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Effectiveness of Ergonomic Intervention Among the Garment's Worker Suffering from Chronic Neck Pain: A Quasi-experimental study.

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We attest that we have read this dissertation with great attention and suggest it for acceptance by the University of Dhaka's Faculty of Medicine.

Effectiveness of Ergonomic Intervention Among the Garment's Worker Suffering from Chronic Neck Pain: A Quasi-Experimental Study.

Sumon Chandra Dash submitted this in order to partially complete the prerequisites for the Bachelor of Science in Physiotherapy degree.

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DECLERATION

This work has never before been approved in full for a degree, nor is it presently being presented as a candidate for one. A portion of the criteria for the B.Sc. in Physiotherapy degree are being met by submitting this dissertation.

I confirm that I will receive an inadequate rating and be subject to disciplinary action from the appropriate authorities if it is found in my work that I have plagiarized or otherwise cheated. I guarantee that the bound copy of the thesis and the electronic version are the same.

If the results of this project are published in the future, the research supervisor will be very concerned. The Physiotherapy department of SAIC College of Medical Science and Technology (SCMST) will provide consent, and the poject will be properly Recognized as a graduate thesis.

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CONTENTS

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ACRONYMS

BPT **:** Bachelor of Physiotherapy

CNP **:** Chronic Neck Pain

DU **:** Dhaka University

IRB **:** Institutional Review Board

NDI **:** Neck Pain Disability Index

NP **:** Neck Pain

NPRS **:** Numeric Pain Rating Scale

NSNP **:**Non-specific Neck Pain

SCMST **:** Saic College of Medical Science And Tecnology

SPSS **:** Statistical Package For The Social Science

WHO **:** World Health Organization

WT **:** Wilcoxon Test

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Purpose: The study assessed the ergonomic treatment given to a garment worker who had been experiencing persistent neck pain. **Objectives:** to evaluate how well an ergonomic intervention works for employees of the clothing company who have persistent neck pain. Examine the social and demographic aspects that affect neck discomfort. Examine the relationship between the intensity of neck discomfort and medical baseline measures such as BMI and comorbidities. Use the Neck Disability Index and the Numeric Pain Rating Scale to examine the functional effects and characteristics of neck pain before and after the intervention. Compare the pain and disability scores before and after the intervention to determine its efficacy. **Methodology:** A quantitative, quasi-experimental research design was employed in the study. In this exploratory trial, 50 people who had been experiencing neck pain for a long time were randomly assigned. For these 50 patients, a single group design was employed. This group attended 10 ergonomic intervention sessions at Lodestar Fashion Ltd Garments, situated at Mirpur-14, Dhaka-1216, for a duration of 5 weeks. Additionally, the Neck Pain Disability Index (NDI) scale was used to measure the disability status of individuals with chronic neck pain, and the Numeric suffering Rating Scale (NPRS) was used to measure the intensity of their suffering. **Analysis of data:** SPSS version 22 was used to perform inferential statistics, including the Wilcoxon test. **Results:** Pain and disability in the neck decreased in this group. Both the numerical pain rating scale (NPRS) and the neck pain disability index demonstrated significant improvements in this group. The significance threshold, according to the study, was ($P<0.01$). **Conclusion:** The effectiveness of the ergonomic intervention was supported by the study's conclusion that it can dramatically reduce pain and functional handicap in people with chronic neck pain.

Keywords: Neck pain, ergonomic intervention, neck disability, garment's worker

CHAPTER-I INTRODUCTION

1.1 Background of the study:

Any neck discomfort that lasts for a day or more, regardless of whether it spreads to one or both upper limbs, is considered neck pain. It also includes any discomfort in the joints, discs between the bones, muscles, nerves, and bones (vertebrae) of the neck (Safiri et al. 2017, p.3). Every year, over 30% of people suffer from pain in the neck, making it the fourth most prevalent reason for disability (Cohen 2015, p.290). Neck pain is deemed chronic if it lasts more than 12 weeks or Following six months of experiencing severe neck pain, signs of chronic neck pain started to appear and it is a costly musculoskeletal condition that is common in western society (Noori et at. 2020, p.1485).

Neck pain is a pretty frequent condition all over the world. In China, the one-month prevalence ranges from 15.4% to 45.3%, while the 12-month prevalence ranges from 12.1% to 71.5% for adults. Despite its high frequency, 10% of men and 17% of women experience neck pain, which often progresses into chronic pain (Cheng & Huang 2014, p.5). Cheng and Huang (2014, p.13) also discuss that` Over 50% of older people are experiencing pain in their neck in the past six months, indicating a significant increase in the prevalence of neck discomfort over the past 20 years.

Hussain et al. (2016, p. 23) state that whereas prevalence at the point varies from 6% to 22% and up to 38% of the aged population, lifetime prevalence in Pakistan ranges from 14.2% to 71%. The incidence of neck discomfort ranged from 10.4% to 21.3% over a 12-month period, and the prevalence over a one-year period ranged from 4.8% to 79.5% (mean, 25.8%). A thorough review of the literature revealed that women are more likely than men to experience persistent neck pain, with a prevalence of 27.2% compared to 17.4% (Cheng & Huang 2014, p.7). However, So far, no pertinent Studies have been identified on the prevalence of neck pain in Bangladeshis. One study indicated that 52.22% of respondents occasionally experienced neck discomfort, while 22.22% of office workers experienced it often (Rahman 2017, p. 38).

According to estimates, the mean lifetime prevalence of neck pain is almost 50%, and the prevalence in one month is 25% and It appears which women are more probable to than males to experience 50% of chronic pain illnesses, while men are more likely to have an experience 20% of these conditions (Mills, Nicolson and Smith 2019, p.275). This literature review addresses the worldwide epidemiological issues and trends associated with neck pain before looking at the emotional and physiological risk factors related to the onset and progression of neck pain. In 2019, neck discomfort was one of the most common musculoskeletal conditions, with an age-standardized occurrence rate of 27.0 per 1000 people (Kazeminasab et at. 2022, p.5).

According to Safiri et al. (2017, p.15), In today's world, neck discomfort is a prevalent ailment, affecting 30 to 50 percent Among the overall populace at any particular moment and the average person experiences neck pain between 29 and 40% of the time each year. The age-standardized incidence rates in 2017 were 1029 and 624 per 100,000 populations, respectively, in Andean Latin America and East Asia. The countries with the lowest prevalence rates were South Sudan and Djibouti of neck pain, whereas the highest levels of prevalence were found in Scandinavian countries, especially as Norway, Finland, and Denmark. Age-standardized occurrence and prevalence rates increased by 3% and 4.1%, respectively, in high-income North America and decreased by 1.1% and 1.4%, respectively, in Australasia among 1990 and 2017 (Figs. 1 and 2).

Safiri et al. (2017, p.17) also demonstrate that the age-standardized point prevalence of neck discomfort in the country in 2017 varied from 2444 to 6151 cases per 100,000 people. According to Fig. 3, Djibouti 2444 and South Sudan 2450 had the lowest age standardized point prevalence estimates, while Norway 6151 and Finland 5750 had the highest estimates. Additionally in 2017, there were 600 to 1145 incidences of age-standardized neck pain for every 100,000 people in the country. According to Figure 4, Norway 1145 and Iran 1056 had the greatest rates, while Canada 600 and Bhutan 612 had the lowest estimates. Bangladeshi garment workers usually sit or stand for eight hours or longer every day at their workplaces. Long periods of time spent sitting on poorly designed furniture can contribute to shoulder, neck, and back pain, which lowers working skill and lowers productivity (Hoque et al. 2021, p.665).

Many employees experience lower back and shoulder pain as a result of their poor posture. Workers between the ages of 31 and 45 (OR 2.03, 95% CI [0.84, 4.91]) and those without formal education (OR 2.06, 95% CI [0.90, 4.71]) have a substantial correlation with upper back discomfort (Biswas et al. 2017, p.7). For physical therapists, clinical practice guideline offers a somewhat different classification that is nonetheless divided into four categories: headache coupled with neck pain, neck pain combined with movement coordination failure and neck pain with deficiency in mobility and neurological indications of widespread neck discomfort (Blanpied et al. 2017, p.23).

The clinical history and other components would provide information on the manifestations, including distribution of pain or other symptoms like weakness, disorientation, pain patterns, onset of symptoms, worsening and resolving symptoms, and identifying warning indicators like trauma (Fandim et al. 2021, p.77). Numerous studies involving populations have examined the effects of various risk factors, both changeable and non-modifiable, on neck pain. These factors include advanced age, gender, a lack of community support, and past experiences of neck or upper back pain. Neck discomfort is a multifactorial condition (Kim et al. 2018, p.79).

Numerous risk factors may contribute to the development of neck discomfort because it is a complex condition. However, additional research has been done on a number of risk variables, including age, poor ergonomics, obesity, stress and tension, degenerative changes, length of daily sewing machine use, perceived stress, and herniated discs (Jahre et al. 2020, p.8). The relationship between employees and their working environments is known as ergonomics; employees' capacity and work should be balanced by either growing or adjusting the former and Ergonomics, also referred to as human factors and information, is "the study of science concerned with the fundamental understanding of relationship among humans and other elements of a system, and the application of suitable methods, theory, and practice" to improve human well-being and overall system performance (Karimi et al. 2020, p.88).

People factors, which is another name for ergonomics, is a scientific discipline that examines how people interact with other system elements, according to the International Ergonomics Association (Septiani et at. 2024, p.79). The main goals of ergonomics are efficiency and comfort, which raise worker satisfaction and productivity. Their study demonstrated that proper ergonomic practices not only improved workplace comfort but also significantly enhanced productivity levels, highlighting the critical role of ergonomic interventions in occupational settings (Baba et al. 2021, p.68).

All things considered, MY study advances academic understanding and offers workable solutions to enhance the lives of garment workers, all of which are in line with the general objectives of advancing social responsibility, occupational health and safety.

1.2 Justification

Chronic neck discomfort is a common problem that affects people all across the world, including in Bangladesh. The most common cause of neck discomfort worldwide is mechanical. Any strain, exhaustion, or neck pain that can spread to the upper limbs is how it manifests. It's most likely as a result of their regular bad posture, slouching, sewing machine use, or prolonged sitting at work.

According to the International Ergonomics Association (IEA), ergonomics is a field of science that studies how people interact with other components of systems. The science of making a worker's workspace efficient, safe, secure, and fit in order to guarantee that they produce quality work is known as ergonomics. Conducting a study on the effectiveness of ergonomic interventions among garment workers suffering from chronic neck pain is justified by the pressing occupational health concerns, the need for targeted research in this area, the practical implications for workers and employers, the fulfillment of social responsibility obligations, and the potential global relevance of the findings. Physical ergonomic interventions programs to manage chronic neck pain can differ with the duration, frequency, intensity and mode of physical activity. Among the physical ergonomic intervention can reduce pain and prevent reinjures. If the ergonomic intervention are given among patient with chronic neck pain it will be more fruitful.

1.3 Aim

The goal of this study is to assess how well ergonomic interventions work for garment workers who have chronic neck pain.

1.4 Research Question

How effective is ergonomic intervention in reducing pain intensity among garments workers with chronic neck pain?

1.5 Objectives of the study

1.5.1 General objectives:

I. To evaluate the effectiveness of ergonomic intervention among the garment's worker suffering from chronic neck pain.

1.5.2 Specific Objectives:

I. To describe demographic and socioeconomic factors influencing neck pain.

II. To identify medical baseline metrics like BMI and comorbidities to examine their impact on neck pain severity.

III. To assess the degree of neck discomfort using the Neck Disability Index and the Numerical Pain Rating Scale both before and after the intervention.

IV. To evaluate the efficacy of the intervention by contrasting the pain and disability scores before and after the intervention.

1.6 Research Hypothesis

Null hypothesis:

Ergonomic intervention is not effective for the patients with chronic neck pain.

Ho: $\mu 1-\mu 2=0$ or $\mu 1=\mu 2$, when the experimental group starting and ending average variance is similar.

Alternative hypothesis:

Ergonomic intervention is more effective for the patients with chronic neck pain.

Ho: $\mu 1-\mu 2=0$ or $\mu 1=\mu 2$, when the experimental group starting and ending average variance is not similar.

Where,

Ho= stands for the hypothesis.

Ha= stands for the alternative hypothesis

$\mu 1$= stands for the mean of population 1, and

$\mu 2$= stands for the mean of population 2

1.7 Operational Definition:

Chronic neck pain: Any discomfort in the neck's anatomical region that persists for more than 12 weeks, regardless of whether it spreads to the head, trunk, or upper limbs, is referred to as chronic neck pain. It is frequently felt when the neck and shoulder areas are moved passively or actively.

Pain: For the study of pain (IASP), pain is defined as an unpleasant sensory and emotional experience connected to acute or potential tissue damage, or described in terms of such damage. The word pain is derived from the Latin word poena.

Neck Pain: The feeling of pain in the neck region is known as neck pain. Dysfunction of any of the neck's structures can cause neck pain. Neck discomfort, often known as cervical pain, can be caused by a number of different conditions.

Radiating Pain: Pain that radiates from one area of the body to another is referred to as "radiating pain." After beginning in one location, this discomfort gradually moves to other parts of the body. For instance, neck pain may develop in those who have illness and entrapment of any of the cervical spine's nerve roots.

Ergonomic intervention: Interactions between employees and other components of the physical, corporate, and cognitive aspects of the workplace are referred to as ergonomic. Enhancing the workspace's furnishings and surroundings is one example of an operational ergonomic intervention.

Chronic pain: Pain in one or more structural areas that lasts or recurs for more than three months and is linked to severe psychological distress or functional limitation is referred to as chronic primary pain.

Musculosketal disorder: Pain that is frequently chronic along with dexterity and mobility impairments are the main characteristics of musculoskeletal disorders, which make it harder for patients to work and engage in society. Musculoskeletal pain is the most prevalent type of pain that is not related to cancer.

1.8 Conceptual Framework:

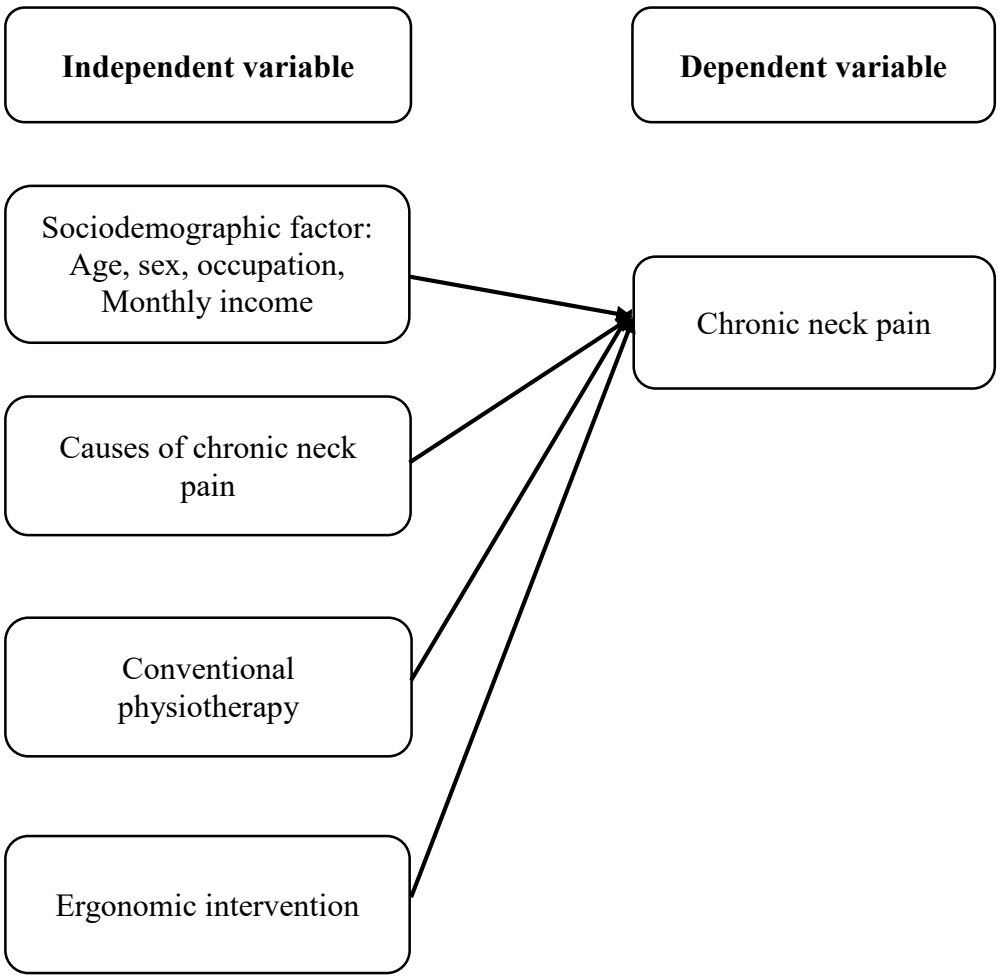

Figure no1.8: Conceptual Framework

CHAPTER:II LITERATURE REVIEW

A musculoskeletal condition that results in neck discomfort or dysfunction is poor posture that impairs function or causes physical disability (Kataria et al. 2020, p.8). Neck discomfort is a common and often incapacitating condition that contributes significantly to global self-reports of pain, disability, and ongoing own medical costs, regardless of its traumatic or non-traumatic origin (Wu et al. 2021, p.143). Health loss due to diseases, injuries, and associated risks is examined in 204 countries and territories by the Global Burden of Diseases, Injuries, and Risk Factors Research Study (GBD) (Baune et al. 2019, p.11).

Numerous multifactorial causes have been identified by the evidence, including: inactivity; pro-inflammatory and degenerative modifications in the spinal discs, joints, ligaments, and nerves; non-catastrophic injury from a car accident, job-related incident, sporting event, or other degenerative conditions (e.g., degenerative cervical myelopathy or secondary osteoarthritis of the facet joints); neurological disorders and neoplasms; or muscle strain from injuries, sleep disorders, poor posture, repetitive movements, or other causes; or muscle strains (Jahre et al. 2020, p.5).

A musculoskeletal condition that results in neck discomfort or dysfunction is poor posture that impairs function or causes physical disability (Iqbal et al. 2013, p.658). According to a Pakistani survey, 78% of sewing machine operators experienced NP within a year and Sewing machine operators have a significant prevalence of NP, according to earlier investigations (Hassan et al. 2017, p.55).

The percentage of sewing machine operators who reported net positive symptoms in the preceding 12 months was 50%, 54.1%, 39.64%, 61.4%, 60.7%, and 36.7%, respectively, according to research conducted in Bangladesh, Iran, Sri Lanka, Estonia, India, and Turkey (Merisalu et al. 2016, p.7). The average amount of NP in the two Nigerian cities was 34.8% and 80%, as well, according to previous studies (Akinpelu et al. 2016, p.155).

Millions of workers in both developed and developing countries are at risk for injury and disability due to the burden of musculoskeletal illnesses related to work brought on by unhygienic working conditions. The prevalence of muscular injuries, including NP, in the textile and apparel manufacturing industries is well documented (Bayzid et al., 2019). Neck pain is a major health concern worldwide, with an overall recurrence rate of 37.2% (range 16.7-75.1%) (Cohen and Hooten 2017, p.13).

Since the majority of chronic pain is caused by aging, understanding protective and risk factors is essential to spreading knowledge about high-risk groups' educational needs and effective prevention actions (McLean et al. 2010, p.570). The normal design of the cervical spine changes as people age, which can cause neck pain and long-term dysfunction. Neck pain is more common in adults, however it can occur at any age. The worldwide burden of Diseases 2017 study found that the overall occurrence of neck discomfort peaked in the middle decades ages and then declined. The age groups of 45–49 years for males and 50–54 years for women had the largest burdens (Safiri et al. 2017, p.17).

According to Shin et al. (2019, p.9) In terms of years spent disabled, neck discomfort is more common in women than in men, but it rises with age in both sexes, reaching a peak between 45 and 54 years old before starting to decline around 74 years old. This suggests that aging has a major part in the disease load, which will, regrettably, get more and more severe over the next few decades. This might become a problem in the future in low-income nations, particularly those in Africa where population increase and aging are happening at a very rapid rate (Mukhtar et al. 2023, p.19).

The problem is further made worse by the low socioeconomic position, widespread shortage of healthcare resources, and inadequate or nonexistent preventive measures in many nations (Azevedo 2017, p.6). In sub-Saharan Africa, the only regions having greater point prevalences of neck discomfort (males 4.1–4.7%; females 6.0–6.8%) are the USA (men 5.3%; women 7.6%), Western Europe (men 5.2%; women 7.4%), and East Asia (males 4.8%; females 7.0%) (Hoy et al. 2014, p.1315).

Most studies have shown that among the most prevalent health issues in the apparel sectors are musculoskeletal disorders. According to a study done in Sri Lanka, 15.5% of garment factory Employees had muscles and tendons difficulties in the previous year (11), while a study done in the Gazhipur area found that 78.8% of workers had skeletal problems (Ahmed and Raihan 2014, p.44). According to a survey done in a Kolkata slum, 69.6% of garment workers said that their main concern was a musculoskeletal issue. According to a Bangalore study, ergonomic factors accounted for 71.9% of musculoskeletal issues. The most often reported musculoskeletal problem among individuals with a range of 22.2% to 68.5% was back discomfort. It was discovered that 60% of the women who operated sewing machines had back pain (Lillypet et al. 2017, p.117). It was typical for sewing machine operators to report both shoulder and neck pain at the same time, with a reported incidence of 50.5% to 60.7% for neck pain. The prevalence of shoulder pain alone varied from 24.4% at the lowest to 50.2% at the highest (Bandyopadhyay et al. 2012, p.13).

According to a Danish survey, 11.9% of sewing machine operators missed work for at least one day in the previous year as a result of neck-shoulder issues, while 4.7% missed eight days or more. The reported frequency of upper back discomfort varied from 35.6% to 52% (Sealetsa and Thatcher 2011, p.282). The majority of respondents (81%) to a research on the pattern of pain experienced by Bangladeshi garment workers reported having transitory pain, or pain that occurred once a day, while 13% reported constant pain. In terms of pain intensity, 38.5% reported mild pain, 35.2% reported moderate pain, and 2.4% reported severe pain. Additional symptoms mentioned by the garment workers were 10% muscular weakness in various areas, 68.1% aches and pains, 43% numbness, 25.9% stiffness, and 21.5% weakness of the affected part (Jahan et al. 2015, p.107).

The survey also showed that the shoulders and back were the most often affected areas by musculoskeletal issues. In a survey of sewing machine operators, the majority of males (45.4%) reported having shoulder discomfort, compared to 60% of women who reported having back pain. Additionally, 29% of men and 38.1% of women reported having both back and neck pain. Only a small portion reported having hand pain. Gender differences were also found in the studies. There are gender disparities in health problems, according to a Danish textile study (Roy 2010, p.5).

In an ergonomic study of sewing machine operators, 52.8% of men reported experiencing pain once a week or once a month, while 23.6% of female workers reported experiencing discomfort once in less than a week. In two textile factories in Turkey, a study of Swedish residents aged 35 to 45 years revealed that the one-year average frequency of self-reported pain, including neck, upper back, and lower back pain, was 69.5% for women and 63.2% for men. A smaller proportion of workers reported experiencing constant pain for one or two days, which caused them to take time off for at least two days (Berberoglu and Tokuc 2013, p.25).

According to Jahan et al. (2015, p.119), the review demonstrated a substantial association among musculoskeletal issues and factors connected to both personal and professional life. A study conducted in the city of Dhaka assessed the prevalence of musculoskeletal issues among Bangladeshi textile workers. Workstation and task analysis showed that the primary causes of musculoskeletal issues were incorrect posture and movements taken while working, static muscular loads, and the lack of an armrest or footrest. Other significant ergonomic risk factors included bending and twisting at the waist (79.4%), using technology (0.5%), vibration exposure (68.6%), and exerting force with the hands (83.8%) while employing manage tools or deal with parts (Senthil kumar et al. 2009, p.105).

Years spent handicapped are most frequently caused by muscular skeletal disorders (MSDs) (Vos et al. 2010, p.2169). Workplace physical activity has been linked to work-related musculoskeletal disorders (WMSDs) according to a number of epidemiological studies. Common risk factors for WMSDs include being older, female, more experienced, working longer hours, having uncomfortable postures, repetitive motions, handling manual materials, exerting yourself vigorously, and vibrating (Jin et al. 2022, p.55). One study found that from October 2015 to February 2016, 24.7% of Bangladeshi garment workers reported having lower back discomfort, neck pain, or knee pain 23.7% and 13%, in that order (Hossain et al. 2018, p.33).

One of the most common musculoskeletal conditions affecting adults is neck pain (Vingard 2006, p.109). Its global occurrence varies from 16.7% to 75.1% (Fejer et al. 2006, p.839). Individual factors (e.g., age, body mass index, genetics, history of musculoskeletal pain), behavioral factors (e.g., smoking and level of regular exercise),

psychological aspects (e.g., job satisfaction, stress level, anxiety, and depression), and ergonomic factors (e.g., repetitive movement, inadequate posture, use of force and vibration, intense physical activity) are all part of the condition's complex etiology (Cimmino et al. 2011, p.177). Research has shown that certain factors are linked to neck discomfort; in China, people who reported having neck pain were more likely to use vibrating equipment, perform manual labor above shoulder level, and sit or stand with their necks bent (Yue et al. 2012, p.5). Neck discomfort was linked in the United States to women, married and divorced individuals who experienced some form of illness (cardiovascular, respiratory and gastrointestinal disorders, among others) as well as psychological changes (depression, trouble sleeping, insomnia), while regular physical activity and a high educational level were thought to be protective variables (Hush et al. 2009, p.1539).

Neck pain is a major cause of illness and impairment in day-to-day functioning and occupational performance in many countries. In addition to increasing costs for businesses and society, it may have an impact on an individual's physical, social, and mental well-being. In addition, the incidence of neck discomfort will rise significantly over the next few decades as the population in middle-class and low-income countries ages. This necessitates knowledge of the risk factors as well as a variety of preventive and/or therapeutic measures, including segmental stretching, dry needling, global posture re-education, and percutaneous electrically stimulation of the nerve (Leon-Hernandez et al. 2016, p.433).

Further research on pain is required. It is also important to note that in Brazil, population-based research investigations on pain have generally associated it with either lumbar or overall discomfort. Confirming the prevalence of neck pain in a population-based sample of individuals aged 20 and above, as well as investigating the associations between neck pain and ergonomic, socioeconomic, and demographic factors linked to lifestyle and mortality previously mentioned, were the goals of the current study (Ferreira et al. 2011, p.34).

The human body experiences a great deal of discomfort when we go about our daily lives. In a normal textile industry, the working environment can be hazardous and extremely stressful for the human body. Tasks like weight lifting and other forms of

lifting, factory workers frequently engage in tasks including pushing and/or pulling trolleys, extended standing or sitting, and torso bending and stretching. These activities, when performed incorrectly or regularly over time, can cause stress on the body and eventually result in musculoskeletal pain and/or illnesses. As a result, the factory workers become more susceptible and less productive (Norman et al. 2013, p.9).

Musculoskeletal diseases, or MSDs, are conditions that impact the nerves, tendons, muscles, and supporting structure of the human body. Peripheral nerve, muscle, tendon, and joint pain, discomfort, or injury are known as "related to work musculoskeletal disorders" (WMSDs). Nerves or more blood vessels that labor-related stress might cause or worsen. It is possible to prevent or at least postpone WMSDs to a considerable degree. It increases presenteeism and absenteeism, lowers productivity, and costs the company money. It is the second most common cause of disability worldwide (Kanniappan and Palani 2020, p.35). Depending on the circumstances, it is possible for its severity to range from moderate to severe and for its length to be either acute or chronic. Additionally, its length could vary from mild to severe (Park et al. 2023, p.11).

Neck discomfort is a widespread problem in America and a major global health concern. 15.1% of Americans report having neck pain at least once every three months, according to a 2009 Centers for Disease Control and Prevention (CDC) poll. Pain in the neck ranks fourth in terms of disability and twenty-first in terms of overall pain burden worldwide. This disease impacts not just the patient but also their families and communities, and it has major financial consequences (Hoy et al. 2014, p.1314). It has been demonstrated that some factors increase the incidence of neck pain in adults, including female sex, advanced age, smoking cessation, low back pain in the past or present, prior episodes of neck pain, and psychosocial issues (Kim et al. 2018, p.79).

This disorder has a complicated etiology that includes a number of factors, including genetics, a history of musculoskeletal pain, behavioral factors (such as smoking and physical activity), psychosocial factors (pain, anxiety, and depression), and individual characteristics (such as age, body mass index, repeated movement, inappropriate posture, application of force and vibration, and severe physical activity) (Cimmino et al. 2011, p.178).

Research has shown that neck pain is associated with linked factors. In China, people who used vibrating devices, performed manual labor above shoulder level, and sat or stood with their necks bent were more likely to report having neck pain (Yue et al. 2012, p.7). Neck discomfort was linked in the United States to women, married and divorced individuals who experienced some form of illness (cardiovascular, respiratory, and gastrointestinal disorders, among others) as well as psychological changes (depression, trouble sleeping, insomnia), while regular physical activity and a high educational level were thought to be protective variables (Hush et al. 2009, p.1537). One of the main causes of disease and a hindrance to day-to-day functioning and occupational performance in many countries is neck pain. It could affect a person's physical, mental, and social well-being, which could increase costs for society and enterprises (Genebra et al. 2017, p.276).

Additionally, as the population in medium- and low-income countries ages, neck pain will become much more common in the coming decades, making knowledge of the risk factors and types of preventive and/or curative treatments (e.g., segmental stretching, dry needling, percutaneous electrical nerve stimulation, global postural re-education, and others) essential (Leon-Hernandez et al. 2016, p.433). Although there are many causes of neck pain, the most prevalent ones are prolonged sitting, poor workplace ergonomics, and holding one's neck in an uncomfortable position. If neck discomfort lasts less than six weeks, it is considered acute; if it lasts three months or less, it is considered subacute; and if it lasts longer than six months, it is considered chronic. A shorter duration of neck pain is associated with a better prognosis for long-term outcomes (Peterson et al. 2012, p.13).

Neck pain is one explanation for unexplained dizziness. Current theories suggest that because dizziness limits neck movement and increases cervical muscle tension, it might result in neck pain. On the other hand, cervical pain may trigger sensory abnormalities in the cervical sensory system, which may subsequently result in vertigo (Magnusson and Malmstrom 2016, p.366). Along with the direct physical pain, patients with chronic nonspecific neck pain (CNSNP) may also have decreased cervical mobility, muscle weakness, and poor neck or shoulder area function. Physical dysfunction can result in psychological problems like kinesiophobia, anxiety, melancholy, work-related stress,

and even catastrophizing views, which can ultimately lead to the improvement, repetition, and chronicity of CNSNP (Hou et al. 2020, p.168).

Given the suspected muscular etiology of tension-type headache, neck discomfort and pericranial muscle tension or tenderness are frequently considered to be special characteristics of this type of headache. However, since migraine may have a neurovascular origin, it is challenging to attribute neck pain in migraine cases to muscular soreness (Ashina et al. 2015, p.215).

Pain that was referred includes radiating pain, lower back pain, headache, shoulder discomfort, and numbness in the upper extremities. These symptoms may be directed or generalized discomfort from the connected cervical spine tissue. Lack of coordination and mobility (decrease in range of motion) as well as tenseness, muscle spasms, nausea, lightheadedness, fever, etc (Brandt and Huppert 2016, p.975).

Millions of workers suffer from disabilities and injuries as a result of work-related musculoskeletal disorders brought on by unfavorable working circumstances in both developed and developing nations (Hayes et al. 2009, p.163). In order to operate a sewing machine, a provider must continually press the foot and knee pedals, bend forward to see the operation point, and control the fabric feed to the needle with their hands. It is an extremely accurate and repetitive job (Chan et al. 2002, p.249). Like any other piece of equipment, sewing machines don't harm their users when used properly, but if they are not paired with the right person, they can cause major health problems. NP is one of the health problems that negatively affects workers' quality of life, productivity, and workplace efficiency (Parimalam et al. 2006, p.76).

MSDs are a health concern that is frequently noted in many other industries, not just the textile industry throughout the globe. These impact people's and organizations' performance as well as the quality of their work-life balance (Dianat et al. 2015, p.186). Employment in the clothing business entail extended periods of sitting or standing, repetitive hand and arm motions, awkward postures, and poor Workplace design and sewing machine operators are prone to multiple hand movements and forward leaning postures that might result in motor-spasm of the neck, back, and upper limb (Bernard 2019, p.99).

There have been reports of the prevalence of WRMSDs in the textile industry, especially in the garment manufacturing sector, due to the nature of the occupations and the working conditions (Pascual et al. 2008, p.239). Due to work-related responsibilities, prolonged periods of sitting still usually affect specific body parts, including the neck, shoulders, back, and lower limbs. Rapid repetitive work, difficult gripping positions, and neck, wrist, elbow, and lower back pain are among the symptoms that are commonly mentioned (Deyyas and Tafese 2014, p.17). It's also critical to emphasize that, in Brazil, population-based research on pain has typically focused on lumbar or general pain, whereas neck More research is needed on pain (Ferreira et al. 2011, p.34).

The goal of the current research was to verify the frequency of neck pain in a sample drawn from the population of individuals aged 20 and above, as well as to investigate the associations between neck pain and the demographic, ergonomic, and socioeconomic factors linked to the daily life and mortality previously mentioned.

CHAPTER-III METHODOLOGY

3.1 Study design:

It was a single-group research with a quasi-experimental design that included an intervention. There was no control group in this design with which to compare the experimental group. This study used a quantitative study design and was carried out as an experiment. This study examined a single patient group under a single condition using a test before and after approach. The data was gathered both before and after 5 weeks 10 sessions of ergonomic intervention treatment (pre-test score). To find any discrepancies, the two scores were compared. Researchers were able to validate treatment procedures and methods with the help of these designs. Pre- and post-tests were administered to patients in the chosen group to compare the chronic neck pain experienced by garment workers before and after the intervention.

3.2 Study area:

The researcher is a fourth-year student pursuing a Bachelor of Science degree in physiotherapy at Saic College of Medical Science and Technology (SCMST), and the research is part of the course curriculum. Data were taking from those patients who were Garment's worker suffering from chronic neck pain at Lodestar Fashion Ltd Garment's, Mirpur-14, Dhaka-1216.

3.3 Study period

The study's duration is twelve's months from September 2023 to August 2024.

3.4 Study Population:

The populations were selected by me. The study populations were taken from Lodestar Fashion Ltd Garment's, Mirpur-14, Dhaka-1216. Patients with suffering from chronic neck pain.

3.5 Sample Size: Formula of one sample population used calculating sample size

$n=\left\{\frac{z2pq}{d2}\right\}$

Here,

n = sample size

z^2 = standardized normal deviate, usually set as 1.96 which correspond to 95% confidence level

p = 13.8%= 0.13 (Shazzad et al. 2018, p.2065).

q = 1-p

d = degree of error, which is 5% (Whitley and Ball 2002, p.67).

Sample Size Calculation

z = 1.96

p = 0.13

q = 1 – p = 0.87

d = 0.05

$n = (1.96/0.05)^2 \times (0.13 \times 0.87)$

n = 173.794

So, my sample size was 173.

3.6 Sampling Technique:

The researcher chose 60 individuals with chronic neck pain for this investigation due to the short data collection period. 50 samples meet the qualifying requirements after 60 individuals have been screened. 50 participants were then chosen at random to take part in the experiment. Convenience sampling technique was used in the garment health care chamber as the sample method. The sample used in this sampling process consists of people who were easily accessible to the researcher. The study's sample was made up of subjects who satisfied the inclusion requirements. During this time, participants with persistent neck discomfort were chosen at random from Lodestar Fashion Ltd Garments, Mirpur-14, Dhaka. The samples were assigned the numbers A01, A02, A03, and so on.

3.7 Eligibility Criteria: This study had used to determine if those interested in participating had met the requirements for inclusion or exclusion.

3.7.1 Inclusion criteria:

- Individuals with persistent neck pain
- The 20–50 age range was chosen because it is when neck pain is most common in persons (Gautam et al. 2014, p.119).
- Males and females are both included: Both men and women were included because a study by Schopflocher et al. (2011, p.115) revealed that neck pain primarily affects men before the age of thirty, with a prevalence of 16.3% for men and 17.6% for women after that age.
- Pain duration at least 3 months.
- Patients who indicated a willingness to participate were included because they signed a written consent form and could potentially be useful or refrain from stopping treatment during the study (Gautam et al. 2014, p.111).
- Any neck pain patients with dysfunction.

3.7.2 Exclusion criteria:

- Incomplete assessment
- Ages under 20 and over 50: Participants in this age group were not included since chronic neck discomfort with a mechanical cause is less common (Hussain et al. 2016, p.23).
- Maintaining red flags for neck pain: Referred pain from myocardial ischemia, weight loss, fever, malignancy, inflammatory arthritis, vascular headache, cervical cord compression, and vertibro-basilary insufficiency were among the red flags that led to the exclusion of subjects (McColl 2013, p.68).
- Patients with traumatic neck pain were not included in the study (Hussain et al 2016, p.23).

3.8 Method of data collection

The data collector conducted the pre-test examination through face-to-face interviews using an open-ended questionnaire, adhering to guidelines provided by a physiotherapist. Similarly, the post-test examination involved face-to-face interviews conducted by the same data collector, who recorded the responses to the questionnaire under the supervision and guidance of a physiotherapist.

The Consolidated Standard of Reporting Trials (CONSORT) statements guidelines, which ensure precise and through reporting of findings, have been followed when reporting trial Results (Figure3. 1).

CONSORT (Consolidated Standards of Reporting Trials):

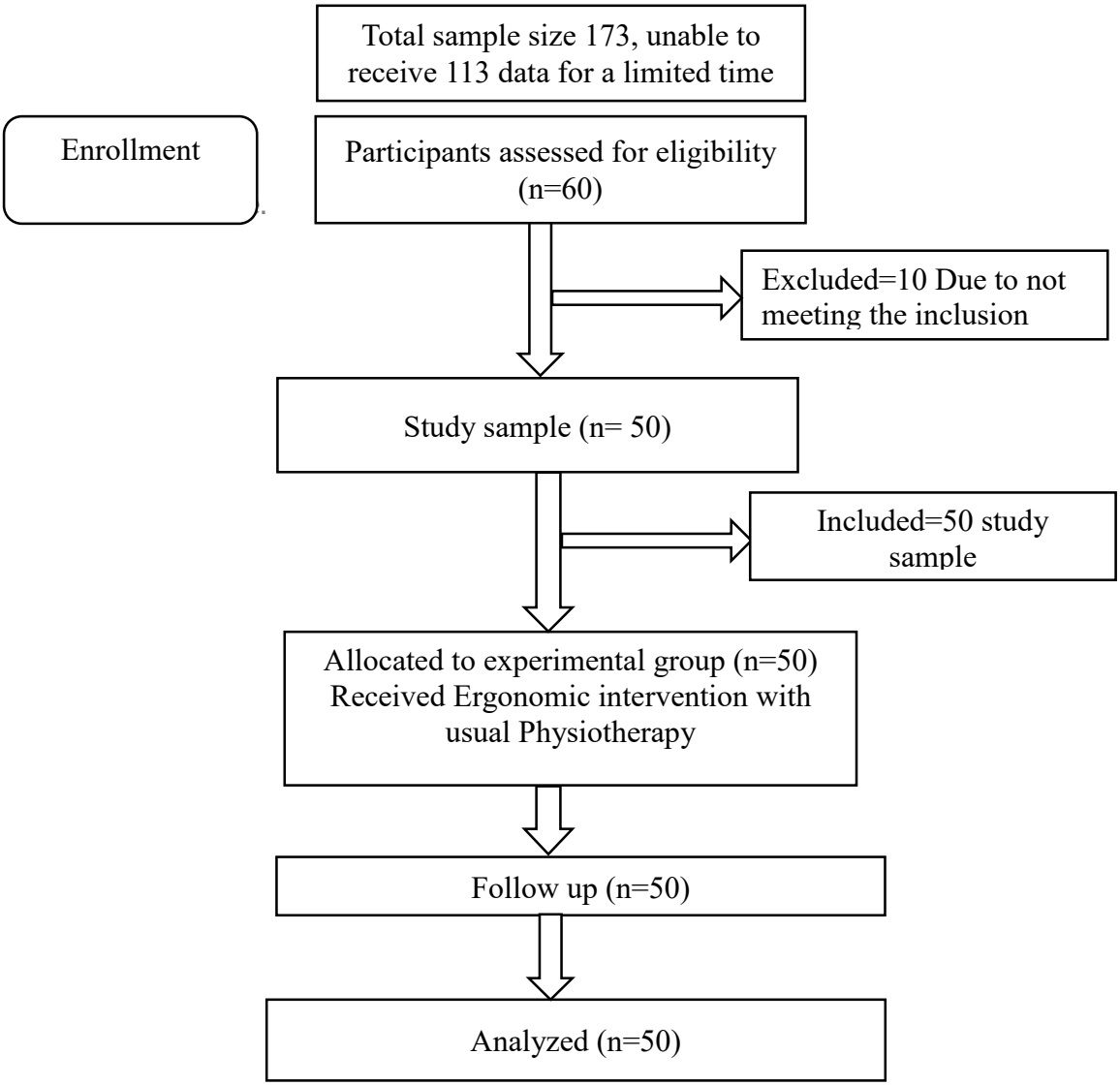

Figure 3.1: CONSORT flow diagram

3.8.1 Data collection Tools

- Informed consent
- A pre-test and post-test semi-structured questionnaire and demographic information chart used as a data collection instrument.
- Appropriate questionnaire (The English questionnaires were converted into Bengali to ask the participants during interviews).
- NPRS scale for rating the intensity of neck pain (e.g., 0-10 scale).
- NDI scale for measuring disability score of neck due chronic neck pain related to Garment's worker.

3.8.2 Measurement Tools

A sociodemographic questionnaire was utilized to determine the patient's socioeconomic level in relation to neck discomfort.

A numerical pain rating scale is used to quantify the level of pain. To gauge the patient's level of pain, the 11-point NPRS was employed. The words "no pain" on the left and "worst imaginable pain" on the right serve as the scale's anchors. In the past 24 hours, patients rate their greatest and least degree of pain in addition to their current level. The average of the three ratings or any single rating may be used to indicate the patient's level of pain. Research has demonstrated the validity and reliability of numerical pain scales (Mintken et al. 2009, p.925).

50-point Neck Disability Scale to Assess Status of Disability in Neck Pain Patients The NDI, which was adapted from Vernon and Mior's Oswestry Low Back Pain Disability Questionnaire, comprises 10 items related to pain intensity, personal care, lifting, reading, headache, concentration, work, driving, 21 sleeping, and recreation. Each item is scored from 0 (no disability) to 5 (greatest disability), and the sum of all completed items is expressed as a percentage of the maximum points of all completed items (Salo, et al., 2010). NDI score is a percentage determined by: Another popular outcome measure for patients with chronic neck pain is the Neck Pain Disability Index (NDI), which is a numerical rating scale (NRS) for pain (Waqas et al. 2016, p22.; Al Shehri et al. 2018, p.21).

3.9 Data Collection Procedure:

Following the patient's assessment, initial recording, treatment, and final recording, the data collection process was carried out after the inclusion and exclusion criteria were met. A graduate physiotherapist evaluated the patients following departmental screening. Each subject received treatment for 5 weeks 10 sessions. Data was acquired using a written questionnaire form that the researcher created, and it was collected through an intervention, a pre-test and post-test. Before starting treatment, a pre-test was conducted, and the Neck Disability Index was used to measure disability and a numerical pain rating scale to record the level of discomfort. After 5 weeks 10 therapy sessions, the same process was used to administer a post-test. The researcher gathered data from the group in front of a qualified physiotherapist to reduce bias.

3.10 Intervention

Patients were treated by physiotherapists who specialized in treating garment workers with persistent neck pain.

3.10.1 Treatment Protocol

Stretching exercises, isometric exercises, retraction exercises, and home advice were the key ergonomic interventions used in this patient's treatment regimen along with standard care.

3.11 Data Analysis:

The statistical analysis was performed using the statistical program for social science (SPSS) version 22. The Wilcoxon test was used to assess the pain numerical rating scale (NRS). The Wilcoxon test was used to examine the Neck Pain Disability Index (NDI).

3.11.1 Statistical Test

The term "statistical analysis" describes the systematic, mathematical process and principles used to organize and understand data.

Hypothesis Test

Wilcoxon Test.

When the equality of variances or normality assumptions are not satisfied, The Wilcoxon matched pair signed ranked test is another name for this test, can be used in place of the paired t test. A paired t test is used when the data are normally distributed, the sample size is large, or only two measures from the same instance need to be compared. If the data is not spreading correctly in this situation, apply the Wilcoxon test. My study sample of 50 was not normally distributed, hence I utilized the Wilcoxon signed rank test.

Formula:

$$Z = \frac{T - \frac{N(N+1)}{4}}{\sqrt{\frac{N(N+1)(2N+1)}{24}}}$$

Here,

T= The value with the lowest positive and negative rank

N= The overall count of participants

Z= Wilcoxon matched pair signed rank test value.

Interpretation: To determine the p value, the calculated z value is compared to the table z value. The null hypothesis is rejected if p is less than.05. If not, we are unable to accept and reject the null hypothesis.

3.12 Level of Significance

The study's relevance was assessed by computing the "p" value. The probability of the experimental investigation's findings is represented by the p values. The precision of the outcomes is referred to as probability. For health care research, a "p" value of less than 0.05 was determined to be a significant outcome. A "p" value is the level of significance for an experiment. The results are considered significant if the "p" value is at least as high as the significant threshold.

3.13 Ethical Consideration

The researcher adhered to the following ethical guidelines: The SCMST physiotherapy department was asked to approve a research proposal. The idea was approved by the faculty, and they also received approval from the course coordinator and the supervisor of the research project before to starting the study. For an oral presentation defense, the dissertation proposal and techniques were delivered to the IRB (Institutional Review Board) of the Saic College of Medical Science & Technology (SCMST). The Institutional Review Board then authorized the required data, enabling the study to move forward. Following approval by the academic institution to carry out this investigation, the researcher got started. Lodestar Fashion Ltd Garments, situated in Mirpur-14, Dhaka, granted the researcher permission to gather data. The researcher followed the guidelines set forth by the Bangladesh Medical Research Council (BMRC) and the World Health Organization. After learning about the academic and clinical guidelines for what should and shouldn't be done, the researcher was qualified to carry out the study. Every participant's rights were upheld, and the researcher was in charge of answering any questions about the study.

3.14 Informed Consent

Before completing the questionnaire, each participant provided written consent. The participant's role in this study is explained by the researcher. Each participant signed a written consent form that was given to the researcher. Therefore, the participant affirmed that their participation was voluntary and that they understood the consent form. The participants received explicit notice that the privacy of their information would be maintained. Participants were reassured by the researcher that they would not suffer any negative effects from the study. It was told that although the volunteers might not directly gain from the study, they might in the future. Without affecting their current or future access to care in the community, participants were free to revoke their consent and stop taking part at any moment. To maintain confidentiality, study data were coded anonymously, and no publication that included the study's findings could identify any individual.

3.15 Dissemination:

After the trial was over, the original research was published in a scientific manuscript that was ready to be submitted to an indexed journal. Furthermore, a seminar had been organized to share the research's interim and final findings. A systematic treatment plan would have been created if the study's findings had been successful. To increase the impact of sharing the original research, the trial results were eligible for open-access publication.

CHAPTER-IV RESULTS

Table 4.1: Baseline characteristics of participants

A descriptive synopsis of the participants' frequency distribution is provided below: With a mean age of 27.44 ± 6.597 years, the study included 50 participants, of whom 64 percent were female and 36 percent were male. According to the BMI distribution, 50% of participants were of normal weight, 30% were underweight, 18% were pre-obese, and 2% were in obesity class I. Of the participants, 48% had completed SSC, 40% had completed SSC, 6% were graduates or higher, and 4% were illiterate. A total of 42% of cases had pain radiating to the hand, whereas 58% had no radiating pain; 52% had unilateral radiation above the elbow, 30% had bilateral radiation above the elbow, 12% had unilateral radiation below the elbow, and 6% had bilateral radiation below the elbow. 38% reported prolonged sitting, 32% prolonged standing, 24% long working hours, and 6% cited other reasons for the neck pain. 74% of subjects reported having sporadic neck pain, whilst 26% reported having continuous pain. In 80% of cases, pain increased throughout the day, then by 10% at night, 6% at night, and 4% in the morning. Prior to therapy, 82% of patients experienced severe pain, and 18% experienced moderate pain, according to the Numeric Pain Rating Scale (NPRS). Significantly less pain was reported after therapy, with 64% reporting no discomfort, 34% reporting mild pain, and only 2% reporting moderate pain.

Frequency distribution of participants		
Variable	**Frequency (n)**	**Percentage (%)**
Gender		
Female	32	64.0
Male	18	36.0
Age category		
20-29	35	70.0
30-39	10	20.0
40-49	5	10.0

Mean±SD: 27.44±6.597		
Educational_qualification		
Graduate_and_above	3	6.0
HSC	1	2.0
Illiterate	2	4.0
Primary	24	48.0
SSC	20	40.0
Marital_status		
Married	42	84.0
Single	8	16.0
BMI_category		
Normal weight	25	50.0
Obesity class I	1	2.0
Pre-obesity	9	18.0
Underweight	15	30.0
Mean±SD:20.88±4.22		
Neck_pain_cause		
Long_time_sitting	19	38.0
Long_time_standing	16	32.0
Long_time_working	12	24.0
Others	3	6.0
Pain_radiate_hand		
No	29	58.0
Yes	21	42.0
Neck_pain_radiate		
Bilateral_above_elbow	15	30.0

Bilateral_below_elbow	3	6.0
Unilateral_above_elbow	26	52.0
Unilateral_below_elbow	6	12.0
Neck_pain_type		
Constant	13	26.0
Intermittent	37	74.0
Pain_worse		
As_the_day_progress	40	80.0
At_evening	3	6.0
At_morning	2	4.0
At_night	5	10.0
NPRS_Pre		
Moderate	9	18.0
Severe	41	82.0
NPRS_Post		
Mild	17	34.0
Moderate	1	2.0
None	32	64.0

4.1 Gender of participants:

The data's gender breakdown of the participants indicates that, with 32 (64.0%) female participants and 18 (36.0%) male participants, the majority were female. The mean gender value is 0.62 (SD = 0.49), indicating a slightly higher proportion of one gender over the other. There were 50 people in the entire sample, and the valid percent matched the cumulative percent numbers. This suggests that there are more women in the research population.

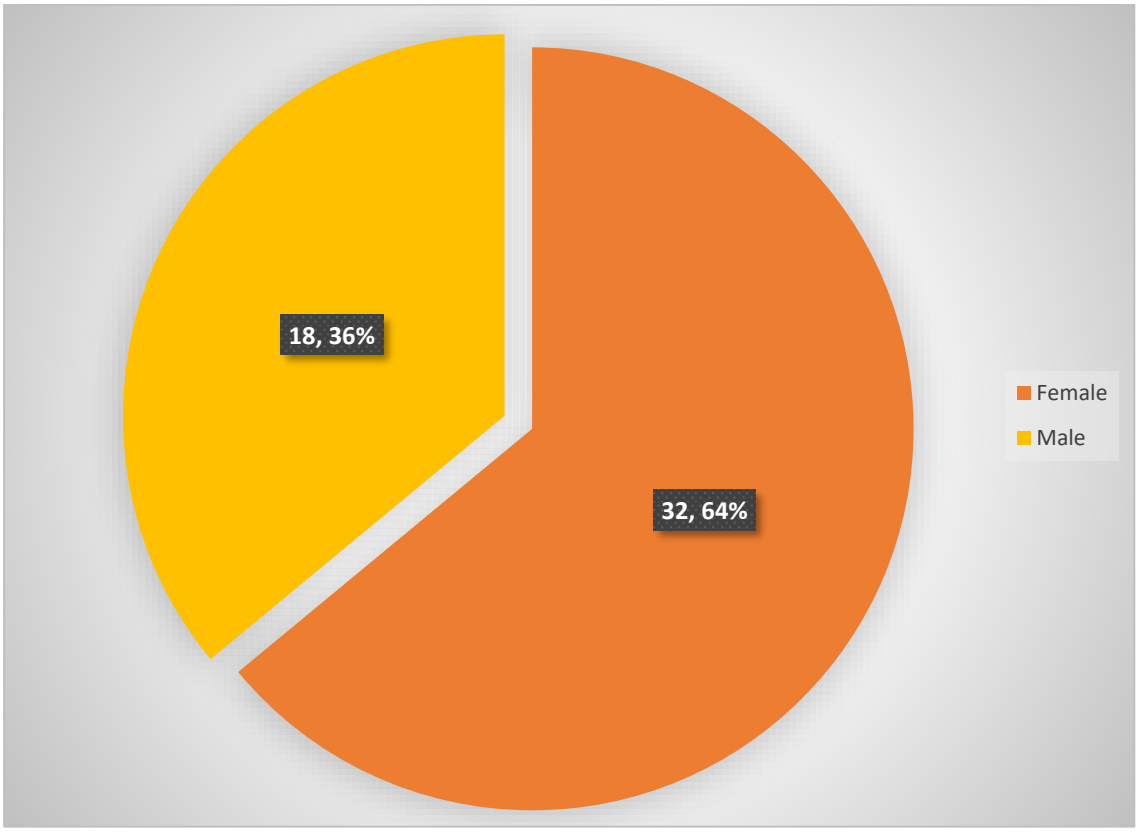

Figure no 4.1: Gender of the participants

4.2 Age group

The bulk of participants, or the biggest share, are between the ages of 20 and 29, as seen by the bar chart that shows their distribution among age categories. The 30–39 age group is notably underrepresented, and the 40–49 age group has the fewest participants. The mean value for the category of age is 1.40 (SD = 0.67), suggesting that the sample leans towards a younger or middle-age group. This trend emphasizes how younger people make up the majority of the study population.

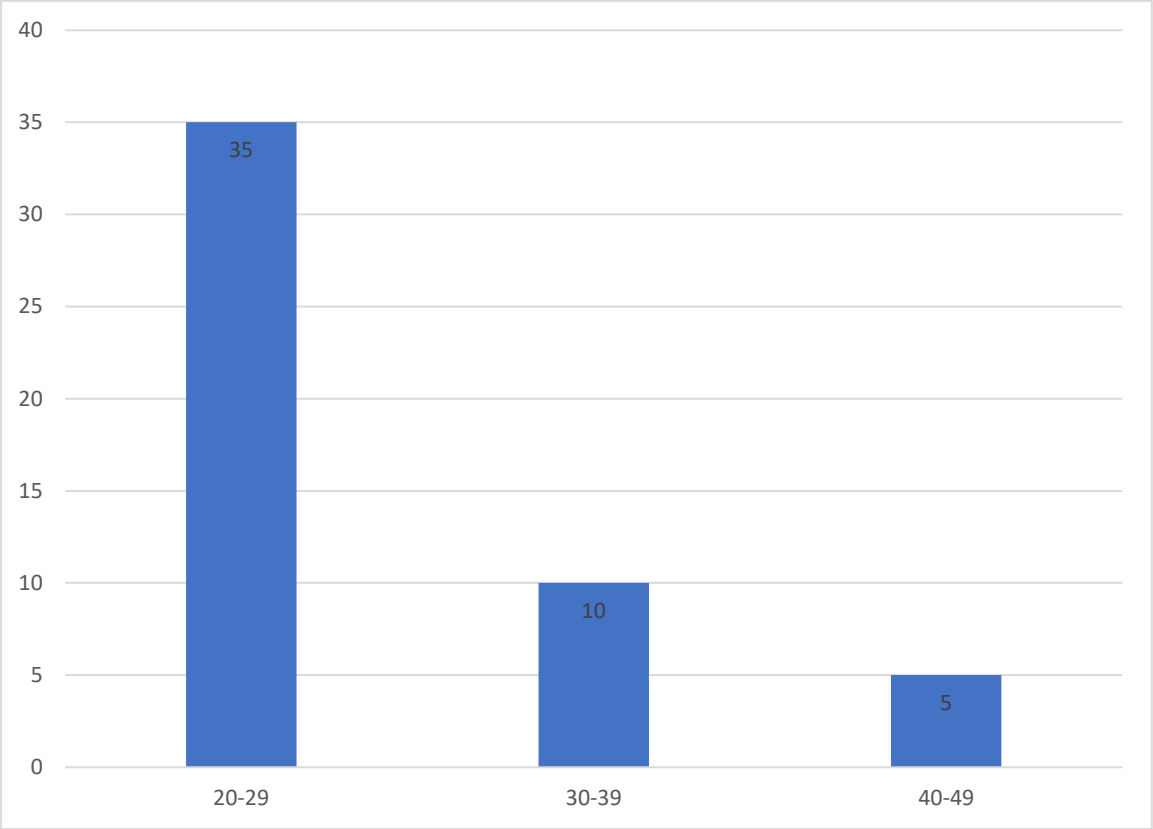

Figure no 4.2: Age groups of the participants.

4.3 Educational qualification of participants:

The educational qualifications of the participants revealed that the majority had completed primary education, with 24 individuals (48.0%) falling into this category. This was followed by those who completed SSC, accounting for 20 participants (40.0%). A smaller proportion of participants were graduates or held higher qualifications (3 participants, 6.0%), while 2 participants (4.0%) were illiterate. Only 1 participant (2.0%) reported HSC as their highest educational attainment. With a mean of 1.58 (SD = 0.859), the data likely reflects a predominance of lower educational levels, such as primary or SSC. These findings highlight that most participants had a basic level of education, with limited representation from higher educational tiers.

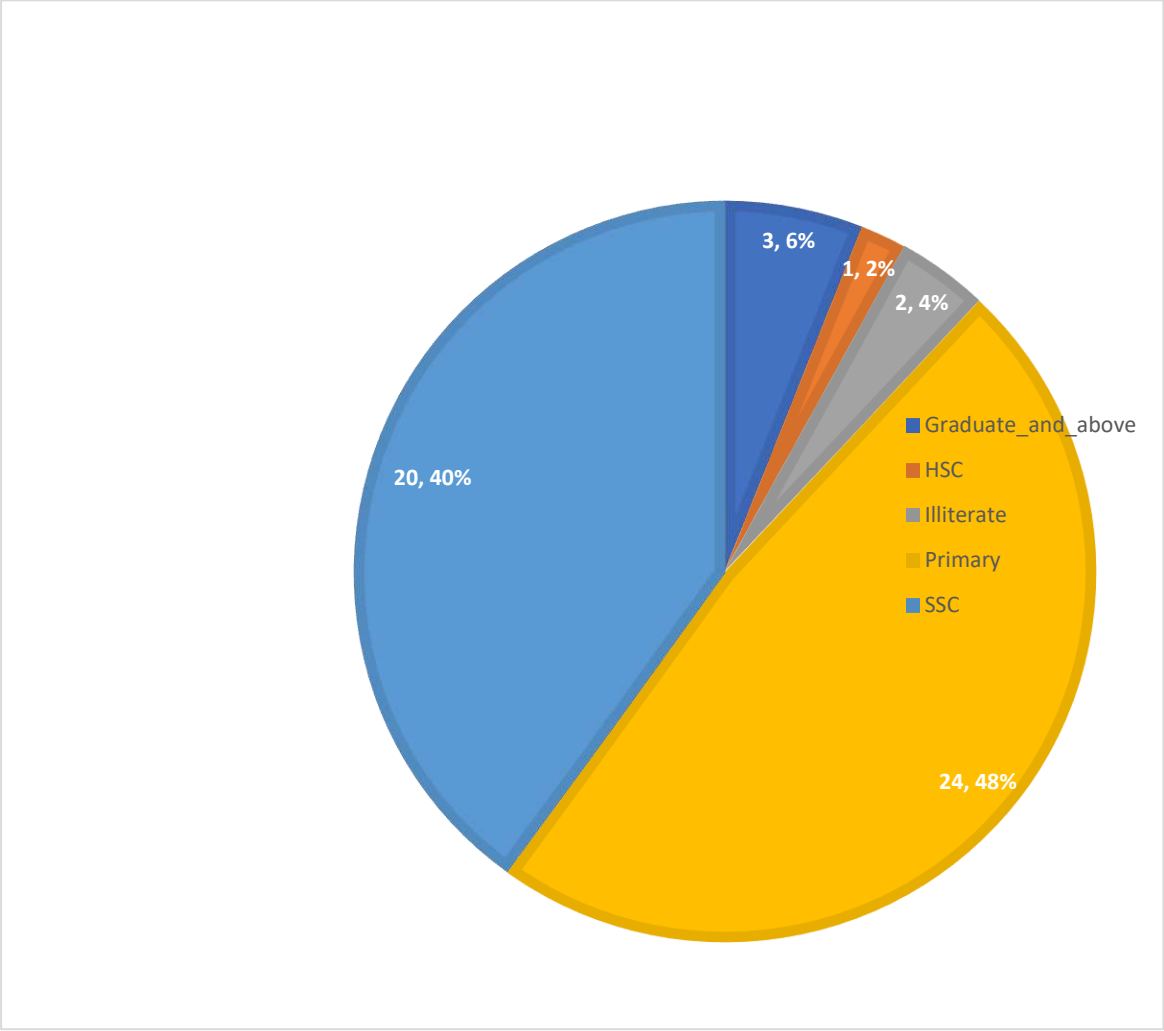

Figure no 4.3: Educational qualification of participants

4.4 Designation of participants:

According to the designation data, the most prevalent role is Operator, which is held by 17 people. The Helper category, which includes 10 people, and Others, which includes 11 people, come next. Supervisor is the least prevalent title, with only five people, whereas Quality roles have seven people. With fewer people in supervisory and quality control responsibilities, this distribution implies that operational tasks predominate.

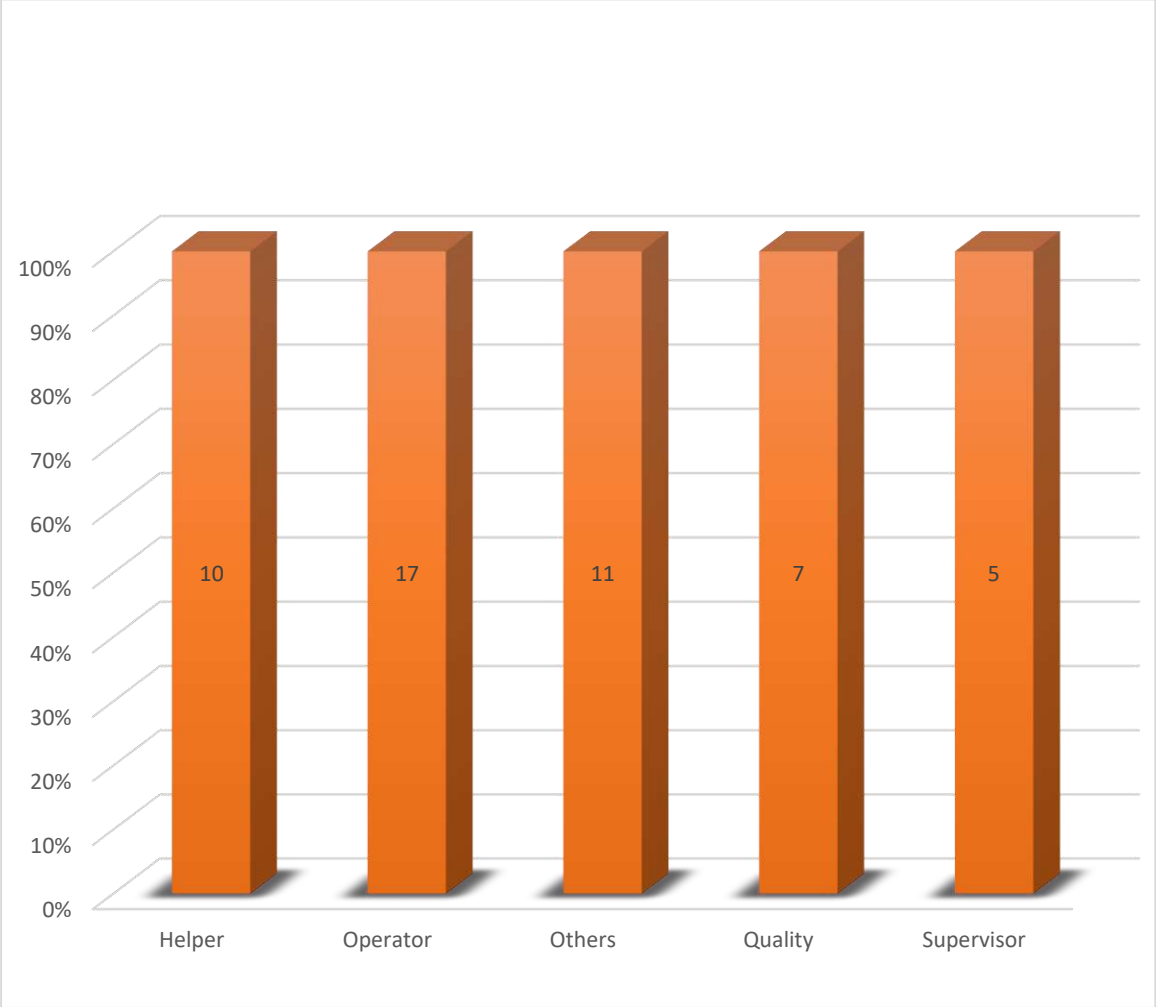

Figure no 4.4: Designation of participants

4.5 Living area of participants:

With 35 people living in urban regions, the living area data demonstrates a high concentration of people in urban areas. Nine people reside in semi-urban areas, compared to just six in rural areas. This distribution indicates that the group has a strong desire or propensity for urban living, with fewer people living in semi-urban and rural locations.

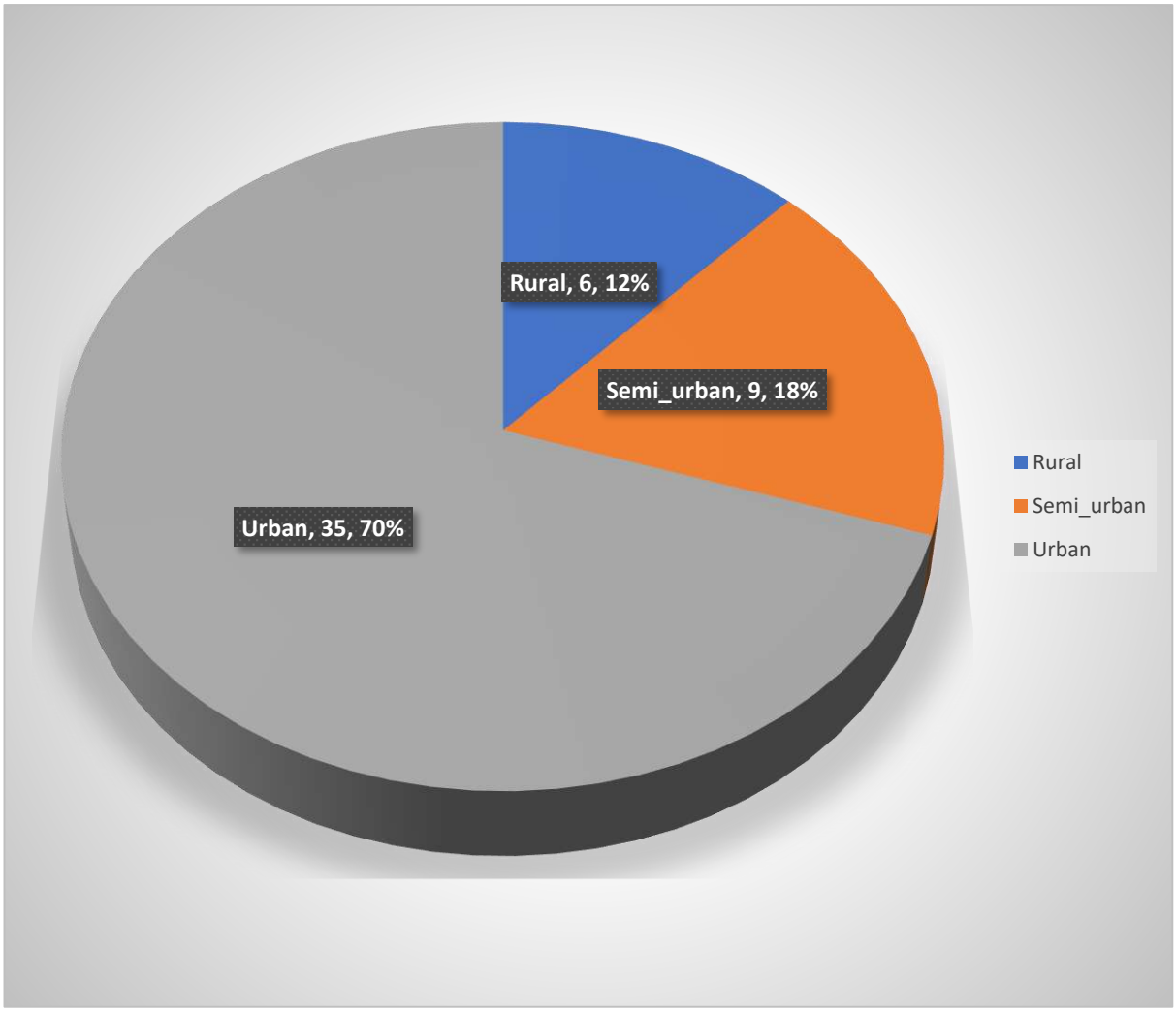

Figure no 4.5: Living area of participants

4.6 Marital status of Participants:

The majority of respondents, or 84.0% (n=42) of the sample, were married, according to the participants' marital status distribution. Eight individuals, or 16.0% of the total, were unmarried. The mean value is 0.16 (SD = 0.370), reflecting a predominance of married individuals in the sample, as "married" is likely coded as the lower value. 50 valid replies in all, comprising the entire study sample, were obtained from this distribution.

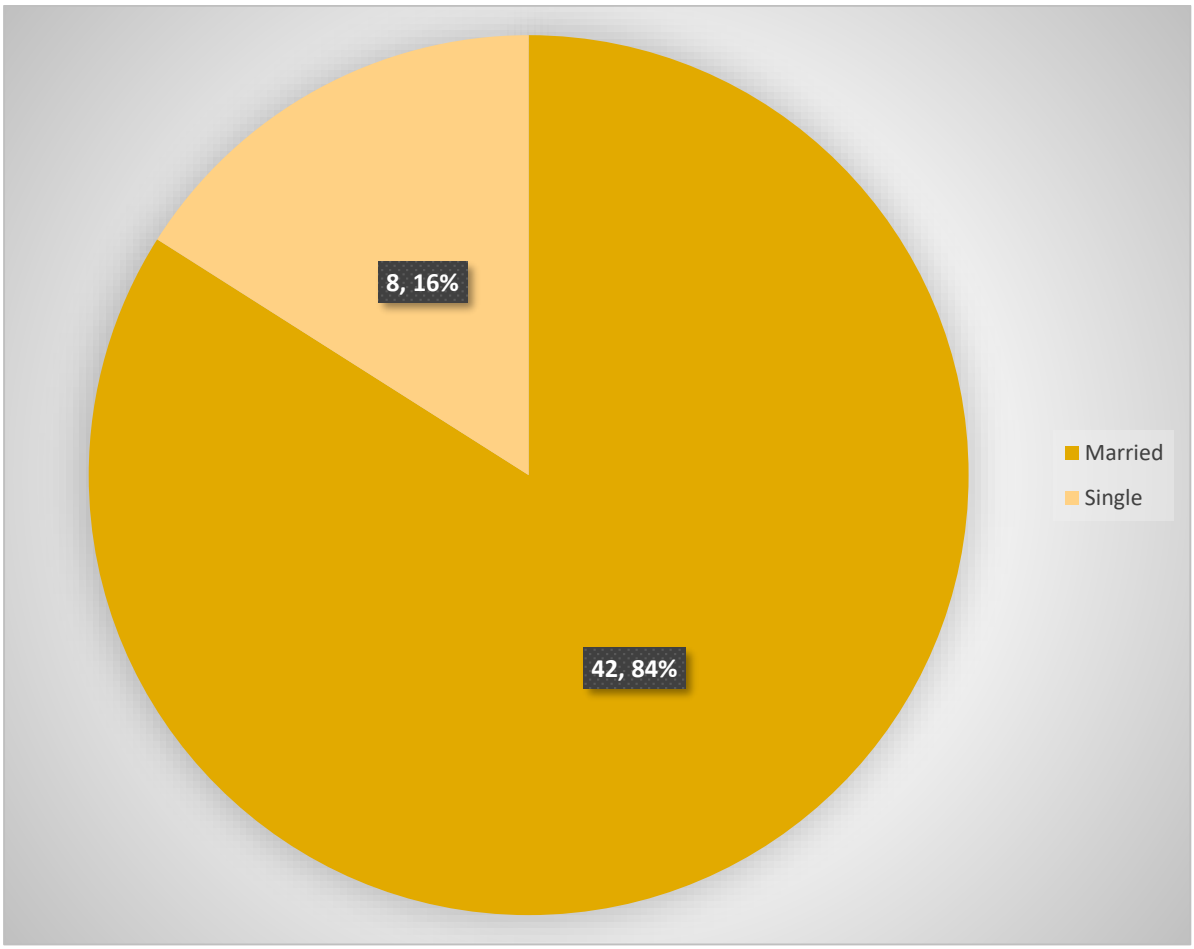

Figure no 4.6: Marital status of Participants

4.7 Nutritional status:

According to the participants' BMI category distribution, half of the sample (50.0%, n=25) was of normal weight. The following categories were applied to the remaining participants: 18.0% (n=9) were in the pre-obesity category, 30.0% (n=15) were underweight, and 2.0% (n=1) were in the obesity class I. This completes the study sample, bringing the total number of valid responses to 50.

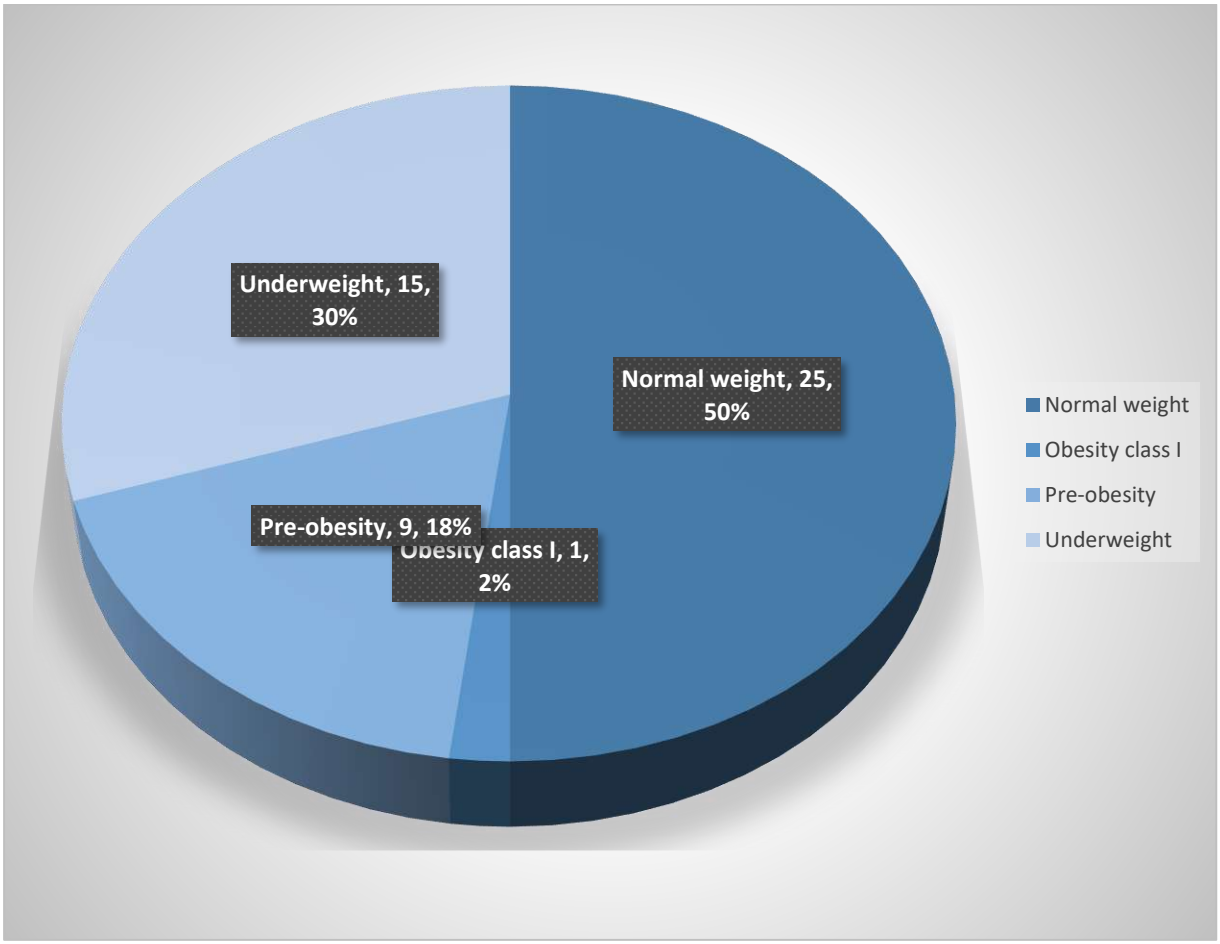

Figure no 4.7: Nutritional status

4.8 Comorbidities of participants:

According to the comorbidity data, 45 percent of people are unaware about their health status, as indicated by the response "Don't know." Four people with documented diseases have been reported to have hypertension, however only one person has diabetes mellitus. With few documented occurrences of diabetes and hypertension, this shows that the group's awareness or reporting of health issues is lacking.

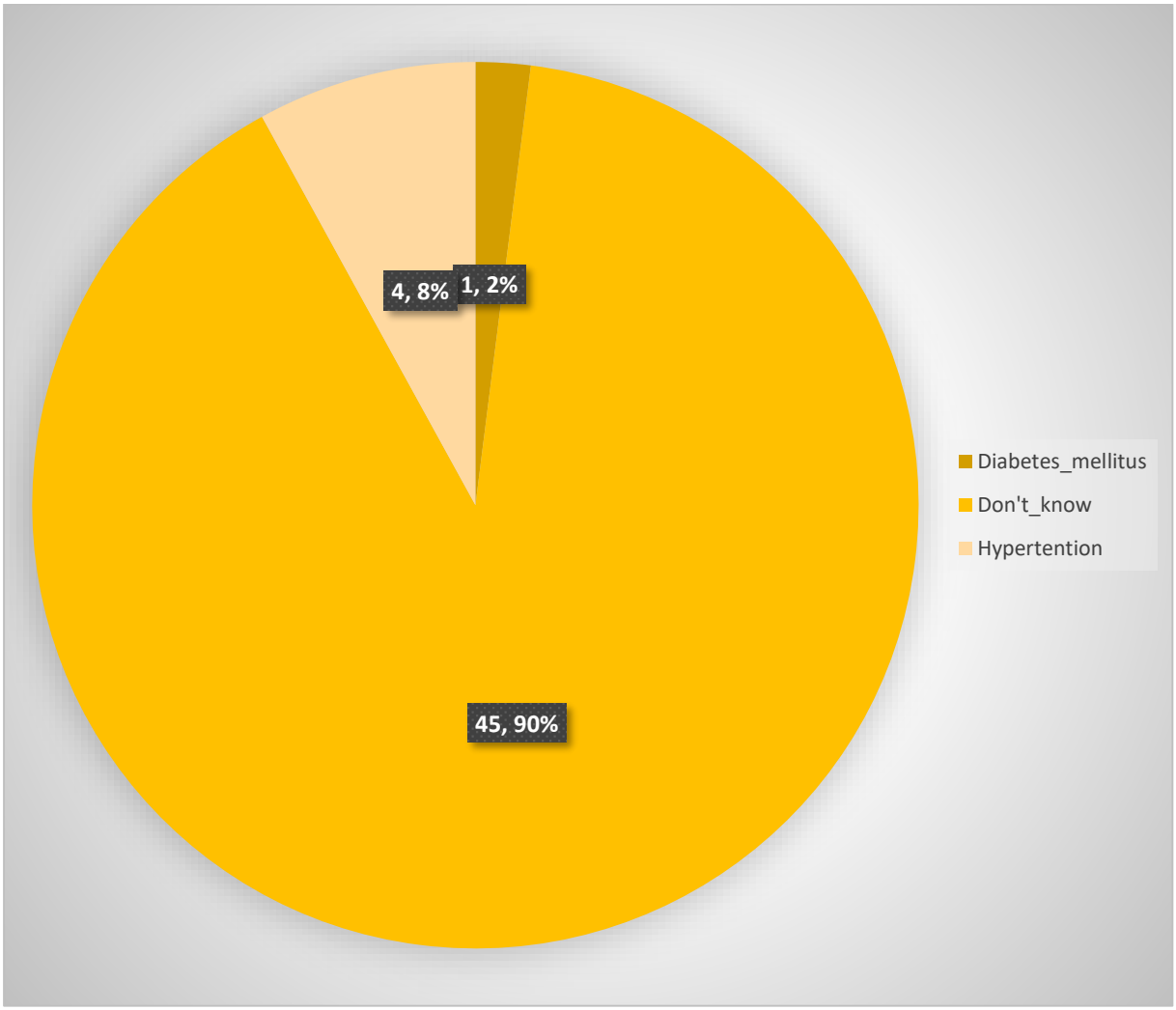

Figure no 4.8: Comorbidites of participants

4.9 Neck pain duration of participants:

The length of neck pain varies from person to person, according to the study. Eleven people reported a period of one year, while ten people claimed a duration of six months. With six and seven persons, however, three and four months are also quite common. A few months to as long as six years (reported by one person) are among the other lengths that have been documented, along with one year three months and one year six months (each with three people). According to this distribution, neck discomfort is a chronic problem for many people, lasting for many months and, in certain situations, for years.

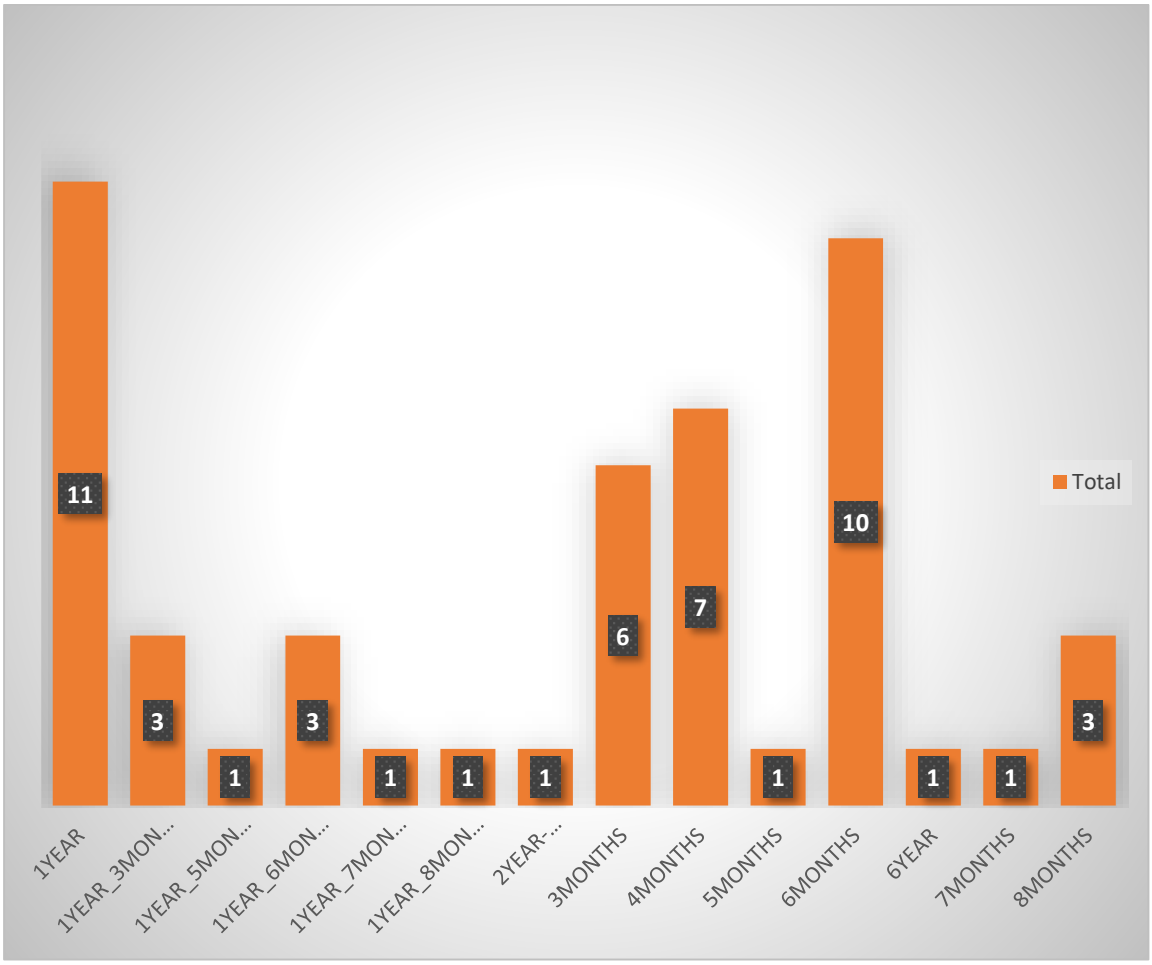

Figure no 4.9: Neck pain duration of participants

4.10 Neck pain cause of participants:

According to the participants' reported reasons of neck pain, prolonged sitting was the most often cited cause, with 38.0% (n=19) of respondents citing it as a contributing factor. Long-term standing came next, as indicated by 32.0% (n=16) of participants, while long-term working was mentioned by 24.0% (n=12). 6.0% (n=3) of respondents said that "others" was the reason behind their neck pain, which is a lower percentage. The mean value of 0.98 (SD = 0.937) suggests variation in the identified causes of neck pain, with no single dominant factor. There were 50 valid responses in all, which reflected the full sample.

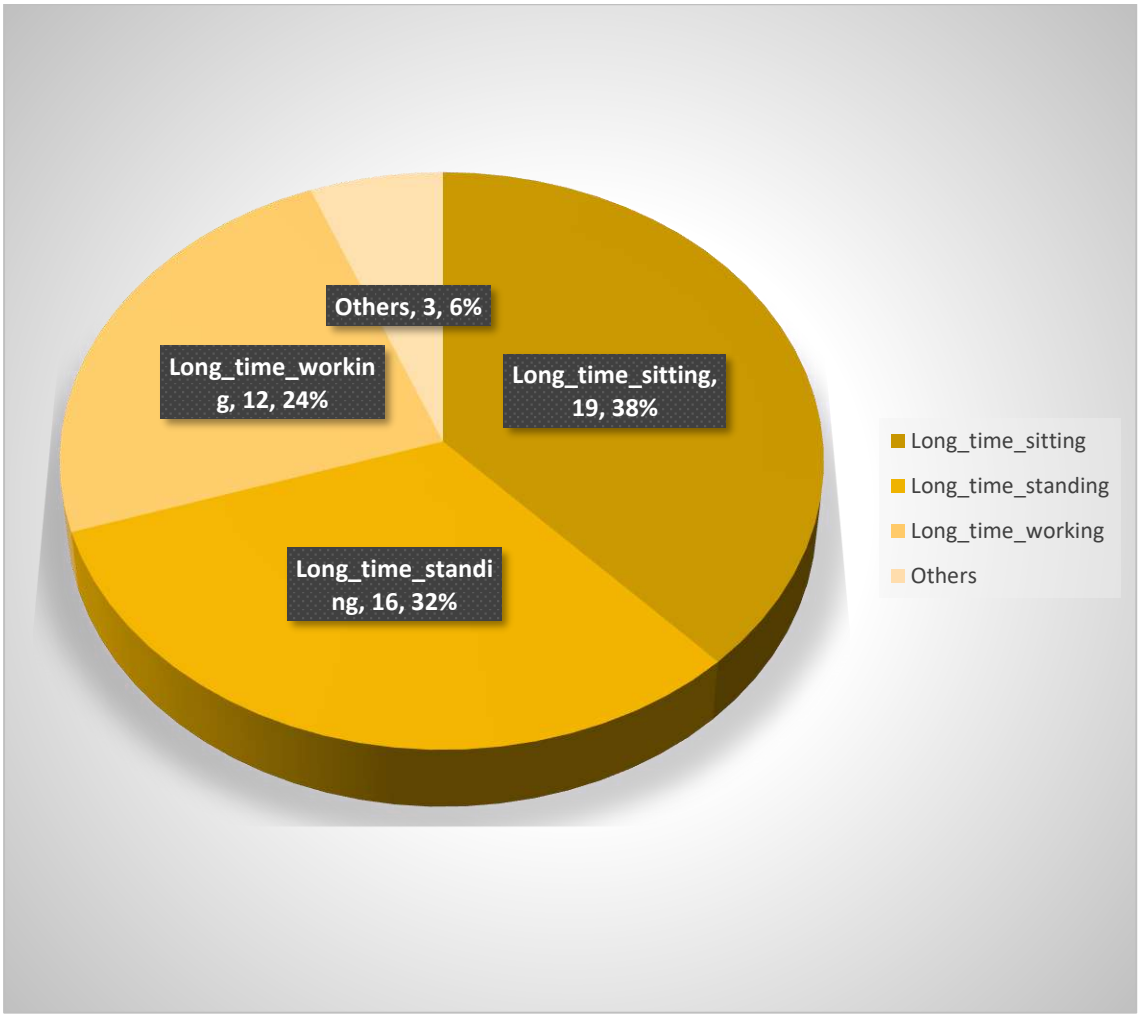

Figure no 4.10: Neck pain cause of participants

4.11 Pain radiate hand of participants:

42.0% (n=21) of individuals reported having pain that radiates to the hand, whereas 58.0% (n=29) of participants reported no radiating pain at all. A mean of 0.58 (SD = 0.499) shows a near-even distribution between participants experiencing pain radiating to the hand and those who do not. The entire sample, or 50 valid responses, served as the basis for these findings.

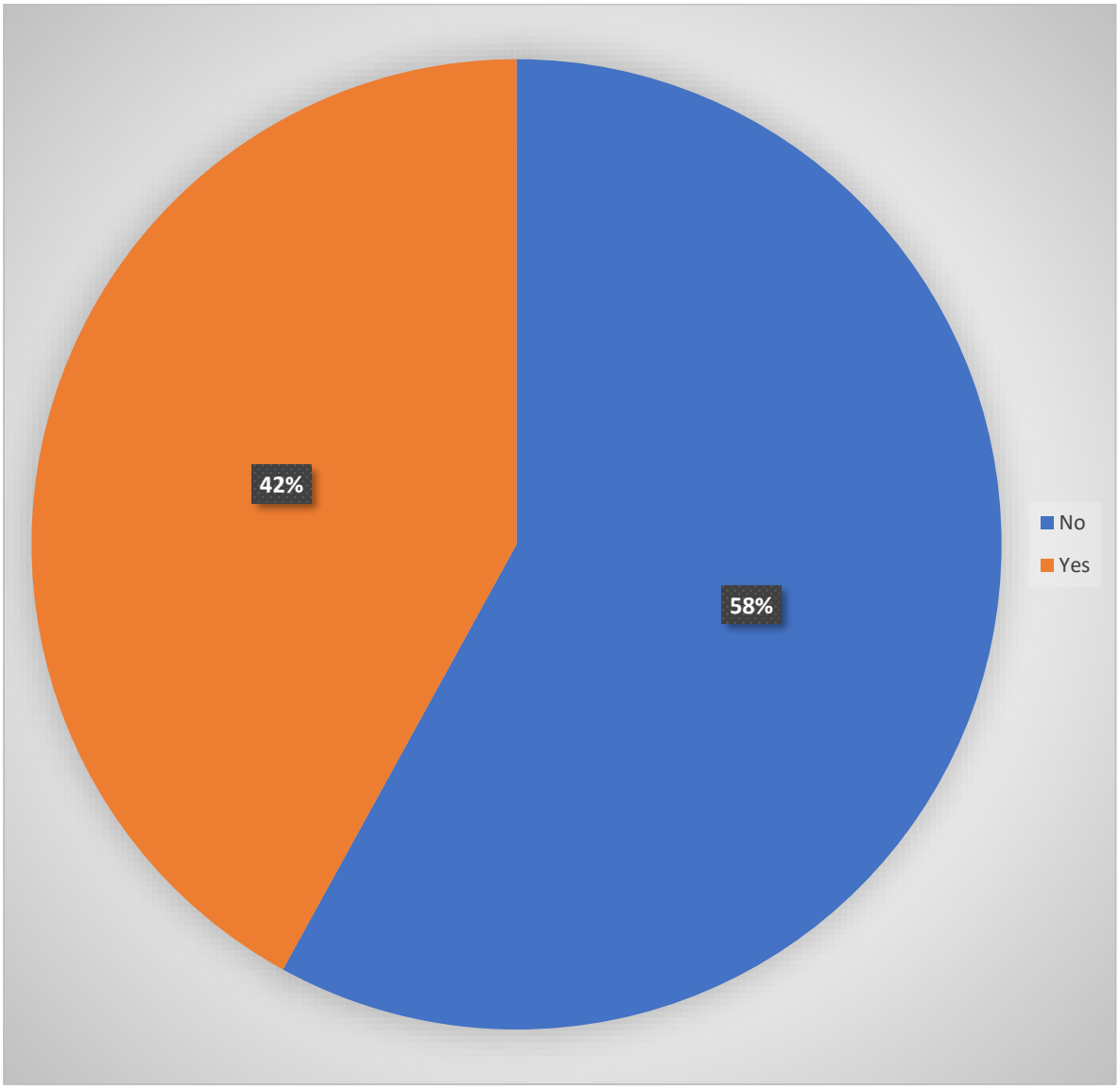

Figure no 4.11: Pain radiate hand of participants

4.12 Neck pain radiate of participants:

52.0% (n=26) of subjects reported unilateral discomfort above the elbow, which was the most prevalent pattern in the distribution of neck pain radiated. 12.0% (n=6) reported unilateral discomfort below the elbow, whereas 30.0% (n=15) reported bilateral pain above the elbow. Bilateral soreness below the elbow was reported by a smaller percentage, 6.0% (n=3). The mean value of 0.82 (SD = 1.024) indicates variation in the areas where neck pain radiates. The entire study sample, or 50 valid responses, served as the basis for these findings.

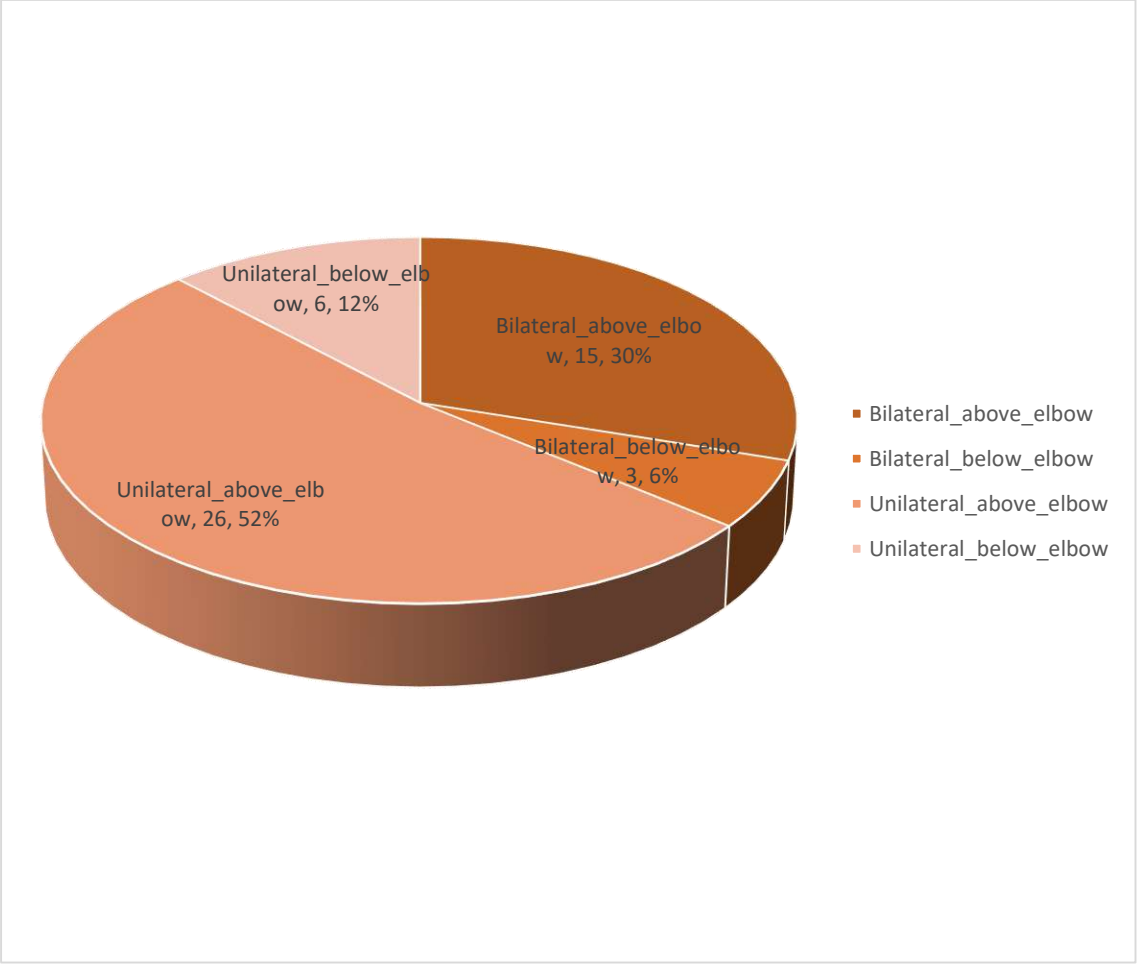

Figure no 4.12: Neck pain radiate of participants

4.13 Neck pain type of participants:

74.0% (n=37) of participants reported having intermittent neck pain, which was the most common type of pain. On the other hand, 13 participants, or 26.0%, reported having neck pain all the time. A mean of 0.74 (SD = 0.443) suggests that intermittent pain is more common among participants. The full study sample, or 50 valid responses, served as the basis for these conclusions.

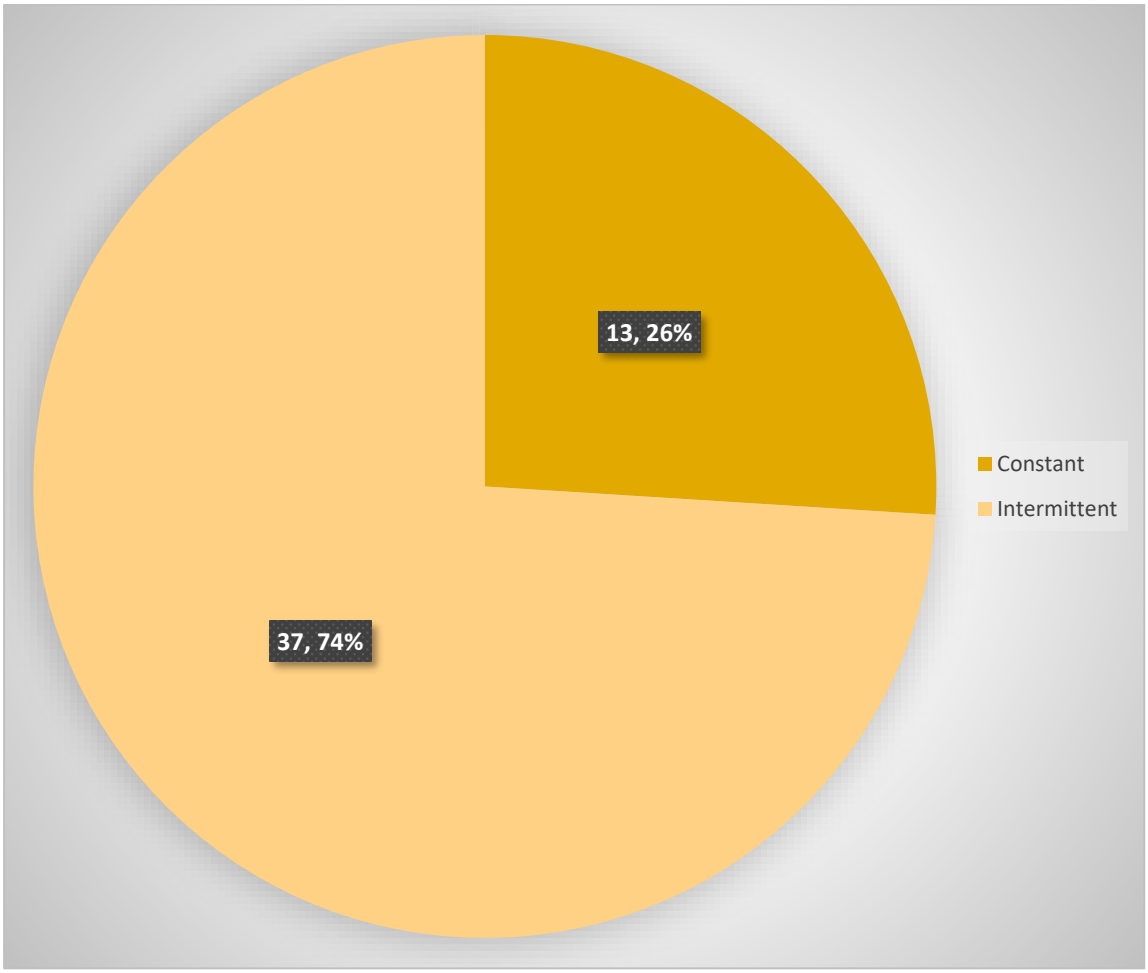

Figure no 4.13: Neck pain type of participants

4.14 Pain worse of participants:

The majority of participants (80.0%; n = 40) reported that their discomfort increased during the course of the day. Fewer individuals said that their pain got worse in the morning (4.0%, n=2), at night (10.0%, n=5), or in the evening (6.0%, n=3). The mean value of 1.22 (SD = 0.679) implies that pain worsens most often as the day progresses. The entire sample, or 50 valid responses, served as the basis for these findings.

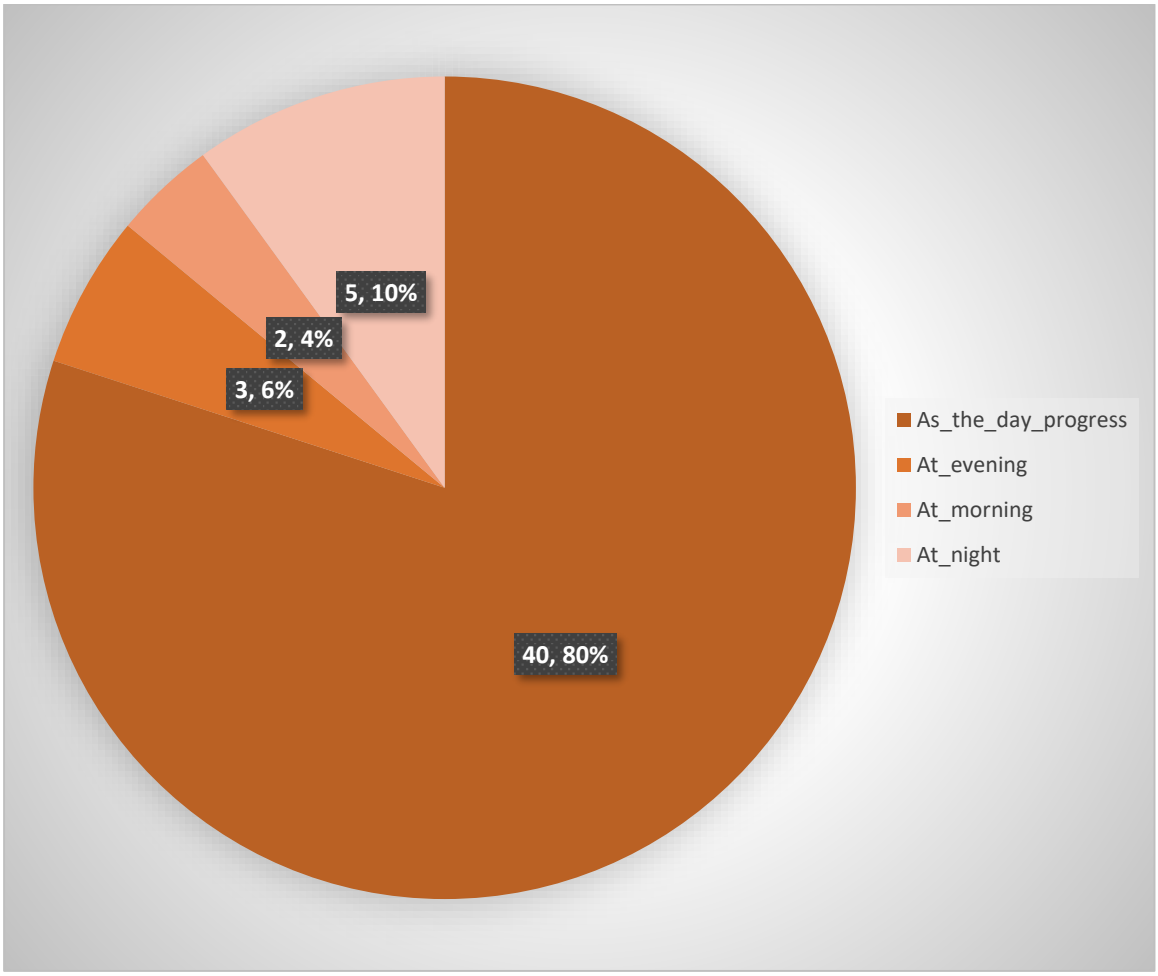

Figure no 4.14: Pain worse of participants

4.15 NPRS pre-test score of participants:

Most participants reported experiencing severe pain at the pre-intervention stage, with 82.0% (n=41) reporting this degree of pain severity. Only 18.0% (n=9) of respondents said they were in moderate pain. The mean score is 2.76 (SD = 0.555), indicating a high level of pain before the intervention. The whole sample, or 50 valid responses, served as the basis for these findings.

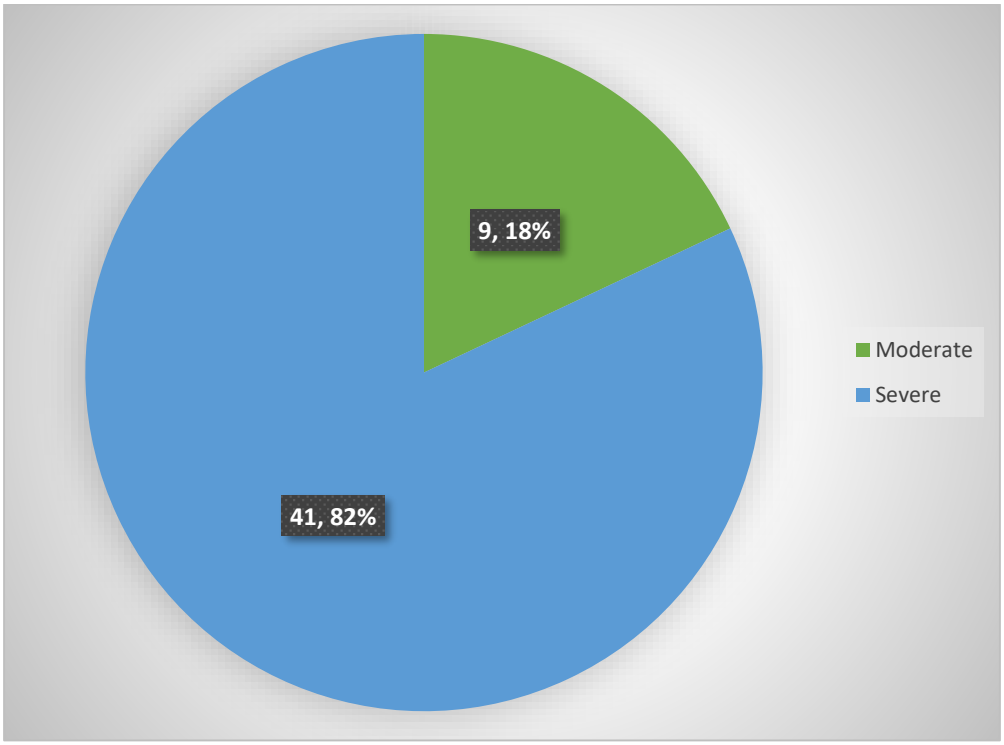

Figure no 4.15: NPRS pre-test score of participants

4.16 NPRS post-test score of participants:

There was a noticeable decrease in pain levels after the intervention. 64.0% of participants (n=32) said they were pain-free. Furthermore, just 2.0% (n=1) felt significant pain, compared to 34.0% (n=17) who reported mild discomfort. The mean score is 0.36 (SD = 0.525), reflecting a significant reduction in pain after the intervention. The complete sample, or 50 valid responses, served as the basis for these conclusions.

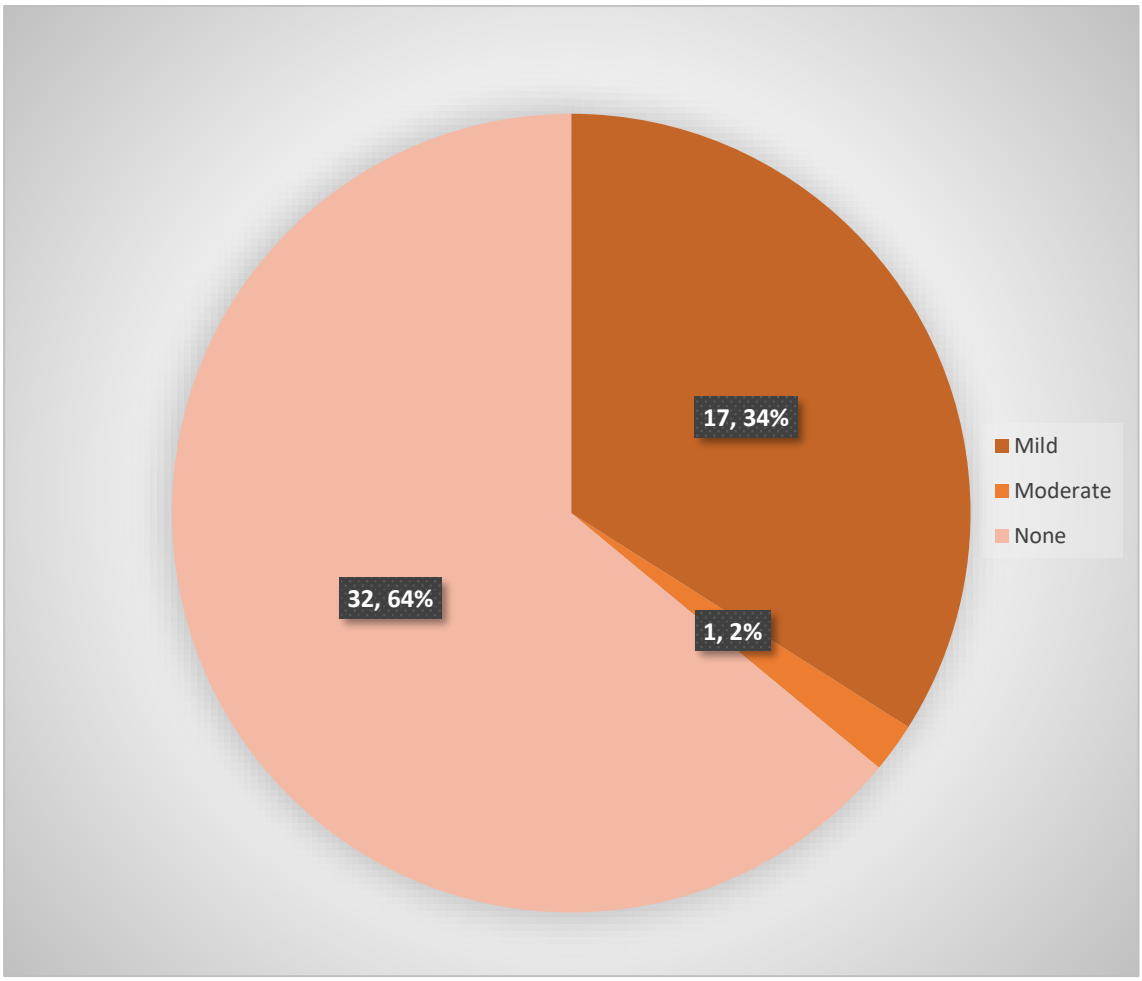

Figure no 4.16: NPRS post-test score of participants

4.17 NDI Pre-test score of Participants:

Prior to the intervention, the distribution of NDI (Neck Disability Index) values showed a range of 46% to 86%. The most common score among the participants (N=50) was 78%, which accounted for 36% of the sample. Scores of 80% (12%), 82% (10%), and 60% and 76% (each 8%), came next. The following scores were less common: 58% (6%), 84% (6%), and 86% (4%). Only 2% of individuals had scores below 58%, which included the lowest ranges of 46%, 48%, 52%, and 62%. The whole distribution of scores across the study population was indicated by the cumulative frequency, which reached 100% at 86%.

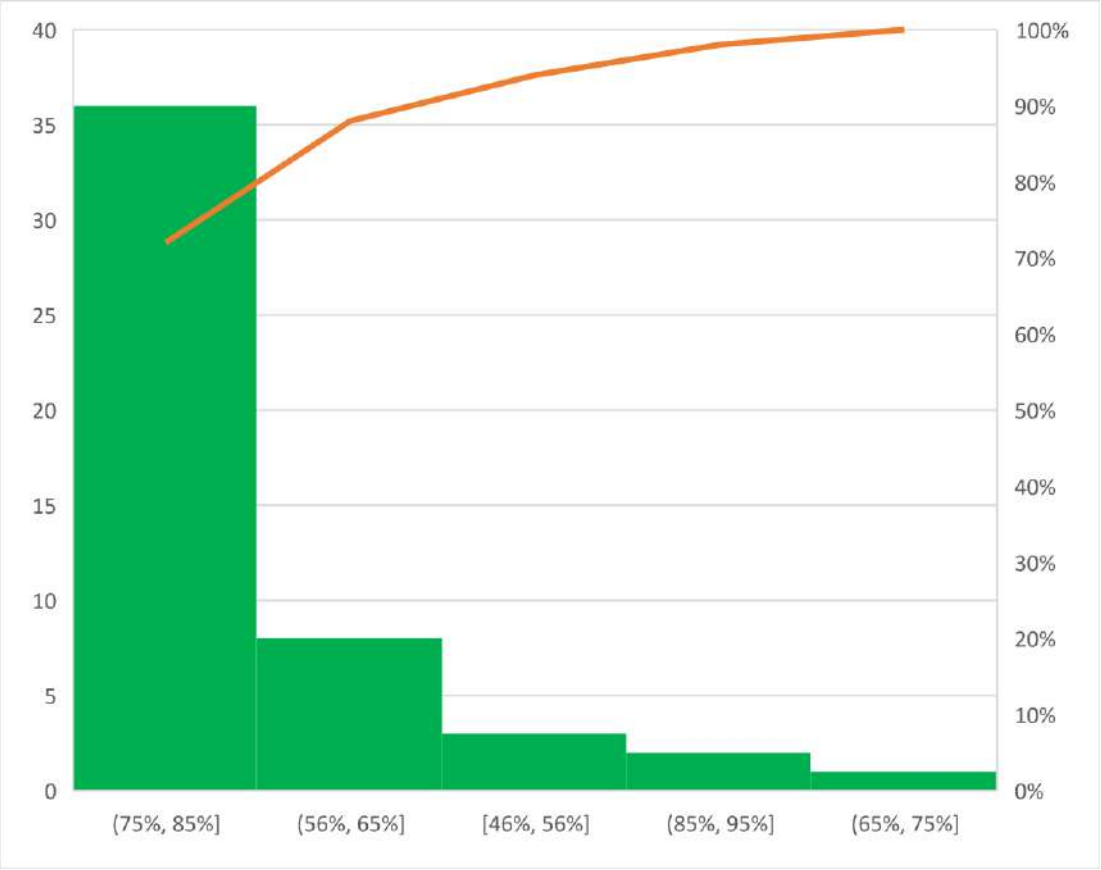

Figure no 4.17: NDI Pre-test score of participants

4.18 NDI Post-test score of Participants:

The distribution of NDI scores following the intervention demonstrates a significant shift, with scores ranging from 0% to 40%. A large proportion of participants (38%) achieved a score of 0%, indicating no disability. Scores of 2%, 4%, and 6% were observed in 6% of participants each, cumulatively accounting for 56% of the sample. Scores of 20% and 22% were reported in 8% and 10% of participants, respectively. Less frequent scores included 8%, 24%, 26%, 28%, 30%, and 40%, with each category representing between 2% and 4% of the sample. The cumulative percentage reached 100% at 40%, highlighting the complete distribution of post-intervention scores.

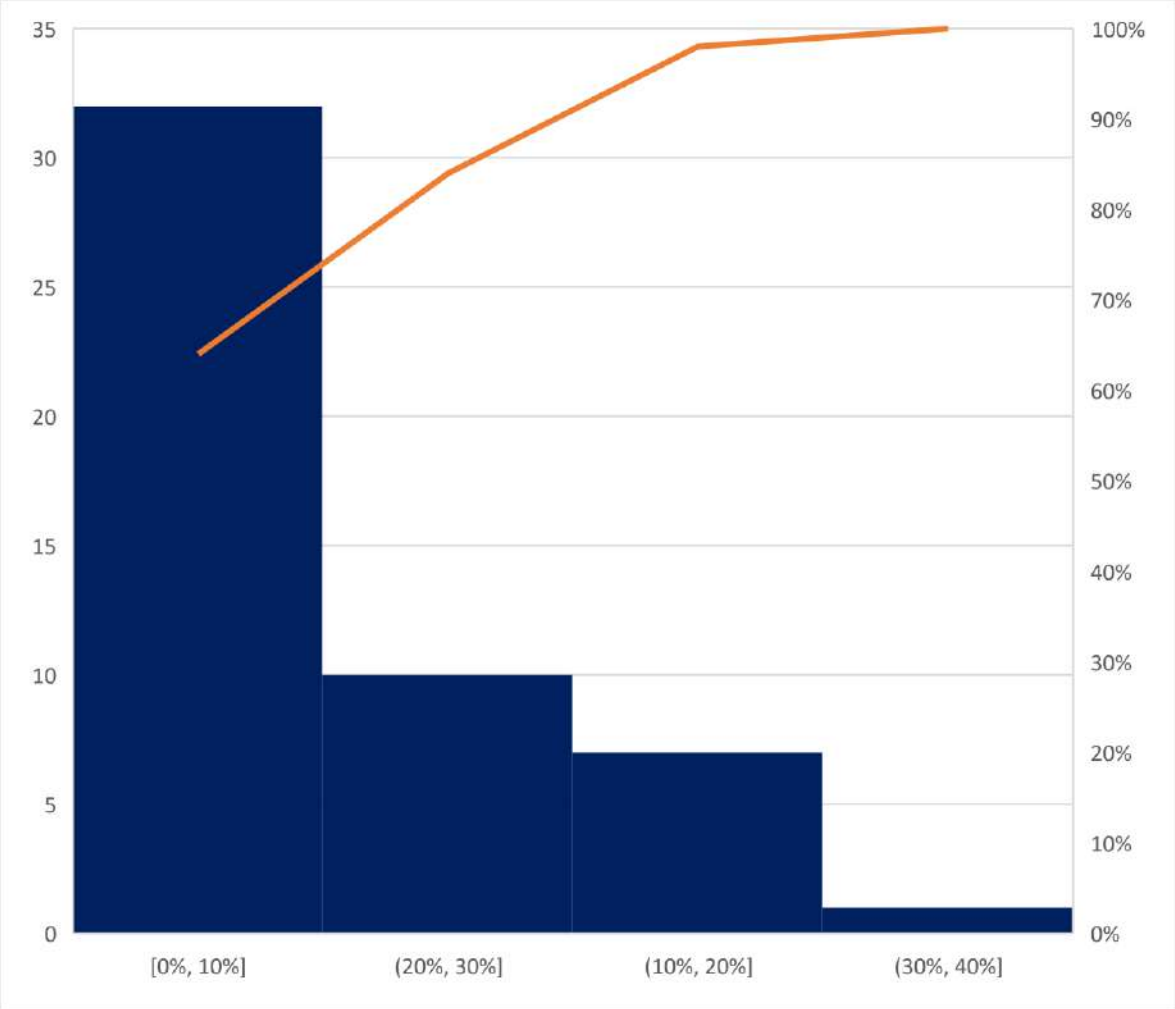

Figure no 4.18: NDI Post-test score of participants

4.19 Wilcoxon Test: (Difference between NPRS and NDI score before and after test)

Table 4.2: Rank and statistics of NPRS score before and after test

Posttest-pretest NPRS Score	N	Mean rank	Sum of rank	Wilcoxon signed rank test based on Z rank	p-value
Negative Ranks	50[a]	25.50	1275	-6.194[b]	0.01
Positive Ranks	0[b]	0.00	0.00		
Ties	0[c]				
Total	50				

When comparing the NPRS ratings from the pretest and posttest, the Wilcoxon signed-rank test results show a substantial reduce in pain. 50 people took the exam, and the results showed that 50 of them had negative rankings, which means that their posttest NPRS scores were lower than their pretest scores. With a total rank sum of 1275, the mean rank of the negative rankings was 25.50. An improvement in pain levels from the pretest to the posttest was statistically significant, as indicated by the test's Z value of -6.194 and p-value of 0.01.

Table 4.3: Rank and statistics of NDI score before and after test

Posttest-pretest NDI Score	N	Mean rank	Sum of rank	Wilcoxon signed rank test based on Z rank	p-value
Negative Ranks	50[a]	25.50	1275	-6.165[b]	0.01
Positive Ranks	0[b]	0.00	0.00		
Ties	0[c]				
Total	50				

The individuals' neck disability levels significantly improved, according to the Wilcoxon signed-rank test results comparing the pretest and posttest NDI scores. Fifty people in all had negative rankings, meaning that their NDI scores on the posttest were lower than their pretest scores. With a total rank of 1275, the mean rank of the negative ranks was 25.50. There was a statistically significant decrease in neck impairment from the pretest to the posttest, as indicated by the test's Z value of -6.165 and p-value of 0.01.

CHAPTER-V DISCUSSION

5.1 Discussion

The goal of this study was to determine how well an ergonomic intervention worked for textile workers who had persistent neck pain. In this exploratory experiment, 50 individuals who experienced neck pain were chosen at random to take part. A single group design was used for these 50 patients. For five weeks, ten sessions of therapy lasting thirty minutes each were provided to these folks in the health care chamber at Lodestar Fashion Ltd Garments, Mirpur-14, Dhaka. To determine if the lower or bigger p value supported the null hypothesis, the hypothesis was analyzed and evaluated using a variety of measuring instruments. A self-oriented structural questionnaire was used to gather sociodemographic information. There were significant changes in most of the parameters that were taken before and after therapy. Additionally, the Numeric Pain Rating Scale (NPRS) is used to measure the level of pain, and the Neck Pain Disability Index (NDI) scale is used to quantify the disability status of people with neck pain.

The participants' average age of mean was 28.5 years old. Of them, 36% were men and 64.0 percent were women. The bulk of the 50 participants—34.0% (n=17) of the sample—were operators, according to the distribution of designations across participants. Helpers came in second at 20.0% (n=10) and those in the "others" group at 22.0% (n=11). Supervisors comprised the smallest category at 10.0% (n=5), while quality personnel comprised 14.0% (n=7). The variety of roles among the study participants is demonstrated by this distribution. Among the participants, 48.0% (n=24) had only an elementary level education, according to the distribution of educational qualifications. Those who have an SSC qualification came next, accounting for 40.0% (n=20). 4.0% (n=2) of participants were illiterate, while 6.0% (n=3) of participants were graduates or above. The smallest group had an HSC qualification, making up 2.0% (n=1). The participants' primarily low-level educational backgrounds are highlighted by this data. According to the participants' marital status, 84.0% (n=42) of the sample were married, making them the majority. On the other hand, 16.0% (n=8) of the participants were unmarried.

This suggests that married people made up the majority of the study participants. According to the distribution of participants' living areas, 70.0% (n=35) of the sample lived in urban areas. Participants from semi-urban areas came next (18.0%; n = 9), while the smallest group (12.0%; n = 6) resided in rural areas. This suggests that the study's participants were primarily from urban areas.

According to the participants' BMI category distribution, half of the sample (50.0%, n=25) was of normal weight. The following categories were applied to the remaining participants: 18.0% (n=9) were in the pre-obesity category, 30.0% (n=15) were underweight, and 2.0% (n=1) were in the obesity class I. This completes the study sample, bringing the total number of valid responses to 50.

According to the distribution of comorbidities among study participants, 45 patients, or the majority, fell into the "Don't know" category since they were not aware of any pre-existing conditions. A lower percentage of participants had a verified diagnosis of diabetes mellitus (1 person) or hypertension (4 people). Potential gaps in patients' knowledge or recording of their medical histories are highlighted by this variance in comorbidity reporting, which may have an impact on their preoperative risk assessments as well as their postoperative recovery procedures.

Participants' reported durations of neck pain varied widely, ranging from three months to six years. One year (11 individuals) and six months (10 individuals) were the most commonly reported durations. Three months (6 persons) and four months (7 individuals) were other noteworthy lengths. There was only one person in each category for longer durations, such as 6 years and 2 years 6 months. This broad range points to a varied cohort in terms of the chronicity of symptoms, which may have an impact on the results of rehabilitation techniques and emphasizes the significance of customized treatment planning.

The majority of individuals' reported reasons of neck pain were related to extended physical activity or posture. The most frequent reason, as reported by 19 people, was extended sitting, followed by prolonged standing, as recorded by 16 people. Twelve people indicated long work hours as a relevant factor. Three people, a smaller subset, gave other unidentified reasons for their neck pain. These results demonstrate the

importance of postural habits and ergonomic considerations in the etiology of neck discomfort, indicating that lifestyle or workplace changes may be essential to therapy and preventative tactics.

When comparing the NPRS ratings from the pretest and posttest, the Wilcoxon signed-rank test results show a substantial decrease in pain. 50 people took the exam, and the results showed that 50 of them had negative rankings, which means that their posttest NPRS scores were lower than their pretest scores. With a total rank sum of 1275, the mean rank of the negative rankings was 25.50. An improvement in pain levels from the pretest to the posttest was statistically significant, as indicated by the test's Z value of -6.194 and p-value of 0.01.

The individuals' neck disability levels significantly improved, according to the Wilcoxon signed-rank test results comparing the pretest and posttest NDI scores. Fifty people in all had negative rankings, meaning that their NDI scores on the posttest were lower than their pretest scores. With a total rank of 1275, the mean rank of the negative ranks was 25.50. There was a statistically significant decrease in neck impairment from the pretest to the posttest, as indicated by the test's Z value of -6.165 and p-value of 0.01.

According to Tanveer et al. (2017, p.433) and Cheng (2014, p.45), women are more likely than men to suffer from chronic neck pain. According to the study sample analysis, women are more impacted than men. According to the study's findings, 36.00% of participants were men and 64.00% of participants were women. That means female are more experience chronic neck pain than male. The majority of those impacted were of working age, as seen by the sample's average age of 29.

Gayanthri D.M. (2019, p.68) showed that the study was carried out in Telangana, India's Kothawada, Warangal (Urban) district. A total of 120 weavers were chosen to participate in the survey. To quantify the visual strain, postural discomfort, and musculoskeletal discomfort, an exploratory investigation was carried out. Interventions such as reed frame handles, soft handle ratch, shears, movable trays, and exercises were created in response to the demands of the weavers in order to alleviate physical discomfort and eye strain. Twelve respondents were used to assess the comfort and

satisfaction of the interventions. The majority of respondents reported having pain in their neck (86.66%), shoulders (85%), lower back (76.66%), and both ankles/feet (74.16%) during the previous 12 months. Dyeing, winding yarn, warping, putting the warp on the loom, weaving, and finishing are all steps in the Durrie weaving process. The only people who worked on yarn winding and finishing were women. Male employees performed the dyeing, while both sexes carried out other tasks. Weavers spend a lot of time in cramped quarters with poor ventilation, dim illumination, and uncomfortable postures. Weaving and related hobbies are dangerous and can lead to musculoskeletal problems.

By lessening physical strain, boosting employee well-being, and raising overall productivity, ergonomic treatments have demonstrated a great deal of promise in improving office settings. The significance of customizing ergonomic solutions to meet certain occupational demands is highlighted by the study conducted by Gayathri, D.M. Modifications like task-specific gadgets, better seating, and adjustable workstations, for example, can help reduce musculoskeletal diseases that are frequently linked to extended postures and repeated tasks (Gayanthri D.M 2019, p.69).

According to Rostami et al. (2022, p.9) was showed that human resource program increased significantly ($p < 0.05$) as a result of the examined industry's adoption of Ergonomic Intervention Program. Following the therapies, the prevalence of MSDs declined significantly in the majority of body regions ($p < 0.001$). Additionally, the training significantly decreased employee occupational weariness ($p < 0.001$) and enhanced general health ($p < 0.001$). The findings of Rostami et al. (2022, p.11), who documented notable improvements after ergonomic adjustments, are consistent with the findings of this investigation. The efficacy of the intervention in lowering pain is further supported by the Wilcoxon signed-rank test used in this study to compare pretest and posttest NPRS scores. With a mean rank of 25.50 and a total rank sum of 1275, all 50 subjects showed a decrease in pain levels, as indicated by negative scores. Pain levels have decreased statistically significantly, as indicated by the Z value of -6.194 and the p-value of 0.01. These results, together with those of Rostami et al., demonstrate how important focused therapies are for reducing pain and enhancing health outcomes, especially for individuals with musculoskeletal problems.

This study's results are consistent with those of Rostami et al. (2022, p.11), which highlight the value of focused ergonomic and restorative therapies in enhancing musculoskeletal health and productivity at work. According to Rostami et al., an ergonomic intervention program improved overall employee health ($p < 0.001$), decreased occupational fatigue ($p < 0.001$), and significantly increased human resource efficiency ($p < 0.05$). It also decreased the prevalence of musculoskeletal disorders (MSDs) across most body regions ($p < 0.001$). In a similar vein, participants' neck impairment levels significantly improved, according to the Wilcoxon signed-rank test results. 50 participants in all showed negative rankings, meaning that their Neck Disability Index (NDI) values were lower on the posttest than on the pretest. With a total rank sum of 1275, the mean rank of these negative ranks was 25.50. There was a statistically significant decrease in neck disability from the pretest to the posttest, as indicated by the Z value of -6.165 and the p-value of 0.01. Together, these results show how important organized interventions are for reducing musculoskeletal strains and enhancing functional outcomes, which emphasizes the importance of ergonomic and therapeutic approaches in both clinical and professional environments.

On contrast, one study Sumardiyono et al. (2015, p.7) showed that most women who work in batik use seats that are not ergonomic, which increases their risk of developing musculoskeletal conditions. The goal of this study was to construct an ergonomic chair and assess how well it reduced workers' musculoskeletal ailments. utilizing a pre- and post-test technique with a single group, this study is quasi-experimental and involves 50 female batik workers chosen using quota sampling. The samples were instructed to utilize the ergonomic chair for two months, and their musculoskeletal conditions were measured both before and after. The analysis was conducted using the Wilcoxon test, T-test, ANCOVA, McNemar test, and Chi Square test. Prior to and following their usage of the ergonomic chair, the workers' risk factors for musculoskeletal diseases were statistically significantly different ($p<0.05$), and their musculoskeletal disorders were statistically different ($p=0.035$).

But my research study showed that The participants' neck impairment and pain levels significantly improved, according to the Wilcoxon signed-rank test results for both NPRS and NDI scores. All fifty participants in the NPRS had decreases in posttest scores relative to pretest scores and this pattern was also shown in the NDI results,

where all participants had decreased posttest scores. A statistically significant improvement in neck disability was confirmed and p-value of 0.01. These results demonstrate the intervention's efficacy in managing pain and functional limitations, underscoring its potential to enhance musculoskeletal health in general. So, this study was very effectiveness and highly significant.

5.2 Limitation

This study's limitations include the use of inexpensive educational interventions, the impossibility of implementing organizational interventions or freedom of action and decision-making, and the impossibility of changing or modifying office workplace equipment, job design, including workflow programs or work-rest times. Lastly, the study's primary constraint was time and the primary constraint of this research was its brief duration. The workshop's training materials were given to the attendees, and the training program was only used once.

CHAPTER-VI CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Educational treatments were effective in reducing MSDs in the neck and upper limbs. It is recommended that short and continuous training sessions be conducted to lower the risk factors for body-impacting ergonomic issues, with a focus on the limbs that garment workers use the most. The ergonomic principles and underpinnings for treating MSDs and the educational treatments in this study focused primarily on treating chronic neck pain on an individual basis. It was suggested that a more thorough approach be taken to protect employee health, which is an organization's most valuable asset, as ergonomics training had no influence on all research variables. Workstation modifications, posture training, management training, ergonomic training, and employee motivation guidelines should all be a part of this plan. These efforts are meant to strengthen the organization, reduce MSDs linked to chronic neck pain, and consistently raise employee health.

6.2 Recommendation

The findings of this investigation, it is advised that additional research be conducted to determine the efficacy of ergonomic therapies among garment workers in preventing the recurrence of chronic mechanical neck pain-

- Future studies need to take a larger, more diverse population to enhance the generalizability of findings.
- Explore its effects over a more extended period with longitudinal analyses to determine whether its impact remains consistent.
- Conduct multicenter trials to generalize the results in different clinical and cultural environments.

CHAPTER-VII REFERENCE

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Institutional Review Board (IRB) Permission Letter

SCMST-BPT/IRB/ 05-23/002

To
Sumon Chandra Dash
4th Year Student of B.Sc. in Physiotherapy
Session: 2018-2019, Reg No:10432
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Subject: Approval of the thesis proposal "**Effectiveness of ergonomic intervention among the Garment's worker suffering from chronic neck pain**" by ethics committee.

Dear Sumon Chandra Dash Congratulations.
The Institutional Review Board (IRB) of SCMST has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator. The Following documents have been reviewed and approved:

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

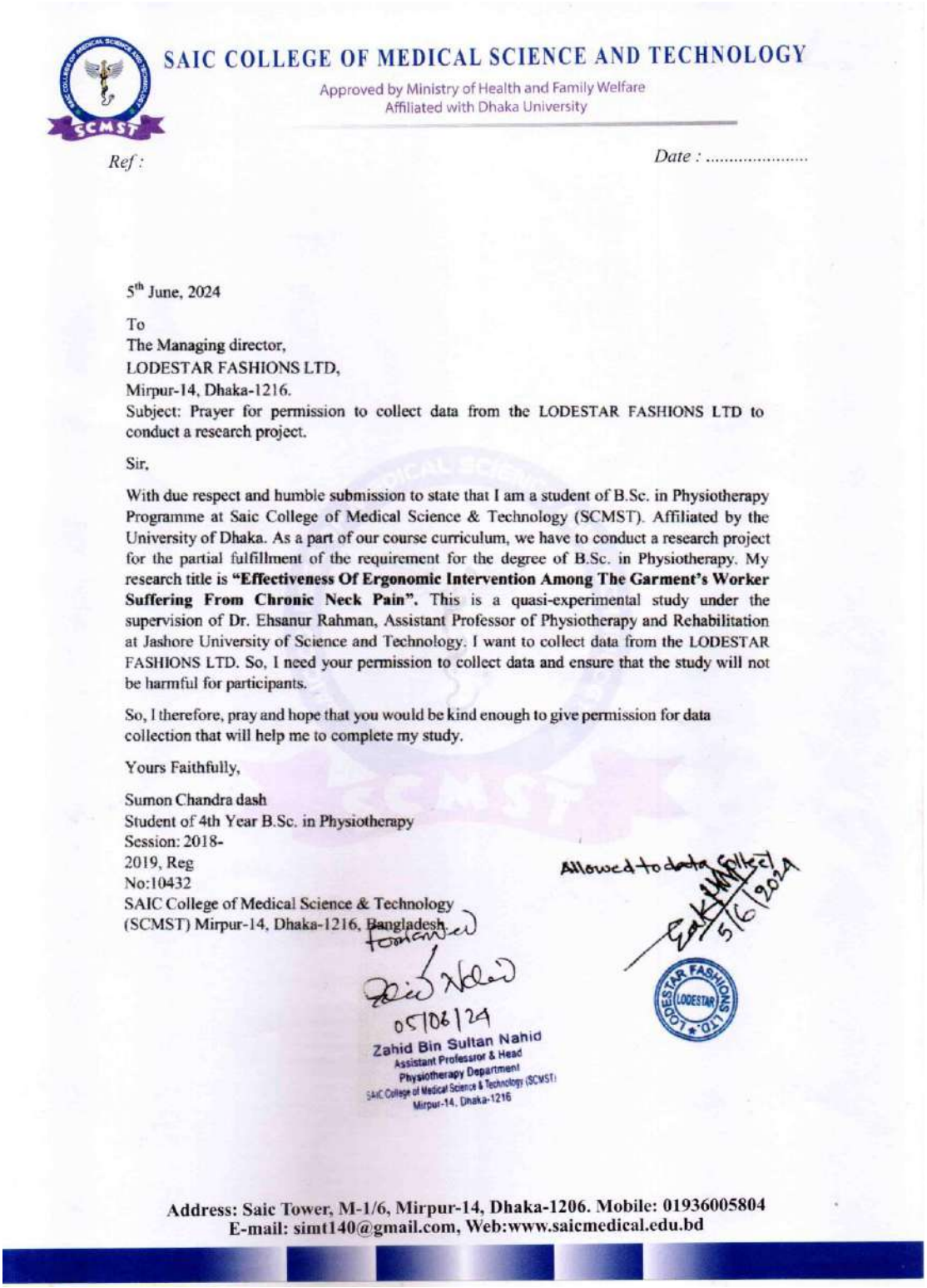
The purpose of the study is to determine the Effectiveness of ergonomic intervention among the Garment's worker suffering from chronic neck pain. The study involves face to face interview by using semi-structured questionnaire to explore the Effectiveness of ergonomic intervention among the Garment's worker suffering from chronic neck pain that may take 15 to 20 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 accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,
15.05.24

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.

Permission letter for data collection



SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref :

Date : .....

5th June, 2024

To
The Managing director,
LODESTAR FASHIONS LTD,
Mirpur-14, Dhaka-1216.

Subject: Prayer for permission to collect data from the LODESTAR FASHIONS 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 Programme at Saic College of Medical Science & Technology (SCMST). Affiliated by the University of Dhaka. 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 **"Effectiveness Of Ergonomic Intervention Among The Garment's Worker Suffering From Chronic Neck Pain".** This is a quasi-experimental study under the supervision of Dr. Ehsanur Rahman, Assistant Professor of Physiotherapy and Rehabilitation at Jashore University of Science and Technology. I want to collect data from the LODESTAR FASHIONS 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,

Sumon Chandra dash
Student of 4th Year B.Sc. in Physiotherapy
Session: 2018-
2019, Reg
No:10432
SAIC College of Medical Science & Technology
(SCMST) Mirpur-14, Dhaka-1216, Bangladesh.

Allowed to data collect
5/6/2024

05/06/24
Zahid Bin Sultan Nahid
Assistant Professor & Head
Physiotherapy Department
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216

LODESTAR FASHIONS LTD.

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

সম্মতি পত্র

আসসালামু আলাইকুম/ নমস্কার,
আমি সুমন চন্দ্র দাস, সাইক কলেজ অব মেডিকেল সায়েন্স অ্যান্ড টেকনোলজি এর বিএসসি ইন ফিজিওথেরাপি বিভাগের শেষ বর্ষের ছাত্র। কোর্সের পাঠ্যক্রম অনুসারে, আমি একটি গবেষণা করছি যার শিরোনাম "গার্মেন্টস কর্মীর মধ্যে দীর্ঘস্থায়ী ঘাড়ের ব্যথায় ভুগছেন এমন এর্গোনোমিক হস্তক্ষেপের উপকারিতা।" এটা আমার অধ্যয়নের একটা অংশ। উল্লেখ্য যে, নিচে অধ্যয়ন পরিচালনার জন্য প্রয়োজনীয় কিছু প্রশ্নপত্রের তালিকা নিচে দেয়া আছে । এই তালিকাটি আপনাকে এই গবেষণা সম্পর্কে তথ্য দেওয়ার জন্য নির্বাচিত করা হয়েছে। এই গবেষণার জন্য আপনাকে কিছু প্রশ্ন করা হবে, যা ১৫-২০ মিনিটের মত সময় লাগবে ।আমার গবেষণার নাম হচ্ছে **"গার্মেন্টস কর্মীর মধ্যে দীর্ঘস্থায়ী ঘাড়ের ব্যথায় ভুগছেন এমন এর্গোনোমিক হস্তক্ষেপের উপকারিতা।"**

সাক্ষাৎকার নেওয়ার সময়, আপনি যদি কোনো মানসিক অশান্তি, সামাজিক ও অর্থনৈতিক ঝুঁকি, বা অন্য কোনো অস্বস্তি বা শারীরিক সমস্যা অনুভব করেন,তাহলে আমাকে বলবেন, আমি অবিলম্বে সাক্ষাৎকার বন্ধ করে দেব। আমি প্রতিশ্রুতি দিচ্ছি যে, এই অধ্যয়নটি আপনার জন্য ক্ষতিকারক বা ঝুঁকিপূর্ণ হবে না। এই সাক্ষাৎকারে আপনার অংশগ্রহণ হচ্ছে আপনার নিজের ইচ্ছায় এবং আপনি যেকোনো সময় চাইলে এইটা বন্ধ করতে পারবেন। সাক্ষাৎকারের সময় আপনি পছন্দ করেন না বা উত্তর দিতে চান না এমন একটি নির্দিষ্ট প্রশ্নের উত্তর না দেওয়ার অধিকারও আপনার আছে। সাক্ষাৎকার বিষয়ে আপনার কোন কিছু জানার থাকলে আপনি আমার সুপারভাইজার সহকারী অধ্যাপক ডাঃএহসানুর রহমান স্যারের সাথে যোগাযোগ করতে পারবেন যশোর বিজ্ঞান ও প্রযুক্তি বিশ্ববিদ্যালয় যশোর, খুলনা। সাক্ষাৎকার শুরু করার আগে কি আপনার কোন প্রশ্ন আছে?

হ্যাঁ ☐ না ☐

গবেষকের স্বাক্ষর: ..... তারিখ: .....
অংশগ্রহণকারীর স্বাক্ষর: ..... তারিখ: .....
মোবাইল নাম্বার: .....
সাক্ষীর স্বাক্ষর: ..... তারিখ: .....
মোবাইল নাম্বার: .....

প্রশ্নপত্র (বাংলা)

গার্মেন্টস কর্মীর মধ্যে দীর্ঘস্থায়ী ঘাড়ের ব্যথায় ভুগছেন এমন এর্গোনোমিক হস্তক্ষেপের উপকারিতা নির্ণয়ঃ

বিভাগ-১: ব্যক্তিগত তথ্য

১.১ কোড নম্বরঃ	
১.২ রোগীর নামঃ	
১.৩ ঠিকানাঃ	গ্রামঃ জেলাঃ
১.৪ মোবাইল নাম্বারঃ	

বিভাগ-২: সামাজিক জীবন সংক্রান্ত তথ্য

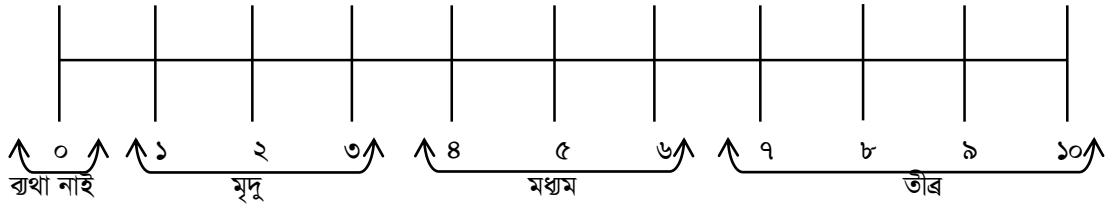
প্রশ্ন	উত্তর
২.১ বয়স	.....(বছরগুলোতে)
২.২ লিঙ্গ	পুরুষ= ০ মহিলা= ১
২.৩ আপনার শিক্ষাগত যোগ্যতা কি?	নিরক্ষর= ০ প্রাথমিক শিক্ষা= ১ এস এস সি= ২ এইচএসসি= ৩ স্নাতক এবং তার উপরে= []
২.৪ আপনার পদবী কি?	হেলপার= ০ অপারেটর= ১ কাটিং= ২ সুইং= ৩ ফিনিশিং= ৪ কোয়ালিটি= ৫ সুপারভাইজার= ৬ অন্যান্য = ৭
২.৫ আপনার বসবাসের এলাকা কি?	শহুরে= ০ অর্ধশহর= ১ গ্রাম = ২
২.৬ আপনার মাসিক আয় কত?	..... (টাকা)
২.৭ আপনার বৈবাহিক অবস্থা কি?	বিবাহিত=০ অবিবাহিত=১ তালাকপ্রাপ্ত = ২ বিচ্ছিন্ন=৩ বিধবা = ৪

বিভাগ-৩: মেডিকেল তথ্য

প্রশ্ন	উত্তর
৩.১ আপনার উচ্চতা কত?	.....
৩.২ আপনার ওজন কত?	.....কেজি
৩.৩ বিএমআই	০ = কম ওজন ১ = স্বাভাবিক ওজন ২ = অতিরিক্ত ওজন ৩ = স্থূলতা
৩.৪ কমরবিডিটিস	০ = উচ্চ রক্তচাপ ১ = ডায়াবেটিস মেলিটাস ২ = জানি না
৩.৫ ঘাড় ব্যথার সময়কাল কত?	.....
৩.৬ আপনার ঘাড় ব্যথার কারণ কি?	০ = দীর্ঘ সময় বসে থাকা ১ = দীর্ঘ সময় দাঁড়িয়ে থাকা ২ = দীর্ঘ সময় কাজ করা ৩ = অন্যান্য
৩.৭ ঘাড়ের ব্যথা কি হাতের কাছে ছড়িয়ে পড়ে?	০ = হ্যাঁ ১ = না
৩.৮ যদি হ্যাঁ, অনুগ্রহ করে পরবর্তী প্রশ্নের উত্তর দিন। আপনার ঘাড় ব্যথা কোথায় বিকিরণ করে?	০ = কনুইয়ের উপরে একপাশে ১ = কনুইয়ের নিচে একপাশে ২ = কনুইয়ের উপরে দুইপাশে ৩ = কনুইয়ের নিচে দুইপাশে
৩.৯ ঘাড় ব্যথার ধরন কি?	০ = সবসময় ১ = মাঝে মাঝে
৩.১০ কখন আপনার ব্যাথা আরও বেড়ে যায়?	০ = সকালে ১ = দিন যত এগোচ্ছে ২ = সন্ধ্যায় ৩ = রাতে

বিভাগ-৩: চিকিৎসার পূর্ববর্তী উপাত্তসমূহ

ব্যথার তীব্রতা (নিউমেরিক পেইন রেটিং স্কেল)



ঘাড়ের অক্ষমতা সূচক

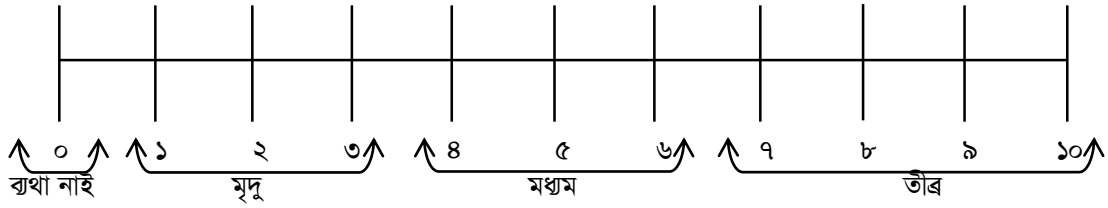
প্রশ্ন	উত্তর
১। আজকে আপনার ব্যথার তীব্রতা কি পরিমাণ?	➢ এই মুহূর্তে আমার কোন ব্যথা নেই = ০ ➢ এই মুহূর্তে ব্যথা খুব হালকা = ১ ➢ এই মুহূর্তে ব্যথা মাঝারি = ২ ➢ এই মুহূর্তে ব্যথা মোটামুটি গুরুতর = ৩ ➢ এই মুহূর্তে ব্যথা খুব তীব্র = ৪ ➢ এই মুহূর্তে ব্যথা সবচেয়ে খারাপ = ৫
২। ব্যক্তিগত কাজে (পরিচ্ছন্নতা, জামাকাপড় পরিধান ইত্যাদি) আপনি কি পরিমাণ স্বাবলম্বী?	➢ আমি সাধারণত অতিরিক্ত ব্যথা ছাড়াই নিজেকে দেখাশুনার কাজ করতে পারি=০ ➢ আমি সাধারণত নিজেকে দেখাশোনা করতে পারি কিন্তু এতে অতিরিক্ত ব্যথা হয়= ১ ➢ আমি নিজেকে দেখাশোনা করার কাজ করতে গেলে ব্যথা অনুভব করি এবং আমি ধীরগতি এবং সতর্কতা অবলম্বন করি= ২ ➢ আমাকে সামান্য সাহায্য করলে আমি আমার ব্যক্তিগত যত্নের অধিকাংশ কাজই পরিচালনা করতে পারি= ৩ ➢ আমার নিজের যত্নের অধিকাংশ ক্ষেত্রেই প্রতিদিনই সাহায্য প্রয়োজন হয়= ৪ ➢ আমি কাপড় পরিধান করতে পারি না, আমার কাপর ধৌত করতে অসুবিধা হয় এবং বিছানায় শুয়ে থাকতে হয়=৫
৩। কোন বস্তু উঠানোর ক্ষেত্রে আপনি কি পরিমান স্বাবলম্বী?	➢ আমি অতিরিক্ত ব্যথা ছাড়াই ভাড়ী ওজন উত্তোলন করতে পারি= ০ ➢ আমি ভারী ওজন উত্তোলন করতে পারি কিন্তু এটা অতিরিক্ত ব্যথা দেয়= ১ ➢ ব্যথা আমাকে মেঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি তা পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে, উধাহরনস্বরুপ, কোন একটি টেবিলের উপর থেকে= ২ ➢ ব্যথা আমাকে মেঝে থেকে ভাড়ী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি মাঝারি থেকে হালকা ওজন উত্তোলন করতে পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে=৩ ➢ আমি শুধুমাত্র খুব হালকা ওজন উত্তোলন করতে পারি=৪ ➢ আমি কোন কিছু উত্তোলন বা কিছু বহন করতে পারি না= ৫

৪। খবরের কাগজ অথবা বই পড়ার সময় আপনি কি রকম অনুভব করেন?	➢ আমি ঘাড়ে কোন ব্যথা ছাড়াই যতটা চাই ততটা পড়তে পারি= ০ ➢ আমি ঘাড়ে সামান্য ব্যথা নিয়ে যতটা চাই ততটা পড়তে পারি= ১ ➢ আমি ঘাড়ে সহনীয় ব্যাথা নিয়ে যতটা চাই পড়তে পারি= ২ ➢ আমি ঘাড়ে মাঝারি ব্যাথার কারণে যতটা চাই ততটা পড়তে পারি না= ৩ ➢ আমি আমার ঘাড়ে তীব্র ব্যাথার কারণে খুব কমই পড়তে পারি= ৪ ➢ আমি ব্যাথার কারণে একদমই পড়তে পারি না= ৫
৫। আপনি ঘাড়ে ব্যাথার জন্য কি পরিমান মাথা ব্যাথা অনুভব করেন?	➢ আমার কোন মাথা ব্যাথা নেই= ০ ➢ আমার সামান্য মাথা ব্যাথা আছে, যা কদাচিৎ আসে= ১ ➢ আমার সহনীয় মাথা ব্যাথা আছে, যা কদাচিৎ আসে= ২ ➢ আমার তীব্র মাথা ব্যাথা আছে, যা ঘন ঘন আসে= ৩ ➢ আমার মাথা ব্যাথা আছে, যা ঘন ঘন আসে= ৪ ➢ আমার প্রায় সবসময় মাথা ব্যাথা হয়= ৫
৬। ঘাড়ে ব্যাথা ছাড়া আপনি কাজে কি পরিমান মনোযোগ দিতে পারেন?	➢ আমি কোন অসুবিধা ছাড়াই যখন চাই তখনই সম্পূর্ণ মনোযোগ দিতে পারি= ০ ➢ আমি সামান্য অসুবিধার সঙ্গে যখন চাই তখনই সম্পূর্ণরুপে মনোযোগ দিতে পারি= ১ ➢ আমি যখন মনোযোগ দিতে চাই তখন চলনসই মাএার অসুবিধা হয়= ২ ➢ আমি যখন মনোযোগ দিতে চাই তখন অনেক অসুবিধা হয়= ৩ ➢ আমি যখন মনোযোগ দিতে চাই তখন অনেক গুরুতর অসুবিধা হয়= ৪ ➢ আমি একদমই মনোযোগ দিতে পারি না= ৫
৭। ঘাড়ে ব্যাথা আপনার প্রতিদিনের কাজে কি পরিমান প্রভাবিত করে?	➢ আমি যত চাই তত কাজ করতে পারি= ০ ➢ আমি শুধুমাএ আমার স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশী না= ১ ➢ আমি আমার অধিকাংশ স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশী না= ২ ➢ আমি স্বাভাবিক কাজ করতে পারি না= ৩ ➢ আমি খুব কমই কোন কাজ করতে পারি= ৪ ➢ আমি একদমই কোন কাজ করতে পারি না= ৫
৮। গাড়িতে ভ্রমণের সময় আপনার ঘাড়ে কি পরিমান ব্যাথা হয়?	➢ আমি কোন ঘাড়ে ব্যাথা ছাড়াই গাড়িতে ভ্রমণ করতে পারি= ০ ➢ আমি ঘাড়ে সামান্য ব্যাথা নিয়ে যতক্ষন দীর্ঘ ততক্ষণ ভ্রমণ করতে পারি= ১ ➢ আমি ঘাড়ে সহনীয় ব্যাথা নিয়ে যতক্ষন দীর্ঘ ততক্ষণ ভ্রমণ করতে পারি= ২ ➢ আমি ঘাড়ে মাঝারি ব্যাথা নিয়ে যতক্ষন খুশি ততক্ষণ ভ্রমণ করতে পারি=৩ ➢ আমি ঘাড়ে তীব্র ব্যথার কারণে খুব কমই ভ্রমণ করতে পারি= ৪ ➢ আমি একদমই গাড়িতে ভ্রমণ করতে পারি না= ৫

৯। ঘুমানোর সময় ঘাড়ে ব্যাথা আপনার ঘুমকে কি পরিমান প্রভাবিত করে?	➢ আমার ঘুম আসতে কোন কষ্ট হয় না= ০ ➢ আমার ঘুম আসতে সামান্য সমস্যা হয় (১ ঘন্টার কম সময় নির্ঘুম কাটে)= ১ ➢ আমার ঘুম আসতে সমস্যা হয় (১ থেকে ঘন্টা নির্ঘুম কাটে)= ২ ➢ আমার ঘুম পরিমিত রুপে নষ্ট হয়(২ থেকে ৩ ঘন্টা নির্ঘুম কাটে)= ৩ ➢ আমার ঘুম ব্যাপকভাবে নষ্ট হয়(৩ থেকে ৫ ঘন্টা নির্ঘুম কাটে)= ৪ ➢ আমার ঘুম সম্পূর্ণূপে নষ্ট হয়(৫ থেকে ৭ ঘন্টা নির্ঘুম কাটে)= ৫
১০। ঘাড়ে ব্যাথা আপনার চিও বিনোদনের কার্যক্রমকে কি পরিমান প্রভাবিত করে?	➢ আমি ঘাড়ে কোন ব্যাথা ছাড়াই সব চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি= ০ ➢ আমি ঘাড়ে কিছু ব্যাথা নিয়ে সব চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি= ১ ➢ আমি ঘাড়ে ব্যাথার কারণে অধিকাংশ কার্যক্রম অংশগ্রহণ করতে পারছি কিন্তু আমার সকল স্বাভাবিক চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি না= ২ ➢ আমি ঘাড়ে ব্যাথার কারণে আমার স্বাভাবিক চিওবিনোদন কার্যক্রমের কয়েকটি কাজে নিয়োজিত হতে পারনে= ৩ ➢ আমি ঘাড়ে ব্যাথা কারণে আমার স্বভাবিক চিওবিনোদন কার্যক্রমের খুব কম কাজে নিয়োজিত হতে পারছি= ৪ ➢ আমি একদমই কোন চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি না= ৫

বিভাগ-৩: চিকিৎসার পরবর্তী উপাত্তসমূহ

ব্যথার তীব্রতা (নিউমেরিক পেইন রেটিং স্কেল)



ঘাড়ের অক্ষমতা সূচক

প্রশ্ন	উত্তর
১। আজকে আপনার ব্যথার তীব্রতা কি পরিমাণ?	➢ এই মুহূর্তে আমার কোন ব্যথা নেই = ০ ➢ এই মুহূর্তে ব্যথা খুব হালকা = ১ ➢ এই মুহূর্তে ব্যথা মাঝারি = ২ ➢ এই মুহূর্তে ব্যথা মোটামুটি গুরুতর = ৩ ➢ এই মুহূর্তে ব্যথা খুব তীব্র = ৪ ➢ এই মুহূর্তে ব্যথা সবচেয়ে খারাপ = ৫
২। ব্যক্তিগত কাজে (পরিচ্ছন্নতা, জামাকাপড় পরিধান ইত্যাদি) আপনি কি পরিমাণ স্বাবলম্বী?	➢ আমি সাধারণত অতিরিক্ত ব্যথা ছাড়াই নিজেকে দেখাশুনার কাজ করতে পারি=০ ➢ আমি সাধারণত নিজেকে দেখাশোনা করতে পারি কিন্তু এতে অতিরিক্ত ব্যথা হয়= ১ ➢ আমি নিজেকে দেখাশোনা করার কাজ করতে গেলে ব্যথা অনুভব করি এবং আমি ধীরগতি এবং সতর্কতা অবলম্বন করি= ২ ➢ আমাকে সামান্য সাহায্য করলে আমি আমার ব্যক্তিগত যত্নের অধিকাংশ কাজই পরিচালনা করতে পারি= ৩ ➢ আমার নিজের যত্নের অধিকাংশ ক্ষেত্রেই প্রতিদিনই সাহায্য প্রয়োজন হয়= ৪ ➢ আমি কাপড় পরিধান করতে পারি না, আমার কাপর ধৌত করতে অসুবিধা হয় এবং বিছানায় শুয়ে থাকতে হয়=৫
৩। কোন বস্তু উঠানোর ক্ষেত্রে আপনি কি পরিমান স্বাবলম্বী?	➢ আমি অতিরিক্ত ব্যথা ছাড়াই ভাড়ী ওজন উত্তোলন করতে পারি= ০ ➢ আমি ভারী ওজন উত্তোলন করতে পারি কিন্তু এটা অতিরিক্ত ব্যথা দেয়= ১ ➢ ব্যথা আমাকে মেঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি তা পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে, উধাহরনস্বরুপ, কোন একটি টেবিলের উপর থেকে= ২ ➢ ব্যথা আমাকে মেঝে থেকে ভাড়ী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি মাঝারি থেকে হালকা ওজন উত্তোলন করতে পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে=৩ ➢ আমি শুধুমাত্র খুব হালকা ওজন উত্তোলন করতে পারি=৪ ➢ আমি কোন কিছু উত্তোলন বা কিছু বহন করতে পারি না= ৫

৪। খবরের কাগজ অথবা বই পড়ার সময় আপনি কি রকম অনুভব করেন?	➢ আমি ঘাড়ে কোন ব্যথা ছাড়াই যতটা চাই ততটা পড়তে পারি= ০ ➢ আমি ঘাড়ে সামান্য ব্যথা নিয়ে যতটা চাই ততটা পড়তে পারি= ১ ➢ আমি ঘাড়ে সহনীয় ব্যাথা নিয়ে যতটা চাই পড়তে পারি= ২ ➢ আমি ঘাড়ে মাঝারি ব্যাথার কারণে যতটা চাই ততটা পড়তে পারি না= ৩ ➢ আমি আমার ঘাড়ে তীব্র ব্যাথার কারণে খুব কমই পড়তে পারি= ৪ ➢ আমি ব্যাথার কারণে একদমই পড়তে পারি না= ৫
৫। আপনি ঘাড়ে ব্যাথার জন্য কি পরিমান মাথা ব্যাথা অনুভব করেন?	➢ আমার কোন মাথা ব্যাথা নেই= ০ ➢ আমার সামান্য মাথা ব্যাথা আছে, যা কদাচিৎ আসে= ১ ➢ আমার সহনীয় মাথা ব্যাথা আছে, যা কদাচিৎ আসে= ২ ➢ আমার তীব্র মাথা ব্যাথা আছে, যা ঘন ঘন আসে= ৩ ➢ আমার মাথা ব্যাথা আছে, যা ঘন ঘন আসে= ৪ ➢ আমার প্রায় সবসময় মাথা ব্যাথা হয়= ৫
৬। ঘাড়ে ব্যাথা ছাড়া আপনি কাজে কি পরিমান মনোযোগ দিতে পারেন?	➢ আমি কোন অসুবিধা ছাড়াই যখন চাই তখনই সম্পূর্ণ মনোযোগ দিতে পারি= ০ ➢ আমি সামান্য অসুবিধার সঙ্গে যখন চাই তখনই সম্পূর্ণরুপে মনোযোগ দিতে পারি= ১ ➢ আমি যখন মনোযোগ দিতে চাই তখন চলনসই মাএার অসুবিধা হয়= ২ ➢ আমি যখন মনোযোগ দিতে চাই তখন অনেক অসুবিধা হয়= ৩ ➢ আমি যখন মনোযোগ দিতে চাই তখন অনেক গুরুতর অসুবিধা হয়= ৪ ➢ আমি একদমই মনোযোগ দিতে পারি না= ৫
৭। ঘাড়ে ব্যাথা আপনার প্রতিদিনের কাজে কি পরিমান প্রভাবিত করে?	➢ আমি যত চাই তত কাজ করতে পারি= ০ ➢ আমি শুধুমাএ আমার স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশী না= ১ ➢ আমি আমার অধিকাংশ স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশী না= ২ ➢ আমি স্বাভাবিক কাজ করতে পারি না= ৩ ➢ আমি খুব কমই কোন কাজ করতে পারি= ৪ ➢ আমি একদমই কোন কাজ করতে পারি না= ৫
৮। গাড়িতে ভ্রমণের সময় আপনার ঘাড়ে কি পরিমান ব্যাথা হয়?	➢ আমি কোন ঘাড়ে ব্যাথা ছাড়াই গাড়িতে ভ্রমণ করতে পারি= ০ ➢ আমি ঘাড়ে সামান্য ব্যাথা নিয়ে যতক্ষন দীর্ঘ ততক্ষণ ভ্রমণ করতে পারি= ১ ➢ আমি ঘাড়ে সহনীয় ব্যাথা নিয়ে যতক্ষন দীর্ঘ ততক্ষণ ভ্রমণ করতে পারি= ২ ➢ আমি ঘাড়ে মাঝারি ব্যাথা নিয়ে যতক্ষন খুশি ততক্ষণ ভ্রমণ করতে পারি=৩ ➢ আমি ঘাড়ে তীব্র ব্যথার কারণে খুব কমই ভ্রমণ করতে পারি= ৪ ➢ আমি একদমই গাড়িতে ভ্রমণ করতে পারি না= ৫

৯। ঘুমানোর সময় ঘাড়ে ব্যাথা আপনার ঘুমকে কি পরিমান প্রভাবিত করে?	➢ আমার ঘুম আসতে কোন কষ্ট হয় না= ০ ➢ আমার ঘুম আসতে সামান্য সমস্যা হয় (১ ঘন্টার কম সময় নির্ঘুম কাটে)= ১ ➢ আমার ঘুম আসতে সমস্যা হয় (১ থেকে ঘন্টা নির্ঘুম কাটে)= ২ ➢ আমার ঘুম পরিমিত রুপে নষ্ট হয়(২ থেকে ৩ ঘন্টা নির্ঘুম কাটে)= ৩ ➢ আমার ঘুম ব্যাপকভাবে নষ্ট হয়(৩ থেকে ৫ ঘন্টা নির্ঘুম কাটে)= ৪ ➢ আমার ঘুম সম্পূর্ণূপে নষ্ট হয়(৫ থেকে ৭ ঘন্টা নির্ঘুম কাটে)= ৫
১০। ঘাড়ে ব্যাথা আপনার চিও বিনোদনের কার্যক্রমকে কি পরিমান প্রভাবিত করে?	➢ আমি ঘাড়ে কোন ব্যাথা ছাড়াই সব চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি= ০ ➢ আমি ঘাড়ে কিছু ব্যাথা নিয়ে সব চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি= ১ ➢ আমি ঘাড়ে ব্যাথার কারণে অধিকাংশ কার্যক্রম অংশগ্রহণ করতে পারছি কিন্তু আমার সকল স্বাভাবিক চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি না= ২ ➢ আমি ঘাড়ে ব্যাথার কারণে আমার স্বাভাবিক চিওবিনোদন কার্যক্রমের কয়েকটি কাজে নিয়োজিত হতে পারনে= ৩ ➢ আমি ঘাড়ে ব্যাথা কারণে আমার স্বভাবিক চিওবিনোদন কার্যক্রমের খুব কম কাজে নিয়োজিত হতে পারছি= ৪ ➢ আমি একদমই কোন চিওবিনোদন কার্যক্রমে অংশগ্রহণ করতে পারছি না= ৫

Consent Form (English)

Assalamu Alaikum/Nomoskar,

I am Sumon Chandra dash, a student of 4th year B.Sc. in Physiotherapy Programme at SAIC College of Medical Science & Technology (SCMST), affiliated by the University of Dhaka. As per the course curriculum, I am conducting a research project that entitled "Effectiveness of ergonomic intervention among the Garment's worker suffering from chronic neck pain."It is part of my B.Sc. in Physiotherapy degree. Note that the following is a list of question papers required to conduct the study. This list has been selected to give you information about this study. I would like to give you a description of this study and answer any of your questions. It takes about 15-20 minutes.

My project is **"Effectiveness of Ergonomic Intervention Among the Garment's Worker Suffering from Chronic Neck Pain."**

During the interview period, if you feel any emotional disturbance, social and economic risk, or any other discomfort or physical risk, please tell me, and I will stop the interview immediately. I am committed to ensuring that the study will not be harmful or risky for you. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have at right not to answer a particular question that you don't like or do not want to answer during the interview. If you have any queries about the study or your rights as a participant, you may contact me or my supervisor, Dr. Ehsanur Rahman, Assistant Professor of Physiotherapy and Rehabilitation at Jashore University of Science and Technology (JUST), Jashore 7408, Bangladesh. Do you have any question before I start?

So, may I have your consent to proceed with the interview?

Yes ☐ No ☐

Signature of the researcher: …… Date:……..

Signature of the Participants: …… Date:…….

Mobile NO: ……..

Signature of the Witness: ……... Date:……

Mobile No: ……

Questionnaire (English)

Identify the Effectiveness of ergonomic intervention among the Garment's worker suffering from chronic neck pain.

Part-1: Personal information

1.1 Code No:	
1.2 Patient's name:	
1.3 Address	Village: District:
1.4 Mobile NO:	

Part-2: Socio-demographic information

Question	Answer
2.1 Age	……(In years)
2.2 Gender	Male=0 Female=1
2.3 What is your educational qualification?	Illiterate=0 Primary=1 S.S.C=2 H.S.C=3 Graduate and above=4
2.4 What is your designation?	Helper=0 Operator=1 Cutting=2 Sewing=3 Finishing=4 Quality=5 Supervisor=6 Others=7

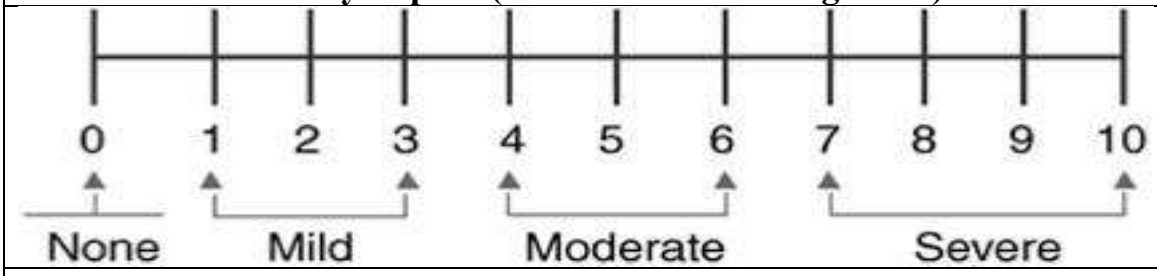
2.5 What is your living area?	Urban=0 Semi urban=1 Rural=2
2.6 What is your monthly income?	……. (In BDT)
2.7 What is your marital status?	Married=0 Single=1 Divorced=2 Separated=3 Widow=4

Part -3: Medical information

Question	Answer
3.1 What is your Height?	.....
3.2 What is your Weight?	……....kg
3.3 BMI	0= Under weight 1= Normal weight 2= Over weight 3= Obesity
3.4 Comorbidities	0= Hypertension 1= Diabetes mellitus 2= Don't Know
3.5 What is the duration of neck pain?	.....
3.6 What is the Causes of your neck pain?	0= Long time sitting 1= Long time standing 2= Long time working 3= Others
3.7 Is the neck pain radiate to hand?	0= Yes 1= No
3.8 If yes, please answer the next question. Where does your neck pain radiate?	0= Unilateral above elbow 1= Unilateral below elbow 2= Bilateral above elbow 3=Bilateral below elbow
3.9 What is the type of neck pain?	0= Constant 1= Intermittent
3.10 At when your pain get more worse?	0= At morning 1= As the day progress 2= At evening 3= At night

Part-4: Pre-test

Severity of pain (Numeric Pain Rating Scale)



Neck Disability Index

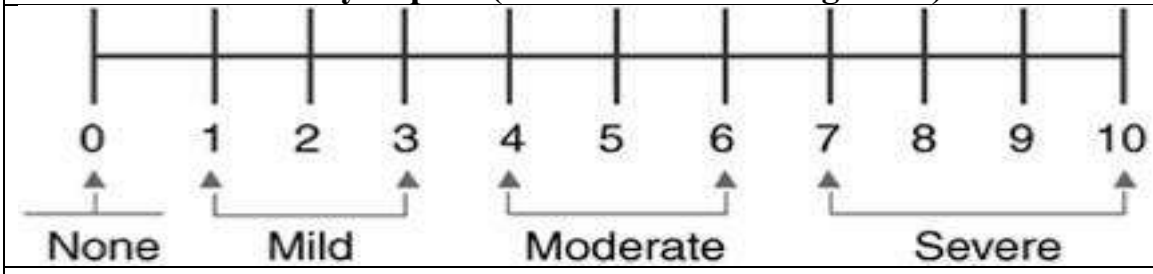
Question	Answer
1. How much pain do you have today?	I am currently pain-free=0 Right now, the pain is really little=1 Right now, the pain is moderate=2 Right now, the pain is really intense=3 Right now, the pain is really intense=4 Right now, the pain is the worst that can be imagined=5
2. How independent are you at personal care (washing, dressing etc.)	I can take care of myself as usual without giving myself further discomfort=0 I can take care of myself normally, but it hurts more=1 It is tough to look after yourself and I am slow and careful=2 I can take care of myself most of the time, but I need some assistance=3 I require daily assistance with the majority of self-care tasks=4 I stay in bed, wash with difficulty, and don't dress=5

3. How independent are you during lifting object?	I can lift huge weights without extra pain=0 I can lift huge weights, but it hurts more=1 I am unable to raise huge weights off the ground due to pain, but I can manage if they are put comfortably, such on a table=2 I can manage light to medium weights if they are positioned comfortably, but I am unable to lift high weights due to pain=3 I am only able to lift extremely small weights=4 I am unable to lift or carry anything=5
4. How do you feel while reading newspaper or books?	I have no neck ache, so I can read as much as I want to=0 I have some neck ache, but I can read as much as I want to=1 I have some neck ache, but I can read as much as I want=2 I have some neck pain that prevents me from reading as much as I would like to=3 I have terrible neck pain that makes it difficult for me to read at all=4 I am completely incapable of reading=5
5. To which state of headache do you feel?	I don't have any headaches=0 I occasionally have mild headaches=1 I occasionally get moderate headaches=2 I frequently have moderate headaches=3 I frequently have really bad headaches=4 I nearly always get headaches=5

6. To which level of concentration do you keep during working despite of neck pain?	I have no trouble focusing completely when I want to=0 When I want to, I can focus completely with only a little help=1 When I want to focus, I find it fairly tough=2 When I want to focus, I find it really tough=3 Whenever I want to focus, I find it really tough=4 I am unable to focus at all=5
7. To which state neck pain affect your daily work?	I am able to work as much as I choose=0 I am limited to my regular tasks=1 I can complete the most of my regular tasks, but no more=2 I am unable to complete my regular tasks=3 I'm barely able to work at all=4 I am completely incapable of working=5
8. How do you feel your neck pain during travelling?	I don't have any neck pain while I travel=0 I have some neck ache, but I can travel for as long as I wish=1 I have some neck ache, but I can travel for as long as I wish=2 I have moderate neck pain that prevents me from traveling for as long as I would want=3 I have terrible neck discomfort that makes it difficult for me to travel at all=4 I am unable to travel at all=5

9. To which state neck pain affect your sleep?	I have no issue falling asleep=0 I'm having a little trouble sleeping (less than an hour)=1 I have mild sleep disturbances (1-2 hours of insomnia)=2 I have moderate sleep disturbances (2–3 hours of insomnia)=3 I'm having a lot of trouble sleeping (three to five hours)=4 I can't sleep for five to seven hours straight=5
10. To which state your neck pain affect your recreational activities?	I have no neck pain and can participate in all of my leisure activities=0 Despite minor neck pain, I can still participate in all of my recreational activities=1 Due to neck pain, I can participate in the majority of my typical leisure activities, but not all of them=2 Due to neck pain, I am able to participate in some of my typical leisure activities=3 Neck pain prevents me from engaging in many leisure activities=4 I am unable to engage in any leisure activity=5

Part-4: Post-test

Severity of pain (Numeric Pain Rating Scale)	
	
Neck Disability Index	
Question	**Answer**
1. How much pain do you have today?	I am currently pain-free=0 Right now, the pain is really little=1 Right now, the pain is moderate=2 Right now, the pain is really intense=3 Right now, the pain is really intense=4 Right now, the pain is the worst that can be imagined=5
2. How independent are you at personal care (washing, dressing etc.)	I can take care of myself as usual without giving myself further discomfort=0 I can take care of myself normally, but it hurts more=1 It is tough to look after yourself and I am slow and careful=2 I can take care of myself most of the time, but I need some assistance=3 I require daily assistance with the majority of self-care tasks=4 I stay in bed, wash with difficulty, and don't dress=5

3. How independent are you during lifting object?	I can lift huge weights without extra pain=0 I can lift huge weights, but it hurts more=1 I am unable to raise huge weights off the ground due to pain, but I can manage if they are put comfortably, such on a table=2 I can manage light to medium weights if they are positioned comfortably, but I am unable to lift high weights due to pain=3 I am only able to lift extremely small weights=4 I am unable to lift or carry anything=5
4. How do you feel while reading newspaper or books?	I have no neck ache, so I can read as much as I want to=0 I have some neck ache, but I can read as much as I want to=1 I have some neck ache, but I can read as much as I want=2 I have some neck pain that prevents me from reading as much as I would like to=3 I have terrible neck pain that makes it difficult for me to read at all=4 I am completely incapable of reading=5
5. To which state of headache do you feel?	I don't have any headaches=0 I occasionally have mild headaches=1 I occasionally get moderate headaches=2 I frequently have moderate headaches=3 I frequently have really bad headaches=4 I nearly always get headaches=5

6. To which level of concentration do you keep during working despite of neck pain?	I have no trouble focusing completely when I want to=0 When I want to, I can focus completely with only a little help=1 When I want to focus, I find it fairly tough=2 When I want to focus, I find it really tough=3 Whenever I want to focus, I find it really tough=4 I am unable to focus at all=5
7. To which state neck pain affect your daily work?	I am able to work as much as I choose=0 I am limited to my regular tasks=1 I can complete the most of my regular tasks, but no more=2 I am unable to complete my regular tasks=3 I'm barely able to work at all=4 I am completely incapable of working=5
8. How do you feel your neck pain during travelling?	I don't have any neck pain while I travel=0 I have some neck ache, but I can travel for as long as I wish=1 I have some neck ache, but I can travel for as long as I wish=2 I have moderate neck pain that prevents me from traveling for as long as I would want=3 I have terrible neck discomfort that makes it difficult for me to travel at all=4 I am unable to travel at all=5

9. To which state neck pain affect your sleep?	I have no issue falling asleep=0 I'm having a little trouble sleeping (less than an hour)=1 I have mild sleep disturbances (1-2 hours of insomnia)=2 I have moderate sleep disturbances (2–3 hours of insomnia)=3 I'm having a lot of trouble sleeping (three to five hours)=4 I can't sleep for five to seven hours straight=5
10. To which state your neck pain affect your recreational activities?	I have no neck pain and can participate in all of my leisure activities=0 Despite minor neck pain, I can still participate in all of my recreational activities=1 Due to neck pain, I can participate in the majority of my typical leisure activities, but not all of them=2 Due to neck pain, I am able to participate in some of my typical leisure activities=3 Neck pain prevents me from engaging in many leisure activities=4 I am unable to engage in any leisure activity=5

Gant Chart

Activities/ months	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	June 24	July 24	Aug 24
Proposal presentation												
Introduction												
Literature review												
Methodology												
Data collection												
Data Analysis												
Result												
1st progress presentation												
Discussion												
Conclusion And Recommendation												
2nd progress presentation												
Communication with supervisor												
Final submission												