Faculty of Medicine

University of Dhaka

Outcome of Dry Needling on Gluteus Medius Muscle among Patients with Chronic Low Back Pain

Md. Tanvir Hossain

B. Sc in Physiotherapy

DU exam roll: 1402

DU registration:10447

Session: 2018-19

SAIC College of Medical Science and Technology

Department of Physiotherapy

Mirpur-14, Dhaka-1216

Bangladesh

January, 2024

We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for acceptance this dissertation entitled **"Outcome of Dry Needling on Gluteus Medius Muscle among Patients with Chronic Low Back Pain"** Submitted by **Md. Tanvir Hossain** for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc in PT)

…….....

Dr. Mohammad Habibur Rahman

Assistant Professor of Physiotherapy, SST

Bangladesh Open University, Gazipur, Dhaka

Supervisor

…….....

Dr. Mohammed Sohrab Hossain, PhD

Professor

Department of Physiotherapy, BHPI, CRP

Executive Director,

Center for the Rehabilitation of the Paralysed (CRP)

CRP Savar, Chapain, Savar, Dhaka-1343

……

Zahid Bin Sultan Nahid

Assistant Professor and Head

Department of Physiotherapy

SCMST, Mirpur-14, Dhaka

…….

Dr. Abul Kasem Mohammad Enamul Haque

Principal

SCMST, Mirpur-14, Dhaka

DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that for any publication or dissemination of information of the study, I am bound to obtain written consent from my supervisor.

Name & Signature: Date:

Md. Tanvir Hossain

Bachelor of Science in Physiotherapy (B.Sc. PT)

DU Roll no: 1402

Reg. no: 10447

Session: 2018-2019

Contents

Topic	Page No.
Acknowledgment	i
List of tables	ii
Acronyms	iii
Abstract	iv
CHAPTER I: INTRODUCTION	
1.1 Background	1- 3
1.2 Rationale	4
1.3 Research question	5
1.4 Aim of the study	6
1.5 Objectives	7
1.5.1 General Objective	7
1.5.2 Specific Objectives	7
1.5 Statement of Hypothesis	8
1.6 List of Variables	9
1.7 Operational definition	10 - 11
CHARTER-II: LITERATURE REVIEW	12 - 17
CHARTER-III: METHODOLOGY	
3.1 Study design	18
3.2 Study area	18
3.3 Study Place	18
3.4 Study period	18
3.5 Study Population	18
3.6 Sample Size	19

3.7 Sampling Technique 20
3.8 Consort 21
3.9 Eligibility Criteria 22
3.10 Method of data collection 22
3.11Instrument of Data Collection 22
3.12 Procedure of data collection 23
3.13Tools of data collection 23
3.14 Intervention 24
3.15 Management of data collection 27
3.16 Data analysis 27
3.17 Ethical Consideration 27
CHAPTER-IV: RESULTS 28 -43
CHAPTER- V: DISCUSSION 44-46
5.1 Limitation 47
CHAPTER -VI: CONCLUSION AND RECOMMENDATION 48 - 49
REFERENCES 50-56
APPENDIX 57- 74

ACKNOWLEDGEMENT

First of all, I would like to pay my gratitude to **Almighty Allah** who has given me the ability to complete this project in time with success. The second acknowledgment must go to my parents who have always inspired me to prepare the project properly. I am extremely grateful to my honorable and praiseworthy Supervisor **Mohammad Habibur Rahman**, Assistant Professor of Physiotherapy, SST Bangladesh Open University, Gazipur, Dhaka for giving me his valuable time, his keen supervision, and excellent guidance without which I could not be able to complete this project.

I am also very thankful to **Zahid Bin Sultan Nahid**, Assistant Professor, and Head, Department of Physiotherapy, SCMST; **Dr. Abul Kasem Mohammad Enamul Haque**, Principal, SCMST; **Md. Shahidul Islam**, Assistant Professor & Clinical Head Department of Physiotherapy, SCMST; **Asma Arzo**, Lecturer, Department of Physiotherapy. **Md. Furatul Haque**, Lecturer Department of Physiotherapy, **Md. Billal Hossain,** Lecturer, Department of Physiotherapy, Saic College of Medical Science and Technology (SCMST); **Md. Forhad Hosen**, Lecturer, Department of Physiotherapy, **Shahid Afridi,** Lecturer, Department of Physiotherapy SCMST, and also all of my respected teachers for helping me in this study.

I wish to thank to all the respectable Physiotherapy staff working at Aichi Hospital Physiotherapy Unit for helping me in the collection of my data.

I am grateful to the intern physiotherapists, Department of Physiotherapy, SCMST, Mirpur-14, Dhaka for their support throughout the period of this study. I wish to thank the Librarian of SCMST and his associates for their kind support to find out related books, journals and also access to internet.

Finally, I would like to thanks all the participants who willingly participated as the study population during the conduction of my study and the entire individual who were directly or indirectly involved with this study.

LIST OF TABLES

Table Description	Page No.
Table 1: Baseline characteristics of participants	28
Table 2: Distribution of respondents by Occupation	29
Table 3: Distribution of Respondents by BMI	30
Table 4: Distribution of respondents by Oswestry Disability Index (ODI)	31
Table 5: Descriptive statistics of ODI, Oxford muscle grade, VAS	33-34
Table 6: Wilcoxon results of VAS scores (Experimental Group)	35
Table 7: Wilcoxon results of ODI scores (Experimental Group)	36
Table 8: Wilcoxon results of Oxford Muscle grading scale (Experimental Group)	37
Table 9: Wilcoxon results of VAS scores (Control Group)	38
Table 10: Wilcoxon results of ODI scores (Control Group)	39
Table 11: Wilcoxon results of OMG scores (Control Group)	40
Table 12: Mann-Whitney U-test for between group for VAS (post-test)	41
Table 13: Mann-Whitney U-test for between group for ODI (post-test)	42
Table 14: Mann-Whitney U-test for between group for Oxford Muscle Grading (post-test)	43

ACRONYMS

LBP- Low Back Pain

CLBP- Chronic Low Back Pain

TrPs- Trigger Point

MTrTs- Myofascial Trigger Point

NLBP- Non-Specific Trigger Point

DN- Dry needling

SWD- Short wave diathermy

MWD- Microwave diathermy

UST- Ultrasound therapy

IFT- Interferential therapy

TENS- Transcutaneous electrical nerve stimulation

NSAIDs- Nonsteroid anti-inflammatory drugs

VAS- Visual analog scale

ROM- Range of motion

ODI- Oswestry disability index

BMI- Body mass index

HTN- Hypertension

DM- Diabetes Mellitus

Abstract

Introduction: Chronic low back pain (CLBP) is a widespread condition that severely impacts quality of life and functionality. Among various therapeutic options, dry needling has emerged as a promising intervention. This study evaluates the efficacy of dry needling applied to the gluteus medius muscle, in conjunction with conventional physiotherapy, compared to physiotherapy alone, in alleviating pain, reducing disability, and improving muscle strength in CLBP patients. **Methodology:** A randomized controlled trial was conducted with 30 participants divided into two groups: an experimental group receiving dry needling with conventional physiotherapy and a control group receiving conventional physiotherapy alone. Pain levels were measured using the Visual Analogue Scale (VAS), functional disability was assessed with the Oswestry Disability Index (ODI), and muscle strength was evaluated using the Oxford Muscle Grading system. Pre- and post-treatment data were analyzed using the Willcoxon signed rank test and Mann-Whitney U-test. **Results:** Significant improvements were observed in both groups. The experimental group demonstrated greater reductions in pain (VAS scores decreased by 4.20 compared to 3.93 in the control group), enhanced functional recovery (ODI improvement of 26.13 versus 27.73), and increased muscle strength (Oxford Muscle Grade difference of 0.47 versus 0.40). Statistical tests revealed that while both interventions were effective, the experimental group exhibited slightly superior outcomes across all parameters. **Conclusion:** Dry needling combined with conventional physiotherapy enhances the management of CLBP, leading to improved pain relief, functional ability, and muscle strength. While the additional benefits of dry needling were not statistically significant, the findings underscore its potential as a complementary approach. Further studies with larger sample sizes and long-term follow-up are recommended to validate these results.

Keywords: *Chronic Low Back Pain, Dry Needling, Gluteus Medius, Conventional Physiotherapy, Pain Management, Functional Recovery*

CHAPTER: I INTRODUCTION

1.1 Background:

Globally, low back pain (LBP) is thought to be the most common type of musculoskeletal disorders that cause disability. (Hartvigsen, et al. 2018, p. 2356). Pain that is felt above the buttocks and below the final few ribs, along with or without lower extremity pain, is known to as low back pain (LBP) (Balague, et al. 2012, p. 482). 80% of adults are expected to experience low back pain at some point in their lives, making LBP a major threat to global public health (Hemmer, 2021, p. 336). When the pain lasts for more than 3 months, it is considered chronic. Lumbar disc hernia (LHNP), a common reason for chronic low-back pain, is characterized by particular findings, such as pain, paravertebral muscle spasms, losses of strength, and hypoesthesia, during the course of the disease. It causes social and financial problems as well as health problems. Many psychosocial elements play a role in making the problem chronic. Cognitive, behavioral, and emotional aspects of the condition gain importance as the disease becomes chronic (Tuzun, et al. 2017, p. 1502).

According to a 2016 assessment on the global burden of diseases, injuries, and risk factors, low back pain (LBP) was in the top 328 morbidities for any population group. (Vos, et al. 2017, p.1211). LBP can cause its bearer to feel physically uncomfortable or burdened, mentally disturbed, and lacking in enthusiasm (Hannan, et al. 2019, p. 80). According to various studies published worldwide, office workers' 1-month LBP prevalence ranges from 23% to 46% (Fumero, et al., 2017). It has been found that low-income countries have a higher frequency of LBP than high-income countries (Hartvigsen, et al, 2018, p. 2356).

CLBP is challenging to manage despite having a plethora of treatment options. Clinicians heavily relied on pharmacological treatment and surgery in the past. However, in the past three decades, significant changes were made to the main recommendations in many countries' national clinical practice guidelines to manage low back pain (Foster, et al. 2018, p. 2368). Nowadays, self-management, physical and psychological therapies, and some complementary medical modalities are given more importance than pharmaceutical

surgical and rational interventions. For instance, acupuncture, spinal manipulation, Tai Chi, and yoga are recommended by US national standards as treatments for low back pain (Stochkendahl, et al. 2018, p. 60). A prior study carried out in Bangladesh revealed that doctors treating back pain mostly use non-approved and partially recommended treatments (Ali et al. 2022, p. 275). But according to a different clinical experiment conducted in Bangladesh, combination therapy and evidence-based physiotherapy significantly lessen both physical and emotional interference as well as pain intensity (Ali, et al, 2021, p. 717473). Patients with CLBP may benefit from dry needling, an evidence-based therapeutic technique, to reduce their pain and associated symptoms (Rajfur et al., 2022, pp. 15803).

A scientific study found that when dry needling was used in conjunction with physiotherapy, individuals with chronic pain from different musculoskeletal conditions experienced notable improvements in pain management, range of motion, functional ability, and the decrease of myofascial trigger points (Nunez-Cortes, et al. 2017, p. 209). Low back pain is one of the primary health conditions that greatly increases medical expenses, missed work, and disability. It is typically brought on by musculoskeletal or neuropathic (myelopathy, radiculopathy) factors. Even when neuropathic pain is also present, myofascial TrPs in the lumbar and proximal muscles may be triggered in addition to local or referral low back pain sensations. Therefore, it is essential to access and treat the myofascial TrPs in these patients in addition to the neuropathic component. (Chiarotto, et al. 2016, p. 316).

Low back pain is among the most common complaints. It affects people of all ages, from young children to the elderly, and in countries with rich, middle, and low incomes. Between 1990 and 2015, the number of years lived with a handicap from low back pain increased by 54% worldwide, primarily due to aging and population expansion. The biggest increase was seen in middle-class and low-income countries. Low back pain is currently the leading cause of disability globally (Hartvigsen, et al. 2018, p.1356). Activity-limiting low back pain was present in 7·3% of the world's population in 2015, meaning that 540 million people were affected at that time. at any given moment. Currently, the leading cause of disability worldwide is low back pain (Hartvigsen, et al. 2018, p.1356) .One common issue

that has serious social and economic ramifications is low back pain. All between 85% and 90% of occurrences of low back pain are labeled as "non-specific." The majority of low back pain patients receive effective treatment in primary care, but 10% to 15% go on to experience chronic symptoms (those that last longer than three months). Any area of the back with a nerve supply that can convey pain signals can cause chronic low back pain. Discs, vertebrae, sacroiliac joints, facet joints, muscles, ligaments, and other tissues are some of these sources (Maas, et al. 2015, p. 1465).

Dry needling (DN) is a common method used to treat musculoskeletal disorders. It penetrates the skin, muscles, and subcutaneous tissues with a small needle. This piercing technique causes localized muscular spasms that relax the treated area. As a result, the DN therapy can reduce tension and pain locally (Hoch, 2019). Dry needling (DN) is a standard procedure for treating musculoskeletal disorders. However, there are no clear recommendations for using DN in low back pain (LBP). Therefore, this study aimed to assess the effectiveness of the novel DN program for reducing pain intensity and improving functional efficiency in patients with chronic LBP (Rajfur et al.2022, p .15803).

1.2: JUSTIFICATION:

A large percentage of people suffer from chronic low back pain (CLBP), a common and debilitating condition that frequently lowers functionality and quality of life. Dysfunction in the lumbar and pelvic muscles is one of the main causes of CLBP; the gluteus medius muscle is essential for maintaining good posture and movement patterns as well as for stabilizing the pelvis.

Thin needles are pushed into myofascial trigger points as part of the therapeutic process known as dry needling (DN), which reduces discomfort and tension in the muscles and increases range of motion. Because it is essential for keeping pelvic stability and alignment, the gluteus medius muscle is frequently related to low back discomfort, particularly when it becomes weak, tight, or dysfunctional. Although dry needling's potential benefits in treating musculoskeletal pain have drawn more attention, little study has specifically examined how it affects the gluteus medius muscle in people with CLBP.

This study intends to investigate the effectiveness of dry needling in reducing pain, promoting muscle function, and maybe increasing general mobility in individuals with chronic low back pain by concentrating on the gluteus medius muscle. This study will shed important light on the therapeutic effects of dry needling on a crucial muscle, which may have wider ramifications for enhancing CLBP patients' treatment results. Additionally, it can provide physicians with evidence in favor of including dry needling into multidisciplinary CLBP care plans.

1.3 Research question:

What are the outcomes of dry needling among the patients with chronic low back pain?

1.4 Aim of the study:

The aim of the study was outcome of dry needling in patients with chronic low back pain.

1.5 Objectives

General objectives:

- To compare the outcome between dry needling along with the conventional physiotherapy and only conventional physiotherapy among the patient with chronic low back pain.

Specific objectives:

- To assess the level of pain by using Visual Analog Scale (VAS) of experimental and control group before and after intervention.

- To assess the functional disability by using The Oswestry Disability Index (ODI) questionnaire of experimental and control group before and after intervention.

- To assess the muscle strength by using Oxford grading muscle scale of experimental and control group before and after intervention.

- To compare the outcome due to intervention within experimental and control group.

- To determine the socio-demographic characteristics and pain-related information of participants.

1.6 Hypothesis:

Null hypothesis:

Dry needling of the gluteus muscle is not more effective for the patient with chronic low back pain.

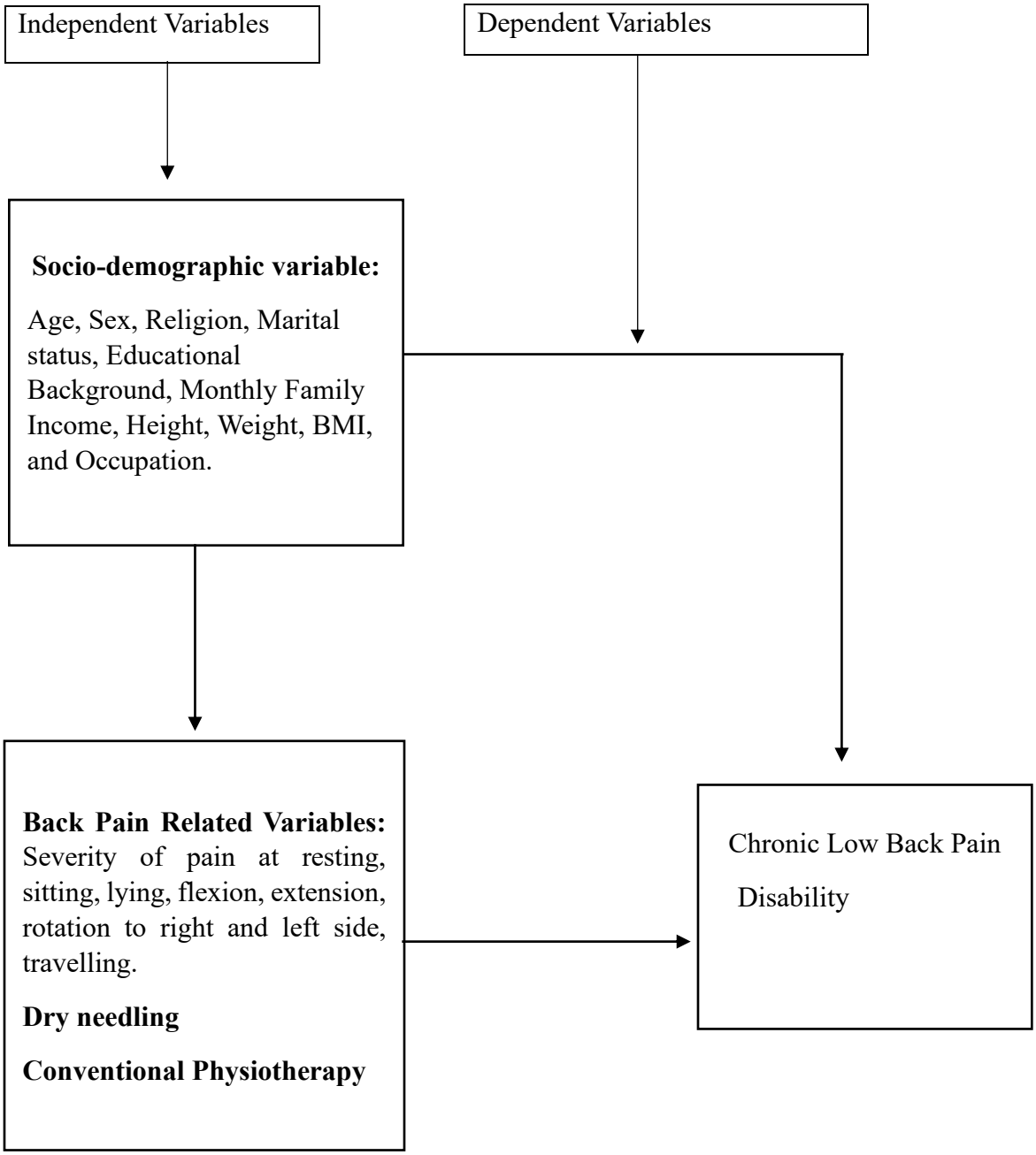
$$\mu_1 - \mu_2 = 0 \text{ or } \mu_1 \geq \mu_2$$

Alternative hypothesis:

Dry needling of the gluteus muscle is more effective for the patient with chronic low back pain.

$$\mu_1 - \mu_2 \neq 0 \text{ or } \mu_1 \neq \mu_2$$

1.7 List of Variable /Conceptual Framework



1.8 Operational definition:

Age:

Age refers to the age of a person (or subject) of interest at the last birthday (or relative to a specified, well-defined reference date).

Sex:

Sex refers to the biological and physiological characteristics that define humans as female or male.

Height:

distance, measured along a perpendicular, between. a point and a reference surface.

Weight:

Weight is the Gravitational force with which the Earth attracts the masses towards its center.

Occupation:

set of jobs whose main tasks and duties are characterized by a high degree of similarity

Pain:

An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.

Low back pain:

Low back pain (LBP) describes pain between the lower edge of the ribs and the buttock. It can last for a short time (acute), a little longer (sub-acute) or a long time (chronic). It can affect anyone.

Chronic low back pain:

Chronic low back pain (CLBP) is defined as lower back pain lasting for longer than 12 weeks or 3 months, even after an initial injury or underlying cause of acute low back pain has been treated.

Visual analog scale (VAS):

The visual analog scale for pain is a straight line with one end meaning no pain and the other end meaning the worst pain imaginable. A patient marks a point on the line that matches the amount of pain he or she feels. It may be used to help choose the right dose of pain medicine. Also called VAS.

Dry needling:

Dry needling is a technique that acupuncturists, physical therapists and other trained healthcare providers use to treat musculoskeletal pain and movement issues. It's almost always used as part of a larger pain management plan that could include exercise, stretching, massage and other techniques. During this treatment, a provider inserts thin, sharp needles through your skin to treat underlying myofascial trigger points.

Conventional physiotherapy: Conventional physiotherapy is a traditional form of treatment that uses manual techniques, exercises, and physical modalities to improve movement, reduce pain, and promote recovery from injuries or physical conditions.

Body mass index (BMI):

Body mass index (BMI) is a value derived from the mass (weight) and height of a person. The BMI is defined as the body mass divided by the square of the body height, and is expressed in units of kg/m2, resulting from mass in kilograms (kg) and height in meters (m)

CHAPTER: II LITERATURE REVIEW

80% of people on the globe suffer from lower back pain (LBP). (D. Griswolda, 2019, pp. p,141). Chronic low back pain (CLBP) is a significant worldwide public health issue that has a wide range of effects on daily living. (Hartvigsen, et al. 2018, p. 2356). Between 1990 and 2019, there was a 54% increase in years lived with disability due to low back pain globally. The point prevalence of low back pain was 7.3%, suggesting said there were 540 million affected persons at any given period of time (Abbafati, et al. 2020, p. 43). In Bangladesh, the prevalence of LBP is significantly increased (Ali, et al. 2023, p. 23). An earlier study carried out in Bangladesh revealed that doctors treating back pain mostly use treatments that are neither recommended nor partially recommended (Ali, et al. 2022, p . 275).

However, an additional clinical trial conducted in Bangladesh demonstrated that individuals with musculoskeletal problems, including low back pain, have a significant reduction in pain intensity as well as physical and affective interference when receiving evidence-based physiotherapy and combination therapy. (Ali, et al. 2021, p. 717). In 1990, the age-standardized point prevalence of LBP was 8.20% (95% UI: 7.31 to 9.10%), and by 2017, it had somewhat declined to 7.50% (95% UI: 6.75 to 8.27%). At any given moment in 1990, there were 377.5 million persons living with LBP; by 2017, that figure had risen to 577.0 million. The age-standardized prevalence of low back pain was greater in women than in men. Age-related increases in LBP prevalence peaked between the ages of 80 and 89, after which it somewhat declined. In 1990, there were 42.5 million YLDs worldwide (95% UI: 30.2 million to 57.2 million). By 2017, that number had risen by 52.7% to 64.9 million (95% UI: 46.5 million to 87.4 million). Moreover, YLDs were more common in women than in men and rose with age at first, peaking between the ages of 35 and 39 in 1990. in opposed to 2017, when they peaked at 45–49 years old before declining. There were more LBP YLDs in Western Europe than anywhere else (Wu, et al. 2017, p. 299).

The widespread issue of low back pain has important social and economic ramifications. Between 85% and 90% of cases of low back pain are "non-specific" in nature. Although most individuals with low back pain are adequately treated by primary care physicians, 10

to 15 percent of patients have chronic symptoms (lasting more than three months). Every area of the back that has the potential to produce persistent low back pain has nerves that can transmit pain. Muscles, ligaments, discs, sacroiliac joints, facet joints, and other tissues make up these sources. In an effort to identify the source of low back pain, pain specialists employ nerve blocks (Maas, et al. 2015, p. 45).

Pain in the lower back is quite common. It affects people of all ages, from young toddlers to the elderly, and in countries with rich, middle, and low incomes. The number of years lived with a disability from low back pain increased by 54% globally between 1990 and 2015, mostly as a result of aging and population expansion. The biggest increase was seen in low-income and middle-class countries. Low back pain is currently the leading cause of disability worldwide. Nearly all people who suffer from low back pain are unable to identify a single nociceptive reason. Only a small portion of instances have a known pathological cause, like a spinal fracture, malignancy, or infection. Smokers, obese persons, people with medical and mental comorbidities, and those with physically demanding jobs are the groups most prone to develop low back pain. Disabling low back pain disproportionately affects people with lower socioeconomic status. (Wu, et al. 2017, p. 295).

The majority of people who have new bouts of low back pain recover quickly. are common, however, and only a small portion of people suffer with persistent, debilitating low back pain. Psychological anguish, many body pain sites, and initial high pain intensity are associated with a higher likelihood of persistent, incapacitating low back pain. An increasing amount of evidence suggests that central pain-modulating systems and pain perceptions are important factors in the development of persistent, debilitating low back pain. The cost, use of medical services, and disability of low back pain vary widely among countries and are influenced by local culture, social structures, and cause-and-effect theories. Low back pain is expected to increase disability and expenses in the coming decades, especially in low- and middle-income countries where health and other institutions are often fragile and unprepared to cope with this growing burden. It is clear that in order to address the prevalence of low back pain as a public health issue, more research and international cooperation are needed. (Hartvigsen, et al. 2018, p. 2356).

More people now see low back pain as a chronic illness with a changeable course as opposed to isolated episodes (Dunn, et al. 2013, p. 591). About 50% of patients with low back pain who attend a primary care physician have a trajectory of persistent or intermittent low-to some recover with modest intensity, while others have severe low back pain that lasts a lifetime (Kongsted, et al. 2016, p.1). There is strong proof from a systematic review (33 cohorts, 11 166 participants) that most episodes of low back pain significantly resolve. Average pain levels are low (6 points on a 100-point scale; 95% CI 3–10) after 12 months after 6 weeks. Nonetheless, at 3 months, 67% of patients (95% CI 50–83) and at 12 months, 65% of patients (54–75) still report having some pain (Itz & C.J. et al. 2013, p. 5).

Although low back pain recurrences are frequent, a 2017 systematic review comprising seven studies with 1780 participants discovered that reliable estimates of the risk of low back pain recurrence are lacking in the literature. Based on available data, approximately 33 percent of individuals will experience another episode within a year of their prior recovery (Da Silva, et al. 2017, p. 305). Most of the time, a precise pathoanatomical cause cannot be determined; nonspecific LBP (NLBP) accounts for 90–95% of cases (Oliveira, et al.,2018). Hip abductor dysfunction is one possible etiology of NLBP that clinicians frequently ignore (Cooper, et al. 2016, p. 1258). In fact, one of the most typical presentations of chronic NLBP is weakening of the gluteus medius muscle and associated discomfort (Cooper, et al 2016, p. 1258).

When compared to healthy individuals, those with low back pain have been demonstrated to have a weaker gluteal medius muscle, more discomfort, and higher amounts of MTrPs (Sadler, et al. 2019, p. 67). Various degrees of sensory and motor dysfunction, such as hyperalgesia, spontaneous pain, transferred pain, and muscle weakening, have been associated with myofascial trigger points (MTrPs) (Shah, et al. 2015, p. 746).

The physical therapy examination is used to match the majority of patients with chronic LBP to exercise treatment. Physical therapists usually prescribe exercises that target the strength of the abdominal and lumbar musculature or activities that are preferred in a particular. Many therapies have been recognized as effective in treating NLBP (Delitto, et al. 2012, p. 57). although there isn't a single treatment that has been proved to be better (Deyo, et al. 2017, p. 97). The results of physical rehabilitation techniques, such exercise,

and dry needling (Oliveira, et al. 2018, p. 5791). The goal of the DN approach, which is frequently used to treat MTrPs, is to mechanically disrupt tissue by puncturing the epidermis, subcutaneous tissues, and muscle with a small needle (Gattie et al. 2017, p. 56). Patients with CLBP may have a reduction in pain and associated symptoms by using dry needling, an evidence-based therapeutic technique (Rajfu, et al. 2022, p.15803).

One common treatment for musculoskeletal conditions is dry needling (DN). With the use of a tiny needle, it enters the muscles, subcutaneous tissues, and skin. This puncturing method relaxes the treated area by causing localized muscular spasms. Thus, the DN therapy may reduce discomfort and stress in the area. (Mullins, et al. 2021, p. 672). Changes in muscle tissue mechanosensitivity, range of motion, lower muscular tone, and decreased pain in individuals with musculoskeletal problems have been seen, while the consequences of DN are still unknown (Gattie, et al. 2017, p. 133).

There is some evidence to suggest that DN of MTrPs may be advised, particularly when combined with other therapy. Measure the degree of LBP (Liu, et al. 2018, p. 144). Although DN methods and exercise have been beneficial for NLBP patients, no study has examined how well these approaches work when used to get together. Therefore, we suggested that, in patients with chronic nonspecific low back pain, the application of a specific hip abductor exercise program along with DN of MTrPs of the gluteus medius muscle would prove to be more effective at three months than the application of a specific hip abductor exercise program along with sham DN of MTrPs of the gluteus medius muscle. Thus, this study's main goal was to investigate the impact of adding DN to a four-week exercise program on patients' pain intensity at three months for persistent nonspecific low back pain. Finding out how adding DN to a four-week exercise program affected disability, psychological aspects, and other goals was the secondary goal. pressure discomfort sensitivity in the abdomen. (Martin-Corrales, et al. 2020, p. 2948).

According to a scientific investigation, using dry needling in addition to physiotherapy produced significant improvements in pain management, range of motion, functional ability, and the reduction of myofascial trigger points in people with chronic pain from other musculoskeletal disorders (Nunez-Cortes, et al. 2017, p .209). DN was performed on latent or active TPs in the individuals' quadratus lumborum, gluteus medius, multifidus,

and erector spinae muscles without the use of a local anesthetic. These muscles were chosen based on a number of criteria. Even though active TPs are also commonly experienced by the multifidus muscle, which is located in the quadratus lumborum and gluteus medius muscles, One of the fundamental stabilizers, deeper, has not gotten enough attention as a major cause of discomfort (Tellez-Garcia, et al. 2015, p. 464).

The benefits of DN include the rapid normalization of active myofascial TP chemistry, the restoration of joint range of motion and muscle activity, and acute decreases in local, reflected, and generalized pain. DN can reduce both peripheral and cerebral sensitivity. "DN appears to be a useful adjunct to other therapies for chronic low-back pain," according to the findings of the comprehensive research (Furlan, et al. 2005, p. 331). Consequently, DN applied to TPs may help reduce TP sensitivity in people with chronic low back pain. However, a meta-analysis revealed insufficient evidence to support DN. (Tough, et al. 2009, p. 3). The DN technique alters activity in the TPs by actively interfering with the sensory or motor components of nerve endings that result in abnormal aspects of muscle contractions. Overstimulation of sensory nerves and taut bands of palpable muscle fibers is reduced as a result of this disturbance. The local sensitivity and reflected discomfort are caused by excessive sensory neuron activation. The needle causes a temporary damage to the muscle fibers, which results in the release of local intracellular potassium. When extracellular potassium levels are sufficiently high, this prevents nerve fibers from depolarizing (Simons, et al. 2016, p. 255).

In his investigation, a randomized control trial was observed. Both before and after treatment, as well as after one and three months, the experimental group's RMQ improved statistically more than the controls' ($p=0.923$ before and $p<0.001$ after treatment). The experimental group had a significant advantage over the controls in this area, despite the positive analgesic effect ($p=0.001$ in favor of DN overall). Both groups demonstrated a statistically insignificant improvement in postural stability and balance after treatment, but these advantages didn't appear to last long. Unexpectedly, DN was no better than phony interventions. Every variation in the swing phase was statistically insignificant for both groups. for the first swing phase ($p=0.201$ for the dominant side and $p=0.283$ for the non-dominant side). For the dominant side of the body, all stance phase changes were

statistically not significant (p=0.480), and for the non-dominant side, p=0.410. Information evaluating the efficacy of dry needling in conjunction with physiotherapy for the treatment of CLBP patients is lacking, nevertheless. We believed that treating CLBP with a combination treatment plan would be more effective. Thus, the goal of this randomized clinical trial is to evaluate the effects of dry needling and simple physiotherapy on patients with CLBP in order to ascertain the significance of combination therapy (Prodhania, et al. 2023, p. 101).

CHAPTER: III METHODOLOGY

This thesis was designed to evaluate the Outcome of Dry Needling on Gluteus Medius Muscle Among the Patients with Chronic Low Back Pain. To identify the effectiveness of this treatment regime Visual Analogue scale, Goniometer, Oswestry Disability Index and Oxford grading scale were used as measurement tools for measuring pain, range of motion, disability and muscle strength.

3.1. Study Design: The study design was a Randomized Controlled Trial (RCT). This design was best for comparing the outcome of dry needling along with conventional physiotherapy and only conventional physiotherapy among the patients with chronic low back pain.

3.2. Study Area:

Aichi Hospital, Physiotherapy Unit, Abdullahpur, Uttara, Dhaka

3.3 Study Place:
The study was conducted at Saic College Of Medical Science And Technology Mirpur, Dhaka.

3.4 Study Period:
The study period was one year (September 2023 to August 2024).

3.5 Study population:

Patient with chronic neck pain constituted the study population for the present study.

3.6 Sample Size

Sample size for this thesis was 34. Among them 17 participants were in trial group and 17 participants in control group.

$$k = \frac{n_2}{n_2} = 1$$

$$n_1 = \frac{\left(\sigma\frac{2}{1} + \sigma\frac{2}{2}/K\right)\left(Z_1 - \frac{\alpha}{2} + Z_1 - \beta\right)^2}{\Delta^2}$$

$$n_1 = \frac{(1.48^2 + 1.48^2/1)\,(1.96+1.04)^2}{1.39^2}$$

$$n_1 = 20$$

$$n_2 = K \times n_1 = 20$$

Here,

$\Delta = \mu_2 - \mu_1$ = absolute difference between two means

σ_1 , σ_1 = variance of mean 1 and 2

n_1 = sample size for group 1

n_2 = sample size for group 2

α = probability of type I error (usually 0.05)

β = probability of type II error (usually 0.2)

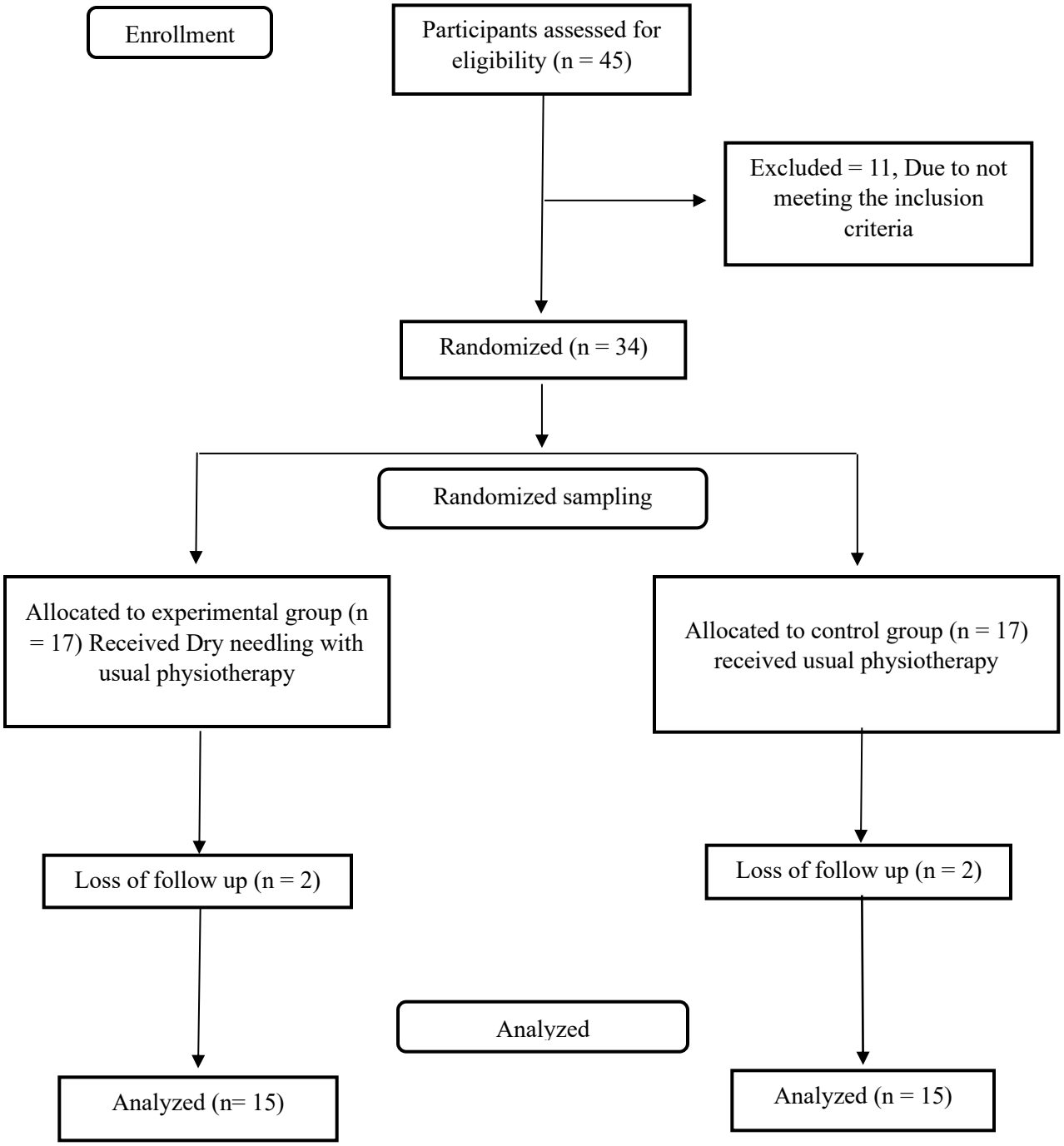
z = critical Z value for a given α or β

k = ratio of sample size for group 2 to group 1

3.7 Sampling technique:

Convenience sampling technique was adopted to select the patients with chronic low back pain from Aichi hospital, Physiotherapy unit, Abdullahpur, Uttara, Dhaka. Then screening of the patients was done on the basis of inclusion criteria. The patients were included who met the inclusion criteria. There after, Simple random sampling technique was used to allocate the participants into experimental and control group.

3.8 CONSORT (Consolidated Standards of Reporting Trials) flow chart:



3.9 Eligibility criteria

Inclusion criteria:

- Patient with confirmed chronic low back pain.
- Age range 18-70 year (Suvarnnato et al., 2019).
- Both gender of male and female.

Exclusion criteria:

- Patient with severe pathological condition.
- Patient with recent surgery.
- Patient who are not interested.
- Mental unstable patients.
- Patients use of anticoagulant steroid therapy.
- Sensory disturbances patient.
- Uncontrolled high blood pressure patients.
- Patients fear of needles.

3.10 Method of data collection

Data was collected through a face-to-face interview using an internationally accepted questionnaire. The assessor was bilingual (Bengali and English), and the investigator did forward and backward translation of the questionnaire by different people and found the same meaning.

3.11 Instrument of data collection

A questionnaire was prepared according to the objectives and variables of the present study. The questionnaire contained both open-ended and closed-ended questions. The questionnaire has three parts. The first part contained questions on socio-demographic information (a structured questionnaire was used for socio-demographic information). The second part included questions about pain using the Visual Analogue Scale (VAS) and

ROM using a goniometer. The third part included questions about disability using the Oswestry Disability Index (ODI). and the Fourth part included the Oxford grading scale.

3.12 Procedure of data collection

The researcher selected 45 patients with chronic lower back pain from the outpatient services at the Aichi Hospital, Physiotherapy Unit, Abdullahpur, Uttara, Dhaka. The 11 patients were excluded on the basis of exclusion criteria. Then the 34 patients were allocated into experimental and control groups by randomization. Allocated to the experimental group 17 patients received Dry needling with Conventional physiotherapy and Allocated to the control group 17 patients received usual physiotherapy. Two patients in both groups did not complete 12 sessions of treatment. Ultimately the number of participants in the experimental and control group where 15 respectively. Information on pain and disability was collected. This information has been regarded as pre-test data. The intervention for the present study by dry needling and conventional physiotherapy in the experimental group. For the control group only conventional physiotherapy was given. Both group received similar 12 sessions. After completion of intervention information on pain and disability was collected. The information after the intervention has been regarded as post-test data among with 30 chronic Low back pain patients.

3.13 Tools of data collection

In this particular study, a weight machine, goniometer, height measure tape, ODI scale, Oxford grading scale, were used.

3.14 Intervention (Appendix- D)

Control group (Conventional Physiotherapy):

1. Myofascial release on back muscle -10 min

2. Stretching exercise of back muscle -10 rep.20 sec.

3. Strengthening exercise of core, back, and abdominal muscles

4. Back extension exercise – 10 rep.10 sec

5. Bridging exercise -10 rep.10 sec

6. Transcutaneous electrical nerve stimulation (TENS) over the back muscle- 10 min

7. Ultra sound over the back muscle -5 min

Experimental group (Dry needling + Conventional Physiotherapy)

1. Use sterile, solid, stainless steel acupuncture needles (0.25mm–0.30mm diameter, 30-50mm length) for dry needling.

2. Insert needles into identified trigger points or myofascial tight bands within the gluteus medius muscle.

3. Needle insertion depth typically ranges from 1–2.5 cm.

4. Manipulate the needle (e.g., twirling or piston movement) for 30–60 seconds to elicit a local twitch response (LTR).

5. Leave the needle in place for 10–15 minutes or until LTR is observed or pain relief occurs.

6. Conduct 3 treatment sessions per week for 2 weeks.

7. Instruct the patient to avoid intense activity for 24-48 hours post-treatment.

8. Suggest ice or heat for mild soreness, if needed.


HUANQIU

3.15 Management of data:

At the end of each day, the collected questionnaires where checked for any errors or inconsistencies. The necessary corrections where made. The recorded data where coded accordingly into the SPSS-26 version of the program.

3.16 Data analysis

Data were analyzed by SPSS version 26 using descriptive analysis for sociodemographic variables. An independent t-test and pair t-test was used to assess pre-test and post-test intervention within the group. Microsoft Excel 2019 was used for the bar diagram and chart.

3.17 Ethical consideration

This study will be conducted with prior permission from the ethical review committee of Saic College of Medical Science & Technology (SCMST). Before starting data collection I will obtain a permission letter from the authority and I will maintain all kinds of ethics strictly. I will try to avoid all kinds of biases in my research. I will keep all information secure and will not use it for any purposes without the concerns of the respondent and supervisor of this study.

Chapter IV RESULT

4.1 Baseline characteristics of participants

Table 1: Distribution of respondents by age.

Age (in years)	Experimental		Control		
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)	Total
21-30	-	-	1	6.7	1
31-40	8	53.3	8	53.3	16
41-50	5	33.3	4	26.7	9
51-60	2	13.3	1	6.7	3
61-70	-	-	1	6.7	1
Mean ± SD	41.60 ± 8.210		40.40 ± 9.745		

The socio-demographic characteristics of participants, as represented in Table 1**,** show the age distribution across the experimental and control groups. The majority of respondents in both groups fall within the 31–40 age range**,** accounting for 53.3% of participants in each group. The next largest category is the 41–50 age range**,** comprising 33.3% of participants in the experimental group and 26.7% in the control group. Participants aged 51–60 represent 13.3% in the experimental group and 6.7% in the control group, while participants in the 61–70 age range are exclusively found in the control group, contributing 6.7% of its respondents. Interestingly, only one participant **(**6.7%**)** in the control group is within the 21–30 age range**,** with no corresponding representation in the experimental group. The mean age of participants is slightly higher in the experimental group **(**41.60 ± 8.210 years**)** compared to the control group **(**40.40 ± 9.745 years**).** These findings highlight

a fairly balanced age distribution between the groups, with minor variations in representation across specific age brackets.

4.2 Distribution of Participants by Occupation

Table 2: Distribution of respondents by occupation.

Occupation	Experimental		Control		
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)	Total
Businessman	2	13.3	1	6.7	3
Housewife	1	6.7	4	26.7	5
Job	10	66.7	9	60.0	19
Teacher	2	13.3	-	-	2
Retired	-	-	1	6.7	1

The distribution of participants by occupation shows varying trends across the experimental and control groups. In the experimental group**,** the majority of participants (66.7%**,** 10 out of 15) are engaged in jobs, followed by businessmen and teachers**,** each contributing 13.3% (2 out of 15). Only 6.7% (1 out of 15) of participants in this group are housewives, and no retired individuals are present.

In the control group**,** a similar trend is observed, with the majority of participants **(**60.0%**,** 9 out of 15) being in jobs. This is followed by housewives, who represent 26.7% (4 out of 15), and businessmen, who make up 6.7% (1 out of 15). Additionally**,** 6.7% (1 out of 15) of participants in the control group are retired, and no teachers are present in this group.

4.3 Distribution of Respondents by BMI

Table 3: Distribution of respondents by BMI.

BMI Categories	Experimental		Control		
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)	total
Normal weight (18.5-24.9)	7	46.7	7	46.7	14
Pre-obesity (25.0-29.9)	8	53.3	8	53.3	16
Mean ± SD	20.71 ± 2.02		22.32 ± 1.48		

Normal weight and pre-obesity participants are evenly represented in both the experimental and control groups, according to the respondents' Body Mass Index (BMI) category distribution. Of the participants in both groups, 53.3% (8 out of 15) are categorized as pre-obese, while 46.7% (7 out of 15) are classed as normal weight. In comparison to the control group, which has a mean BMI of 22.32 ± 1.48, the experimental group's members had a slightly lower mean BMI (20.71 ± 2.02). Notwithstanding this slight variation, the groups' initial weight status features are identical, as evidenced by the consistent distribution of BMI categories. Comparable results between the two groups are guaranteed by this balance.

4.4 Distribution of respondents by Oswestry Disability Index (ODI):

Table 4: Distribution of respondents by Oswestry disability Index (ODI)

Disability Level	Experimental		Control		
	Pre N (%)	Post N (%)	Pre N (%)	Post N (%)	Total
Minimal disability	-	2 (13.3%)	-	1 (6.7%)	3
Moderate disability	-	11 (73.3%)	-	13 (86.7%)	24
Severe disability	11 (73.3%)	2 (13.3%)	10 (66.7%)	1(6.7%)	24
Crippling disability	4 (26.7%)	-	5 (33.3%)	-	9
Mean ± SD	58.4 ± 7.05	32.27 ± 9.49	59.73 ± 7.6	32 ± 5.58	

The distribution of respondents by the Oswestry Disability Index (ODI) demonstrates notable improvements in disability levels in both the experimental and control groups following treatment. In the experimental group, the majority of participants (73.3%) initially presented with severe disability, and 26.7% with crippling disability, with no cases of minimal or moderate disability. Post-treatment, 73.3% transitioned to the moderate disability category, 13.3% achieved minimal disability, and only 13.3% remained in the severe category, with no cases of crippling disability. The mean ODI score improved significantly from 58.4 ± 7.05 to 32.27 ± 9.49. Similarly, in the control group, 66.7% of participants initially had severe disability and 33.3% had crippling disability. Post-treatment, 86.7% moved to moderate disability, 6.7% achieved minimal disability, and only 6.7% remained in the severe category, with no cases of crippling disability. The mean ODI score in this group decreased from 59.73 ± 7.6 to 32 ± 5.58, reflecting substantial progress.

4.5 Pain Persistence:

The persistence of pain among participants varied slightly between the experimental and control groups. In the experimental group, the majority of participants (80%**,** 12 out of 15) reported pain lasting for 6–12 hours**,** while a smaller proportion (20%**,** 3 out of 15) experienced pain persisting for 13–24 hours**.** Similarly, in the control group, 86.7% (13 out of 15) of participants experienced pain lasting for 6–12 hours, and the remaining 13.3% (2 out of 15) reported pain persisting for 13–24 hours. These results show that most participants in both groups experienced moderate-duration pain (6–12 hours). However, a slightly higher proportion of participants in the experimental group reported longer-lasting pain (13–24 hours) compared to the control group, which may influence the evaluation of treatment effectiveness between the groups.

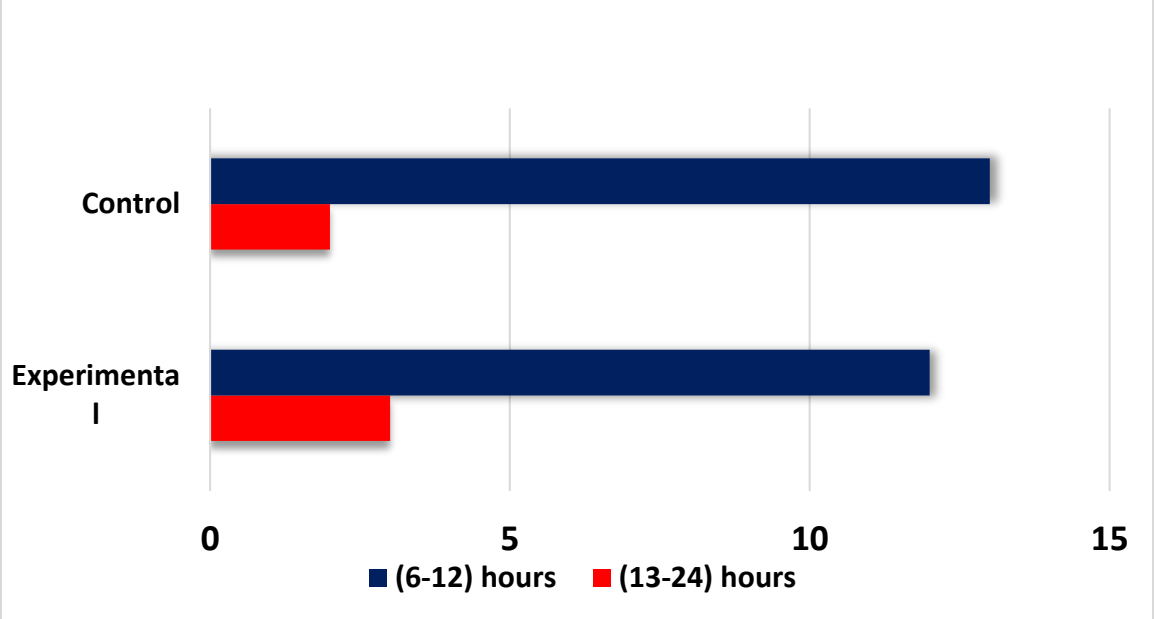


Figure 1: Pain persistant level.

Table 4.6 Descriptive statistics of ODI, Oxford muscle grade, VAS

Table 5: Pre test and Post test mean and standard deviation of experimental and control group of ODI, Oxford and VAS scale.

Variables	Experimental			Control		
	Pre Median ± SD	Post Median ± SD	Difference of median	Pre Median ± SD	Post Median ± SD	Difference of median
Oswestry Disability Index (ODI)	59.0 ± 7.06	33.0 ± 9.50	26.0	59.0 ± 7.63	31.5 ± 5.86	27.5
Oxford Muscle Grade	4.5 ± 0.51	5.0 ± 0.52	0.5	4.5 ± 0.49	5.0 ± 0.46	0.5
Visual Analogue Scale (VAS)	7.0 ± 0.80	3.0 ± 0.92	4.0	7.0 ± 0.80	3.0 ± 0.68	4.0

The table compares the pre- and post-intervention results for the experimental and control groups across three different measures: Oswestry Disability Index (ODI), Oxford Muscle Grade, and Visual Analogue Scale (VAS), showing the median values along with the standard deviations (SD). For the ODI, both groups show significant improvements, but the control group has a slightly higher median change (27.5 points) compared to the experimental group (26.0 points). In the Oxford Muscle Grade, both groups demonstrate a median improvement of 0.5 points, with identical pre- and post-measurements of 4.5 and 5.0, respectively. Similarly, for the VAS, both groups show a 4.0-point improvement, with the pre- and post-median values being 7.0 and 3.0.

While both groups show positive changes across all variables, the ODI improvement is slightly more pronounced in the control group, whereas the Oxford Muscle Grade and VAS show identical improvements. These findings suggest that both groups experienced beneficial outcomes, although there are minor differences in the extent of improvement, particularly in the ODI. Overall, the table demonstrates the effectiveness of the intervention in both groups, though the control group appears to have a slight edge in reducing disability levels.

4.7 Wilcoxon Signed Rank test of VAS for the experimental group:

Table 6: Wilcoxon sign rank test of the experimental group pre and post treatment of VAS.

Posttest-Pretest VAS scores	N	Means Rank	Sum of Ranks	Wilcoxon signed-rank test based on Z rank	*P*-Value
Negative Ranks	15	8.00	120.00	-3.462	0.001
Positive Ranks	0	.00	.00		
Ties	0				
Total	15				

The experimental group's Visual Analogue Scale (VAS) scores before and after treatment show a substantial decrease in pain, according to the Wilcoxon Signed Rank Test results. No ties or positive ranks were seen, and all 15 participants displayed negative ranks, which indicated a decrease in post-treatment VAS scores. With a sum of ranks of 120.00, the mean rank was 8.00. With a statistically significant p-value of 0.001 and a Z-value of -3.462, the test confirmed that the intervention was successful in lowering pain levels.

4.8 Wilcoxon Signed Rank test of Oswestry Disability Index (ODI) for the experimental group:

Table 7: Wilcoxon sign rank test of the experimental group pre and post-treatment of ODI.

Posttest-Pretest ODI scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	*P*-Value
Negative Ranks	15	8.00	120.00	-3.417	0.001
Positive Ranks	0	.00	.00		
Ties	0				
Total	15				

The experimental group's pre- and post-treatment Oswestry impairment Index (ODI) scores on the Wilcoxon Signed Rank Test show a significant improvement in impairment levels. There were no ties or positive ranks noted, and all 15 participants had negative ranks, which indicated declines in ODI scores after treatment. With a sum of ranks of 120.00, the mean rank was 8.00. The test yielded a statistically significant p-value of 0.001 and a Z-value of -3.417, indicating that the intervention was successful in lowering participants' disability levels.

4.9 Wilcoxon Signed Rank test of Oxford Muscle Grade for experimental group:

Table 8: Wilcoxon sign rank test of the experimental group pre and post treatment of OMG.

Posttest-Pretest Oxford Muscle Grade scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	*P*-Value
Negative Ranks	1	5.00	5.00	-2.333	.02
Positive Ranks	8	5.00	40.00		
Ties	6				
Total	15				

Significant gains in muscle strength are demonstrated by the experimental group's pre- and post-treatment Oxford Muscle Grade scores on the Wilcoxon Signed Rank Test. Six of the 15 participants had no change (ties), one had a negative rank, and eight had positive ranks, indicating higher muscle grades after therapy. With a sum of ranks of 40.00 for positive ranks and 5.00 for negative ranks, the mean rank for both positive and negative ranks was 5.00. A Z-value of -2.333 and a statistically significant p-value of 0.020 were obtained from the test, indicating that the intervention was successful in increasing muscle strength.

4.10 Wilcoxon Signed Rank test of Visual Analogue Scale (VAS) for the control group:

Table 9: Wilcoxon sign rank test of the control group pre and post-treatment of VAS.

Posttest-Pretest VAS scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	*P*-Value
Negative Ranks	15	8.00	120.00	-3.477	.001
Positive Ranks	0	.00	.00		
Ties	0				
Total	15				

Significant gains in muscle strength are shown by the experimental group's pre- and post-treatment Oxford Muscle Grade scores on the Wilcoxon Signed Rank Test. Six of the 15 subjects had no change (ties), one had a negative rank, and eight had positive ranks, indicating higher post-treatment muscle grades. With a sum of ranks of 40.00 for positive ranks and 5.00 for negative ranks, the mean rank for both positive and negative ranks was 5.00. The test showed a statistically significant increase in muscle strength after the intervention, with a Z-value of -2.333 and a p-value of 0.020.

4.11 Wilcoxon Signed Rank test of Oswestry Disability Index (ODI) for control group:

Table 10: Wilcoxon sign rank test of the control group pre and post treatment of ODI.

Posttest-Pretest ODI scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	*P*-Value
Negative Ranks	15	8.00	120.00	-3.440	.001
Positive Ranks	0	.00	.00		
Ties	0				
Total	15				

Significant improvements in disability levels are shown by the Wilcoxon Signed Rank Test results for the control group's Oswestry Disability Index (ODI) scores before and after therapy. No ties or positive ranks were seen, and all 15 participants had negative ranks, which indicated declines in ODI scores after treatment. The sum of the ranks was 120.00, with the mean rank being 8.00. The test's Z-value of -3.440 and statistically significant p-value of 0.001 demonstrated how well traditional physiotherapy reduced individuals' levels of impairment.

4.12 Wilcoxon Signed Rank test of Oxford Muscle Grade for control group:

Table 11: Wilcoxon sign rank test of the control group pre and post-treatment of OMG.

Posttest-Pretest Oxford Muscle Grade scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	*P*-Value
Negative Ranks	0	.00	.00	-2.449	.014
Positive Ranks	6	3.50	21.00		
Ties	9				
Total	15				

Significant gains in muscle strength are shown by the control group's pre- and post-treatment Oxford Muscle Grade scores on the Wilcoxon Signed Rank Test. Nine patients had no change (ties), and no negative ranks were seen, whereas six of the fifteen participants displayed positive ranks, indicating higher post-treatment muscle grades. With a sum of ranks of 21.00, the mean rank for positive ranks was 3.50. The test yielded a statistically significant p-value of 0.014 and a Z-value of -2.449, indicating that the intervention was successful in increasing muscle strength in the control group.

4.13 Mann Whitney U test for between group analysis for Visual Analogue Scale (Post-test):

Table 12: Mann Whitney U test for the post treatment between group of VAS.

	Category of participants	N	Mean Rank	Sum of Ranks	Mann Whitney U score	*P*
Difference between Pain	**Experimental**	15	15.63	234.50	110.500	.929
	Control	15	15.37	230.50		
	Total	30				

There is no statistically significant difference between the experimental and control groups' post-treatment Visual Analogue Scale (VAS) ratings according to the Mann-Whitney U test for pain reduction outcomes. With a mean rank of 15.63 and a sum of rankings of 234.50, the experimental group (n=15) outperformed the control group (n=15) with a mean rank of 15.37 and a sum of ranks of 230.50. With a p-value of 0.929 and a Mann-Whitney U score of 110.500, both groups experienced similar degrees of pain reduction following treatment.

4.14 Mann Whitney U test for between group analysis for Oswestry Disability Index (Post-test):

Table 13: Mann Whitney U test for the post treatment between group of ODI.

	Category of participants	N	Mean Rank	Sum of Ranks	Mann Whitney U score	*P*
Difference between Disability	**Experimental**	15	16.57	248.50	96.500	.494
	Control	15	14.43	216.50		
	Total	30				

There is no statistically significant difference in the improvement of disability between the experimental and control groups, according to the Mann-Whitney U test for the post-treatment Oswestry Disability Index (ODI) scores. With a mean rank of 16.57 and a sum of ranks of 248.50, the experimental group (n=15) outperformed the control group (n=15) with a mean rank of 14.43 and a sum of ranks of 216.50. With a p-value of 0.494 and a Mann-Whitney U score of 96.500, it appears that both groups saw comparable increases in impairment levels after therapy.

4.15 Mann Whitney U test for between group analysis for Oxford Muscle Grade (Post-test):

Table 14: Mann Whitney U test for the post treatment between group of OMG.

	Category of participants	N	Mean Rank	Sum of Ranks	Mann Whitney U score	*P*
Difference between Muscle Power	**Experimental**	15	16.37	245.50	219.500	.484
	Control	15	14.63	219.50		
	Total	30				

There is no statistically significant difference in the improvement in muscle strength between the experimental and control groups based on the Mann-Whitney U test for the post-treatment Oxford Muscle Grade scores. With a mean rank of 16.37 and a sum of rankings of 245.50, the experimental group (n=15) outperformed the control group (n=15) with a mean rank of 14.63 and a sum of ranks of 219.50. With a p-value of 0.484 and a Mann-Whitney U score of 219.500, the two groups' post-treatment increases in muscle strength were comparable.

CHAPTER V DISCUSSION

In terms of age, occupation, and BMI, the study's participants were evenly distributed across the experimental and control groups. This matching helps ensure that any discrepancies in outcomes are caused by the treatments and not by the initial variances between the groups. To ensure fair and trustworthy results, it's critical to balance the groups in randomized controlled trials (RCTs) (Schulz et al. 2010, p. 466). The control group's average age was 40.40 ± 9.75 years, while the experimental group's was 41.60 ± 8.21 years. This indicates that the groups' ages were comparable, which lessens the possibility that age-related variables influenced the outcomes.

The distribution of BMI categories was also consistent, with 53.3% of participants in each group being classified as pre-obese and 46.7% of people in each group being classified as normal weight. Because the sample's body compositions are similar, there is less chance that body composition will obscure the effectiveness of the interventions. (Gattie et al. literature review 2017, p. 43) emphasizes the importance of balancing demographic status to guarantee that RCT results are appropriate. This is because demographic balancing facilitates the comparison of treatment effects and prevents biases caused by sample disproportions.

With the majority of participants in both groups working—66.7% in the experimental group and 60.0% in the control group—the occupational distribution similarly revealed a balanced sample. This resemblance implies that both groups were probably subjected to similar physical demands and work pressures. Nevertheless, a number of drawbacks include a very limited focus on particular professions, such as teachers, pensioners, and housewives, which might not adequately represent the diversity of people impacted by CLBP. As a result, although findings are strong in this demographic context, they are not very generalizable to other groups.

After therapy, both groups' Oswestry Disability Index scores decreased, indicating a considerable improvement in their level of disability. With a mean difference of 26.13, the experimental group's mean dropped from 58.4 ± 7.06 before treatment to 32.27 ± 9.50 after

treatment. The control group's mean difference was significantly greater at 27.73, but it nevertheless dropped from 59.73 ± 7.63 to 32.00 ± 5.86. It's interesting to note that the experimental group experienced a greater percentage change in the disability categories, with 13.3% achieving the status of little disability and 73.3% moving up to the category of moderate disability. Only 6.7% of the control group achieved the classification of low disability, whereas 86.7% achieved the status of substantial disability.

These findings are in concert with those of Fernandez-de-Las-Penas et al. (2011, p. 356), who found that DN directed at MTrPs significantly enhanced functional disability through improved lumbopelvic stability. Additive benefits of DN from this study would suggest the intervention addressed specific pain generators and motor control deficits associated with CLBP. On the other hand, the large improvements in the control group agree with Cairns et al. (2006, p. 68), who pointed out that spinal stabilization exercises are effective in reducing disability levels. These exercises target core muscle endurance and coordination, which are crucial for functional recovery in CLBP patients.

The experimental group's slightly higher percentage of people with minimal disability suggests that DN and traditional therapy may work in concert, even though the Mann-Whitney U test did not show a statistically significant difference in the post-treatment condition between groups using the ODI scoring system. To validate these results, larger samples and longer follow-up are needed.

Both groups experienced a significant decrease in pain intensity as determined by the VAS. The mean VAS scores in the experimental group decreased from 7.07 ± 0.80 to 2.87 ± 0.92, with an average reduction of 4.20. In the control group, the mean decrease was 3.93, from 6.73 ± 0.80 to 2.80 ± 0.68. The experimental group demonstrated a somewhat higher improvement, which may have been caused by DN's pain-modulating properties, even though the group differences were not statistically significant.

In contrast, Tough et al. (2009, p. 823) believed that DN did not offer any significantly greater immediate pain relief compared to other forms of physiotherapeutic treatment, like manual therapy and exercises. The Mann-Whitney U test in this study also supports such findings, as no significant difference was found in VAS scores between the two groups.

Such findings suggest that long-term pain relief from DN needs to be evaluated through further research by examining its comparative effectiveness against other interventions.

According to Oxford Muscle Grading, both groups' muscle strength increased from 4.4 ± 0.51 to 4.87 ± 0.52, with the experimental group's average being 0.47. With a mean difference of 0.40, the control group also improved, but marginally less, going from an average of 4.33 ± 0.49 to 4.73 ± 0.46. Despite the experimental group's marginally higher increases, these results indicate that both DN and traditional physiotherapy are useful in enhancing muscular function.

The Wilcoxon Signed Rank Test results showed that both groups' intragroup differences in muscular strength measurements before and after therapy were statistically significant. Likewise, Fernandez-de-Las-Penas et al. (2011, p. 122) concluded that DN lessens the inhibition of muscles caused by active MTrPs. In fact, by addressing MTrPs, DN most likely maximizes muscular activation patterns, which boosts strength and functional ability.

One may conclude that both therapies are equally successful for strengthening muscles because the Mann-Whitney U test revealed no significant difference in the groups' post-treatment Oxford Muscle Grading scores. These results corroborate those of Gattie et al. (2017, p. 46), who suggested that substantial strength increases might be achieved with standard physiotherapy. However, the experimental group's larger benefits in this study are a result of DN's synergistic effects on muscular activation and a decrease in pain-related muscle inhibition.

Limitations

The study included a limited number of participants, which may affect the generalizability of the results to the larger population.

The study only assessed immediate or short-term outcomes. The long-term effects of dry needling remain unexplored.

Participants may lack diversity in terms of demographics such as age, gender, and occupation, limiting the applicability of findings to more heterogeneous populations.

Reliance on self-reported measures like the Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) may introduce bias due to individual perception differences.

The study may not have adequately blinded participants or evaluators, potentially introducing performance or detection bias.

The study primarily compared dry needling to a control group receiving standard treatment, without exploring how it compares to other advanced interventions like manual therapy or electrotherapy.

The study did not investigate the physiological mechanisms underlying the observed effects, such as biochemical changes at the trigger point.

The research targeted only the gluteus medius muscle, which may not account for other muscles contributing to chronic low back pain.

CHAPTER VI CONCLUSION

The study evaluated the effectiveness of dry needling (DN) in conjunction with conventional physiotherapy vs physiotherapy alone in individuals with chronic low back pain (CLBP). The results demonstrated a considerable improvement in pain relief, muscle strength, and functional impairment in both groups. Overall, the experimental group, which received DN in addition to physiotherapy, performed somewhat better, indicating DN's potential as a helpful supplemental treatment. Both groups' pain levels significantly decreased, with the experimental group feeling somewhat more relief, according to Visual Analogue Scale (VAS) measures. This is most likely due to DN's ability to enhance local blood flow and deactivate myofascial trigger points (MTrPs). According to the Oswestry impairment Index (ODI), the impairment levels of both groups significantly improved, with a greater proportion of individuals in the experimental group achieving minimal disability status. This suggests that DN not only lessens pain but also enhances overall functioning abilities. According to the Oxford Muscle Grade (OMG), both groups' muscle strength increased, although the experimental group's gains were marginally greater. These results show how DN reduces muscle inhibition and restores optimal activation patterns. Despite the favorable outcomes, post-treatment scores for every parameter did not reveal statistically significant differences between groups, indicating that both treatments are effective and that DN offers additional benefits that are not statistically significant. By combining basic therapies like physiotherapy with focused interventions like DN, the study highlights the benefits of multimodal methods in the treatment of CLBP. A small sample size, a brief follow-up time, and a specific muscle group focus are among the limitations that restrict generalizability and long-term insights. Future studies should examine how DN affects different muscles, involve a range of demographics, and evaluate its long-term advantages over competing treatments. All things considered, the study provides important evidence in favor of DN's inclusion in the treatment of CLBP, emphasizing its capacity to improve muscular function, pain management, and functional recovery.

Recommendation

To improve the management of persistent low back pain, combine dry needling with physiotherapy. This will help to strengthen your muscles and relieve discomfort. Expand the focus to include other muscles, such as the piriformis and quadratus lumborum, in order to address pain and dysfunction more thoroughly. To learn more about the long-term benefits of dry needling for patients, do follow-up studies over an extended period of time. Make sure the results are applicable to a wider population by using a larger and more varied sample of individuals. For chronic low back pain, compare dry needling to other cutting-edge therapies like manual therapy or electrotherapy to find the best solutions.

Reference

Ali, M, Uddin, Z & Hossain, A 2021, 'Combined effect of vitamin D supplementation and physiotherapy on reducing pain among adult patients with musculoskeletal disorders: a quasi-experimental clinical trial', *Frontiers in Nutrition*, vol. 8, pp. 717473.

Ali, M, Uddin, Z & Hossain, A 2022, 'Clinical practice pattern of managing low back pain among physiotherapists in Bangladesh: a cross-sectional study', *Physiotherapy Practice and Research*, vol. 43, no. 2, pp. 275-282.

Ali, M, Siddiq, MAB, Pranto, NK, Amran, NH, Akter, M, Munny, MA, Hossain, MI, Khan, SS & Mehedi, MMH 2023, 'Prevalence and predictors of musculoskeletal health complaints among sedentary, monotonous urban workers: A survey in Bangladesh', *Plos One*, vol. 18, no. 4, pp. e0282922.

Ali, M, Uddin, Z & Hossain, A 2022, 'Clinical practice pattern of managing low back pain among physiotherapists in Bangladesh: a cross-sectional study', *Physiotherapy Practice and Research*, vol. 43, no. 2, pp. 275-282.

Balague, F, Mannion, AF, Pellise, F & Cedraschi, C 2012, 'Non-specific low back pain', *The Lancet*, vol. 379, no. 9814, pp. 482-491.

Campos-Fumero, A, Delclos, GL, Douphrate, DI, Felknor, SA, Vargas-Prada, S, Serra, C, Coggon, D & de Porras, DGR 2017, 'Low back pain among office workers in three Spanish-speaking countries: findings from the CUPID study', *Injury Prevention*, vol. 23, no. 3, pp. 158-164.

Chiarotto, A, Clijsen, R, Fernandez-de-Las-Penas, C & Barbero, M 2016, 'Prevalence of Myofascial Trigger Points in Spinal Disorders: A Systematic Review and Meta-Analysis', *Archives of Physical Medicine and Rehabilitation*, vol. 97, no. 2, pp. 316-337.

Cagnie, B, Dewitte, V, Barbe, T, Timmermans, F, Delrue, N & Meeus, M 2013, 'Physiologic Effects of Dry Needling', *Current Pain and Headache Reports*, vol. 17, no. 8, pp. 348.

Cooper, NA, Scavo, KM, Strickland, KJ, Tipayamongkol, N, Nicholson, JD, Bewyer, DC & Sluka, KA 2016, 'Prevalence of gluteus medius weakness in people with chronic low back pain compared to healthy controls', *European Spine Journal*, vol. 25, pp. 1258-1265.

Da Silva, T, Mills, K, Brown, BT, Herbert, RD, Maher, CG & Hancock, MJ 2017, 'Risk of recurrence of low back pain: a systematic review', *Journal of Orthopaedic & Sports Physical Therapy*, vol. 47, no. 5, pp. 305-313.

Delitto, A, George, SZ, Van Dillen, LR, Whitman, JM, Sowa, G, Shekelle, P, Denninger, TR, Godges, JJ 2012, 'Low back pain', *Journal of Orthopaedic Sports Physical Therapy*, vol. 42, pp. A1-A57.

Deyo, RA 2017, 'The role of spinal manipulation in the treatment of low back pain', *JAMA*, vol. 317, no. 14, pp. 1418-1419.

Dommerholt, J, Fernandez-de-las-Penas, C & Finnegan, M 2011, 'Trigger Point Dry Needling', *American Academy of Physical Medicine and Rehabilitation*, vol. 3, no. 10, pp. 731-738. https://doi.org/10.1016/j.pmrj.2011.04.008.

Dunn, KM, Hestbaek, L & Cassidy, JD 2013, 'Low back pain across the life course', *Best Practice & Research Clinical Rheumatology*, vol. 27, no. 5, pp. 591-600.

Dunning, JR, Butts, R, Mourad, F, Young, I, Flannagan, S & Perreault, T 2014, 'Dry Needling: A Literature Review with Implications for Clinical Practice Guidelines', *Physical Therapy Reviews*, vol. 19, no. 4, pp. 252-265.

Fernandez-de-Las-Penas, C, Dommerholt, J & Simons, DG 2011, 'Myofascial Trigger Points: Pathophysiology and Evidence-Informed Diagnosis and Management', *Physical Therapy*, vol. 91, no. 5, pp. 758-759.

Foster, NE, Anema, JR, Cherkin, D, Chou, R, Cohen, SP, Gross, DP, Ferreira, PH, Fritz, JM, Koes, BW, Peul, W & Turner, JA 2018, 'Prevention and treatment of low back pain: evidence, challenges, and promising directions', *The Lancet*, vol. 391, no. 10137, pp. 2368-2383.

Furlan, AD, Van Tulder, MW, Cherkin, D, Tsukayama, H, Lao, L, Koes, BW & Berman, BM 2005, 'Acupuncture and dry-needling for low back pain', *Cochrane Database of Systematic Reviews*, no. 1.

Gattie, EE, Cleland, JA & Snodgrass, SJ 2017, 'Dry Needling for Musculoskeletal Pain: A Clinical Commentary', *International Journal of Sports Physical Therapy*, vol. 12, no. 6, pp. 1033-1042.

Gattie, E, Cleland, JA & Snodgrass, S 2017, 'The effectiveness of trigger point dry needling for musculoskeletal conditions by physical therapists: a systematic review and meta-analysis', *Journal of Orthopaedic & Sports Physical Therapy*, vol. 47, no. 3, pp. 133-149.

Gattie, E, Cleland, JA & Snodgrass, S 2017, 'The effectiveness of trigger point dry needling for musculoskeletal conditions by physical therapists: a systematic review and meta-analysis', *Journal of Orthopaedic & Sports Physical Therapy*, vol. 47, no. 3, pp. 133-149.

Gillan, MGC, Ross, JC, McLean, IP & Porter, RW 1998, 'The natural history of trunk list, its associated disability and the influence of McKenzie management', *European Spine Journal*, vol. 7, pp. 480-483.

Griswold, D, Gargano, F & Learman, KE 2019, 'A randomized clinical trial comparing non-thrust manipulation with segmental and distal dry needling on pain, disability, and rate of recovery for patients with non-specific low back pain', *Journal of Manual & Manipulative Therapy*, vol. 27, no. 3, pp. 141-151.

Hanna, F, Daas, RN, El-Shareif, TJ, Al-Marridi, HH, Al-Rojoub, ZM & Adegboye, OA 2019, 'The relationship between sedentary behavior, back pain, and psychosocial correlates among university employees', *Frontiers in Public Health*, vol. 7, p. 80.

Hartvigsen, J, Hancock, MJ, Kongsted, A, Louw, Q, Ferreira, ML, Genevay, S, Hoy, D, Karppinen, J, Pransky, G, Sieper, J & Smeets, RJ 2018, 'What low back pain is and why we need to pay attention', *The Lancet*, vol. 391, no. 10137, pp. 2356-2367.

Hemmer, CR 2021, ‘Evaluation and treatment of low back pain in adult patients’, *Orthopaedic Nursing*, vol. 40, no. 6, pp. 336-342

Itz, CJ, Geurts, JW, Van Kleef, M & Nelemans, P 2013, ‘Clinical course of non-specific low back pain: A systematic review of prospective cohort studies set in primary care’, *European Journal of Pain*, vol. 17, no. 1, pp. 5-15.

Kalichman, L & Vulfsons, S 2010, ‘Dry Needling in the Management of Myofascial Trigger Points’, *The Journal of the American Board of Family Medicine*, vol. 23, no. 5, pp. 640-646.

Kietrys, DM, Palombaro, KM & Azzaretto, E 2013, ‘Effectiveness of Trigger Point Dry Needling for Musculoskeletal Conditions by Physical Therapists: A Systematic Review and Meta-Analysis’, *Journal of Orthopaedic & Sports Physical Therapy*, vol. 43, no. 9, pp. 620-634. https://doi.org/10.2519/jospt.2013.4668.

Kongsted, A, Kent, P, Axen, I, Downie, AS & Dunn, KM 2016, ‘What have we learned from ten years of trajectory research in low back pain?’, *BMC Musculoskeletal Disorders*, vol. 17, pp. 1-11.

Liu, L, Huang, QM, Liu, QG, Thitham, N, Li, LH, Ma, YT & Zhao, JM 2018, ‘Evidence for dry needling in the management of myofascial trigger points associated with low back pain: a systematic review and meta-analysis’, *Archives of Physical Medicine and Rehabilitation*, vol. 99, no. 1, pp. 144-152.

Maas, ET, Ostelo, RWJG, Niemisto, L, Jousimaa, J, Hurri, H, Malmivaara, A & Van Tulder, MW 2015, ‘Radiofrequency denervation for chronic low back pain’, *Cochrane Database of Systematic Reviews*, Issue 10, Art. No.: CD008572.

Martin-Corrales, C, Bautista, IV, Mendez-Mera, JE, Fernández-Matias, R, Achalandabaso-Ochoa, A, Gallego-Izquierdo, T, Nunez-Nagy, S & Pecos-Martín, D 2020, ‘Benefits of adding gluteal dry needling to a four-week physical exercise program in a chronic low back pain population: A randomized clinical trial’, *Pain Medicine*, vol. 21, no. 11, pp. 2948-2957

Mullins, JF, Nitz, AJ & Hoch, MC 2021, 'Dry needling equilibration theory: A mechanistic explanation for enhancing sensorimotor function in individuals with chronic ankle instability', *Physiotherapy Theory and Practice*, vol. 37, no. 6, pp. 672-681.

Nunez-Cortes, R, Cruz-Montecinos, C, Vásquez-Rosel, A, Paredes-Molina, O & Cuesta-Vargas, A 2017, 'Dry needling combined with physical therapy in patients with chronic postsurgical pain following total knee arthroplasty: a case series', *Journal of Orthopaedic & Sports Physical Therapy*, vol. 47, no. 3, pp. 209-216.

Oliveira, CB, Maher, CG, Pinto, RZ, Traeger, AC, Lin, CWC, Chenot, JF, Van Tulder, MW & Koes, BW 2018, 'Clinical practice guidelines for the management of non-specific low back pain in primary care: an updated overview', *European Spine Journal*, vol. 27, pp. 2791-2803.

Prodhania, MS, Ahsan, GU & Ali, M 2023, 'Physiotherapy combined with dry needling among patients with chronic low back pain: Study protocol for a randomized controlled clinical trial', *Contemporary Clinical Trials Communications*, vol. 34, p. 101170.

Rajfur, J, Rajfur, K, Kosowski, L, Walewicz, K, Dymarek, R, Ptaszkowski, K & Taradaj, J 2022, 'The effectiveness of dry needling in patients with chronic low back pain: a prospective, randomized, single-blinded study', *Scientific Reports*, vol. 12, no. 1, p. 15803.

Sadler, S, Cassidy, S, Peterson, B, Spink, M & Chuter, V 2019, 'Gluteus medius muscle function in people with and without low back pain: a systematic review', *BMC Musculoskeletal Disorders*, vol. 20, pp. 1-17.

Shah, JP, Thaker, N, Heimur, J, Aredo, JV, Sikdar, S & Gerber, L 2015, 'Myofascial trigger points then and now: a historical and scientific perspective', *PM&R*, vol. 7, no. 7, pp. 746-761.

Stochkendahl, MJ, Kjaer, P, Hartvigsen, J, Kongsted, A, Aaboe, J, Andersen, M, Andersen, MO, Fournier, G, Højgaard, B, Jensen, MB & Jensen, LD 2018, 'National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy', *European Spine Journal*, vol. 27, pp. 60-75.

Tellez-Garcia, M, de-la-Llave-Rincon, AI, Salom-Moreno, J, Palacios-Cena, M, Ortega-Santiago, R & Fernandez-de-Las-Penas, C 2015, 'Neuroscience education in addition to trigger point dry needling for the management of patients with mechanical chronic low back pain: A preliminary clinical trial', *Journal of Bodywork and Movement Therapies*, vol. 19, no. 3, pp. 464-472.

Tuzun, EH, Gildir, S, Angın, E, Tecer, BH, Dana, KO & Malkoç, M 2017, 'Effectiveness of dry needling versus a classical physiotherapy program in patients with chronic low-back pain: A single-blind, randomized, controlled trial', *Journal of Physical Therapy Science*, vol. 29, no. 9, pp. 1502-1509.

Tough, EA, White, AR, Cummings, TM, Richards, SH & Campbell, JL 2009, 'Acupuncture and dry needling in the management of myofascial trigger point pain: A systematic review and meta-analysis of randomized controlled trials', *European Journal of Pain*, vol. 13, no. 1, pp. 3-10.

Hong, CZ 2016, 'Lidocaine Injection Versus Dry Needling to Myofascial Trigger Point: The Importance of the Local Twitch Response', *American Journal of Physical Medicine & Rehabilitation*, vol. 73, no. 4, pp. 256-263.

Shah, JP & Gilliams, EA 2008, 'Uncovering the Biochemical Milieu of Myofascial Trigger Points Using Microdialysis: An Application of Muscle Pain Concepts to Myofascial Pain Syndrome', *The Journal of Bodywork and Movement Therapies*, vol. 12, no. 4, pp. 371-384.

Simons, DG, Travell, J & Simons, LS 1999, *Myofascial Pain and Dysfunction: The Trigger Point Manual* (2nd ed.), Philadelphia, Lippincott Williams & Wilkins.

Tekin, L, Akarsu, S, Durmuş, O, Cakar, E, Dincer, U & Kiralp, MZ 2013, 'The Effect of Dry Needling in the Treatment of Myofascial Pain Syndrome: A Randomized Double-Blind Study', *Clinical Rheumatology*, vol. 32, no. 3, pp. 381-387.

Tough, EA, White, AR, Cummings, TM, Richards, SH & Campbell, JL 2009, 'Acupuncture and dry needling in the management of myofascial trigger point pain: A

systematic review and meta-analysis of randomized controlled trials', *European Journal of Pain*, vol. 13, no. 1, pp. 3-10.

Vos, T, Abajobir, AA, Abate, KH et al. 2017, 'Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016', *Lancet*,

Vos, T et al. 2016, 'Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: A systematic analysis for the Global Burden of Disease Study 2015', *Lancet*, vol. 388, pp. 1545–1602.

Wu, A, March, L, Zheng, X, Huang, J, Wang, X, Zhao, J, Blyth, FM, Smith, E, Buchbinder, R & Hoy, D 2020, 'Global low back pain prevalence and years lived with disability from 1990 to 2017: Estimates from the Global Burden of Disease Study (2017)', *Annals of Translational Medicine*, vol. 8, no. 6, p. 299.

Appendix- A

SCMST-BPT/IRB/.05-23/015

To
Md. Tanvir Hossain
4th Year Student of B.Sc. in Physiotherapy
Session:2018-19 Reg No:10447
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Subject: Approval of the thesis proposal **"Outcome measure of dry needling on gluteus medius muscle among the patients with chronic low back pain"** by the ethics committee.

Dear Md. Tanvir Hossain
Congratulations.
The Institutional Review Board (IRB) of SCMST has reviewed and discussed your application to conduct the above-mentioned dissertation, with you, as the principal investigator. The following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation Proposal
2	Questionnaire (English version)
3	Information sheet & consent form.

The purpose of the study is to determine the Outcomes of dry needling among patients with chronic low back pain. The study involves face-to-face interviews using a semi-structured questionnaire to explore the Barriers and Challenges Confronted by lower-limb amputees in Bangladesh. It may take 30 to 40 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. The members of the Ethics Committee have approved the study to be conducted in the presented form at the meeting held at 09.00 AM on 28th September 2023 at SCMST.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring during the study, any revision in the protocol, and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working in accordance with the Nuremberg Code 1947, the World Medical Association Declaration of Helsinki, 1964 - 2013, and other applicable regulations.

Best regards, 16.05.24

Dr. Abul Kasem Mohammad Enamul Haque
Principal, SCMST &Chairman, Institutional Review Board (IRB)
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Appendix- B

To

The Dept. head of physiotherapy

Aichi Hospital Ltd,

Abdullah-pur, Uttara, Dhaka.

Subject: Prayer for permission to collect data from the Physiotherapy dept. Aichi hospital Ltd. to conduct a research project.

Sir,

With due respect and humble submission to state that I am a student of B.Sc. in Physiotherapy at SAIC College of Medical Science and Technology (SCMST). As a part of our course curriculum, we have to conduct a research project for the partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. My research title is **"Outcome of dry needling of gluteus medius muscle among the patient with chronic low back pain."** This is a experimental study under the supervision of Dr. Mohammad Habibur Rahman Assistant professor of Physiotherapy, SST (BOU). I want to collect data from the Physiotherapy dept. of Aichi hospital Ltd. So, I need your permission to collect data and ensure that the study will not be harmful for participants.

So, I, therefore, pray and hope that you would be kind enough to give permission for data collection that will help me to complete my study.

Yours Faithfully

Md. Tanvir Hossain

Student of B.Sc. in Physiotherapy (4th year).

Session: 2018-2019

Reg No: 10447

SAIC College of Medical Science and Technology (SCMST).

Mirpur-14, Dhaka 1216, Bangladesh.

Appendix- C

QUESTIONNAIRE

Title: "Outcome of dry needling of gluteus medius muscle among patients with chronic low back pain"

Questionnaire (English)

Part 1: Personal information			
1.1	Patient ID:		
1.2	Date of Test:		
1.3	Name of participant:		
1.4	Code:		
1.5	Address:	Village:	Post-office:
		Upazilla:	District:
1.6	Phone:		

Part 2: Socio-demographic information			
Questions		Responses	
2.1	Age	[ ] years	
2.2	Sex	(1) Male	(2) Female
2.3	Occupation		
2.4	What is your marital status?	(1) Married	(2) Unmarried
2.5	What is your living area?	(1) Urban	(2) Rural
2.6	What about your educational level?	(1) Illiterate	(2) SSC
		(3) HSC	(4) Graduation & above
2.7	What is your monthly income?	[ ] in BDT	

Part 3: Medical information		
3.1	What is your height?	……..cm
3.2	3.2 What is your weight?	……..kg
3.3	3.3 BMI	1. Underweight 2. Normal weight 3. Overweight 4. Obese
3.4	Comorbidities	1. Hypertension 2. Diabetes mellitus 3. Don't know
3.5	How tired are you normally at the end of a working day physically?	1. Not tried 2. A bit tired 3. Very tired
3.6	Do you carry out the same work almost the whole day?	1. Yes 2. No
3.7	Do you think your lower back discomfort is responsible for carrying out the same work?	1. Yes 2. No
3.8	Which kind of work creates your low back pain (LBP)	1. Standing 2. Sitting 3. Working in the same position for long periods. 4. Doing repetitive tasks many times
3.9	Do you think your pain is responsible for using materials?	1. Yes 2. No
3.10	How long the pain persist?	1. (0-5) hours 2. (6-12) hours 3. (13-24) hours
3.11	What is the type of pain?	1. Constant 2. Intermittent

Baseline

Visual analog Scale (VAS)		
		
S.N	**Outcome measures**	**VAS score**
1.	Pain on back	

Range of motion (ROM)

S. N	**Hip joint movement** (Degree)	**Test result** (Degree)
1	Flexion (110-120)	
2	Extension (10-15)	
3	Abduction (35-45)	
4	Adduction (15-25)	
5	Medial rotation (30-45)	
6	Lateral rotation (40-60)	

[The Oswestry Disability Index (ODI) Version 2.1a]

Oswestry low back pain disability questionnaire:

Section	Question	Answer
1. Pain intensity	0. I have no pain at the moment 1. The pain is very mild at the moment 2. The pain is moderate at the moment 3. The pain is fairly severe at the moment 4. The pain is very severe at the moment 5. The pain is the worst imaginable at the moment	
2. Personal care	0. I can look after myself normally without causing extra pain 1. I can look after myself normally but it is very painful 2. It is painful to look after myself and I am slow and careful. 3. I need some help but manage most of the personal care. 4. I need help every day in most aspect of self-care. 5. I do not get dressed, wash with difficulty and stay in bed.	
3. Lifting	0. I can lift heavy weight without extra pain. 1. I can lift heavy weight but it gives extra pain. 2. Pain prevents me from lifting heavy weights off the floor but I can manage if they are conveniently positioned. 3. Pain prevent me from lifting heavy weight but I can manage light to medium weights if they are conveniently positioned. 4. I can lift only very light weight. 5. I can not lift or carry anything at all.	
4. Walking	0. Pain does not prevent me walking any distance. 1. Pain prevent me walking more than one mile. 2. Pain prevent me walking more then a quarter of a mile. 3. Pain prevent me walking more than 100 yards. 4. I can only walk using a stick or crutches. 5. I am in bed most of the time and have to crawl to the toilet.	
5. Sitting	0. I can sit in any chair as long as like. 1. I can sit in my favorite chair as long as I like. 2. Pain prevents me from sitting for more than 1 hour. 3. Pain prevents me from sitting for more than half an hour.	

Oxford Muscle Grading Scale:

0/5 No visible or palpable contraction

1/5 Visible/palpable muscle contraction but no movement

2/5 Movement through full range with gravity eliminated (poor strength)

3/5 Movement through full range against gravity only (fair strength)

4/5 Movement through full range against gravity with some resistance (good strength)

5/5 Movement through full range against gravity with full resistance (normal strength)

S.N	Testing muscle	Result
1	Gluteus muscle	

Post-test

Visual analog Scale (VAS)		
		
S.N	**Outcome measures**	**VAS score**
1.	Pain on back	

Range of motion (ROM)

S. N	**Hip joint movement** (Degree)	**Test result** (Degree)
1	Flexion (110-120)	
2	Extension (10-15)	
3	Abduction (35-45)	
4	Adduction (15-25)	
5	Medial rotation (30-45)	
6	Lateral rotation (40-60)	

[The Oswestry Disability Index (ODI) Version 2.1a]

Oswestry low back pain disability questionnaire:

Section	Question	Answer
1. Pain intensity	0. I have no pain at the moment 1. The pain is very mild at the moment 2. The pain is moderate at the moment 3. The pain is fairly severe at the moment 4. The pain is very severe at the moment 5. The pain is the worst imaginable at the moment	
2. Personal care	0. I can look after myself normally without causing extra pain 1. I can look after myself normally but it is very painful 2. It is painful to look after myself and I am slow and careful. 3. I need some help but manage most of the personal care. 4. I need help every day in most aspect of self-care. 5. I do not get dressed, wash with difficulty and stay in bed.	
3. Lifting	0. I can lift heavy weight without extra pain. 1. I can lift heavy weight but it gives extra pain. 2. Pain prevents me from lifting heavy weights off the floor but I can manage if they are conveniently positioned. 3. Pain prevent me from lifting heavy weight but I can manage light to medium weights if they are conveniently positioned. 4. I can lift only very light weight. 5. I can not lift or carry anything at all.	
4. Walking	0. Pain does not prevent me walking any distance. 1. Pain prevent me walking more than one mile. 2. Pain prevent me walking more then a quarter of a mile. 3. Pain prevent me walking more than 100 yards. 4. I can only walk using a stick or crutches. 5. I am in bed most of the time and have to crawl to the toilet.	
5. Sitting	0. I can sit in any chair as long as like. 1. I can sit in my favorite chair as long as I like. 2. Pain prevents me from sitting for more than 1 hour. 3. Pain prevents me from sitting for more than half an hour.	

Oxford Muscle Grading Scale:

0/5 No visible or palpable contraction

1/5 Visible/palpable muscle contraction but no movement

2/5 Movement through full range with gravity eliminated (poor strength)

3/5 Movement through full range against gravity only (fair strength)

4/5 Movement through full range against gravity with some resistance (good strength)

5/5 Movement through full range against gravity with full resistance (normal strength)

S.N	Testing muscle	Result
1	Gluteus muscle	

সম্মতিপত্র

আসসালামু আলাইকুম,

আমি মোঃ তানভির হোসেন , ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে সাইক কলেজ অব মেডিকেল সায়েন্স অ্যান্ড টেকনোলজি (এসসিএমএসটি) এর বিএসসি ফিজিওথেরাপির চতুর্থ বর্ষের শিক্ষার্থী। আমার স্নাতক ডিগ্রি অর্জনের জন্য আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটি আমার অধ্যয়নের একটি অংশ। আমার গবেষণার শিরোনাম "দীর্ঘস্থায়ী পিঠে ব্যথার রোগীদের মধ্যে গ্লুটিয়াস মিডিয়াস পেশীর ড্রাই নিডেলিং এর ফলাফল "। আমার গবেষণা প্রকল্পটি পূরণ করার জন্য আপনার পিঠে ব্যথা সম্পর্কিত, ব্যক্তিগত ও অন্যান্য তথ্য সংগ্রহ করতে হবে। সুতরাং, আপনি এই গবেষণায় একজন সম্মানিত অংশগ্রহণকারী হতে পারেন এবং কথোপকথনের সময়টি দুই বার করে ১৫-৩০ মিনিট হবে। আমি আপনাকে জানাতে চাই যে এটি একটি সম্পূর্ণরূপে একাডেমিক গবেষণা ও এটি অন্য কোনও উদ্দেশ্যে ব্যবহার করা হবে না। আমি আপনাকে আশ্বাস দিচ্ছি যে সমস্ত তথ্য গোপন রাখা হবে। আপনার অংশগ্রহণ ঐচ্ছিক হবে। এই গবেষণা থেকে আপনি যে কোনো সময় আপনার সম্মতি ও অংশগ্রহণ প্রত্যাহার করতে পারবেন। আপনার যদি কোন প্রশ্ন পছন্দ না হয় সেক্ষেত্রে আপনি প্রশ্ন প্রত্যাখান করার অধিকার রাখেন।

গবেষণা সম্পর্কে আপনার যদি কোনও প্রশ্ন থাকে তাহলে আপনি যোগাযোগ করতে পারেন গবেষক মোঃ তানভির হোসেন অথবা গবেষনার সুপারভাইজার মোহাম্মদ হাবিবুর রহমান, সহকারী অধ্যাপক ফিজিওথেরাপি বিভাগ, বাংলাদেশ উন্মুক্ত বিশ্ববিদ্যালয় (বাউবি) এর সাথে । শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

সুতরাং, আমি কি সাক্ষাত্কারটি শুরু করতে পারি?

হ্যাঁ ☐ না ☐

অংশগ্রহণকারীর স্বাক্ষর……. তারিখ……

ফিজিওথেরাপিস্ট / সাক্ষীর স্বাক্ষর ……. তারিখ……..

তথ্যসংগ্রহকারীর স্বাক্ষর …… তারিখ……

গবেষকের স্বাক্ষর…….. তারিখ……

শিরোনাম: "দীর্ঘস্থায়ী পিঠে ব্যথার রোগীদের মধ্যে গ্লুটিয়াস মিডিয়াস পেশীর ড্রাই নিডেলিং এর ফলাফল"

প্রশ্নপত্র (বাংলা)

অংশ ১- ব্যাক্তিগত তথ্য			
১.১	**রোগীর আইডি:**		
১.২	**নিরিক্ষনের তারিখ:**		
১.৩	**অংশগ্রহনকারীর নাম:**		
১.৪	**কোড:**		
১.৫	**ঠিকানা:**	**গ্রাম:**	**পোস্ট অফিস:**
		উপজেলা:	**জেলা:**
১.৬	**ফোন:**		

অংশ ২: রোগীর সামাজিক জন-তাত্ত্বিক তথ্য			
প্রশ্ন		উত্তর	
২.১	বয়স	[ ] বছর	
২.২	লিঙ্গ	(১) পুরুষ	(২) নারী
২.৩	পেশা		
২.৪	বৈবাহিক অবস্থান?	(১) বিবাহিত	(২) অবিবাহিত
২.৫	বসবাসের স্থান?	(১) শহর	(২) গ্রাম
২.৬	শিক্ষাগত যোগ্যতা?	(১) অশিক্ষিত	(২) মাধ্যমক
		(৩) উচ্চ মাধ্যমিক	(৪) স্নাতক এবং উচ্চতর
২.৭	আপনার মাসিক আয় কত?	[ ] টাকা	
অংশ ৩: মেডিকেল তথ্যাবলি			

৩.১	আপনার উচ্চতা কত?	.....সেমি
৩.২	আপনার ওজন কত?	.....কেজি
৩.৩	বি এম আই	১. কম ওজন ২. স্বাভাবিক ওজন ৩. অতিরিক্ত ওজন ৪. স্থুল
৩.৪	অন্যান্য জটিলতা	১. উচ্চরক্তচাপ ২. ডায়াবেটিস ৩. জানিনা
৩.৫	সারাদিন কাজের শেষে আপনি সাধারনত কি পরিমান ক্লান্ত থাকেন?	১. ক্লান্ত নয় ২. সামান্য ক্লান্ত ৩.অন্যন্ত ক্লান্ত
৩.৬	আপনি কি একই কাজ প্রতিদিন করেন?	১. হ্যাঁ ২. না
৩.৭	আপনি কি মনে করেন যে আপনার নীচের পিঠের অস্বস্তি একই কাজ করার জন্য দায়ী?	১. হ্যাঁ ২. না
৩.৮	আপনি কি মনে করেন আপনার ব্যথা উপকরণ ব্যবহার করার জন্য দায়ী?	১. দাঁড়ানো ২. বসে ৩. একই অবস্থানে অনেক্ষন ধরে কাজ করে ৪. বারবার একই কাজ করে
৩.৯	আপনি কি মনে করেন আপনার ব্যথা উপকরণ ব্যবহার করার জন্য দায়ী?	১. হ্যাঁ ২. না
৩.১০	কতক্ষণ ব্যথা অব্যাহত থাকে?	১. (০-৫) ঘন্টা ২. (৬-১২) ঘন্টা ৩. (১৩-২৪) ঘন্টা
৩.১১	ব্যথার ধরন কি?	১. স্থায়ী ২. অস্থায়ী

পরীক্ষা পূর্ববর্তী

ব্যাথা পরিমাপক স্কেল		
		
ক্রমিক নং	**পরিমাপক**	**ব্যাথার স্কোর**
১.	পিঠের নিচে ব্যাথা?	

রেঞ্জ অব মোশন (রওম)

ক্রমিক নং	**হিপ জয়েন্ট মুভমেন্ট** (ডিগ্রী)	**টেস্টের রেজাল্ট** (ডিগ্রী)
১	ফ্লেকশন (১১০-১২০)	
২	এক্সটেনশন (১০-১৫)	
৩	এবডাকশন (৩৫-৪৫)	
৪	এডাকশন (১৫-২৫)	
৫	মিডিয়াল রোটেশন (৩০-৪৫)	
৬	লেটারাল রোটেশন (৪০-৬০)	

[দ্যা ওয়েস্ট্রি ডিসেবিলিটি ইন্ডেক্স (ওডিই) ২.১ এ]

ওয়েস্ট্রি লো ব্যাক পেইন ডিসেবিলিটি কোয়েশ্চেনিয়ার:

অধ্যায়	প্রশ্ন	উত্তর
১. ব্যাথার মাত্রা	০. এই মুহূর্তে আমার কোন ব্যথা নেই ১. এই মুহূর্তে ব্যথা খুবই হালকা ২. এই মুহূর্তে ব্যথা মাঝারি ৩. এই মুহূর্তে ব্যথা মোটামুটি তীব্র ৪. এই মুহূর্তে ব্যথা খুব তীব্র ৫. এই মুহুর্তে যন্ত্রণা সবচেয়ে খারাপ	
২. ব্যাক্তিগত যত্ন	০. আমি অতিরিক্ত ব্যথা না করেই নিজের যত্ন নিতে পারি ১. আমি স্বাভাবিকভাবে নিজের যত্ন নিতে পারি তবে এটি খুব বেদনাদায়ক ২. নিজেকে দেখাশোনা করা বেদনাদায়ক এবং আমি ধীর এবং যত্নশীল। ৩. আমার কিছু সাহায্য দরকার কিন্তু ব্যক্তিগত যত্নের বেশিরভাগই পরিচালনা করি। ৪. স্ব-যত্নের বেশিরভাগ ক্ষেত্রে আমার প্রতিদিন সাহায্যের প্রয়োজন। ৫. আমি কাপড় চোপড় পাই না, কষ্ট করে ধুয়ে বিছানায় পড়ে থাকি।	
৩. ভার বহন	০. আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন তুলতে পারি। ১. আমি ভারী ওজন তুলতে পারি তবে এটি অতিরিক্ত ব্যথা দেয়। ২. ব্যথা আমাকে মেঝে থেকে ভারী ওজন তুলতে বাধা দেয় তবে তারা সুবিধামত অবস্থানে থাকলে আমি পরিচালনা করতে পারি। ৩. ব্যথা আমাকে ভারী ওজন তুলতে বাধা দেয় তবে আমি হালকা থেকে মাঝারি ওজন পরিচালনা করতে পারি যদি সেগুলি সুবিধাজনকভাবে অবস্থান করে। ৪. আমি কেবল খুব হালকা ওজন তুলতে পারি। ৫. আমি কিছুতেই তুলতে বা বহন করতে পারি না।	
৪. হাটা	০. ব্যথা আমাকে কোনো দূর হাঁটতে বাধা দেয় না। ১. ব্যথা আমাকে এক মাইলের বেশি হাঁটতে বাধা দেয়। ২. ব্যথা আমাকে এক মাইলের এক চতুর্থাংশের বেশি হাঁটতে বাধা দেয়। ৩. ব্যথা আমাকে ১০০ গজের বেশি হাঁটতে বাধা দেয়। ৪. আমি কেবল লাঠি বা ক্রাচ ব্যবহার করে হাঁটতে পারি। ৫. আমি বেশিরভাগ সময় বিছানায় থাকি এবং টয়লেটে হামাগুড়ি দিতে হয়।	
৫. বসা	০. আমি যতক্ষণ চাই ততক্ষণ যে কোনও চেয়ারে বসতে পারি। ১. আমি আমার পছন্দের চেয়ারে যতক্ষণ খুশি বসতে পারি। ২. ব্যথা আমাকে ১ ঘন্টার বেশি বসতে বাধা দেয়। ৩. ব্যথা আমাকে আধা ঘন্টার বেশি বসতে বাধা দেয়.	

অক্সফোর্ড মাসেল গ্রেডিং স্কেল:

০/৫ কোন দৃশ্যমান বা স্পষ্ট কন্ট্রাকশন নেই

১/৫ দৃশ্যমান/স্পষ্টযোগ্য পেশী কন্ট্রাকশন কিন্তু নড়াচড়া নেই

2/5 গ্রেভিটি ছাড়া (কম শক্তি) সম্পূর্ণ রেঞ্জ অব মোশন

৩/৫ শুধুমাত্র গ্রেভিটির বিরুদ্ধে সম্পূর্ণ রেঞ্জ অব মোশন (ন্যায্য শক্তি)

৪/৫ কিছু প্রতিরোধ (ভাল শক্তি) সহ অভিকর্ষের বিরুদ্ধে সম্পূর্ণ পরিসরের মাধ্যমে চলাচল

৫/৫ পূর্ণ প্রতিরোধের (স্বাভাবিক শক্তি) সাথে অভিকর্ষের বিরুদ্ধে পূর্ণ পরিসরের মাধ্যমে চলাচল

ক্রমিক নং	**নিরিক্ষনের পেশী**	**স্কোর**
১	গ্লুটিয়াস পেশী	

পরীক্ষা পরবর্তী

ব্যাথা পরিমাপক স্কেল		
		
ক্রমিক নং	**পরিমাপক**	**ব্যাথার স্কোর**
১.	পিঠের নিচে ব্যাথা?	

রেঞ্জ অব মোশন (রওম)

ক্রমিক নং	**হিপ জয়েন্ট মুভমেন্ট** (ডিগ্রী)	**টেস্টের রেজাল্ট** (ডিগ্রী)
১	ফ্লেকশন (১১০-১২০)	
২	এক্সটেনশন (১০-১৫)	
৩	এবডাকশন (৩৫-৪৫)	
৪	এডাকশন (১৫-২৫)	
৫	মিডিয়াল রোটেশন (৩০-৪৫)	
৬	লেটারাল রোটেশন (৪০-৬০)	

[দ্যা ওয়েস্ট্রি ডিসেবিলিটি ইন্ডেক্স (ওডিই) ২.১ এ]

ওয়েস্ট্রি লো ব্যাক পেইন ডিসেবিলিটি কোয়েশ্চেনিয়ার:

অধ্যায়	প্রশ্ন	উত্তর
১. ব্যাথার মাত্রা	০. এই মুহূর্তে আমার কোন ব্যথা নেই ১. এই মুহূর্তে ব্যথা খুবই হালকা ২. এই মুহূর্তে ব্যথা মাঝারি ৩. এই মুহূর্তে ব্যথা মোটামুটি তীব্র ৪. এই মুহূর্তে ব্যথা খুব তীব্র ৫. এই মুহুর্তে যন্ত্রণা সবচেয়ে খারাপ	
২. ব্যাক্তিগত যত্ন	০. আমি অতিরিক্ত ব্যথা না করেই নিজের যত্ন নিতে পারি ১. আমি স্বাভাবিকভাবে নিজের যত্ন নিতে পারি তবে এটি খুব বেদনাদায়ক ২. নিজেকে দেখাশোনা করা বেদনাদায়ক এবং আমি ধীর এবং যত্নশীল। ৩. আমার কিছু সাহায্য দরকার কিন্তু ব্যক্তিগত যত্নের বেশিরভাগই পরিচালনা করি। ৪. স্ব-যত্নের বেশিরভাগ ক্ষেত্রে আমার প্রতিদিন সাহায্যের প্রয়োজন। ৫. আমি কাপড় চোপড় পাই না, কষ্ট করে ধুয়ে বিছানায় পড়ে থাকি।	
৩. ভার বহন	০. আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন তুলতে পারি। ১. আমি ভারী ওজন তুলতে পারি তবে এটি অতিরিক্ত ব্যথা দেয়। ২. ব্যথা আমাকে মেঝে থেকে ভারী ওজন তুলতে বাধা দেয় তবে তারা সুবিধামত অবস্থানে থাকলে আমি পরিচালনা করতে পারি। ৩. ব্যথা আমাকে ভারী ওজন তুলতে বাধা দেয় তবে আমি হালকা থেকে মাঝারি ওজন পরিচালনা করতে পারি যদি সেগুলি সুবিধাজনকভাবে অবস্থান করে। ৪. আমি কেবল খুব হালকা ওজন তুলতে পারি। ৫. আমি কিছুতেই তুলতে বা বহন করতে পারি না।	
৪. হাটা	০. ব্যথা আমাকে কোনো দূর হাঁটতে বাধা দেয় না। ১. ব্যথা আমাকে এক মাইলের বেশি হাঁটতে বাধা দেয়। ২. ব্যথা আমাকে এক মাইলের এক চতুর্থাংশের বেশি হাঁটতে বাধা দেয়। ৩. ব্যথা আমাকে ১০০ গজের বেশি হাঁটতে বাধা দেয়। ৪. আমি কেবল লাঠি বা ক্রাচ ব্যবহার করে হাঁটতে পারি। ৫. আমি বেশিরভাগ সময় বিছানায় থাকি এবং টয়লেটে হামাগুড়ি দিতে হয়।	
৫. বসা	০. আমি যতক্ষণ চাই ততক্ষণ যে কোনও চেয়ারে বসতে পারি। ১. আমি আমার পছন্দের চেয়ারে যতক্ষণ খুশি বসতে পারি। ২. ব্যথা আমাকে ১ ঘন্টার বেশি বসতে বাধা দেয়। ৩. ব্যথা আমাকে আধা ঘন্টার বেশি বসতে বাধা দেয়.	

অক্সফোর্ড মাসেল গ্রেডিং স্কেল:

০/৫ কোন দৃশ্যমান বা স্পষ্ট কন্ট্রাকশন নেই

১/৫ দৃশ্যমান/স্পষ্টযোগ্য পেশী কন্ট্রাকশন কিন্তু নড়াচড়া নেই

2/5 গ্রেভিটি ছাড়া (কম শক্তি) সম্পূর্ণ রেঞ্জ অব মোশন

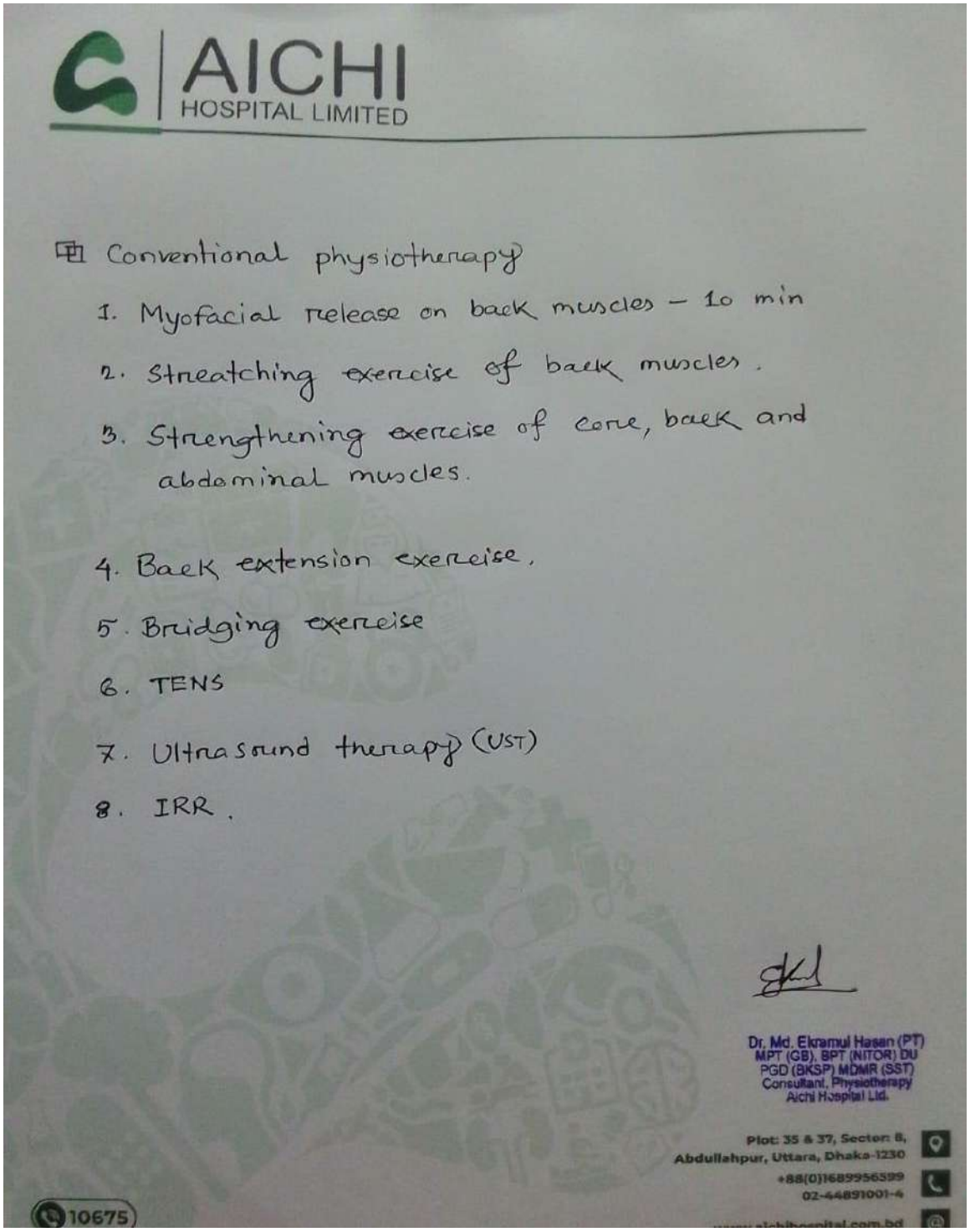
৩/৫ শুধুমাত্র গ্রেভিটির বিরুদ্ধে সম্পূর্ণ রেঞ্জ অব মোশন (ন্যায্য শক্তি)

৪/৫ কিছু প্রতিরোধ (ভাল শক্তি) সহ অভিকর্ষের বিরুদ্ধে সম্পূর্ণ পরিসরের মাধ্যমে চলাচল

৫/৫ পূর্ণ প্রতিরোধের (স্বাভাবিক শক্তি) সাথে অভিকর্ষের বিরুদ্ধে পূর্ণ পরিসরের মাধ্যমে চলাচল

ক্রমিক নং	**নিরিক্ষনের পেশী**	**স্কোর**
১	গ্লুটিয়াস পেশী	

APPENDIX- D



AICHI
HOSPITAL LIMITED

Conventional physiotherapy

1. Myofacial release on back muscles – 10 min
2. Streatching exercise of back muscles.
3. Strengthening exercise of core, back and abdominal muscles.
4. Back extension exercise.
5. Bridging exercise
6. TENS
7. Ultrasound therapy (UST)
8. IRR.

Dr. Md. Ekramul Hasan (PT)
MPT (GB), BPT (NITOR) DU
PGD (BKSP) MDMR (SST)
Consultant, Physiotherapy
Aichi Hospital Ltd.

Plot: 35 & 37, Secter: 8,
Abdullahpur, Uttara, Dhaka-1230
+88(0)1689956589
02-44891001-4

10675

AICHI
HOSPITAL LIMITED

Dry needling

- ✓ Use sterile, solid, stainless steel acupuncture needles (0.25mm – 0.30 mm, diameter, 30-50 mm length) for dry needling.
- ✓ Insert needle into identified trigger point within the gluteus medius muscle.
- ✓ Needle insertion depth typically range from 1-2.5 cm.
- ✓ Manipulate the needle for 30-60 seconds
- ✓ Level the needle in place for 10-15 minutes.
- ✓ Conduct 3 treatment session per week for 2-4 weeks.
- ✓ Avoid intense activity for 24-48 hours post treatmen
- ✓ Suggest ice or heat for mild soreness.

Dr. Md. Ekramul Hasan (PT)
MPT (GB), BPT (NITOR) DU
PGD (BKSP) MDMR (SST)
Consultant, Physiotherapy
Aichi Hospital Ltd.

Plot: 35 & 37, Sector: 8,
Abdullahpur, Uttara, Dhaka-1230
+88(0)1689956599
02-44891001-4
www.aichihospital.com.bd
10675

Appendix- E

Gant Chart

Activities/ months	Jan 24	Feb 24	Mar 24	Apr 24	May 24	June 24	July 24	Aug 24	Sep 24	Oct 24	Nov 24	Dec 24	Jan 25
Proposal presentation													
Introduction													
Literature review													
Methodology													
Data collection													
Data Analysis													
Result													
1st progress presentation													
Discussion													
Calclusion And Recommendation													
2nd progress presentation													
Communication with supervisor													
Final submission													