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Effectiveness of Exercise Sessions on the Management of Frozen Shoulder and Dysphagia for Patients After Stroke

A Dissertation

Submitted To Council of the College of Nursing-University of Babylon in Partial Fulfillment of the Requirements for the Degree of Doctorate of Philosophy in Nursing

By

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Dedication

I dedicate this work to:

God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding.

My beloved parents, brothers, and sisters who have been my source of inspiration and give me strength when I thought of giving up, who continually provide their moral, spiritual, and emotional support.

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Abstract

Stroke is a major health issue that affects the people all over the world. It is also one of the main causes of serious complications like dysphagia, Shoulder pain and disability (Frozen Shoulder) speech issues, urinary or bowel incontinence, emotional problems, depression, anxiety, paralysis of the limbs, and numbness. Frozen shoulder one of the major causes of disability after stroke. In the initial few hours and days following a stroke post-stroke dysphagia and a frequent consequence that affects many patients. it is also linked to an increased risk of death and morbidity from aspiration pneumonia and malnutrition. The Exercise Sessions are very important to improve Strength and Mobility, Gait and Balance, Energy Levels, Confidence and Self-Esteem, and Wellbeing for patients after stroke, as well as the Exercise Sessions are effort to improve understanding of stroke and risk prevention, Social Peer Support, Communication, Integration, Health, and wellbeing through a better understanding of self-management and care after stroke.

A quantitative study, quasi-experimental design study carried out in Middle Euphrates Neuroscience Center in AL-Najaf AL-Ashraf City in order to evaluate the effectiveness of exercise sessions on the management of frozen shoulder and dysphagia for patients after stroke from the period 19th October 2021 to 4th June 2023.

Non- probability purposive sample method was selected to carry out the study, stroke patients with frozen shoulder and dysphagia assigned to participate in the study, The study sample consists of (60) patients have the same inclusion criteria. Those patients are divided into two groups: (30) patients selected as experimental group, the other (30) patients are treated as control group, who visit the center regularly for follow up, all the study sample divided into

patients admitted to the ward and who visits to the center for treatment and consultation.

Most of the participants were male, between the ages of 51 and 60, and had suffered from ischemic stroke. They also tended to have diabetes mellitus and hypertension. The mean of shoulder pain level and disability for both group recorded as (6.0) for experimental group compared with the (4.8) for control group in their pretest and changes in the dysphagia severity after the exercise sessions, shows a significant decrease in the severity of dysphagia among the experimental group.

Frozen shoulder as well as Dysphagia significantly decreased among experimental group after exercise sessions compared with control group members.

The establishment of a structured program recognized the difficulties that post-stroke patients would encounter due to lengthy recovery process, which required special planned care to reduce the severity of Frozen Shoulder and dysphagia for patients via rehabilitation facilities to improve their self-care proper.

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List of Abbreviations and Symbols

Abbreviation	Meaning
ADL	Activity Of Daily Living
AIDS	Acquired Immunodeficiency Syndrome
ATP	Adenosine Triphosphate
AVMs	Arteriovenous Malformations
CNS	Central Nervous System
CSF	Cerebrospinal Fluid
CT	Computerized Tomography
CTAR	Chin Tuck Against Resistance Exercise
CVA	Cerebrovascular Accidents
DALYs	Disability Adjusted Life Years
DNA	Deoxyribonucleic Acid
e.g.	For Example (Example Gratia)
EEG	Electroencephalogram
EM	Early Mobilization
FOIS	Functional Oral Intake Scale
G	Gram
ICA	Internal Carotid Artery
Kg	Kilogram
L	Litter
LES	Lower Esophageal Sphincter
m.s.	Mean Of Score

Ml	Milliliter
mm Hg	Millimeter(S) Of Mercury
MRI	Magnetic Resonance Image
N	Sample Number
NS	Non-Significant
P	Page
p.p.	Pages
P.value	Probability Value
PA	Physical Activity
PAS	Penetration-Aspiration Scale
PNF	Proprioceptive Neuromuscular Facilitation
PSD	Post – Stroke Dysphagia
PSFS	Post – Stroke Frozen Shoulder
ROM	Range Of Motion
S	Significant
SAH	Subarachnoid Hemorrhage
SAH	Subarachnoid Hemorrhage
SD	Standard Deviation
SPADI	Shoulder Pain And Disability Index
SPSS	Statistical Package Of Social Sciences
SUS	System Usability Scale
TAM-2	Technology Acceptance Model-2
TCD	Trans Cranial Doppler
TIA	Transient Ischemic Attack

tPA	Tissue Plasminogen Activator
TPI	Territorial Posterior Circulation Infarcts
TSH	Thyroid Stimulating Hormone
U.K	United Kingdom
U.S	United States
UES	Upper Esophagus Sphincter
USE	Usefulness, Satisfaction, And Ease Of Use
UTI	Urinary Tract Infections
VAS	Visual Analogue Scale
VFSS	Video Fluoroscopic Swallowing Study
Vol.	Volume
VS	Versus
VTE	Venous Thromboembolism
WHO	World Health Organization
χ^2	Chi-Sequare
%	Percentage
&	And
~	Approximately
<	Less Than
>	More Than

Chapter One

Introduction

Chapter One

Introduction

1.1. Introduction:

In the context of stroke, early rehabilitation frequently targets the significant deficiencies that patients experience during the acute stage of the illness. These include swallowing impairment, motor impairment reduced mobility, reduced balance, and reduced ability to carry out simple self-care activities. An early focus on movement is likely to be beneficial for the majority of acute stroke patients. Exercise after a stroke should be started as soon as feasible under the term "Early Mobilization" (EM), early stroke descriptions usually refer to EM and it is thought that this has a big impact on how well stroke therapy is delivered. Nevertheless, there are divergent views on how EM functions (Langhorne *et al.*, 2017).

Stroke is a major health issue that affects people all over the world. It is also one of the main causes of serious complications like Dysphagia, speech issues, urinary or bowel incontinence, emotional problems, depression, anxiety, paralysis of the limbs, numbness, and shoulder pain and disability (Liu *et al.*, 2018).

According to several studies frozen shoulder (FS) (shoulder pain and disability) may be one of the major causes of disability after a stroke. It is estimated that 56.6% of stroke patients are affected, and 77% of those who have hemiplegic shoulder pain also have Frozen Shoulder (Martn *et al.*, 2019).

In the initial few hours and days following a stroke, post-stroke dysphagia (PSD), or trouble swallowing, is the medical term for swallowing difficulties, Some people with dysphagia have problems

swallowing certain foods or liquids, while others can't swallow at all. other signs of dysphagia include: Coughing or choking when eating or drinking, is a frequent consequence that affects many patients. It is also linked to an increased risk of death and morbidity from aspiration pneumonia and malnutrition. Even while most patients resume swallowing on their own, at six months, a sizable percentage still struggle with dysphagia. The therapy of dysphagia post- stroke continues to be an under studied field of research, despite numerous advancements in the hyper acute treatment of stroke and secondary prevention (Chen *et al*., 2022).

Patients may have trouble swallowing if they have a stroke that affects their face, lips, or throat. The word dysphagia is used to describe issues with swallowing. Increased drooling or chewing, coughing or choking while swallowing or right after, and food falling into pockets are all indications of dysphagia. The inability to swallow and the sensation of swallowing in the mouth. Patients who struggle with this risk having food or fluids enter their windpipe, which can cause pneumonia. Oral Restrictions on food and liquid consumption may be necessary at initially to allow for the recovery of swallowing function (American Stroke Association, 2020).

1.2. Importance of The Study:

Stroke occurs in the United States every 40 seconds. One person has a stroke and dies every 3.5 minutes. Every year the more than 795,000 people have a stroke, approximately 610,000 of these are first or new strokes (Virani *et al*., 2020).

Stroke is the second biggest cause of mortality in Europe, accounting for 405,000 male fatalities and 583,000 female deaths annually.

With almost 1.6 million new stroke cases overall, stroke represents close to 14% of all new stroke cases in Europe (Benjamin *et al*., 2018).

Incidence rates of stroke in Iraq ranged from 196.2 to 218.3 per 100,000 people in 2019, according to Global Burden of Disease 2019 Stroke Collaborators. Furthermore, 35.8% of Iraqis are estimated to suffer from hypertension, 14% from diabetes mellitus, 38% are smokers, and more than 30% are obese. Moreover, many Iraqi people have reported an unhealthy lifestyle, including a lack of physical activity and poor nutrition with high-calorie foods (Al-Obaidi *et al*., 2023).

Each year more than 13 million individuals worldwide will suffer a stroke, and nearly 5.5 million will die as a result. The blood vessel when it supply to the brain and disrupted it can cause a stroke, which causes oxygen deprivation, brain damage, and function loss. A stroke partial paralysis, impaired speech, understanding, and memory loss are just a few of the long-term effects that a stroke can have (WHO, 2022).

Finding practical methods to enhance stroke victims' quality of life is urgently needed. In particular, regular exercise, which is defined as a Planned, Organized, and repetitive Physical Activity with the goal of conditioning any body part, or physical activity (any bodily movement produced by the skeletal muscles that results in an energy expenditure beyond the expenditure of rest) is important. Unfortunately, few healthcare practitioners have training or experience in developing exercises for this wide-ranging and expanding patient community (Huang *et al*., 2022).

Early exercise is crucial for maximizing functional recovery and independence following stroke, Neuroplasticity and cortical remodeling, which promote functional improvement (Fakhraldeen, 2022).

The objectives of exercise sessions or a session of vigorous physical exercise or training of the management of frozen shoulder and dysphagia for patients after a stroke are improve strength and mobility, gait and balance, energy levels, confidence and self-esteem, and wellbeing. The objectives of education sessions are to improve understanding of stroke and risk prevention, social peer support, communication, and integration, as well as health and wellbeing through a better understanding of self-management and care (Eng & Pastva, 2022).

Stroke management during hospitalization and, in many circumstances, following release well is reliant on nursing care for stroke patients. Receiving thorough care for the first four weeks following a stroke may reduce overall morbidity and mortality . Compared to other healthcare providers, nurses are more likely to keep in touch with patients after they are discharged. They can ensure that the requirements of a stroke patients and their at home careers are met by working together with members of an interdisciplinary team (Clare, 2018).

Stroke recovery therapy patients are encouraged to focus on self-care activities and can leave the hospital and go home without making any preparations for returning to work, getting better, or contributing to society. The term "self-care" refers to a wide range of activities، including dealing with health issues, maintaining a healthy lifestyle, and other obligations. The idea of self-care is linked to Autonomy, Self-Discipline, and Personal Activities for healthy performance, as well as to improving the actions required to monitor and manage health cases, before beginning any Exercise Session, patients dealing with the after effects of a stroke should speak with a health care provider (physician or nurse practitioner) to undergo a medical screening to make sure there are no conditions that would make the program's participation unsafe (Billinger *et al*., 2014).

1.3. Statement Of The Problem:

Effectiveness of Exercise Sessions on the management of the Frozen Shoulder and Dysphagia for Patients After Stroke.

Patients with a stroke are at a significant risk of complications, just like with other severe sickness. up to half of all hospital deaths following stroke are attributed to severe complications, many of which cannot be anticipated and by the time they are identified, the patient has already developed an irreversible infection. these complications frequently impede recovery and can significantly affect functional outcomes, as well as lengthen hospital stays and delay successful rehabilitation. Nevertheless the prevention, recognition, and management of stroke complications are crucial components of contemporary stroke care, possibly even more crucial than acute instances reperfusion or resuscitation therapy in terms of short- and long-term recovery from stroke (Birnbaum, 2020).

One of the main causes post-stroke is frozen shoulder as a common symptoms produce pain and discomfort which effects the quality of life if cannot be successfully treated (Zong *et al*., 2020).

Patients with adhesive capsulitis (frozen shoulder) are recommended to perform physically demanding physical therapy exercises that don't cause shoulder pain. for those who have mild to severe symptoms of frozen shoulder (Mertens *et al*., 2021).

The aimed of exercise sessions to decrease the severity of disability and pain symptoms for stroke patient and to preventing, treating, and developing. It may extended to measure the knowledge of patients related to their health status and to determined their quality of life. A challenge in this study is to focus on particular issues or knowledge gap of patients with

stroke related to self-care management and to the severity of their symptoms and increase functional capacity, enhances patients' abilities to carry out everyday tasks and improves their quality of life while lowering their chance for developing new cardiovascular problems (Kargarfard *et al*., 2018).

A challenge is a particular issue or knowledge gap that we hope to address through the research. Some research will include both of these goals, but often the research challenge focuses on either theoretical difficulties meant to further knowledge or practical problems meant to effect change. The broad area of interest and the kind of research you believe will fit best will influence the research problem we select (Kumar, 2018).

1.3.1. Research Hypothesis:

1. Exercise sessions are effective as management method to decrease the severity of frozen shoulder and dysphagia symptoms.

2. If the patients involvement in the training sessions act as important factor to decrease of shoulder pain and enhance their abilities to perform daily tasks when pain reduce.

3. There is significant relationship between exercise training session and decrease the severity of frozen shoulder and dysphagia.

4. No significant relationship between exercise training session and lowering shoulder pain and disability (frozen shoulder), and decrease the severity of dysphagia for patients post stroke.

1.3.2. Objectives of The Study:

1. To assess the patients need for Exercise Sessions to decrease the impact of Frozen Shoulder and Dysphagia of their life.
2. To prepare of Exercise Sessions to decrease the severity of the Frozen Shoulder and Dysphagia in patients after stroke.
3. To evaluate the effectiveness of the Exercise Sessions on patients health status related to frozen shoulder and dysphagia (pre- posttest).
4. To find out the relationship between the outcome of Exercise Sessions and the study sample demographical characteristic variables such as (Age, Sex, Educational Level).

1.4. Defining of The Terms:

1.4.1. Effectiveness:

Theoretical Definition:

Effectiveness is the ability to produce a better result, one that delivers more value or achieves a better outcome (Salminen *et al*., 2020).

Operational Definition:

The outcome which may to achieved after application of exercise sessions for related to frozen shoulder and dysphagia for patient diagnosed with stroke.

1.4.2. Exercise Sessions:

Theoretical Definition:

Training which may improve muscle power output by performance of heavy load strength-oriented exercises (Helland *et al*. 2020).

Operational Definition:

Exercise Sessions includes systematic exercise steps used for frozen shoulder and dysphagia in patients after stroke.

1.4.3. Frozen shoulder:

Theoretical Definition:

An elusive painful shoulder ailment called adhesive capsulitis is also referred to as frozen shoulder. This inflammatory condition results in fibrosis of the glenohumeral joint capsule and is characterized by gradually increasing stiffness and a significant reduction in range of motion, usually in the external rotation (Mezian *et al*., 2021).

Operational Definition:

As one of the post stroke complication, when the shoulder becomes thickened and inflamed and appears to tighten or shrink around the joint resulting in a reduced range of movement and pain.

1.4.4 Dysphagia:

Theoretical Definition:

Any disruption in the swallowing process during the transit of boluses from the oral cavity to the stomach is referred to as dysphagia (a difficulty swallowing). oral, pharyngeal, and esophageal are the three phases of swallowing (Philipsen, 2019).

Operational Definition:

Enhancement of swallowing abilities to maintain normal diet and safe efficient alimentation and hydration.

1.4.5 Stroke:

Theoretical Definition:

Brain attack occur when blood supply to an area of brain is interrupted or cut off due to blood vessels blockage or rapture (Crussell, 2017).

Operational Definition:

Neurological disorders that affect vital functions and cause a variety of medical problems such as frozen shoulder and dysphagia.

Chapter Two

Review of Literature

Chapter Two

Review of Literature

This chapter presents literature and previous studies related to Effectiveness of Exercise Sessions on the management of Frozen Shoulder and Dysphagia for Patients After Stroke, which are classified in the following parts:

2.1. Overview of Stroke:

Over 2400 years ago, Hippocrates, a Master of Medicine, defined a stroke as the sudden onset of paralysis. Johann Jacob Wafer was the first doctor to explain a stroke during anatomy and bleeding of the brain for patients with shook. He also explained that in addition to the bleeding, the main arteries supplying the brain can become blocked (Veeraiah, 2014).

Wepfer distinguished between two types of strokes, and this distinction is still made in current medicine, A blood clot blocking a brain blood vessel and interrupts the blood supply for specific region of the organ, resulting in an ischemic insult, which accounts for about 85% of strokes and the other type of stroke is known as a hemorrhagic stroke if, on the other hand (Luzzatti & Whitaker, 2021)

The burden of a stroke on families and society is expected to increase from about 38 million Disability-Adjusted Life Years (Dalys) lost globally in 1990 to 61 million (DALYS) in 2020 as a result of population aging. Stroke is the second most common cause of death worldwide and a frequent cause of adult disability in developed countries. Stroke also has a significant physical, psychological, and monetary impact on patients and their families, the healthcare system, and society (Wafa *et al.*, 2020).

A bleed or blockage on one side of the brain affects movement on the opposite side of the body, which is known as hemiplegia; (hemi) is mean half and (plegia) is mean paralysis, meaning one side of the body is weaker. A stroke is the result of damage to nerve cells in the brain due to either a blockage of a blood vessel or bleeding into the brain, each individual's stroke-related issues are unique (Shaw *et al*., 2020).

A stroke can cause severe and permanent disability. In addition to numerous neurological abnormalities, sequelae from a stroke might include a disability that makes it difficult for them to obtain employment, a movement disorder that requires rehabilitation treatment in more than 80% of patients and other medical issues (kim *et al*., 2017).

According to the World Health Organization (WHO), stroke is the fifth most common cause of death for adults between the ages (15 to 59) and the second top cause of death for people over the age of sixty. every year, six million people worldwide pass away from a stroke. A stroke will affect around one in every six people worldwide at some point in their lives, a stroke victim is lost every six seconds, taking twice as many lives as AIDS. Despite the fact that malaria and tuberculosis also afflict people who live in low-resource countries, stroke continues to be the leading cause of death each year (WHO, 2022).

2.2. Theoretical Framework of The Research:

Recent nursing practice has focused on using nursing theories as a foundation for behaviors that make the profession more exceptional and meaningful and that transition nursing from a vocation to the best structured profession (Arora, 2015).

One of the key ideas in nursing that focuses on self-care is Orem's theory. Self-care must be intentional and mindful of its effects on one's

life, function, and well-being. according to Orem's self-care for those with chronic conditions to become independent, each person has the ability to take care of themselves. Orem proposed three steps in which nurses play a crucial role in the placement of the self-care, starting with therapeutic communication with the patient to identify patients' problems, setting up care plans in accordance with patients' needs, and finally preparing patients and their families to self-care to become independent (Queiros *et al*., 2014).

According to Orem's theory, everyone is capable of caring for themselves. Orem proposed three steps for those with chronic conditions to self-care so they can become independent. the nurse plays a crucial role in each step starting with therapeutic communication with the patient to identify their problems, putting care plans in place based on those needs, preparing patients, and their families for self-care so they can become independent. Living with cancer is therefore difficult and stressful for patients, families, and society as a whole (Lee *et al*., 2021).

In accordance with the Orem self-care theory, nurses will assign these patients' self-care responsibilities so as to reduce the cost of therapy and frequent hospitalization and to improve their quality of life by developing their self-care abilities (Mohammad *et al*., 2019).

Applying Orem's self-care theory will lay the groundwork for the finest interdisciplinary health care, with the majority of the system's support coming from the patients themselves through self-care and a little portion from nurses or other healthcare professionals (Taylor *et al*., 2011).

No.	Theory	Nurses Responsibility According to Nursing Theories	Nursing Process	According to Current Study
1.	Orem's Theory	Prepare an Education of Exercise Sessions to Decrease The Severity of Patient.	1. Assessment 2. Diagnosis 3. Planning	To Assess The Patients Need For Exercise Sessions to Decrease The Impact of Frozen Shoulder and Dysphagia on Their Life
2.	Orem's Theory	Prepare An Education Of Exercise Sessions To Decrease The Severity Of Frozen Shoulder And Dysphagia In Patients After Stroke.	Implementation	Exercise Sessions of The Management of Frozen Shoulder and Dysphagia After Stroke
3.	Orem's Theory	Prepare An Education Of Exercise Sessions To Decrease The Severity Of Frozen Shoulder And Dysphagia In Patients After Stroke.	Evaluation	Determine The Effectiveness of The Exercise Sessions on Patients Health Status Related to Frozen Shoulder and Dysphagia(Pre-Posttest).

Table (2) Application of nursing theories as a framework of the study (Ali *et al*., 2019).

2.3. Anatomy and Physiology of the Brain:

The adult brain, which weighs about 1500 g, requires about 150 g of glucose and 72 L of oxygen every day. Each minute, the brain receives 10 to 15 ml of the approximately 70 ml of blood that cardiac contractions push into the ascending aorta. Furthermore, 350 ml of blood will flow through each internal carotid artery, with approximately 100 to 200 ml of that blood reaching the vertebrobasilar system (Telano & Baker, 2022).

The brain, which weighs three pounds, is the structure that manages all functions, including learning, emotion, and creativity. The brain gets information through the five senses of hearing, sight, smell, touch, and taste while being protected inside the skull, The brain consists of three main parts; (Coolen *et al*., 2022).

A. Forebrain.

B. Midbrain.

C. Brain stem/hind brain (medulla, pones, and the cerebellum).

The forebrain is the most complex and largest part of the brain, it is responsible for human higher level of behavior as speaking and thinking, it also functions as the processor and receptor of sensory information like thought, perception, memory and speech. Forebrain is divide into three parts:

1. Cerebrum
2. Thalamus
3. Hypothalamus

2.3.1. Cerebrum:

Cerebrum contains the Cerebral Cortex, which has two cerebral hemi-

spheres:

1. Right hemisphere
2. Left hemisphere

The right side of hemisphere control left side of body and receive left side of body impulses and left hemisphere control right side of body.

2.3.2. Cerebral Cortex:

A folded membrane covering the surface of the brain is referred to as the cortex, and it contains 100 billion nerve cells. The bodies of nerve cells are gray in hue. Why it is termed grey matter is because a lengthy fiber connecting the neurons is what gives it that name (Azevedo *et al*., 2009).

2.3.3. Lobes of Cerebrum:

Frontal, temporal, parietal and occipital lobes distributed in the which connected by complex relationship (Telano & Baker, 2021)

2.3.4. Thalamus:

The telencephalon and the brain stem are separated by the thalamus. In addition to receiving information from the senses, the thalamus serves as a relay station for ascending information from the cortex. The right and left thalamus are separated by the third ventricle (Brooks *et al*., 2017).

2.3.5. Hypothalamus:

The hypothalamus, which is roughly the size of a fingertip, is situated directly beneath the thalamus, the constant interior environment of the organism is one of its primary functions. the limbic system a subcortical component involved in emotional reactions and memory formation, is also a part of it, the amygdala, hippocampus, basal ganglia, and cingulated gyres are all parts of the limbic system. Just in front of the hippocampus in the temporal lobe is where you'll find the amygdala. the cluster of neurons that make up the amygdala is primarily responsible for memory, learning, and emotions (Waters *et al*.,2018).

2.3.6. Mid Brain:

The forebrain and the hindbrain are connected by the midbrain. It performs a crucial role in seeing, moving, and hearing as well as serving as a relay station for messages entering the brain (Gandhimathi & Eljo, 2010).

2.3.7. Hind Brain:

This parte coordinates functions that are fundamental to survival, which includes, motor activities, sleep, respiratory, rhythm, and wakefulness. It is a part of three major development divisions of the brain, the remain two parts are midbrain and forebrain. This part consist of three structures. Pons, and medulla oblongata (Goldstein, 2016).

2.3.8. Brain lobes:

2.3.8.A. The Frontal Lobe:

It is situated behind the forehead and functions in memory, impulse control, judgment, and problem solving. The ability to think critically or solve problems is impacted by frontal lobe injury (Glynn *et al*., 2020).

In terms of the brain's two halves, the left half is more involved in language than the right. In terms of processing, the right side of the brain is more active (Alain *et al*., 2017).

2.3.8.B. The Parietal Lobe:

The processing of sensory information occurs in the brain's parietal lobe, which is located behind the frontal lobe. it contains the somatosensory cortex, which processes sensory information from all over

the body, such as touch, temperature, and pain. The somatosensory cortex is topographically organized, which implies that on its surface, spatial relationships that exist in the body are preserved. For instance, the region of the cortex responsible for processing sensory information from the hand is near to the region in charge of processing information from the wrist. (Weiller *et al*., 2021).

2.3.8.C. The Temporal Lobe:

The Speech, memory, and information are all organized through it. The temporal lobes amygdala plays a role in information organizing and storage. Its function declines in the event of malfunction (Javaid *et al*., 2022).

2.3.8.D. The Occipital Lobe:

The primary visual cortex, which interprets incoming visual information, is housed in the occipital lobe, which is at the very rear of the brain. The position of an object in a person's visual field and the position of that object's representation in the cortex are closely related because the occipital cortex is structured retinotopically (Weiller *et al*., 2021).

The principal arteries that supply blood to the brain include the aortic arch, extracranial carotid, vertebral, intracranial internal carotid, middle cerebral, anterior cerebral, vertebral, basilar, and posterior cerebral arteries. (Gorelick, 2014).

Three pairs of cerebral arteries the anterior, middle, and posterior cerebral arteries leave the Willis circle to nourish the cerebral hemispheres. The frontal and medial portions of the brain are supplied by the anterior cerebral artery. The lateral (external) portion of each hemisphere is supplied by a cerebral artery (Bosmia *et al*., 2015).

2.4. Definition of Stroke:

Stroke is a common illness, the risk of stroke increases with age, and as the elderly population increases, this risk also increases. In the United States in 2030, there were more deaths from stroke, many strokes are distinguished due to a focal neurologic deficit that appeared out of nowhere. Nevertheless, in cases when the patient was "struck by the hand of God" the neurologic disability's abrupt beginning can be referred to as having a centric vascular etiology (Rexrode *et al*., 2022).

In the United States the most prevalent and harmful abnormality is stroke, which can be caused by ischemia, hemorrhagic, and cerebrovascular disorders such cerebral aneurysms and arteriovenous malformation (AVMs). Brain imaging is therefore employed in laboratory investigations to support the diagnosis of stroke, whereas the definition of stroke is clinical (Rexrode *et al*., 2022).

Although stroke is the most frequent neurological emergency and there are quick, efficient treatments available, the majority of acute neurological presentations should be treated as strokes until otherwise determined by a history, physical examination, or radiographic tests (Brainin & Heiss, 2019).

2.5. Etiology and Risk Factors for Stroke:

A stroke can happen due to aging of the blood arteries. Yet atherosclerosis is responsible for more than one-third of instances (also called arteriosclerosis). This disease affects arteries, progresses slowly, age and hereditary consider as two risk factors that cannot be changed. There are underlying conditions that predominantly affect the heart, blood arteries, or blood that can cause focal cerebral ischemia (Jeffrey *et al*., 2018).

2.5.1.Vascular Disorders:

Among the conditions that fall under this category are (atherosclerosis, hypertension, diabetes mellitus, vasculitis, giant cell arteritis, systemic lupus erythematosus, polyarteritis nodosa, primary angiitis of the central nervous system, syphilitic arteritis, and AIDS) (Lumen, 2021).

2.5.2.Cardiac Disorders:

Atrial fibrillation, myocardial infarction, mechanical heart valves, dilated cardiomyopathy, rheumatic mitral stenosis, infectious endocarditis, nonbacterial thrombotic endocarditis, atrial myxoma, and paradoxical embolus are examples of this type of ailment (Sposato *et al.*, 2020).

2.5.3. Hematologic Disorders:

The components of this condition are secondary polycythemia, hypercoagulable states, hemoglobinopathies, and hypercoagulable states (Fauchier *et al*., 2015).

2.5.4. Other Causes for Stroke:

1. Trauma:

Injury to the closed-head is frequently followed by intracerebral bleeding. Traumatic hemorrhages can happen close to (coup) or across from (countercoup) the location of impact. The frontal and temporal lobes are the most often affected areas. CT or MRI are used to diagnose traumatic bleeding (Wilkinson *et al.*, 2018).

2. Hemorrhagic Transformation of Cerebral Infarcts:

It is typical for hemorrhage to cause a brain infarct, and the result is typically unaffected. The use of Thrombolytic Medication, Anticoagulation, Cardio embolic Stroke, Massive Infarction, Infarction of The Cerebral Gray Matter, and Thrombocytopenia are some of the risk factors for hemorrhagic transformation (Zhang *et al*., 2014).

3. Coagulopathy:

Disorders requiring either clotting factors or platelets, such as immune thrombocytopenic purpura, hepatic failure, hemophilia, or disseminated intravascular coagulopathy, might become more complicated by intracerebral hemorrhage (Bang *et al*., 2016).

4. Cerebral Amyloid Angiopathy:

Amyloid deposits in the walls of leptomeningeal and cortical capillaries, arterioles, and tiny arteries are the hallmark of cerebral amyloid (congophilic) angiopathy. The condition most frequently affects elderly patients and is characterized by lobar hemorrhage, including microbleeds, at numerous places. Apolipoprotein E (ε4) and (ε2) alleles, anticoagulant or antiplatelet treatment, head trauma, and hypertension are risk factors (Blok, 2017).

5. Vascular Malformations:

The rupture of cerebral vascular malformations, such as saccular or berry aneurysms, cavernous malformations, or their connections with one another (arteriovenous malformations, or AVMs), can result in intracerebral bleeding (Topiwala *et al*., 2022).

6. **Amphetamine or Cocaine Abuse**:

When consumed within minutes to hours of each other, cocaine or amphetamine consumption might result in intracerebral hemorrhage. The majority of these hemorrhages are found in the subcortical white matter and can be brought on by abruptly high blood pressure, the rupture of a pre-existing vascular abnormality, or drug-induced arteritis (Sordo *et al*., 2014).

7. Hemorrhage Into Tumors:

The source of intracerebral hemorrhage might occasionally be bleeding into primary or metastatic brain tumors. Melanoma, lung carcinoma, glioma, breast carcinoma, renal cell carcinoma, and oligodendroglioma are among the tumors connected to hemorrhage. when a patient with known cancer suffers from sudden neurologic deterioration, bleeding into a tumor should be taken into account; it may also be the malignancy's presenting symptom (Navi & Iadecola, 2018).

8. Acute Hemorrhagic Leukoencephalitis:

In children, a respiratory infection is frequently followed by this uncommon monophasic demyelinating and hemorrhagic illness. The brain has a number of tiny perivascular hemorrhages. Fever, headache, confusion, and coma are some of the clinical signs. A polymorphonuclear pleocytosis is visible in the CSF, and bleeding may be visible on a CT or MRI scan. The typical clinical picture is one of a fulminant course that ends in death within a few days, however some patients benefit from corticosteroids or plasma exchange (Grzonka *et al*., 2020).

2.5.5. Etiology of Global Cerebral Ischemia:

Global cerebral ischemia happens when the amount of blood flowing to the brain is insufficient to support its metabolic needs, as in cardiac arrest. the reason why global ischemia causes more severe brain damage than pure anoxia with maintained circulation (such as primary respiratory arrest or carbon monoxide poisoning) is likely because it also affects glucose delivery and the clearance of harmful metabolites (Krafft *et al*., 2012).

2.6. Risk Factors for Stroke:

Non-modifiable risk factors
▪ Increased age
▪ Male sex
▪ Low birth weight
▪ Family history of stroke
Modifiable risk factors
Vascular
▪ Hypertension (BP >140 mm Hg systolic or >90 mm Hg diastolic)
▪ Cigarette smoking
▪ Asymptomatic carotid stenosis (>60% diameter)
▪ Peripheral artery disease
▪ Modifiable risk factors
Cardiac
▪ Atrial fibrillation (with or without valvular disease)
▪ Congestive heart failure
▪ Coronary artery disease

Endocrine
▪ Diabetes mellitus
▪ Postmenopausal hormone therapy (estrogen ± progesterone)
▪ Oral contraceptive use
Metabolic
▪ Dyslipidemia
▪ High total cholesterol (top 20%)
▪ Low HDL cholesterol (<40 mg/dL)
▪ Obesity (especially abdominal)
Hematologic
▪ Sickle cell disease
Lifestyle
▪ Physical inactivity
▪ Obstructive sleep apnea

Table (2.1) the risk factors for stroke included the following (Goldstein *et al.*, 2011).

2.7. Pathophysiology:

Focal cerebral ischemia's pathophysiology is intricate since it changes over time, has an uneven impact on the brain, and affects a variety of cell types. Nevertheless, several potentially significant underlying mechanisms have been discovered, some of which are probably active early on in the course of stroke and others later. In addition, certain pathways promote tissue survival or regeneration, whilst others cause ischemia injury (Siesjo, 2022).

2.7.1. Injury Mechanisms:

1. Energy Failure:

Adenosine triphosphate (ATP), which is essential for meeting the high energy requirements of neurons, is produced through oxidative metabolism. The transport of oxygen and glucose, two essential substrates for this activity, are hampered by reduced blood flow, which results in a decrease in ATP levels. However, without quick reperfusion, cells stop working and finally perish. Cells can compensate to a certain amount by producing ATP through glycolysis (Qu *et al*., 2016).

2. Ion Gradients:

The preservation of trans membrane ion gradients is a significant utilization of cellular energy. These vanish with energy failure. Na+/ K+-ATP, which is in charge of maintaining high intracellular K+ concentrations and is primarily responsible for neuronal energy expenditure, is unable to do so. When K+ leaks from cells, it depolarizes nearby cells, activating voltage-gated ion channels and causing the release of neurotransmitters (Zhao *et al.*, 2021).

3. Calcium Dysregulation:

Normal intracellular Ca2+ concentrations are kept low, but ischemia increase of extracellular K+ results in membrane depolarization and initiates extracellular Ca2 + influx into neurons. The activation of catabolic enzymes, impairment of mitochondrial function, and mobilization of cell death pathways occur (Belov *et al*., 2020).

4. Excitotoxicity:

Excitatory neurotransmitters, particularly glutamate, have neurotoxic effects and are known as excitotoxic substances. Astrocytic glutamate uptake is reversed, glutamate receptor-coupled ion channels are activated, and neuronal glutamate release is stimulated, all of which help excitotoxicity (Mattson, 2017).

5. Oxidative and Nitrosative Injury:

Highly reactive oxidative and nitrosative substances, such as superoxide and nitric oxide, which largely act during the reperfusion period following ischemia mediate some harmful effects of ischemia. They can cause covalent alteration of proteins, DNA damage, activation of ion channels, inhibition of mitochondrial enzymes and function, and activation of cell death pathways, among other things (Tejero *et al*., 2019).

6. Cell Death Cascades:

The infarct core is where ischemic cell death happens most quickly, while it happens less quickly in the penumbra and during reperfusion. While more delayed cell death predominates in the penumbra and after reperfusion, rapid cell death involves necrosis, in which cells and organelles enlarge, membranes burst, and cellular contents flow into the extracellular space (Tuo *et al*., 2022).

7. Inflammation:

The innate immune system's inflammatory response is brought on by cerebral ischemia and involves both blood-borne and localized immune cells. The latter are neutrophil, lymphocytes, and monocytes, while the

former are astrocytes and microglia. Later on in the course, adaptive immune responses start to appear (Amantea, 2016).

2.7.2. Pathophysiology of Intracerebral hemorrhage (ICH):

refers to bleeding within the brain parenchyma as opposed to bleeding within the brain's surrounding epidural, subdural, or subarachnoid spaces (Whiteley *et al*., 2016).

1. Chronic Hypertension:

Chronic hypertension promotes changes in the walls of penetrating small cerebral arteries and arterioles in the subcortical white matter, basal ganglia, thalamus, pons, and cerebellum. These changes include lipohyalinosis and fibrinoid necrosis, which are connected to ischemic (lacunar) stroke and may also cause the development of miliary aneurysms, increasing the risk of hemorrhage (Fulop *et al*., 2019).

2. Acute Hypertension:

It is unclear what part acute blood pressure increase plays in intracerebral bleeding. After an intracerebral hemorrhage, the majority of patients have hypertension, however this may be because of both their preexisting chronic hypertension and the Cushing reflex, which is a vasopressor reaction to elevated intracranial pressure (Peixoto, 2019).

3. Hematoma Effects:

Brain tissue is both destroyed and compressed by hypertensive hemorrhage. Additionally, the breakdown byproducts of extravasated blood may result in secondary harm such inflammation. A poor result is predicted by the correlation between per hematoma edema and hematoma size (Ostergaard *et al.,* 2013).

4. Hydrocephalus:

Hematomal compression of the ventricular system or its occlusion by intraventricular or subarachnoid blood can lead to hydrocephalus. after cerebellar hemorrhage, this consequence is very prevalent (Hu *et al*., 2021).

5. Rebleeding:

This occurs in up to ~15% of cases of hemorrhagic stroke and is associated with clinical worsening (Oppong *et al.*, 2018).

2.8. Clinical Manifestation Of Stroke:

According on where the ischemia occurred and frequently depending on the extent of the affected area, stroke victims frequently have severe neurological issues. The following signs and symptoms are found in stroke patients (Aminoff *et al*., 2018).

1. Weakness in The Right or Left Side, Numbness in The Face, Arm or Leg.
2. Difficulty Walking or Dizziness, or Losing Coordination.
3. Visual Disturbances.
4. Severe Headache.
5. Dysarthria (Difficult to Speak).

There are numerous stroke symptoms and warning indications. the location and extent of the brain damage caused by the stroke determine the kind and severity of these abnormalities, which healthcare professionals refer to as neurological deficits. Although medical care and

physical therapy aid in recovery, a stroke frequently leaves a permanent impression. Some neurological impairments might be irreversible and remain despite treatment. they may have an impact on functions and cause some handicap depending on their severity (Sacco *et al*., 2022).

The list of stroke-related neurological impairments is extensive, not all stroke sufferers will experience them all. the combination of deficits in a stroke patient will assist the medical professionals in identifying the most probable afflicted area of the brain (Silva *et al*., 2014).

Memory problems
• Confusion, disorganized thinking. • Altered reasoning and judgment. • Memory difficulties. • Emotional changes. • Difficult with naming (Anomia). • Inability to identify fingers (Finger agnosia). • Inability to distinguish right from left (Left-right disorientation). • Difficulties with reading and writing (Alexia, Agraphia). • Difficulty with arithmetic (Acalculia).
Visual problem
• Double vision • Inability to sense one side through vision or touch (Hemineglect). • Inability to see one part of the visual field. • Blindness in one or both eyes. • Inability to associate visual stimuli with meaning despite being able to see them (Visual agnosia).

Speech problem
• Slurring of speech (dysarthria). • Difficulty expressing language through speech or writing (Broca's aphasia or expressive aphasia). • Difficulty understanding language from speech and writing (Wernicke's aphasia or reception aphasia).
Movement and sensation problems
• Weakness of one side of the body (hemiparesis), or both sides of the body. • Drooping of one or both sides of the face. • Altered voluntary movements (Apraxia). • Difficulty swallowing (Dysphagia). • Numbness on one side or both sides of the body. • Hearing difficulties. • Incoordination.

Table (2.2) suggested the following neurological deficits of stroke (Silva *et al*., 2014).

2.9. Diagnosis of Stroke:

2.9.1. Medical Diagnosis:

A head CT can be used to determine the difference between an ischemic and hemorrhagic stroke, which is the first crucial task. Comprehensive brain and vascular imaging is crucial, but it shouldn't put off determining tPA candidacy. One should assume it is a stroke and proceed with determining whether or not the patient is a candidate for acute therapy unless the presentation is unusual or a stroke mimic is proposed (Denny *et al*., 2020).

It is important to identify the type of cerebrovascular event. Hemorrhagic cerebrovascular accidents are caused by blood vessels rupturing, while ischemic cerebrovascular accidents are brought on by a blocked artery in the brain. Hemorrhagic stroke is treated differently from ischemic stroke. Tissue plasminogen activator (TPA), a clot-busting medication, may be used to treat ischemic stroke. Therefore, before starting treatment, which should start within 3 to 4.5 hours, it is vital to acquire a proper diagnosis. Ask the patient when the symptoms of the stroke appear. this is critical in determining what the medication is best for the patients. The Medical History for the client. The Physical and Neurological Examination. Correct Blood Tests. Computed Tomography Scan (CT scan) or magnetic resonance imaging (MRI) brain scan, performed in order to determine the type of stroke (Paul & Candelario, 2021).

2.9.2. Nursing Diagnosis:

The primary nursing diagnoses for a patient with a stroke may include depending on the assessment results such as Impaired physical mobility related to loss of balance, hemiparesis, spasticity, coordination, and brain injury. Acute shoulder pain which is related to hemiplegia. Self-care defect (feeding, hygiene, and toileting) related to stroke. Disturbed sensory perception related to altered sensory reception, transmission, and/or integration. Interrupted family processes related to catastrophic illness and caregiving burdens. Sexual impairment connect to neurologic defect or failure. Incontinence related to detrusor instability, flaccid bladder, confusion, or difficulty in communicating. Disturbed thought processes related to brain damage, confusion, or inability to follow instructions (Brunner & Suddarth, 2018) .

2.10. Complications of Stroke:

Up to 96% of patients hospitalized with stroke develop one or more medical or neurological complications during their hospitalization, according to the complications or health issues that follow stroke. Urinary tract infections (UTI), pneumonia, falls following stroke, pressure ulcers or bed sores, and constipation are the most frequent medical consequences, whereas symptomatic venous thromboembolism (VTE) seems to occur less frequently with stroke care (Varatharaj *et al*., 2020).

2.11. Management of Stroke:

2.11.1. Medical Management:

Stroke patients require extensive general healthcare, always taking care to address any issues they may be having and to prevent any health issues from getting worse as they progress from the acute stage into recovery, rehabilitation, and finally long-term preservation. For individuals who have suffered a cerebrovascular accident, it is crucial (Attrill *et al*., 2018).

The main goal for ischemic stroke patients is the management of neurological damage at the site of ischemia and the restoration of blood flow. Edema may also play a role, and hydrocephalus may develop as a result of mass shift. The following are possible pharmaceutical treatments: Thiebaut *et al*., (2018).

1. Thrombolytics like TPA, urokinase, and streptokinase; Antithrombotic drugs like aspirin and heparin.

2. Neuroprotective substances such glutamate antagonists, gangliosides, naloxone, free-radical scavengers, and Ca+ channel blockers.

3. Anti-edema medications such glycerol, mannitol, piracetam, corticosteroids, and vinca alkaloids.

4. Operative intervention (surgery), including endarterectomy and balloon angioplasty, or extracranial-intracranial bypass.

The size and location of the lesion affect a patient's overall prognosis after a hemorrhagic stroke, supratentorial lesions larger than 5 centimeters have a poor prognosis, and brain stem lesions smaller than 3 centimeters are typically deadly. controlling edema is crucial in these situations, and surgical intervention may be necessary at times. Patients with subarachnoid hemorrhage (SAH) typically get more aggressive care that concentrates on a number of concerns, including intracranial pressure (ICP) control, preventing rebleeding (hemorrhagic stroke), maintaining cerebral perfusion, and controlling vasospasm (Rindler *et al*., 2020).

2.11.2. Nursing Management:

Patients who have suffered a stroke require general nursing care for both themselves and their families, including care for their emotional, spiritual, physical, psychological, social, and cognitive needs. The patient and their family each have a discrete and distinct domain impairment. Nurses should always consider the patient's and his family's needs while making decisions and when the patient is recovering and being rehabbed (Touhy & Jett, 2021).

When cerebral vascular accident nursing is provided, the multidisciplinary working environment facilitates the sharing and integration of clinical practice. Stroke nursing will be a constant, round-the-clock effort throughout the patient's course of treatment. Nurses with knowledge, clinical skills, confidence, and interest are also needed for

cerebrovascular accident nursing in order to provide efficient therapeutic care and rehabilitation. the care of patients after stroke requires education, training, and practice development for nurses (Rao *et al*., 2020).

To ensure that recovery from hospitalization doesn't take too long, Henderson has developed a nursing concept that defines the patient's independence. The essential human needs were the basis for each of the fourteen components she classified into the nursing activities (Ahtisham & Jacoline, 2015).

2.12. Nursing Interventions:

Hinkle and Cheever, (2014) indicate that nursing intervention has an important effect on the patient's survivor. usually, several impairments of body systems are due to stroke, with careful management and appropriate implications can stop incapacitating problems. Intra and post-acute stage, nursing intervention focused on:

1. Optimizing Cerebral Tissue Perfusion:

Keep an eye on the patient for any neurologic deterioration, such as repeated bleeding, vasospasm, or an increase in ICP. It is still possible to check the patient using the neurologic flow chart. Every hour, it is necessary to check the patient's vital signs, blood pressure, level of consciousness (Cerebral Perfusion Indicator), pupillary response, and motor status (Hinkle & Cheever, 2014).

2. Enhancing Self-Care:

Many positive actions for the patient's wellbeing are supported once they can sit up. a new mission is being completed every day thanks to the patient's help in setting realistic goals. for the patient to recover

from a stroke, functional capacity must return self-care is a a powerful tool for preventing repeated strokes. self-care emphasizes, self-behaviors, related to medication compliance, and a healthier lifestyle in those with chronic diseases while focusing on health promotion in healthy individuals. the patient's ability to care for himself or herself must also be taken into account when determining the patient's needs for discharge (Jafari *et al.*, 2019).

3. Maintaining Skin Integrity:

Due to a change in sensation and an inability to move and turn in response to stress and discomfort, patients who have recently had a stroke may be at risk of experiencing disintegration of tissues and skin. the skin must be regularly examined with a focus on the bone regions and other body components in order to prevent breakage of the tissues and skin. A customized bed (low air loss bed) may be utilized during the acute stage so that the patient can move on their own or with assistance. By turning in bed, one can employ pressure-relieving devices to relieve pressure and prevent skin breakdown (Lichterfeld *et al.,* 2020).

4. Attaining Bladder and Bowel Control:

After a stroke, the patient complains of urine incontinence due to confusion, is mute, and is unable to use a bedpan or urinal due to difficulty moving around and managing their posture. The maturation pattern is also studied at this time, and the patient is helped in this condition by the discontinuous catheterization with sterilized technology procedure to provide the urinal or bedpan. Furthermore, patients recovering from a stroke may experience digestive issues, particularly constipation (Taleb *et al*., 2023).

5. Managing Tube Feeding:

Dysphagia, or difficulty swallowing, can result from a stroke if the function of the tongue, mouth, larynx, palate, pharynx, or upper esophagus is compromised. a gastrointestinal feeding tube is placed to continue tube feedings and administer medication if the patient is unable to resume oral intake. to lower the danger of aspiration, enteral tubes may be nasogastric (put into the stomach) (Kahraman *et al.*, 2020).

6. Improving Mobility and Preventing Joint Deformities:

Correct positioning can prevent contractures. actions are taken to reduce skin stress, maintain the body's natural alignment, and prevent neuropathies, notably compression of the ulnar and peroneal nerves (Alfiana & Maryoto, 2023).

7. Changing Positions:

To optimize venous return and prevent edema, it is crucial to switch positions every two hours while using a pillow placed between the lower extremities if the patient is in a lateral (side-lying) posture. the patient is frequently placed in a prone posture during the day for 15 to 30 minutes when appropriate (Alshahrani *et al*., 2021).

8. Establishing the Exercise Program:

The affected extremities are passively exercised and moved through their full range of motion 4-5 times per day to improve blood flow, motor stability, avoid contractures in the affected extremity, prevent further deterioration of the neuromuscular system, and consistency of joint movement. exercise can help prevent venous stasis, which can lead to thromboembolism (Williams & Hopper, 2015).

9. Preparing for Ambulation:

When thrombosis occurs in hemiplegia, immediate assistance is needed for the patient to get out of bed. A recovery procedure is then started as soon as the patient regains consciousness. The patient is first trained to maintain balance while sitting, and then they condition them to keep balance while standing. A patient who has experienced a brain hemorrhage is unable to engage actively until all signs of bleeding have stopped (Gamal *et al.,* 2019).

10. Managing Sensory-Perceptual Difficulties:

Moving patients with impaired visualization to the side with integral visual perception is necessary, as is placing visual cues like the (TV, calendar, and clock) on that side. In attempt to balance the damaged vision, the patients can be told to turn their heads in the direction of the impaired visual field. Nurses must make eye contact with patients and help them swivel their heads, which will draw their attention to the sides that are being affected (Naga *et al.,* 2021).

11. Improving Thought Processes:

It's possible that the patient would struggle with behavioral, cognitive, and emotional impairments brought on by a brain injury following a stroke. The nurse's job is to analyze the results of diagnostic findings connected to the psycho-neurological condition, support them, and be positive while expressing confidence in the patient's recovery. When trying to establish activities on the affected side, nurses caring for stroke patients must take into account his strength and exceptional talents (Wolcott & Lobczowski, 2021).

12. Improving Communication:

The patient and family will experience severe distress due to aphasia, which limits the patient's capacity to express themselves. it has been thought to be highly beneficial to try asking with yes or no questions when the patient's responses are appropriate. using nonverbal cues and visualization aids, along with occupational or speech therapists, to create an image chart that shows the patient the services they need such as a picture of food, a toilet, a dressing will help communication (Machiels *et al.*, 2017).

13. Improving Family Coping:

Families are crucial to the patient's healing. Counseling and assurance must be used to give the family a chance to implement healthy measures that can be learned from medical staff; doing so will help patients avoid paying a high fee for nurses to implement healthy measures, which may completely interfere with the patient's life. In the course of the patient's therapy and training, this may entail additional approaches and strategies (Kiwanuka *et l.*, 2022).

2.13. Exercise and Physiotherapy After Stroke:

In terms of recovery and quality of life, stroke rehabilitation in America leaves a lot to be desired. Between stroke patients receiving a discharge and moving on to physical recovery programs, there is a significant delay. The American Heart Association has advised the medical community to promote exercise as a crucial component of post-stroke care in an effort to speed recovery and improve quality of life (Benjamin *et al.*, 2018).

Even severe persistent brain damage does not automatically result in disability, thanks to a mechanism known as neuroplasticity. Exercise application to enhance motor function has been a key component of stroke therapy. Although it's still a relatively recent usage of exercise in this population, exercise has been utilized to increase muscle strength after stroke. It is well known that stroke affects one's ability to produce force due to a number of mechanisms, including decreased corticospinal drive to the spinal motoneurones, Tran synaptic degeneration of spinal motor neurons, decreased numbers of motor units, especially large units, and changed mechanical properties of the muscle, which increase joint stiffness. Strength training in people with spasticity, however has occasionally generated debate. according to a recent study, the knee flexors and extenders were more active (Rudberg *et al.,* 2021).

Strong evidence supports the idea that exercise and physical activity can help stroke survivors walk more easily and have stronger arms. Additionally, according to recent studies, exercise may help with post-stroke depression symptoms, cognitive function, memory, and quality of life (Alwatban *et al*., 2021).

2.13.1. Frozen Shoulder After Stroke:

We can utilize our hands and arms in a variety of postures because the shoulder is made to allow for a lot of movement. Between the shoulder blade and chest wall, there is some mobility. the majority of shoulder movements, however, occur at the ball and socket joint, where the humerus, the arm bone at the top, fits into the glenoid, a shallow socket that is a component of the scapula, the shoulder blade. the joint is encased in a loose bag or capsule. ligaments and muscles help to support this (Berhouet *et al*., 2014).

One of the main causes of post-stroke frozen shoulder is frozen shoulder (FS) PSFS is said to be impacted in 56.6% of stroke patients. in addition, 77% of stroke patients with hemiplegic shoulder discomfort had PSFS. Patients' quality of life is significantly impacted if such a condition cannot be successfully treated (Zong *et al.*, 2020).

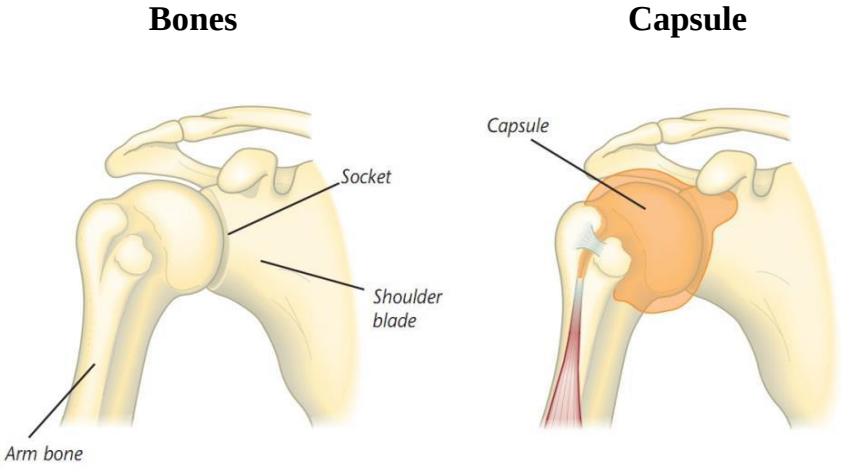

Figure (1) Right Normal shoulder (view from front) (Dyce et al., 2009).

Patients with adhesive capsulitis (frozen shoulder) are recommended to perform physically demanding physical therapy exercises that don't cause shoulder pain. For those who have mild to severe symptoms of frozen shoulder, the exercises listed below are recommended (Mertens *et al.*, 2021).

2.13.2. Exercises For Frozen Shoulder:

usually works out 1-2 times per day. Following a shower or bath, might find them easier to complete. the patient should be able to tolerate some stretching. However, we should limit the workouts by performing them less frequently or vigorously, or stop altogether, if we experience persistent pain. These are a few examples of exercises to stretch the shoulder and management of frozen shoulder (Hanchard *et al.*, 2020).

1. Pendulum Stretches:

In this exercise, the shoulder is initially relaxed, Leaning slightly forward while maintaining patient, stand with the affected arm hanging down. swing the arm in a minuscule, foot diameter circle. Once a day, make 10 revolutions in each direction. Increase the swing's diameter as the symptoms go better, but never force it. Then add a modest weight to the swinging arm that weighs three to five pounds, or roughly 1.5 to 2.5 kg, to lengthen the muscle (Bhatikar & Bhodaji, 2018).

Figure (2) Pendulum stretches (Bhatikar and Bhodaji, 2018).

2. Towel Stretch:

A three-foot towel is held in one hand behind the back while the other hand takes hold of the other end. The towel should be held horizontally. Pull the afflicted arm upward with your strong arm to stretch it. With the unaffected arm, draw the towel toward the lower back while holding the bottom with the affected arm (Bhatikar & Bhodaji, 2018).

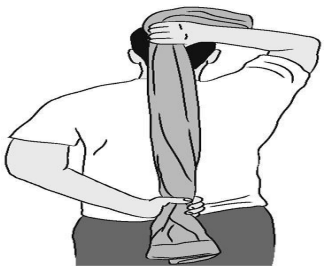

Figure (3) Towel stretch (Bhatikar and Bhodaji, 2018).

3. Fingers walk:

- Maintain an arm's length distance from the wall while he stand in front of it.
- Bend one arm at the waist so that the shoulder that is being affected by it can slowly reach out and touch the wall.
- Slowly move the fingertips up the wall while comfortably raising your arm as high as he can.
    - Retrace the fingertips' path down the wall to where he were before.

Figure (4) Fingers walk (Bhatikar and Bhodaji, 2018).

4. Cross-Body Reach:

When stretching the shoulder, lift the affected arm at the elbow with the good arm and bring it up and across the body. For 15 to 20 seconds, maintain the stretch. Ten to twenty times a day, repeat this (Bhatikar & Bhodaji, 2018).

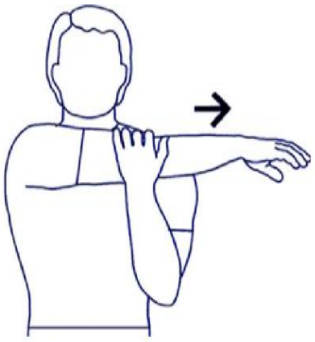

Figure (5) Cross-body reach (Bhatikar and Bhodaji, 2018).

5. Armpit Stretch:

- Place himself in front of a breast-high shelf.
- Set the arm on the bookcase.
- To extend the armpit as comfortable as possible, slightly bend his knees.
- Each time, try bending a little bit more.

Figure (6) Armpit stretch (Bhatikar and Bhodaji, 2018).

6. Arm circles:

- When the patient sit on a flat surface, keeping back straight, try to make small circles in the air, both clockwise and counter clockwise.
- Do this simple exercise about 2 or 3 times a day.

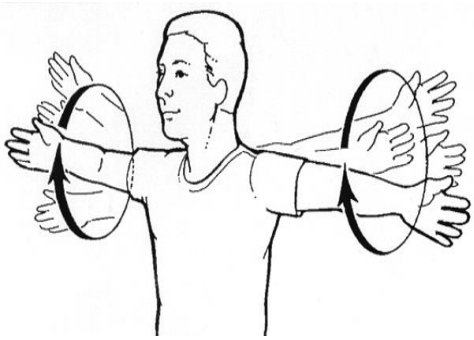

Figure (7) Arm circles (Bhatikar and Bhodaji, 2018).

7. Shoulder flexion:

- Stand straight with back supported by the wall.
- Using the pulley handle, lift the unaffected arm in the air in full-extended motion while keeping the injured arm by the side of the body.
- Hold this position for a few seconds.
- Extend the injured arm overhead, while keeping the unaffected arm by the side of the body.
- Relax and repeat the exercise again, do it 10 times to complete a cycle and do this exercise at least once daily.

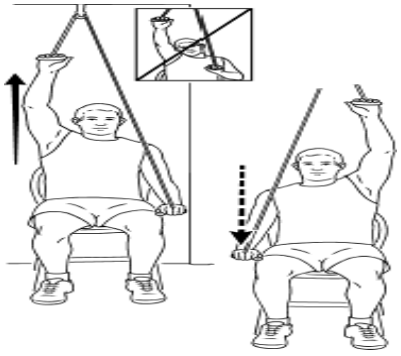

Figure (8) shoulder flexion (Bhatikar and Bhodaji, 2018).

After a stroke, shoulder pain affects 16% to 72% of patients. Hemiplegic shoulder discomfort results in significant distress, decreased activity, and can seriously impede recovery. Hemiplegic shoulder discomfort is likely complex in origin. preventing hemiplegic stroke pain is the optimum management strategy. prophylaxis must start as soon as possible after the stroke for it to be successful. The likelihood of shoulder pain following a stroke is decreased by being aware of potential damage to the shoulder joint (Alanbay *et al.*, 20020).

2.14. Dysphagia After Stroke:

The coordination of numerous nerves and muscles is necessary for the difficult motor skill of swallowing. It is possible for people to have trouble swallowing if they have neurological diseases including cerebral palsy, dementia, a cervical spine injury, or a stroke. dysphagia the medical term for difficulty swallowing, can manifest as anything from excessive salivation to choking during meals. Aspiration pneumonia and other problems could develop as well (Jones *et al.,* 2021).

Inability to swallow or dysphagia describes issues with the passage of food or fluids from the mouth to the hypopharynx or through the esophagus. in addition to affecting nutrition and quality of life, severe dysphagia can also lead to aspiration. The following terms are also used to describe disorders of swallowing. a food bolus or foreign body impaction is the most frequent acute cause of aphagia (inability to swallow) which is generally associated with total esophageal obstruction (Kahrilas & Hirano, 2012).

Swallowing is a complex process. Some 50 pairs of muscles and many nerves work to receive food into the mouth, prepare it, and move it from the mouth to the stomach. this happens in three stages: (Paul & Nazni, 2020).

The First stage: During what is known as the oral phase, the tongue gathers the food or fluids to prepare it for swallowing. In order to chew solid food, the tongue and jaw move the food around in the mouth. by combining the meal with saliva while chewing, solid food becomes the proper size and texture to swallow. Food is softened and moistened by saliva to make it simpler to swallow (Wirth *et al.,* 2016)..

The Second stage: begins when the tongue pushes the food or liquid to the back of the mouth. This triggers a swallowing response that passes the food through the pharynx, or throat (Paul & Nazni, 2020).

The Third stage: beginnings occur when food or liquid enters the esophagus, the tube that transports food and liquid to the stomach. The esophageal phase, also known as the passage through the esophagus, typically lasts three seconds, depending on the food's texture or consistency, but it can occasionally take a little longer, such as when swallowing a tablet. Dysphagia, which most frequently affects elderly people, may have a variety of causes. Any condition that affects or causes damage to the muscles and nerves involved in swallowing can cause dysphagia. As an illustration, people with neurological disorders like Parkinson's disease or cerebral palsy frequently have trouble swallowing. Additionally, a stroke or head damage may reduce or obstruct the coordination of the swallowing muscles or restrict mouth and throat feeling (Wirth *et al.,* 2016).

Dysphagia occurs when there is a problem with brain function or the structures involved in any phase of the swallowing process. If the muscles in the tongue or cheeks are not strong enough, chewing food may be difficult. After a stroke or another neurological disorder, it may be difficult to trigger the swallowing reflex, a stimulation that enables food and liquids to flow safely through the throat. Another problem arises when it is challenging to move all of the food toward the stomach due to weakened neck muscles, such as those left over from cancer surgery. Esophageal disorders can also cause dysphagia (Clave & Shaker, 2015).

Aspiration, pneumonia, and malnutrition are some of the factors that contribute to post-stroke dysphagia, which is a frequent and intensive complication of acute stroke. It is also linked to higher mortality,

morbidity, and institutionalization. At six months, a sizable minority of patients still suffer dysphagia, even though the majority of patients recover their ability to swallow on their own. Although there have been significant advancements in both secondary prevention and hyperacute stroke treatment, the optimal management of post-stroke dysphagia, including diagnosis, investigation, and treatment, has not yet been established (Cohen *et al.,* 2016).

2.15. Pathophysiology of Dysphagia:

Long thought to be the cause of dysphagia after stroke, pharyngeal muscle dysfunction and incoordination are secondary to central nervous system loss of control. It is widely claimed that brain stem lesions are connected to dysphagia. However, it has also been suggested that those who have difficulty swallowing or who are at risk for aspiration may have higher lesions in specific cortical areas. Additionally, dysphasic symptoms could be brought on by oral weakening of the pharyngeal, palatal, and facial muscles. Dysphagia can be identified by symptoms such as choking on food, coughing while eating, drooling or food loss from the mouth, pocketing of food in the cheeks, slow, laborious eating, difficulty swallowing pills, avoiding food or liquids, complaining of food sticking in the throat, difficulties swallowing, reflux, or heartburn (Brodsky *et al.,* 2020).

Dysphagia is accompanied by a variety of pathophysiologic problems, dysfunction associated with the post-stroke occurrence of dysphagia is frequently documented. particularly frequent swallowing difficulties are those that occur during the pharyngeal phase. Explored the connection between swallowing issues and lesion site in a reasonably high powered observational research. Comparatively territorial anterior circulation infarcts were linked to oral phase dysfunction while territorial

posterior circulation infarcts (TPI) and white matter disease caused issues with the pharyngeal phase of swallowing. (Kim *et al.*, 2014).

As the patient eats or drinks, nurses are crucial in diagnosing swallowing issue, oral hygiene and difficulties of swallowing are crucial areas in which nurses may help . As swallowing difficulties typically develop while patients are being fed and given drinks, nurses are often the first to notice them. When taking steps to treat a swallowing disorder, the nurses make sure the patient is getting enough water and food, oral hygiene is also crucial to prevent oral mucosal alterations and tooth decay in the oral cavity (Buijck & Ribbers, 2018).

Patients with dysphagia have long received therapy through exercise. There are many different exercises, including direct and indirect exercises, solitary and mixed exercises, and exercises including or not involving swallowing. in contrast to compensatory therapies which are employed to have a short-term effect, rehabilitation exercises aim to change and improve the swallowing physiology in force, speed, or timing. Since stressing any muscular system repeatedly and intensely will result in changes in neuronal innervation and movement patterns, rehabilitation exercises also involve retraining the neuromuscular systems to promote neuroplasticity (Langmore & Pisegna, 2015).

Many of the concepts of neuromuscular rehabilitation are followed by swallowing exercises, or swallow manoeuvres as they are also known. First the adage "use it or lose it" holds true because failing to use a swallow will lead the innervation and swallowing muscles to deteriorate. use it and enhance it applies in that training drives plasticity; this is most shown in gastrointestinal-tube feeders and in post-surgical deconditioning (Langmore & Pisegna, 2015).

2.15.1. Masako Maneuver:

The Masako maneuver is one of several swallowing rehabilitation treatments that can help with stroke related swallowing function issues. in order to improve the constrictor phargeus superior's functionality, the Masako maneuver is an oropharyngeal exercise rehabilitation approach (Byeon, 2016).

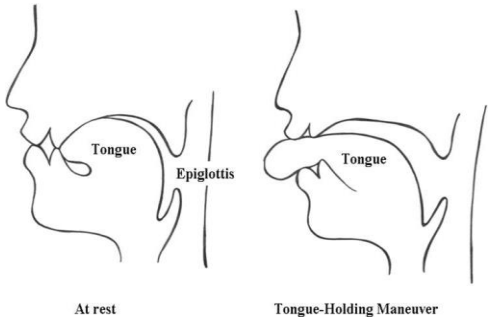

Figure (9) Masako maneuver (Byeon, 2016).

2.15.2. Shaker exercise:

Exercise with a shaker for dysphagia, The patient lies flat and elevates their head to look at their toes while keeping their shoulders on the bed or mat, as instructed in the study. The patient holds this position for the desired duration of 60 seconds, followed by two more repetitions. The exercise's second phase consists of a repeated motion (Sze *et al.*, 2016).

Figure (10) Shaker exercise (Choi et al., 2017).

Headlift Shaker, the Shaker Head Lift, which combines an isometric and an isokinetic exercise, has been proven to have positive long-term effects by increasing the opening of the upper oesophageal sphincter in patients with dysphagia and gradually strengthening the suprahyoid muscles. it has long-term effects and enhances both strength and endurance. The high quality study designs that were examined here should provide solid evidence that this exercise may be employed in a clinical setting with confidence (Yoon *et al.*, 2014).

For individuals who aspirate frequently or who are at high risk of aspiration, therapeutic exercises to strengthen the suprahyoid muscles are crucial. Several exercise techniques are currently being used in clinical settings to strengthen suprahyoid muscles, in the Shaker exercise, the supine position is used to repeatedly elevate the head off the floor against gravity. However, previous research have shown that the Shaker exercise is beneficial in enhancing and minimizing aspiration, and opening the upper esophageal sphincter (Choi *et al.*, 2017).

2.15.3. Chin tuck against resistance exercise (CTAR):

patients with dysphagia can benefit from CTAR exercise (Chin tuck against resistance), a therapeutic exercise that more precisely engages the suprahyoid muscle. It takes less physical strain and effort than Shaker exercise, which promotes better compliance (Park *et al.*, 2016).

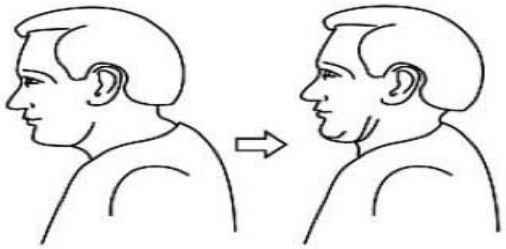

Figure (11) CTAR exercise (Park et al., 2016).

2.16. Previous studies:

2.16.1. Previous studies related to the management of frozen shoulder:

First Study through Mertens et al., (2021). There is preliminary evidence that supervised exercises are better for Range of Motion and function than home exercises. Exercises alone may provide little to no difference in ROM compared to multimodal regimens that include exercises. When compared to programs that include other workouts, programs that use muscle energy approaches exhibit little to no difference in range of motion. A multimodal program with exercises and the addition of stretches may increase ROM. Uncertain data suggests that those programs differ in how they treat function and pain. There is preliminary support for the use of exercises as part of various therapy plans to help patients with their passive and active range of motion, function, discomfort, and muscular strength. Patient satisfaction was not a measurement of success in any trials.

Conclusion: Range of motion, function, and pain all improve with exercises alone or in combination with programs, but there is little to no difference between the two for ROM and pain ،and there is conflicting evidence for function. When compared to a program without exercises, adding exercises improve active ROM; however, adding physical modalities has no positive impact. Compared to other forms of exercise, muscle energy techniques are a helpful form of exercise treatment for enhancing function. Unfortunately, no conclusions can be made regarding the outcomes of the most potent and long-lasting exercise therapy regimen. In conclusion, exercises (in a program or on their own) improve ROM, function/disability, and pain. However, only little to no difference

was found in PROM and pain between the programs, and the effects in function/disability are uncertain.

The Second Study by Stutz et al., (2017). provides Methods: A pilot study of a recently created app for people with frozen shoulder was carried out with 5 patients for a period of three weeks in order to evaluate the viability of the health intervention. The instructions for exercising at home were the app's primary purpose. Participants in the study completed standardized usability questionnaires at the conclusion of the study, including the System Usability Scale (SUS), USE (Usefulness, Satisfaction, and Ease of use), and Technology Acceptance Model-2 (TAM-2). Additionally, each patient answered a non-standardized questionnaire. A physiotherapist evaluated the accuracy of the exercises as performed by the patients at the conclusion of the trial. At the beginning and conclusion of the trial, a physiotherapist evaluated the shoulder's mobility and pain when moving the shoulder.

Results: The pilot trial was completed successfully, and three weeks later, the patients gave the app a rating. The findings of the standardized surveys revealed that the produced app had a good level of acceptance (TAM-2) and usability (SUS). According to the SUS questionnaire, the system's general usability was extremely good overall (an average score of 88 out of 100). The majority of patients would use the app if it were more widely available, according to the TAM-2 questionnaire, which had an average score of 4.2 out of 5. The results of the USE surveys showed that the patients had little trouble figuring out how to use the app and were generally happy with it (an average score of 4.7 out of 5). according to patient reports and usage data analysis, the frequency of app usage and training was very high. The patients performed the activities nearly faultlessly.

Conclusions: Our results indicate the feasibility of the Health intervention, as the app was easy to use and frequently used by the patients. The app supported the patients' physiotherapy by providing clear exercising instructions.

2.16.2. Previous Studies Related to The Management of Dysphagia After Stroke:

First study through the First study for management of patient with dysphagia after stroke by Park et al., (2018), chin tuck against resistance exercise, According to reports, (CTAR) can be used to treat pharyngeal dysphagia. However, there is currently a lack of clinical proof of the effect.

This study looked at how CTAR affected patients with dysphagia after a subacute stroke who were having trouble swallowing.

Randomly, the patients were divided into two groups: an experimental group (n = 11) and a control group (n = 11). The CTAR gadget was used by the experimental group to conduct CTAR. The control group simply received standard dysphagia care. For four weeks, both groups had training five days each week. Based on a videofluoroscopic swallowing study (VFSS), the functional dysphagia scale (FDS) and penetration-aspiration scale (PAS) were used to assess the swallowing function.

In comparison to the control group, the experimental group displayed more advancements in the oral cavity, laryngeal elevation/epiglottic closure, residue in valleculae, and residue in pyriform sinuses of FDS and PAS (p 0.05, all).

In individuals with dysphagia following a stroke, this study showed that CTAR is useful in improving pharyngeal swallowing function. As a result, we suggest CTAR as a fresh remedial training option to HLE.

Second study through the second study for management of patient with dysphagia after stroke with Shaker exercise by Choi et al., (2017), Dysphagia after stroke can cause a variety of complications, especially aspiration pneumonia, which can be life-threatening. Therefore, rehabilitation methods to reduce aspiration in patients with dysphagia are important.

In the present study, we aimed to investigate the effects of Shaker exercise on aspiration and oral diet level in stroke survivors with dysphagia.

Participants were randomly assigned to an experimental group (n = 16) or a control group (n = 16). Participants in the experimental group performed Shaker exercise and conventional dysphagia therapy, whereas those in the control group performed only conventional dysphagia therapy. All participants performed training 5 days a week for 4 weeks. Degree of aspiration was assessed using the Penetration-Aspiration Scale (PAS) based on videofluoroscopic swallowing study, while oral diet level was assessed using the Functional Oral Intake Scale (FOIS).

The experimental group showed greater improvement on both the PAS ($p < 0.05$) and FOIS ($p < 0.05$) compared with the control group.

The results of this study suggest that Shaker exercise is a effective exercise for recovery of swallowing function in stroke survivors with dysphagia.

Third study: The Third study for management of patient with dysphagia after stroke by Masako maneuver by Byeon, (2016). This study compared

the Masako maneuver's intervention and neuromuscular electrical stimulation's effects on swallowing function in patients with dysphagia brought on by stroke. [Subjects and Procedures] 47 individuals with dysphagia brought on by stroke underwent the Masako technique (n=23) and neuromuscular electrical stimulation (n=24) over the course of 4 weeks. Based on videofluoroscopic research, the functional dysphagiascale was used to measure the extent of swallowing recovery.

After the treatments, the mean functional dysphagia scale values for the groups receiving the Masako technique and neuromuscular electrical stimulation decreased. However, there were no statistically significant differences between the groups in the pre-post functional dysphagia scale scores.

For patients with dysphagia brought on by a stroke, the Masako technique and neuromuscular electrical stimulation each had a considerable impact on the restoration of swallowing function, although there was no discernible difference between the two treatments.

Chapter Three

Methodology

Chapter Three

Methodology

This chapter is focused on the presentation of all the methodological guiding principles used systematically to meet the study's goals. These principles include sampling, validity, administrative regulation study setup, pilot study, data gathering techniques, and statistical analysis techniques.

3.1. The Study Design:

A quantitative study, quasi-experimental design of the study carried out with two groups in Middle Euphrates Neuroscience Center in AL-Najaf AL-Ashraf City in order to evaluate the effectiveness of exercise sessions on the management of frozen shoulder and dysphagia for patients after stroke from the period October 19th 2021 to June 4th 2023.

3.2. Administrative Agreements:

Administrative arrangement plays an important issue in research process, which provide the legal aspect to facilitate the link between research activities and outcomes, by promoting the use of best practices, ensure that the research is conducted according to governing principles, control and manage obstacles, provide proper environment for data collection.

For obtaining administrative and formal permission the following steps take place:

1. Scientific Postgraduate Committee- College of Nursing/ University of the Babylon- in 19/10/2021 in order to obtain formal agreement to start the study.

2. Approval letter from ethical committee College of Nursing – University of Babylon obtain after filling special protocol papers and three ethical forms were completed (appendix A).
3. Official agreement was obtained from AL- Najaf AL-Ashraf health directorate/ training and human development center/ The Middle Euphrates Neuroscience Center in Al-Najaf Al-Ashraf City which is selected as a proper setting for collecting the data (Appendix B1and B2).

3.3. Setting of The Study:

The Middle Euphrates Neuroscience Center in AL-Najaf AL-Ashraf City was the specialized center selected as a setting in order to carry out this quasi- experimental design study. This center received the first case in 2010, according to AL- Najaf AL-Ashraf health directorate, The number of the patients who receive the center services in 2015 was form Al-Najaf AL-Ashraf and other Iraqi governorates about 100,000 cases (stroke and others neurological cases), The center includes the following department:

1. Neurological consultant.
2. Neurophysiology unit.
3. 40 bed mixed ward for patients with stroke and other neurological diseases.
4. Plasma-pheresis unit.
5. Advanced Laboratory unit.
6. Pharmacy unit.
7. Video EEG unit.
8. Multiple sclerosis unit.
9. Trans cranial Doppler (TCD) and carotid Doppler unit.
10. Administrative and scientific sector with classroom.

3.4. The Study Sample:

A non- probability purposive sample method was selected to carry out the study, (60) patients with frozen shoulder and dysphagia who participated in the study admitted to the ward and who visits to the center for treatment and consultation, Those patients are divided into two groups: (30) patients selected as experimental group (10) females and (20) males, the other (30) patients are treated as control group (10) females and (20) males. The study sample divided into two groups. According to the specific characteristics that assign the study population through the eligibility criteria, the study sample subjects was selected as the following:

1. Agree to participate in the study.
2. Patient who determine the previous of diagnosis with stroke and who complaint from frozen shoulder and dysphagia.
3. Oriented and able to receive the exercise sessions until when discharge from the center.
4. All the study sample have not attended any exercise sessions related to frozen shoulder and dysphagia management.

3.5. Steps of the study:

3.5.1.Ethical Permission:

Oral permission was obtained to start data collection from the director of the center after explaining the study purpose and objectives to secure the cooperation of the healthcare provider to facilitate data collection and provide the exercise sessions as well as the respect for patients' personalities as a human is considered in the current study as issue of ethical consideration.

3.5.2.Need assessment:

Need assessment consider as the first step which explain the importance of study process and determine the needs of the stroke patients to such exercise program to carrying out the assessment (10) patients who have stroke with frozen shoulder and dysphagia, the mean of their age were (59), special form assessment with (14) multiple choice prepared for this reason. Need assessment carried out from period July 17th to July 28th 2022. The findings indicated that stroke patients for exercise as management which improve the patients' health outcome, the estimated mean of the patients score were (37) (Appendix C1 and C2).

3.5.3. The Exercise Sessions on Frozen Shoulder and Dysphagia.

A: Special Objectives of the Frozen Shoulder:

1. Identifying that the exercise sessions are recommended for decreased severity of pain, improving in range of motion and function in patients with a frozen shoulder after stroke as well as for improving passive external rotation and abduction range of motion.

2. Understanding that the exercise sessions also support the evidence of using treatment of choice in patients with frozen shoulders after stroke.

Contents:

1. Pendulum stretches.

2. Towel stretch.

3. Fingers walk.

4. Cross-body reach.

5. Armpit stretch.

6. Arm circles.

7. Shoulder flexion.

Teaching strategies:

1. Place: teaching center.

2. Duration of the session: 15-20 minutes.

3. Teaching methods: Lecture, discussion, role play, and re demonstration.

4. Teaching aids: Power Point presentation, images, and videos.

B: The Exercise Sessions on Dysphagia:

Special objectives of Dysphagia:

1. Recognizing that early exercise for a stroke patients with dysphagia plays a crucial part in their recovery from the condition, as well as in preventing aspiration pneumonia, which can lead to malnutrition and dehydration.

2. Recognizing the value of exercise in preventing swallowing problems, which can lead to excessive salivation, drooling, coughing or choking when eating, as well as trouble speaking or a hoarse voice. learn how to maintain hydration and nutrition while managing irregularities in feeding and swallowing.

Contents:

1. Shaker’s exercise.
2. Masako exercises.
3. Chin Tuck Against Resistance exercise (CTAR).

Teaching strategies:

1. Place: center of the session.
2. Duration of the session: 10-15 minutes.
3. Teaching methods: Lecture, discussion, role play, and Redemonstration.
4. Teaching aids: PowerPoint presentation, images, and videos.

3.5.4. The Study Instrument:

Questionnaire was adopted and developed by the researcher to assess the Effectiveness of Exercise Sessions on the management of Frozen Shoulder and Dysphagia for Patients After Stroke after intensive review of related literatures.

The shoulder pain and disability index (SPADI) is a 13-item survey meant to gauge one's current level of frozen shoulder pain and impairment. The SPADI assessment employs two scales, a 5-item subscale to assess pain and an 8-item subscale to assess disability, properties in the population with various shoulder illnesses. As a result, the questionnaire is divided into three sections as follows:

Part 1: Demographic Data:

A socio demographic data sheet, consists of (6) items, which included age, sex, marital status, level of education, occupational status, and residency.

Part 2: Clinical Data:

Second part consist (7) items related to clinical data such as type of stroke, body side that is affected by stroke, recurrence of stroke, durations of stroke, Using Tube Feeding, family history for stroke, associated other chronic diseases, smoking, body mass index, and complications of Stroke.

Part 3: Frozen shoulder and Dysphagia scales:

A: Shoulder Pain and Disability Index (SPADI)

- Pain scale: The two options for discomfort are "worst pain imaginable" and "no pain at
- Disability scale: There is no difficulty and aid was needed for the functional activities.

Two dimensions, The Shoulder Pain and Disability Index (SPADI), one measuring pain and the other functional activities. The pain dimension consists of five questions about how much pain a person is experiencing. Eight questions are used to assess functional activities and determine how difficult it is for an individual to perform various daily tasks that call for the use of the upper extremities. The pain score that most accurately reflected the pain was: On the disability scale, where 0 is no pain and 10 is the most excruciating agony imaginable, choose the number that best captures the following: Between 0 and 10, the difficulty is measured as a number between 1 and 10.

B: Dysphagia Classification Scale (lower esophageal sphincter LES**)** The Dysphagia Outcome and Severity Scale; the severity of dysphagia started from No dysphagia, mild dysphagia, moderate dysphagia, and sever dysphagia.

Severity	Score	Description
No dysphagia	**0**	Normal passage of food from lower esophageal sphincter zone.
Mild dysphagia	**1**	Sensation or short delay of passage of dysphagia food from lower esophageal sphincter, without the need of water.
Moderate dysphagia	**2**	Need of water for passage of food from dysphagia lower esophageal sphincter zone.
Severe	**3**	Accompanied with passive or active dysphagia regurgitation.

Table 3.1. dysphagia classification scale (lower esophageal sphincter LES).

Rating and Scoring:

Total score for pain: 50 x 100 = %

(Note: If a person does not correctly answer all of the questions, divide by the highest score that may be earned, if one question is missed, divide by 40).

Disability score overall: 80 x 100 = %

(Note: If a person doesn't answer all the questions, divide by the highest score that may be earned, if one question is missed, divide by 70).

SPADI overall score: 130 x 100 = %

(Note: If a person doesn't answer all the questions, divide by the highest possible score; for instance, if 1 question is skipped, divide by 120).

To generate a final score that ranges from 0 (best) to 100 (worst), the means of the two subscales are averaged.

According to the dysphagia classification scale (lower esophageal sphincter LES), the Dysphagia Outcome and Severity Scale; the severity of dysphagia started from no dysphagia = 0, mild dysphagia = 1, moderate dysphagia = 2, and severe dysphagia = 3.

3.5.5. Validity of the Study Instrument:

In order to investigate the clarity, relevance, and suitability of the study instrument and the content of exercise sessions was distributed to (12) experts who work in different fields and have at least (15) years of experience. All suggestions taken into consideration in order to achieve the objectives of the study (Appendix D).

3.5.6. Pilot study:

In order to determine the Reliability of the study questionnaire which prepared to the patient related to Frozen Shoulder and Dysphagia after stroke, From July 31 to August 11th 2022, a pilot study was conducted on (10) patients who visited the Middle Euphrates neuroscience center in Al-Najaf Al-Ashraf city as outpatients and as inpatients. Patient who participate in the pilot study were excluded from the original sample.

The Purpose Of The Pilot Study

1. To determine whether the participant understood the questions.
2. To estimate how long it typically takes to complete the form.
3. To identify any obstacles or limitations that might exist so that the researcher can plan how to get around them while collecting data.
4. To collect information on the form's reliability.

3.5.7.Reliability of the Study Instrument:

Reliability concerns the consistency and dependability of a research tool used to test a variable. Correlation between Test and retest are used to evaluate the reliability of the questionnaire.

No.	Scale of Frozen Shoulder	Correlation
1	Test	**0.82**
2	Re- test	

No.	Scale of Dysphagia	Correlation
1	Test	**0.78**
2	Re- test	

Table 3.2. Correlation Between test and re- test (Reliability)

3.5.8. Methods of Data Collection:

Data were collected through Interview method during 13th August 2022 to 19th January 2023; Data from stroke patients who visit the center and who admitted to the wards for management. An exercise session for each patient takes about (20 to 30) minutes to complete all items of the questionnaire.

3.5.9. Data Collection:

To achieve the main objective of the study which directed to evaluate the effectiveness of exercise sessions on the management of Frozen Shoulder and Dysphagia. structured to improve the knowledge of patients who were diagnosed previously with stroke. All the participants of the study consists of (60) patients are exposed to pretest. Those patients are divided into two groups: (30) patients selected as experimental group (10) females and (20) males, the other (30) patients are treated as control group (10) females and (20) males. The steps of the data collection and presentation of the exercise sessions performed as the following:

1. Patients who participate select related to special criteria.
2. The total sample number was divided into experimental and control group.
3. All the study samples (experimental and control group) involved in pre-test which considers as a baseline test.
4. The experimental group members were exposed to the pre-test section, exercise session presented to the experimental group as a small group to maintain physical distance between person to person which should be not less than (2) meters and wearing masks, maintain the classroom ventilation and cleanliness. The participant receives exercise sessions structured to cover all the practice related to the systematic steps of the exercise session. The patient attends the sessions according to their visit schedule which is assigned by the center to have consultation units, they are exposed to the first post-test after three weeks (21) days from pretest for any patient , and they exposed to the second post-test after same time.

5. The control group full the first post-test after three weeks (21) days of the pre-test, while the second post-test was collected after three weeks (21) days after the first post-test. No experimental activities were received by the control group members they only receive their routine treatment who visited the Middle Euphrates neuroscience center in Al-Najaf Al-Ashraf city.

3.6. Statistical Analysis:

The statistical data analysis approaches were conducted using the statistical package (SPSS) software version (22.0).

Data of the (60) patients with frozen shoulder and dysphagia after stroke in the studied groups were checked for errors, inconsistency or incomplete filling of the questionnaire, then all data were transferred into computerized database using Microsoft Excel software and analyzed using the statistical package for social sciences version (25) software for windows. According to the type of variable, they were expressed as frequency, percentage, mean and standard deviation when applicable.

For more precise decision about the effect of the training program that applied, as the significant P. value is not enough to give an idea about this effect, the effect size was calculated at each level (posttest 1, and posttest 2). The effect size is good estimator for the effect of an intervention in experimental studies and it is calculated according to the Cohen's d equation as Mean 1 (group 1) – Mean 2 (group 2) divided by Pooled standard deviation (*S*p).

The interpretation of effect size as followed:

Less than 0.5 indicates small effect size, 0.5 – 0.8 medium and > 0.8 is large effect, other classification considered an effect size of ≥ 1.3 as very large effect (1,2).

$$r_{xy} = \frac{\operatorname{cov}(x,y)}{\sqrt{\operatorname{var}(x)} \cdot \sqrt{\operatorname{var}(y)}}$$

All statistical procedures, analysis and testing were performed under a two tailed level of significance (P. value) of 0.05 or less to be considered as significant. Finally, the results and findings of the study were summarized in tables and figures accordingly.

Statistical formulas that used to find out the results:

- ***Frequency (F)***
- ***Percentage (%) as:*** $\frac{part}{whole} \times 100$
- $mean = \frac{\Sigma x}{x}$
- $SD = \sqrt{\frac{\sum x^2 - (\sum x)^2/n}{(n-1)}}$
- **Where:**
- **X, y: variables x and y**
- **cov: covariance**
- **var: sample variance of variable**

Chapter Four

Results and finding of study

Chapter Four

Results and Finding of Study

Table 4.1. Demographic characteristics of the studied groups.

Variable		Group				P.Value
		Experimental		Controls		
		No.	%	No.	%	
Age (year)	≤ 50	5	16.7	4	13.3	0.710 ns
	51 – 60	10	33.3	11	36.7	
	61 – 70	7	23.3	10	33.3	
	> 70	8	26.7	5	16.7	
Sex	Male	20	66.7	20	66.7	1.00 ns
	Female	10	33.3	10	33.3	
Marital Status	Married	25	83.3	26	86.7	0.718 ns
	Other*	5	16.7	4	13.3	
Educational level	Illiterate	6	20.0	5	16.7	0.920 ns
	Read and write	6	20.0	8	26.7	
	Primary	9	30.0	7	23.3	
	Secondary	6	20.0	6	20.0	
	Institute-college-higher	3	10.0	4	13.3	
Occupation	Employed	6	20.0	8	26.7	0.542 ns
	Unemployed	24	80.0	22	73.3	
Residency	Rural	14	46.7	14	46.7	1.00 ns
	Urban	16	53.3	16	53.3	

Ns: not significant (p. value not significant indicate to high level of Homogeneity of the studied groups), chi-square test used in all comparison. Others: Divorced, separated/widow.

Table (1) shows There were 60 Stroke patients enrolled in this study and were assigned into two equal groups , namely the experimental group, to whom the program was implemented. The second group did not receive the program and enrolled as control group Both groups were almost matched for their demographic characteristics including the age, sex, marital status, educational level, occupation, residency.

Table 4.2. Distribution of the study sample related to family history and smoking.

Family History for Stroke	**Yes**	**8**	**26.7**	**10**	**33.3**	**0.573**
	No	**22**	**73.3**	**20**	**66.7**	**Ns**
Smoking	**Yes**	**8**	**26.7**	**9**	**30.0**	**0.774 Ns**
	No	**22**	**73.3**	**21**	**70.0**	

The Result In Table (2) shows that the higher percentage 22(7303), 20(66.7) were with family history of smoking and 22(73.3), 21(70.0) were not smoking among both group (experimental and control), with indicate homogeneity of studied group.

Table 4.3. Descriptive statistics of scale variables (age, Duration of stroke, Duration of smoking and Number of cigarette /day) of both studied groups.

Variable	Experimental		Controls		P.Value
	Mean	SD	Mean	SD	
Age (year)	61.9	10.3	61.7	8.8	0.946 ns
BMI (kg/m^2)	27.2	3.9	27.7	3.2	0.582 ns
Duration of stroke (days)	38.2	22.6	39.1	20.4	0.871 ns
Duration of smoking	29.4	7.3	28.9	7.8	0.897 ns
Number of cigarette	26.3	7.4	26.7	10.0	0.924 ns

Ns: not significant, *t* test used in all comparison

This table (3) shows that the Mean values of scale variables were further compared and no significant difference was found between the experimental and control groups regarding the mean age, body mass index (BMI), Duration of stroke, Duration of smoking and Number of cigarette smoked per day, t test used in comparison and it was not significant in all of these variables (P. value > 0.05).

Table 4.4. Stroke related variables in both groups.

Variable		Group				P.value
		Experimental		Controls		
		No.	%	No.	%	
Type of stroke	Non-Hemorrhagic	25	83.3	24	80.0	0.739 ns
	Hemorrhagic	5	16.7	6	20.0	
Body side that is affected by stroke	Right	12	40.0	14	46.7	0.602 ns
	Left	18	60.0	16	53.3	
Recurrence of stroke	Yes	12	40.0	11	36.7	0.791 ns
	No	18	60.0	19	63.3	
Using Tube Feeding	Yes	8	26.7	10	33.3	0.573 ns
	No	22	73.3	20	66.7	

None of these variables were significantly different between both groups (P. value > 0.05).

This table (4) shows that, non-hemorrhagic strokes were the more frequent in the study and control groups; 83.3% and 80%, respectively. Left side of the body was relatively more affected than the right side in both groups; 60% in the experimental group and 53.3% in controls. Recurrence of stroke reported by 12 patients (40%) in the experimental group and 11 patients (36.7%) of the control group. Additionally, 8 patients of the experimental group and 10 patients of the controls were using tube feeding. None of these variables were significantly different between both groups, (P. value > 0.05).

Table 4.5. Distribution of chronic diseases in both studied groups.

Chronic diseases*		Group				P.Value
		Experimental		Controls		
		No.	%	No.	%	
Hypertension	Yes	27	90.0	29	96.7	0.301 ns
	No	3	10.0	1	3.3	
Diabetes mellitus	Yes	16	53.3	14	46.7	0.606 ns
	No	14	46.7	16	53.3	
CHF	Yes	2	6.7	2	6.7	1.00 ns
	No	28	93.3	28	93.3	

None of the patients reported other chronic diseases (P. value >0.05).

This table shows Chronic diseases were reported in the majority of the patients in both groups, with no statistically significant difference between groups regarding the distribution of hypertension, diabetes mellitus (DM) and CHF, however, hypertension was the most frequent chronic diseases reported in 90% of patients in the experimental group and 96.7% of controls, (p. value > 0.05). Followed by DM which reported in 53.3% and 46.7%, respectively, (P. value > 0.05). The least frequent chronic disease was CHF and it was reported in 6.7% of each group, (P. value >0.05),

Table 4. 6. Changes in pain experienced by patients in both studied groups at its worse before and after the program.

Time point	Experimental		Control		Effect size	P. Value
	Mean	SD	Mean	SD		
Pre Test	6.0	1.1	5.7	1.2	-	0.381 ns
Post Test 1	4.7	1.6	5.2	1.4	0.36	0.148 ns
Post Test 2	2.9	0.9	4.8	1.5	1.58	<0.001 sig
Mean difference Pre - Post 1	1.3	0.62	0.50	0.42		<0.001 sig
Mean difference Pre -Post 2	3.1	1.10	0.9	0.44		<0.001 sig
Mean difference Post1-Post 2	1.8	1.02	0.4	0.12		<0.001 sig
Percentage change	51.7%	11.6%	15.8%	7.2%		<0.001 sig

The difference did not reach the statistical significance at posttest 1, (P=0.148), but it became highly significant at posttest 2, (P<0.001).

This Table (5) The mean **score of** pain experienced by patients at its worse was not significantly different before the program, the mean score was 6.0 ± 1.1 in the experimental group compared to 5.7 ± 1.2 in control group, (P. value = 0.381, not significant), after the exercise sessions, a significant change was reported in the experimental group at post test1 and posttest 2, to reach a mean score of 4.7 and 2.9, respectively, changed significantly. In the control group a relatively small reduction in the mean score was observed to reach 5.2 and 4.8 at posttest and posttest 2, respectively. At both time, the mean score was lower in the experimental group than controls, however, the difference did not reach the statistical significance at posttest 1, (P. value =0.148), but it became highly significant at posttest 2, (P. value <0.001). the mean difference in the mean score was much higher in the experimental group than controls, 3.1 vs. 0.9, with a percentage change of 51.7% vs. 15.8%. Furthermore, the effect size was large at post-test 2 and it was 1.58.

Table 4.7. Changes in pain experienced by patients in both studied groups when lying on the involved side before and after the program.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	6.3	1.3	5.6	1.5	-	0.215 ns
Post Test 1	5.4	1.6	5.6	1.5	0.13	0.618 ns
Post Test 2	2.9	0.8	5.4	1.5	2.19	<0.001 sig
Mean difference Pre - Post 1	0.9	0.24	0.2	0.01		<0.001 sig
Mean difference Pre -Post 2	3.4	0.24	0.2	0.11		<0.001 sig
Mean difference Post1-Post 2	2.5	0.27	0.2	0.11		<0.001 sig
Percentage change	54.0%	13.3%	4.1%	2.9%		<0.001 sig

Table (7) shows that The mean **score of** pain experienced by patients when lying on the involved side was not significantly different before the program, the mean score was 6.3 ± 1.3 in the experimental group compared to 5.6 ± 1.5 in the control group, (P. value = 0.215, not significant), after the exercise sessions, at posttest 1, no significant difference was found between both groups, despite the reduction in the mean score, (P. value >0.05). At posttest 2 a significant reduction was reported in the Experimental group where the mean score was 2.9 with a mean difference of 3.4, compared to minimal change in the control group with a mean score of 5.4 at posttest 2 and a mean difference of only 0.2, giving a large effect size of 2.19 and high significant difference , (P. value <0.001).

Table 4.8. Changes in pain experienced by patients in both studied groups on reaching something on a high shelf before and after the program.

Time point	Experimental		Control		Effect size	P
	Mean	SD	Mean	SD		
Pre Test	5.7	1.1	5.5	1.8	-	0.618 ns
Post Test 1	4.9	1.4	5.3	1.5	0.27	0.372 ns
Post Test 2	2.8	1.0	4.6	1.3	1.58	0.000
Mean difference Pre - Post 1	0.8	0.25	0.2	0.15		
Mean difference Pre -Post 2	2.9	0.25	0.8	0.15		
Mean difference Post1-Post 2	2.1	0.23	0.7	0.10		
Percentage change	51.5%	12.8%	15.2%	8.7%		

Neither Significantly Different Before The Exercise Sessions Nor At Posttest 1, (P. Value >0.05).

In This Table (8) The mean **score of** pain experienced by patients on reaching something on a high shelf was neither significantly different before the program nor at posttest 1, (P. value >0.05). At posttest 2 much reduction in the mean score was reported in the experimental group while only small change in the control group; the mean difference at posttest 2 was 2.9 in the experimental group with a percentage change of 51.5% than its baseline pretest value while the mean difference in the control group was only 0.15 and a percentage change of 8.7%. This difference giving an effect size of 1.58 which is large effect for the program. (P. value <0.001).

Table 4.9. Changes in pain experienced by patients in both studied groups when touching the back of the neck before and after the program.

Time point	Experimental		Control		Effect size	P.Value
	Mean	SD	Mean	SD		
Pre Test	5.2	1.3	5.4	1.9	-	0.485 sig
Post Test 1	4.3	1.5	5.1	1.9	0.46	0.079 ns
Post Test 2	2.8	0.9	4.8	1.5	1.57	< 0.001 sig
Mean difference Pre - Post 1	0.9	0.27	0.3	0.14		< 0.001 sig
Mean difference Pre -Post 2	2.4	0.27	0.6	0.14		< 0.001 sig
Mean difference Post1-Post 2	1.5	0.24	0.3	0.12		< 0.001 sig
Percentage change	45.5%	14.3%	11.7%	6.2%		< 0.001 sig

Not Significantly Different Before The Program And At Posttest 1, (P>0.05).

Table (9) shows **that** As shown in (Table 4.8), the mean **score of** pain experienced by patients touching the back of the neck was not significantly different before the program and at posttest 1, (P. value >0.05). At posttest 2, a significant reduction in the mean score was reported in the experimental group while only minimum change in the control group; the mean difference at posttest 2 was 2.8 in the experimental group with a percentage change of 45.5% while the mean difference in the control group was only 0.14 and a percentage change of 6.2%. The effect size was 1.57 and it was large e (P. value <0.001). Furthermore, graphical comparisons are demonstrated.

Table 4.10. Changes in pain experienced by patients in both studied groups on pushing with the involved arm before and after the program.

Time point	Experimental		Control		Effect size	P.Value
	Mean	SD	Mean	SD		
Pre Test	7.0	1.1	7.1	2.0	-	0.811 ns
Post Test 1	5.4	1.5	6.3	1.8	0.55	0.022 sig
Post Test 2	2.8	1.2	5.9	1.6	2.23	< 0.001 sig
Mean difference Pre - Post 1	1.6	1.5	0.8	1.1		< 0.001 sig
Mean difference Pre -Post 2	4.2	1.5	1.2	1.1		< 0.001 sig
Mean difference Post1-Post 2	2.6	1.3	0.4	0.9		< 0.001 sig
Percentage change	60.0%	10.4%	16.9%	9.3%		< 0.001 sig

At posttest 1, significant difference was found between groups, where the mean score was significantly lower in the experimental group than controls, (P=0.022).

In This Table (10) Shows That The mean score of pain experienced by patients on pushing with the involved arm was not significantly different before the program. At posttest 1, significant difference was found between groups, where the mean score was significantly lower in the experimental group than controls, (P. value =0.022). So as at posttest 2 where much reduction in the mean score had been reported with a mean difference at posttest 2 of 2.6 and a percentage change of 60% in the experimental group compared to 0.4 and 16.9% in the control group, respectively. The effect size was large of 2.23 , (P. value <0.001).

Table 4.11. Changes in total pain scale of the patients in both studied groups before and after the program.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	30.1	2.6	29.3	7.3	-	0.120 ns
Post Test 1	24.8	5.2	27.5	6.8	0.45	0.125 ns
Post Test 2	14.1	4.2	25.5	6.4	2.16	< 0.001 sig
Mean difference Pre - Post 1	5.3	3.1	1.8	2.4		< 0.001 sig
Mean difference Pre -Post 2	16.0	5.6	3.8	3.4		< 0.001 sig
Mean difference Post1-Post 2	10.7	4.5	2.0	2.7		< 0.001 sig
Percentage change	53.2%	16.1%	13.0%	6.5%		< 0.001 sig

No significant difference at pre or post-test 1, (P. value > 0.05).

This Table (11) shows that , In total, the summation of the scores of different item of pain scales, revealed an overall mean score before program of 30.1 in the experimental group compared to 29.3 in the control group. At posttest 1, it was 24.8 vs. 27.5, respectively, with no significant difference at pre or post-test 1, (P. value >0.05). At post test2 the change was much larger in the experimental group to reach 14.1 with a mean difference of 16 and a percentage change of 53.2%. In control group the mean difference was only 3.8 and a percentage change of 13%. (P. value <0.001). The effect size was large; 2.16.

4.3. Disability:

Table 4.12. Comparison of disability scale for washing hair before and after the program in both studied groups.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	6.2	1.1	6.0	1.5	-	0.558 ns
Post Test 1	4.8	1.5	5.8	1.5	0.27	0.012 sig
Post Test 2	2.9	0.9	5.5	1.4	2.26	<0.001 sig
Mean difference Pre - Post 1	1.4	1.1	0.2	0.7		<0.001 sig
Mean difference Pre -Post 2	3.3	1.1	0.5	0.3		<0.001 sig
Mean difference Post1-Post 2	1.9	1.3	0.3	0.6		<0.001 sig
Percentage change	53.2%	12.5%	8.3%	5.0%		

Highly significant difference and a large effect size at posttest 1 (P. value = 0.012).

In Table (11), At the end, a significant reduction in the mean disability score for this item was reported, it was 6.2 ± 1.1 at pretest and reach 2.9 ± 0.9 at posttest 2, in the experimental group compared to 6 ± 1.5 and 5.5 ± 1.4 in the control group, with a highly significant difference and a large effect size of 2.26, (P<0.001).

Table 4.13. Comparison of disability scale for washing back before and after the program in both studied groups.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	6.7	1.1	6.4	1.5	-	0.380 ns
Post Test 1	5.2	1.5	6.0	1.4	0.55	0.036 sig
Post Test 2	2.9	0.9	5.3	1.4	2.09	<0.001 sig
Mean difference Pre - Post 1	1.5	1.2	0.4	0.4		<0.001 sig
Mean difference Pre -Post 2	3.8	1.2	1.1	0.4		<0.001 sig
Mean difference Post1-Post 2	2.3	1.2	0.7	0.4		<0.001 sig
Percentage change	56.7%	11.6%	17.2%	8.0%		<0.001 sig

Significant Difference At Posttest 1 (P. Value = 0.036). The Change Was Not Much Different Than The Previous Item

In this table (13), the change was not much different than the previous item, a mean difference of 3.8 was reported at posttest 2 and a percentage change of 56.7% in the experimental group compared to only 1.1 and a percentage change of 17.2% in the control group. Giving an effect size of 2.09, (P. value <0.001), (Table 4.12).

Table 4.14. Comparison of disability scale for putting on an undershirt or jumper before and after the program in both studied groups.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	6.4	1.2	6.2	1.5	-	0.570 ns
Post Test 1	5.1	1.1	5.8	1.4	0.56	0.035 sig
Post Test 2	2.8	0.9	5.0	1.3	2.00	<0.001 sig
Mean difference Pre - Post 1	1.3	1.2	0.4	0.6		<0.001 sig
Mean difference Pre -Post 2	3.6	1.4	1.2	1.0		<0.001 sig
Mean difference Post1-Post 2	2.3	1.3	0.8	0.8		<0.001 sig
Percentage change	56.3%	13.5%	19.4%	7.0%		<0.001 sig

A significant reduction was found in the disability score for this item, (P<0.001).

Table (14) shows that , A significant reduction was found in the disability score for this item, (P<0.001) . The mean difference was 3.6 and the percentage change was 56.3% in the experimental group while it was 1.2 and 19.4% in the control group with an effect size of 2.0, (P<0.001).

Table 4.15. A comparison of disability scale for putting on a shirt that buttons down the front before and after the program in both studied groups.

Time point	experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	6.3	1.1	6.1	1.5	-	0.561 ns
Post Test 1	4.7	1.4	5.6	1.5	0.62	0.019 sig
Post Test 2	2.8	1.0	5.4	1.7	1.93	<0.001 sig
Mean difference Pre - Post 1	1.6	1.1	0.5	0.6		<0.001 sig
Mean difference Pre -Post 2	3.5	1.4	0.7	0.5		<0.001 sig
Mean difference Post1-Post 2	1.9	1.3	0.2	0.8		<0.001 sig
Percentage change	55.6%	14.4%	11.5%	6.1%		<0.001 sig

At posttest 1 (P. value = 0.019) A significant reduction was found in the disability score for this item, (P. value < 0.001).

Table (15) show that , A significant reduction was found in the disability score for this item, (P. value <0.001) . The mean difference was 3.5 and the percentage change was 55.6% in the experimental group and it was 0.7 and 11.5% in the control group with an effect size of 1.93, (P. value <0.001).

Table 4.16. Comparison of disability scale for putting on pants before and after the program in both studied groups.

Time point	experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	7.3	1.6	7.0	1.8	-	0.497 ns
Post Test 1	5.3	1.3	6.6	1.7	0.87	0.001 sig
Post Test 2	2.9	1.0	5.9	1.8	2.14	<0.001 sig
Mean difference Pre - Post 1	2.0	1.0	0.4	0.7		<0.001 sig
Mean difference Pre -Post 2	4.4	1.1	1.1	1.0		<0.001 sig
Mean difference Post1-Post 2	2.4	1.2	0.7	0.7		<0.001 sig
Percentage change	60.3%	14.0%	15.7%	2.8%		<0.001 sig

A significant reduction was found in the disability score for this item, (P<0.001).

Table (16),A significant reduction was found in the disability score for this item, (P. value <0.001) . The mean difference was 4.4 and the percentage change was 60.3% in the experimental group and it was 1.1 and 15.7% in the control group with a large effect size of 2.1. (P. value <0.001).

Table 4.17. Comparison of disability scale for placing an object on a high shelf before and after the program in both studied groups.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	6.1	1.1	5.7	2.0	-	0.341 ns
Post Test 1	5.0	1.4	5.4	1.7	0.26	0.324 ns
Post Test 2	2.8	1.1	4.7	1.5	1.46	<0.001 sig
Mean difference Pre - Post 1	1.1	1.1	0.3	0.6		<0.001 sig
Mean difference Pre -Post 2	3.3	1.5	1.0	0.8		<0.001 sig
Mean difference Post1-Post 2	2.2	1.5	0.7	0.7		<0.001 sig
Percentage change	54.1%	15.9%	17.5%	6.1%		<0.001 sig

A significant reduction was found in the disability score for this item, (P. value <0.001). while at posttest 1 non-significant but was effect size (0.26).

Table (17), A significant reduction was found in the disability score for this item, (P. value <0.001). The mean difference was 3.3 and the percentage change was 54.1% in the experimental group and it was 1.0 and 17.5% in the control group with a large effect size of 1.46, (P. value <0.001).

Table 4.18. Comparison of disability scale for carrying a heavy object of 10 pounds (4.5 kilograms) before and after the program in both studied groups.

Time point	Experimental		Control		Effect size	P. Value
	Mean	SD	Mean	SD		
Pre Test	6.6	1.4	6.3	1.7	-	0.458 ns
Post Test 1	4.8	1.3	6.2	1.8	0.90	0.008 sig
Post Test 2	2.3	1.3	5.8	2.1	2.06	<0.001 sig
Mean difference Pre - Post 1	1.8	1.1	0.1	0.2		<0.001 sig
Mean difference Pre -Post 2	4.3	1.9	0.5	0.4		<0.001 sig
Mean difference Post1-Post 2	2.5	1.9	0.4	0.4		<0.001 sig
Percentage change	65.2%	17.4%	7.9%	5.0%		<0.001 sig

A significant reduction was found in the disability score for this item, (P<0.001) .

Table (18) shows that, A significant reduction was found in the disability score for this item, (P. value <0.001) . The mean difference was 4.3 and the percentage change was 65.2% in the experimental group and it was 0.5 and 5.0% in the control group with a large effect size of 2.06, (P. value <0.001).

Table 4.19. Comparison of disability scale for removing something from back pocket before and after the program in both studied groups.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	6.1	1.2	5.9	2.0	-	0.422 ns
Post Test 1	5.1	1.3	5.4	1.7	0.20	0.445 ns
Post Test 2	2.9	1.0	5.2	1.8	1.64	<0.001 sig
Mean difference Pre - Post 1	1.0	1.2	0.5	0.6		<0.001 sig
Mean difference Pre -Post 2	3.2	1.5	0.7	0.5		<0.001 sig
Mean difference Post1-Post 2	2.2	1.4	0.2	0.6		<0.001 sig
Percentage change	52.5%	13.1%	11.9%	2.8%		<0.001 sig

Table (19) shows that **,**A significant reduction was found in the disability score for this item, (P. value <0.001) . The mean difference was 3.2 and the percentage change was 52.5% in the experimental group and it was 0.7 and 11.9% in the control group with a large effect size of 1.64. (P. value <0.001).

Table 4.20. Comparison of total disability before and after the program in both studied groups.

Time point	experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	51.7	7.9	49.6	12.8	-	0.521 ns
Post Test 1	40.0	10.4	46.8	11.8	0.61	**0.044 sig**
Post Test 2	22.3	6.8	43.8	11.3	2.38	**<0.001 sig**
Mean difference Pre - Post 1	11.7	7.47	2.8	1.82		**<0.001 sig**
Mean difference Pre -Post 2	29.4	9.46	5.8	4.44		**<0.001 sig**
Mean difference Post1-Post 2	17.7	9.20	3.0	3.38		**<0.001 sig**
Percentage change	56.9%	11.6%	11.7%	2.9%		**<0.001 sig**

Table (20) shows that **,** A significant reduction was found in total disability scale score, (P. value <0.001). The mean difference was 29.4 and the percentage change was 56.9% in the experimental group and it was 5.8 and 11.7% in the control group with a large effect size of 2.38, (P. value <0.001).

Table 4.21. Comparison of the overall pain and disability scale (SPDI scale) before and after the program in both studied groups.

Time point	Experimental		Control		Effect size	P. value
	Mean	SD	Mean	SD		
Pre Test	81.8	6.2	78.9	9.3	-	0.353 ns
Post Test 1	64.8	7.2	74.3	8.7	0.45	0.002 sig
Post Test 2	36.4	6.4	69.3	8.1	2.16	< 0.001 sig
Mean difference Pre - Post 1	17.0	3.1	4.6	2.2		< 0.001 sig
Mean difference Pre -Post 2	45.4	6.3	9.6	4.7		< 0.001 sig
Mean difference Post1-Post 2	28.4	5.5	5.0	1.9		< 0.001 sig
Percentage change	55.5%	13.1%	12.2%	4.3%		< 0.001 sig

Table (21) shows In total, the overall SPADI scale was significantly reduced in the experimental group compared to the control group, (P. value <0.001) . The mean difference was 45.4 and the percentage change was 55.5% in the experimental group compared to 9.6 and 12.2% in the control group with a large effect size of , (P. value <0.001).

Table 4.22. Changes in Dysphagia experienced by patients in both studied groups before and after the program.

Time point	Dysphagia	Experimental		Control		P. value
		No	%	No.	%	
Pretest	None	0	0.0	0	0.0	0.785 ns
	Mild	10	33.3	9	30.0	
	Moderate	16	53.3	15	50.0	
	Severe	4	13.3	6	20.0	
Posttest 1	None	8	26.7	0	0.0	0.001 sig
	Mild	20	66.7	19	63.3	
	Moderate	2	6.7	11	36.7	
Posttest 2	None	21	70.0	2	6.7	< 0.001 sig
	Mild	9	30.0	19	63.3	
	Moderate	0	0.0	9	30.0	

A significant improvement was found in the severity of dysphagia in the experimental group, (P. value <0.001).

Table 4. 23. Cross-tabulation for the changes in the dysphagia after education program in the experimental group (N=30).

		Dysphagia Posttest 1			Dysphagia Posttest 2	
		None	Mild	Moderate	None	Mild
Dysphagia Posttest 1	Mild	6	4	0	9	1
	Moderate	2	14	0	12	4
	Severe	0	2	2	0	4
Total		8	20	2	21	9
Dysphagia Posttest 2	None	-	-	-	8	0
	Mild	-	-	-	14	6
	Moderate	-	-	-	0	2
Total		-	-	-	21	9

Color Key Improved No change

Table 4.24. Cross-tabulation for the changes in the dysphagia after education program in the Controls group (N=30)

Dysphagia		Dysphagia Posttest 1		Dysphagia Posttest 2		
		Mild	Moderate	None	Mild	Moderate
Pretest	Mild	8	1	2	7	0
	Moderate	11	4	0	12	3
	Severe	0	6	0	0	6
Total		**19**	**11**	**2**	**19**	**9**
Posttest 1	Mild	-	-	2	17	0
	Moderate	-	-	0	2	9
Total		**-**	**-**	**2**	**19**	**9**

Color Key Improved No change Get worse

Table 4.25. Comparison of changes in Dysphagia severity after the program between study and control groups at Posttest 1

Dysphagia status	Experimental		Controls	
	No.	%	No.	%
Improved	26	86.7	17	56.7
No change	4	13.3	12	40.0
Get Worse	0	0.0	1	3.3

Fisher's exact test, P. value = 0.032 significant

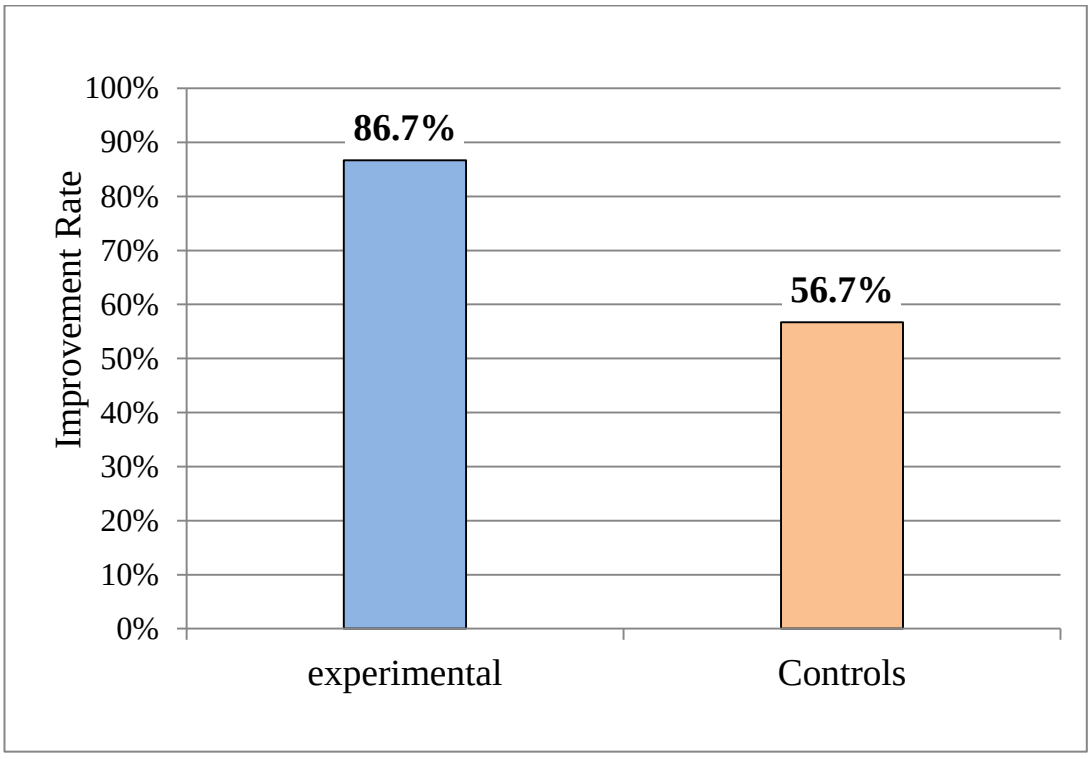

Figure 4.1. Rates of improvement in dysphagia severity after the program in study and control groups at Posttest 1.

Table 4.26. Comparison of changes in Dysphagia severity after the program between study and control groups at Posttest 2

Dysphagia status	Experimental		Controls	
	No.	%	No.	%
Improved	29	96.7	20	66.7
No change	1	3.3	10	33.3
Get Worse	0	0.0	0	0.0

Fisher's exact test, P. value =0.003 significant

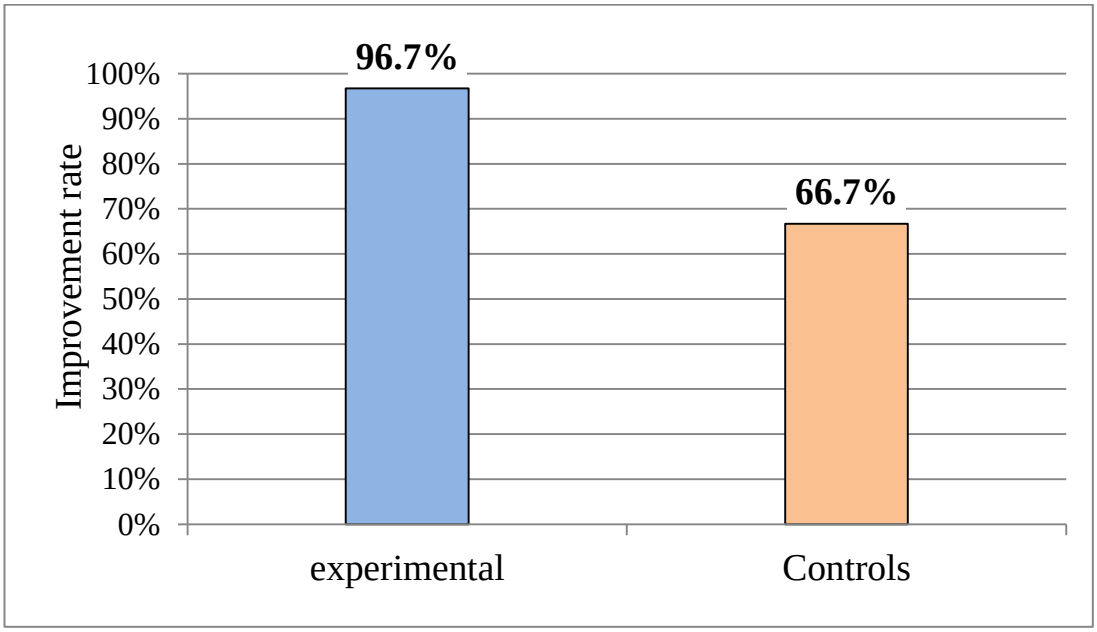

Figure 4.2. Rates of improvement in dysphagia severity after the program in study and control groups at Posttest 2.

In this table (26), A significant improvement was found in the severity of dysphagia in the experimental group, (P. value <0.001) . At the end point, posttest 2, the number of patients with improvement was 29/30 (96.7%) and only one patient had no change in the severity of dysphagia compared to 20/30 (66.7%) in the control group and 10 patients with no change in the dysphagia, the difference was significant at (P. value <0.05), more details about the changes in the dysphagia are demonstrated in (Tables 21, 22, 23 ,24 and 25) in addition to the comparison of improvement rates which demonstrated.

Table 4.27. Results of bivariate correlation analysis between improvement in pain scores after the program and other variables in the experimental group.

Variable	Statistical parameters	
	R	P. value
Age	0.028	0.885
Sex	0.192	0.310
Marital Status	0.113	0.552
Educational status	0.087	0.648
Occupation	0.181	0.339
Residency	0.133	0.484
Smoking	0.03	0.874
Duration of smoking	0.009	0.964
Number of cigarette	0.131	0.491
BMI (kg/m^2)	0.057	0.765
Having a chronic disease	0.082	0.668
Family History for Stroke	0.068	0.721
Type of stroke	0.194	0.304
Body side that is affected by stroke	0.123	0.517
Duration of stroke (days)	0.169	0.371
Using Tube Feeding	0.204	0.279
Complications of stroke	0.195	0.303
Recurrence of stroke (days)	0.072	0.704

R: Correlation Coefficient

Table 4.28. Results of bivariate correlation analysis between improvement in disability scores after the program and other variables in the experimental group.

Variable	Statistical parameters	
	R	P. value
Age	0.328	0.076
Sex	0.100	0.599
Marital Status	0.034	0.860
Educational status	0.215	0.255
Occupation	0.146	0.441
Residency	0.160	0.399
Smoking	0.201	0.287
Duration of smoking	0.173	0.361
Number of cigarette	0.118	0.533
BMI (kg/m^2)	0.280	0.133
Having a chronic disease	0.346	0.061
Family History for Stroke	0.094	0.622
Type of stroke	0.211	0.264
Body side that is affected by stroke	0.056	0.767
Duration of stroke (days)	0.238	0.205
Using Tube Feeding	0.094	0.622
Complications of stroke	0.075	0.695
Recurrence of stroke (days)	0.149	0.433

R: Correlation Coefficient

Table 4.29. Results of bivariate correlation analysis between improvement in the overall SPDI after the program and other variables in the experimental group.

Variable	Statistical parameters	
	R	P. value
Age	0.296	0.112
Sex	0.226	0.229
Marital Status	0.064	0.739
Educational status	0.160	0.399
Occupation	0.278	0.136
Residency	0.097	0.609
Smoking	0.175	0.356
Duration of smoking	0.167	0.377
Number of cigarette	0.047	0.804
BMI (kg/m^2)	0.293	0.117
Having a chronic disease	0.235	0.211
Family History for Stroke	0.109	0.568
Type of stroke	0.294	0.115
Body side that is affected by stroke	0.007	0.970
Duration of stroke (days)	0.141	0.456
Using Tube Feeding	0.012	0.950
Complications of stroke	0.166	0.380
Recurrence of stroke (days)	0.176	0.353

R: Correlation Coefficient

Table 4.30. Results of bivariate correlation analysis between improvement in pain scores after the program and other variables in the controls group.

Variable	Statistical Parameters	
	R	P. value
Age	0.034	0.857
Sex	0.129	0.498
Marital Status	0.121	0.525
Educational status	0.028	0.884
Occupation	0.141	0.456
Residency	0.182	0.362
Smoking	0.216	0.251
Duration of smoking	0.202	0.283
Number of cigarette	0.225	0.231
BMI (kg/m^2)	0.061	0.747
Having a chronic disease	0.098	0.606
Family History for Stroke	0.265	0.157
Type of stroke	0.214	0.256
Body side that is affected by stroke	0.186	0.325
Duration of stroke (days)	0.087	0.647
Using Tube Feeding	0.015	0.937
Complications of stroke	0.153	0.419
Recurrence of stroke (days)	0.141	0.456

R: Correlation Coefficient

Table 4.31. Results of bivariate correlation analysis between improvement in disability scores after the program and other variables in the controls group.

Variable	Statistical parameters	
	R	**P. value**
Age	0.098	0.607
Sex	0.105	0.582
Marital Status	0.067	0.726
Educational status	0.155	0.413
Occupation	0.065	0.734
Residency	0.278	0.137
Smoking	0.147	0.439
Duration of smoking	0.079	0.678
Number of cigarette	0.034	0.857
BMI (kg/m^2)	0.214	0.256
Having a chronic disease	0.057	0.766
Family History for Stroke	0.037	0.848
Type of stroke	0.063	0.741
Body side that is affected by stroke	0.041	0.832
Duration of stroke (days)	0.081	0.671
Using Tube Feeding	0.120	0.527
Complications of stroke	0.088	0.645
Recurrence of stroke (days)	0.155	0.412

R: Correlation Coefficient

Table 4.32. Results of bivariate correlation analysis between improvement in the overall SPDI after the program and other variables in the controls group.

Variable	Statistical parameters	
	R	P. value
Age	0.026	0.892
Sex	0.129	0.498
Marital Status	0.051	0.788
Educational status	0.099	0.602
Occupation	0.067	0.725
Residency	0.243	0.195
Smoking	0.228	0.225
Duration of smoking	0.184	0.331
Number of cigarette	0.177	0.349
BMI (kg/m^2)	0.153	0.419
Having a chronic disease	0.137	0.472
Family History for Stroke	0.161	0.396
Type of stroke	0.119	0.529
Body side that is affected by stroke	0.111	0.559
Duration of stroke (days)	0.103	0.588
Using Tube Feeding	0.072	0.704
Complications of stroke	0.063	0.739
Recurrence of stroke (days)	0.020	0.915

R: Correlation Coefficient

Table (32)Using bivariate correlation analysis, no significant correlation was found between each of improvement in pain , improvement in disability and the overall improvement in the SPADI and other variables, in both groups, in all correlations, (P. values >0.05).

Table 4.33. Results of bivariate correlation analysis between improvement in dysphagia after the program and scale variables of patients in the experimental group.

Variable	R	P. value
Age	0.172	0.363
BMI (kg/m²)	0.172	0.363
Duration of smoking	0.092	0.628
Number of cigarette	0.062	0.747
Duration of stroke (days)	0.199	0.292

Table 4.34. Results of cross-tabulation for the association between improvement in dysphagia after the program and categorical variables of patients in the experimental group.

Variable	Statistical parameters	
	Chi-square \ Fisher's	P. value
Sex	0.517	0.472
Marital Status	0.207	0.649
Educational status	4.138	0.388
Occupation	1.138	0.422
Residency	1.182	0.277
Smoking	0.259	0.611
having a chronic disease	2.414	0.120
Family History for Stroke	0.376	0.540
Type of stroke	0.207	0.649
Body side that is affected by stroke	0.690	0.406
Using Tube Feeding	2.845	0.092
Complications of stroke	0.791	0.374
Recurrence of stroke	1.182	0.277

Table (34) shows that, Using cross-tabulation with chi-square and Fisher's exact tests , no significant correlation was found between improvement in dysphagia and all other variables of the patients in experimental group.

Table 4.35. Results of bivariate correlation analysis between improvement in dysphagia after the program and scale variables of patients in the controls group.

Variable	R	P. value
Age	0.320	0.085
BMI (kg/m²)	0.039	0.839
Duration of smoking	0.042	0.826
Number of cigarette	0.000	1.000
Duration of stroke (days)	0.141	0.458

Table 4.36. Results of cross-tabulation for the association between improvement in dysphagia after the program and categorical variables of patients in the controls group.

Variable	Chi-square \ Fisher's	P. value
Sex	0.075	0.784
Marital Status	0.144	0.704
Educational status	6.536	0.163
Occupation	0.341	0.559
Residency	0.068	0.794
Smoking	0.000	1.000
having a chronic disease	0.000	1.000
Family History for Stroke	1.200	0.273
Type of stroke	0.000	1.000
Body side that is affected by stroke	0.067	0.796
Using Tube Feeding	1.200	0.273
Complications of stroke	0.625	0.429
Recurrence of stroke	0.480	0.488

Table (36) shows that, Using cross-tabulation with chi-square and Fisher's exact tests , no significant correlation was found between improvement in dysphagia and all other variables of the patients in control group.

Chapter Five

Discussion of the Study Results

Chapter Five

Discussion

This chapter interpretates the tabulated results by using a scientific approach depend on related literature .

Part 1: Discussion of the Demographic and clinical characteristics of the studied groups for Patients after stroke:

The results in Table (1) shows that the demographical characteristics of the studied groups for Patients after stroke which is presented that the higher percentage 11 (36.7). (N=30) of the studied groups were between (51 – 60) years of age, 20 (66.7%) were male, This result consistent with the findings of a study on the quality of life of stroke patients conducted in Iraq, which found that men made up the majority of stroke patients (70%) under the age of 61 and that the risk of stroke increases with advancing age, with elderly men being nearly twice as likely to experience a stroke as women (Siriratnam *et al.,* 2020).

The present study results in Table (1) which pointed on high percentage 26 (86.7 %) of sample were married and (30%) were primary educational level, (20%) were Illiterate, and (26.7%) were Read and write, was label to expose to determining patients after stroke, this results agree with (Serda et al., 2015) that 94.2% of patients were married, that patients in the same age group performed better than those in young people, and that patients with low levels of education may put themselves at risk for stroke at every time so, Due to their ignorance of the classification of all symptoms and signs of such need, individuals are unable to recognize when they require counseling or medical assistance.

Table (1) shows that residing in urban areas were 16 (53%). this result agrees with Pengpid and Peltzer, K. (2021). living in an urban residency people reside in urban areas. Also This outcome was consistent with study by Jun et al. (2015) , that found 72% of the study's individuals resided in urban areas. More stroke patients are at danger due to the urban lifestyle of that person.

The results in Table (1) show 21 (70%) of the study sample are no smoker. This finding is consistent with Sanakayala et al., (2015), who emphasize in their study that adults with a history of smoking were (23.7%), because there are other risk factors for stroke that patients may have.

A study connected by Baktash *et al.,* 2021, showed that smoking was uncommon among elderly Iraqi populations. It also showed that diabetes mellitus and hypertension were the most common illnesses and leading causes of death among older adults in Iraq.

The results of Table (3) shows that the majority of the study's 25 participants (83.3%) had ischemic strokes. This finding supports the findings of numerous research indicating ischemic stroke is more common than hemorrhagic stroke, For instance, Hassoun *et al.,* (2016) discovered that in their study, 34 out of 50 patients (68% of the total) had an ischemic stroke, whereas 16 out of 50 patients (32% of the total) had a hemorrhagic stroke. In addition, 36 patients (72%) and 14 patients (36%), respectively, had cerebral hemorrhage, according to Kamel *et al.,* (2010).

Regarding the recurrence of the stroke, the study findings showed that most of the study subjects disabled no recurrent stroke. these results may come because the majority of the patients are diagnosed for a few days only so there is not enough time for recurrence, and all the patients are

admitted to the hospital, so they are under the supervision of health professionals and they receive a treatment that prevents the recurrence.

The results of Table (4) presented that diabetes mellitus and hypertension affect the majority of the sample among stroke patients; the results show that 29 (96.7%) of study subjects have Hypertension and 16 (53.3%) have Diabetes mellitus. Also concluded that diabetes mellitus was more prevalent in the older group than in the younger group of patients with stroke; this finding is consistent with many earlier studies that found hypertension to be the most common comorbidity (Hassan & Chen, (2021); The increased blood pressure had an impact on the arteries, which could result in weak places that could rupture easily or thin patches that accumulated blood and protruded from the artery wall (an aneurysm). Hemorrhagic strokes are mostly caused by hypertension and flexible blood arteries, while ischemic strokes result in the constriction or obstruction blood vessels in the tissue of the brain, that stops the blood supply to the brain and its tissues.

On the other hand, when a patient with diabetes mellitus experiences excessive blood glucose levels, their tissues are unable to absorb enough energy. Additionally, the accumulation of fat on the inner wall of the blood arteries may be the cause of the elevated glucose. this clot may build up and narrow or obstruct a blood vessel in the brain or neck, preventing blood flow and reducing the amount of oxygen delivered to the brain, which increases the risk of stroke.

Part 2: Discussion of the Changes in pain experienced by patients after a stroke in both studied groups after the exercise sessions:

(Table 10) revealed an overall mean score before exercise session and the changes in total pain scale (30.1) in the Experimental group compared to 29.3 in the control group at pretest. At posttest (1) it was 24.8 vs. 27.5, respectively, with no Significant difference at pre or posttest (1), (P. value >0.05) but with effect size (0.45). At posttest 2 the change was much larger in the experimental group to reach 14.1 with a mean difference of 16 and a percentage change of 53.2%. In control group, The mean difference was only 3.8 and a percentage change of 13%. (P. value <0.001). The effect size was large (2.16). These mean improve and changes in pain scale. The study agrees with Ma, Y *et al*. (2022) that the majority of stroke patients suffer pain, which has a severe adverse effect on their daily activities and quality of life. Therefore, it is essential to treat pain in post-stroke patients. Various exercises can effectively reduce post-stroke pain, and exercise may also have other mechanisms for doing so. As a result, it shows the value of exercise interventions in the treatment of PSP and patient comfort. In addition, exercise therapy has the advantages of being more patient-acceptable and affordable than other forms of treatment. The effectiveness of exercise therapies for (PSP) is therefore reviewed in this article, along with any potential mechanisms. For individuals with post-stroke pain, exercise training not only enhances physical performance but also significantly lessens pain intensity and attenuates the behavioral response to pain.

As well as the study that Changes in total pain scale for frozen shoulder after exercise sessions. this agrees with Kumar et al., (2021) the study findings showed varied practice in the assessment and treatment of hemiplegic shoulder pain (HSP) and indicate that time constraints are a

considerable barrier to the management of these patients. Further research is required to establish the best exercise which may help improve outcomes and care for people with post-stroke shoulder pain, that Sixty-seven responses were received 40 (60%) by physiotherapists (PTs) working in stroke rehabilitation.

Also, the study supported by Kumar, P. (2019). that physiotherapy has been used in the treatment of hemiplegic shoulder pain, the occurrence of pain in patients receiving rehabilitation exercise programs.

Part-3 : Discussion of The Disability Experienced by Patients After Stroke in Both Studied Groups After The Exercise Sessions:

The results in (Table 19) in total disability scale score (P<0.001). The mean difference were 29.4 and the percentage change were (56.9%), with a large effect size of (P<0.001). in the experimental group after exercise sessions. This study agrees with Sonu, P. (2015), There are five examples of frozen shoulder, three in men and two in women, that were taken in order to prevent disability, improve functional capacity, and give pain relief. They were all bothered by shoulder discomfort. The First Patient complain of left shoulder pain and stiffness, generalized mobility limitation, and difficulty performing Activity of Daily Living (ADL). Before physiotherapy, the Visual Analogue Scale (VAS) score was (7) and it was decreased to (3) following treatment. Both the pain and the stiffness in the joint decreased. The Second patient complain of discomfort and movement limitations. Before an exercise, the Visual Analogue Scale (VAS) score was (8) and after physiotherapy, it was lowered to (4). Both the amount of pain and the range of motion improved. The Third Patient had shoulder discomfort and stiffness, nocturnal pain, and generalized movement restriction. Before treatment, the Visual

Analogue Scale (VAS) score was (8) and after Physiotherapy, it was (5). Joint stiffness was lessened, and the patient could do daily tasks. The Fourth patient had diabetes, shoulder soreness and stiffness, acute pain with sideways lifting, and a history of trauma. The Visual Analogue Scale (VAS) score was (8) prior to treatment and decreased to (4) during Physiotherapy. He was able to perform everyday tasks because the discomfort was less intense and his range of motion had improved. The Fifth Patient had shoulder stiffness and pain, restrictions on sideways and overhead movements, and nocturnal pain. Before treatment, the (VAS) scale read (7) and after physiotherapy, it read (3) indicating a decrease in discomfort, an increase in range of motion, and an improvement in the capacity to do daily activities.

The cases examined demonstrate that physiotherapy is crucial in the treatment of patients with shoulder pain. Strengthening activities significantly reduce discomfort, improve range of motion, and reduce joint stiffness in frozen shoulder patients.

The total disability scale table (19), percentage change was (56.9%), agree with Jung and Choi, (2019), The difference in distance measured for shoulder subluxation between the experimental group and the control group was substantially higher (4.71±1.72 vs. 2.86±2.16 mm; p=0.008). Active shoulder exercise had a substantial positive impact on patients with shoulder subluxation after acute stroke, according to the study's findings when compared to the control group.

Change in the overall SPADI scale after the exercise sessions, In total the Overall Shoulder Pain and Disability Index (SPADI) was Significantly reduced in the experimental group compared to control group (P. value <0.001). The mean difference was 45.4 and the percentage change was 55.5% in the experimental group compared to 9.6 and 12.2% in the control group with a large effect size of , (P<0.001), (Table 20).

This agree through Mertens *et al.,* (2021), Patients with frozen shoulders can benefit from Exercise Treatment to increase their Range of Motion (ROM) and decreased of Pain. This is true whether the exercises are done on their own or in conjunction with other programs.

Part 4 : Discussion Changes in Dysphagia Experienced by Patients After Stroke in Both Studied Groups Before and After The Exercise Sessions:

In Tables (21, 22, 23 ,24 and 25). a significant improvement was found in the severity of dysphagia in the experimental group ($P<0.001$). At the end, posttest 2, the number of patients with improvement was 29/30 (96.7%) after exercise sessions, and only one patient had no change in the severity of dysphagia compared to 20/30 (66.7%) in the control group and 10 patients with no change in the dysphagia, the difference was significant at ($P<0.05$), more details about the changes in the dysphagia are demonstrated in addition to the comparison of improvement rates which demonstrated. This agree with Warnecke *et al*., (2017), According to the study's findings, the statistical mean changed, indicating an improvement in the findings where the mean in the pre-test was better, it was good in the post-test 1, and the results in the post-test 2 were really patients' swallowing ability, the study's findings show that the swallowing ability improved after exercise.

Furthermore, supported by Vose *et al.,* (2014), the results of the study sample overall assessment, the results that improved according to the statistical mean, the study findings indicate that the swallowing ability increased the longer the program is applied. traditional therapies focus on the prevention of secondary complications early after stroke and continue into the sub-acute stage to improve affected swallowing control, the suggested frequency is three times each day for six consecutive weeks. the exercise

increases anterior hyolaryngeal excursion, and Upper Esophageal Sphincter (UES) opening, strengthens suprahyoid muscles, and enhances thyrohyoid shortening.

This result comes out along with Park and Hwang (2021). In healthy people, CTAR exercise not only helped to activate the suprahyoid muscle but also the sternocleidomastoid muscle. Additionally, according to five articles, CTAR exercise was successful in enhancing oral food stage in the pharyngeal phase and improving swallowing function in individuals with dysphagia following stroke, including a decrease in airway aspiration.

The present study agrees with Sze *et al.,* (2016). The Chin Tuck against Resistance (CTAR) and Shaker exercises, were assessed using the principles of muscle-specificity and training intensity from the field of exercise science. Both exercises were developed to improve bolus transfer by strengthening the suprahyoid muscles, which contractions help the upper esophageal sphincter open.

Also the study with Byeon, (2016), The Masako maneuver, an exercise for swallowing rehabilitation to improve the function of the pharynx rear wall, was conducted for 20 minutes per day, 5 days a week for 4 weeks. This maneuver was performed by inducing dry swallowing. In this method, the patients softly bite the end of their tongues with their front teeth and maintain this posture while swallowing.

The study agrees with Burkhead *et al.*, (2007), Masako maneuver significantly improved the swallowing function in patients with dysphagia caused by stroke; this result agrees with those obtained by previous studies.

the study agrees with Byeon, (2016), Masako maneuver, which is an exercise for swallowing rehabilitation to improve the function of pharynx constriction by strengthening muscle strength of the tongue base, has been

reported to improve swallowing by helping the coordination of the larynx and the hyoid bone and improving the constriction of the pharynx and airway obstruction during pharyngeal swallowing.

Finally, and according to the hypotheses that I predicted at the beginning of the study, I can say, after the results that appeared in the study. The exercise sessions are for patients after a stroke who suffer from frozen shoulder and dysphagia, that exercise sessions are important and effective in a positive way in reducing pain and improving disability for frozen shoulder among experimental group after compared with control group members. The exercise sessions also has a positive and effective in reducing the severity of dysphagia and it is lead to improve the quality of life.

Chapter Six

Conclusions and Recommendations

Chapter Six

Conclusion and Recommendation

This chapter presents conclusions derived out of the discussion and interpretation of the study findings and recommendations relied on early declared conclusions.

6.1. The majority of the study sample demonstrates that ischemic stroke, diabetes mellitus, and hypertension are the most common causes of stroke.

6.2. Changes in total pain scale, the summation of the scores of different item of pain scales, revealed an overall mean score by exercise sessions. At posttest 2 the change was much larger in the experimental group and a percentage change of (53.2%). while In control group a percentage change of (13%), The effect size was large (2.16).

6.3. Changes in total disability scale after exercise sessions. a significant reduction was found in total disability scale score, ($P<0.001$). The larger in the experimental group and the percentage change was (56.9%), while in the control group was (11.7%), with a large effect size of (2.38).

6.4. The overall shoulder pain and disability index (SPDI) was (55.5%) in the experimental group compared with the control group (12.2%) , with a large effect size of ($P<0.001$).

6.5. Changes in the dysphagia severity after the exercise sessions, a significant improvement was found in the severity of dysphagia in the experimental group ($P<0.001$). the number of patients with improvement was (96.7%) compared with control group (66.7%).

6.2. Recommendations:

The researcher recommended the following in the light of the findings:

1. The Establishment of a structured program recognized the difficulties that post-stroke patients would encounter due of the lengthy recovery process, which required specially planned care to lessen the severity of frozen shoulder and dysphagia for patients via special rehabilitation facilities.

2. To improve and reduce complications, guided protocols may be required to manage the first few weeks of rehabilitation.

3. Special license nurses and a case manager should be ready, as they can assess the patient's needs and provide guidance, counseling, and referrals as necessary.

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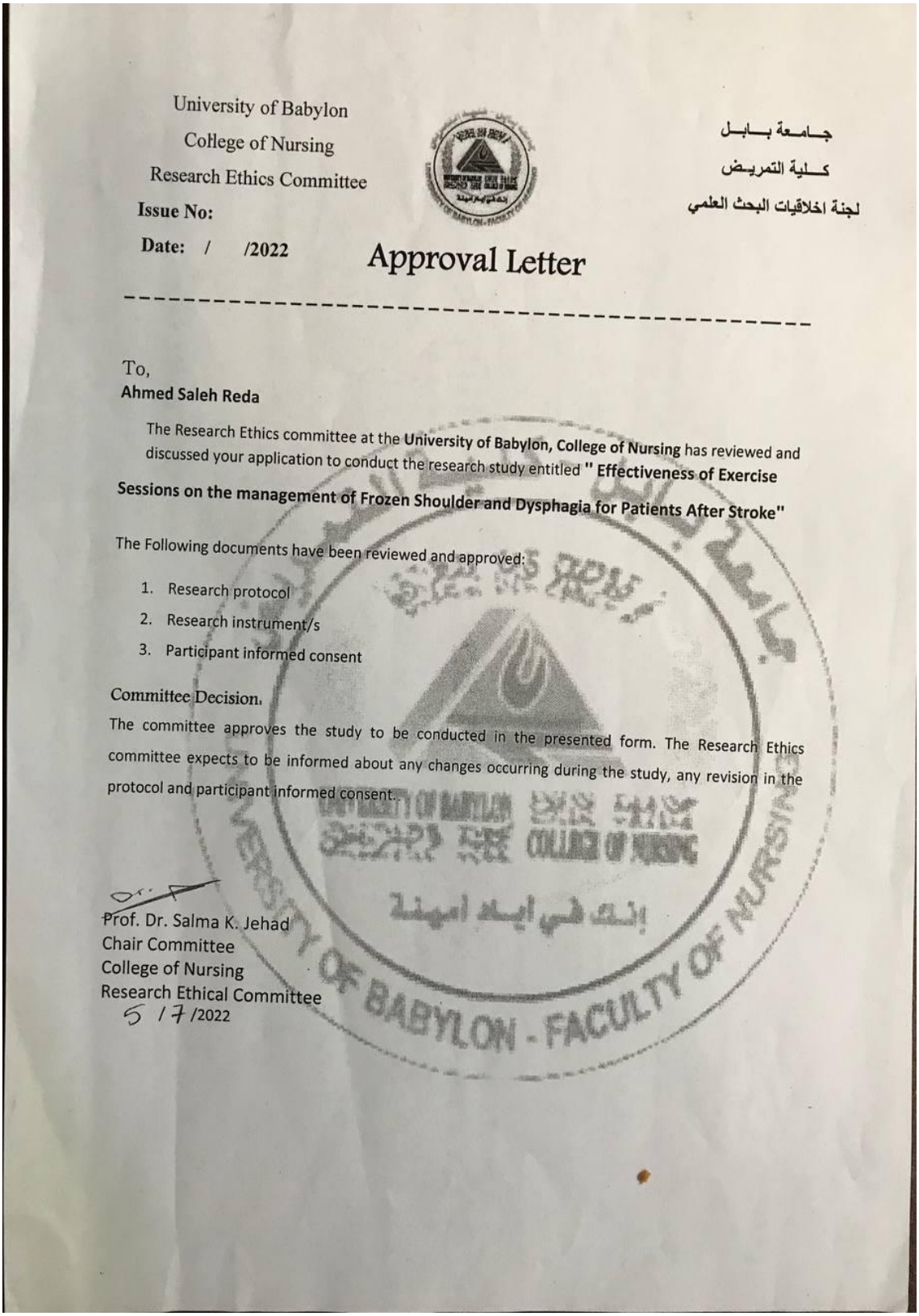
Appendices

Appendix A

Approval Letter



University of Babylon
College of Nursing
Research Ethics Committee
Issue No:
Date: / /2022

جـامـعة بـابـل
كـلية التمريـض
لجنة اخلاقيات البحث العلمي

Approval Letter

To,
Ahmed Saleh Reda

The Research Ethics committee at the **University of Babylon, College of Nursing** has reviewed and discussed your application to conduct the research study entitled **" Effectiveness of Exercise Sessions on the management of Frozen Shoulder and Dysphagia for Patients After Stroke"**

The Following documents have been reviewed and approved:

1. Research protocol
2. Research instrument/s
3. Participant informed consent

Committee Decision.

The committee approves the study to be conducted in the presented form. The Research Ethics committee expects to be informed about any changes occurring during the study, any revision in the protocol and participant informed consent.

Prof. Dr. Salma K. Jehad
Chair Committee
College of Nursing
Research Ethical Committee
5 / 7 /2022

Appendix B1

Administrative Agreement

Republic of Iraq
Najaf Governorate
Najaf Health Directorate
Training and Human Development Center
No.

جمهورية العراق
محافظة النجف الأشرف
مركز التدريب والتنمية البشرية
العدد : ٩٧٤٨
التاريخ : ١٧ / ٧ / ٢٠٢٢

إلى/ جامعة بابل / كلية التمريض
م / تسهيل مهمة

تحية طيبة ...
كتابكم ذي العدد ٢٣٦٩ في ٦ /٧/ ٢٠٢٢ ، بخصوص تسهيل مهمة الباحث طالب الدراسات العليا /الدكتوراه (**احمد صالح رضا راضي**) لإجراء البحث الموسوم .

Effectiveness of exercise sessions on the management frozen shoulder and dysphagia for patients after stroke

حصلت موافقة اللجنة العلمية للبحوث / مركز الدائرة على إجراء البحث في (مدينة الصدر الطبية/مركز الفرات الاوسط للعلوم العصبية) على أن لا تتحمل دائرتنا أية تبعات مادية ولا يسمح بإخراج العينات خارج المختبر..... مع الاحترام .

دائرة صحة النجف الاشرف

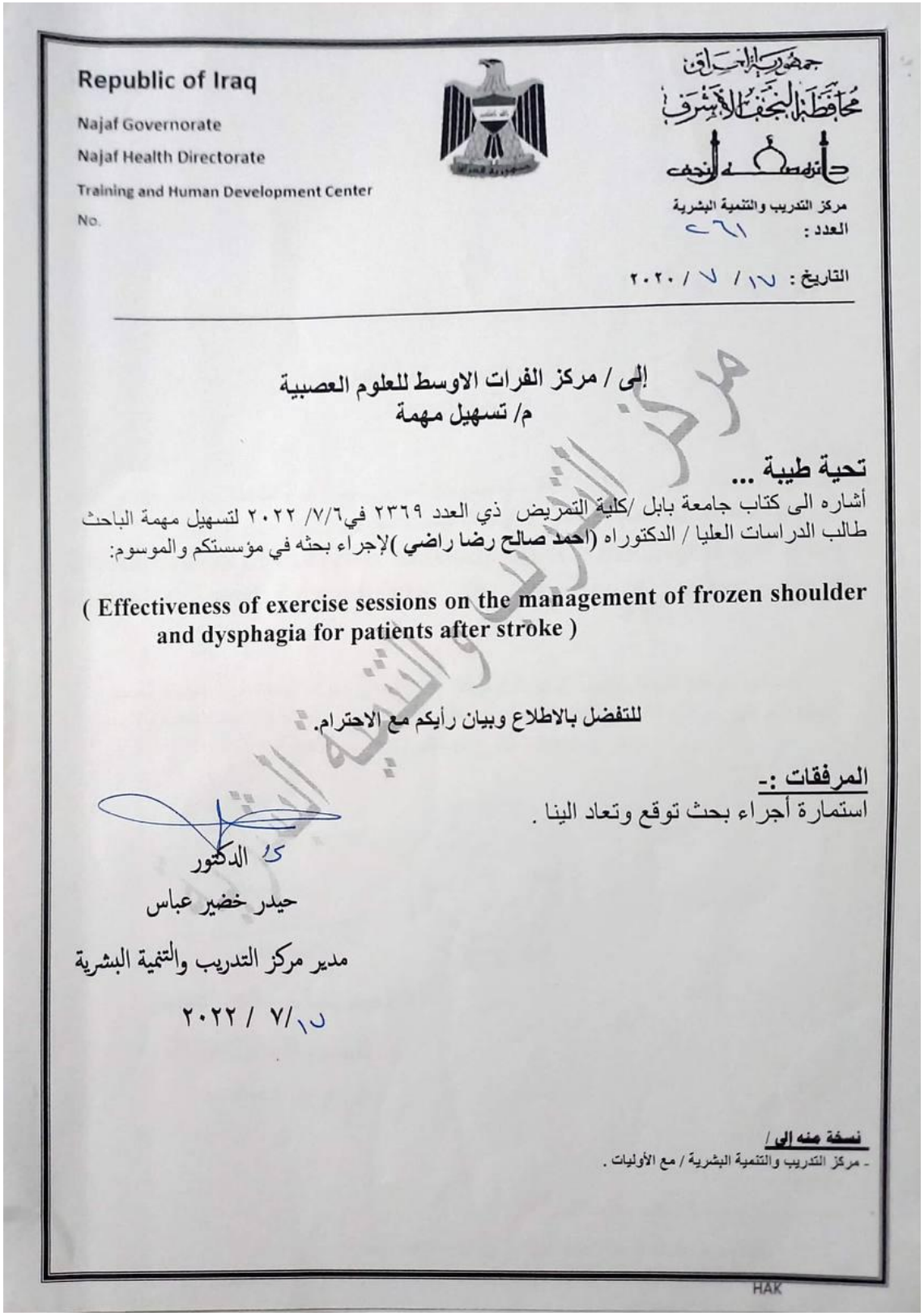
الدكتور
احمد عباس طاهر الاسدي
المدير العام/وكالة
٢٠٢٢/ ٧ /١٧

نسخة منه الى:
مركز التدريب والتنمية البشرية/ شعبة ادارة المعرفة والبحوث
مدينة الصدر الطبية / مركز الفرات الاوسط للعلوم العصبية / تسهيل مهمة الباحث.....مع الاحترام

HAK

Appendix B2

Administrative Agreement



Republic of Iraq
Najaf Governorate
Najaf Health Directorate
Training and Human Development Center
No.

جمهورية العراق
محافظة النجف الأشرف
مركز التدريب والتنمية البشرية
العدد : ٦١
التاريخ : ١٧ / ٧ / ٢٠٢٠

إلى / مركز الفرات الاوسط للعلوم العصبية
م/ تسهيل مهمة

تحية طيبة ...

أشاره الى كتاب جامعة بابل /كلية التمريض ذي العدد ٢٣٦٩ في٦/٧/ ٢٠٢٢ لتسهيل مهمة الباحث طالب الدراسات العليا / الدكتوراه (**احمد صالح رضا راضي**)لإجراء بحثه في مؤسستكم والموسوم:

(Effectiveness of exercise sessions on the management of frozen shoulder and dysphagia for patients after stroke)

للتفضل بالاطلاع وبيان رأيكم مع الاحترام.

المرفقات :-
استمارة أجراء بحث توقع وتعاد الينا .

الدكتور
حيدر خضير عباس
مدير مركز التدريب والتنمية البشرية
١٧/ ٧ / ٢٠٢٢

نسخة منه إلى /
- مركز التدريب والتنمية البشرية / مع الأوليات .

HAK

Appendix C1

Need Assessment

No.	Age	Sex	Level of Education	Duration of Stroke	Scoring
1	70	Male	Primary school graduate	14 Days	28
2	52	Male	able to read and write	17 Days	42
3	60	Female	unable to read and write	15 Days	42
4	65	Female	able to read and write	10 Days	42
5	45	Male	primary school graduate	16 Days	45
6	65	Male	primary school graduate	15 days	35
7	50	Male	unable to read and write	14 days	21
8	60	Male	primary school graduate	10 days	35
9	52	Male	Intermediate school graduate	14 days	35
10	73	Male	Institute graduated	12 days	45
General					**37**

Appendix C2

Needs Assessment Questions (MCQ)

- Sex ----------
- Age ----------
- Duration of stroke ----------
- Level of education ----------

Frozen shoulder MCQ

1. Stability in the glen humeral joint is derived primarily from the ____

a) **Joint Contact Area**

b) Ligaments and Muscles

c) Vacuum in The Joint

d) None of The Above

2. Slowly lowering the arm in the sagittal plane would use the ____ muscle group.

a) Shoulder Flexor

b) Shoulder Extensor

c) Shoulder Abductor

d) Shoulder Adductor

3. The greatest strength output in the shoulder is generated in _____.

a) extension

b) flexion

c) **abduction**

d) adduction

4. Impingement at the shoulder can be minimized by ____ motion.

a) Shoulder Abduction

b) Shoulder Flexion

c) **Shoulder Internal Rotation**

d) Shoulder External Rotation

5. What is the plane of motion when performing abduction about the glenohumeral joint?

a) **Frontal**
b) Sagittal
c) Transverse
d) Horizontal

6. What action is caused by the levator scapula muscle?

a) Shoulder flexion
b) Shoulder extension
c) **Scapula elevation**
d) Scapula depression

7. Which muscle does not directly move the scapula?

a) Pectoralis minor
b) **Subclavius**
c) Rhomboids
d) Trapezius

8. Which muscle causes internal rotation of the humerus?

a) Pectoralis minor
b) **Subscapularis**
c) Trapezius
d) Rhomboid

Dysphagia MCQ

1. What is dysphagia?

a) Failure to swallow solids
b) Failure to swallow liquids
c) Failure to swallow solids and liquids
d) All of the above

2. Which of the following is a treatment for dysphagia?

a) Strengthening the facial muscles

b) Learning new techniques of eating

c) Preparing food to allow easier swallowing

d) All of the above

3. Which is the age category commonly affected by dysphagia?

a) Infant

b) Children

c) Adult

d) Elderly

4. How many stages exist in the action of swallowing?

a) 1 stage

b) 3 stage

c) 4 stage

d) 7 stage

5. What are the causes of dysphagia?

a) Cancer of the head and neck

b) Infection of esophagus

c) Paralysis

d) All of the above

6. What are the complications of dysphagia?

a) Aspirating food

b) Malnutrition

c) All of the above

d) Not of the above

اسئلة اختيارات متعددة حول الكتف المتجمد وعسر البلع

- **الجنس----------**
- **العمر----------**
- **مدة الجلطة الدماغية----------**
- **مستوى التعليم----------**

اسئلة الكتف المتجمد

1. الثبات في مفصل الكتف ناشئ بشكل أساسي من_____.

أ- منطقة اتصال المفصل

ب- الأربطة والعضلات

ت- . فراغ في المفصل

ث- . لا شيء مما بالأعلى

2. تحريك الذراع ببطء الى الاسفل يتم باستخدام عضلات _____.

أ- ثني الكتف

ب- بسط الكتف

ت- رفع الكتف

ث- خفض الكتف

3. تحتاج عضلات الكتف الى قوة كبير عند _____.

أ. مده

ب. ثنيه

ت. **رفعه**

ث. انزاله

4. يمكن التقليل من اجهاد الكتف بحركة_____.

أ. رفع الكتف

ب. ثني الكتف

ت. **الدوران الداخلي للكتف**

ث. الدوران الخارجي للكتف

5. ما هو مستوى الحركة عند إجراء رفع مفصل الكتف؟

أ. أمامي

ب. السهمي

ت عرضي

ث. أفقي

6. ما هي الحركة التي تسببه تقلص عضلة لوح الكتف؟

أ. ثني الكتف

ب. فتح الكتف

ت. **ارتفاع الكتف**

ث. انخفاض الكتف

7. أي عضلة لا تحرك لوح الكتف مباشرة؟

أ. لعضلة الصدرية الصغرى

ب. **تحت الترقوة**

ت. عضلات الظهر الكبيرة والصغيرة

ث. العضلة الشبه منحرف

8. ما هي العضلة التي تسبب الدوران الداخلي لعظم العضد؟

أ. صدرية الصغرى

ب. **عضلة تحت الكتف**

ت. شبه منحرف

ث. عضلات الظهر الكبيرة والصغيرة

اسئلة عسر البلع

1. ما هو عسر البلع؟

أ- عدم بلع المواد الصلبة

ب- عدم بلع السوائل

ت- عدم بلع المواد الصلبة والسوائل

ث- كل ما سبق

2. أي مما يلي هو علاج لعسر البلع؟

أ- تقوية عضلات الوجه

ب- تعلم تقنيات جديدة في الأكل

ت- تحضير الطعام لتسهيل البلع

ث- كل ما سبق

3. ما هي الفئة العمرية التي تتأثر عادة بعسر البلع؟

أ- الرضع

ب- الأطفال

ت- .البالغين

ث- **.كبار السن**

4. تتم عملية البلع على عده مراحل ؟

أ- مرحلة واحدة

ب- ثلاثة مراحل

ت- اربعة مراحل

ث- سبعة مراحل

5 . ما هي أسباب عسر البلع؟

أ- سرطان الرأس والرقبة

ب- التهاب المريء

ت- الشلل

ث- كل ما سبق

6. ما هي مضاعفات عسر البلع؟

أ. استنشاق الطعام

أ- سوء التغذية

ب- كل مما سبق

ت- .ليس مما ورد أعلاه

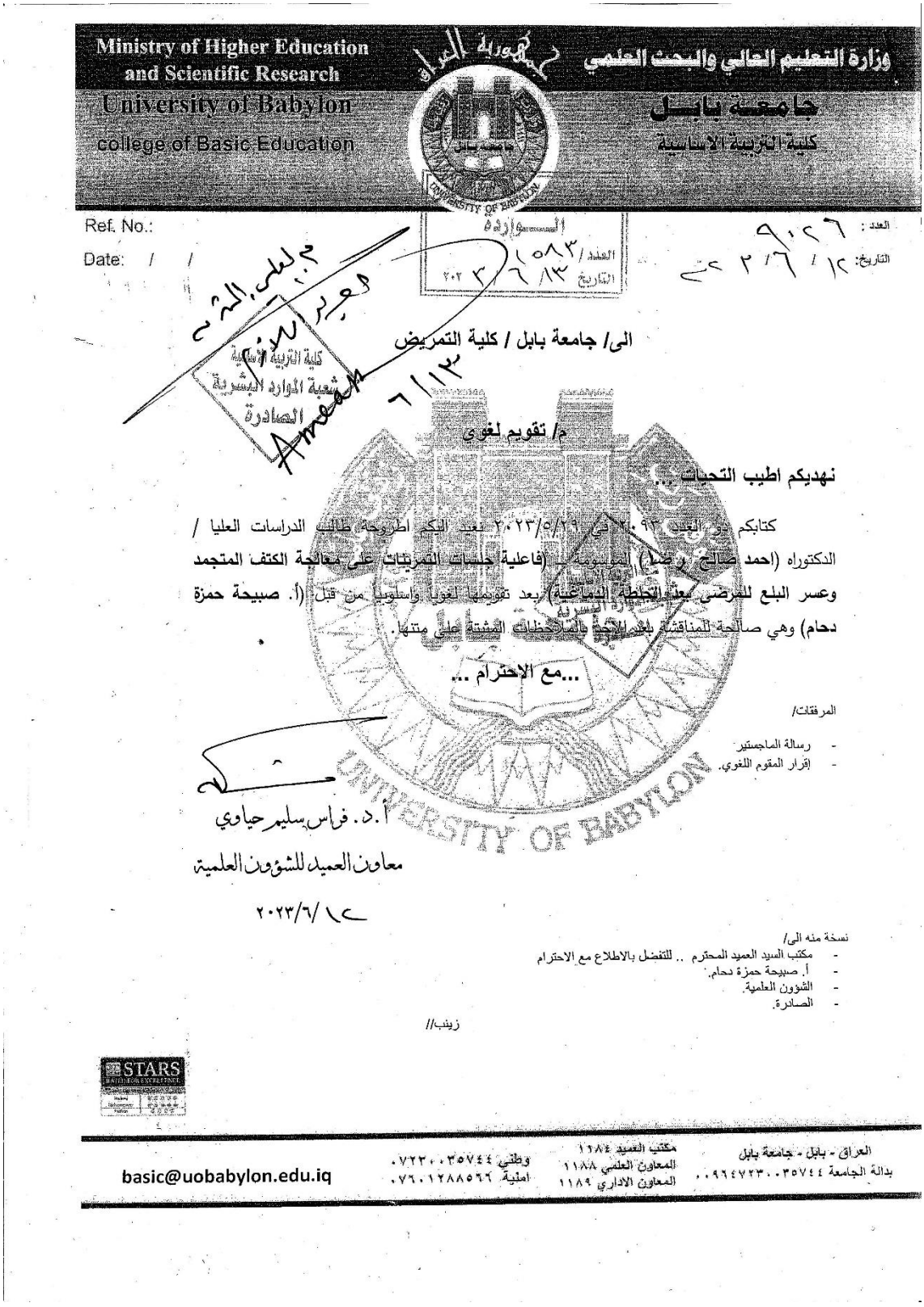
Appendix D

Panel of experts

ت	اسم الخبير	اللقب العلمي	مكان العمل	الاختصاص الدقيق	سنوات الخبرة
1.	د .راجحة عبد الحسن حمزة	أستاذ	جامعة الكوفة / كلية التمريض	تمريض بالغين	39سنة
2.	د. حسين هادي عطية	استاذ	جامعة بغداد / كلية التمريض	تمريض بالغين	38 سنة
3.	د. هدى باقر حسن	استاذ	جامعة بغداد / كلية التمريض	تمريض بالغين	36 سنة
4.	د. شذى سعدي محمد	استاذ	جامعة بابل / كلية التمريض	تمريض بالغين	29 سنة
5.	د. ماهر خضير هاشم	استاذ مساعد	جامعة بابل / كلية التمريض	لغة عربية/ لغة	20سنة
6.	د. حيدر وليد الموسوي	طبيب اختصاص (بورد)	مركز الفرات الاوسط للعلوم العصبية	طب الاعصاب والدماغ	20 سنة
7.	د. ضياء كريم عبد علي	استاذ مساعد	جامعة الكوفة / كلية التمريض	تمريض بالغين	18سنة
8.	د. صادق عبد الحسين حسن	استاذ مساعد	جامعة بغداد / كلية التمريض	تمريض بالغين	17 سنة
9.	د. محمد راضي رديف	استاذ مساعد (بورد)	جامعة الكوفة / كلية الطب	طب الجملة العصبية	16 سنة
10.	د. اسعد عادل منعثر	استاذ مساعد (بورد)	جامعة المثنى / كلية الطب	طب الجملة العصبية	15 سنة
11.	د. حسنين عباس الخالدي	استاذ مساعد (بورد)	جامعة الكوفة / كلية الطب	طب الجملة العصبية	15 سنة
12.	د. احمد سمير شبع	طبيب اختصاص (بورد)	مركز الفرات الاوسط للعلوم العصبية	طب الجملة العصبية	15 سنة

Appendix E

Linguist's certification



Ministry of Higher Education and Scientific Research
University of Babylon
college of Basic Education

وزارة التعليم العالي والبحث العلمي
جامعة بابل
كلية التربية الاساسية

Ref. No.:
Date: / /

العدد: ٩٠٢٦
التاريخ: ١٢ / ٦ / ٢٠٢٣

الى/ جامعة بابل / كلية التمريض

م/ تقويم لغوي

نهديكم اطيب التحيات ..

كتابكم ذو العدد ٩٣٠٢٦ في ٢٠٢٣/٥/٢٩ بعد اليكم اطروحة طالب الدراسات العليا / الدكتوراه (احمد صالح رضا) الموسومة بـ (فاعلية جلسات التمرينات على معالجة الكتف المتجمد وعسر البلع للمرضى بعد الجلطة الدماغية) بعد تقويمها لغويا واسلوبيا من قبل (أ. صبيحة حمزة دحام) وهي صالحة للمناقشة بعد الاخذ بالملاحظات المثبتة على متنها.

...مع الاحترام ..

المرفقات/
- رسالة الماجستير
- إقرار المقوم اللغوي.

أ.د. فراس سليم حياوي
معاون العميد للشؤون العلمية
٢٠٢٣/٦/١٢

نسخة منه الى/
- مكتب السيد العميد المحترم .. للتفضل بالاطلاع مع الاحترام
- أ. صبيحة حمزة دحام.
- الشؤون العلمية.
- الصادرة.

زينب//

العراق - بابل - جامعة بابل
بداله الجامعة ٠٢٣٥٧٤٤ ٠٠٩٦٤٧٢٣
مكتب العميد ١١٨٤
المعاون العلمي ١١٨٨
المعاون الاداري ١١٨٩
وطني ٠٧٢٣٠٣٥٧٤٤
اصلية ٠٧٦٠١٢٨٨٥٦٦
basic@uobabylon.edu.iq

Appendix F

Ethics Committee Form

كلية التمريض – جامعة بابل
لجنة أخلاقيات البحوث العلمية

نموذج موافقة الاشخاص للمشاركة بالبحوث العلمية

استمارة رقم (3)

رقم الاستمارة:
التاريخ

Ethics Committee Form

السيد / السيدة .....

أنت مدعو للمشاركة بمشروع بحث علمي بعنوان:

(فاعلية جلسات التمرينات في معالجة الكتف المتجمد وعسر البلع للمرضى بعد الجلطة الدماغية)

يرجى أن تأخذ الوقت المناسب لقراءة المعلومات الآتية بتأنٍ قبل أن تقرر إذا ما كنت راغباً بالمشاركة أم لا. وبإمكانك طلب مزيداً من الإيضاحات أو المعلومات الإضافية عن أي أمر مذكور بالاستمارة أو عن الدراسة من الباحث أو اي مختص أخر.

أولا : معلومات البحث	
اسم الباحث / أحمد صالح رضا	
اسم المشرف/ أ.د. سحر ادهم علي	
أهداف البحث/	**1. – لتقييم حاجة المرضى إلى جلسات التمرينات لتقليل تأثير تجمد الكتف وعسر البلع في حياتهم.** **2- التحضير لجلسات تمرينات في معالجة الكتف المتجمد وعسر البلع لدى المرضى بعد الجلطة الدماغية.** **3- تحديد مدى فاعلية جلسات التمرينات للمرضى بعد الجلطة الدماغية فيما يتعلق بالكتف المتجمد وعسر البلع.** **4. التعرف على العلاقة بين فعالية جلسات التمرينات والخصائص الديموغرافية لعينة الدراسة مثل (العمر والجنس والمستوى التعليمي).**
الفترة المتوقعة لمشاركة الشخص في البحث	**6 أسابيع**
الاجراءات المتبعة في جمع العينات	
المخاطر المتوقعة كنتيجة للمشاركة في البحث	**لا يوجد**
الفوائد التي ستعود على الشخص مقابل الاشتراك في البحث	**لتقليل تأثير تجمد الكتف وعسر البلع للمرضى بعد الجلطة الدماغية على الاخرين**

ثانيا: معلومات للشخص المشارك بالبحث
1. ان المشاركة في هذا البحث طوعية
2. بإمكانك سَحب مشارَكتك من الدِراسة متى شئت ولأي سبب
3. من حقك ان لا تجيب عن اي سؤال لا ترغب بإجابته
4. ان مشاركتك بالبحث لن تحملك اي نفقات مالية
5. ان مشاركتك بالبحث لا يترتب عليها اي مسائلة قد تضر بك شخصيا أو بعملك.
6. ان اسمك سيكون سريا و إن المعلومات الناتجة عن مشاركتك سوف تعامل بسرية تامة ولن يطلّع عليها أي شخص ما عدا الباحث والمشرف ولجنه الاخلاقيات عند الضرورة.
7. وأن المعلومات التي ادليت بها والنتائج العلمية لهذا البحث هي للأغراض العلمية فقط ولن تكون هناك أية إشارة إلى لك أو لعائلتك في أي منشور عن هذه الدراسة.
8. ان من حقك بمعرفة النتائج العامة للبحث، او اي نتائج تتعلق بك بصورة خاصة.

ثالثا: معلومات الاتصال
في حال وجود اي استفسار او شكوى من قبلك حول مشروع البحث بإمكانك الاتصال بالباحث أو لجنة اخلاقيات البحث في جامعة بابل – كلية التمريض
اسم الباحث أحمد صالح رضا رقم الهاتف 07803479400 البريد الالكتروني ahmedsalehreda03@gmail.comu.iq
لجنة أخلاقيات الابحاث العلمية – جامعة بابل – كلية التمريض: رقم الهاتف البريد الالكتروني mailto:ammar_shalan@yahoo.com.au

اسم المشترك بالبحث: توقيعه : التاريخ:2022/ /

Appendix G

Questionnaire

Part I: Demographical data.

1. Age ☐ **years**

2. Sex: **Male** ☐ **Female** ☐

3. Marital Status:

- Single ☐
- Married ☐
- Divorced ☐
- Widowed ☐
- Separated ☐

4. Educational Status:

- Unable to read and write ☐
- Able to read and write ☐
- Primary school graduate ☐
- Intermediate school graduated ☐
- Preparatory school graduated ☐
- Institute graduated ☐
- College graduated ☐

5. Occupation:

- Employee ☐
- Free working ☐
- Retired ☐
- Jobless ☐
- Housewife ☐

6. Residency:

- Rural ☐
- Urban ☐

Part II: Medical History:

A – Present History

1. Type of stroke

- Ischemic stroke ☐
- Hemorrhagic stroke ☐

2. Body side that is affected by stroke:

Right sided ☐ Left sided ☐

3. Recurrence of stroke: Yes ☐ **No** ☐

- Duration of stroke / Day ☐

4. Using Tube Feeding Yes ☐ **No** ☐

5. **Family History for Stroke** **Yes** ☐ **No** ☐

6. **Associated Chronic Diseases**

- Hypertension ☐
- Diabetic mellitus ☐
- Congestive Heart failure ☐
- Coronary artery disease ☐
- Renal failure ☐
- Atrial fibrillation ☐
- Sickle cell disease ☐
- Other ☐

7. **Smoking** Yes ☐ No ☐

- For how long/ year ☐
- How many cigarette/day ☐

8. **Body Mass Index** **W** ☐ **H** ☐ **BMI =** ☐

9. **Complications of Stroke**

- Headache ☐
- Seizure ☐
- Urinary Tract Infection (UTI) ☐
- Pneumonia ☐
- Bedsore ☐
- Deep Venous Thrombosis (DVT) ☐

Part: III: Frozen shoulder and Dysphagia Assessment

A: Shoulder Pain and Disability Index (SPADI)

Pain scale.

At its worst?	0	1	2	3	4	5	6	7	8	9	10
When lying on the involved side?	0	1	2	3	4	5	6	7	8	9	10
Reaching for something on a high shelf?	0	1	2	3	4	5	6	7	8	9	10
Touching the back of the neck?	0	1	2	3	4	5	6	7	8	9	10
Pushing with the involved arm?	0	1	2	3	4	5	6	7	8	9	10

Disability scale

Washing the hair	0	1	2	3	4	5	6	7	8	9	10
Washing back back	0	1	2	3	4	5	6	7	8	9	10
Putting on an undershirt or jumper	0	1	2	3	4	5	6	7	8	9	10
Putting on a shirt that buttons down the front	0	1	2	3	4	5	6	7	8	9	10
Putting on pants	0	1	2	3	4	5	6	7	8	9	10
Placing an object on a high shelf	0	1	2	3	4	5	6	7	8	9	10
Carrying a heavy object of 10 pounds (4.5 kg.)	0	1	2	3	4	5	6	7	8	9	10
Removing something from back pocket	0	1	2	3	4	5	6	7	8	9	10

B: dysphagia scale: (lower esophageal sphincter LES)

Severity	Score	Description
No dysphagia	**0**	Normal passage of food from lower esophageal sphincter zone.
Mild dysphagia	**1**	Sensation or short delay of passage of dysphagia food from lower esophageal sphincter, without the need of water.
Moderate dysphagia	**2**	Need of water for passage of food from dysphagia lower esophageal sphincter zone.
Severe	**3**	Accompanied with passive or active dysphagia regurgitation.

The Exercise Sessions on the Frozen Shoulder and Dysphagia

Introduction:

patients who have frozen shoulder (adhesive capsulitis) are advised to do physical therapy exercises that are physically challenging but do not trigger shoulder pain. The exercises described below are designed for people experiencing moderate to severe frozen shoulder symptoms.

Swallowing is a complex motor skill that requires the coordination of a multitude of nerves and muscles. Individuals with neurological conditions such as cerebral palsy, dementia, cervical spine injury, or a stroke, may experience difficulty swallowing. Known as dysphagia, symptoms of trouble swallowing can range from excess saliva production to choking while eating. Further complications such as aspiration pneumonia may also occur.

General objectives:

1. Identify the benefit of regular preaching of exercise to improve daily living activities and enhance the quality of life .
2. To understand the advantage of exercise session to decrease shoulder pain, which is recommended to improve shoulder range of motion.
3. To assign the importance of exercise sessions for enhancement of swallowing abilities to maintain normal diet and safe efficient alimentation and hydration .
4. Aware of the positive effect of the exercise as un prevention intervention to reduce the complication of dysphagia like aspiration pneumonia .

5. To know that early interventions and exercise for dysphagia in stroke have an important role in recovery from dysphagia and prevention of complications like aspiration pneumonia.

6. to identify and treat abnormalities of feeding and swallowing while maintaining safe and efficient alimentation and hydration.

First Session: The Exercise sessions on Frozen Shoulder.

Introduction:

Patients with severe cases may notice that their shoulder's active range of motion is less than passive range of motion. (Active range of motion is movement a person can perform individually, without assistance) Because of this fact, many of the recommended exercises require assistance from a therapist, the patient's healthy arm, or an object such as a cane or pole.

Special objectives:

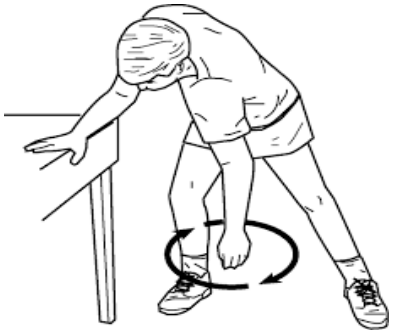
1. To identify that the exercise sessions are recommended for reducing pain, improving range of motion and function in patient with frozen shoulder after stroke as well as for improving passive external rotation and abduction range of motion.

2. To understand that the exercise sessions also support the evidence of using local corticosteroid injections as the treatment of choice in patients with frozen shoulder after stroke.

Contents:

8. Pendulum stretches:

this exercise first. Relax the shoulder. Stand patient and lean over slightly, allowing the affected arm to hang down. Swing the arm in a small circle about a foot in diameter. Perform 10 revolutions in each direction, once a day. As the symptoms improve, increase the diameter of swing, but never force it. than, increase the stretch by holding a light weight three to five pounds Approximately (1.5 – 2.5) kg. in the swinging arm.



2 .Towel stretch:

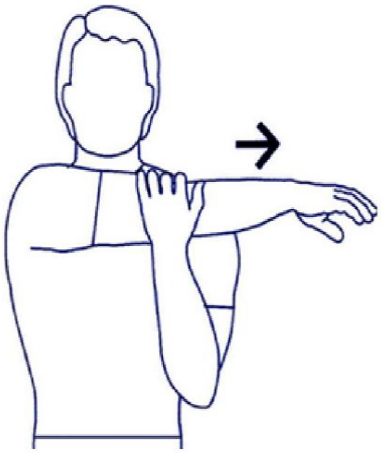
Hold one end of a three-foot-long towel behind your back and grab the opposite end with other hand. Hold the towel in a horizontal position. Use good arm to pull the affected arm upward to stretch it. Hold the bottom of the towel with the affected arm and pull it toward the lower back with the unaffected arm.

3 .Fingers walk:

- Stand in front of a wall, keeping an arm's length distance from it.
- Using one arm, for effected shoulder slowly reach out and touch the wall with your fingertips, keeping your arm slightly bent at waist level.
- Slowly move fingers up the wall, moving arm upward as far as passible with comfortable manner.
- Walk fingers back down the wall to the starting position.

4 .Cross-body reach:

Use the good arm to lift affected arm at the elbow, and bring it up and across body, exerting gentle pressure to stretch the shoulder. Hold the stretch for 15 to 20 seconds. Do these 10 to 20 times per day.

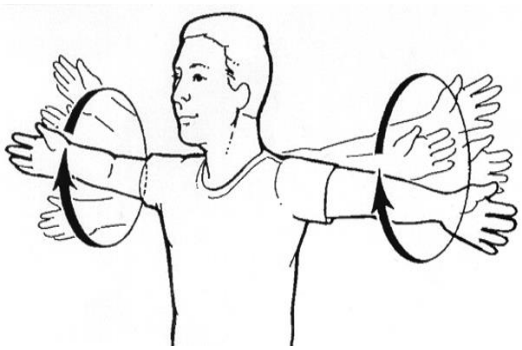


5 .Armpit stretch:

- Stand in front of a shelf that is breast high.
- Place the arm on the shelf.
- Slightly bend knees to open up the armpit, and stretch the armpit as comfortably as you can.
- Try bending a bit deeper each time.

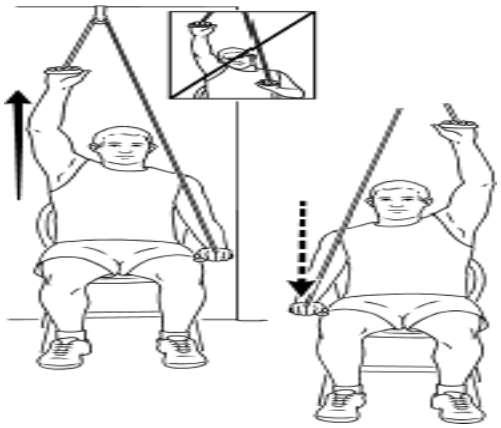
6. Arm circles:

- Sit on a flat surface, keeping back straight.
- Try to make small circles in the air, both clockwise and counter-clockwise.
- Do this simple exercise 2 or 3 times a day.



7. shoulder flexion:

- Stand straight with back supported by the wall.
- Using the pulley handle, lift the unaffected arm in the air in full-extended motion, while keeping the injured arm by the side of body.
- Hold this position for a few seconds.
- Extend the injured arm over head, while keeping the unaffected arm by the side of the body.
- Relax and repeat the exercise again.
- Do it 10 times to complete a cycle.
- Do this exercise at least once daily.



Teaching strategies:

- Place: center of the session.
- Duration of the session: 15 minutes.
- Teaching methods: Lecture, discussion, and role play.
- Teaching aids: Power Point presentation, images, videos, and Towel to explain the stretch.

Second Session: The Exercise program on Dysphagia.

The exercise secessions designed to improve swallowing are focused on strengthening muscles and building coordination of the nerves and muscles involved in swallowing، Exercising swallowing muscles is the best way to improve your ability to swallow, the purpose of exercise sessions to strengthen muscles and improve the ability to swallow.

Special objectives:

1. To identify that early exercise for patients with dysphagia in stroke have an important role in recovery from dysphagia and to prevent infection of the lungs called aspiration pneumonia may also occur, as can malnutrition and dehydration.

2. To understand the importance of exercise to prevent the swallowing difficulties can result in excess production of saliva, drooling, coughing or choking during eating, and even difficulty speaking or a hoarse voice.

3. To learn how to treat abnormalities of feeding and swallowing while maintaining safe and efficient alimentation and hydration.

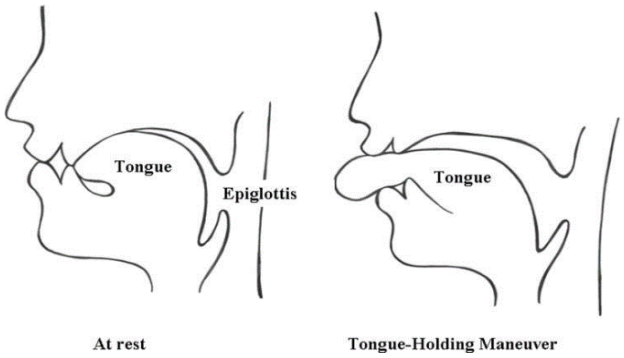
Contents:

4. Shaker's exercise:

- Strengthens muscles at the back of throat (epiglottis and esophageal opening).
- When lying down flat, lift up your head until seeing toes.
- Keep head up for one minute.
- Repeat 30 times, 3 sets a day.

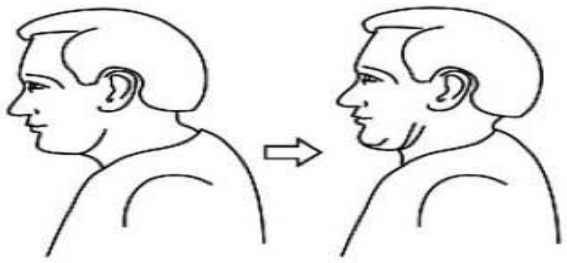
5. Masako exercises:

- Trains tongue and throat.
- Stick tongue out and gently bite the tip of tongue. While still biting the tongue, try to swallow saliva.
- Repeat 30 times, 3 times a day.



6. CTAR exercise (Chin Tuck Against Resistance):

- Strengthens muscles at the back of throat (epiglottis and esophageal opening).
- In a sitting position, put a small ball under the chin.
- Press the chin down against the ball or rolled cloth.
- Repeat 30 times, 3 times a day.



Teaching strategies:

- Place: center of the session.
- Duration of the session: 10 minutes.
- Teaching methods: Lecture, discussion, and role play.
- Teaching aids: PowerPoint presentation, images, videos, and Towel to explain the stretch.

الاستبانة

الجزء الاول : المعلومات الشخصية

1. **العمر** ☐ سنة

2. **الجنس :** ذكر ☐ أنثى ☐

3. **الحالة الزوجية**

- أعزب ☐
- متزوج ☐
- مطلق ☐
- أرمل ☐
- منفصل ☐

4. **المستوى العلمي** ☐

- لايقرا ولايكتب ☐
- يستطيع القراءة والكتابة ☐
- حاصل على شهادة الابتدائية ☐
- حاصل على شهادة المتوسطة ☐
- حاصل على شهادة الاعدادية ☐
- حاصل على شهادة دبلوم معهد ☐
- حاصل على شهادة بكالوريوس فأعلى ☐

5. الحالة العملية

- موظف
- عمل حر
- متقاعد
- عاطل عن العمل / لا يعمل
- ربة بيت

6. بيئة السكن :

- ريف
- حضر

الجزء الثاني: المعلومات السريرية

أ- تاريخ التشخيص

10. نوع الجلطة الدماغية

- خثرة
- نزف

11. الجانب المتأثر من الجلطة الدماغية

الجانب الأيمن الجانب الايسر

12. تكرار الجلطة نعم لا

- **مدة الجلطة**

13. استخدام أنبوب التغذية نعم لا

14. **تاريخ الأسرة للجلطة** نعم ☐ لا ☐

15. **مصاحبة الأمراض المزمنة**

- ارتفاع ضغط الدم ☐
- داء السكري ☐
- عجز القلب ☐
- امراض الشرايين التاجية ☐
- الفشل الكلوي ☐
- ارتجاف الأذيين ☐
- امراض الخلايا المنجلية ☐
- أخرى ☐

16. **التدخين** **نعم** ☐ **لا** ☐

- **مدة التدخين** ☐
- **عدد مرات التدخين في اليوم** ☐

17. **موشر كتلة الجسم** **الوزن** ☐ **الطول** ☐ = ☐

18. **مضاعفات الجلطة**

- صداع ☐
- نوبة دماغية ☐
- التهاب المجاري البولية ☐
- التهاب الرئة ☐
- قرحة فراش ☐
- خثرة وريدية عميقة ☐

الجزء الثالث: الكتف المتجمدة وعسر البلع

أ: مؤشر (الكتف المتجمدة) : آلم الكتف وصعوبة الحركة

مقياس الألم:

1. مقدار الالم في أسوأ حالاته	0	1	2	3	4	5	6	7	8	9	10
2. مقداره عندما تستلقي على الجانب المصاب؟	0	1	2	3	4	5	6	7	8	9	10
3. عندما تبحث عن شيء ما على مكان مرتفع؟	0	1	2	3	4	5	6	7	8	9	10
4. مقدار الالم عند لمس منطقة خلف العنق؟	0	1	2	3	4	5	6	7	8	9	10
5. مقداره عند رفع الذراع المتأثرة؟	0	1	2	3	4	5	6	7	8	9	10

مقياس الاعاقة:

1. عند غسل او لمس الشعر	0	1	2	3	4	5	6	7	8	9	10
2. عند غسل او لمس خلف الجسم	0	1	2	3	4	5	6	7	8	9	10
3. عند ارتداء قميص او سترة	0	1	2	3	4	5	6	7	8	9	10
4. مقداره عند ارتداء قميصًا ذات الأزرار	0	1	2	3	4	5	6	7	8	9	10
5. مقداره عند ارتداء البنطلون او السراويل	0	1	2	3	4	5	6	7	8	9	10
6. مقداره عندما تضع شيئًا على مكان عالٍ	0	1	2	3	4	5	6	7	8	9	10
7. عند حمل اشياء ثقيلة وزنه 10 أرطال (4.5 كجم)	0	1	2	3	4	5	6	7	8	9	10
8. عند اخراج شيء من الجيب الخلفي؟	0	1	2	3	4	5	6	7	8	9	10

ب: عسر البلع

مقياس عسر البلع:

شدة الحالة	درجة	وصف الحالة
لايوجد عسر في االبلع	0	المرور الطبيعي للغذاء من منطقة العضلة العاصرة للمريء السفلية.
عسر بلع خفيف	1	إحساس أو تأخير قصير لمرور الطعام من خلال العضلة العاصرة للمريء السفلية دون الحاجة إلى الماء.
عسر بلع متوسط	2	الحاجة إلى الماء لمرور الطعام من منطقة العضلة العاصرة المرئية السفلية .
عسر بلع حاد	3	يرافقه قلس سلبي أو نشط عسر البلع.

الجلسات التمرينية في معالجة الكتف المتجمد وعسر البلع

مقدمة:

يُنصح المرضى الذين يعانون من تجمد الكتف (التهاب المحفظة اللاصق) بممارسة تمارين العلاج الطبيعي التي تمثل تحديًا جسديًا ولكنها لا تسبب آلامًا في الكتف. تم تصميم التمارين الموضحة أدناه للأشخاص الذين يعانون من أعراض الكتف المتجمدة المتوسطة إلى الشديدة.

البلع مهارة حركية معقدة تتطلب التنسيق بين العديد من الأعصاب والعضلات. قد يعاني الأفراد المصابون بحالات عصبية مثل الشلل الدماغي أو الخرف أو إصابة العمود الفقري العنقي أو السكتة الدماغية ، من صعوبة في البلع. يمكن أن تتراوح أعراض صعوبة البلع ، المعروفة باسم عسر البلع ، من إفراز اللعاب الزائد إلى الاختناق أثناء تناول الطعام. قد تحدث أيضًا مضاعفات أخرى مثل الالتهاب الرئوي التنفسي.

الأهداف العامة:

1. لتحديد الفائدة من جلسات التمارين المنتظمة لتحسين نشاطات الحياة اليومية وتحسين نوعية الحياة.
2. لفهم فائدة جلسات التمارينات لتقليل الالم التي توصى لتحسين معدل حركة الكتف.
3. لدعم اهمية جلسات التمرينات لتحسين قابلية البلع والحفاظ على طبيعة التغذية والحماية من سوء التغذية والجفاف.
4. العلم بالتأثير الايجابي للتمارين كتداخل غير منعي لتقليل مضاعفات عسر البلع مثل والفعال.
5. لمعرفة التداخل المبكر وتمرينات عسر البلع لمرضى الجلطة الدماغية لها دور كبير في شفاء عسر البلع ومنع المضاعفات مثل التهاب الرئة الاستنشاقي.
6. لتحديد ومعالجة التغيرات الغير طبيعية لطبيعة الغذاء والبلع والمحافظة على منع الجفاف وسوء التغذية.

الجلسة الأولى: الجلسات التمرينية في معالجة الكتف المتجمد.

مقدمة:

قد يلاحظ المرضى الذين يعانون من الحالات الشديدة أن نطاق الحركة النشط لأكتافهم أقل من النطاق السلبي للحركة. (نطاق الحركة النشط هو الحركة التي يمكن للشخص أن يؤديها بشكل فردي، دون مساعدة) وبسبب هذه الحقيقة، تتطلب العديد من التمارين الموصي بها المساعدة من المعالج، أو ذراع المريض السليمة، أو شيء مثل عصا أو عمود .

الأهداف الخاصة:

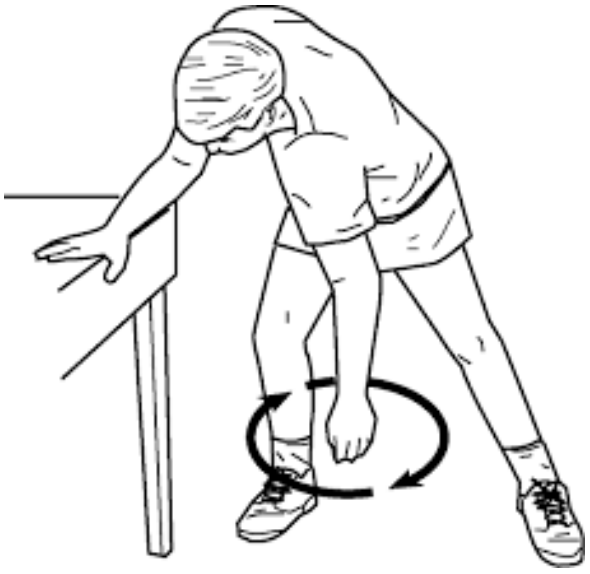
1. يوصى بجلسات التمرين لتقليل الألم وتحسين نطاق الحركة والوظيفة في المريض المصاب بتجمد الكتف بعد الجلطة الدماغية وكذلك لتحسين الدوران الخارجي السلبي ونطاق الاختطاف للحركة.

2. تدعم جلسات التمرين أيضًا الدليل على استخدام حقن الكورتيكوستيرويد الموضعية كعلاج مفضل في المرضى الذين يعانون من تجمد الكتف بعد الجلطة الدماغية.

المحتويات:

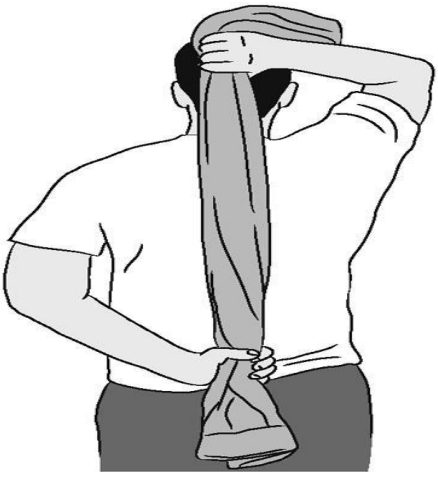
1. مد البندول:

هذا التمرين أولاً، أرخِاء الكتف، يقف المصاب وينحني قليلاً ، مما يسمح للذراع المصابة بالتدلي. يقوم بدوران اليد في دائرة يبلغ قطرها حوالي قدم. يقوم بذلك (10) مرات في كل اتجاه مرة واحدة يوميًا كلما تحسنت الأعراض ، القيام بزيادة قطر الدوران ، لكن من غير جهد أبدًا. عندما تكون مستعدًا للمزيد ، قم بزيادة التمرين عن طريق حمل وزن خفيف ثلاثة إلى خمسة أرطال اي حوالي (من 1.5 –2.5) كغم في الذراع المتأرجحة.



2. السحب بالمنشفة:

مسك أحد طرفي المنشفة (بطول ثلاثة أقدام) خلف الظهر ومسك الطرف الآخر باليد الأخرى ، بمسك المنشفة في الوضع الأفقي. استخدم ذراعك السليمة لسحب الذراع المصابة لأعلى لتمديدها وبعدها امسك الجزء السفلي من المنشفة بالذراع المصاب واسحبه نحو أسفل الظهر مع الذراع السليمة.

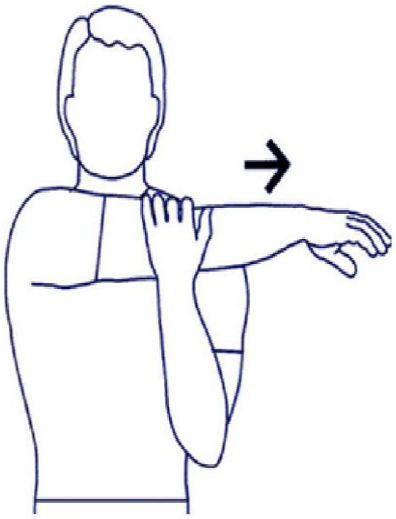


3. تحريك الاصابع:

- الوقوف أمام الحائط ، مع إبقاء مسافة ذراع منه.
- باستخدام ذراع واحدة ، مد اليد للكتف المصابة ببطء ولمس الحائط بأطراف الأصابع ، مع إبقاء الذراع مثنيًا قليلاً عند مستوى الخصر.
- تحرك ألاصابع ببطء على الحائط ، وتحرك الذراع للأعلى بقدر ما يمكن الوصول إليه بشكل مريح.
- تحريك الأصابع للاسفل إلى وضع البداية.

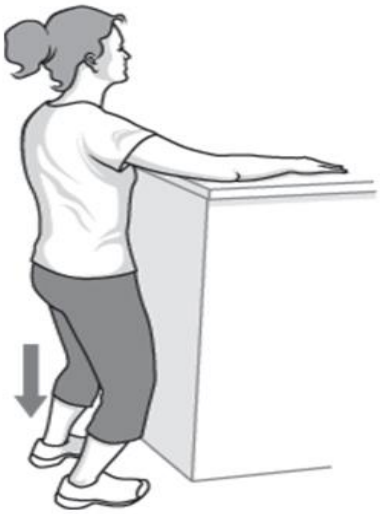
4. مد الجسم عرضياً:

استخدم الذراع السليمة لرفع الذراع المصاب من المرفق ، ثم الرفع لأعلى عبر الجسم ، والضغط برفق لتمديد الكتف، البقاء على ذلك لمدة 15 إلى 20 ثانية. افعل هذا من 10 إلى 20 مرة في اليوم.



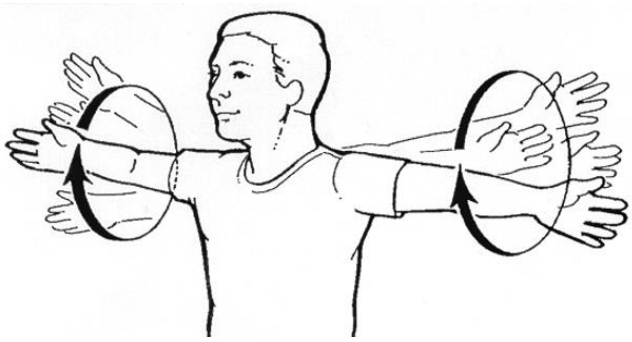
5. مد الإبط

- قف أمام رف مرتفع الصدر.
- ضع الذراع على الرف.
- اثنِ ركبتيك قليلاً لفتح الإبط ، وقم بشد الإبط بشكل مريح قدر الإمكان.
- حاول الانحناء بشكل أعمق قليلاً في كل مرة .



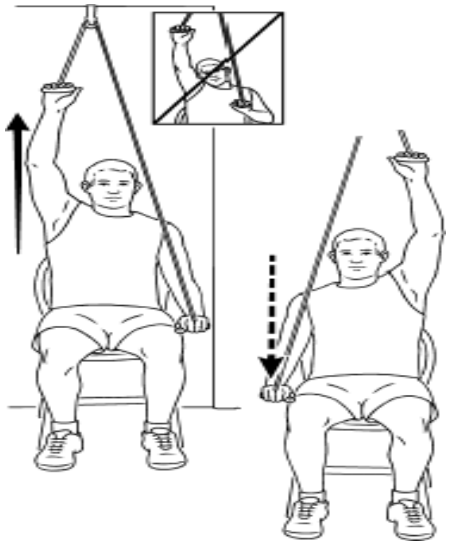
6. تدوير الذراع:

- اجلس على سطح مستوٍ ، وحافظ على ظهرك بشكل مستقيم.
- حاول عمل دوائر صغيرة في الهواء ، في اتجاه عقارب الساعة وعكس اتجاه عقارب الساعة.
- قم بهذا التمرين البسيط 2 أو 3 مرات في اليوم.



7. ثني الكتف للاعلى:

- قف بشكل مستقيم مع دعم ظهرك بالحائط.
- باستخدام مقبض بكرة ، ارفع الذراع السليمة في الهواء بحركة ممتدة بالكامل ، مع إبقاء الذراع المصابة بجانب جسمك.
- شغل هذا المنصب لبضع ثوان.
- مد الذراع المصابة فوق رأسك ، مع إبقاء الذراع السليمة بجانب جسمك.
- استرخ وكرر التمرين مرة أخرى.
- افعل ذلك 10 مرات لإكمال الدورة.
- القيام بهذا التمرين مرة واحدة على الأقل يوميًا.



الاستراتيجيات التعليمية:

• المكان: الردهات أو قاعة الدرس في مركز الفرات الاوسط للعلوم العصبية بمدينة النجف الأشرف وكذلك في عيادات أطباء الأعصاب.

• المدة: 15 دقيقة.

• طرق التدريس: محاضرة.

• وسائل تعليمية: عرض بوربوينت ، صور ، فيديوهات ، ومنشفة لشرح التمدد.

الجلسة الثانية: برنامج التمرينات على عسر البلع.

مقدمة:

تركز فترات التمرين المصممة لتحسين البلع على تقوية العضلات وبناء التنسيق بين الأعصاب والعضلات المشاركة في البلع. تعتبر تمرين عضلات البلع أفضل طريقة لتحسين قدرتك على البلع ، والغرض من جلسات التمرين لتقوية العضلات وتحسين القدرة على البلع.

ألاهداف الخاصة:

1. ممارسة التمارين المبكرة للمرضى الذين يعانون من عسر البلع أثناء الجلطة الدماغية لها دور مهم في الشفاء من عسر البلع والوقاية من عدوى الرئتين التي تسمى الالتهاب الرئوي التنفسي قد تحدث أيضًا ، مثل سوء التغذية والجفاف.

2. لمنع صعوبات البلع يمكن أن يؤدي إلى زيادة إفراز اللعاب ، وسيلان اللعاب ، والسعال أو الاختناق أثناء الأكل ، وحتى صعوبة الكلام أو صوت أجش.

3. لعلاج تشوهات التغذية والبلع مع الحفاظ على التغذية والترطيب الآمن والفعال.

المحتويات:

1. تمرين الارتجاج

• يقوي عضلات نهاية الحلق (لسان المزمار وفتحة المريء).

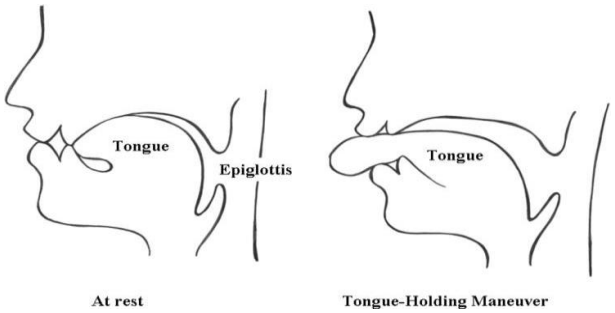
• عند الاستلقاء بشكل مسطح ، ارفع رأسك حتى تتمكن من رؤية أصابع قدميك.

• حافظ على رأسك مرفوعة لمدة دقيقة واحدة.

• كرر 30 مرة ، 3 مجموعات في اليوم.

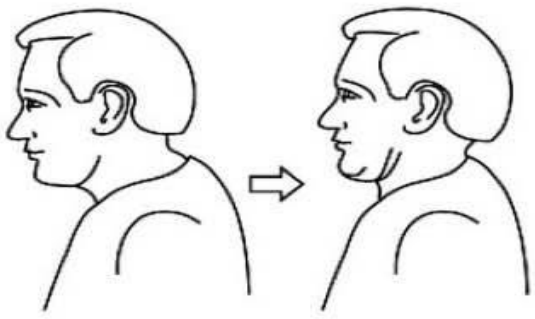
2. تمارين ماساكو

- تدريب اللسان والحلقك.
- أخراج اللسان والضغط بلطف على طرف اللسان. بينما لا يزال الضغط للسان ، يتم بلع اللعاب.
- يتكرر ذلك 30 مرة ، 3 مرات في اليوم.



3. تمرين CTAR (ثني الذقن ضد المقاومة)

- تقوي عضلات نهاية الحلق (لسان المزمار وفتحة المريء).
- في وضعية الجلوس ، توضع كرة صغيرة تحت الذقن.
- يضغط على الذقن للأسفل .
- يتكرر ذلك 30 مرة ، 3 مرات في اليوم.



الاستراتيجيات التعليمية:

- المكان: الأجنحة والفصول الدراسية بمركز علوم الأعصاب في الفرات الأوسط بمدينة النجف الأشرف وكذلك في عيادات أطباء الأعصاب.
- المدة: 10 دقيقة.
- طرق التدريس: محاضرة.
- الوسائل التعليمية: عرض بوربوينت ، صور ، فيديو ، كرة أو قماش ملفوف لشرح ثني الذقن ضد المقاومة.

Appendix H

Figures Of The Results and Finding

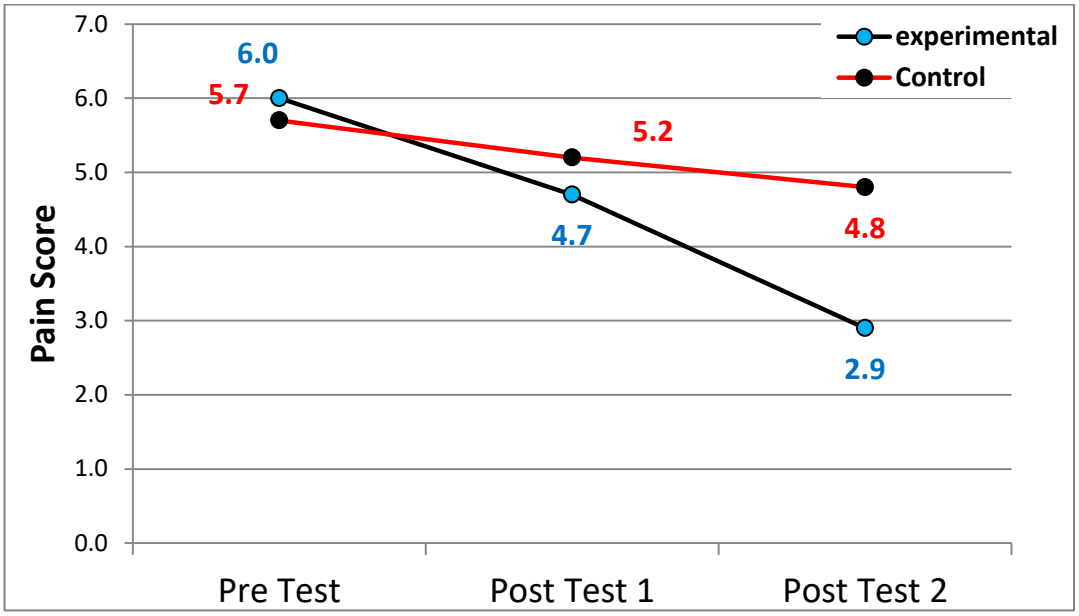


Figure 4.1. Change in pain score experienced by patients at its worse before and after the program in both groups.

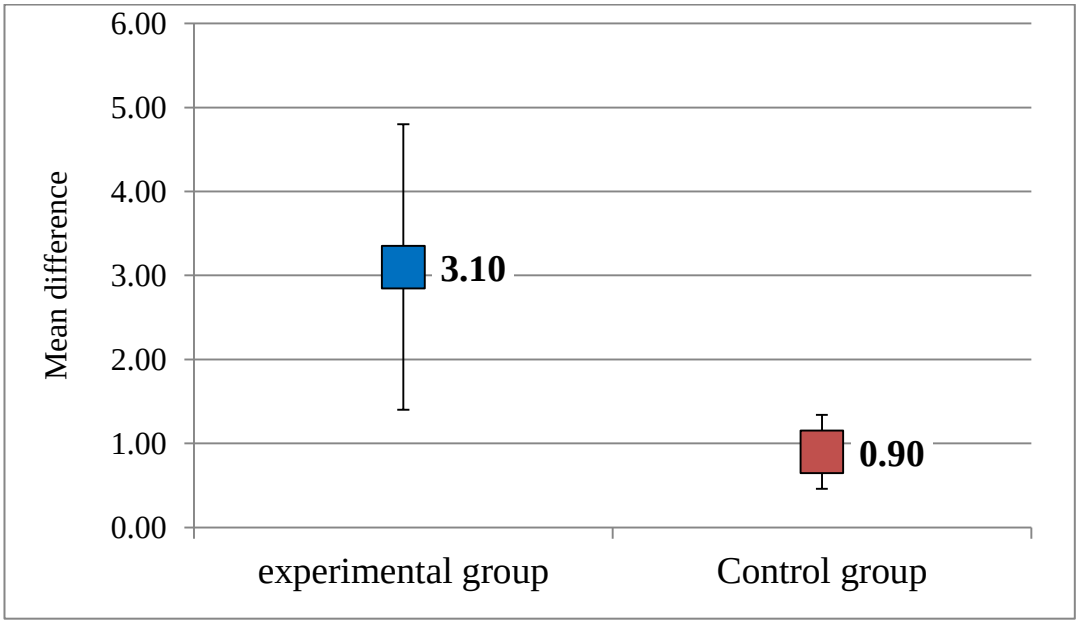


Figure 4.2. Comparison of mean difference (Pre -Post 2) in pain experienced by patients at its worse in both groups at the end of program.

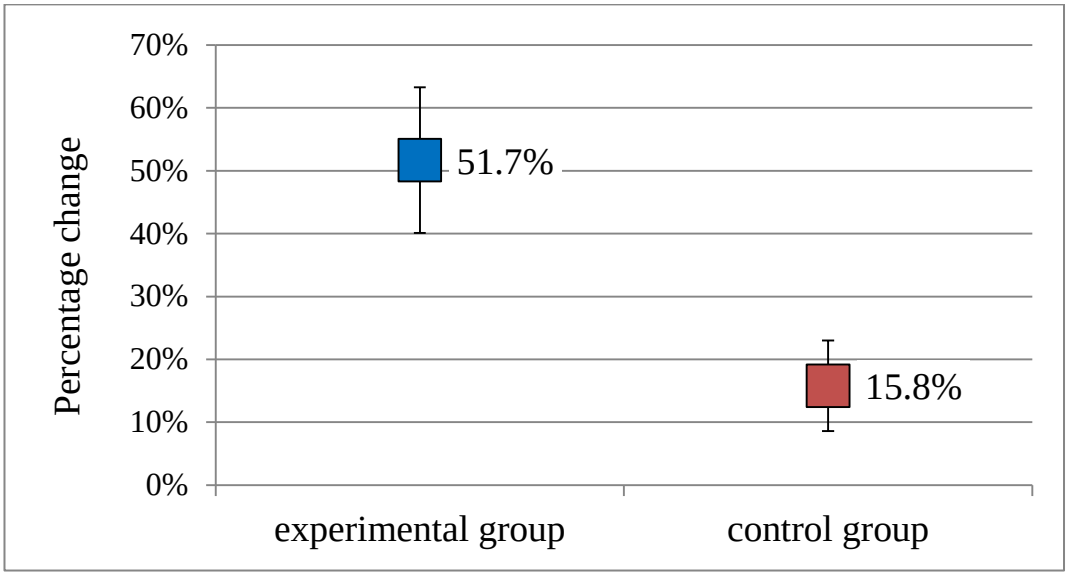


Figure 4.3. Comparison of percentage change in pain experienced by patients at its worse in both groups at the end of program.

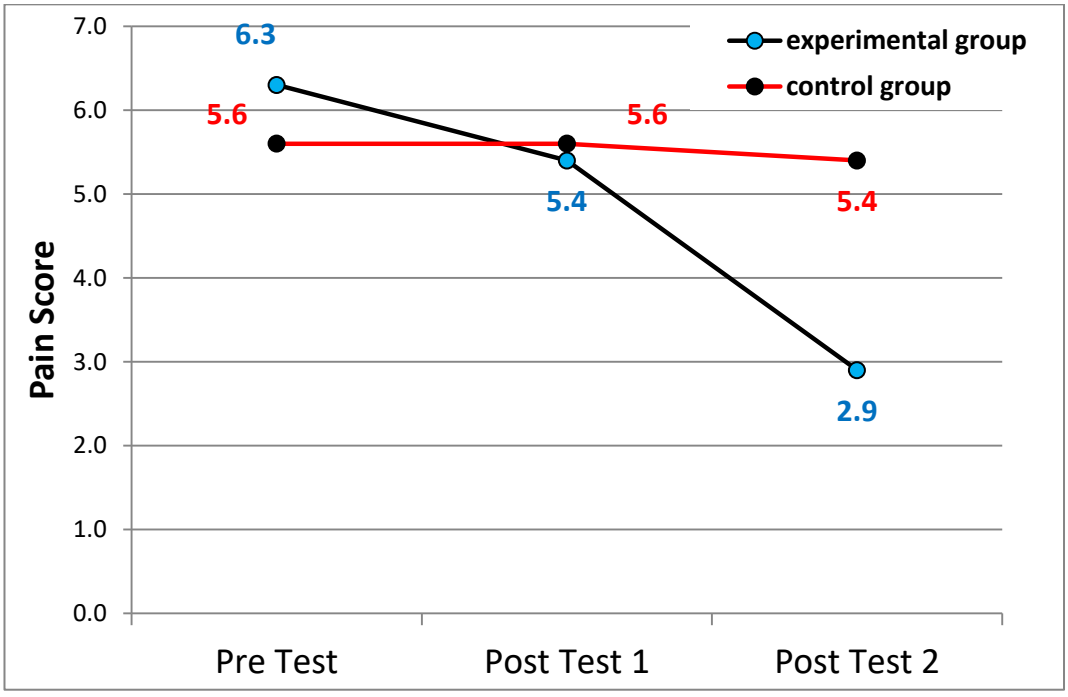


Figure 4.4. Change in pain score when lying on the involved side before and after the program in both groups.

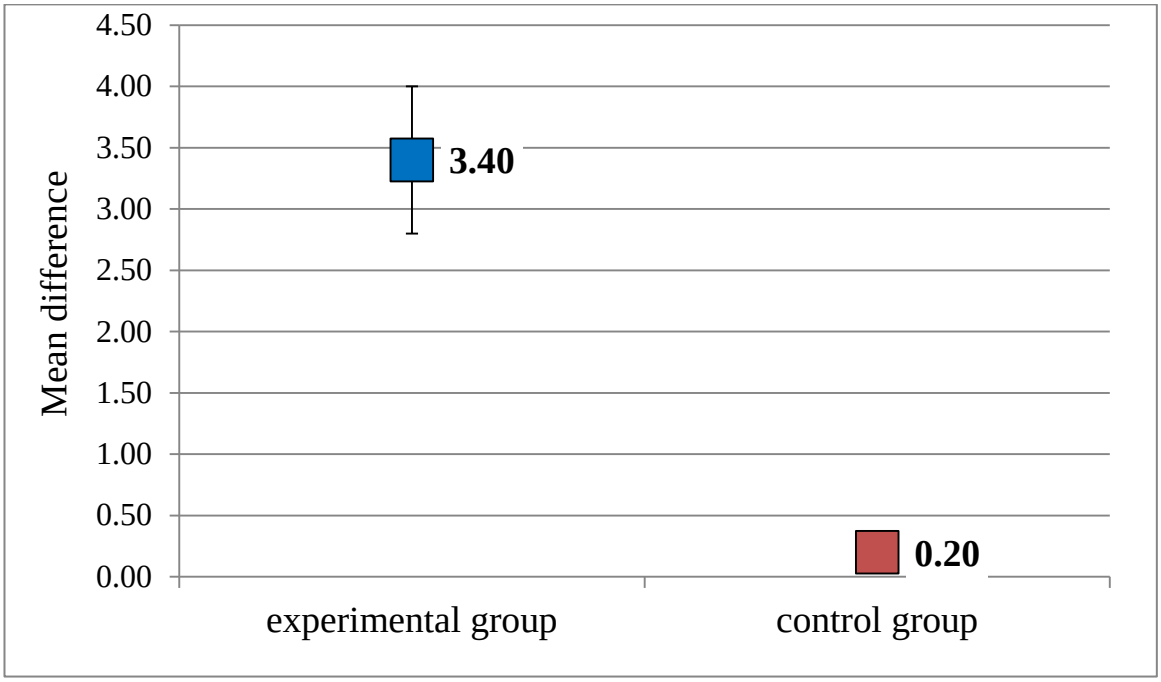


Figure 4.5. Comparison of mean difference (Pre -Post 2) pain experienced by patients when lying on the involved side in both groups at the end of program.

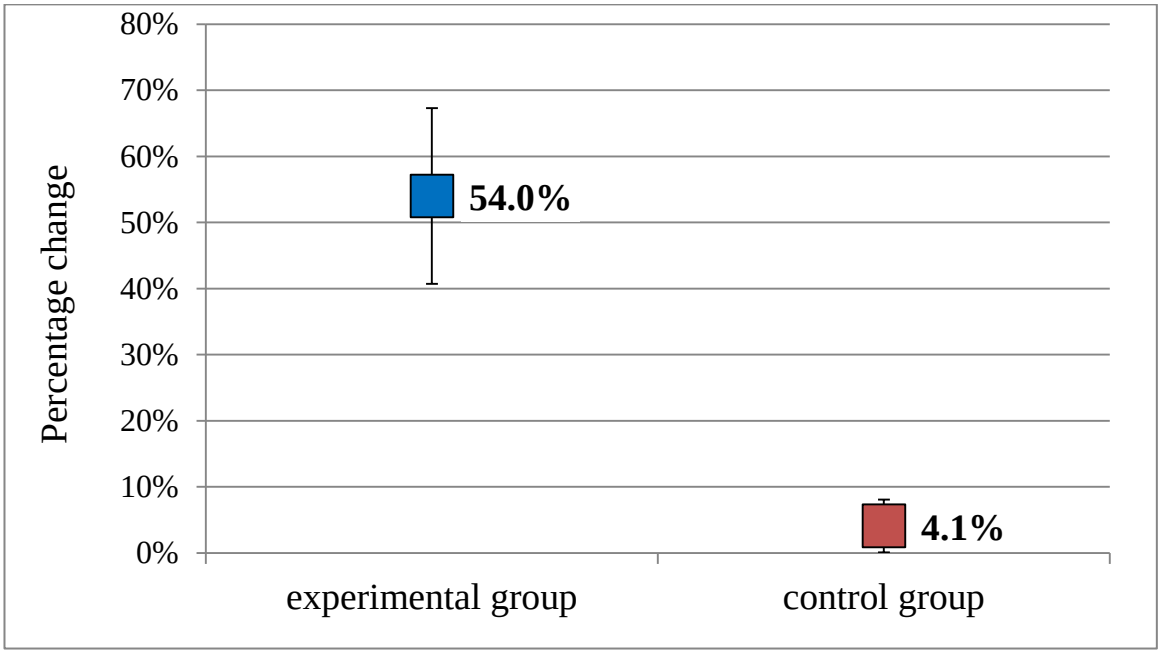


Figure 4.6. Comparison of percentage change in pain experienced by patients when lying on the involved side in both groups at the end of program.

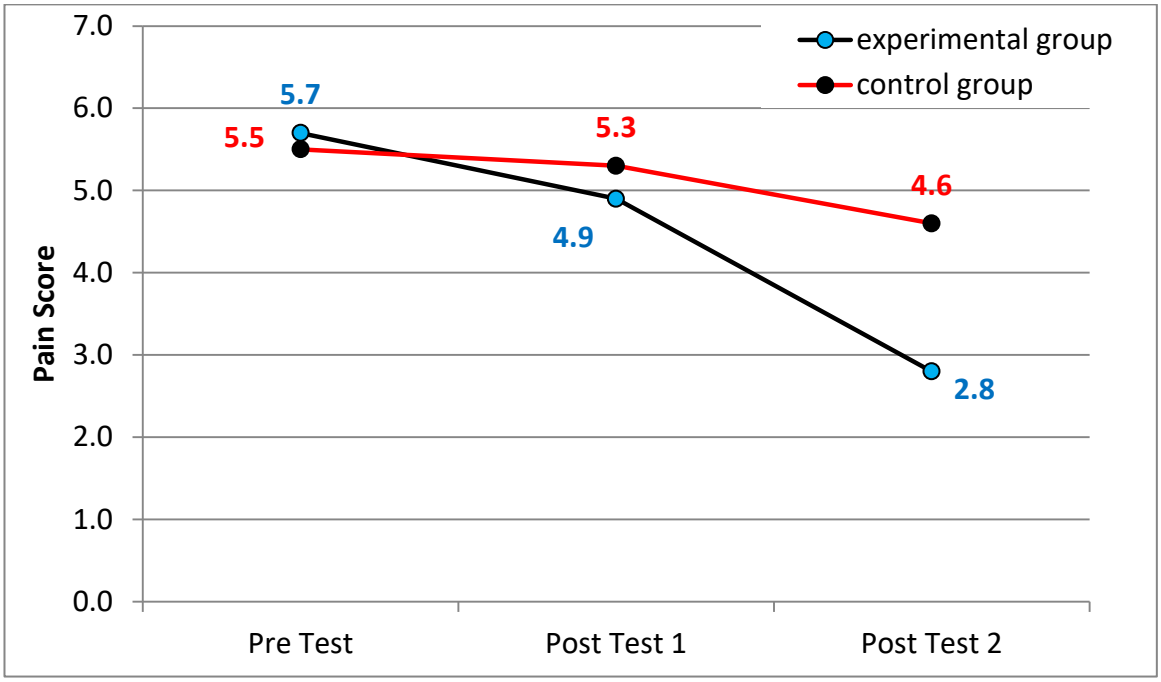


Figure 4.7. Change in pain score experienced by patients on reaching something on a high shelf before and after the program in both groups.

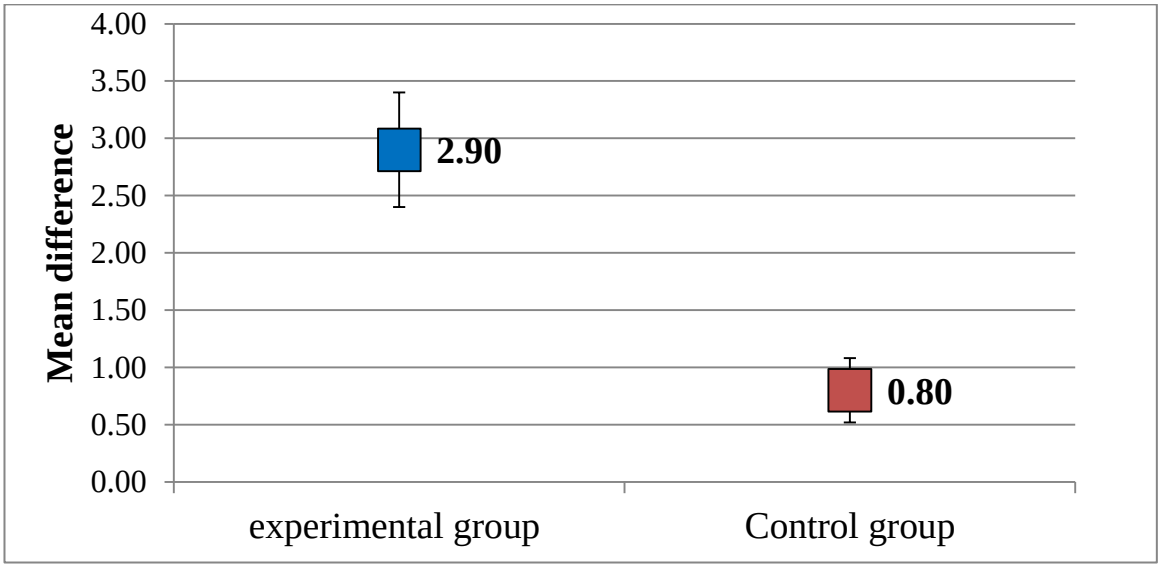


Figure 4.8. Comparison of mean difference (Pre -Post 2) in pain experienced by patients on reaching something on a high shelf at the end of the program.

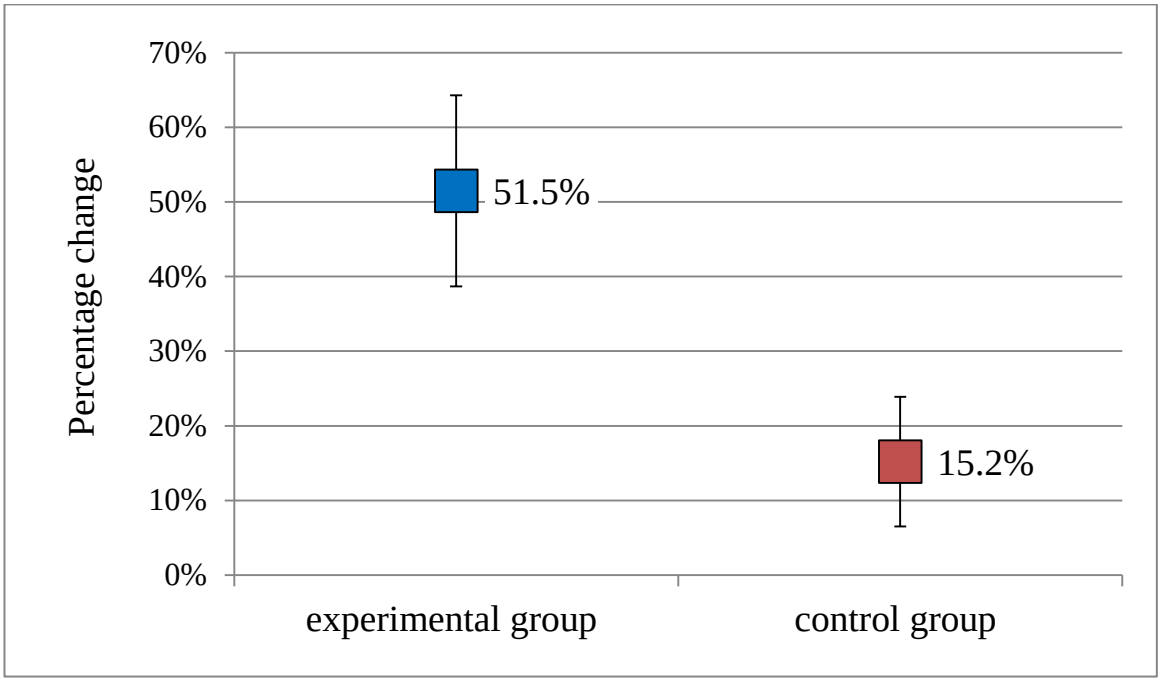


Figure 4.9. Comparison of percentage change in pain experienced by patients on reaching something on a high shelf at the end of the program

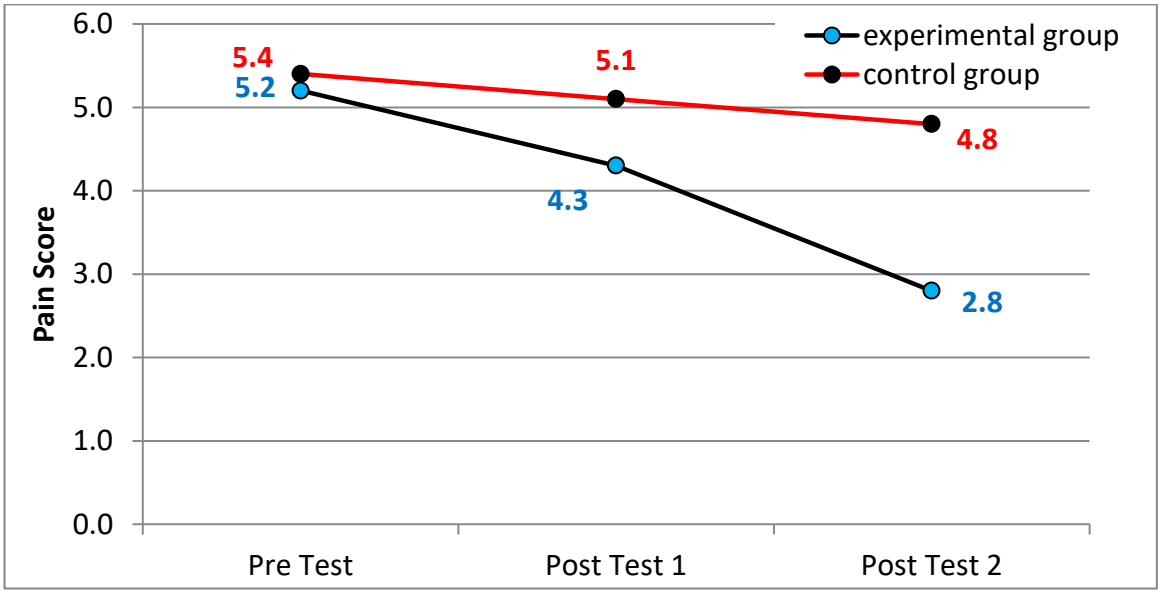


Figure 4.10. Change in pain score experienced by patients when touching the back of the neck before and after the program in both groups.

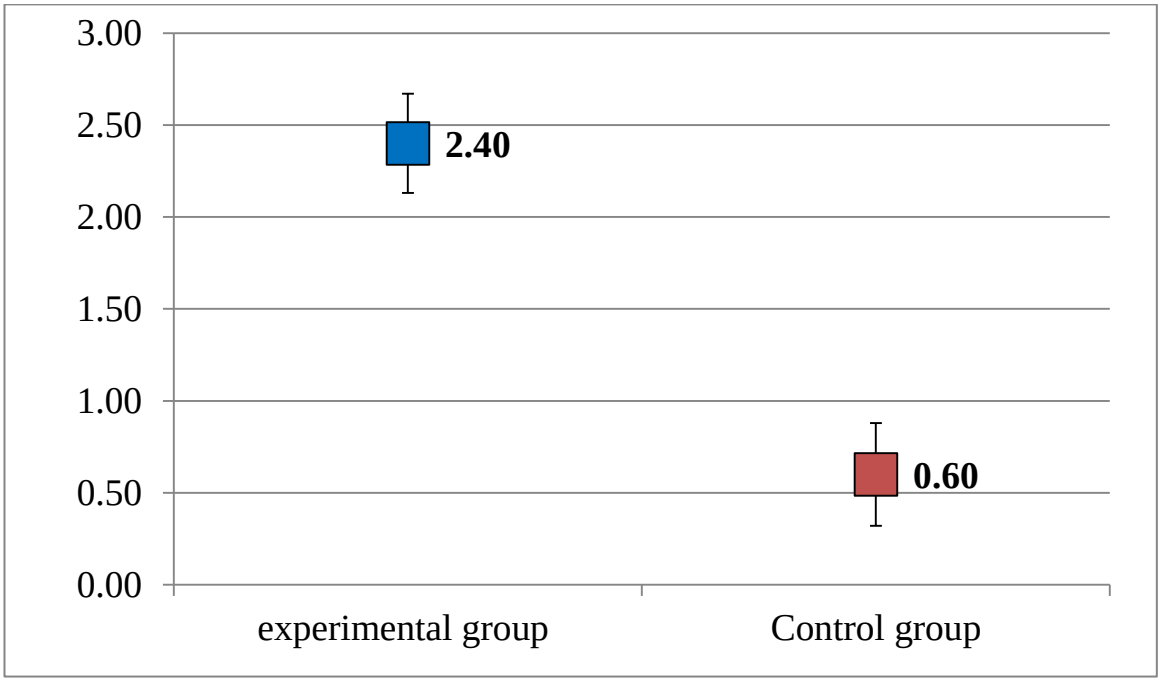


Figure 4.11. Comparison of mean difference in pain experienced by patients when Touching the back of the neck.

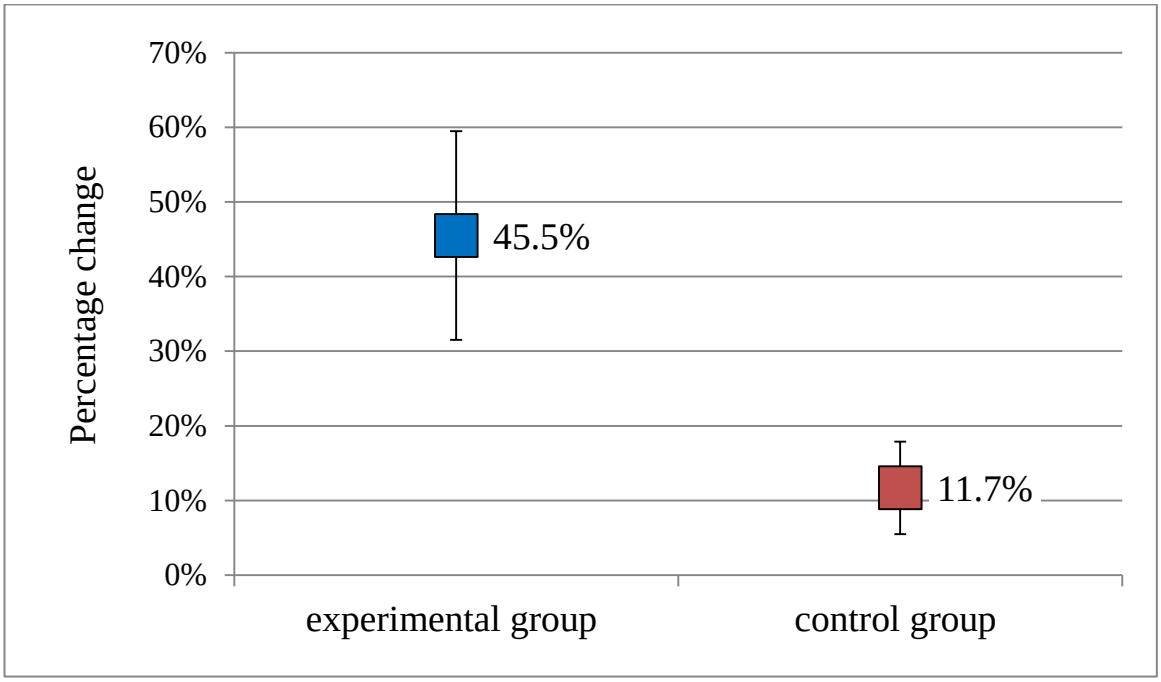


Figure 4.12. Comparison of percentage change in pain experienced by patients when touching the back of the neck.

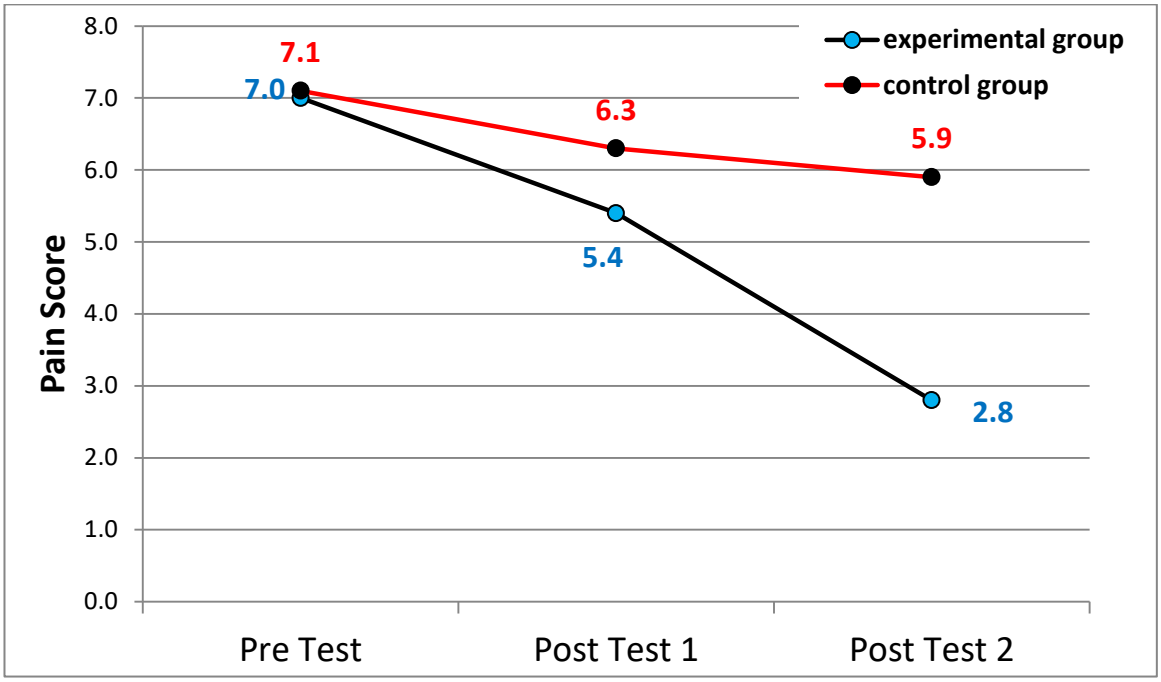


Figure 4.13. Change in pain score experienced by patients on Pushing with the involved arm before and after the program in both groups.

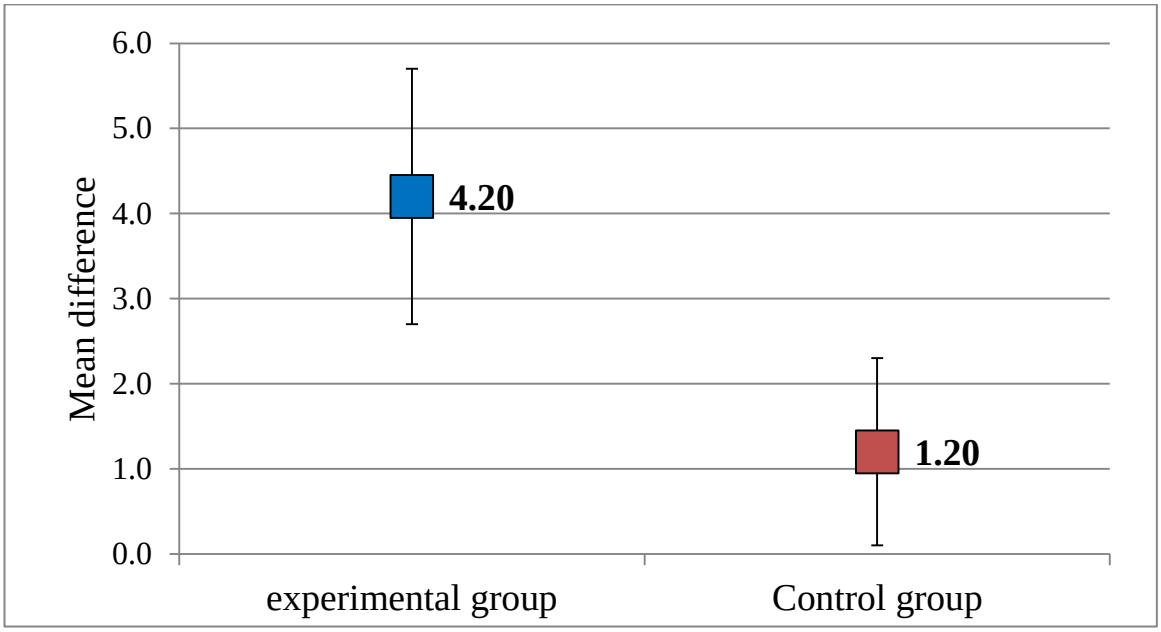


Figure 4.14. Comparison of mean difference (Pre -Post 2) in pain experienced by patients on Pushing with the involved arm.

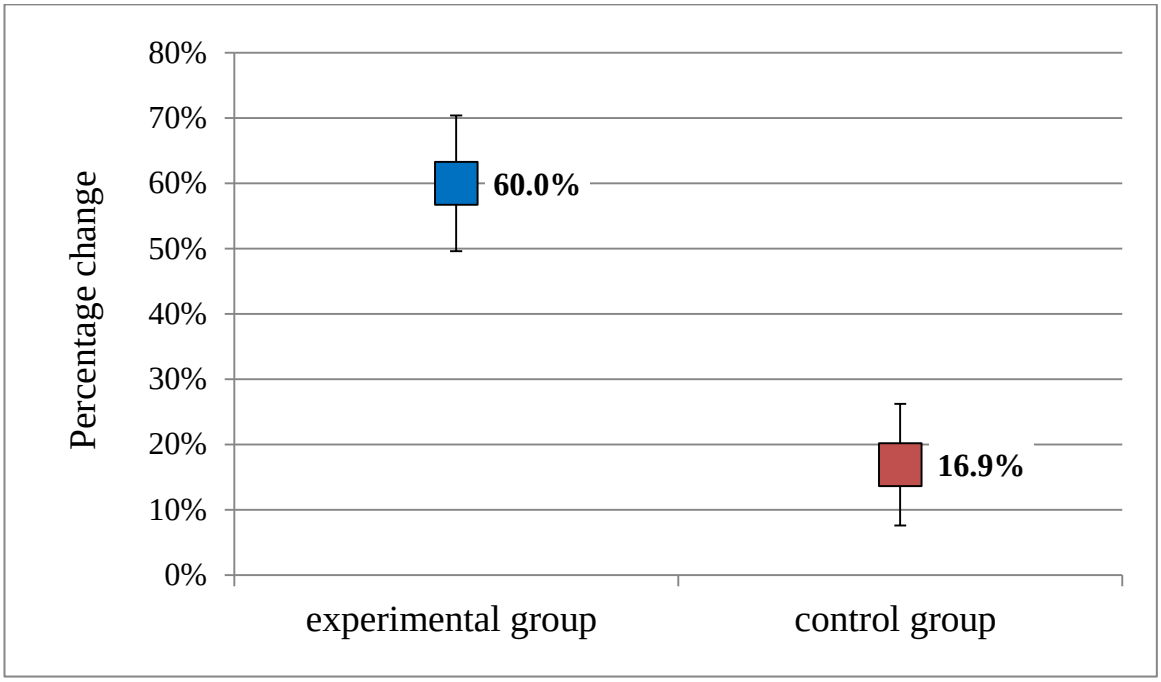


Figure 4.15. Comparison of percentage change in pain experienced by patients when pushing with the involved arm.

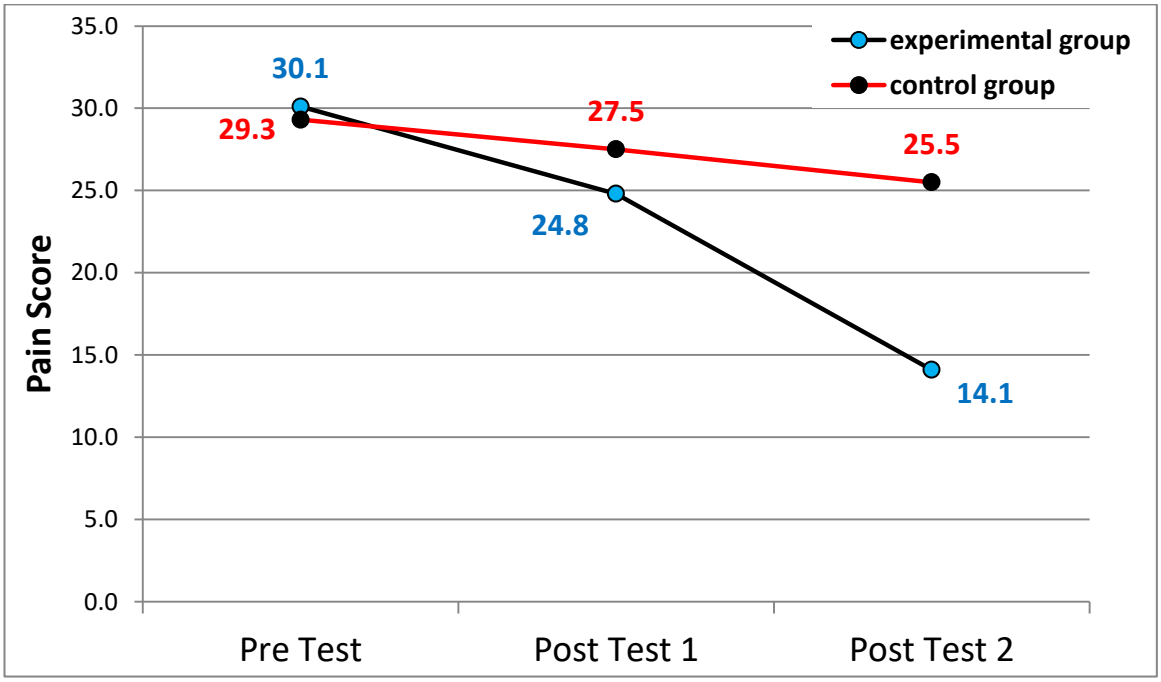


Figure 4.16. Change in total pain scale before and after the program in both groups.

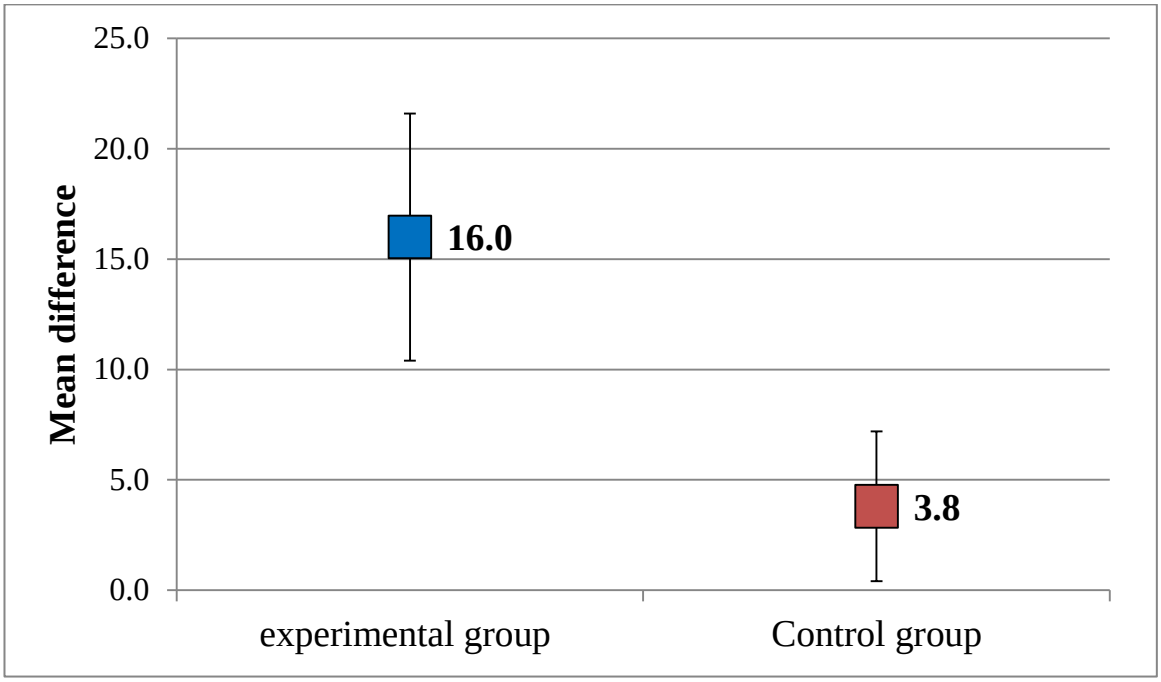


Figure 4.17. Comparison of mean difference (Pre -Post 2) in total pain scale of patients in both groups.

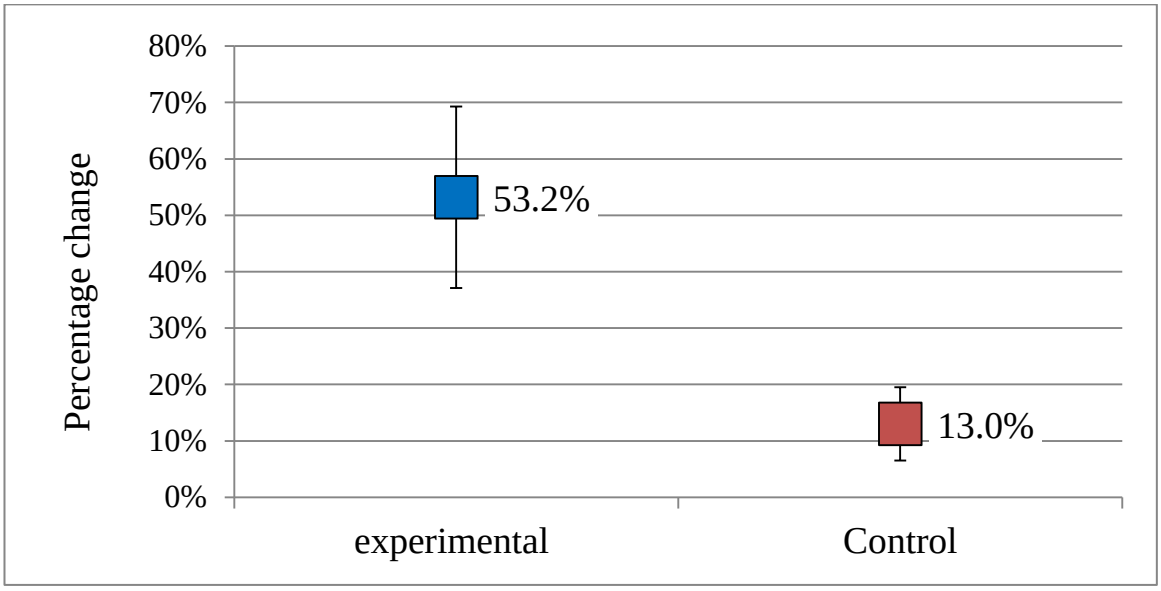


Figure 4.18. Comparison of percentage change in total pain scale experienced by patients.

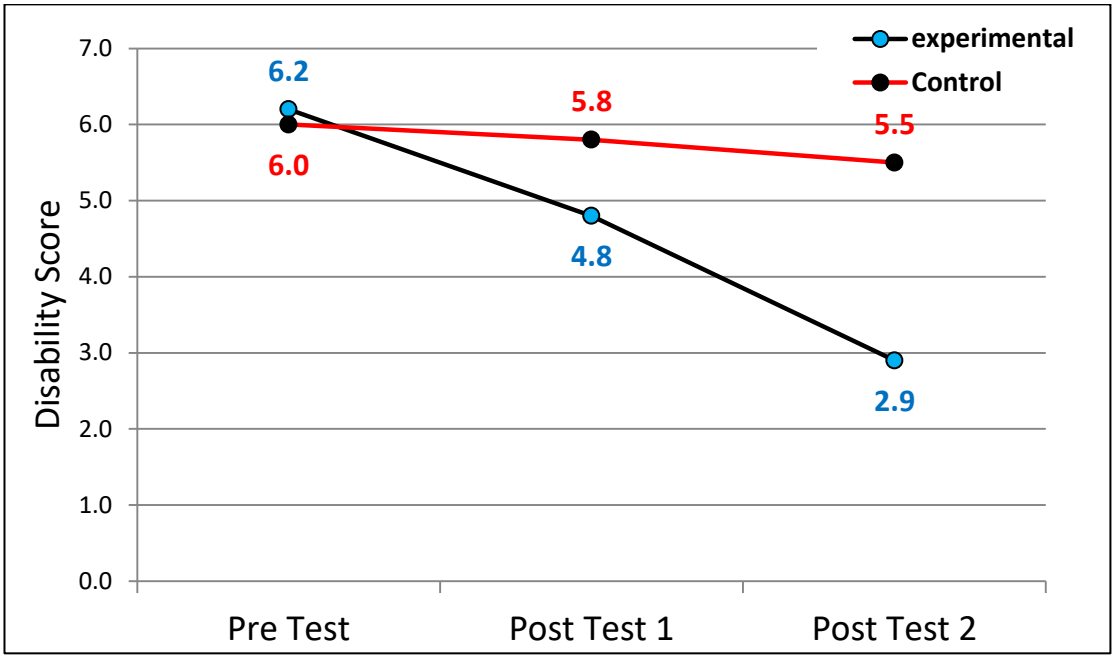


Figure 4.19. Change in disability scale for washing hair at the end of the program in both studied groups.

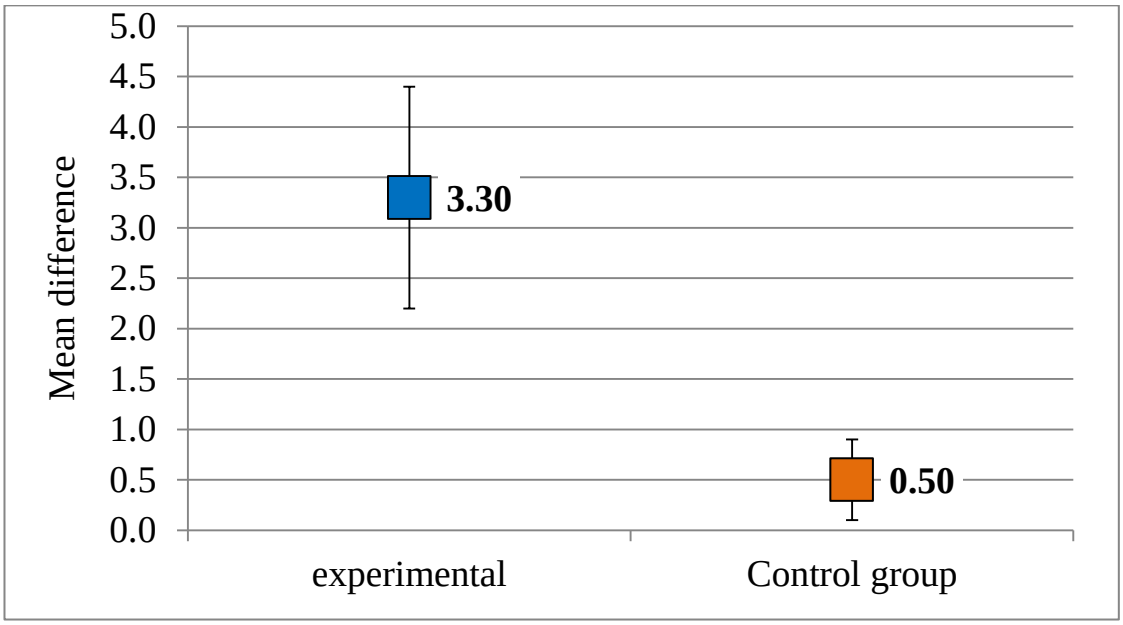


Figure 4.20. Comparison of mean difference (Pre -Post 2) in disability scale for washing hair at the end of the program in both studied groups.

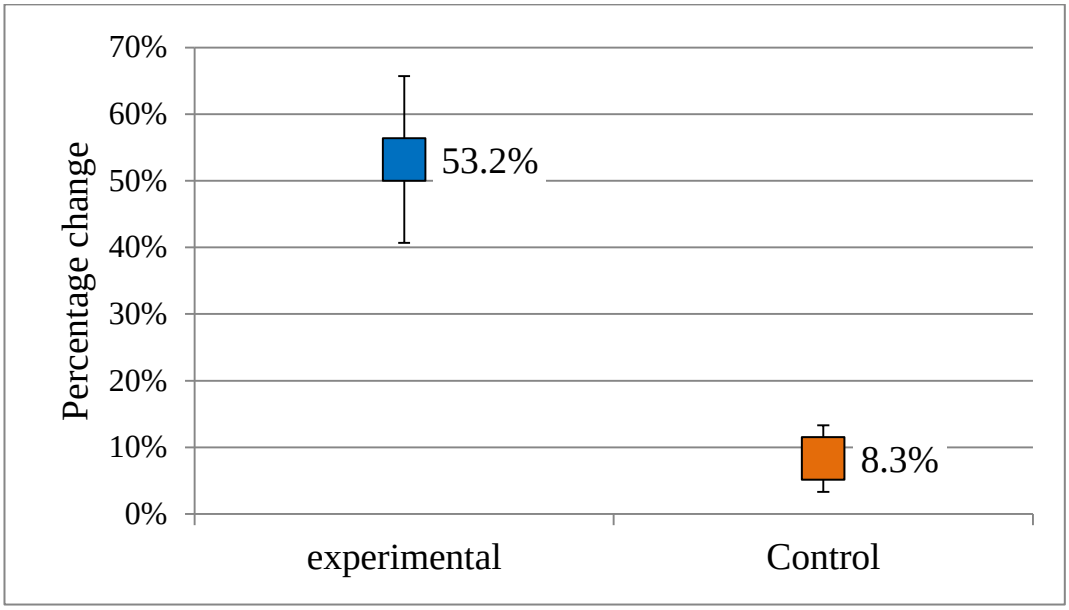


Figure 4.21. Comparison of percentage change in disability scale for washing hair at the end of the program in both studied groups.

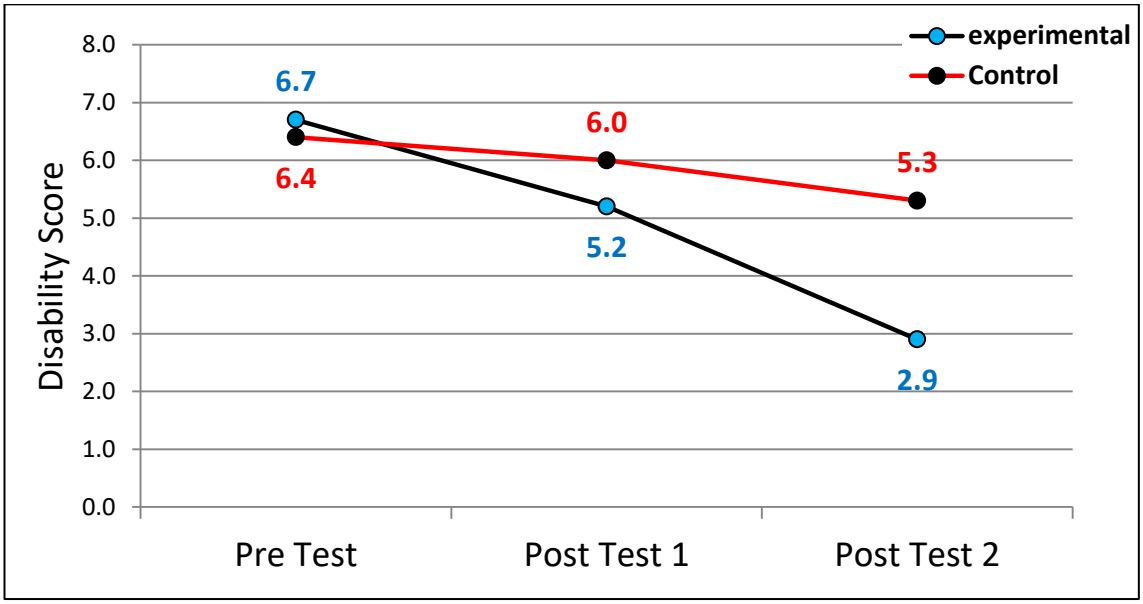


Figure 4.22. Change in disability scale for washing back during the program in both studied groups.

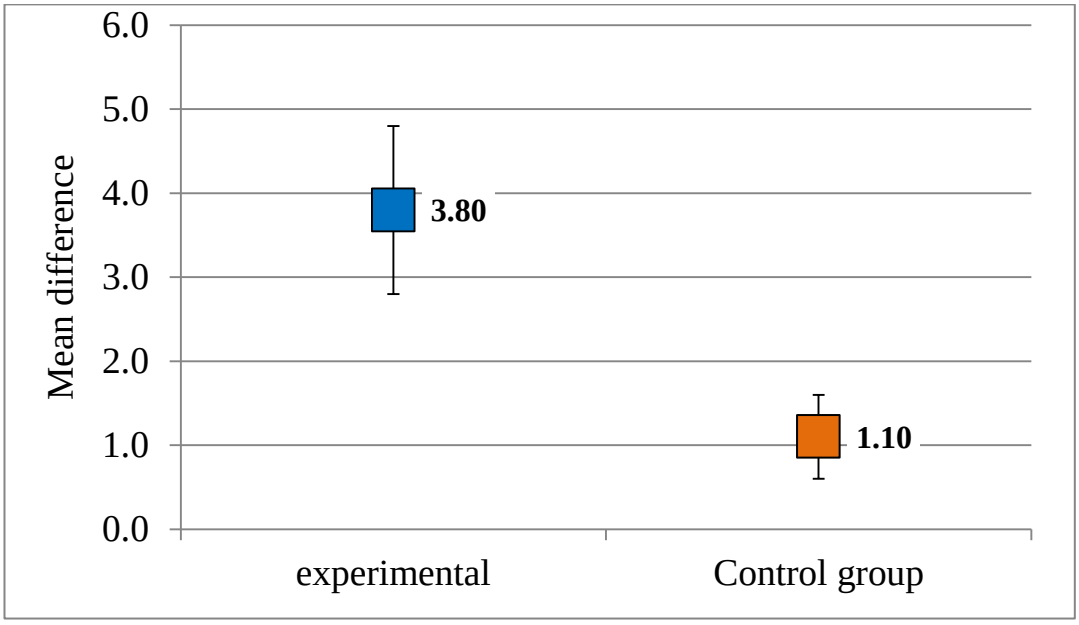


Figure 4.23. Comparison of mean difference (Pre -Post 2) in disability scale for washing back at the end of the program in both studied groups.

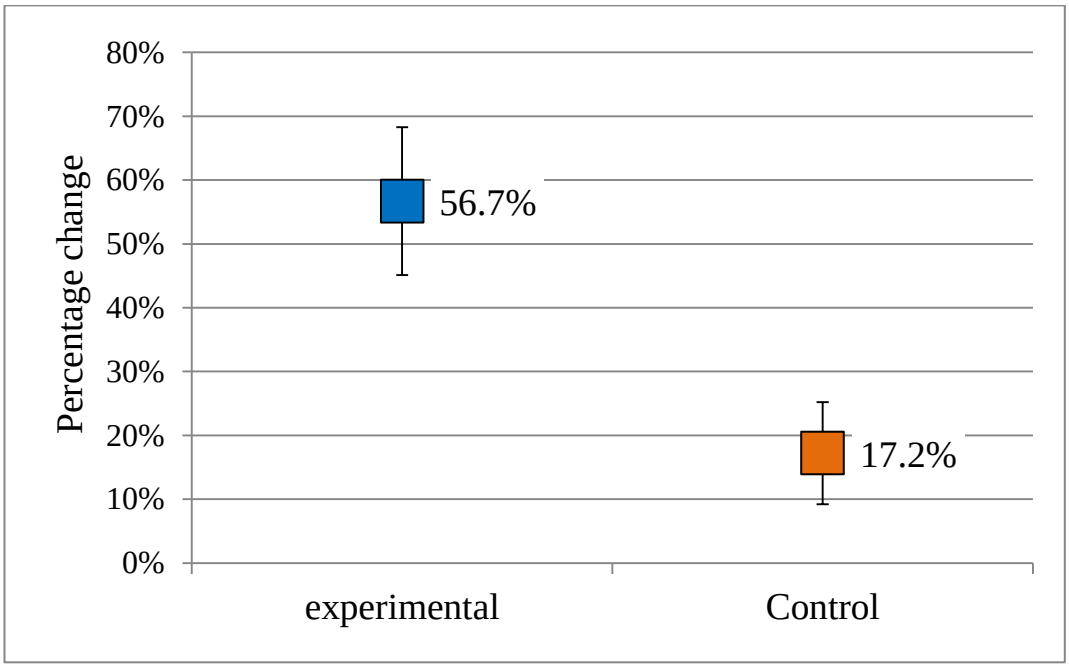


Figure 4.24. Comparison of percentage change in in disability scale for washing back at the end of the program in both studied groups.

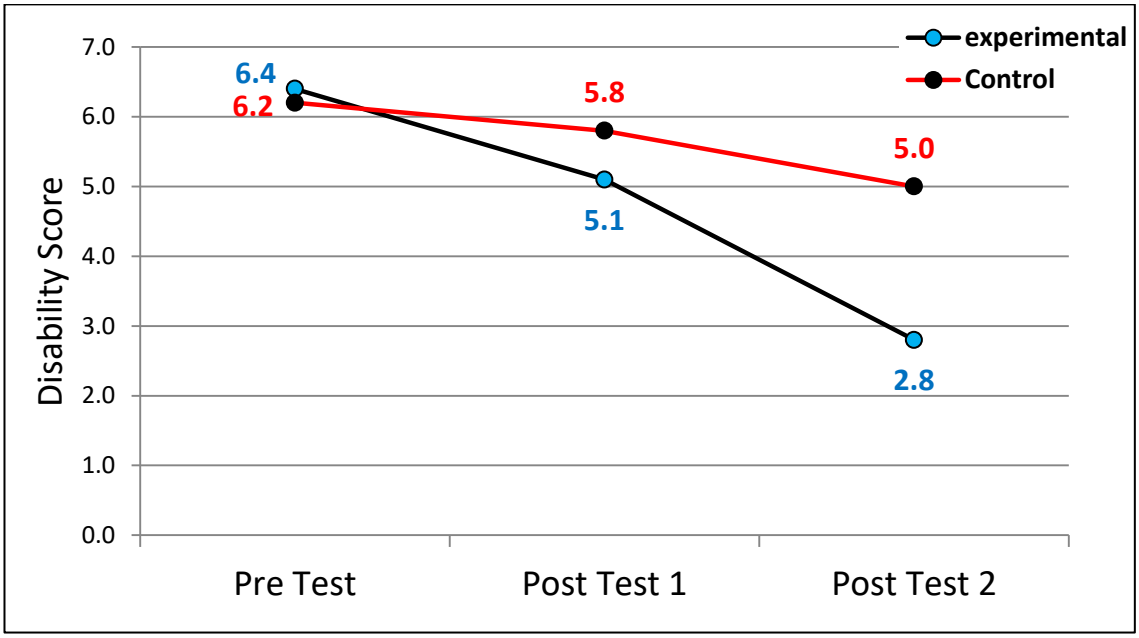


Figure 4.25. The change in disability scale for putting on an undershirt or jumper during the program in both studied groups.

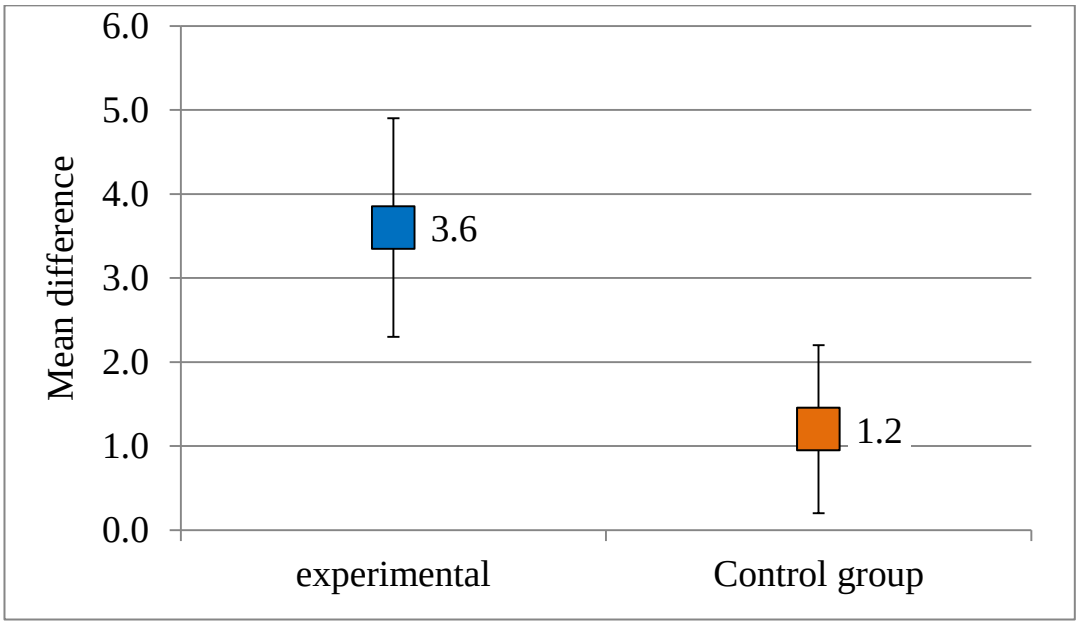


Figure 4.26. A comparison of mean difference (Pre -Post 2) in disability scale for putting on an undershirt or jumper at the end of the program in both studied groups.

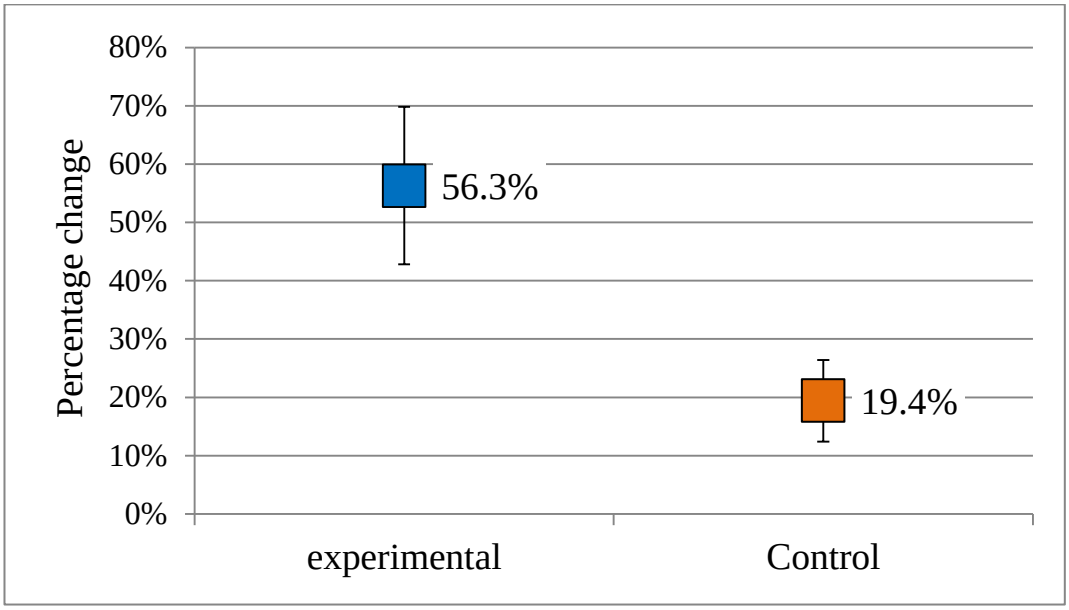


Figure 4.27. A comparison of percentage change in disability scale for putting on an undershirt or jumper at the end of the program in both studied groups.

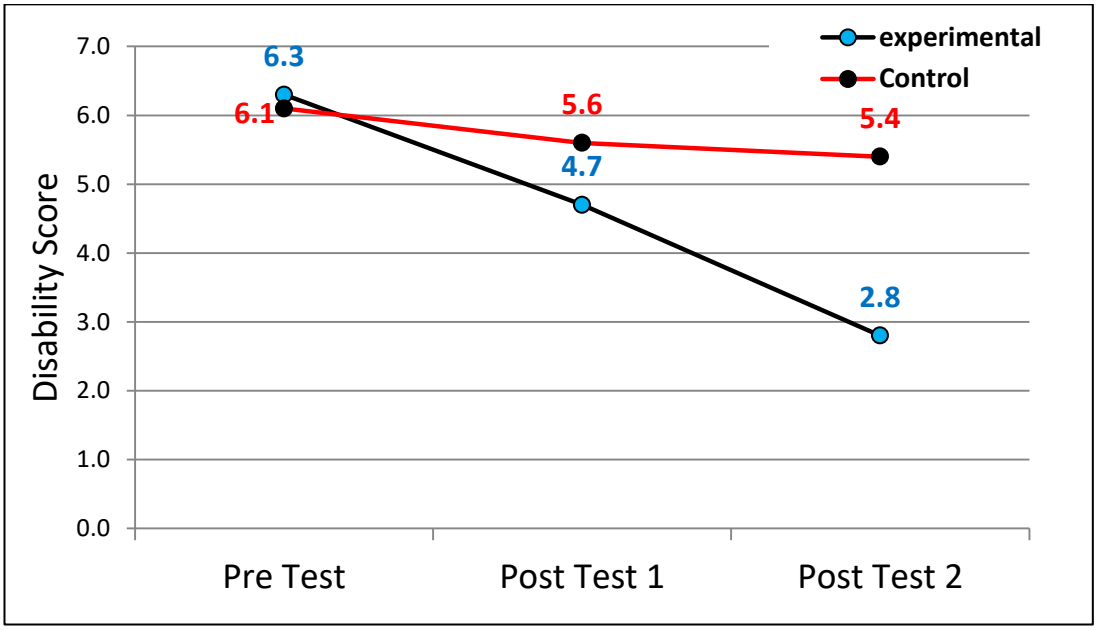


Figure 4.28. A change in disability scale for putting on a shirt that buttons down the front during the program in both studied groups.

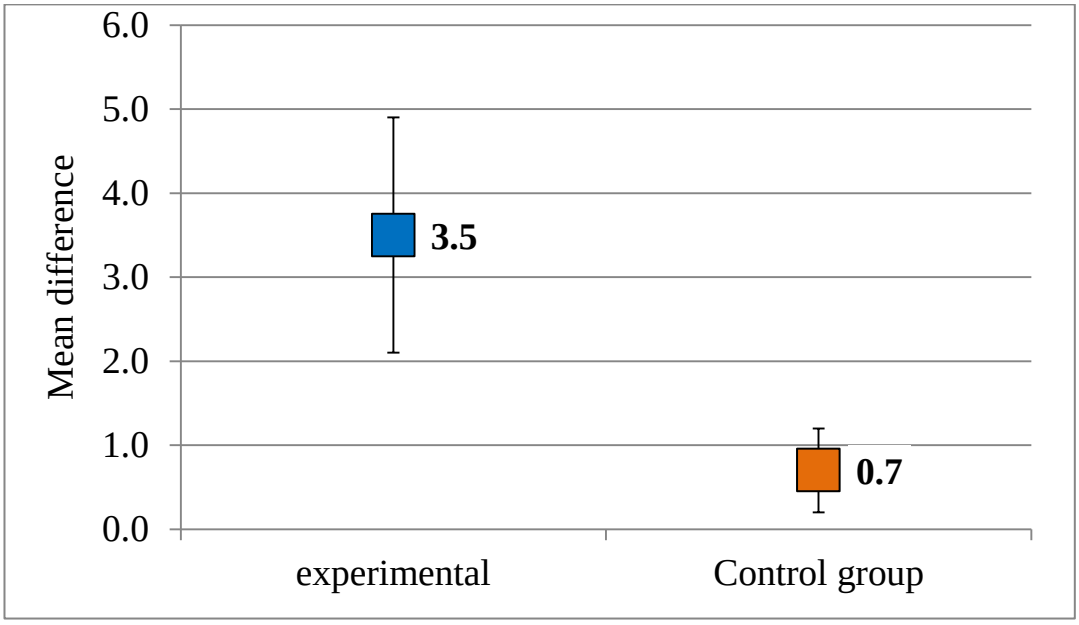


Figure 4.29. A comparison of mean difference (Pre -Post 2) in disability scale for putting on a shirt that buttons down the front at the end of the program in both studied groups.

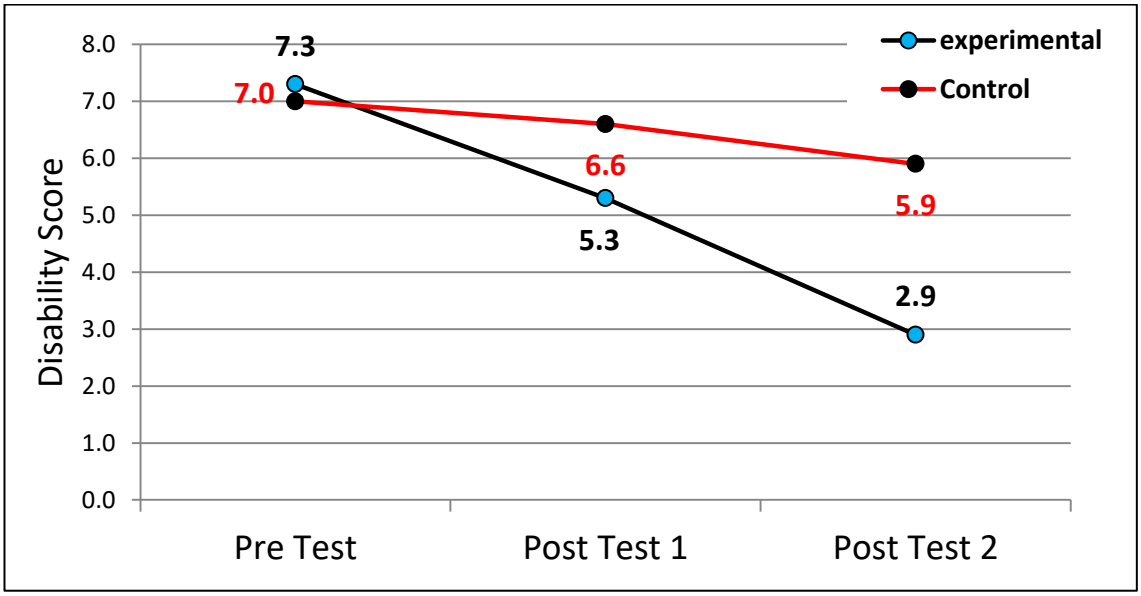


Figure 4.31. A change in disability scale for putting on pants during the program in both studied groups.

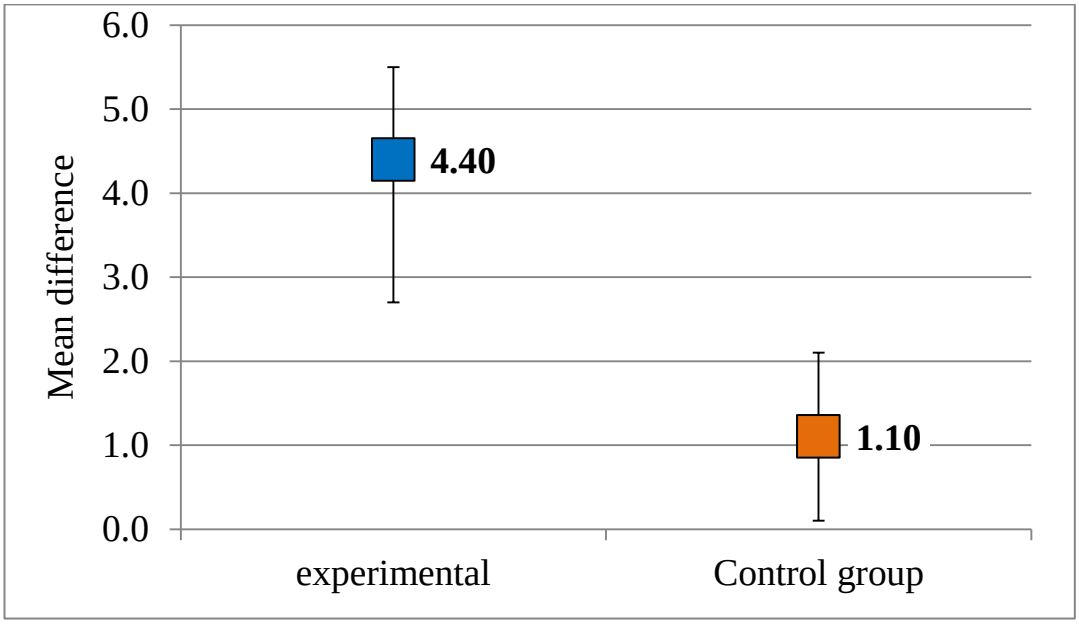


Figure 4.32. A comparison of mean difference (Pre -Post 2) in disability scale for putting on pants at the end of the program in both studied groups.

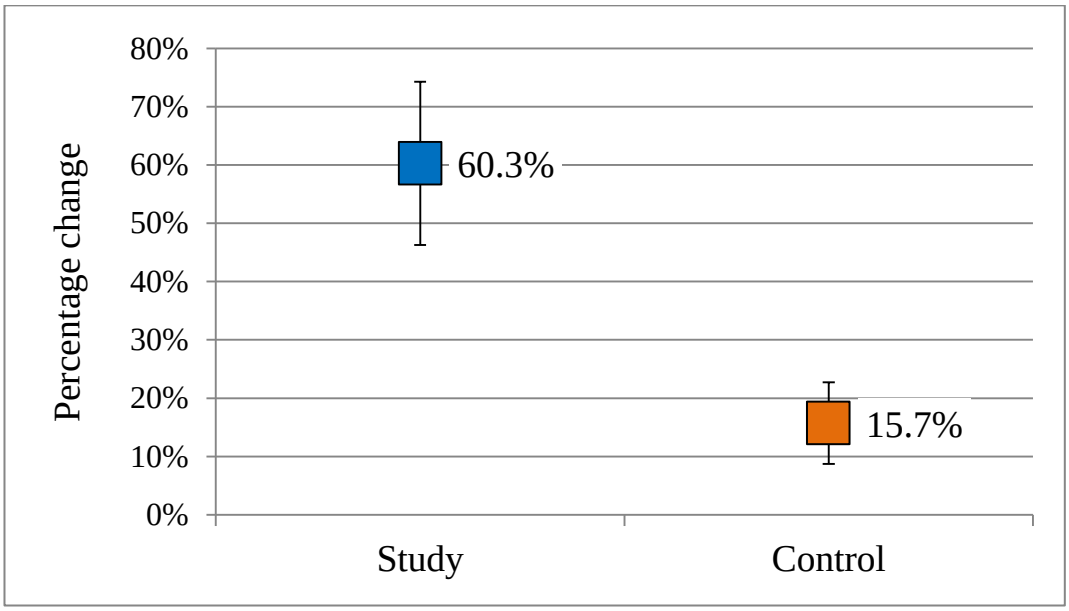


Figure 4.33. A comparison of percentage change in disability scale for putting on pants at the end of the program in both studied groups.

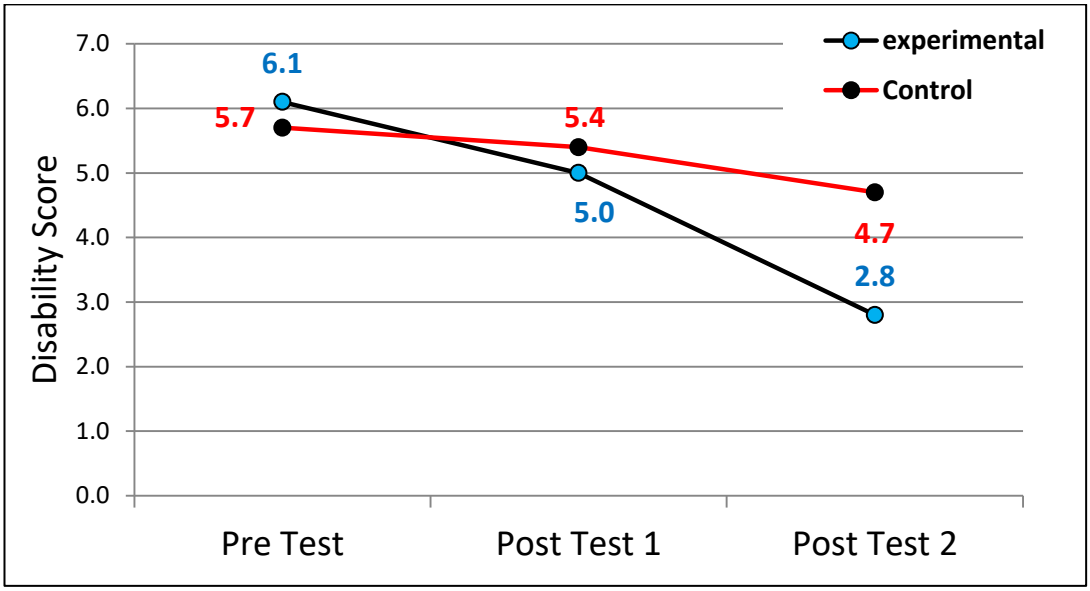


Figure 4.34. Change in disability scale for placing an object on a high shelf during the program in both studied groups.

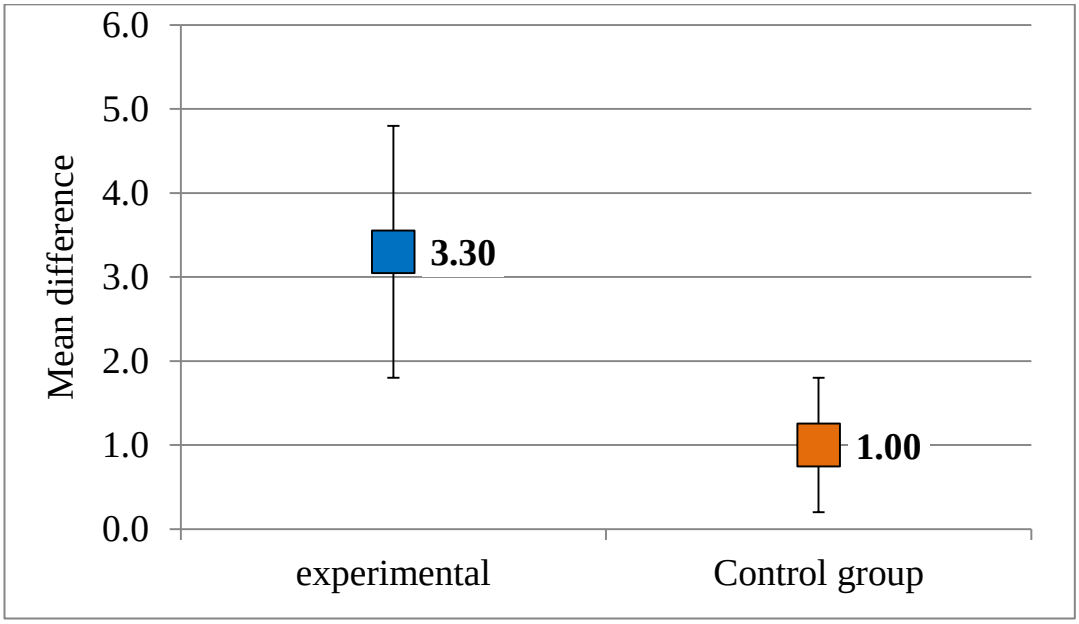


Figure 4.35 Comparison of mean difference (Pre -Post 2) in disability scale for placing an object on a high shelf at the end of the program in both studied groups.

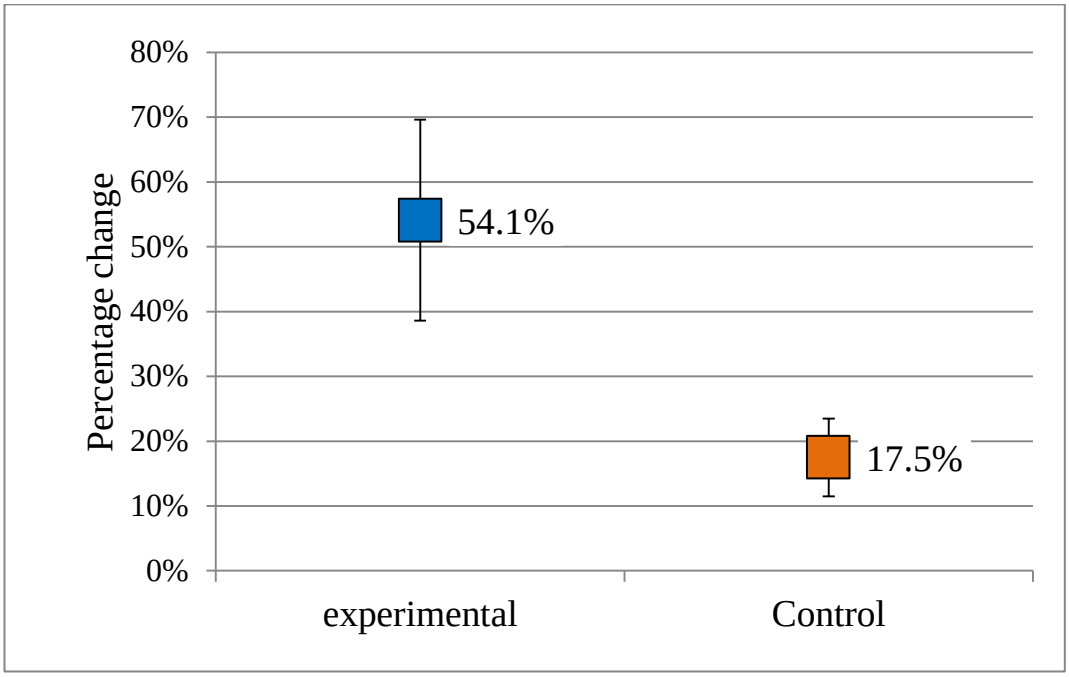


Figure 4.36. Comparison of percentage change in disability scale for placing an object on a high shelf at the end of the program in both studied groups.

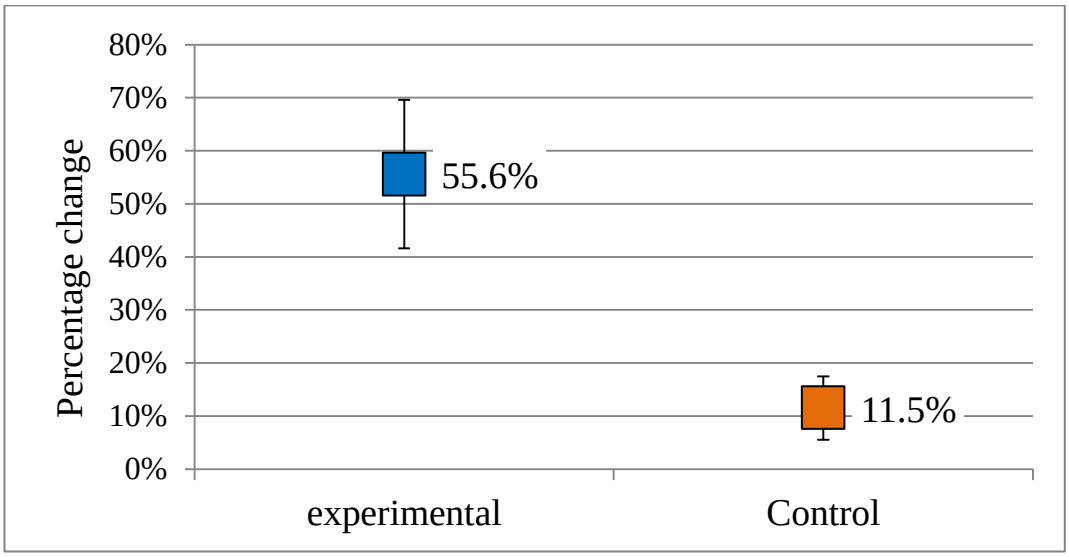


Figure 4.30. A comparison of percentage change in disability scale for putting on a shirt that buttons down the front at the end of the program in both studied groups.

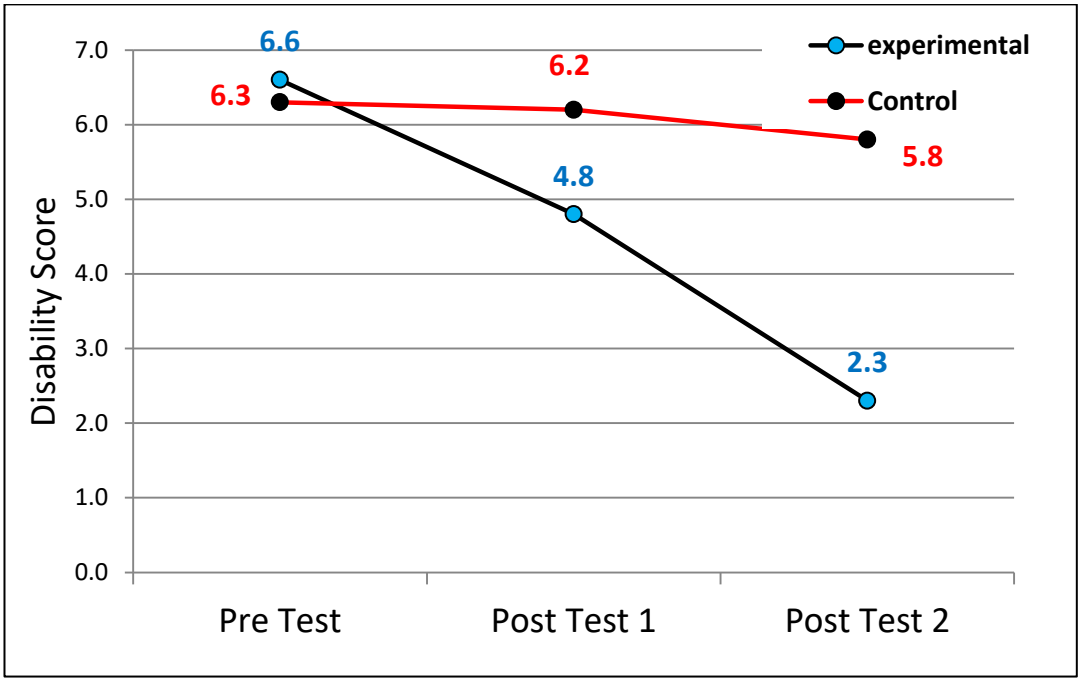


Figure 4.37. Change in disability scale for carrying a heavy object of 10 pounds (4.5 kilograms) during the program in both studied groups.

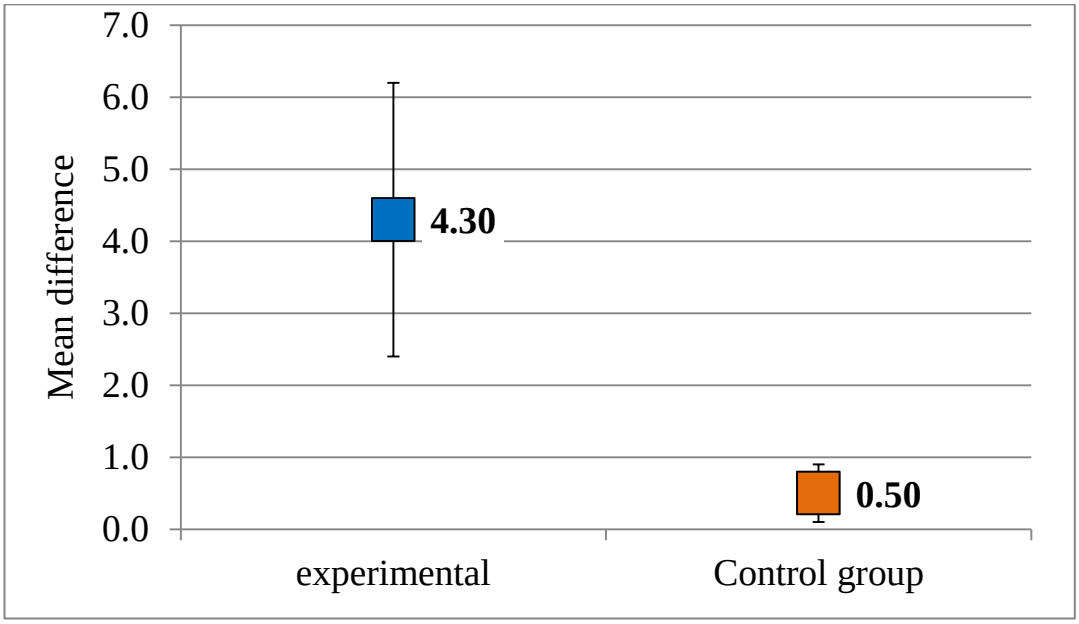


Figure 4.38. Comparison of mean difference (Pre -Post 2) in disability scale for carrying a heavy object of 10 pounds (4.5 kilograms) at the end of the program in both studied groups.

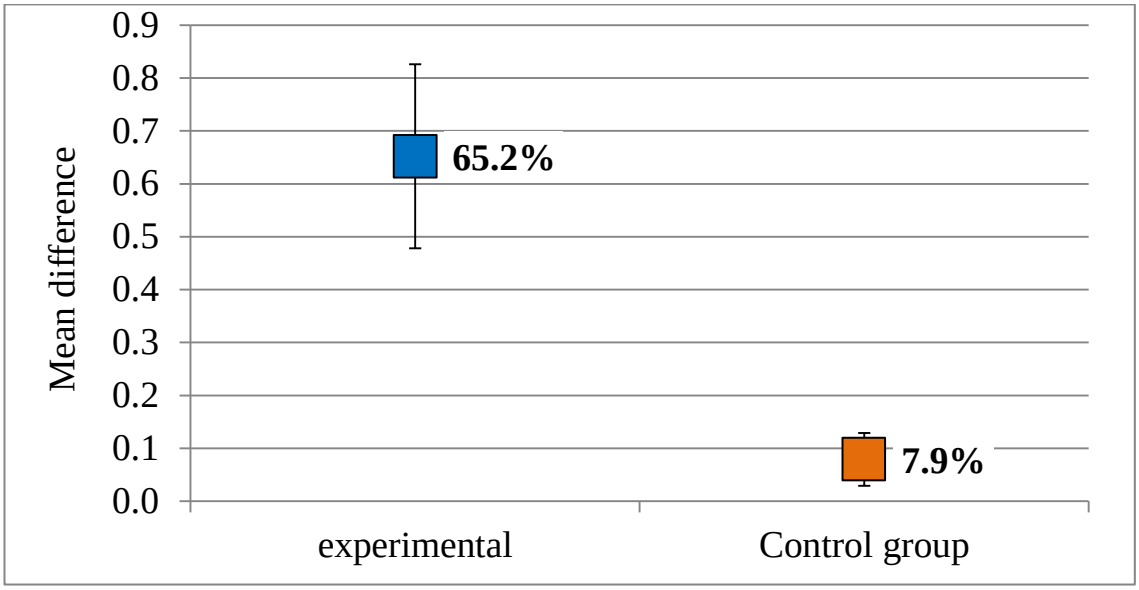


Figure 4.39. Comparison of percentage change in disability scale for carrying a heavy object of 10 pounds (4.5 kilograms) at the end of the program in both studied groups.

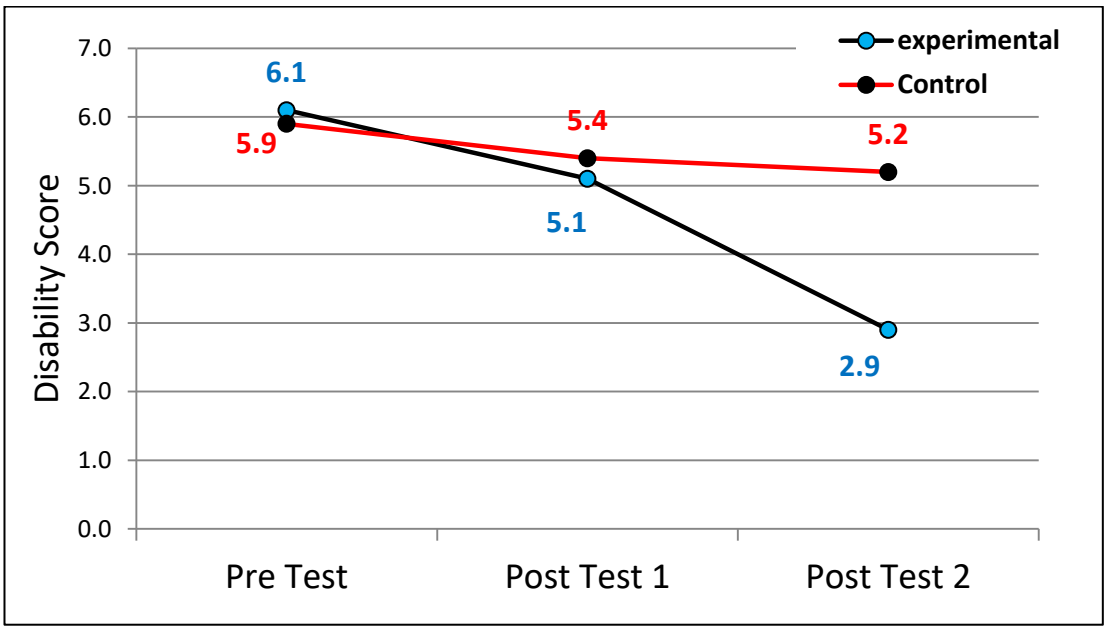


Figure 4.40. Change in disability scale for removing something from back pocket during the program in both studied groups.

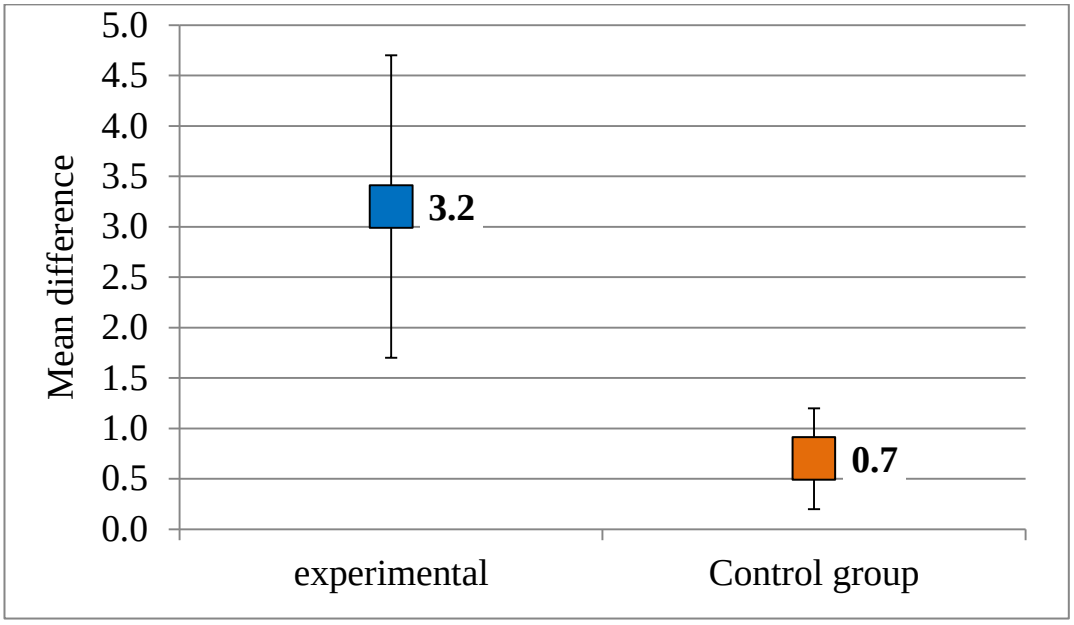


Figure 4.41. Comparison of mean difference (Pre -Post 2) in disability scale for removing something from back pocket at the end of the program in both studied groups.

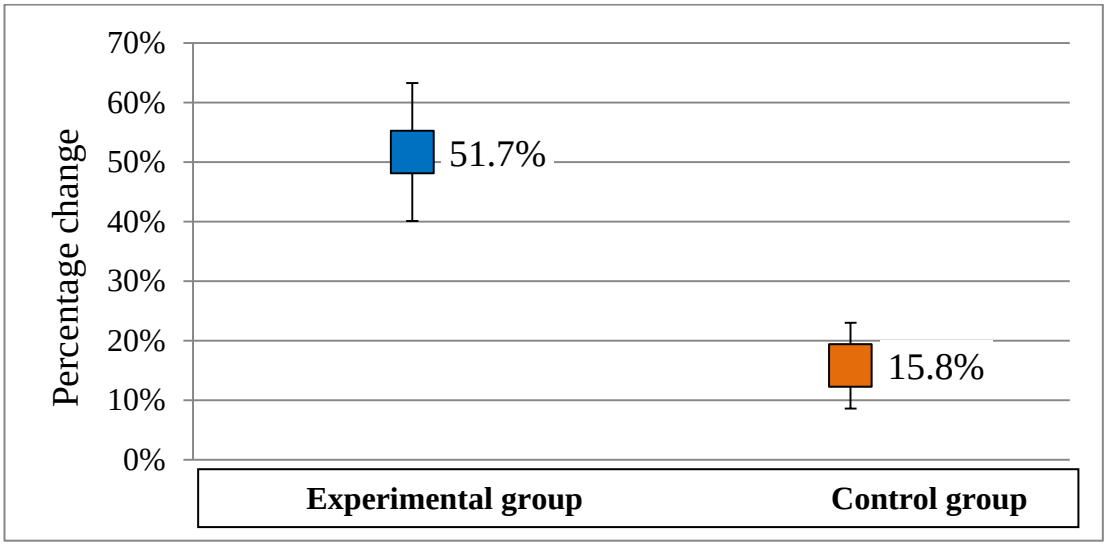


Figure 4.42. Comparison of percentage change in disability scale for removing something from back pocket at the end of the program in both studied groups.

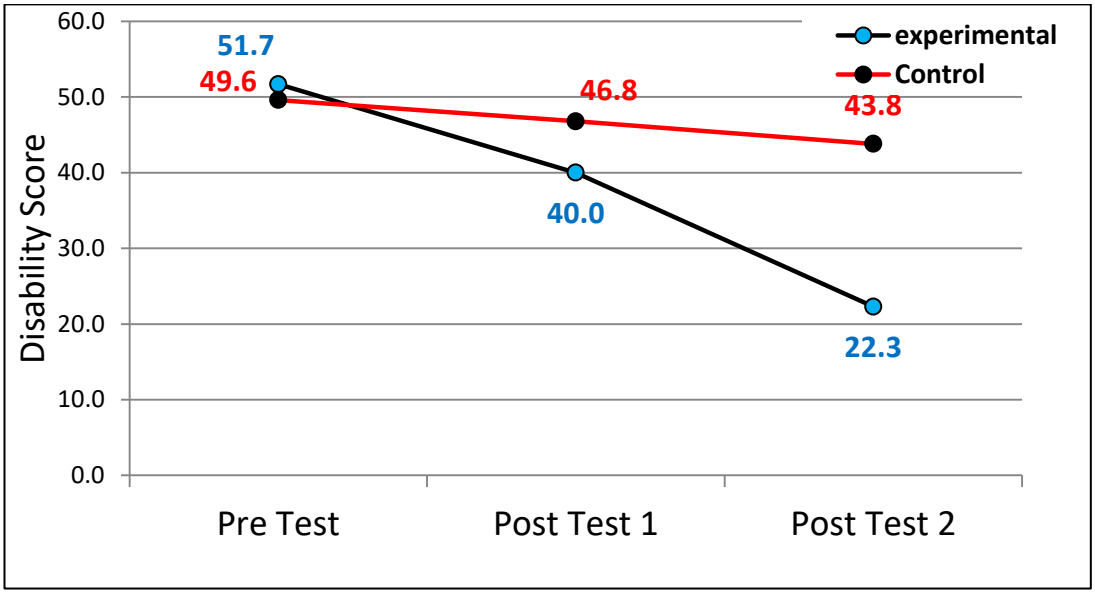


Figure 4.43. Change In Total Disability Scale During The Program In Both Studied Groups.

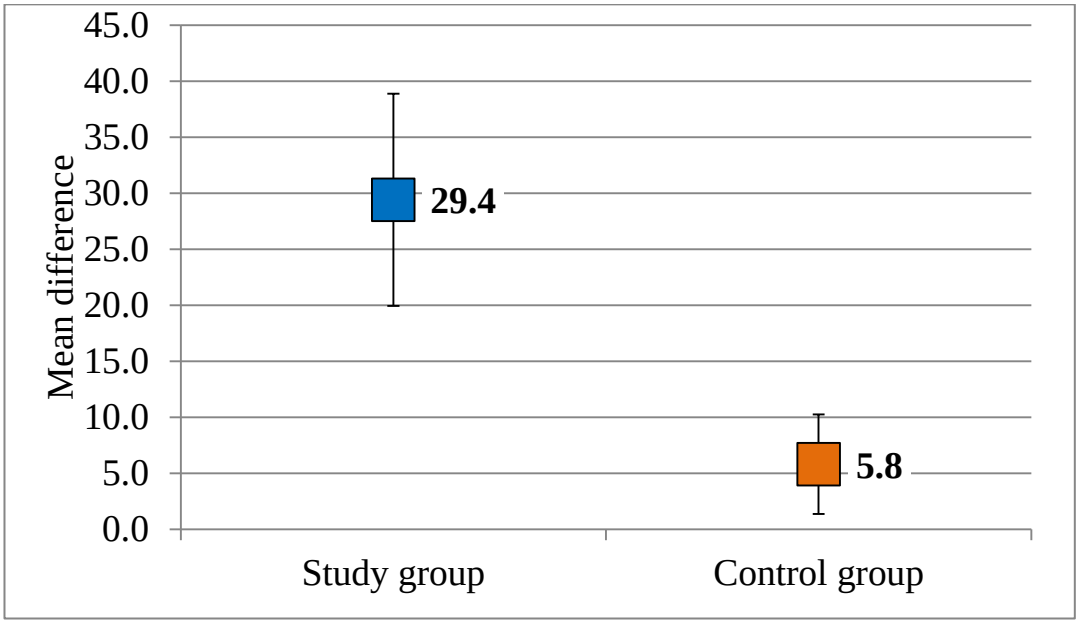


Figure 4.44. Comparison Of Mean Difference (Pre -Post 2) In Total Disability Scale At The End Of The Program In Both Studied Groups.

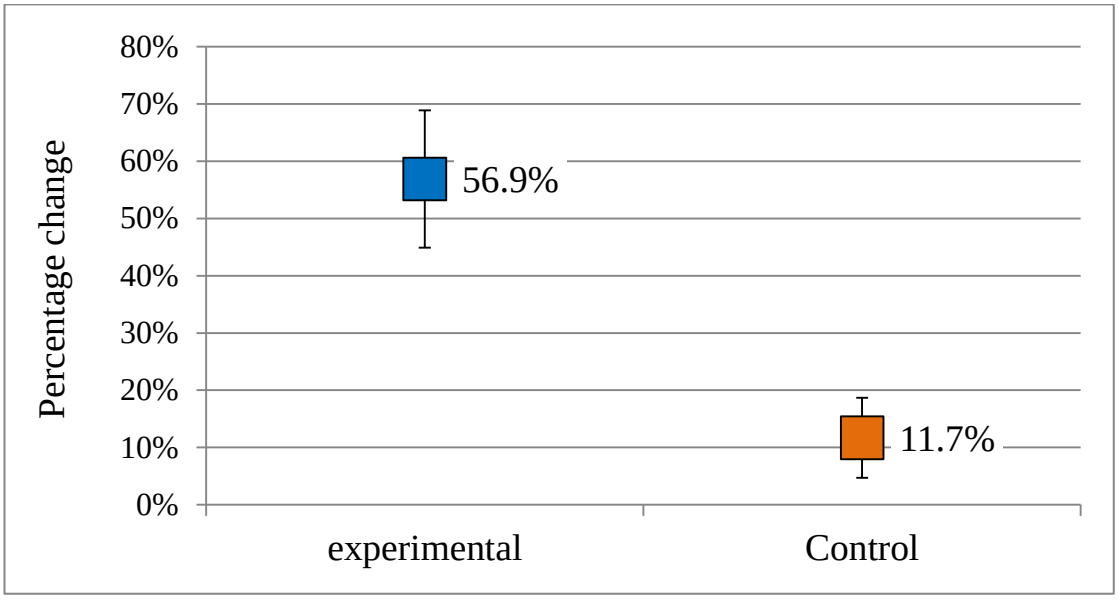


Figure 4.45. Comparison of percentage change total disability scale at the end of the program in both studied groups

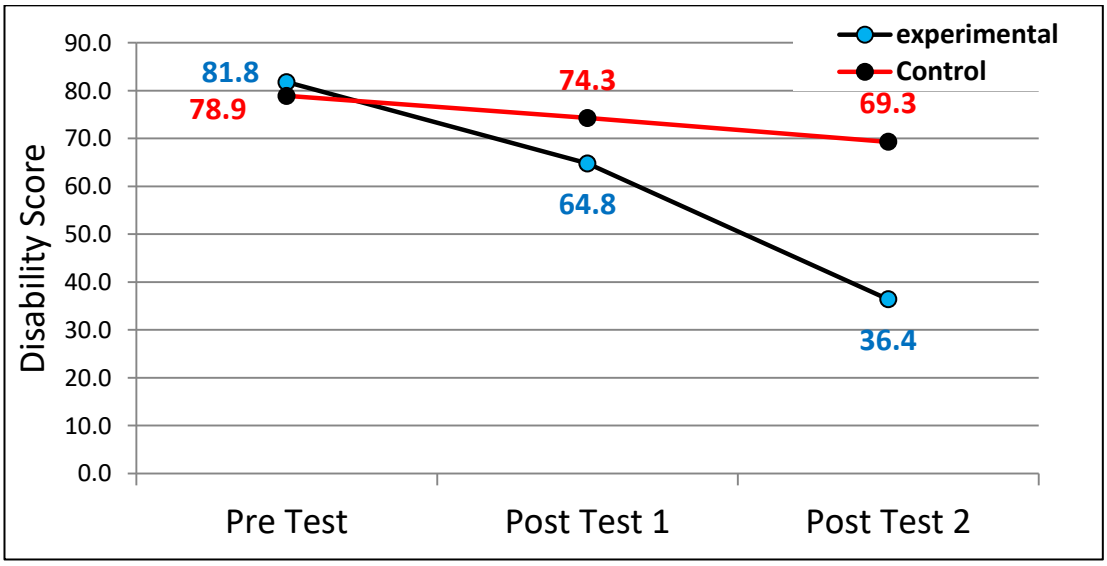


Figure 4.46. Change in the overall pain and disability scale (SPDI scale) during the program in both studied groups.

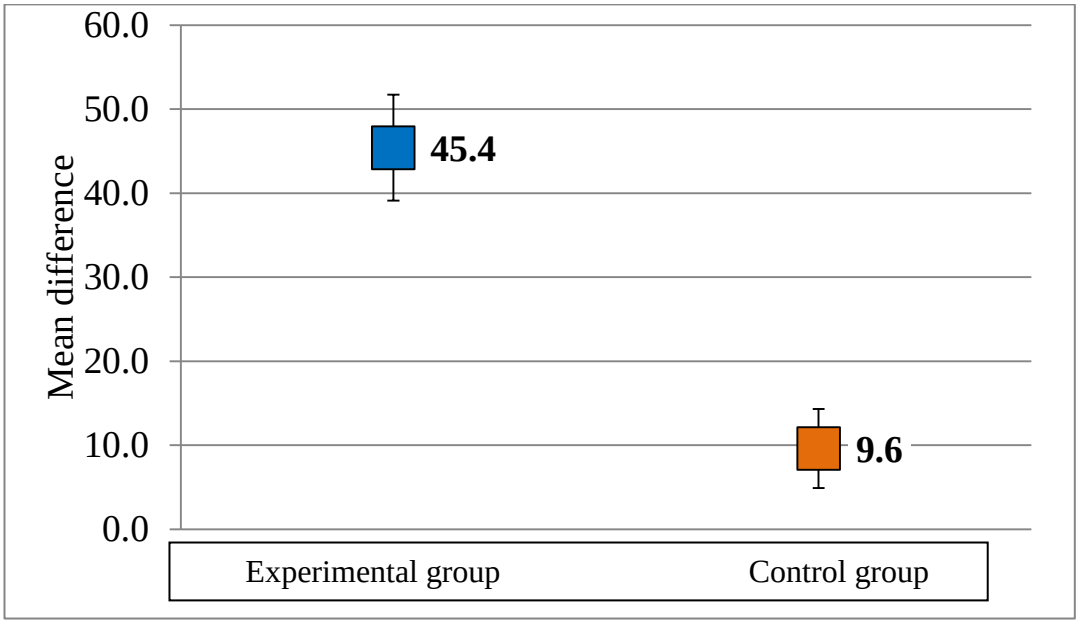


Figure 4.47. Comparison of mean difference (Pre -Post 2) in the overall pain and disability scale (SPDI scale) at the end of the program in both studied groups.

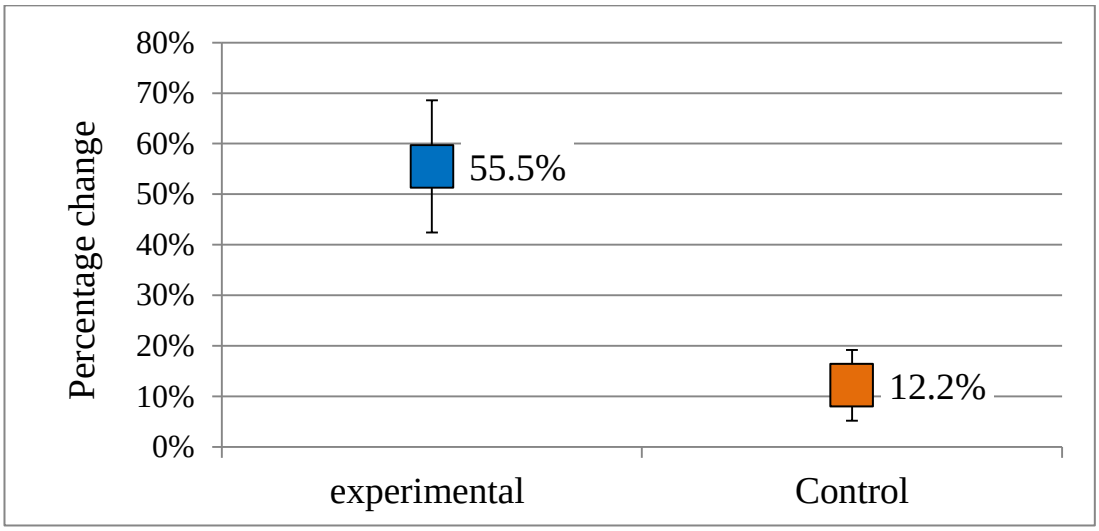


Figure 4.48. Comparison of percentage change in the overall pain and disability scale (SPADI scale) at the end of the program in both studied groups

مستخلص

الجلطة الدماغية هي مشكلة صحية كبيرة تؤثر على الناس في جميع أنحاء العالم .كما أنها أحدى الأسباب الرئيسية للمضاعفات الخطيرة مثل تجمد الكتف (الم وعجز حركة الكتف) وكذلك عسر البلع بعد الجلطة، سلس البول أو الأمعاء، مشاكل عاطفية ، الاكتئاب ، القلق ، شلل الأطراف، والتنمل. الكتف المتجمد هو أحد المضاعفات الرئيسية بعد الجلطة الدماغية. اما في الساعات والأيام القليلة الاولى بعد الجلطة الدماغية يصاب المريض بعسر البلع ويسمى (عسر البلع بعد الجلطة الدماغية) كنتيجة تؤثر على العديد من المرضى بعد الجلطة الدماغية كما أنه يرتبط بزيادة خطر الوفاة وبعض الحالات المرضية مثل الالتهاب الرئوي الاستنشاقي وسوء التغذية . تعتبر الجلسات التمرينية للكتف المتجمدة وعسر البلع مهمة جدًا لتحسين القوة والحركة، المشية والتوازن، مستوى الطاقة ،الثقة واحترام الذات، والرفاهية للمرضى بعد الجلطة الدماغية ، كما ان الجلسات التمرينية هي لتحسين فهم الجلطة الدماغية والوقاية من مخاطرها ، ودعم الأقران الاجتماعي ، التواصل ،التكامل ، والصحة والرفاهية من خلال فهم أفضل للعناية الذاتية والرعاية بعد الجلطة الدماغية.

دراسة كمية شبة تجريبية نفذت في مركز الفرات الاوسط للعلوم العصبية في مدينة النجف الاشرف بهدف تقييم فاعلية جلسات التمرين في معالجة الكتف المتجمد وعسر البلع لمرضى بعد الجلطة الدماغية من الفترة من 19 تشرين الاول 2021 الى 4 حزيران 2023 .

تم اختيار طريقة العينة القصدية غير الاحتمالية لإجراء الدراسة ، وتم اختيار مرضى الجلطة الدماغية الذين يعانون من الكتف المتجمد وعسر البلع للمشاركة في الدراسة ، حيث تتكون عينة الدراسة من (60) مريضاً وجميعهم لديهم نفس المعايير في اختيار العينة .ينقسم هؤلاء المرضى إلى مجموعتين: (30) مريضاً تم اختيارهم كمجموعة تجريبية ، ويتم التعامل مع (30) مريضاً كمجموعة ضابطة، الذين يزورون المركز بانتظام للمتابعة ، جميع عينة الدراسة مقسمة إلى مرضى يدخلون إلى الردهة واللذين يزورون المركز لتلقي لعلاج والاستشارة.

أظهرت غالبية عينة الدراسة أن النسبة المئوية أعلى كانت بين عمر (51-60) سنة ولدى الرجال، ويعانون من جلطة دماغية خثرية. ومعظم العينة يعانون من مرض السكري وارتفاع ضغط الدم، متوسط آلام الكتف وعجز الحركة لكلا المجموعتين كان (6.0) للمجموعة التجريبية مقارنة مع المجموعة الضابطة (4.8) في قبل الجلسات، والتغيرات في حدة عسر البلع بعد جلسات التمرينات يظهر انخفاضا ملحوظا في حدة عسر البلع للمجموعة التجريبية.

الكتف المتجمد وعسر البلع قل بشكل ملحوظ في المجموعة التجريبية بعد جلسات التمرينات مقارنةً مع المجموعة الضابطة.

إن تقديم جلسات تمرينية منظمة ومعروفة في معالجة الكتف المتجمد وعسر البلع للصعوبات التي يواجها المرضى بعد الجلطة الدماغية ، لأن هذه الرحلة الطويلة تحتاج إلى رعاية مخططة وخاصة لهذه المضاعفات لتقليل شدة هذه المضاعفات الكبيرة للمرضى وكذلك خطط تأهيلية لتحسين رعاية ذاتية .

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وزارة التعليم العالي والبحث العلمي
جامعة بابل
كلية التمريض

فاعلية جلسات التمرينات في معالجة الكتف المتجمد وعسر البلع للمرضى بعد الجلطة الدماغية

أطـــروحـــة

مـقـدمـة الـى مجـلـس كـلـيـة الـتـمـريـض/ جـامـعـة بـابـــل - جزء مـن مـتـطـلـبات نـيـل درجـة الـدكـتوراه - فـلـسـفـة فـــي الـتـمـريـض

مـــن قـبـل

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بإشراف

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ذو الحجة 1444هجرية **حزيران 2023 ميلادية**