significantly increased respectively. The patients who had cerebellar ataxia had a significant improvement in their gait according to the rhythmic stimulation. Hence multidimensional exercise is an effective central nervous system stimulant too.

Webrod H,(2006),conducted a study to investigate the effects of dimensional breathing exercises on pulmonary function, atelectasis, and arterial blood gas levels after coronary artery bypass graft surgery. In the prospective,

randomized trial, patients performing deep breathing exercises (n=33) were compared to control group (n=22) who performed no breathing exercises postoperatively. Patient management was similar in the groups in terms of assessment, positioning, and mobility. The patients in the deep breathing group were instructed to perform breathing exercises hourly during day time for the first 4 postoperative days. The exercises consisted of 30 slow, deep breaths performed with a positive expiratory pressure blow-bottle device (+10 cm H2O). spirometric measurements spiral ct, arterial blood gas analysis, and scoring of subjective experiences of the control group, amounting to 2.6+/- 2.2% vs +/- 5.7 (p=0.045) at the basal level and 0.1+/- 0.2% vs 0.3+/- -0.5% (p=0.01) at the apical level. Compared to the control group, the patients in the deep-breathing group had a significantly smaller reduction in FVC (p=0.01) and FEV(1) (P=0.01). Arterial oxygen tension, carbondioxide tension, fever, or length of ICU or hospital stay did differ between the groups. In the deep breathing group, 72% of the patients experienced a subjective benefit from the exercises. Patients performing deep breathing exercises after CABG surgery had significantly smaller atelectatic areas and better pulmonary function on the forth postoperative day compared to control group performing no exercises.

McHugh P, Aitcheson F, Duncan B, Houghton F, (2003), conducted a study to assess the impact of the Breathing exercise on muscular atrophy in asthma. A randomized controlled trial comparing aerobic breathing

with control was conducted in 38 people with asthma aged between 20 and 70. Participants were followed for six months following the intervention. Medication use and indices of ventilatory function were recorded. No significant change in FEV1 (forced expiratory volume in one second) was recorded in either group. The exercise group exhibited a reduction in inhaled steroid use of 50% and beta2-agonist use of 85% at six months from baseline. In the control group inhaled steroid use was unchanged and beta2-agonist use was reduced by 37% from baseline. Investigator contact between the two groups was equal. There were no adverse events recorded in either group. BBT is a safe and efficacious asthma management technique. Breathing exercise has clinical and potential pharmaco-economic benefits that merit further study.

Crit J. (2009), conducted a study to evaluate the work of breathing (WOB) behavior during a 120-minute successful spontaneous breathing trial (SBT) with T-tube trial, and its predictive value for extubation outcome. A prospective cohort study. 2 medical-surgical intensive care units. Fifty-one consecutive patients mechanically ventilated for more than 48 hours after a successful SBT were extubated based on the institutional protocol and followed for the occurrence of postextubation respiratory distress during 48 hours. All cases were serially monitored during 120 minutes of SBT using the respiratory monitoring system Ventrak 1500 (Medical Novametrix Systems, Wallingford, CT). Successful extubation occurred in 38 (74.5%) of 51 of the sample.

Respiratory and hemodynamic parameters, APACHE II score, sex, days on mechanical ventilation, and cause of respiratory failure were unable to predict extubation outcome. The WOB significantly increased during SBT in extubation failure patients (WOB at 1st minute 0.24 +/- 0.06 J/L vs WOB at 120th minute = 0.39 +/- 0.07 J/L; P < .01) when compared to successfully extubated patients (WOB at 1st minute 0.21 +/- 0.08 J/L vs WOB at 120th minute =0.24 +/- 0.11 J/L; P = .12). The WOB variation was able to predict extubation outcome only after the 90th minute of SBT (extubation failure = 0.35 +/- 0.08 J/L vs extubation success = 0.22 +/- 0.11 J/L; P = .01). An increase in the WOB could predict extubation failure during a T-tube trial of 120 minutes.

Paul G ellam(2006), did a experimental study to assess the effectiveness of breathing and resistant exercises in prevention of pulmonary complication and muscular atrophy after major abdominal surgery. Prospectively randomized 153 bedridden patients who had non compromised pulmonary status and progressive muscle weakness, the control group(84 patients) engaged no exercises, and 69 patients motivated with effective breathing exercise in preoperative and postoperative periods. Pulmonary complications were classified using criteria derived from chest roentgenograms, arterial blood gas analysis, and temperature registration. The incidence of postoperative complications in the treatment group and in the control group were 19% and 60% respectively .in the present study

,preoperative and postoperative dimensional exercise as a prophylactic treatment in all scheduled for major abdominal surgery

Ronenn r roubeno (2006), conducted a study tested the hypothesis that a home-based exercise program would improve functional performance in elderly people. We conducted a 6-month, single-blinded, randomized controlled trial. 72 community dwelling men and women (aged ≥70 years) with self-reported and laboratory-based functional impairment were recruited for the study. Participants were randomly assigned to either a home-based progressive strength, balance, and general physical activity intervention or an attention-control group that received home-based nutrition education. Functional performance was measured in the laboratory using the Physical Performance Test (PPT) and the Established Populations for Epidemiologic Studies of the Elderly (EPESE) short physical performance battery. Physiologic capacity was measured by strength (one repetition maximum), dynamic balance (tandem walk), gait speed (2-meter walk), and cardiovascular endurance (6-minute walk).70 participants (97%) completed the 6-month trial. Compliance with study interventions within each group ranged from 75% in controls to 82% in exercisers. PPT increased by 6.1 ± 13.4% in exercisers and decreased by 2.8 ± 13.6% in controls (p =.02). EPESE improved by 26.2 ± 37.5% in exercisers and decreased by 1.2 ± 22.1% in controls (p =.001). Dynamic balance improved by 33.8 ± 14.4% in exercisers versus 11.5 ± 23.7% in controls (p =.0002). There were no differences between groups in the change in

strength, gait speed, or cardiovascular endurance. Minimally supervised exercise is safe and can improve functional performance in elderly individuals. The improvements in functional performance occurred along with improvements in balance but without a significant change in muscle strength or endurance.

Manal Osman and Khaled ElBahy (2008), To evaluate the effect of multidimensional resistant exercise on spasticity in spinal cord injured patients and its effect on functional outcome. Forty patients with spasticity due to traumatic spinal cord injury were included in the study. Initial assessment includes general and neurological examination to detect the level, ASIA classification, motor power. Spasticity grading using clonus score, global pain scale, spasm frequency scale, adductor tone scale and modified ashowrth scale .Functional assessment using activity of daily living (ADL) measures, lower extremity muscle strength (LEMS) and functional impairment measure (FIM) rating levels of disability, these assessment were done at the start, at 3 months and 6 months . Thirty patients of them (group I) received progressive resistant exercises in the spastic muscles ,10 patients (group II) didn't receive exercise. There was no significant difference between group I and group II as regard ADL, at start and at 3 and 6 months. The FIM results showed no significant difference between group I and II at start but there was a statistical significant lower mean FIM in group 2 at 3 and 6 months. In group I there was a significant increase in FIM mean at 3 months and significant decrease at 6 months. on the other hand group II showed a significant decrease

FIM mean at 3 and 6 months .Clonus score showed no significant difference between group I and group II at start and at 3 months but significant higher score of grade 3 and 4 was observed at 6 months in group II. There was a significant lower clonus score at 3 months in group I with no change at 6 months on the other hand there was a significant higher score at 3months with no change at 6 months in group II.Spasm frequency scale showed no significant difference between group I and group II at start but there was a significant higher rate of scale 3 and 4 in group II at 3 and 6 months. In group I, there was a significant change of spasm frequency scale at 3 and 6 months with tendency towards lower scale, although group II showed no significant change at 3 and 6 months. Global pain scale showed no significant difference between group I and II at start, 3 and 6 months. In group I there was a significant decrease in pain scale after 3 months with no change at 6 months while in group II there was no significant difference at 3 months with significant increase at 6 months compared to 3 months. Adductor tone scale results showed no significant difference between group I and II at start but significant higher rate of scale 3 and 4 was observed in group II at 3 and 6 months. Group I showed a significant decrease of adductor tone scale at 3 and 6 months while group II showed no significant change at 3months with significant increase at 6 months. Modified ashowrth scale showed no significant difference between group I and II at start with significant higher rate of scale 3 and 4 in group II at 3 and 6 months. Group I showed a significant decrease in modified ashowrth scale at 3 and 6 months, while group II showed

significant increase in scale at 3 months with no change at 6 months compared to 3 months but there was an increase in scale at 6 months compared to the start. Multidimensional exercise has a reducing effect of spasticity in spinal cord injured patients; consequently, it improves their functional outcome. It is recommended to use it on more frequent bases as it helps to improve spasticity safely and decreases the dose of central muscle relaxant with reduction of its adverse effect.

2 Studies related muscle strength among poisoned patients.

Dorly HS (2008),conduct a prospective study regarding age-related change in metal toxic substance and concentrations has been hypothesized to play a role in the loss of muscle mass and muscle strength with aging, also called sarcopenia. The aim of this prospective study was to investigate whether low cholinesterase level and high cholinesterase concentration were associated with sarcopenia. In men and women aged 65 yr and older, participants of the Longitudinal Aging Study Amsterdam, muscle strength (n = 1008) and appendicular skeletal muscle mass (n = 331, using dual-energy x-ray absorptiometry and hormonal assay) were measured in 2005–2006 and after a 3-yr follow-up. Sarcopenia was defined as the lowest sex-specific 15th percentile of the cohort, translating into a loss of muscle strength greater than 40% or a loss of muscle mass greater than 3%. After adjustment for physical activity level, season of data collection, serum creatinine concentration, chronic disease, and body mass

index, persons with high (<25 nmol/liter) baseline cholinesterase levels were 2.57 (95% confidence interval 1.40–4.70, based on muscle strength) and 2.14 (0.73–6.33, based on muscle mass) times more likely to experience sarcopenia, compared with those with low (>50 nmol/liter) levels. Low cholinesterase levels (≥4.0 pmol/liter) were associated with an increased risk of sarcopenia, compared with high cholinesterase (<3.0 pmol/liter): odds ratio = 1.71 (1.07–2.73) based on muscle strength, odds ratio = 2.35 (1.05–5.28) based on muscle mass. The associations were similar in men and women. The results of this prospective, population-based study show that lower level of cholinesterase levels increase the risk of sarcopenia in older men and women.

Jerli J W (2004), conducted a study to assess the effect of OP poisoning on skeletal muscles. Twenty-one cases out of 272 patients of acute organophosphates poisoning were diagnosed as intermediate syndrome (IMS) with a prevalence at 7.7%. The responsible OP insecticides included parathion, omethoate and some OP containing pesticide mixtures. IMS occurred mainly in severe OP poisoning patients who recovered from the acute cholinergic crisis at 7-75 h after the onset of acute poisoning. Muscular weakness appeared in the following three categories of muscles: (1) neck flexors and proximal limb muscles; (2) muscles innervated by motor cranial nerves and/or (3) respiratory muscles. Blood acetyl cholinesterase activity was persistently inhibited. Electroneuromyography (ENMG) with repetitive nerve stimulation (RNS) at

frequencies of 20 Hz or 30 Hz in seven patients showed decrements of common muscle action potentials during the presence of myasthenia in five patients and became normal when their muscle strength recovered. Mild IMS recovered within 2-7 days and had a favorable prognosis. Severe IMS patients with respiratory paralysis needed immediate endotracheal intubation and mechanical ventilation. Recovery of weakness of the respiratory muscles and proximal limb muscles took longer, the slowest being 30 days. Four of the patients died of respiratory paralysis and the fatality rate was 19%.The mechanism of IMS remains to be further investigated. The RNS/ENMG changes indicate a post-synaptic block at the neuromuscular junctions.

N.A Buckley (2000), describe the clinical patterns of OP-induced respiratory failure, and to determine whether the two syndromes are clinically distinct. Prospective study of 376 patients with confirmed OP poisoning. Patients were observed throughout their admission to three Sri Lankan hospitals. Exposure was confirmed by butyrylcholinesterase and blood OP assays. Ninety of 376 patients (24%) required intubation: 52 (58%) within 2□h of admission while unconscious with cholinergic features. Twenty-nine (32%) were well on admission but then required intubation after 24□h while conscious and without cholinergic features. These two syndromes were not clinically distinct and had much overlap. In particular, some patients who required intubation on arrival subsequently recovered consciousness but could not be extubated, requiring ventilation for up to

6 days. Respiratory failure did not occur as two discrete clinical syndromes within distinct time frames. Instead, the pattern of failure was variable and overlapped in some patients. There seemed to be two underlying mechanisms (an early acute mixed central and peripheral respiratory failure, and a late peripheral respiratory failure) rather than two distinct clinical syndromes.

M. Eddleston(2008),conducted a study to analyse the cholinesterase reactivation among OP poisoning patients with severe respiratory failure. Many organophosphorus (OP) insecticides have either two *O*-methyl or two *O*-ethyl groups attached to the phosphorus atom. This chemical structure affects their responsiveness to oxime-induced acetyl cholinesterase (AChE) reactivation after poisoning. However, several OP insecticides are atypical and do not have these structures. Study aimed to describe the clinical course and responsiveness to therapy of people poisoned with two *S*-alkyl OP insecticides—profenofos and prothiofos. prospective cohort of patients with acute profenofos or prothiofos self-poisoning admitted to acute medical wards in two Sri Lankan district hospitals. Clinical observation was carried out throughout their inpatient stay; blood samples were taken in a subgroup for assay of cholinesterases and insecticide. Ninety-five patients poisoned with profenofos and 12 with prothiofos were recruited over 5 years. Median time to admission was 4 (IQR 3–7) h. Eleven patients poisoned with profenofos died (11/95; 11.6%, 95% CI 5.9–20); one prothiofos patient died (1/12; 8.3%, 95% CI 0.2–38). Thirteen patients poisoned

with profenofos required intubation for respiratory failure (13/95; 13.7%, 95% CI 7.5–22); two prothiofos-poisoned patients required intubation. Both intubations and death occurred late compared with other OP insecticides. Prolonged ventilation was needed in those who survived—a median of 310 (IQR 154–349) h. Unexpectedly, red cell AChE activity on admission did not correlate with clinical severity—all patients had severe AChE inhibition (about 1% of normal) but most had only mild cholinergic features, were conscious, and did not require ventilatory support. Compared with other commonly used OP insecticides, profenofos and prothiofos are of moderately severe toxicity, causing relatively delayed respiratory failure and death. There was no apparent response to oxime therapy. The lack of correlation between red cell AChE activity and clinical features suggests that this parameter may not always be a useful marker of synaptic AChE activity and severity after OP pesticide poisoning.

C Wesseling (2005), conducted a study To evaluate the association of acute organophosphate (OP) poisoning with chronic sensory and muscular impairment. This study concerns the third of a series of three examinations of hand strength and vibration thresholds in a two year period after acute OP poisoning among 48 Nicaraguan men. The first two examinations were performed at hospital discharge and seven weeks after poisoning, and the present examination two years later. Twenty eight cattle ranchers and fishermen who had never experienced pesticide poisoning were examined as controls, also three times over the two year

period. The poisonings were categorized as caused by “non-neuropathic” OPs and “neuropathic” OPs, each subdivided in moderate and severe poisonings. Men poisoned with OP insecticides had persistent reduced hand strength. We previously reported weakness at hospital discharge for OP poisoned in all categories that worsened seven weeks later for those severely poisoned with neuropathic OPs. Strength improved over time, but the poisoned were still weaker than controls two years after the poisoning, most noticeably among the subjects most severely poisoned with neuropathic OPs. Also, index finger and toe vibration thresholds were slightly increased at the end of the two year period, among men with OP poisonings in all categories, but patterns of onset and evolvement of impairment of vibration sensitivity were less clear than with grip and pinch strength. Persistent, mainly motor, impairment of the peripheral nervous system was found in men two years after OP poisoning, in particular in severe occupational and intentional poisonings with neuropathic OPs. This finding is possibly due to remaining organophosphate induced delayed polyneuropathy.

Thomson JJ (2005), conducted a study to analyze Acute neurotoxin effects during the cholinergic phase of Organophosphorus insecticide poisoning and delayed neurotoxic effects appearing two to three weeks later are well recognized. We observed 10 patients who had paralysis of proximal limb muscles, neck flexors, motor cranial nerves, and respiratory muscles 24 to 96 hours after poisoning, after a well-defined cholinergic phase. The compounds involved were fenthion, monocrotophos, dimethoate, and methamidophos. Four patients urgently

required ventilatory support. The paralytic symptoms lasted up to 18 days. A delayed polyneuropathy later developed in one patient. Three patients died. Electromyographic studies showed fade on tetanic stimulation, absence of fade on low-frequency stimulation, and absence of post-tetanic facilitation, suggestive of a postsynaptic defect. This neuromuscular junctional defect may have been the predominant cause of the paralytic symptoms, with neural and central components contributing to various degrees. Our patients appeared to have a distinct clinical entity (a so-called intermediate syndrome) that developed after the acute cholinergic crisis and before the expected onset of the delayed neuropathy.

Walker FO, Tan KH(2008), conducted a study to assess the effects of neuromuscular blockade using botulinum toxin A on juvenile muscles at a dosage of 6 units/kg body weight in a rat model.A total of 34 male Sprague-Dawley rats (1-mo old) were used. A small incision was made along the posterior aspect of the left hind leg with the exposure of the gastrocnemius. Botulinum toxin A was injected at a dosage of 6 units/kg body weight in the medial and lateral heads of the muscle. An equivalent volume of saline was injected into the right gastrocnemius (control). Motor evoked action potentials, muscle force generation, and muscle mass and neuromuscular junction morphometry were analyzed at different time intervals up to 1 yr after toxin injection. During the 1-2 wks after botulinum toxin A injection, muscle mass, electrophysiological variables, and muscle force generation were significantly reduced but returned to nearly normal

at 6 post injection. In the study group, neuromuscular junction gutter depth became significantly shallower 2 mos after injection, then normalized at 1 yr. There was a nonsignificant trend toward larger neuromuscular junctions from the gastrocnemius injected with botulinum toxin A.Our findings provide scientific evidence to support the clinical situation in which the inter injection interval of 3-6 mos of botulinum toxin A at a similar dosage is used.

3 Studies related to alternative therapies among poisoned patients.

Ja-Liang Lin, Huei-Huang Ho, (2008) conducted a study related to Chelation Therapy for Patients with acute lead poisoning and Progressive Renal Insufficiency To examine whether chelation therapy slows the progression of renal insufficiency in patients with acute lead poisoning. Randomized, controlled trial. Academic medical center in Taiwan. 32 patients with chronic renal insufficiency (serum creatinine level > 132.6 μmol/L [1.5 mg/dL] and < 353.8 μmol/L [4.0 mg/dL]), mildly elevated body lead burden (>0.72 μmol [150 μg] of lead per 72-hour urine collection and < 2.90 μmol [600 μg] of lead per 72-hour urine collection [EDTA mobilization tests]), and no history of heavy lead exposure. The treatment group received 2 months of chelation therapy; the control group received no therapy. The reciprocal of serum creatinine (1/Cr) was used as an index of progressive renal insufficiency. Rates of progression of renal insufficiency were similar in the treatment group and the control group during a 12-month baseline observation period (1/Cr, 0.000054 L/μmol per month

compared with 0.000046 L/μmol per month;$P > 0.2$). After the 2-month treatment period, improvement in renal function was greater in the treatment group than in the control group. In the 12 months after the treatment period, renal insufficiency progressed more slowly in the treatment group than in the control group (1/Cr, 0.000033 ± 0.00038 L/μmol per month compared with 0.000045 ± 0.000038 L/μmol per month; $P = 0.0030$). Chelation therapy seems to slow the progression of renal insufficiency in patients with mildly elevated body lead burden. This implies that long-term exposure to low levels of environmental lead may be associated with impaired renal function in patients with chronic renal disease.

Marie-Claude Jars-Guincestre(2006),Conducted a study to evaluate the efficacy of immunosuppressive therapy in the management of lung injury due to paraquat poisoning. The study design was a randomised controlled trial, observational study with historical controls or observational study; the study population included patients with paraquat poisoning, and received immunosuppressive therapy; and the study provided data on mortality. We calculated the survival rate with 95 percent confidence intervals (CI) for observational studies, and relative risk and 95 percent CI for dichotomous outcomes.12 studies - four non-randomised, six non-randomised comparing historical controls, and two randomised controlled trials - had employed immunosuppressive therapy in the management of paraquat poisoning. The survival rate in the four non-randomised studies (39 patients) was 74.4 percent (95 percent CI 58.9-85.4). The relative risk of immunosuppressive therapy in

decreasing mortality with paraquat poisoning was 0.55 (95 percent CI 0.39-0.77) and 0.6 (95 percent CI 0.27-1.34) for the non-randomised studies (comparing historical controls) and randomised controlled studies, respectively. One out of four patients (95 percent CI 3-5) were successfully treated with immunosuppressive therapy for paraquat poisoning. However, due to significant heterogeneity and publication bias, a large randomised controlled trial will be required to affirm the role of immunosuppressant in paraquat poisoning

Djillali Annane, Karim Chadda, Philippe Gajdos(2004), conducted a study to assess the Hyperbaric oxygen therapy for acute domestic carbon monoxide poisoning Two prospective randomized trial on two parallel groups.At Critical Care Unit, Raymond Poincaré Hospital, Garches, France.Three hundred eighty-five patients with acute domestic CO poisoning. Patients with transient loss of consciousness (trial A, $n = 179$) were randomized to either 6 h of normobaric oxygen therapy (NBO; arm A0, $n = 86$) or 4 h of NBO plus one HBO session (arm A1, $n = 93$). Patients with initial coma (trial B, $n = 206$) were randomized to either 4 h of NBO plus one HBO session (arm B1, $n = 101$) or 4 h of NBO plus two 2 HBO sessions (arm B2, $n = 105$).proportion of patients with complete recovery at 1 month. In trial A, there was no evidence for a difference in 1-month complete recovery rates with and without HBO [58% compared to 61%; unadjusted odds ratio, 0.90 (95% CI, 0.47–1.71)]. In trial B, complete recovery rates were significantly lower with two than with one HBO session [47%

compared to 68%; unadjusted odds ratio, 0.42 (CI, 0.23–0.79)].In patients with transient loss of consciousness, there was no evidence of superiority of HBO over NBO. In comatose patients, two HBO sessions were associated with worse outcomes than one HBO session.

4 Studies related to Multidimensional exercises on muscle strength among poisoned patients.

G.M. Tomich, D.C. Franca, (2005), conducted a study to evaluate breathing pattern, thoracoabdominal motion and muscular activity of self ingested poisoned patients during three breathing exercises. Deep breathing, flow-oriented incentive spirometry and volume-oriented incentive spirometry. Seventeen healthy subjects aged 23+/- 5 years were studied. Calibrated respiratory inductive plethysmography was used to measure the following variables during rest and breathing exercises tidal volume, respiratory frequency, rib cage contribution to tidal volume, inspiratory cycle, and phase angle. Sternocleidoidal muscle activity was assessed by surface electromyography. Staticall analysis performed by ANOVA and tukey or fried man with the level of significance set at $p<0.05$.Comparison between baseline and breathing exercises periods a showed a significant increase of tidal volume and ph during all exercise , a significant difference in RC/Vt.

Casan,(2006), conducted a prospective longitudinal study among 60 different types poisoned patients to examine the short and long term effects of

multipurpose dimensional exercise as an outpatient pulmonary and physical rehabilitation program in secondary poison rehabilitation centre near Jafna..he conducted a randomized controlled trial with binding of outcome assessment and follow-up at 3,6,9,12,18, and 24 months. Thirty patients randomized to rehabilitation received 3 months of outpatient breathing exercise and chest physiotherapy, 3 months daily supervised resistant exercise and 6 months of weekly supervised breathing exercises. Thirty patients randomized to the control group received standard care .findings suggests that significant difference between groups in perception of dyspnea ($p \leq o.oo1$) and day to day dyspnea ,fatigue and emotional function measured by the chronic respiratory questionnaire ($p \leq 0.01$).the improvement were evident at the third month. Outpatient rehabilitation programs achieve better benefits that persist for a period of two years.

Jonathan et al (2005), conducted a experimental study among 71 pesticide poisoned patients to assess the various dimensional exercise on ventilator functions in 36 male and 35 female subjects (mean age 18.5 years) .subject underwent six weeks course in forced breathing .ventilator function were studied in the form of forced vital capacity (fvc),forced expiratory volume at the end of one second as 1% of forced vital capacity (FEV 1%) maximum voluntary ventilation (MVV),peak expiratory flow rate (PEFR) and breath holding time. Forced vital capacity, maximum voluntary ventilation, peak expiratory flow rate were found to be increased after a course of forced breathing.

Watson, Kyle E (2008), conduct a study to assess the effects of home based multidimensional exercises on spasticity, muscle strength, motor control, gait spatiotemporal parameters, gross motor skills, and physical function among pesticide poisoning adults. Method: fifty-six (34 males, 22 females; mean age 41y 6mo, SD 2y 2mo) with sever muscle spasm were randomly assigned to the MDE exercise (strengthening) group. After a twice daily, 2 week induction continued the intervention at home 5 days a week for 10 weeks. Data collected at baseline, after 12-weeks' intervention, and 4 weeks after the intervention stopped included spasticity, motor control, and strength; gait spatiotemporal parameters; Gross Motor Function Measure (GMFM); and Poison Outcomes Data Collection Instrument (PODCI). Gait speed, cadence, and PODCI global scores improved, with no difference between groups. No significant changes were seen in spasticity, strength, motor control, GMFM scores, or PODCI transfers and mobility. Post-hoc testing showed that gains in gait speed and PODCI global scores were maintained in the SSTTEP group after withdrawal of the intervention. Interpretation: Although our hypothesis that the experimental group would have better outcomes was not supported, in both groups showed changes in function and gait.

Daniel S. Rooks, Caroline B. Silverman (2008),To determine the safety, feasibility and consequences of a program of progressive muscle strength training and deep breathing exercise in women's with insecticide poisoning..Fifteen women were monitored for injury and exercise compliance, and

assessed for muscle strength (1-repetition maximum technique), pulmonary endurance (6-minute walk test), and functional status (physical efficacy Impact Questionnaire [PEIQ]) before and after a 20-week exercise intervention.Zero injuries and an 81% compliance rate occurred during training. Improvement was seen in muscle strength of the lower (191 ± 75 to 265 ± 67 pounds; $P < 0.001$) and upper (61 ± 18 to 76 ± 18 pounds; $P < 0.001$) body, 6-minute walk distance (530 ± 80 to 629 ± 74 meters;$P < 0.001$), and in FIQ score (44 ± 9 to 32 ± 14; $P < 0.01$).A program of progressive strength training and breathing exercise can be safe, well tolerated, and effective at improving muscle strength, pulmonary endurance and functional status in women with ingested poisoning without exacerbating symptoms. This program may also contribute to a reduction in the severity of several symptoms.

Paul lam(2002) conducted a study to assess the effects of Multidimensional exercise on pain, balance, muscle strength, and perceived difficulties in physical functioning in older women with post poisoning complications Twelve forms of multidimensional exercises have been developed specifically to reduce the symptoms and improve the physical functioning of arthritic patients, and this randomized study examined the changes in symptoms and physical characteristics in older women with self ingested poisoning at the completion of a 12-week of exercise program. Seventy-two patients were randomly assigned into 2 groups. Due to a 41% overall dropout rate, 22

experimental subjects and 21 controls completed pre- and post-test measures over a 12 week interval. Outcome variables were physical symptoms and fitness, body mass index, pulmonary functioning, and perceived difficulties in physical functioning. The independent t test was used to examine group differences. The homogeneity test confirmed that there were no significant group differences in demographic data and pre test measures. Mean comparisons of the change scores revealed that the experimental group perceived significantly less pain ($t = -2.19$, $p = 0.034$) and stiffness ($t = -2.13$, $p = 0.039$) in their joints, and reported fewer perceived difficulties in physical functioning ($t = -2.81$, $p = 0.008$), while the control group showed no change or even deterioration in physical functioning after 12 weeks. In the physical fitness test, there were significant improvements in balance ($t = 3.34$, $p = 0.002$) and abdominal muscle strength ($t = 2.74$, $p = 0.009$) for exercise group. No significant group differences were found in flexibility and upper-body or knee muscle strength in the post-test scores. Samples were able to safely perform the 12 forms of dimensional exercise for 12 weeks, and this was effective in improving their post poisoned symptoms, balance, and physical functioning. A longitudinal study with a larger sample size is now needed to confirm the potential use of poisoned management

CHAPTER – III

METHODOLOGY

Research methodology is a significant part of any study, which enables the researcher to project the research undertaken. Research methodology is the systemic way to carry out an academic study, **(Abdellah, 2004)**

This chapter includes research approach, research design, variables, setting of the study, population, sample, sample size, sampling technique, developing and description of the tool, reliability of the tool, and method of data collection procedure and plan for data analysis and interpretation of the data.

RESEARCH APPROACH

The research approach is the most essential part of any research. The entire study based on it. The research approach used in the study is an applied form of research to find out how well a program, intervention, is effective.

In this study, the effectiveness of Multidimensional exercise was evaluated. Therefore on quantitative evaluation research approach was essential to test the effectiveness of the intervention.

RESEARCH DESIGN

Research design incorporates the most important methodological decisions that researcher makes in conducting a research study. It depicts the overall plan organization of scientific investigation, **(Polit and Hungler, 2001).**

The research design selected for the present study was pre experimental design where the one group pre and post test was selected to evaluate the effectiveness of Multidimensional exercise on muscle strength among poisoned patients.

Table3.1: Diagrammatic presentation of the research design

Purposively selected poisoned patients	**Pre-test**	**Intervention**	**Post- test**
Experimental group	**0_1**	**x**	**0_2**

The symbol used are,

0_1 : Pre test scores on muscle strength among poisoned patients.

X : Multidimensional exercise.

0_2 : Post test scores on muscle strength among poisoned patients.

SETTING OF THE STUDY

Research settings are specific places in a research where data collection is to be made. The selection of setting was done based on feasibility of conducting the study, availability of subject and permission of authorities**, (Polit and Hungler, 1999)**

The study was conducted at Dhanvantri Critical Care Center, Erode, which is a parent hospital, it is located 17 km away from Dhanvantri College of nursing, it is about 100 bedded hospital. An average of 25 –30 poisoned patients were admitted per month. An average of 20-25 patients was being mechanically ventilated per month.

VARIABLES

Variables are characters that can have more than value. The categories of variables discussed in the present study are following.

Independent variables

Independent variable is the variable which has the presumed effect on the dependent variable, (**Basavanthappa.B.T, 2007**

In this study independent variable was Multidimensional exercises

Dependent variables

Dependent variable is often referred to as the consequence or the presumed effect that varies with a change in the independent variable, **(Basavanthappa.B.T, 2007)**

In this study dependent variable was Muscle strength.

POPULATION

Population refers to the entire aggregation of cases that meets the designed criteria**, (Polit and Beck, 2002).**

The population for the present study was poisoned patient.

SAMPLE

A sample is a portion of the population that has been selected to represent the population of interest**, (Talbot, 1991)**

In this present study the sample was Poisoned patients admitted at Dhanvanthri Critical Care Centre, Erode.

SAMPLE SIZE

Sample size is normally decided by nature of the study, nature of population, type of sampling technique, total variables statistical test adopted for data analysis sensitivity of the measures and attrition,**(Polit and Hungler, 2002).**

In this present study the total sample size was 25 poisoned patients.

SAMPLING TECHNIQUE

Sampling is the process of selecting a portion of the population to represent the entire population**, (Polit and Hungler, 2001)**

In this present study Purposive sampling technique was used to select the all poisoned patients at Dhanvanthri Critical Care Centre, Erode and admitted during the period of data collection were selected as sample.

Purposive sampling method in which the researcher selects the participants based on personal judgment about which one will be most representative or informative **, (Polit and Hungler, 2001)**

CRITERIA FOR SAMPLE SELECTION

Inclusion Criteria

Poisoned patient

- Age group of above 18 years.
- Both gender.
- Who were extubated from the 2nd day of mechanical ventilator.
- Who were above one muscle grade.
- Who were present during the data collection period
- Who were willing to participate in the study.

Exclusion Criteria

Poisoned patients

- who have epilepsy
- Who have received narcotics and opioids.
- Who have hypersensitivity to drugs

DEVELOPMENT AND DESCRIPTION OF THE TOOL

There are three sections of tools were used. They are,

Section A

It consists of demographic characteristics of poisoned patients; they are "Age in years", "Gender", "Type of poisoning", "Duration of poisoning", and "Type of intubation".

Section B: Respiratory muscle strength assessment scale.

It is used to assess the respiratory muscle functions of poisoned patients. It consists of four parameters such as "Dyspnea", "Respiratory rate", "Oxygen saturation", and Incentive spirometry". It is categorized into 3 grades. Grade 0 caries score 1, Grade 1 caries score 2 and Grade 2 caries score 3. Total score was 12.

Table3.2: Respiratory muscle strength assessment scale.

S.no	Respiratory muscle function parameters	Grade-0	Grade-1	Grade-2
1	Dyspnea	Even in rest period.	In physical exertion.	Not present
2	Respiratory rate.	30 -35 breaths /mins	25-29 breaths/mins	16-24 breaths/mins
3	Oxygen saturation.	91-94%	95-97%	98-100%
4	Incentive spirometry	300ml	600ml	900ml

Scoring procedure

Based on the percentage of scores the respiratory muscle strength was graded in three categories which are Grade0, Grade I and Grade II.

Table 3.3: Scoring procedure of respiratory muscle strength

Level of Respiratory muscle function	Actual scores	Percentage of scores
Grade-0	Below 4	33%
Grade-1	5-8	38-66%
Grade-2	9-12	66- 100%

Grade-0 → Severe respiratory muscle exertion with restlessness

Grade-1 → Mild respiratory muscle exertion with discomfort

Grade-2 → Normal respiratory muscle exertion with comfort

Section C: Muscle strength assessment scale

It is used to assess the muscle strength of extremities. It consists of assessing the muscle strength of upper and lower extremities.

Based on the percentage of extremities muscle strength were Graded in to Grade 1, Grade 2, Grade 3, Grade 4 and Grade 5.

Grade 1 - Palpable contraction, no visible movement.

Grade 2 -Movement but only with gravity eliminated.

Grade 3 -Movement against gravity.

Grade 4 - Movement against resistance but weaker than normal.

Grade 5 -Normal power.

Scoring procedure

Based on the percentage score of muscle strength assessment scale, the scores were categorized into three levels. They were “Minimal movement with gravity”, “Movement against resistant”, “Normal power”.

Table: 3.4: Scoring procedure for extremity muscle strength.

Level of muscle strength	Actual score	Percentage of score
Minimal movement with gravity eliminated.	4 -9	1-33%
Movement against resistant	10-15	33-66%
Normal power	16-20	66-100%

VALIDITY OF THE TOOL

The content validity of the demographic variables of respiratory muscle strength assessment scale and extremity muscle strength assessment scales were validated in consultation with guide and field of experts. The experts are nursing personnel's, critical care physicians, orthopedician, physiotherapist and statisticians. The tool was modified according to the suggestions and recommendations of the experts, (Appendix III)

RELIABILITY

The reliability of respiratory muscle strength assessment scale (r_1) and muscle strength assessment scale (r_2) were tested by implementing the tool on three extubated patients at Dhanvantri Hospital, Pallakkapalayam, Namakkal, which is other than the sample area. Test re-test method was used to test the reliability of the tool and both tool was found to be reliable (r_1'=0.99)and(r_2'=0.9).

METHOD OF DATA COLLECTION

Data collection is the gathering of information needed to address the research problem. The word "data" means information that is systematically collected in the course of a study**, (Treeca and treeca,1996)**

Permission from the concerned authority

Prior to collection of data, permission was obtained from Chairman, Dhanvanthri Critical Care Centre, Erode, Tamilnadu.

Period of data collection

The investigator collected the data from poisoned patients for the period of 11/08/2011 to 10/09/2011.

PRE TEST

Pre test was conduct on second day of extubation from mechanical ventilation among poisoned patients by using respiratory muscle strength assessment scales and extremity muscle strength assessment scale.

IMPLEMENTATION OF MULTIDIMENSIONAL EXERCISE

Immediately after pre test the Multidimensional exercises was provided twice a day for 5 days.

POST TEST

Post test was conducted every day after the intervention. Thus, averages of 5 post test scores were considered as one post test score.

PLAN FOR DATA ANALYSIS

1. The level of muscle strength among poisoned patient before and after Multidimensional exercise was analyzed by using frequency and percentage distribution.
2. The effectiveness of multidimensional exercise on muscle strength among poisoned patient was analyzed by using paired ‘t’test, mean, standard deviation and mean percentage.

3. Association between post test scores of muscle strength among poisoned patients and their demographic variables was analyzed by using chi-square test

SUMMARY

Pre experimental design was carried on 25 poisoned patients admitted at Dhanvantri Critical Care Centre, Erode by using purposive sampling technique. Respiratory muscle assessment scale was used to assess the Respiratory Function and muscle strength assessment scale was used to assess the muscle function among poisoned patients. The data were collected after obtaining the permission from concerned authority of the hospital. Data were planned to analysis by using descriptive and inferential statistic and to be presented in the form of tables, graphs and figures.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

Analysis is a process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis tested, **(Polit and Hungler, 2003).**

Analyses enable the researcher to reduce, summarize, organize, evaluate, interpret and communicate numerical information, **(Polit and Hungler, 2003).**

This chapter deals with the analysis and interpretation of data collected from 25 poisoned patients by using purposive sampling from Dhanvanthri Critical Care Centre, Erode, "to Assess The Effectiveness Of Multidimensional Exercise On Muscle Strength Among Poisoned Patient".

The data were coded and analyzed as per objectives of the study under the following headings.

SECTION A

Description of poisoned patients according to their demographic variables

SECTION B

Assess the muscle strength among poisoned patients in experimental group before and after Multidimensional exercises.

- Frequency and percentage distribution of the pre test and post test score of level of respiratory muscle strength among poisoned patients.
- Frequency and percentage distribution of the pre test and post test score of level of extremity muscle strength among poisoned patients.

SECTION C

Assess the effectiveness of Multidimensional exercises on muscle strength among poisoned patients.

- Paired‘t’ test value of pre test and post test scores of respiratory muscle strength among poisoned patients.
- Paired‘t’ test value of pre test and post test scores of extremity muscle strength among poisoned patients.
- Area wise comparison of mean, standard deviation and mean percentage of pre test and post test scores of respiratory muscle strength among poisoned patients.

- Area wise comparison of mean, standard deviation and mean percentage of pre test and post test scores of extremity muscle strength among poisoned patients.

SECTION D

Find out the association between the post test scores on muscle strength among poisoned patients with their demographic variables.

- Chi-square value of association between the post test scores on respiratory muscle strength among poisoned patients with their demographic variables.
- Chi-square value of association between the post test scores on extremity muscle strength among poisoned patients with their demographic variables.

SECTION – A

DESCRIPTION OF PATIENTS ACCORDING TO THEIR DEMOGRAPHIC CHARACTERISTICS

Table: 4.1Frequency and percentage distribution of samples according to their demographic variables.

(N=25)

SL.N0:	DEMOGRAPHIC VARIABLES	FREQUENCY(N)	PERCENTAGE(%)
1	**Age in year**		
	a) 16-30years	8	32%
	B) 31-45years	12	48%
	c) 46-60years	3	12%
	d) Above 60years	2	8%
2	**Gender**		
	a) Male	12	48%
	b) Female	13	52%

SL.N0:	DEMOGRAPHIC VARIABLES	FREQUENCY(N)	PERCENTAGE(%)
3	**Types of poisoning**		
	a) Organo-phosphorous poisoning	19	76%
	b) Cowden powder poisoning	4	16%
	c) Sulphar poisoning	2	8%
		-	-
4	**Type of intubation**		
	a) Tracheal	16	64%
	b) Nasal	8	32%
	c) Oral	1	4%
5	**Duration of ventilation**		
	a) 0-5 days	5	20%
	b) 6-10 days	13	52%
	c) 11-15 days	7	28%
	d) More than 15 days	-	-

Distribution of samples according to their age group depicts that, most (48%) of the patients were in the age group of 31-45. However 32%of patients were 16-30 years of age group, 12% of patients were 46-60 years of age group and

8% of patients in the age group of above 60 years. The highest incidence of age ranged of 14-29 years, **(National poisons information centre, 2010)**

Gender wise distribution of sample shows that, most (52%) of the patient was females and only 48% of patients were male. It concludes that females were more affected than males.

Distribution of samples according to their types of poisoning shows that highest percentage (76%) of patients had organo-phosphorus poisoning. However 16% percentage of patients had Cowden powder and only 8% Sulphar poisoning.

Distribution of samples according to their type of intubation shows that highest percentage (64%) of patients was tracheal intubation. However 32% of patients were nasal and only 4% of patients were oral intubation. It shows that most of them had tracheal type of intubation.

Distribution of samples according to the duration of ventilation reveals that most (52%) of the patients were 6-10 days. However 28% of them were 11-15 days duration, 20% of them were 0-5 day's duration and no samples (0%) from the duration of above 15 days. It seems that 52%of patients were distributed in the range of 6-10 days duration of ventilation.

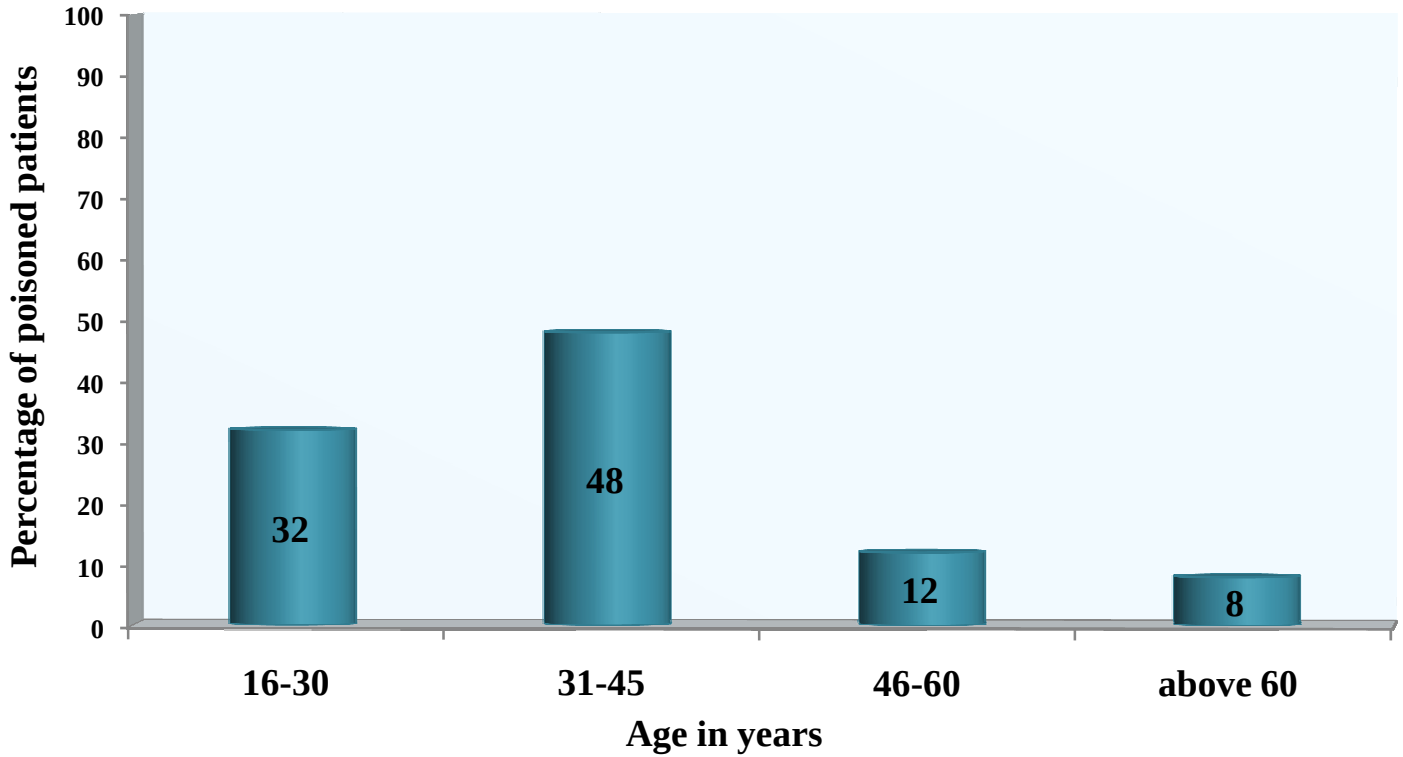

Figure 4.1: Bar diagram showing the frequency and percentage distribution of poisoned patients according to their age in years.

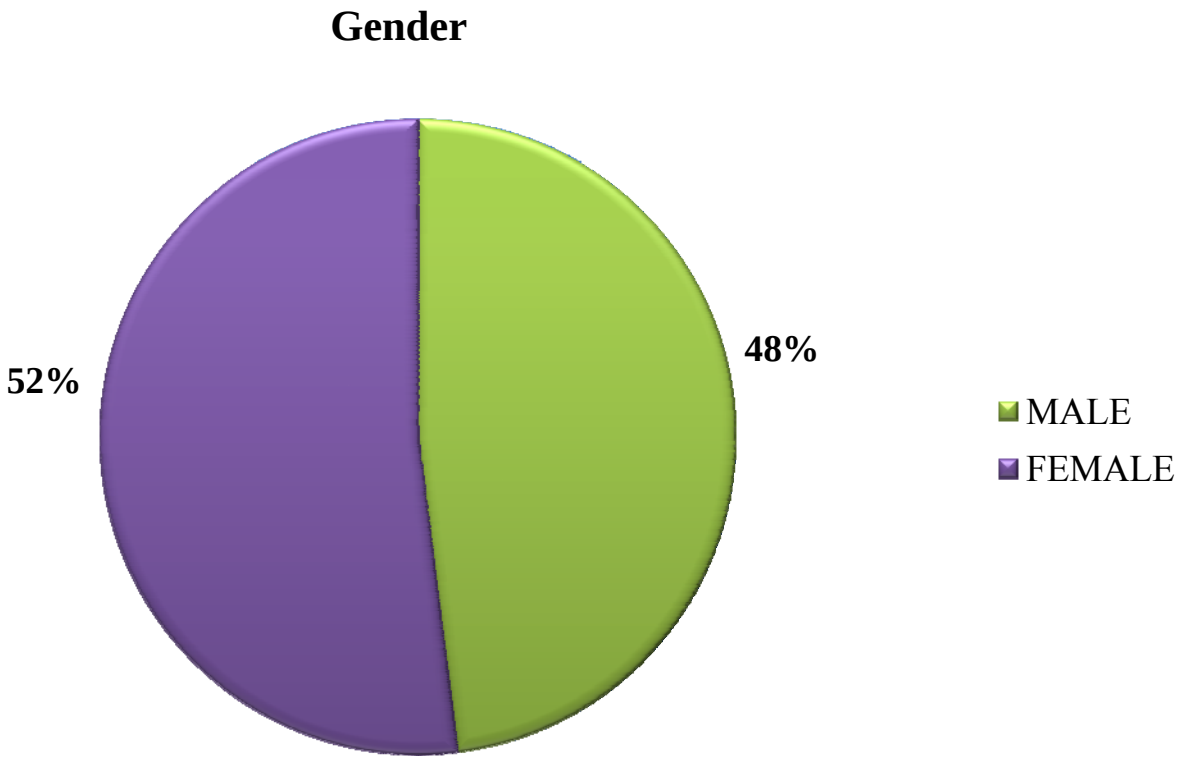

Figure 4.2: Pie diagram showing frequency and percentage distribution of poisoned patients according to their gender.

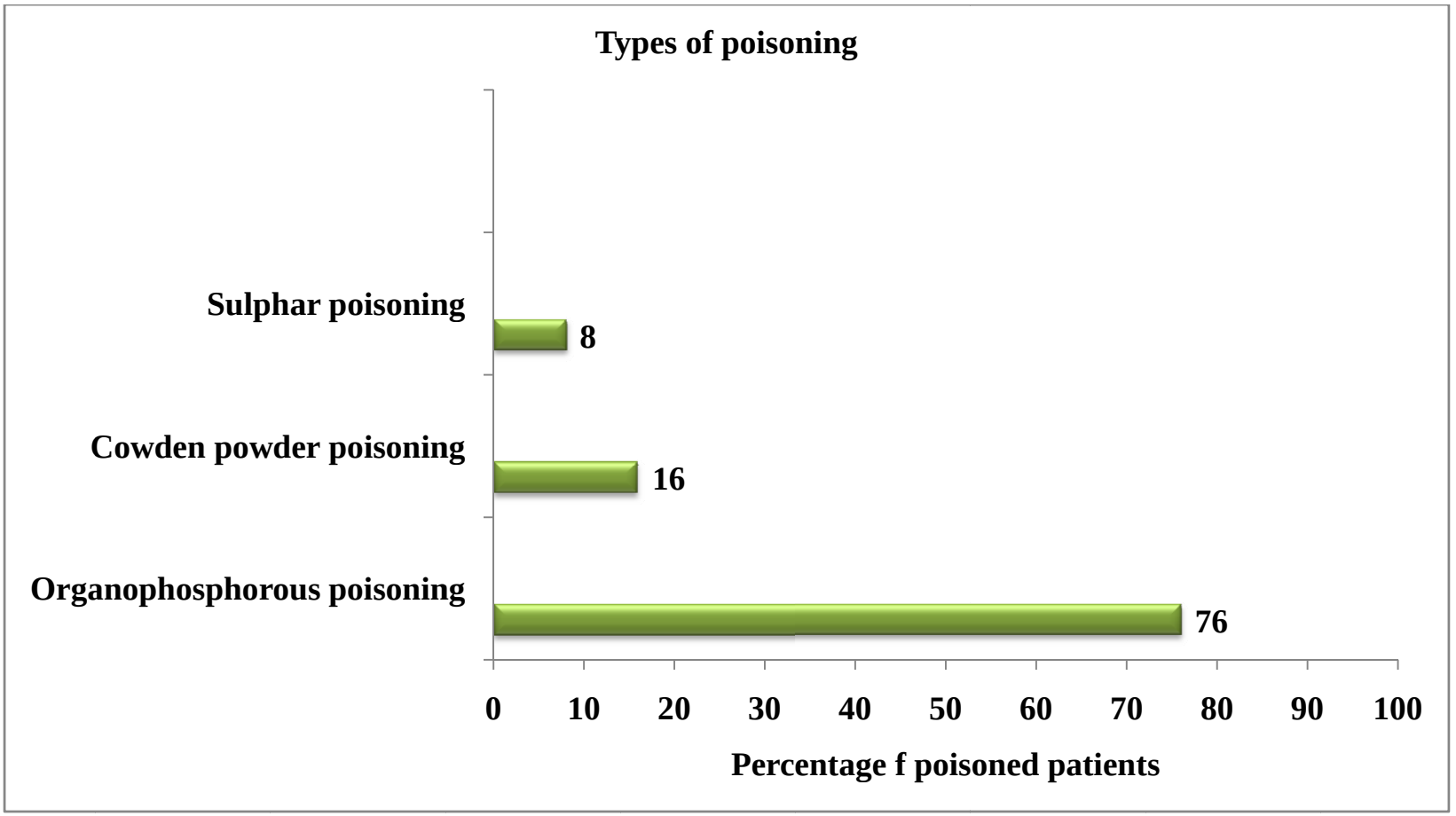

Figure 4.3: Bar diagram showing frequency and percentage distribution of poisoned patients according to types of poisoning.

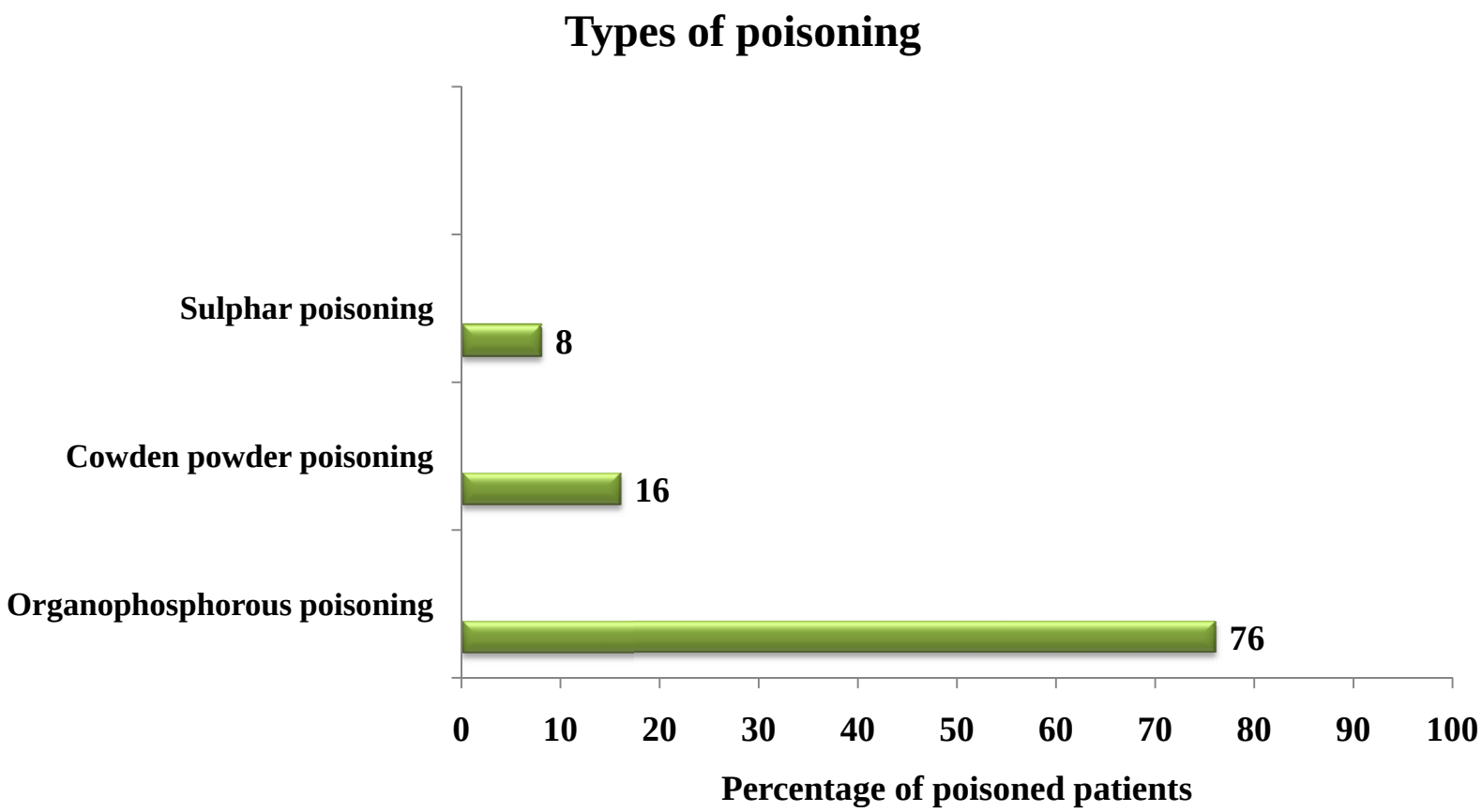

Figure 4.4: Bar diagram showing frequency and percentage distribution of poisoned patients according to the duration of ventilation.

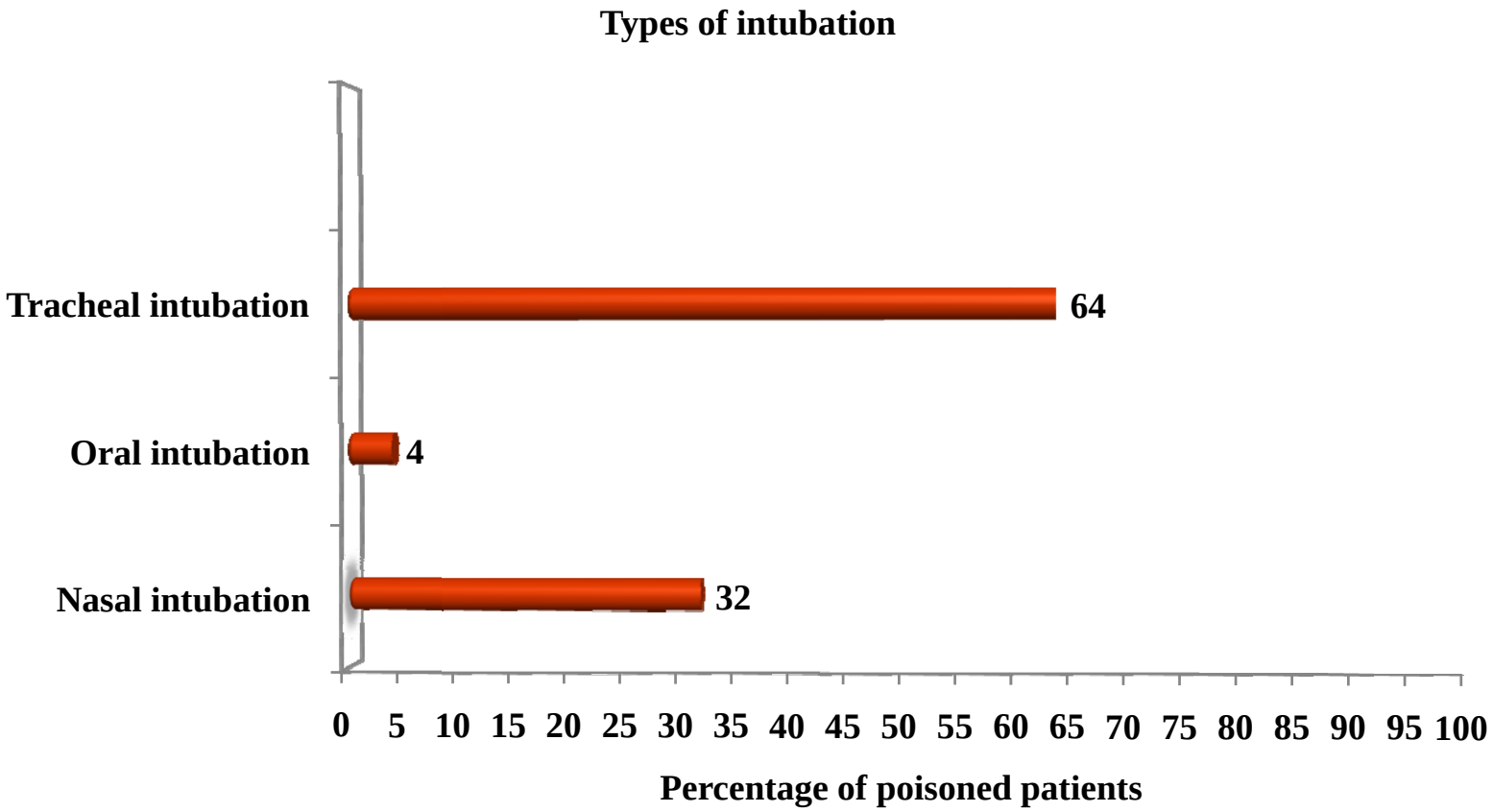

Figure 4.5: Bar diagram showing frequency and percentage distribution of poisoned patients according to their types of intubation

SECTION-B

ASSESS THE MUSCLE STRENGTH AMONG POISONED PATIENTS BEFORE AND AFTER MULTIDIMENSIONAL EXERCISE.

Table: 4.2 Frequency and percentage distribution of the pre test and post test scores on respiratory muscle strength among poisoned patient patients

(N=25)

Level of Respiratory Muscle Strength.	**Poisoned patients**			
	Pre test score		**Post test score**	
	Frequency (N)	**Percentage (%)**	**Frequency (N)**	**Percentage (%)**
Grade-0	-	-	-	-
Grade-1	6	24%	4	16%
Grade-2	19	76%	21	84%

Frequency and percentage distribution of pre test and post test scores of respiratory muscle strength among poisoned patients, depicts that, in pre test 76% of patients were grade-2 level of respiratory muscle strength and only 24% were grade-1 level of respiratory muscle strength, whereas in post test 84% of patients

were in grade-2 level of respiratory muscle strength and 16% were in grade-1 level of respiratory muscle strength. It seems that Multidimensional exercise was effective on respiratory muscle strength among poisoned patients.

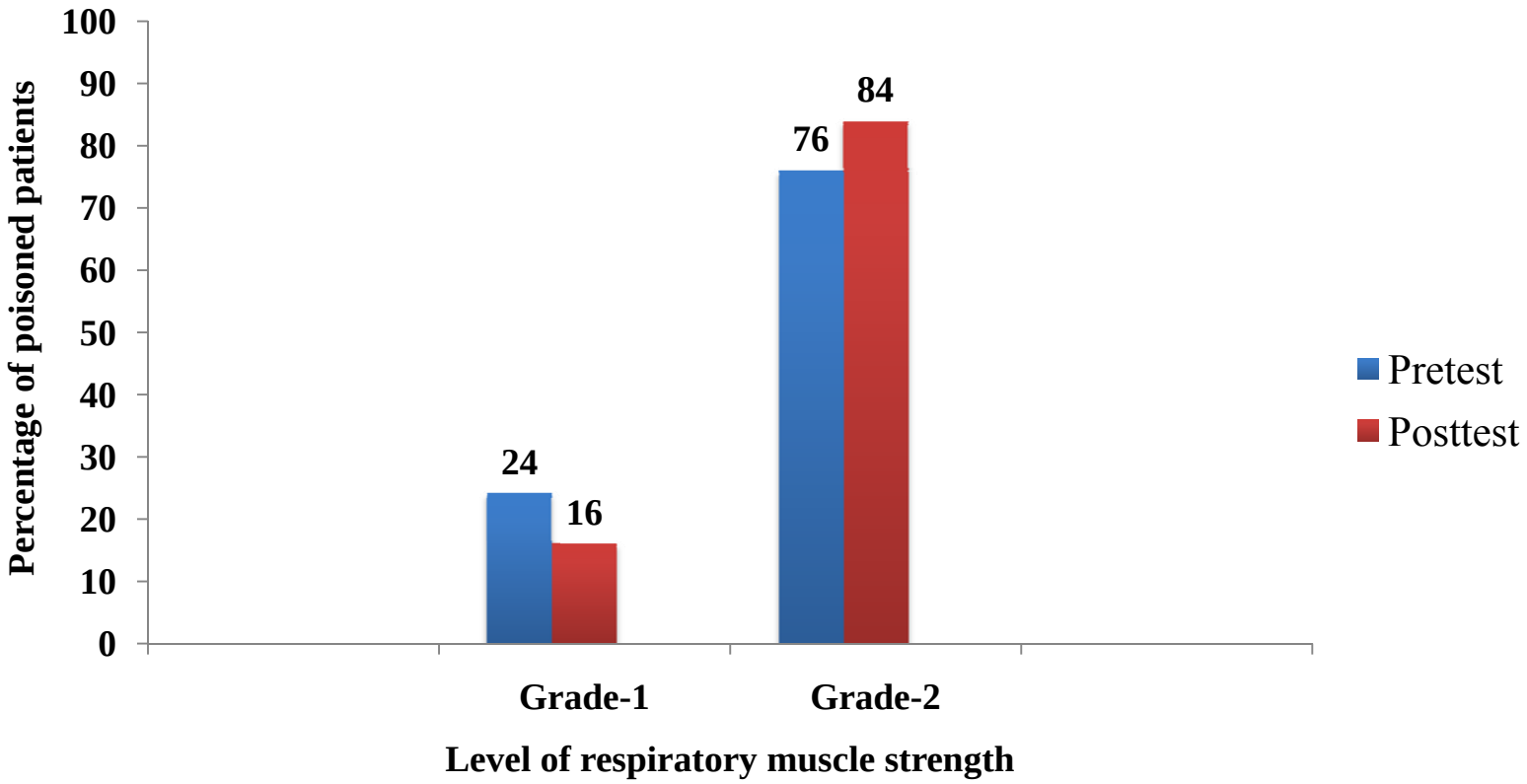

Figure 4.6: Bar diagram shows the Frequency and percentage distribution of pre test and post test score on respiratory muscle strength.

Table 4.3: Frequency and percentage distribution of the pre test and post test scores on extremity muscle strength among poisoned patient patients (N=25)

Level of Extremity Muscle Strength	Poisoned patients			
	Pre test score		Post test score	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Minimal movement with gravity	1	4%	-	-
Movement against the resistant.	21	84%	19	76%
Normal power	3	12%	6	24%

Frequency and percentage distribution of pre and post test scores of extremity muscle strength among poisoned patients, depicts that, in pre test 84% of patients had movement against the resistant power, 12% of patients had normal power and only 4% of patient had minimal movement with gravity, whereas in post test 76% of patients had movement against the resistant power and 24% had normal power. It seems that Multidimensional exercise was effective on extremity muscle strength among poisoned patients.

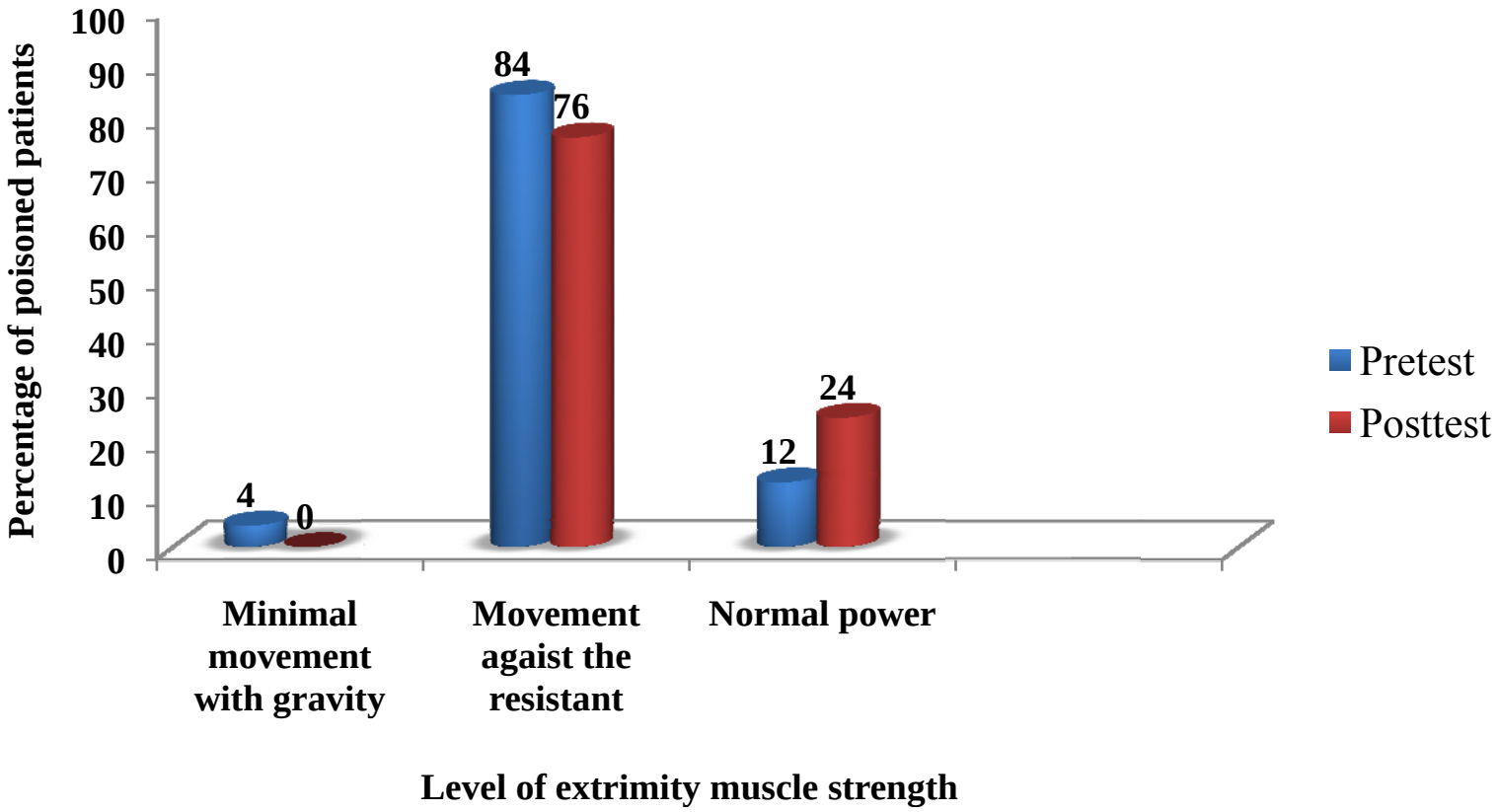

Figure4.7; Bar diagram shows the Frequency and percentage distribution of pre test and post test score on extremity muscle strength among poisoned patients.

SECTION C

ASSESS THE EFFECTIVENESS OF MULTIDIMENSIONAL EXERCISE ON MUSCLE STRENGTH AMONG POISONED PATIENTS.

Table 4.4: Paired' t test value of poisoned patients pre and post test scores of Respiratory muscle strength.

(N=25)

Respiratory Muscle Strength Parameters	**'t' value**	**Level of significance**
Dyspnea	5.89	$p < 0.05$ significant
Respiratory rate	3.75	$p < 0.05$ significant
Oxygen saturation	4.6	$p < 0.05$ significant
Incentive spirometry	4.1	$p < 0.05$ significant
Total	**9.55**	**$p < 0.05$ significant**

Df -24 Table value - 2.06 ($p < 0.05$ significant)

Paired't' test was calculated to analyze the difference in pre and post test scores on Respiratory muscle strength (Dyspnea, Respiratory rate, Oxygen saturation, Incentive spirometry). In poisoned patients the paired 't'value was

9.55, when compared to table values (2.06) it was moderately high. So it can be concluded that, there is significance in respiratory muscle strength among poisoned patients.

Table 4.5: Comparison of Mean, Standard deviation, and Mean percentage of Poisoned patients during pre and post test scores of extremity muscle strength

(N=25)

Respiratory muscle strength parameters	**Max scores**	**Poisoned patients**						**Difference in mean %**
		Pre test			**Post test**			
		Mean	**SD**	**Mean %**	**Mean**	**SD**	**Mean %**	
Dyspnea	3	1.96	0.53	65	2.28	0.38	76	11
Respiratory rate	3	2.48.	0.50	83	2.75	0.42	92	9
Oxygen saturation	3	2.44	0.49	81	2.78	0.29	93	11.3
Incentive spirometry	3	2.24	0.59	73	2.48	0.53	83	9.3
Total	**12**	**9.2**	**1.25**	**77**	**10.30**	**1.13**	**86**	**9.17**

Comparison of mean, standard deviation, and mean percentage of respiratory muscle strength pre and post test score was depicts that, more or less similar percentage of mean score was (2.48±0.50 and 2.44±.49) which is 83% and 81% respectively, where as in post test the mean score was (2.75±.42 and 2.78±0.29) which is 92% and 93% in the area of respiratory rate and oxygen saturation respectively. Similarly the overall mean score was (9.2±1.25) which is 77% where in post test mean score was (10.30±1.13) which is 86%.It showing the difference of 9%. It seems the Multidimensional exercise on respiratory muscle strength among poisoned patients was mildly effective.

Table 4.6: Paired't test value of poisoned patient's pre and post test scores of extremity muscle strength.

(N=25)

Extremity muscle strength Parameters	**'t' value**	**Level of significance**
Upper limb	5.85	$p < 0.05$ significant
Lower limb	5.5	$p < 0.05$ significant
Total	**8.5**	**$p < 0.05$ significant**

Df -24 Table value - 2.06 ($p < 0.05$ significant)

Paired't' test was calculated to analyze the difference in pre and post test scores on extremity muscle strength (upper limb and lower limb). In poisoned patients the paired 't'value was 8.5, when compared to table values (2.06) it was high. So it can be concluded that, there is significance difference in extremity muscle strength among poisoned patients.

Table 4:7 Comparison of Mean, Standard deviation, and Mean percentage of Poisoned patients during pre and post test scores regarding Extremity muscle strength.

(N=25)

Extremity muscle strength parameters		Maximum score	Poisoned patients						Difference in mean %
			Pre test			Post test			
			Mean	SD	Mean %	Mean	SD	Mean %	
Upper limb	Right	5	3.4	1.07	68	3.84	.57	77	9
	Left	5	3.28	.88	66	3.82	.59	76	10
	Total	10	6.68	1.49	69	7.67	1.15	77	8
Lower limb	Right	5	3.04	.67	61	3.34	.67	67	6
	Left	5	2.96	.73	59	3.28	.66	66	7
	Total	10	6	1.35	60	6.63	1.31	66	6
Total		**20**	**12.68**	**2.54**	**63**	**14.30**	**2.32**	**72**	**9**

Comparison of mean ,standard deviation and mean percentage of pre and post test scores depicts that, upper limb over all mean score was (6.68±0.49)

which is 69%.where in post test mean score was (7.67±1.15) which is 77%.it showing difference of 8%.

Lower limb where mean score was (6±1.35) which is 60% where as in post test mean score was (6.63±1.31) which is 66%.it showing the difference of 6%. Similarly the overall pre test means score was (12.68±2.54), which is 63% where as in post test the mean score was (14.30±2.32) which is 72%. It is showing the difference of 8%. It seems the Multidimensional exercise on extremity muscle strength among poisoned patients was mildly effective.

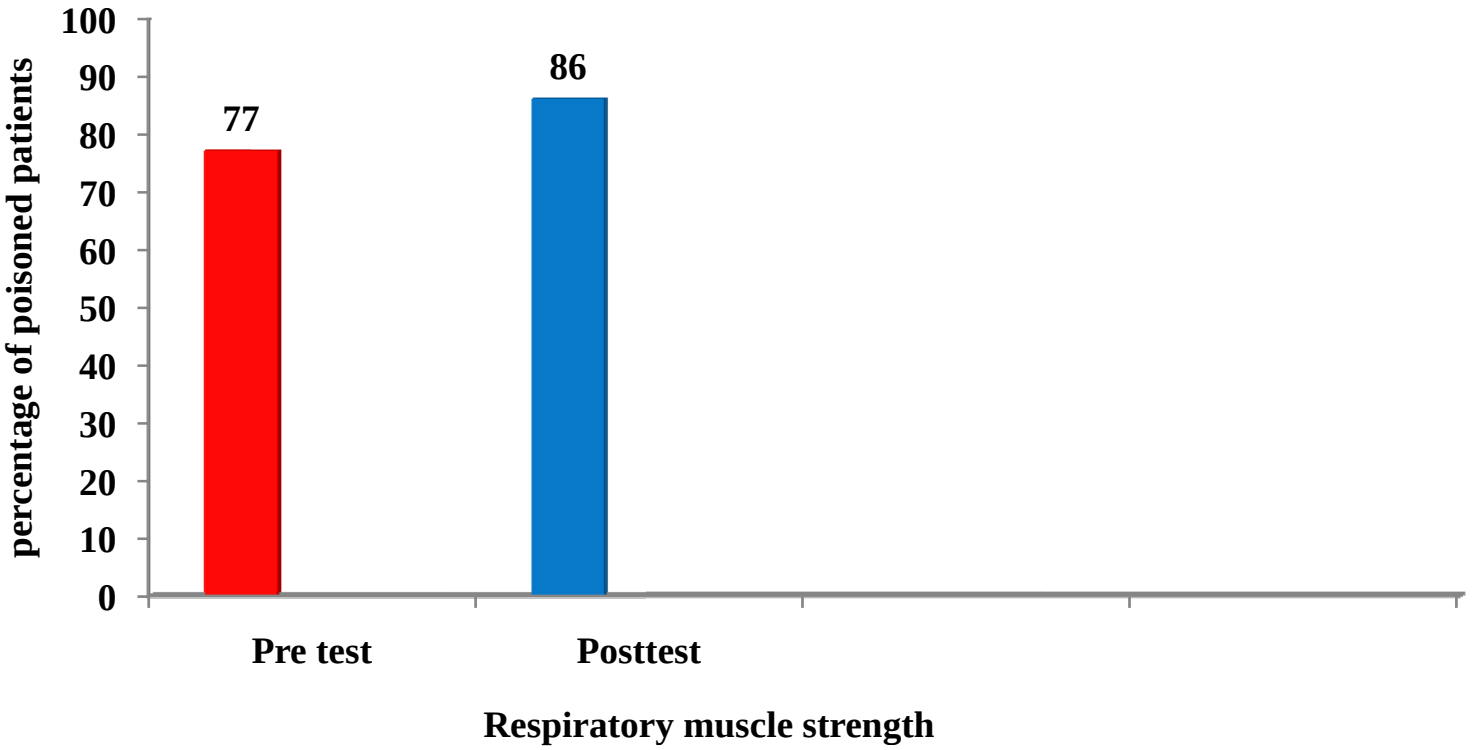

Figure 4.8; Bar diagram showing comparison of pre test and post test scores of respiratory muscle strength among poisoned patients.

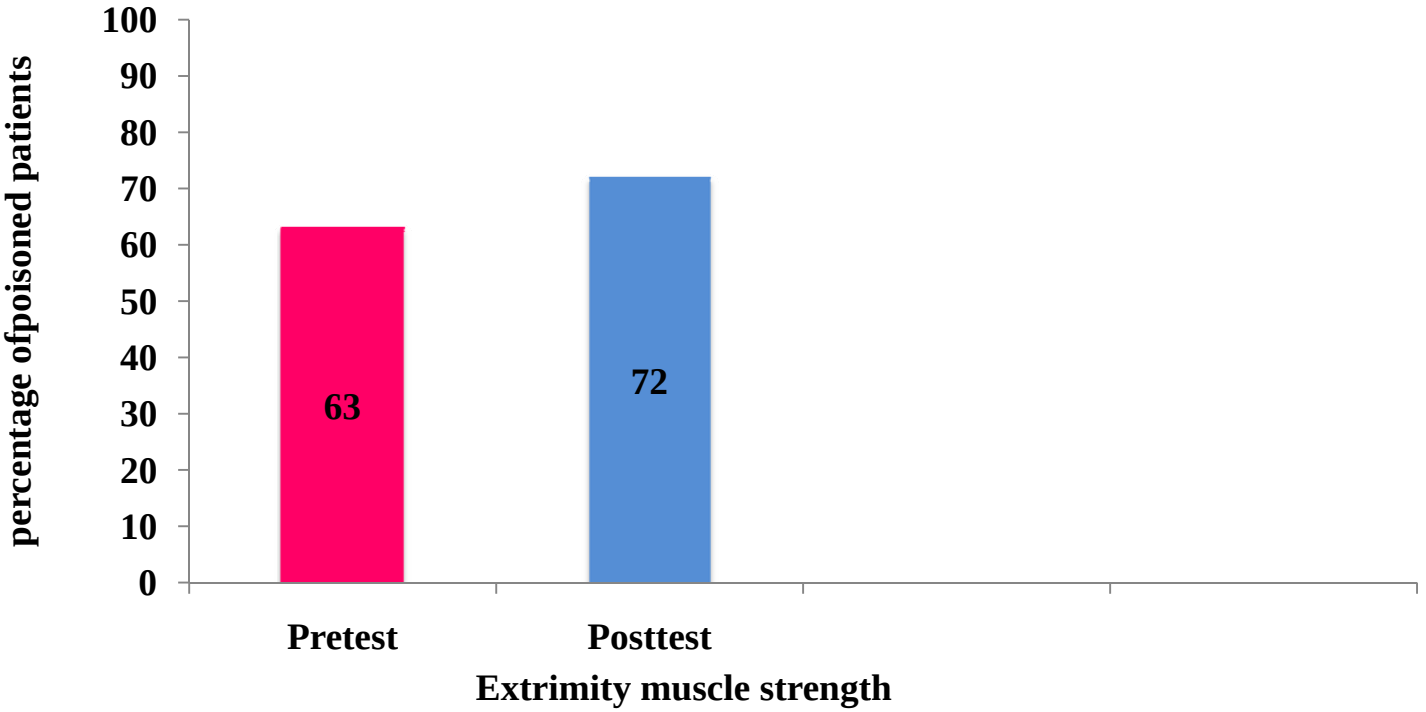

Figure 4.9; Bar diagram showing comparison of pre test and post test scores of extremity muscle strength among poisoned patients.

SECTION-D

FINDOUT ASSOCIATION BEETWEEN POST TEST SCORES ON RESPIRATORY AND EXTRIMITY MUSCLE STRENGTH AMONG POISONED PATIENTS WITH THEIR DEMOGRAPHIC VARIABLES

Table 4:8 Chi-square value of Association between the post test scores of respiratory muscle strength among poisoned patients with their demographic variables.

Demographic variables	DF	X^2	TV	Level of significance
Age	1	.0104	3.84	P>0.05 Not significant
Gender	1	0.125	3.84	P>0.05 Not significant
Types of poisoning	2	6.90	4.99	P<0.05 Significant
Duration of ventilation	1	11.98	3.84	P<0.05 Significant
Types of intubation	2	6.72	4.99	P<0.05 Significant

Chi square was calculated to find out the association between the post test scores of respiratory muscle strength among poisoned patients with their demographic variables (Age, Gender, types of poisoning, duration of ventilation and types of intubation). Hence it can be interpreted that types of poisoning, duration of ventilation and types of intubation were significant association with

their demographic variables. Whereas age and gender were no significant association between post test scores of respiratory muscle strength among poisoned patients with their demographic variables. It seems that Multidimensional exercise was effective among all poisoned patients irrespective with their demographic variables.

Table 4.9; Chi-square value of Association between the demographic variables and the post test scores of extremity muscle strength of poisoned patients.

Demographic variables	DF	X^2	TV	Level of significance
Age	1	.158	3.84	P>0.05 Not significant
Gender	1	0.0369	3.84	P>0.05Not significant
Type of poisoning	2	3.0172	4.99	P>0.05Not significant
Duration of ventilation	1	2.11	3.84	P>0.05Not significant
Type of intubation	2	1.71	4.99	P>0.05Not significant

Chi square was calculated to find out the association between the post test scores of extremity muscle strength among poisoned patients with their demographic variables (Age, Sex, types of poisoning, duration of ventilation and types of intubation). Hence it can be interpreted that there is no significant association between post test scores extremity muscle strength among poisoned patients with their demographic variables. It seems that Multidimensional

exercises were effective among all poisoned patient irrespective with their demographic variables.

SUMMARY

This chapter deals with analysis and interpretation of data collected to evaluate the effectiveness of Multidimensional exercise. The findings revealed that, the pre test mean score on respiratory muscle strength was (9.2±1.25), which is 77% where as in post test mean score was (10.30±1.13), which is 86%, showing the difference of 9%.In extremity muscle strength, the pre test mean score was (12.68±2.54), which is 63% where as in post test mean score was (14.30±2.32) which is 72% and showing the difference of 9%.It indicates Multidimensional exercise on respiratory muscle strength and extremity muscle strength was effective among poisoned patients. The paired‘t’test value showed that, there was significant difference in poisoned patients regarding Multidimensional exercise on respiratory muscle strength and extremity muscle strength in the value of 9.55, 8.5 respectively (Table value = 2.06).Chi square test showed only types of poisoning, duration of ventilation and types of intubation were significant association between the demographic variables and post test scores of respiratory muscle strength among poisoned patients, where as in extremity muscle strength there is no significant association between the demographic variables and post test score.

CHAPTER – V

DISCUSSION

This chapter deals with the discussion which was based on the findings obtained from the statistical analysis and its relation to the objectives of the study, the theoretical frame work and the related literature.

"Effectiveness of Multidimensional exercise on muscle strength among poisoned patients at Dhanvantri Critical Care Centre, Erode". The following were the objectives of this study.

Objectives of the study were

- To assess the level of muscle strength among poisoned patient before and after Multidimensional exercise

- To determine the effectiveness of Multidimensional exercise on muscle strength among poisoned patients.

- To find out the association between post test scores of muscle strength among poisoned patients with their demographic variables.

Objective 1: **To assess the level of muscle strength among poisoned patient before and after Multidimensional exercise.**

a) The frequency and percentage distribution of poisoned patients pre test and post test scores of respiratory muscle strength.

In pre test

- 24% of patients were Grade-I level of muscle strength.
- 76% of patients were Grade-II level of muscle strength.

In post test

- 16% of patients were Grade -I level of muscle strength.
- 84% of patients were Grade -II level of muscle strength.

b) The frequency and percentage distribution of poisoned patients pre test and post test scores of extremity muscle strength.

In pre test

- 4% of patients were in minimal movement with gravity eliminated.

- 84% of patients were in movement against gravity.
- 12% of patients were normal power.

In post test

- 76% of patients having movement against gravity
- 24% of patients having normal power.

HYPOTHESIS 1

There is a significant level of pre test and post test scores on muscle strength among poisoned patients before and after multidimensional exercise on muscle strength so this hypothesis was accepted.

Objectives 2: To assess the effectiveness of Multidimensional on muscle strength among poisoned patients.

1. Paired‘t’ test value of poisoned patients pre and post test scores of respiratory muscle strength.

- The paired ‘t’ test score for Dyspnea was 5.89 when compared to table value (2.06) it was high.
- The paired ‘t’ test score for Respiratory rate was 3.75 when compared to table value (2.06) it was high.

- The paired ‘t’ test score for Oxygen saturation was 4.6 when compared to table value (2.06) it was high.
- The paired ‘t’ test score for Incentive spirometry was 4.1 when compared to table value (2.06) it was high.
- The overall paired ‘t’test score for was 9.55, when compared to the table values of 2.06 it was high.
- It seems that Multidimensional exercise was effective on respiratory muscle strength among poisoned patients.

Paired‘t’ test value of poisoned patients pre and post test scores of extremity muscle strength.

- The paired ‘t’ test score for Upper limb was 5.85 when compared to table value (2.06) it was high.
- The paired ‘t’ test score for Lower limb rate was 5.5 when compared to table value (2.06) it was high.
- The overall paired ‘t’ test score was 8.5, when compared to table values (2.06) it was high.
- It seems that, Multidimensional exercise was effective on extremity muscle strength among poisoned patients.

1. **Mean, standard deviation and mean percentage of pre and post test scores respiratory muscle strength among poisoned patients.**

In pre test

- The mean score for Dyspnea (1.96±0.53) which is 65%
- The mean score for Respiratory rate (2.48±0.50) which is 83%.
- The mean score for Oxygen saturation (2.44±0.49) which is 81%.
- The mean score for Spirometry (2.24±0.59) which is 73%

In post test

- The mean score for Dyspnea 2.28±0.38 which is 76%
- The mean score for Respiratory rate 2.75±0.42 which is 92%.
- The mean score for Oxygen saturation 2.78±0.29 which is 93%.
- The mean score for Spirometry 2.48±0.53 which is83%.

Mean difference are

- Dyspnea 11%.
- Respiratory rate 9%.
- Oxygen saturation 12%.
- Spirometry 10%.
  - The overall pre test mean and standard deviation score was 9.2±1.25, which is 77%
  - The overall post test the mean and standard deviation score was 10.3±1.13 which is 86%. It is showing the difference of 9%.

- It seems the Multidimensional exercise on respiratory muscle strength among poisoned patients was effective.

4. Mean standard deviation and mean percentage of pre and post test scores extremity muscle strength of poisoned patients.

In pre test

- The mean score for upper limb 6.68±1.49 which is 69%.
- The mean score for lower limb 6±1.35 which is 60%.

In post test

- The mean score for upper limb 3.84±1.15 which is 77%.
- The mean score for lower limb 6.63±1.31 which is 66%

Mean difference are

- Upper limb 8%.
- Lower limb 6%.

- The overall mean and standard deviation score was 12±2.54, which is 63%
- The overall post test mean and standard deviation score was 14.3±22.32 which is 72%. It is showing the difference of 9%.
- It seems the Multidimensional exercise on extremity muscle strength among poisoned patients was effective.

HYPOTHESIS 2

There is a significant effectiveness of Multidimensional exercise on muscle strength among poisoned patients so this hypothesis was accepted.

Objectives 3: To find out the association between the post test scores of muscle strength among poisoned patients with their demographic variables.

- Chi-square value reveals that there was no significant association between the post test scores of poisoned patient with their demographic variables regarding respiratory muscle strength except age and gender.
- Chi-square value reveals that there was no significant association between the post test scores of poisoned patient with their demographic variables regarding extremity muscle strength.

HYPOTHESIS 3

There is no significant association between post test scores of muscle strength among poisoned patients with their demographic variables. So the hypothesis was rejected.

CHAPTER – VI

SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATIONS

This chapter deals with the summary of the study, its findings, conclusion and the implications for nursing administration, nursing practice, nursing education and nursing research. This study has been started with a few limitations and ends with suggestions and recommendations for research in future.

SUMMARY

Multidimensional exercise programme are designed to retain the muscles of respiration, improve gas exchange and oxygenation similarly to strengthen the extremity muscle to induce physical capability of patient who ingested toxic substances. The primary goal is to improve health, promoting recovery, and to prevent post poisoning muscular complication. So the investigator studied the statement “A study to Assess The Effectiveness Of Multidimensional Exercise On Muscle Strength Among Poisoned Patients At Dhanvanthri Critical Care Centre, Erode, Tamilnadu.

The objectives of the study were,

- ✓ To assess the muscle strength among poisoned patients before and after Multidimensional exercise
- ✓ To determine the effectiveness of Multidimensional exercise on muscle strength among poisoned patients.
- ✓ To find out the association between the post test scores on muscle strength among poisoned patients with their demographic variables.

HYPOTHESIS

Researchers formulated and tested the following research hypothesis,

H_1: There is a significant level of pre test and post test scores on muscle strength among poisoned patients before and after Multidimensional exercise.

H_2: There is a significant effectiveness of Multidimensional exercise on muscle strength among poisoned patients.

H_3: There is no significant association between the post test scores on

Muscle strength among poisoned patients with their selected demographic variables.

The review of literature on related studies helped the integrations to design the methodology, conceptual frame work and find out the tool. The literature review was done for the present study and presented under the following heading.

- Studies related to poisoned patient.
- Studies related to multidimensional exercise.
- Studies related to alternative therapies among poisoned patients.
- Studies related to multidimensional exercises on muscle strength among poisoned patients

The investigator developed Virginia Henderson's need theory .The research design adopted for the study was pre experimental study. Setting chosen to conduct the study was Dhanvanthri Critical Care Centre, Erode, Tamilnadu. In this study the sample was poisoned patients. The sample size was 25. Respiratory muscle strength assessment scale and extremity muscle strength assessment scale was used to assess Multidimensional exercises.

The reliability of respiratory assessment scale was tested by implementing the tool on three extubated patients at Dhanvantri Hospital Pallakapalayam, Namakkal, which is other than the sample area. Test retest was used to test the reliability of the tool and the tool was found to be reliable (r^1=0.99) and (r^1=0.9).

The main study was conducted in Dhanvanthri Critical Care Centre, Erode, Tamilnadu. The samples were selected by using purposive sampling method among those who fulfill the sampling criteria. Multidimensional exercise was given for five days. Data were gathered through respiratory muscle strength assessment scale and extremity muscle strength assessment scale. The data gathered are analyzed by descriptive and inferential statistical method and interpretation is made based on the objectives of the study.

Findings

The major findings of the study were presented under the following headings.

1. Finding related to Demographic variables of poisoned patients.
2. Finding related to frequency and percentage distribution of pre test and post test scores on level of respiratory muscle strength and extremity muscle strength.
3. Findings related to effectiveness of Multidimensional exercise on respiratory and extremity muscle strength among extubated patients.
4. Finding related to comparison of Mean, Standard deviation, and Mean percentage of pre test and post test scores.
5. Finding related to the association between post test scores of respiratory and extremity muscle strength among poisoned patients with their selected demographic variables.

1. Finding related to Demographic variables of extubated patients.

- Most 48% of patients were in the age group of 31-45 years of age group.
- Most 52% of patients were females.
- Most 76% of patients were ingested Organo-phosphorous poisoning.
- Highest percentage 64% patients were in tracheal intubation.
- Majority 52% of patients were in the duration of 6-10 days.

2. Findings related to frequency and percentage distribution of pre test and post test scores on respiratory and extremity muscle strength.

I Respiratory muscle strength.

- **In pre test**
  - 76% of patients were grade-2 level of respiratory muscle strength.
  - 24% of patients were grade-1 level of respiratory muscle strength.
- **In post test**
  - 84% of patients were in grade -2 level of respiratory muscle strength.
  - 16% of patients were in grade-1 level of respiratory muscle strength.

II Extremity muscle strength.

- **In pre test**
  - 84% of patients had movement against the resistant power

- 12% of patients had normal power
- 4% of patient had minimal movement with gravity,

➢ **In post test**

- 76% of patients had movement against the resistant power.
- 24% of patients had normal power.

3 Finding related to assess the effectiveness of Multidimensional exercise on respiratory and extremity muscle strength among poisoned patients.

In respiratory muscle strength.

Paired 't' test was calculated to analyze the difference in poisoned patients pre test and post test score of respiratory muscle strength. The paired 't'values are,

- Dyspnea was 5.89
- The respiratory rate was 3.75
- Oxygen saturation was 4.6
- Incentive spirometry was 4.1
- The overall paired 't' test score was 9.55,when it compared to table value(2.06) ($p<0.05$) it was high.

It can be concluded that Multidimensional exercise on respiratory muscle strength among poisoned patients was effective.

In extremity muscle strength.

Paired ‘t’ test was calculated to analyze the difference in poisoned patients pre test and post test score of respiratory muscle strength. The paired ‘t’values are,

- Upper limb score was 5.85
- Lower limb score was 5.5
- The overall paired ‘t’ test score was8.5, when it compared to table value(2.06) ($p<0.05$), it was high.

It can be concluded that Multidimensional exercise on extremity muscle strength among poisoned patients was effective.

I Area wise comparison of Mean, Standard deviation, and Mean percentage of poisoned patients pre and post test scores regarding respiratory muscle strength.

- **Dyspnea**
- Pre test mean and standard deviation score was 1.96±0.53 which is 65%.
- Post test mean and standard deviation score was 1.1±0.32 which is 76%.
- Mean percentage difference is 11%.

- **Respiratory rate**

  - Pre test mean and standard deviation score was 2.48±0.50 which is 83%
  - Post test mean score was 2.75± 0.42 which is 92%.
  - Mean percentage difference is 9%.

- **Oxygen saturation**

  - Pre test mean score and standard deviation was 2.44±0.49 which is 81%.
  - Post test mean and standard deviation score was 2.78±0.29 which is 93%.
  - Mean percentage difference is 11%.

- **Incentive spirometry**

  - Pre test mean and standard deviation score was 2.24±0.59 which is 73%.
  - Post test mean and standard deviation score was 2.48±0.53 which is 83%.
  - Mean percentage difference is 9%.

- The overall mean and standard deviation of pre test score was 9.2±1.25 which is 77%.
- The overall mean and standard deviation post test score was 10.30±1.13 which is 86%.
- Mean difference is 9.17%.

◆ It seems that Multidimensional exercise on respiratory muscle strength among poisoned patient was effective.

II Area wise comparison of Mean, Standard deviation, and Mean percentage of poisoned patients pre and post test scores regarding lower and upper extremity muscle strength.

- **Upper limb**
  - The pre test mean score was 6.68±1.49 which is 69%.
  - The post test mean score was 7.67±1.15 which is 77%.
  - Mean percentage difference is 8%.
- **Lower limb**
  - The pre test mean and standard deviation score was 6±1.35 which is 60%.
  - The post test mean and standard score was 6.63± 1.31 which is 66%.
  - Mean percentage difference is 9%.
- The overall mean and standard deviation for pre test score was 12.68±2.54 which is 63%
- The overall mean and standard deviation for post test score was 14.30±2.32 which is 72%
- The mean difference was 9%.
- It seems that Multidimensional exercise on extremity muscle strength among poisoned patient was effective.

4 Findings related to the association between post test scores of respiratory function among extubated patients with their demographic variables.

In respiratory muscle strength

Chi-square value reveals that there is no significant association between demographic variables and post test scores of respiratory muscle strength except age and gender ($p<0.05$).

In extremity muscle strength

Chi-square value reveals that there is no significant association between demographic variables and post test scores of extremity muscle strength.

CONCLUSION

From the findings of the study can be concluded that

- Highest percentage of patients was in age group of 31-45 years.
- Most of patients were females,
- Most of patients were ingested Organophosphorus group of poisoning
- Maximum patients were in tracheal intubation.
- Most of them were in 6-10 days duration of ventilation.

- ❖ The Multidimensional exercise was effective on respiratory and extremity muscle strength among poisoned patients.
- ❖ There was a mild difference in effectiveness of Multidimensional exercise in respiratory muscle strength when compare to extremity muscle strength.
- ❖ There is equal in effectiveness was found in both extremities after Multidimensional exercise.
- ❖ Multidimensional exercise was highly effective on dyspnea in respiratory muscle function among poisoned patients.

IMPLICATIONS

The findings of the study have implication in nursing service, nursing administration, nursing education and nursing research.

Nursing service

- ❖ This exercise can be used by the Nursing professionals who are working in the hospital for further reinforcing their practice.
- ❖ This exercise can be used to demonstrate to the care givers of the patients.
- ❖ This exercise can be used in the community for improvement of respiratory and physical functions.
- ❖ This exercise can be used in different types of respiratory disorders, poisoning and physical incapability conditions such as fracture, paralysis.

Nursing Education

Nurse educator should educate the student Nurses to improve their knowledge and practice regarding the effective management of patients with poisoning complication and motivate them to practice.

Nursing Research

The study may be issued for further reference and for further research studies can be done as replication to standardize the Multidimensional exercise.

Nursing administration

- Nurse educator should educate nursing professionals to follow this technique and find out the effectiveness.
- Administrator staff should understand the need of poisoned patients.
- The researchers educate the family members to follow this technique for improvement of respiratory and physical functions.

RECOMMENDATIONS

Based on the finding of the study the following recommendations have been made for further study.

- A study can conduct with large samples to generalize the findings.
- A similar study can be conducted by using the different type of parameters.

- A similar study can be conducted different types of poisoning patients such as monochrotopos, Botulism, and Paralytic shellfish poisoning.
- A similar study can be conducted by using the different types of disease conditions such as Bronco pneumonia, Hemiplegia, Muscular dystrophy, Amyotrophic lateral sclerosis and myasthenia gravis .
- A similar study can be conducted by using the different settings such as community and home settings.

- A comparative study can be conducted to see the effectiveness of breathing exercises and resistant exercises.

SUMMARY

This chapter was dealt with the summary of the study, major findings, conclusions, implications of the study in the nursing, and recommendation for future.

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Appendix-II

LETTER SEEKING PERMISSION TO CONDUCT STUDY

From

Mr.Vaidyanadhan.C.S,

M.Sc (Nursing) II year, Dhanvantri college of nursing,

Ganapathypurum, No: 1 Renganoor Road,

Munniyappan kovil, Pallakkapalayam, (PO),

Sankagiri west, Namakkal (DT).

To

Prof,Dr.N.Ganapathy ,MBBS MD, DA, FCCP, DCCM(Cardio), MCAM.

Chairman

Dhanvanthri Critical Care Centre, Erode ,Tamilnadu.

Through

The Principal,

Dhanvantri College of Nursing,

Ganapathypurum, No: 1 Renganoor Road,

Munniyappan kovil, Pallakkapalayam, (PO),

Sankagiri west, Namakkal (DT).

Respected Sir/Madam,

Sub: M.Sc., (Nursing) student – research – data collection – regarding.

Mr.Vaidyanadhan.C.S, II year M.Sc.N, student of Dhanvantri College of Nursing, Pallakkapalayam as a partial fulfillment of master of science in nursing, he is to conduct a research and submit the desertion work to the Tamil Nadu Dr M.G.R Medical University, Chennai by December 2011.

The statement of the problem chosen for his study is **"Effectiveness of Multidimensional exercise on muscle strength among poisoned patients at Dhanvanthri Critical Care Centre Erode,Tamilnadu".**

He is in need for your help and cooperation to conduct this research study among patients under spinal anesthesia in your esteemed hospital.

I request you to permit him to collect the data from your hospital and allow my student to utilize the needed facilities.

I assure you that his study will not affect the routine work of your hospital nor would it harm the study subjected for multidimensional exercise intervention. Kindly do the needful.

Thanking you,

Yours sincerely,

Date: 11.08.11

Place: Pallakkapalayam

Appendix-I

LETTER GRANTING PERMISSION TO CONDUCT STUDY

From

Mr.Vaidyanadhan.C.S,

M.Sc (Nursing) II year, Dhanvantri college of nursing,

Ganapathypurum, No: 1 Renganoor Road,

Munniyappan kovil, Pallakkapalayam, (PO),

Sankagiri west, Namakkal (DT).

To

The Principal,

Dhanvantri College of Nursing,

Ganapathypurum, No: 1 Renganoor Road,

Munniyappan kovil, Pallakkapalayam, (PO),

Sankagiri west, Namakkal (DT).

Respected Sir/Madam,

Sub : Permission to conduct research - Regarding

I, Mr.Vaidyanadhan.C.S,, M.Sc (Medical Surgical Nursing) II year student of Dhanvantri College of Nursing, Pallakkapalayam as a partial fulfillment of master of science in nursing, I am going to conduct a research and submit the desertion work to the Tamil Nadu Dr M.G.R Medical University, Chennai by December 2011.

The statement of the problem chosen for my study is **"Effectiveness of Multidimensional exercise on muscle strength among poisoned patients at Dhanvanthri Critical Care Centre Erode,Tamilnadu".**

I request you to permit me to conduct the study. Kindly do the needful.

Thanking you,

Yours Faithfully,

Date: 11.08.11

Place: Pallakkapalayam.

Appendix-III

LETTER SEEKING EXPERT OPINION ON CONTENT

From

Mr.Vaidyanadhan.C.S,

M.Sc Nursing II year, Dhanvantri College of nursing,

Ganapathypuram, No: 1 Renganoor road,

Muniyappan Kovil, Pallakkapalayam, (PO),

Sankagiri west, Namakkal (D.T).

To

Through

The Principal,

Dhanvantri College of Nursing, Ganapathypuram,

No: 1 Renganoor road, Muniyappan Kovil,

Pallakkapalayam, (P.O), Sankagiri West, Namakkal (D.T).

Respected Sir/Madam

Sub: Msc, (Nursing) student –research data collection regarding.

I am Mr. Vaidyanadhan.C.S M.Sc (Nursing) II Year student of Dhanvantri College of Nursing, Pallakkapalayam, as a partial fulfillment of master of science in nursing, He is to conduct a research and submit the dissertation work to the Tamilnadu Dr. M.G.R. Medical University, Chennai.

The Statement of the problem chosen for my study is **"A Study To Assess The Effectiveness Of Multidimensional Exercise On Muscle Strength Among Poisoned Patient At Dhanvanthri Critical Care Centre Erode, Tamilnadu**

To achieve the objectives of the dissertation, I have prepared the following tools:

1 Demographic variables

2.Respiratory muscle strength assessment scale.

3 Extremity muscle strength assessment scale

With regard to this, I kindly request you to go through the tools of muscle strength among poisoned patients, validate it against the given criteria and render your valuable suggestions.

Kindly do the needful.

Thanking You,

Place: Yours Sincerely,

Date:

Enclosure: 1. Demographic data.

2. Respiratory muscle strength assessment scale.

3 Extremity muscle strength assessment scale.

Appendix-IV

CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the tool of **Mr. VAIDYANADHAN C.S** II year M.Sc. Nursing student of Dhanvantri College of Nursing, Pallakapalayam Namakkal (Dt), who is undertaking the dissertation work on **"A Study To Assess The Effectiveness Of Multidimensional Exercise On Muscle Strength Among Poisoned Patient At Dhanvanthri Critical Care Centre Erode, Tamilnadu".**

Signature of the Expert

Place:

Data:

Name & designation

APPENDIX-V

INFORMED CONSENT

Vannakam, I am 30109006 M.sc (N) II year student, studying in Dhanvantri College of Nursing, Pallakapalayam. As a part of my curriculum, I need to do the dissertation. From this study I will not harm you. Whatever information collected that should be in confidential. So I request you to kindly co-operate with me.

Section A: Include selected Demographic variables.

Section B: 1, Respiratory muscle strength assessment scale.

2, Extremity muscle strength assessment scale.

APPENDIX-VI

TOOLS FOR RESEARCH

SECTION -A

DEMOGRAPHIC DATA

1. Age in years
    a. 16-30 ( )
    b. 31-45 ( )
    c. 45-60 ( )

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

3. Types of poisoning
    a Organophosphorus poisoning ( )
    b Cowden powder poisoning ( )
    c Sulphar poisoning ( )

4. Types of intubation
    a. Tracheal ( )

b. Nasal ( )

c. Oral ( )

5. Duration of ventilation

a. 0-5 days ( )

b. 6-10 days ( )

c. 11-15 days ( )

d. More than 15 days ( )

SECTION –B

RESPIRATORY MUSCLE STRENGTH ASSESSMENT SCALE

S.no	Respiratory muscle function parameters	Grade-0	Grade-1	Grade-2
1	Dyspnea	Even in rest period.	In physical exertion.	Not present
2	Respiratory rate.	30 -35 breaths/mins	25-29 breaths/mins	16-24 breaths/mins
3	Oxygen saturation.	91-94%	95-97%	98-100%
4	Incentive spirometry	300ml	600ml	900ml

Grade-0 → Severe respiratory muscle exertion with restlessness

Grade-1 → Mild respiratory muscle exertion with discomfort

Grade-2 → Normal respiratory muscle exertion with comfort.

MUSCLE STRENGTH ASSESSMENT SCALE.

S No	Muscles of extremities.	1	2	3	4	5
1	**Upper extremities** **1. Right** **2. Left**					
2	**Lower extremities** **1. Right** **2. Left**					

Grade 1 - Palpable contraction, no visible movement.

Grade 2 - Movement but only with gravity eliminated.

Grade 3 - Movement against gravity.

Grade 4 - Movement against resistance but weaker than normal.

Grade 5 - Normal power.

APPENDIX-VII

BLUE PRINT OF MULTIDIMENSIONAL EXERCISE.

Definition:

Multidimensional exercise is a series of breathing exercise and resistant exercise that focus to improve the muscle stability of respiratory muscles and extremity muscles.

Goal:

The goal is to retrain breathing to a normal pattern and improve extremity function.

Application of Multidimensional exercise

It is a combination of Aerobic breathing exercise and Resistant exercise.

Aerobic breathing exercise.

Inhale air through the nose by the mental count of 6 and hold the breath for mental count of 8 and slowly exhale through the pursed lips by the mental count of 7 and repeat it for 10 minutes.

Resistant exercise:

It is a type of exercises which means giving resistance to upper extremities by using 2 kg of dumbbell and lower extremities by using one kg of sand bag tied over ankle region and hold it over 30 seconds.

This exercise consists of four steps.

Step 1- holding the dumbbell in the right hand and slowly flex and extent the arm. Repeat it for 5 times.

Step 2- holding the dumbbell in the left hand and slowly flex and extend the arm. Repeat it for 5 times.

Step-3- holding the right leg at 45 degree angle with 1kg of sand bag tied over the ankle region. Repeat it for 5 times.

Step-4-holding the left leg at 45 angle with 1kg of sand bag tied over the ankle region. Repeat it for 5 times.

APPENDIX-VIII

LIST OF EXPERTS

1. **Dr.N,Ganapathy.MBBS,DA,MD,FCCP,DCCM(CARDIO)**
   CRITICAL CARE PHYSCICIAN
   Dhanvanthri Critical Care Centre
   Erode,Tamilnadu.

2. **Dr. Praveen CR ,MS Ortho**
   Mar gregorious memorial muthoot medical centre.
   Kozhencheri,Pathanamthitta,kerala.

3. **Mr.Kuzhanthaivel**
   Professor
   KMCH College Of Nursing.
   Coimbathore,Tamilnadu.

4. **Mrs.P Selvi**
   Physiotherapist
   Dhanvanthri Critical Care Centre
   Erode,Tamilnadu

5. **Prof. Dhanapal**,
   Bio- statistician,
   Dhanvantri College of Nursing,
   Pallakapalayam.

APPENDIX-IX

PHOTOGRAPHS

Photograph Showing Spirometric Assessment

Photograph showing Dumbbell Exercise

ABSTRACT

Background: Poisoning is a significant global public health problem. Due to poisoning effect accumulation of exogenous chemicals enter in to the body .Body muscles are commonly been affected due to the chemical reactions from poisoned substances. It results in progressive muscle weakness, tissue necrosis and paralysis begins within 48-96 hours after intoxication. **Objectives:** To assess the effectiveness of multidimensional exercise on muscle strength among poisoned patients. **Design:** Pre-experimental design. **Setting:** Dhanvantri Critical Centre Erode, Tamilnadu. **Sample size:** 25 poisoned patients **sampling technique:** Purposive sampling technique. **Methods:**25 poisoned patients receives Multidimensional exercise(Aerobic exercise and resistant exercise) twice a day from second day of extubation for five days.Pre test was done by using respiratory muscle strength assessment scale for respiratory function and extremity muscle strength assessment scale for upper & lower limbs .Post test was done by using the same scale at 5^{th} day of intervention. **Results:** From the findings of the study it can be concluded that Most (48%) of poisoned patients were in the age group of 31-45 years of age group. Most of patients were females, ingested Organo-phosphorous poisoning, tracheal intubation and duration of 6-10 days. The paired‘t’ values for respiratory muscle strength 9.55 ,extremity muscle strength 8.5.The difference in the mean percentage in respiratory and extremity muscle strength were 9.17and 9 respectively. Chi-square value shows no significant

association between demographic variables and post score of both respiratory and extremity muscle strength among poisoned patients. **Conclusion**. The Multidimensional exercise was effective respiratory and extremity muscle strength among poisoned patients. But mild difference in effectiveness was found in respiratory muscle strength when compare to extremity muscle strength.