

**A STUDY TO EVALUATE THE EFFECTIVENESS OF
LUMBAR STABILIZATION EXERCISES ON LOW
BACK PAIN DISABILITY AMONG WOMEN WORKING
IN FIREWORKS FACTORY OF SELECTED VILLAGES
AT TIRUNEVELI DISTRICT.**

BY

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**DISSERTATION SUBMITTED TO
THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY
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**IN PARTIAL FULFILLMENT FOR THE DEGREE OF
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G	Copy of the tool(ENGLISH)
H	Copy of the tool(TAMIL)
I	English Interventional guide for lumbar stabilization exercises among women.
j	Tamil Interventional guide for lumbar stabilization exercises among women.

ABSTRACT

This study was undertaken to assess the effectiveness of lumbar stabilization exercises on low back pain disability among women working in fireworks factory of selected villages at Tirunelveli district.

The study carried out in partial fulfilment of the requirement for the degree of Master of Science in nursing at Sri. K.Ramachandran Naidu College of Nursing, under the Tamilnadu Dr.M.G.R. Medical University, Chennai during the year of October 2018.

THE OBJECTIVES OF THE STUDY WERE:

- ❖ To assess the pre and post test level of low back pain disability among women in experimental group and control group.
- ❖ To find out the effectiveness of lumbar stabilization exercises on low back pain disability among experimental group.
- ❖ To compare the pre and post test level of low back pain disability among the women in experimental group and control group.
- ❖ To associate the post test level of low back pain disability among women with their selected demographic variables in experimental group.

THE FOLLOWING HYPOTHESES WERE FORMED FOR THE STUDY AND ALL THE HYPOTHESES ARE TESTED AT 0.05 LEVELS:

H₁: Mean post test level of low back pain disability among women in experimental group will be significantly lower than the mean pre test level low back pain disability in experimental group

H₂: Mean post test level of low back pain disability among experimental group will be significantly lower than the mean post test level of low back pain disability among control group.

H₃: There will not be significant difference between mean pre test and post test level of low back pain disability in control group.

H₄: There will be a significant association in the post test level of low back pain disability among women with their selected demographic variables among women in experimental group.

Researcher adopted the Faye G. Abdellah's (1960), helping art of clinical nursing theory, which focused patient centered approach as the basis for her typology of 21 nursing problems, it directed action towards the explicit goal, this theory has 3 sections.

- Health care need
- Problem solving approach
- Health care need management

The research design selected for this study was quasi experimental pre test and post test control group design. The study was conducted in selected villages Varaganoor (experimental group) and Maiparai (control group) at Tirunelveli district by using convenient sampling technique. The tool used for data collection consisting of demographic variables like age, type of family, nutritional status, monthly income in rupees, marital status, educational status, occupation ,years of suffering with low back pain disability, years of working in fireworks factory etc.

The Modified Quebec scale was used to assess the level of low back pain disability among women working in fireworks factory.

The tool was validated by five experts consisting of four nursing experts and one medical expert and the reliability of the tool was confirmed by test re-test method. The value of the reliability was $r=0.9$, and hence the tool was highly reliable. The pilot study was conducted and the findings revealed that the tool was feasible and

practicable to conduct the main study. The main study was conducted in Varagnoor (experimental group) and Maiparai (control group) village. Sixty patients were selected by using non-probability purposive sampling technique.

MAJOR FINDINGS OF THE STUDY

- ❖ With regard to the age of women with low back pain out of 60 samples, 3(10%) were between the age group of 25-30 years, 11(36.66%) were between the age group of 41-45 years in the experimental group. Whereas 5(16.66%) were between the age group of 25-30 years, 9(30%) were between the age group of 41-45 years in control group.
- ❖ In relation to marital status out of 60 samples, 19(63.33%) were married in experimental group. Whereas 17(56.66%) were married in the control group.
- ❖ With respect to the educational status out of 60 samples, 7(23.33%) were uneducated, 11(36.67%) were completed middle school education. Whereas 5(16.66%) were uneducated, 11(36.67%) were completed middle school education in the control group.
- ❖ On analysis of nature of occupation out of 60 samples studied, 14(46.66%) were filling chemicals in empty crackers, 3(10%) were labeling individual cracker pieces and assembling. Whereas 16(53.33%) were filling chemicals in empty crackers, 5(16.66%) were labeling individual cracker pieces and assembling in the control group.
- ❖ With respect to income per month in rupees out of 60 samples, 7(23.66%) were earning between 3,000-4,000, 13(43.33%) were earning 4,001-5,000, 9(30%) were earning 5,001-6,000 and 1(3.33%) were earning 6,001 and above in the experimental group. Whereas (13.33%) were earning between 3,000-

4,000,16(53.33%) were earning 4,001-5,000,8(26.66%) were earning 5,001-6,000 and 2(6.66%) were earning 6,001 and above in the control group.

- ❖ On analysis of the nutritional status out of the 60 samples,2(6.66%) were underweight,11(36.66%) were overweight in the experimental group. Whereas 4(13.33%) were underweight,12(40%) in the control group.
- ❖ With regard to family type out of 60 samples, 13(43.33%) were in the joint family,15(50%) were in the nuclear family in the experimental group. Whereas 12(40%) were in the joint family,17(56.67%) were in the nuclear family in the control group.
- ❖ With regard to years of working in the factory out of 60 samples, 1(3.33%) were suffering from 6 months to 1 year, 17(56.66%) were suffering more than 3 to 5 years and above in the experimental group. Whereas in control group 2(6.67) were suffering from 6 months to 1 year, 15(50%) were suffering more than 3 to 5 years and above.
- ❖ With regard to years suffering with the low back pain disability out of 60 samples,4(13.33%) were suffering for 6 months to 1 year, 11(36.66%) were suffering more than 3 years to 5 years and above in the experimental group. Whereas in control group 5(16.67%) were suffering for 6 months to 1 year, 12(40%) were suffering more than 3 years to 5 years and above.
- ❖ The comparison of mean and standard deviation of pre-test and post-test on day 10 level low back pain disability in experimental group. In the experimental group mean pre-test value was 29.63 and SD was 5.09 and the Mean post-test on day 10 value was 22.96 and SD was 4.84. Their mean difference was 6.66 The calculated “t” value was 13.74.

- ❖ The mean pre-test value was 29.63 and SD was 5.09 and the mean post-test value on day 21 was 18.70 and SD was 4.50. Their mean difference was 10.93. The calculated “t’ value was 10.93.
- ❖ The comparison of mean pre test level of low back pain disability in the experimental group was 29.63 and SD was 5.09 and for control group the mean pre-test value was 30.80 and SD was 5.06. Their mean difference is 1.17, and the calculated “t’ value was 0.893.
- ❖ The comparison of mean and standard deviation of post-test on day 10 and 21 level of low back pain disability between the experimental and control group. The mean post-test day 10th value for experimental group was 22.96 and SD was 4.84. Their mean difference was 4.26, for control group the mean post-test on 10th day value was 31.43 and SD was 5.02. Their mean difference was 1.53. The calculated “t’ value was 6.66.
- ❖ The comparison of mean and standard deviation of post-test on 21st day level of low back pain disability between the experimental and control group. The mean post-test on day 21st day value for experimental group was 18.70 and SD was 4.50, for control group the mean post-test day 21st value was 32.96 and SD was 4.16. Their mean difference is 14.26. The calculated “t’ value was 12.76.
- ❖ Chi-square test to associate the post-test level of low back pain disability with the selected demographic variables in the experimental group. While analyzing the statistical significance at (P<0.05) level it shows that, there was significant association of the post-test level of low back pain disability with the selected demographic variables like age, nature of work, nutritional status, years of suffering with low back pain and years of working in factory except marital status, type of family, income and educational status at p<0.05 level.

- ❖ The chi-square test to associate the post test level of low back pain disability with the selected demographic variables in the control group. While analyzing the statistical significance at ($P < 0.05$) level it shows that, there was significant association of the post-test level of low back pain disability in the selected demographic variables like age, nutritional status, years of suffering with low back pain and years of working in factory except marital status, type of family, income, educational status, and nutritional status at $p < 0.05$ level.

ON THE BASIS OF THE STUDY, THE RECOMMENDATIONS AND IMPLICATIONS ARE:

The following studies can be undertaken to strengthen the study regarding effectiveness of lumbar stabilization exercises to reduce low back pain disability.

1. A Longitudinal study to assess the effectiveness of lumbar stabilization exercises to reduce low back pain disability.
2. A study to assess the effectiveness of lumbar stabilization exercises to reduce low back pain disability among workers in fireworks factory.
3. A study to assess the knowledge regarding effectiveness lumbar stabilization exercises to reduce low back pain disability among staff nurses working in orthopedic ward.
4. A comparative study to assess the effectiveness of lumbar stabilization exercise and yoga on reduction of low back pain disability among bus drivers.
5. An experimental study to assess the effectiveness of lumbar stabilization exercises on reduction of low back pain disability among software company workers.

Nursing personnel should develop sound knowledge about the low back pain disability among working women in fireworks factory. The Nurse educators need to be equipped with adequate knowledge regarding lumbar stabilization exercises to

reduce low back pain disability. Nurses should assist in implementing public health awareness Campaigns aimed at promoting lumbar stabilization exercises to reduce low back pain disability. Nurses should conduct research to further clarify the beneficial effects of lumbar stabilization exercises to reduce low back pain disability.

CONCLUSION

From the result of the study, it was concluded that administration of lumbar stabilization exercises to reduce low back pain disability was effective in reducing the low back pain disability. Therefore the investigator felt that more importance should be given to lumbar stabilization exercises to reduce low back pain disability.

CHAPTER - I

INTRODUCTION

“PAIN IS INEVITABLE, SUFFERING IS OPTIONAL “

BACKGROUND OF THE STUDY:

The daily routine of a majority of urban Indians driving over bad roads, sitting hunched over workstations or fiddling with their smart phones for hours, seems to be fuelling an epidemic of spine related problems. A new three month survey of 1300 people with back pain related problems across Mumbai, Pune, Delhi showed that person with sitting job, desk job have four fold risk to develop low back pain. Every fourth person suffered with spine and neck problem. **Times of India, (2015).**

The prevalence of musculoskeletal disease and low back pain is rapidly increasing in developing countries. The term low back pain is a common problem because the lumbar region bears most of the weight of the body. Being the most flexible region of the body, in lumbar region, it contains nerve roots that were vulnerable to the injury. **Sharon L Lewis et al,(2014).**

The world health organization’s global burden of disease study said lower back pain arising from ergonomic exposure at work is an important cause of disability. The study said lower back pain was emerging as a leading cause of absenteeism at work place and had resulted in 21.7 million disability adjusted life years (DALYS) in 2010. The largest number of DALYS (Measure of years lost due to ill health occurred in east Asia and south Asia. **World health organization,(2010).**

Low back pain contributes substantially to the workload of general practices. The origin of low back pain is not clearly known and has never been fully described. Many groups have given up trying to describe the causes of low back pain namely lumbo-sacral ligament and the weak muscles, spinal stenosis, stress, obesity and occasionally depression. **Share et al,(2008).**

According to Davidson's and Nicholas the book of internal medicine, back pain is a human condition, with 60-80% of the world's population experiencing pain at some time in their lives. Although there is no evidence that back pain prevalence has increased reported disability and absence of work Low back pain has increased significantly in the last 30 years. In the UK 7% of the adult population consult their general practioner each year with back pain at a cost of 500 Euros millions and 80 million working days are lost. **Davidson's Nicholas et al,(2006).**

A cross-sectional study was carried out to identify the reported morbidity profile of the people according to their age, gender, and organ system affected using International Classification of Diseases coding,(ICD) in the Tirunelveli District of Tamilnadu using a convenience sample of 12,308 persons from the forty-one panchayat units of 90 villages. Diagnosis made was coded using ICD 10 version and data collected was analysed by appropriate statistical methods to explain the distribution of morbidity profile among the study population. Out of total screened 38.1% were males and 61.9% were females. Majority had illness were related to affecting musculo-skeletal system such as: low back pain, joint pain, neck pain and shoulder pain. Study concluded that women have higher level of low back pain morbidity than male. **S Gopalan et al,(2006).**

A person is considered to have a low back pain disability if they have limitation in performance or function in everyday activities, difficulty in walking climbing stairs, lifting or carrying objects and performing activities of daily living.

Brunner and Suddarth's,(2005).

Most low back pain is the result of an injury, such as muscle sprains or strains due to sudden movements, or poor body mechanics, while lifting heavy objects. Low back pain can also be the result of certain diseases, such as cancer of the spinal cord, a ruptured or herniated disc, sciatica, arthritis, infections of the kidney and the spinal cord. **National Institute of Neurological Disorder And Stroke ,(2004).**

Multiple treatment options for acute and chronic low back pain are available. Broadly, these can be classified as pharmacological treatments, non- pharmacological treatments, injection therapies and surgical treatments. Pharmacological treatments include non-steroidal anti-inflammatory drugs (NSAIDS), acetaminophen, opioids, muscle relaxants, anti-seizure medications, antidepressant, and corticosteroids, Non-pharmacological treatments include exercise ,such as lumbar stabilization exercises and related interventions (e.g.,yoga), complementary and alternative therapies, (e.g., spinal region manipulation, acupuncture, and massage) psychological therapies,(e.g., cognitive-behavioral therapy, relaxation techniques, and interdisciplinary rehabilitation) and physical modalities (e.g., traction, ultrasound, transcutaneous electrical nerve stimulation [TENS] ,low level laser therapy, interferential therapy superficial heat or cold, back supports, and magnets).**Mayo clinic US,(2002).**

Exercise plays a very beneficial role on chronic back pain, repetition is the key to increasing flexibility, building endurance, and strengthening the specific muscle to support and neutralize the spine. Exercise should be considered as part of a broader program to return to normal homework and social activities. In this way the positive

benefits of exercise not only affect strength and flexibility, but also alter and improve patient's attitudes toward their disability and pain. Exercise moreover improves blood circulation, increases tolerance, reduces wasting of muscles and also reduces inflammation of muscles. There are different types of back pain exercises. Such as stretching exercise work best for reducing pain, while lumbar strengthening exercises are best for improving functions. **Braggins S Back,(2000).**

Muscle strengthening exercises are best for improving function and these exercises are called lumbar strengthening exercises. Generally these exercises attempt to strengthen the abdomen, improve lower back mobility, strength and endurance, and enhance flexibility in the hip, the hamstring muscles and the tendons of the back of the thigh. Lumbar stabilization exercises increases the strength and endurance of the lumbar paraspinal muscles. Extension exercises increase the lumbar extension range and produces extension stress. It also produces the centralization of pain. The centralization phenomenon occurs when a movement or position results in the migration of symptoms from an area of distal in the buttocks or lower extremity to a location more proximal or closer to the midline of the lumbar spine. It also increases cartilaginous repair and self-sealing phenomenon. **Kendall F,(2000).**

NEED FOR THE STUDY

The Institute of medicine, (2015) reported that musculoskeletal pain is the most common single type of pain disability, chronic low back pain is the most prevalent in this category. Low back pain is a major health problem all over the world. Most people suffer in incapacitating low back pain at some stage in their lives. It is estimated that 6.5 million people in the US are bed ridden because of the low back pain and resulting disability. Approximately 1.5 million new cases of low back pain are seen by physician in each month. There has been growing concern about the low

back pain in western society. In India occurrences of low back pain is also alarming, nearly 60% of the people in India have significant low back pain at some time or the other in the lifespan. Epidemiological studies provides important information regarding various risk factors such as sex, life-cycle, occupation, habit, socio economic status of sample and smoking associated with the severe low back pain. **Shymal K Gurupreet,(2015).**

The incidence of low back pain (LBP) in the general working population has been an issue for many years. Studies have indicated that 62-80% of people in human population will suffer from LBP at some times in their life. The incidence of low back pain however differed with age distribution, women showed an increasing prevalence, as they grew older, whereas men demonstrated a peak incidence at about 40 years of age. **Moluphyet al,(2014).**

Low back pain is one of the major health problem in the US and is associated with the largest number of years lived with disability moreover, as noted by Turk in 2008, there were more than 7.3 million emergency hospital rooms visit ,and more than 2.3 million hospital in patient stay, were related to the low back pain problems. **Journal of American Medical Association,(2014).**

In 2013 Global Burden of disease study revealed that years lived with disability (YLDS) are increasing due to population growth and aging in most countries around the world. As noted: “Leading causes of YLDS included low back pain as one of the top ten causes of YLDS in every country”.Again the economic burden of low back pain is quite large and continues to grow in the US, as well as internationally. Prevalence of chronic impairing back pain in the US increased from 3.9% in 2006 to 10.2% in 2010. Increase was seen in both men and women, about 80% of the world residents suffer from low back pain at any one time. The estimated

prevalence of low back pain is 6 million. **G Sheps Centre for Health Services Research,(2014).**

In India publication of a community based cross sectional study was carried out by Jawaharlal Institute of Post Graduate Medical Education and Research, Pondicherry. The study was conducted among 250 women in the age group of 30 to 65 years residing in nearby villages and working in the field (agriculture) and in industries (textiles, cotton mills, and chemical). Severity of pain was assessed using numerical pain rate scale and modified Oswestry low back pain disability questionnaire was used to measure disability. Overall prevalence of low back pain was found to be 42%. The majority of women (60.9%) with low back pain experienced moderate disability. **Indian Journal Of Pain,(2005).**

In Tamilnadu a longitudinal study was carried out at Virudunagar District by S.Gopalan and team to investigate whether individual or work related factors (physical) were involved in the occurrences of low back pain sickness absence in various industries such as match industry, printing industry, fireworks industry, heavy metal industry etc. Out of 1024 participants,92% participated were aged between 18 years and 65 years. Self administered questionnaire was given and result showed that individual factors did not influence sickness absence, whereas work related physical factors showed strong association with sickness absence. The main risk factor was low back pain occurs due to extreme stress on spine. **Indian journal of occupational and environmental medicine,(2004).**

In Annamalai District of Tamilnadu, a cross-sectional study was conducted by G.Sadashivam along with his colleagues among two hundred industrial workers of beedi making factory by single random sampling technique, the job involved sitting job for a prolonged period of time. Samples were aged between 18 to 60 years both

men and women. Interview schedule had four parts, socio-demographic detail, standard Nordic scale, numeric and facial rating tool. Result showed that prevalence of musculoskeletal pain in the last 12 month and 7 days was 83.6% and 78.5% respectively. The most common site for past 1 year was shoulder (59%) and for last 7 days was the low back pain (52.8%). Women showed major percentage. **Indian Journal of the Occupation and Environmental Medicine,(2004).**

A study which was conducted in metropolitan city of India using a telephone survey of about 4,400 household in 1992 and 5,300 household in year 2006 by the epidemiologists. Individual were considered to have chronic low back pain. They reported pain and activity limitations nearly every day for the past three months and they also reported more than twenty four episodes of pain that limited their activity for one or more days in the past year. Some evidences show that exercises specifically lumbar stabilization exercises reduces pain among 90-95% of the samples and it is more beneficial. **National Institute Of Arthritis And Musculoskeletal Disease, (2012).**

The muscle strengthening exercises by lumbar stabilization technique for patients with recurrent low back pain seems more effective in improving disability and health parameters than daily walks do. Lumbar stabilization exercises is recommended and widely used as treatment for low back pain. **Rasmussen Barr et al, (2012).**

Based on the above mentioned studies it is indicated that 62-80% of people in human population suffer from LBP, at some times in their life. Low back pain is one among top ten global burden of diseases. Low back pain disability found to affect the daily activities of life. Researcher has personal experience of low back pain and resulting level of disability and also by analyzing all the incidences and prevalence

rate of low back pain in India and worldwide particularly among women working in fireworks factories, and the complications and its effects on patients quality of life, the researcher selected this study to reduce the level of low back pain disability by providing lumbar stabilization exercises, which provides strength and endurance to back muscles.

STATEMENT OF THE PROBLEM

A study to evaluate the effectiveness of lumbar stabilization exercises on low back pain disability among women working in fireworks factory of selected villages at Tirunelveli District.

OBJECTIVE

- ❖ To assess the pre and post test level of low back pain disability among women in experimental group and control group.
- ❖ To find out the effectiveness of lumbar stabilization exercises on low back pain disability among experimental group.
- ❖ To compare the pre and post test level of low back pain disability among the women in experimental group and control group.
- ❖ To associate the post test level of low back pain disability among women with their selected demographic variables in experimental group and control group.

HYPOTHESES

H₁: Mean posttest level of low back pain disability among women in experimental group will be significantly lower than the mean pre test level of low back pain disability in experimental group.

H₂: Mean post test level of low back pain disability among experimental group will be significantly lower than the mean post test level of low back pain disability among control group.

H₃: There will not be a significant difference between mean pre test and post test level of low back pain disability in control group.

H₄: There will be a significant association between the post test level of low back pain disability among women with their selected demographic variable in experimental group and control group.

OPERATIONAL DEFINITION

Assess

In this study, it refers to systematically measuring and monitoring the level of low back pain disability before and after administration of lumbar stabilization exercises measured by Modified Quebec low back pain disability scale.

Effectiveness

In this study, it refers to the outcome of the lumbar stabilization exercises on low back pain disability among the women aged between 25-45 years of age working in a fireworks factory of Tirunelveli district, It is measured in terms of the difference between the pre-test and post-test level of low back pain disability.

Lumbar Stabilization Exercises

Lumbar stabilization exercises is an active form of exercises, which is designed to strengthen muscle, to support the spine and helps to prevent the low back pain disability.

In this study, lumbar stabilization exercises such as quadriceps stretch, hip flexor stretch, abductor stretch, hamstring stretch, dynamic hamstring stretch and

supine butt lift with arms at side, was given for seven days a week, for the period of three weeks, twice a day for 30 minutes per session (morning 9am and evening 6pm.)

Low back pain disability

Low back pain disability is a common disorder involving the muscle, nerves, bones of the back, and the pain can vary from a dull constant ache to a sudden sharp feeling.

In this study Low back pain disability refers to the presence of pain in the sacral region which has affected the ability to manage the everyday activities of women aged between 25-45 years, for more than a year, which was assessed by using Modified Quebec low back pain disability scale and the women with low back pain disability were included.

Fireworks factory

In this study, fireworks factory is a factory which manufactures fire crackers, which is a small explosive device primarily designed to produce a large amount of noise bang and which is situated in the Tirunelveli district of Tamilnadu.

Women

In this study, the women with low back pain disability aged between 25-45years working in fireworks factory of Tirunelveli district who fulfilled the inclusion criterias.

ASSUMPTION

- ✓ Low back pain disability may produce discomfort, restlessness, and irritation.
- ✓ Most of the women working in fire factory are experiencing pain in the low back and disability.
- ✓ Lumbar stabilization exercises may help in alleviating discomfort and relieving low back pain disability.

DELIMITATIONS

- ✓ The study is delimited to the women aged between 25-45 years of age.
- ✓ The study is delimited to four weeks period.
- ✓ The study is delimited to women working in fireworks factory.

PROJECTED OUTCOME

1. The study findings will help the women to reduce the low back pain disabilities.
2. The study findings will help to reduce the musculo-skeletal problems such as: sprain, strain, early fatigue, myalgia and related complications among women.
3. The findings of the study will help the nurses to administer the lumbar stabilization exercises among women with low back pain disability.

CONCEPTUAL FRAMEWORK

The conceptual framework for research study presents the measure on which the purpose of study is based. The framework provides the perspective from which the investigator views the problem.

The study is based on the concept of effectiveness of lumbar stabilization exercises in reduction of the low back pain disability among women. The investigator adopted the Modified Abdellah, stypology of given nursing problems as a base for developing conceptual framework.

Faye G Abdellah,(1960) proposed helping art of clinical nursing theory, which focused patient centered approach as the basis for her typology of 21 nursing problems, it directed action towards the explicit goal, this theory has 3 sections.

- Health care need
- Problem solving approach
- Health care need management

Health care need

Nursing problem defined as any condition presented of faced by a client or family for which a nurse can offer assistance. The problem can be overt (an apparent condition faced by client and family) or covert (a concealed or hidden problem).

In this study, the low back pain disability was faced by the women aged 25-45 years. Pre assessment level of low back pain disability was assessed by Modified Quebec scale for both group experimental and control group. After collecting data the group was divided into experimental and control group.

Problem solving approach

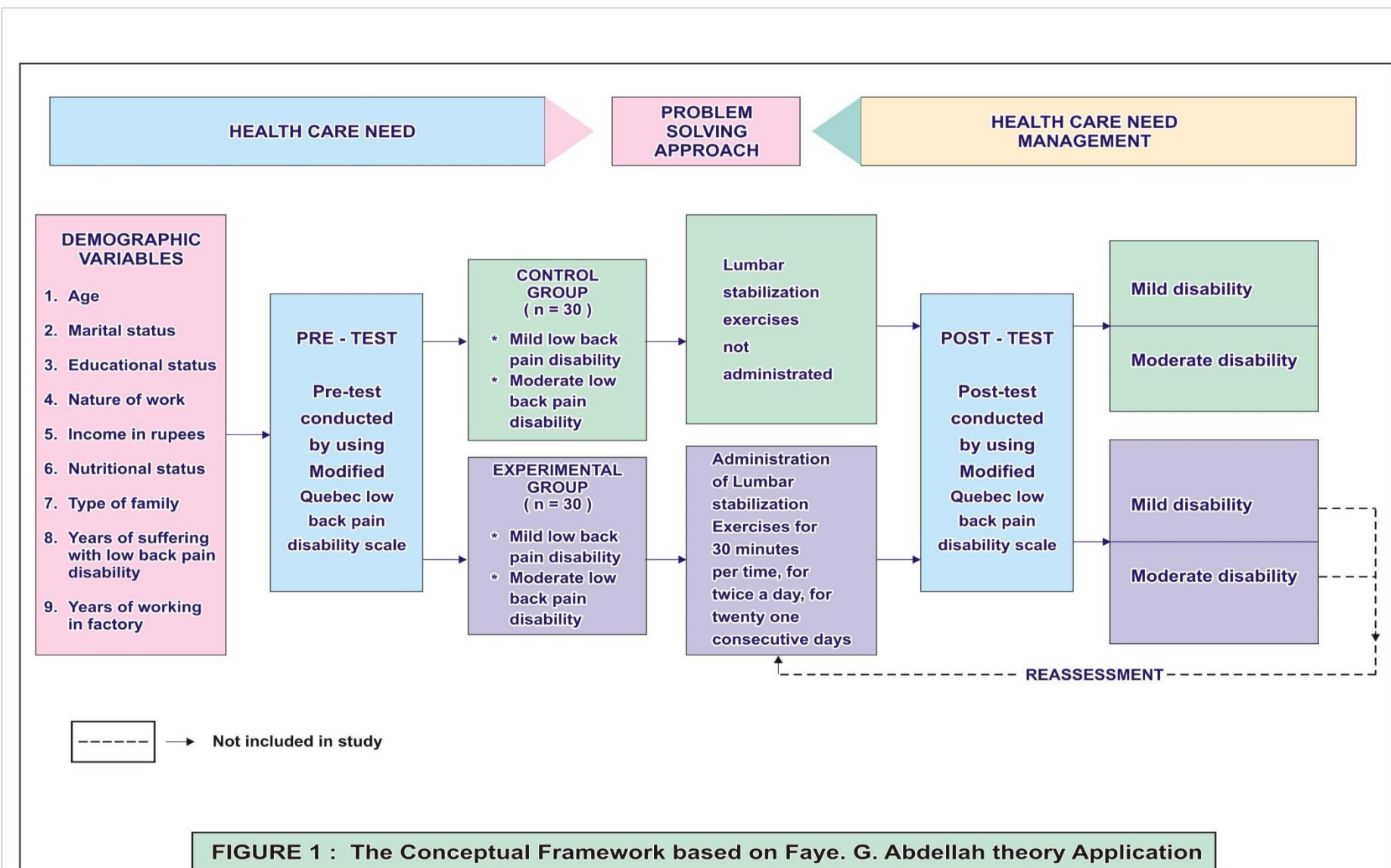
The analyzer identifies overt and covert problem and interprets, analyzes, and selects an appropriate course of action to solve the problem. A nurse must be able to solve the problem and render the best professional nursing care.

In this study, lumbar stabilization exercises for 30 minutes in morning 9 am and evening 6 pm for the period of 3 weeks was given to experimental group and no intervention was given to control group.

Health care need management

It helps to meet the clients need, increases or restores self-help ability or alleviates impairment.

In this study, lumbar stabilization exercises can be used to eliminate low back pain disability and restores normal trunk range of motion in daily living activities.



CHAPTER-II

REVIEW OF LITERATURE

A Review of literature refers to the process in which the investigator examines the strength and weakness of the appropriate scholarly publications.

Review of literature of the present study is arranged in the following headings.

SECTION A: Studies related to prevalence of low back pain disability among women.

SECTION B: Studies related to effects of low back pain disability among women.

SECTION C: Studies related to treatment modalities of low back pain disability.

SECTION D: Studies related to effect of lumbar stabilization exercises on reduction of low back pain disability.

SECTION A: Studies related to prevalence of low back pain disability among women

Vikki J Parikh Pulki,(2015) conducted a retrospective study at private multispecialty Gujrat on prevalence of low back pain disability. Data from April 2014 to March 2015 was analyzed with the permission of hospital authority .They analyzed data and reported that 210 patients diagnosed with chronic low back pain between age of 36 years to 40 years were most common culprits. Among these, 82 (39.05%) were male and 128 (60.95%) were female. Among males, 65 (79.27) were overweight (BMI \geq 25.00) and among females, 95 (74.22%) were overweight .Study concluded

that females were more affected by Low back pain disability. People in age group of 36 years to 40 years are more affected with low back pain.

Shahul hameed,(2015) carried out a cross-sectional study to relate Work Related Low Back Pain (WRLBP) as one of the major Work-related Musculoskeletal Disorders (WMSD's) amongst the blue collar Professionals in Coimbatore city of India. Cornell Musculoskeletal Discomfort Questionnaire was administered to capture the factors pertaining to the occurrence of Low Back Pain (LBP) in four hundred factory workers. Univariate Exploratory Analysis was employed and the means between the groups with and without back pain were tested using Independent t- test. It was inferred that 54% (N=162) male employees and 42% (N=98) female employees have reported LBP. The given study thus concludes that the Low Back Pain is the major Work Related Musculoskeletal Disorder among the factory workers studied.

NurulIzzah Abdul Samad,(2014) conducted a cross sectional study in nine factories in the Klang Valley(Malaysia) to assess prevalence of low back pain. Two hundred and seventy two respondents who fulfilled the study criteria volunteered to participate in the study. Information on low back pain was assessed using a Nordic Questionnaire. The prevalence of low back pain was 40.4% among respondents. Lifting load (28.0%) was ranked as the main factor which contributed to low back pain, followed by prolonged sitting (25.2%). Poor mental health (OR 1.11,95% CI 1.06-1.15) was the risk factor to low back pain. Study concluded that the prevalence of low back pain was 40.4% among factory workers in Klang Valley.

Margetate Molumphyet al,(2012) reported the result of study to assess and determine the incidence of work related low back pain (LBP) in physical therapist and to identify common characteristics of therapist who reported the work related LBP in America. Questionnaire was mailed to random sample of 500 registered physical

therapist. From the 344 returned mail, 29% reported low back pain. The initial onset of (LBP) occurred between the age of 21 and 30 years and within the first four years of experience as a physical therapist. Thirty three percent of the therapist first incurred work related LBP during treatments of patient primarily. The study concluded that the further research is necessary to investigate the effect of work related LBP has on productivity and quality of patients care within facility and to identify preventive measure to decrease the incidence of work related LBP.

Mohd Nazeer,(2011) carried out a retrospective study among the patients who were admitted and treated at a private Orthopedic Hospital, Udai clinic at Hyderabad during the period January-2011 to July- 2011 to assess prevalence of low back pain. Three hundred patients of low back pain between the age group of 31-70 years of both sexes. In 300 cases of low back pain studied, there were 122 cases of heavy physical work (41%), 57 cases of prolonged sitting/standing (19%), 50 cases of definite history of fall/trauma (17%) and 35 cases of bad posture (12%). In 36 cases the cause for backache is unknown (12%). Among 300 cases of low back pain studied, there were 138 males (46%) and the number of females was 162 (54%).Study concluded that more females are affected with low back pain than males.

Carey and Freburger,(2009) conducted a cross-sectional telephone based survey of the representative sample of North Carolina household to find the prevalence of low back pain, 4437 households were contacted in 2006 and 5357 households were contacted in 2004 to identify non-institutionalized adults 21 years and the older with chronic pain disability. The prevalence of chronic impairing LBP rose significantly over the 14 year interval, from 3.9%(95% CI: 3.4-4.4) in 1992 to 10%(95% CI:9.3-11) in 2006.Increases were seen for all adult age strata, in males and females, and in the white and black races. The proportion of individuals who sought

care from a health care provider in the past year increased from 72% to 84%. Study concluded that the prevalence of chronic impairing LBP has risen significantly, with continuing high level of disability and care utilization.

Wassel J T et al,(2000) carried out a cross-sectional survey among the two hundred and twenty two females with an aim to investigate the prevalence of musculoskeletal disorders in Philadelphia. Self-reported questionnaire was used to obtain information from the subjects. The result showed that more than one third of all women (36.9%) reported a current musculoskeletal problem at some body site. By location, 13.5% of them reported disorder of low back pain in comparison with the disorder of other parts like neck (9.5%), knee (5%), forearm (2.7%), legs (2.3%), and feet (1.8%). Thus it was concluded that the low back pain injuries are the commonest musculoskeletal injuries among women.

LAM Elderset al,(2001) conducted a prospective cohort study to describe the natural history of low back pain by its prevalence, incidence, and recurrence in Netherlands during a 3 year period and identify risk factors for cumulative incidence and recurrence of low back pain in scaffolds. Between 1998 and 2001, a cohort of 288 scaffolds (response 85%) completed a questionnaire at baseline and at 3 yearly follow-ups during 3 years. At baseline 60% of the study population had an episode of low back pain in the past 12 months of which 22 % was of chronic nature. During follow-up the yearly incidence of low back pain varied between 20%-28%, while yearly recurrence rates were 64% to 77%. Only few workers consistently reported the presence (20%) or absence (26%) of low back pain each year. Study concluded that low back pain was a dynamic process with high rates for incidence, recurrence, and recovery. General health and work-related physical and psychosocial factors influenced both the incidence and recurrence of low back pain. The incidence and

recurrence of low back pain depend strongly on the recall period of low back pain and the time-window of investigation.

SECTION B: Studies related to effects of low back pain disability among women.

Rahman Panahi,(2016) conducted a a cross-sectional descriptive study in Tehran Iran, to find the effect of low back pain in students. Two hundred eligible students were enrolled through purposive sampling technique. Data was obtained based on demographic data questionnaire, the Roland-Morris Disability Questionnaire and SF-36 inventory. All data were entered into statistical package (SPSS) version 19 and analyzed. Results of this study showed that 60.3 percent (114 people) of students were living with low back pain. Based on Roland-Morris disability questionnaire, 80 percent (91 people) of those with low back pain were suffered from disability. The chi-square test showed there was a significant relationship between quality of life (QOL) (mental health and social function) and disability due to low back pain. It also was shown that indirect relationship between all aspects of QOL and disability due to low back pain was existed. This study indicated low back pain could affect not only on students' physical aspects of quality of life but also psychological and social aspects of quality of life could be decreased. Considering these effects of low back pain among students, multidimensional interventions regarding bio- psychosocial dimensions recommended to improve the quality of life of this target group.

Ryan et al,(2016) conducted a observational cross-sectional study at the Philadelphia to know the effect of LBP. Among fifteen individuals with chronic low back pain and fifteen healthy controls matched for age, gender, and occupation. Participants wore an activity monitor for seven days. Level of physical activity was measured as time standing and walking, and number of steps averaged over a 24-hour

day (midnight to midnight), day time (9.00 am – 4.00 pm), and evening time (6.00 pm – 10.00 pm), and work days versus non-work days. Pattern of physical activity was measured as number of steps during short (< 20 continuous steps), moderate (20–100 continuous steps), long (> 100–499 continuous steps), and extra long walks (\geq 500 continuous steps). Over an average 24-hour day, the chronic low back pain group spent 0.7 fewer hours (95% CI 0.3 to 1.1) walking, and took 3480 fewer steps (95% CI 1754 to 5207) than the healthy controls. They took 793 fewer steps/ day (95% CI – 4 to 1591) during moderate walks, and 1214 fewer steps/day (95% CI 425 to 2003) during long walks, and 11 fewer steps/min (95% CI 4 to 17) during extra long walks than the healthy controls. Study concluded that individuals with chronic low back pain have a lower level, and an altered pattern, of physical activity compared with matched controls.

Khaled S Heissam,(2015) carried out a cross sectional study to estimate the prevalence of low back pain(LBP) and its effect on quality of life on 259 individuals aged in-between 18 to 60 years in Islamia. Data were collected through a semi structured questionnaire containing three parts 1st part containing socio-demo-graphic information, 2nd part about characteristics of LBP and 3rd part investigating the effect of LBP on QOL through Oswestry disability questionnaire. Prevalence of LBP was 48%, it was more in males (57.3%) than females (42.7%). There was statistically significant relationship between LBP and each of age, marital status and the income. (61%) of patients with LBP had minimal disability, (24%) had moderate disability, (12%) had severe disability, (2%) were bed-bound or exaggerate their symptoms and (1%) were crippled. There was statistically significant relationship between degree of disability and each of age, gender, marital status, residence and income. LBP is a

prevalent disorder and has a significant impact on work, lifestyle and social well-being.

Sathya,(2015) reported the symptoms of depression, anxiety and stress in individuals having mechanical low back pain through the cross-sectional study which was conducted amongst to 50 patients by using depression, anxiety and stress using DASS-21scale. Study found that depression is seen more with the younger age group (48.64%) i.e. 22 people from the age group of 25-35 years have either-mild, moderate or severe depression as compared to the older age group where depression accounts for 15.38% i.e.-5 people from the age group of 36-45 years have either- mild, moderate or severe depression. 29.72% (25 people) have severe anxiety in the age group 25-35 years whereas 5.88% (11 people) suffer from severe anxiety in the age group from 36-45 years. The severity of stress was more in the older age group of 36-45 years (23.07%) i.e.-out of 13 people 3 suffered from severe stress as compared to the younger age group (21.62%) i.e.-out of 37 people 8 suffered from severe stress. Depression, anxiety and stress has clearly been shown to influence the clinical course of mechanical low back pain, screening for above symptoms is crucial for optimal physical therapist management.

Fisioter,(2015) carried out a observational descriptive study in Brazil to identify the prevalence of sleep disorders among individuals with chronic low back pain(CLBP), and investigate whether there is an association between these disorders and perceived functional disability. A number of 51 patients seen at the Clinic of the School of Physical Therapy of Santa Catarina State University were selected. Data were collected through interviews addressing socio-demographic and clinical data, and administration of the Roland-Morris Disability Questionnaire (RMDQ) and Pittsburgh Sleep Quality Index (PSQI). Participants had high levels of functional

disability (mean, 16.71 ± 4.16 score points). 82.35% of patients had poor sleep quality (mean, 10.22 ± 4.84 score points). The PSQI components with the highest mean scores were: sleep latency and sleep disturbances. There was also a weak association between functional disability and sleep quality (Spearman = 0.31; $p = 0.025$), i.e, the higher the disability, the worse the quality of sleep. They found a high prevalence of the sleep disorders among patients with CLBP, and a weak association with the level of perceived disability.

Abbas Tavallai,(2014) conducted the result of descriptive study about the relationship between prevalence of chronic low back pain (CLBP) and the personality characteristics. The descriptive study was conducted on 101 patients who suffer from CLBP were referred to neurosurgery and orthopedic clinic in USA. Information were collected through MMPI2 (for find personality traits) & McGill pain questionnaires, Visual analogue scale (VAS) and the socio-demographic characteristic questionnaires. The McGill pain questionnaires investigated the four aspects (sensory-discriminative aspect of pain, an affective aspect of pain, cognitive evaluative aspect of pain and miscellaneous aspects of pain),101 patients enter to this study, 46 of them were men and 55 were women. With the mean age of 45/5 years old. The severity of pain in women was higher than men. There is no relation between age and personality related characteristic ($P > .05$),but the prevalence of hysteria and hypochondriasis were high in older patient there is a relation between sex and personality characteristic in hysteria trait($p < /01$). Patient with high score in hysteria and hypochondriasis trait had a pain according to VAS ($p < /01$).Study concluded that there is relationship between,(CLBP)and personal characteristics.

Lorraine H De Souza,(2014) conducted a unstructured interview in London to describes the consequences of living day-to-day with CBP and documents the

'insider' accounts of its impact on daily life. 'Framework' approach with topic guide, were recorded and transcribed verbatim. A number of 11 subjects were sampled for age, sex, ethnicity and occupation from new referrals with back pain to a rheumatology outpatient clinic. Eleven subjects (5M; 6F) were interviewed (N=11). Interviews were read in depth twice to identify the topics. Data were extracted in phrases and sentences using thematic content analysis. Four themes were emerged: sleep, rest, mobility, independence and leisure. All subjects reported issues about sleep and rest, nine (9) about mobility, seven (7) about independence and six on leisure. Most descriptions concerned loss and limitation in daily life. Strategies for coping with sleep disruption and physical limitations were described. The study concluded that chronic low back pain causes significant difficulty in activities of daily living.

Marino,(2014) conducted a cross sectional descriptive survey to report about the prevalence of depression among low back pain (LBP) patients and to investigate the socio-demographic characteristics of patients with LBP and relationship between depression and pain intensity in LBP patients. The study was conducted on 99 patients treated at Clinical Department of Neurology, Split University Hospital Center. There were 36 (36%) men and 63 (64%) women. Some degree of depression was present in 73 (74%) study patients, including all patients with severe LBP. In the group of patients with severe LBP, the rate of moderate, severe and very severe depression was 1.36-fold that recorded in the group of patients with moderate LBP and 2.58-fold that found in the group of patients with mild LBP ($\chi^2=16.2$; $p=0.003$). The most common symptoms were general physical symptoms 70 (71%), psychic anxiety 69 (70%) and depressed mood 66 (67%). It is concluded that depression was more severe in LBP patients with severe disease compared to patients with mild or moderate LBP.

S Himalowa,(2012) conducted a cross-sectional study in Africa to determine the prevalence as well as the effect of occupationally-related low back pain on the functional activities of workers in a construction company in Cape Town. The questionnaire comprising demographic data, low back pain symptoms information, functional limitations scale and the participation restriction scale was used in 200 participants. Workers suffered physical, emotional, financial and functional problems with 41.5% reporting sickness absence. Lifting and bending were the most affected activities associated to low back pain ($p < 0.05$) while walking/running, recreational activities and carrying out of everyday tasks were among the restricted activities. Study concluded that one year prevalence of low back pain was 25%, comparable with that of developed countries. All stakeholders must be procured for the prevention and management of occupationally-related low back pain in order to prevent functional activity limitations among construction workers.

Chung Wei Christine Lin,(2011) did a systematic review to examine the relationship between physical activity and disability in LBP. The literature search included 6 electronic databases and the reference list of relevant systematic reviews and studies in May 2010. To be included, studies had to measure both disability (eg, with the Roland Morris Disability Questionnaire) and physical activity (eg, by accelerometry) in patients with non-specific LBP. Two independent reviewers screened search results and extracted data, and authors were contacted for additional data. Correlation coefficients were pooled using the random-effects model. The search identified 3213 records and 18 studies were eligible for inclusion. The pooled results showed a weak relationship between physical activity and disability in acute or sub-acute (<3 months) LBP ($r = -0.08$, 95% confidence interval = -0.17 to 0.002), and a moderate and negative relationship in chronic (>3 months) LBP ($r = -0.33$, 95%

confidence interval = $-.051$ to $-.015$). That is, persons with acute or sub-acute LBP appear to vary in the levels of physical activity independent of their pain-related disability. Persons with chronic LBP with high levels of disability are also likely to have low levels of physical activity.

SECTION C: Studies related to treatment modalities for low back pain disability.

Brenda Goodman MA,(2011) performed an interventional study at USA to assess the effectiveness of massage therapy on LBP among adults .In this study randomly assigned 400 adults with moderate to severe LBP were received massage therapy for three months to either weekly whole body or weekly massage that focused on specific muscle problems around the hips and abdomen. People assigned to the usual care group were tracked by researcher, but they dealt with their back problems on their own. The approach could include, for instance, taking pain medicine and muscle relaxant, seeing doctors or chiropractors, physical therapist, or simply not doing anything. At the end of 10 week intervention, low back pain disability was assessed by 2 to 4 points on a 23 point scale. Thirty six of patient in the groups said their pain was nearly or completely gone, compared to 4% in the usual care group.

Sherman,(2010) conducted a randomized trial comparing yoga stretching and self-care book for low back pain in Puget area. A total of 210 participants with low back pain, lasting at least 3 months, were recruited from primary care clinics. They were randomized in a 2:2:1 ratio to receive 12 weekly yoga classes, conventional therapeutic exercise classes of comparable physical exertion. Roland Morris and Bothersomeness of pain scale was used to find the level of low back pain. He concluded that yoga plays an important therapeutic option for treating chronic back pain. Significant session to session improvements were noted on pain ratings and

mood status to the people with chronic low back pain. In this study, a brief four sessions standardized self-hypnosis protocol, combined with psycho education was used which showed significantly and substantially reduced pain intensity and pain interference. Yoga classes were more effective than a self carebook, but not effective than stretching classes in improving low back pain.

Mereket al,2010) carried an interventional study at Sheffield University in the United Kingdom, looked at the long term symptom reduction and economic benefits of acuapunctures for persistent low back pain. An average of 8 acuapuncture treatments was given to 159 people, while 80 people received usual care. After one year, people receiving acuapuncture at reduced pain and reported a significant reduction in worry about their pain compared to the usual care group. After two years the acuapuncture group was significantly more likely to report that the past year had been pain free. They were less likely use medication for pain relief. Visual analog scale was used in meta-analysis assess the effectiveness of spa therapy (water therapy) and balncothrery (mineral spring bathing) upon low back pain. The data for spa therapy, assessed on a 100mm visual analogue scale, suggest significant beneficial effects compared with waiting list control groups (weighted mean difference 26.6mm, 95% confidence interval 20.4-32.8, n= 442) for patients with chronic low back pain. For balncotherapy the data assessed on a 100mm visual analogue scale, also suggest beneficial effects compared with control groups (weighted mean difference 18.8mm, 95% confidence interval 10.3-27.3, n=138).

Adamczy, (2009) carried out the randomized study in Spain compared the outcomes of two different physiotherapeutic approaches to the treatment of low back pain in group of 60 female patients. In the experimental group, a customized programme of treatment was based on the post isometric relaxation of muscles and

ligaments, active mobilization of the spine, kiber fold mobilization, kinesiology tapping and the Maigne's Relaxing exercises. The control group underwent electrotherapy procedures and performed a set of exercises usually recommended for low back pain. Bantard pain rate scale and Quebec pain rate scale was used. As a result of the treatment, low back pain was reduced in about 90% of patients the experimental group. In the control group radiating pain decreased and ligaments in 25% of participants, while other parameters did not change significantly.

Yuan,(2009) conducted a randomized controlled trial in China involving 30 samples on different frequencies of acupuncture treatment for chronic low back pain was done to examine the effectiveness of two frequencies of acupuncture treatment for chronic low back pain. Participants with chronic low back pain were randomized into two groups to receive 10 acupuncture treatments: Low Frequency Group, 2 times per week for five weeks (n=15), High Frequency Group, 5 times per week for two weeks (n=15). The outcomes were measured at baseline using visual analogue scale, 2 weeks, 5 weeks, 3 months and 1 year: It showed that the compliance rate was 100% for each group. There were no significant differences between the groups in terms of any of the outcomes, at each follow-up time point.

McDonough,(2008) has done a systematic review among Chinese patients on treatment regimen of acupuncture for low back pain to investigate the difference in acupuncture treatment regimens for low back pain among textbooks, clinical studies and clinical practice, and explore reasons for such differences. Data on detailed acupuncture treatment regimens were extracted. For chronic nonspecific low back pain, the outstanding differences in the regimens found were:(i) two extreme frequencies of the treatments were used across all sources (1-2 times per week vs. 5-6

times/week). (ii) Clinical studies and surveys (9-11) reported the use of many more points per session than Chinese experts (5 points).

LindstotamI,(2004) conducted a randomized study on effectiveness of acupressure in and analgesics for LBP in Brisbane. The samples were selected by randomly 90 adults with LBP were participated. Intervention started and administered twice a week for 4 weeks. During this period the researcher assessed the other serious complications. Visual analog scale was used as a tool. The researcher found that 95% a statistically p value ($p < 0.05$) and reported a low dropout rate and low back pain.

Taimela et al,(2003) conducted a descriptive study to evaluate the reoccurrences of low back pain among patients receiving active low back rehabilitation program in Lybia. Hundred and twenty five patients with recurrent or chronic low back pain an average of 14 months, after completion of a twelve week active low back rehabilitation programme. Quebec pain rate scale and Rolland Morris scale was used. They found that recurrences of persistent pain occurred significantly less frequently among those who had maintained regular exercise habits after the treatment than those who had maintained regular exercise habits after the treatment than those who had been physically inactive. They also found that less work absenteeism.

Hurley DA et al,(2001) conducted a randomized double blinded trial study in the Ireland and compared a inferential stimulation or low frequency electrical stimulation (IFS) or horizontal therapy or electrotherapy (HT) with the sham stimulations or placebo to reduce (LBP).105 older women with chronic low back pain due to multiple vertebral fractures were participated in this study. All participants received a full therapeutic exercise programme, and blinded evaluation revealed no

difference between the groups following 2 weeks of active or sham stimulation. The active stimulation groups showed post-treatment improvement of about 30% in visual analogue scores (VAS) for pain. The study concluded that the proportion of patients who improved in the horizontal therapy group was greater than sham group.

SECTION D: Studies related to effect of lumbar stabilization exercises on reduction of low back pain disability.

Bashir Bello,(2017)performed a single blind randomized clinical trial in India to compare the effects of lumbar stabilisation and treadmill walk on multifidus activation, pain and functional disability in individuals with chronic mechanical low back pain(CMLBP).Fifty-three individuals (23 females and 30 males) with CMLBP participated. Consecutive participants were recruited and randomly assigned to Lumbar Stabilisation Group (LSG; n = 27) and Treadmill Walk Group (TWG: n = 26). However, 50 participants, (LSG: n = 25; and TWG: n = 25) completed the three week study. Participants in the LSG had lumbar stabilisation exercises using McGill protocol while those in the TWG had walking exercise on a treadmill using the Bruce protocol. Outcomes assessed were: Pain Intensity (PI) using Visual Analogue scale, Functional Disability (FD) using Oswestry Disability Index Questionnaire; and Multifidus Muscle Activation (MMA) level using a surface electromyography machine. Data were analysed using descriptive statistics, paired and independent t-tests at $\alpha 0.05$. Participants in both groups were comparable in age (46.60 ± 11.60 vs 45.20 ± 12.91) years. At baseline, PI, FD and MMA values were comparable in both groups. At the end of eighth week of the study, the LSG when compared with the TWG, had lower scores in PI (2.60 ± 0.48 vs 4.50 ± 0.12), FD (24.20 ± 4.06 vs 40.00 ± 10.56), with a significant higher MMA levels (40.00 ± 4.16 vs

26.95±4.04). Lumbar stabilisation exercises are more effective than treadmill walk in the activation of multifidus muscle, reduction in pain and functional disability in individuals with CMLBP. Lumbar stabilisation exercises are recommended in the management of chronic mechanical low back pain

Hye Jin Moon et al,(2013) conducted a prospective and randomized study to compare the effects of lumbar stabilization exercises and lumbar dynamic strengthening exercises on the maximal isometric strength of the lumbar extensors, pain severity and functional disability in patients with chronic low back pain (LBP). Patients suffering nonspecific LBP for more than 3 months were included into lumbar stabilization exercise group (n=11) or lumbar dynamic strengthening exercise group (n=10). Exercises were performed for 1 hour, twice weekly, for 8 weeks. The strength of the lumbar extensors was measured at various angles ranging from 0° to 72° at intervals of 12°, using a Med X. The visual analog scale (VAS) and the Oswestry Low Back Pain Disability Questionnaire (ODQ) were used to measure the severity of LBP and functional disability before and after the exercise. Compared with the baseline, lumbar extension strength at all angles improved significantly in both groups after 8 weeks. The improvements were significantly greater in the lumbar stabilization exercise group at 0° and 12° of lumbar flexion. VAS decreased significantly after treatment; however, the changes were not significantly different between the groups. ODQ scores improved significantly in the stabilization exercise group only both lumbar stabilization and dynamic strengthening exercise strengthened the lumbar extensors and reduced LBP.

Pahilag Raghani Pinky,(2010) conducted an experimental study to assess the combined effect of lumbar stabilization exercise and interferential therapy or low frequency electrical therapy in subjects with chronic low back pain was done in India.

A convenient sample of 30 subjects undergoing study was divided into control group 15 and experimental group 15 with mean age of 40 years, the outcome measures were assessed by visual analog scale and Oswestry disability index. The outcome measures were obtained on first and sixth week of post treatment intervention. Result showed the significant ($p=0.0007$) reduction in pain and improvement in disability of experimental group than control group. The study concluded that combined therapy of lumbar stabilization exercise with interferential therapy was more effective in the treatment of chronic low back pain.

Bjithranc,(2009) conducted an experimental study or interventional study in the India to assess the effectiveness of lumbar stabilization exercises to reduce back pain among the antenatal mothers between 28 weeks to 36 weeks of gestation. Total samples 60 were divided into two groups that are experimental and control group each contain 30 samples. In this study, the activities are performed to pull tightly and releasing the back muscles to reduce the pain and increase the flexibility. This activity was carried over for 20 to 30 sec and repeated 10 times per days for a period of 2 weeks. McGill and Quebec scale was used. These activities includes wall thigh slide exercise, wall inner thigh slide, seated leg reach, back twist. There was significant reduction in low back pain level after the intervention in experimental group at $p<0.05$ level. The study suggests that allowing pregnant women to take more rest breaks and to have more job autonomy may reduce the severity of back pain.

Norris C et al,(2008) carried out a controlled clinical trial study to assess the effect of an integrated lumbar stabilization exercise programme on a chronic low back pain population, fifty nine patients were included in the study and were divided into two groups. Participants in the intervention groups were prescribed a 6 week individualized exercise program in three stages. In stage I, exercises addressed posture and movement dysfunction and activated the back stabilizing muscles, In

stage II, 'back fitness' was enhanced using progressive exercise principles. In stage III, they emphasized technique specific actions. Participants in the control group received a back care advice leaflet only. The outcome was measured Using Quebec scale and McGill pain scale. They concluded that integrated back programme significantly reduced pain and disability as compared with that achieved by a back pain advice leaflet.

RempeltsJ,(2008) Conducted a randomized comparative study in the Spain to find effectiveness of spine exercise, manual therapy and minimal therapy, for patients of age group 18-65 years, with chronic low back pain . Randomization was stratified based on age, gender, degree of pain. Total of 302 patients participated in this study and were divided into three groups. The spinal stabilization group, manual therapy group, and the minimal care group. Outcome was measured by Oswestry disability index and Nottingham health profile. The study concluded that spinal stabilization exercise was more effective than manual therapy or minimal care. Lumbar stabilization exercise has been proved to reduce level of low back pain and increase the function in chronic low back pain.

StandaertCJ,(2008) carried out a Randomized Controlled Trial from Australia. They compared General Exercise with lumbar (stabilization) Exercise and Spinal Manipulative Therapy (SMT) in patients of 18 to 80 years with Chronic Low Back Pain greater than 3 months. 66 participants were selected, 33 in each group. The groups receiving general exercises received stretching, and strengthening of major muscle groups, aerobic fitness and the lumbar stabilization group received training for Transverse Abdominals, Diaphragm and pelvic floor and the SMT group received joint mobilization and manipulation. Outcomes included the Patient Specific Functional Scale, Visual Analogues Scale and the Roland Morris Disability Questionnaire. The study concluded that lumbar stabilization exercise and Spinal

Manipulative Therapy result in better short term function and perception of effect than General exercise for patients with Chronic Low Back Pain.

Hentry P E,(2006) performed a randomized controlled trial study in Africa to assess the aerobic walking programme versus lumbar stabilization exercise programme for chronic low back pain among patients with chronic low back pain. Fifty-two sedentary patients, aged 18-65 years with chronic low back pain were participated in this study, they administered lumbar stabilization exercise to experimental group and moderate intense treadmill walking to control group for thrice a week for 4 weeks. It was measured by Six-minute walking test, back and abdomen muscle endurance tests, Oswestry Disability Questionnaire, Low Back Pain Functional Scale (LBPFS). Significant improvements were noted in all outcome measures in both groups with non-significant difference between groups. The mean distance in meters covered during 6 minutes increased by 70.7 (95% confidence interval (CI) 12.3-127.7) in the 'walking' group and by 43.8 (95% CI 19.6-68.0) in the 'exercise' group. The trunk flexor endurance test showed significant improvement in both groups, increasing by 0.6 (95% CI 0.0-1.1) in the 'walking' group and by 2.2 (95% CI 0.3-1.8) in the 'exercise' group. The study concluded that the four weeks lumbar stabilization exercise programme was an effective method to reduce the low back.

Mindy C Cairns et al,(2006) conducted a randomized controlled trial in the Brazil to evaluate the effect of adding lumbar stabilization exercise to conventional physiotherapy for patients with recurrent low back pain. A total of 97 patients with recurrent low back pain were recruited and were 36 randomly assigned to two groups; conventional physiotherapy consisting general active exercise and manual therapy, conventional physiotherapy plus specific lumbar stabilization exercises. Outcome measures include duration of symptoms and Rolando Morris disability questionnaire

at 12 month was primary outcome. Pain, quality of life and psychologic measures were collected at 2 and 3 weeks. Results suggested that both groups showed improved physical functioning, reduced pain intensity and an improvement in physical component of quality of life. The study concluded that patients with low back pain had improvement with both treatment s lumbar stabilization exercise and conventional physiotherapy.

CHAPTER -III

RESEARCH METHODOLOGY

This Chapter describes the methodology to evaluate the effectiveness of lumbar stabilization exercises to reduce low back pain disability among women working in fireworks factory.

This chapter provides a brief description of the method adopted for the study. It includes research approach, research design, setting of the study, population sample, sample size, sampling technique and criteria for selection of samples development and description of tool. Pilot study plan for data analysis and protection of human rights.

RESEARCH APPROACH

Quantitative research approach was used.

RESEARCH DESIGN

The Research design adopted for the study was quasi experimental pre test and post test control group design.

GROUP	PRE – TEST	INTERVENTION	POST – TEST
Experimental group	O ₁	X	O ₂ O ₃
Control group	O ₄	-	O ₅ O ₆

KEY

O₁,O₄- Pre test level of low back pain disability among experimental group and control group

X – Administering lumbar stabilization exercises to experimental group.

(-) –Lumbar stabilization exercises not administered to control group.

O₂,O₃ – Post test level of low back pain disability on 10th and 21st day among experimental group.

O₅,O₆ – Post test level of low back pain disability on 10th and 21st day among control group

VARIABLES

Independent variable: Lumber Stabilization Exercises.

Dependent variable: Low back pain disability among women working in fireworks factory.

SETTING OF THE STUDY

The setting of the study refers to the area where the study was conducted and it was selected through convenient sampling technique. The study was conducted in two villages of Tirunelveli District. Varaganoor village was selected for experimental group and, Maiparai village was selected for control group. The distance between the villages are approximately 8Km from the Sri.K.Ramachandran Naidu College of Nursing is 30 km. This arrangement helped the investigator to carry out intervention for the experimental group and also reduce the interruption from the control group.

STUDY POPULATION

The study population composed of women aged between 25-45 years, who had mild and moderate level of low back pain disability.

SAMPLE

The study samples were women with low back pain disability aged between 25-45 years, working in fireworks factory, who fulfill the inclusive and exclusive criterias and live in Varaganoor and Maiparai villages of Tirunelveli District.

SAMPLE SIZE

The Sample Size of the study was 60. Among them 30 samples were in experimental group and remaining 30 samples were in control group.

SAMPLING TECHNIQUE

Step -1: The investigator selected the Varaganoor village for experimental group.

Total population of the village is 3120, among them 1706 are male and 1414 are females. Totally 156 workers are working in the fireworks factory of Varaganoor village. Among them 108 are females and 48 are males. Out of 108 females, 64 females were in the age group of 25-45 years of age. Pre-test was conducted by using Modified Quebec low back pain disability scale and the investigator identified, among 64 females, 14 women had no low back pain disability, 7 had mild low back pain disability, 36 women had moderate low back pain disability and 7 women had severe low back pain disability. Followed by pretest investigator selected mild and moderate level of low back pain disability cases for experimental group, out of 7 mild low back pain disability women, 1 woman had fracture in tibia, 3 women had osteoporosis, 1 woman was not willing to participate in the study. Whereas among 36 moderate low back pain disability women, 2 women had osteoporosis, 1 woman had recent fracture, 2 women underwent lower segment cesarean section and 3 women were not willing to participate in the study. Total thirty samples were selected by using non probability purposive sampling technique in which 2 samples had mild low back pain disability and 28 samples had moderate low back pain disability, rest of the samples were excluded from the study based on inclusive and exclusive criterias.

Step-2: The investigator selected the Maiparai village for control group. Total population of village is 4200, among them 2206 are male and 1994 female. Totally 168 workers are working in the fireworks factory of Maiparai village. Among them, 42 are males and 126 are females. Out of 126 females, 72 females were in the age group of 25-45 years. Pre-test was conducted by using Modified Quebec low back pain disability scale and the investigator identified, among 72 females, 17 women had no low back pain disability, 11 women had mild low back pain disability, 40 women had moderate low back pain disability and 4 women had severe low back pain disability. Followed by pretest investigator selected mild and moderate level of low back pain disability cases for control group ,out of 11 mild low back pain disability women, 2 women had fracture in wrist and toe, 3 women had osteoporosis, 2 women had lower segment cesarean section and 1 woman was not willing to participate in the study. Whereas among 40 moderate low back pain disability women, 4 women had osteoporosis, 2 women had recent fracture, 3 women underwent lower segment cesarean section and 4 women were not willing to participate in the study. Total thirty samples were selected in which 3 samples had mild low back pain disability and 27 samples had severe low back pain disability by using non probability purposive sampling technique and rest of the samples were excluded from the study based on inclusive and exclusive criterias.

CRITERIA FOR SAMPLE SELECTION

The samples were selected based on the following inclusive and exclusive criterias.

INCLUSIVE CRITERIAS

- Women aged between 25-45 years.
- Women who have mild and moderate level of low back pain disability.
- Women who are willing to participate in the study.
- Women working in fireworks factory for more than 1 year.

EXCLUSIVE CRITERIAS

- Physically handicapped women.
- Mentally ill women.
- Women who had chronic low back pain associated with Musculoskeletal disorders such as: fracture, osteoporosis, rheumatoid arthritis.
- Women who are pregnant.
- Who underwent lower segment cesarean section within last one year.
- Women who have no low back pain disability and severe level of low back pain disability.

DEVELOPMENT AND DESCRIPTION OF TOOL

The tool consists of two sections.

SECTION A: DEMOGRAPHIC VARIABLES.

Comprised of demographic data of the samples which consists of age, Education status, Marital Status, Occupation, monthly income in rupees, Nutritional status, type of family ,years of suffering with low back pain disability, and years of working in fireworks factory.

SECTION B: MODIFIED QUEBEC LOW BACK PAIN DISABILITY SCALE

Modified Quebec low back pain disability scale consists of 7 items such as, pain on (standing, sitting, walking on the uneven surfaces, walking, sleeping, housekeeping activities, personal care, positions and recreations).The scale consists of 4 Options such as, no disability, mild level of disability, moderate level of disability and severe level of disability. Score zero(0) indicates no disability, one (1) indicates mild level of disability, two (2) indicates moderate level of disability and three (3) indicates severe level of disability.

SCORING INTERPRETATION:

Total score ranges from 0 to 63

S.NO	LEVEL OF DISABILITY	SCORE
1	No disability	0
2	Mild level of disability	1-20
3	Moderate level of disability	21-40
4	Severe level of disability	41 – 63

INTERVENTION

Lumbar Stabilization Exercises, when practiced for two times a day (9am and 5pm), 30 minutes each time, continuously for three weeks has been found to be effective in reduction of low back pain disability by strengthening the back muscle and increasing the back muscle flexibility. Generally these exercises attempt to strengthen the abdomen and improve lower back mobility, strength, endurance and enhance flexibility in the hip.

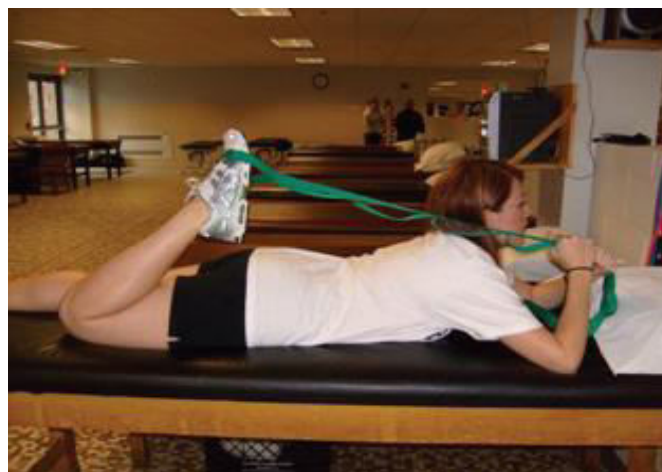
Samples were advised to assemble in common hall in the factory, they were given complete knowledge about steps of exercises. Oral consent was obtained from each sample. Next, exercise was administered by the investigator, and samples were encouraged to follow the investigator. Ongoing instruction was given. Privacy was provided and rights of samples were maintained.

THE STEPS OF LUMBAR STABILIZATION EXERCISES

1. QUADRICEPS STRETCH

Samples were advised to:

- Lie down on stomach.
- Attach a towel or rope to foot.



- Pull foot towards buttocks and hold in position for 1 minutes.
- Do the same exercises 2 times over each side.
- Relaxation – 1 minute.

2. HIP FLEXOR STRETCH

Samples were instructed to:

- Kneel down with one knee on the ground.
- Raise same side arm and take back, causing pelvis to shift forward and back .



- After holding for 20-30 seconds repeat steps 2 times each side.
- Switch to other side and repeat the same procedure.
- Relaxation – 1 Minute.

3. ABDUCTOR STRETCH

Samples were instructed to:

- Prop the inside of one ankle up on the table.
- Raise the arm of opposite side and lean towards the side they are stretching.



- Hold for 20-30 seconds.
- Switch over to other side leg and repeat the same process 2 times on each side.
- Do 1 set per sessions.
- Do 2 sessions per day.
- Relaxation – 1 minute.

4. HAMSTRING STRETCH

Samples were instructed to:

- Prop the back of heel up on the table keeping back straight.
- Lean forward at hips.



- Keep back relaxed and hold for 20-30 seconds.
- Repeat 2 times each side.
- Do 2 sessions per day.
- Relaxation 1 minute.

5. DYNAMIC HAMSTRING STRETCH

Samples were instructed to:

- Stand straight.



- Keep knees at 90 degree angle.
- Kick up until stretch is felt.
- Repeat 10 times each side.

- Do 2 sets per day.
- Relaxation -1 minute.

6. SUPINE BUTT LIFT WITH ARMS AT SIDE

Samples were instructed to:

- Lie on back with feet flat on floor and hips and knees bent to 90 degree.
- Angle with palms facing down at sides.
- Draw in abdominal muscles and maintain throughout exercises.



- Raise butt off the floor by using gluteus and hamstring muscle until their torso are in line with thigh, hold for 3-5 seconds.
- Repeat 20-30 times.
- Do 2 sets per day.
- Relaxation 1 minute

CONTENT VALIDITY

The content validity of the tool was established on the basic opinion of One Medical Expert and Four Nursing Experts in the field of Medical Surgical Nursing.

RELIABILITY OF TOOL

Reliability of the tool was tested with “test-retest” method by using Karl Pearson’s correlation coefficient of the reliability method. The reliability score was $r=0.9$. Hence, tool was considered as highly reliable for conducting the study.

PILOT STUDY

Pilot study is a rehearsal for main study. Investigator got prior permission from the Principal, Head of the Department Medical Surgical Nursing and Ethical Research Committee of Sri K.Ramachandran Naidu College of Nursing. A formal permission was obtained from Block Medical Officer (BMO) of the selected villages and the Managing Directors of fireworks factory. Rapport was established with the participants and a brief introduction and outline of the study was given. Informed oral consent was obtained from the participants, and reassurance was given, that the collected data will be kept confidential.

Pilot Study was conducted in two villages such as Sangupatti and Naduvapatti. Sangupatti was selected for experimental group and Naduvapatti village was selected for control group. Study was conducted for the period of three weeks from 05/02/2018 to 25/02/2018. The total sample size was twelve, six for experimental group and six for control group. They were selected by using non- probability purposive sampling technique. Total population of Sangupatti village is 2220, among them 1075 are male and 1145 are female. Totally 102 workers were working in the fireworks factory of Sangupatti village, out of 102 workers 81 are females and 21 are males , among 81 females ,53 females with age group of 25-45 years of age were working in fireworks factory. Pre-test was conducted for experimental group by using Modified Quebec low back pain disability scale and

investigator identified ,among 53 females, 11 women had no low back pain disability, 6 had mild low back pain disability, 26 women had moderate low back pain disability and 10 women had severe low back pain disability. Among them 3 women had recent fracture in pelvis bone, tibia, and radial bone respectively, 6 women had osteoporosis, 4 women were not willing to participate in the study, 2 women underwent lower segment cesarean section. Totally 6 samples were selected in which, 2 mild low back pain disability samples and 4 moderate low back pain disability samples by using non probability purposive sampling technique and rest of the samples were excluded from the study based on inclusion and exclusion criterias.

Total population of Naduvapatti village is 1010,among them 540 are males and 470 females. Among 470 females, totally 112 workers are working in the fireworks factory of Naduvapatti village, among them 43 are males and 69 are females .Out of 69 females 63 were in the age group of 25-45 years of age. Pre-test was conducted for control group by using Modified Quebec low back pain disability scale and investigator identified, among 63 females, 21 women had no low back pain disability, 12 women had mild low back pain disability, 23 women had moderate low back pain disability and 7 women had severe low back pain disability. Among them 1 woman had recent fracture in scapula, 6 women had osteoporosis, 2 women had lower segment cesarean section and 6 women were not willing to participate in the study. Total six samples were selected, 3 mild level of low back pain disability and 3 moderate level of low back pain disability samples by using non probability purposive sampling technique and rest of the samples were excluded from the study based on inclusion and exclusion criterias.

Followed with pretest the experimental group were advised to do lumbar stabilization exercises in a common hall of factory continuously for three weeks, two

times a day (morning 9 am and evening 5 pm) for 30 minutes each time under the supervision of investigator.

Followed by pre-test no intervention was given for control group. On 10th (14th February) and 21st (25th February) day of study, Investigator assessed the posttest level of low back pain disability, for control group and experimental group using the same Modified Quebec low back pain disability scale. Both descriptive and inferential statistics were used to analyze and interpret the result findings.

DATA COLLECTION PROCEDURE

Researcher got prior permission from the Principal, head of department of Medical Surgical Nursing and the Ethical Committee of Sri.K.Ramachandran Naidu College of Nursing. A formal permission was obtained from the Block Medical Officer of primary health centre of the two villages and Managing Directors fireworks factory. In that Varaganoor village was selected for experimental group and Maiparai village was selected for control. The investigator introduced herself to the participants and explained the procedure of study. Oral consent was obtained from the participants. The participants were assured that the information provided by them will be kept confidential. Study was conducted for the period of four weeks and data collection was done from 26/02/2018 to 31/03/2018.

PHASE 1

Step -1: The investigator selected the Varaganoor village for experimental group.

Total population of village is 3120, among them 1706 are male and 1414 are females. Totally 156 workers are working in the fireworks factory of Varaganoor village. Among them 108 are females and 48 are males. Out of 108 females, 64 females were in the age group of 25-45 years of age.

Pre-test was conducted by using Modified Quebec low back pain disability scale and the investigator identified ,among 64 females, 14 women had no low back pain disability, 7 had mild low back pain disability, 36 women had moderate low back pain disability and 7 women had severe low back pain disability. Followed by pretest investigator selected mild and moderate level of low back pain disability cases for experimental group ,out of 7 mild low back pain disability women, 1 woman had fracture in tibia,3 women had osteoporosis, 1 woman was not willing to participate in the study. Whereas among 36 moderate low back pain disability women, 2 women had osteoporosis, 1 woman had recent fracture, 2 women underwent lower segment cesarean section and 3 women were not willing to participate in the study. Total thirty samples were selected by using non probability purposive sampling technique in which 2 samples had mild low back pain disability and 28 samples had moderate low back pain disability, rest of the samples were excluded from the study based on inclusive and exclusive criterias.

Step-2: The investigator selected the Maiparai village for control group. Total population of village is 4200, among them 2206 are male and 1994 female. Totally 168 workers are working in the fireworks factory of Maiparai village. Among them 42 are males and 126 are females. Out of 126 females, 72 females were in the age group of 25-45 years. Pre-test was conducted by using Modified Quebec low back pain disability scale and investigator identified, among 72 females, 17 women had no low back pain disability, 11 women had mild low back pain disability, 40 women had moderate low back pain disability and 4 women had severe low back pain disability. Followed by pretest investigator selected mild and moderate level of low

back pain disability cases for control group ,out of 11 mild low back pain disability women, 2 women had fracture in wrist and toe, 3 women had osteoporosis, 2 women had lower segment cesarean section and 1 woman was not willing to participate in the study. Whereas among 40 moderate low back pain disability women, 4 women had osteoporosis, 2 women had recent fracture, 3 women underwent lower segment cesarean section and 4 women were not willing to participate in the study. Total thirty samples were selected in which 3 samples had mild low back pain disability and 27 samples had severe low back pain disability by using non probability purposive sampling technique and rest of the samples were excluded from the study based on inclusive and exclusive criterias.

PHASE 2

Followed by pretest, data pertaining to demographic variable of all samples including experimental group and control group were collected by the researcher.

Data Collection Details of Experimental and Control Groups

GROUP	DATE	ASSESSMENT	NUMBER OF SAMPLES	INTERVENTION
EXPERIMENTAL GROUP	26.02.2018	Pre-test	10	LUMBAR STABILIZATION EXERCISES -30 minutes per session -twice a day(morning 9 am and evening 5 pm) -21 consecutive days
	07.03.2018	Post-test 1(day 10)		
	18.03.2018	Post-test 2(day 21)		
	1.03.2018	Pre-test	10	LUMBAR STABILIZATION EXERCISES -30 minutes per session -twice a day (morning 9 am and evening 5 pm) -21 consecutive days
	10.03.2018	Post-test 1(day 10)		
	21.03.2018	Post-test 2(day 21)		

	11.03.2018	Pre-test	10	LUMBAR STABILIZATION EXERCISES -30 minutes per session -twice a day (morning 9 am and evening 5 pm) -21 consecutive days
	20.03.2018	Post-test 1(day 10)		
	31.03.2018	Post-test 2(day 21)		
CONTROL GROUP	27.02.2018	Pre-test	10	Intervention was not administered
	08.03.2018	Post-test 1(day 10)		
	19.03.2018	Post-test 2(day 21)		
	02.03.2018	Pre-test	10	Intervention was not administered
	11.03.2018	Post-test 1(day 10)		
	22.03.2018	Post-test 2(day 21)		
	09.03.2018	Pre-test	10	Intervention was not administered
	18.03.2018	Post-test 1(day 10)		
	29.03.2018	Post-test 2(day 21)		

Duration of data collection : 26.02.2018 to 31.03.2018

Number of samples : Total number of samples=60

Experimental group=30

Control group=30

Name of the tool used : Modified Quebec Low Back Pain Disability Scale was used to select the samples in pre-test and the same scale was used to assess the level of low back pain disability in post-test.

PLAN FOR DATA ANALYSIS

Both descriptive and inferential statistics were used.

DESCRIPTIVE STATISTICS

- ❖ The frequency and the percentage distribution were used to analyze the demographic variables among experimental group and control group of women with low back pain disability.
- ❖ The frequency and percentage distribution was used to assess the pre-test and posttest level of low back pain disability among experimental and control group.
- ❖ Mean and standard deviation was used to assess the pre-test and post-test level of low back pain disability among experimental group and control group.

INFERENTIAL STATISTICS

- ❖ Unpaired “t” test was used to compare the effectiveness of Lumbar Stabilization exercises on the level of low back pain disability between experimental group and control group.
- ❖ Paired ‘t’ test was used to compare the effectiveness of Lumber stabilization exercises on low back pain disability among experimental group
- ❖ Chi-Square test was used to associate the post-test level of low back pain disability with selected demographic variables in experimental group and control group.

PROTECTION OF HUMAN RIGHTS

Ethical clearance was given by the Principal, Research and ethical committee of Sri.K.Ramachandran Naidu College of nursing and formal permission was obtained from Block Medical Officer of the selected villages. Informed consent was obtained and assurance was given to each participant, confidentiality will be maintained and no harm will be done.

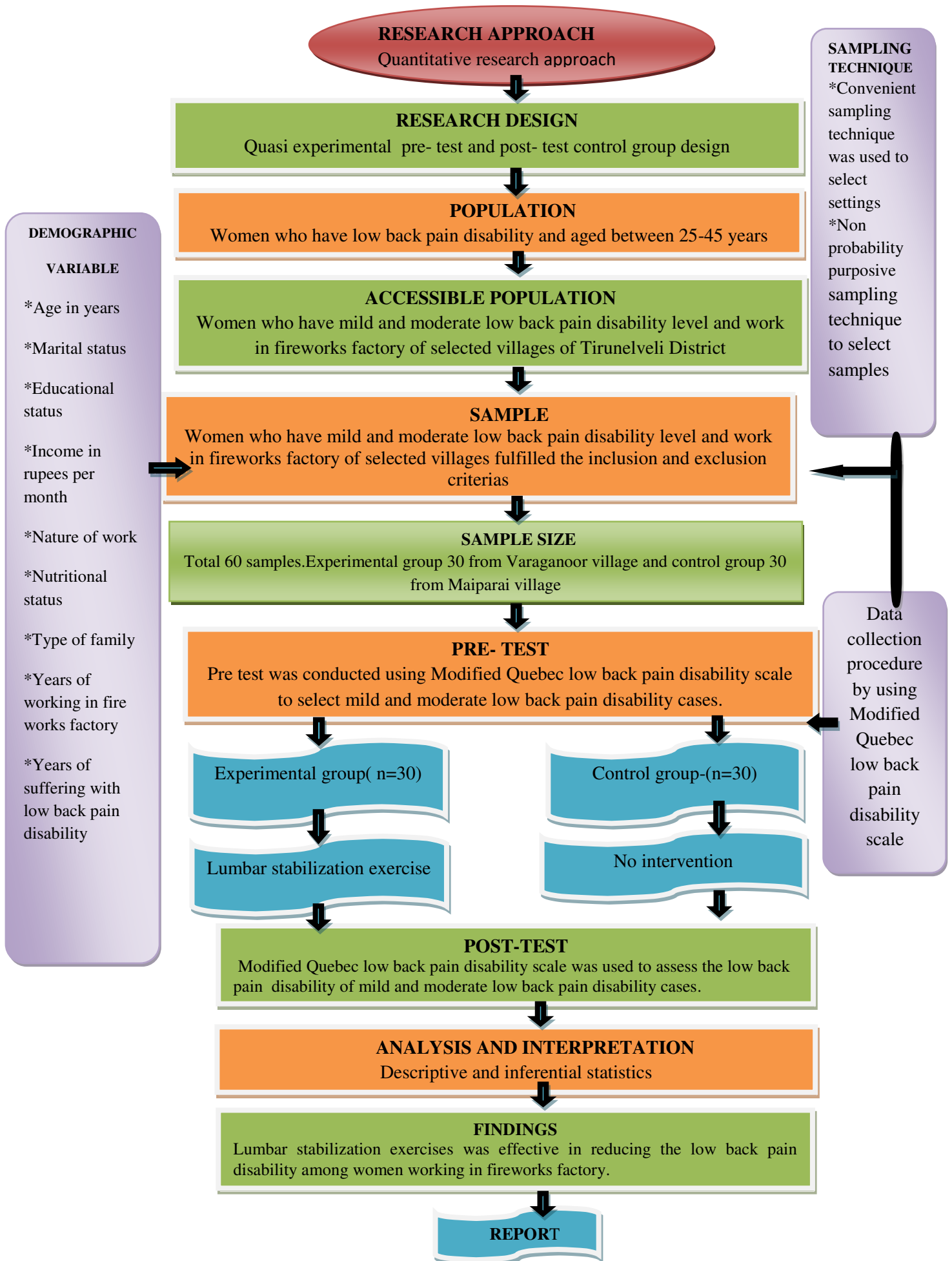


Figure 3: Schematic Diagram Of Research Methodology

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis of the data and interpretation of the data collected from the samples to assess the effectiveness of lumbar stabilization exercises to reduce low back pain disability.

Analysis is the method of organizing, sorting and scrutinizing the data in such a way that research question can be answered [**Polit, Hungler, (2009).**]

The purpose of analysis is to find out the effectiveness so that the relation of the problem can be tested.

The analysis and interpretation of data is based on data collection the results are computed by using descriptive (mean, frequency, percentage of the distribution and standard deviation) and inferential statistics (t'-test and chi square test).The data has been tabulated and organized as follows.

ORGANIZATION OF DATA

Section-I: Description of demographic variables of low back pain disability samples.

- Frequency and percentage distribution of the samples based on demographic variables which consists of age, Educational status, Marital Status, Nature of work, Monthly income in rupees, Nutritional status, type of family, years of suffering with low back pain disability and years of working in fireworks factory.

Section II: Assessment of frequency and percentage distribution of level of low back pain disability among women in experimental and control group.

- Assessment of frequency and percentage distribution of pre-test level of low back pain disability among women in experimental and control group.
- Assessment of frequency and percentage distribution of post test level of low back pain disability among women in experimental and control group on day 10.
- Assessment of frequency and percentage distribution of post test level of low back pain disability among women in experimental and control group on day 21.

Section III: Comparison of level of low back pain disability among women in experimental and control group.

- Comparison of mean pre test level of low back pain disability among women in experimental group and control group.
- Comparison of mean pre test and post test day on 10th level of low back pain disability among women in experimental group and control group.
- Comparison of mean pre test and post test on day 21st level of low back pain disability among women in experimental group and control group.
- Comparison of mean post level of low back pain disability on day 10th and 21st among women in experimental group and control group.
- Comparison of mean post test level of low back pain disability among women between experimental group and control group on day 10th and 21st.

Section IV: Association of post-test level of low back pain disability among women in experimental and control group with their selected demographic variables.

- Association of post-test level of low back pain disability among women in experimental group with their selected demographic variables.
- Association of post-test level low back pain disability among women in control group with their selected demographic variables.

**SECTION-1: DESCRIPTION OF DEMOGRAPHIC VARIABLES OF
LOW BACK PAIN DISABILITY SAMPLES.**

- Frequency and percentage distribution of the samples based on demographic variables which consists of age in years, Educational status, Marital Status, Occupation, Income in rupees per month, Nutritional status(BMI), type of family, years of suffering with the low back pain ,and years of working in fireworks factory.

(N=60)

S. No	Demographic Variables	Experimental group (n=30)		Control group (n=30)	
		f	%	f	%
1.	Age in years				
	a) 25 – 30	3	10	5	16.67
	b) 31 - 35	8	26.67	7	23.33
	c) 36 – 40	8	26.67	9	30
	d) 41 – 45	11	36.66	9	30
2.	Marital status				
	a) Married	19	63.33	17	56.67
	b) Unmarried	6	20	8	26.67
	c) Widow	3	10	4	13.33
	d) Divorced	2	6.66	1	3.33
3.	Educational status				
	a) Uneducated	7	23.33	5	16.66
	b) Primary school education	10	33.33	11	36.67
	c) Middle school education	11	36.67	11	36.67
	d)Secondary school education and above	2	6.67	3	10
4.	Nature of work				
	a) Filling chemicals in empty crackers	14	46.66	16	53.33
	b) Labeling individual cracker pieces and assembling	3	10	5	16.66

	c) Packing of crackers and keeping them as bundles.	7	23.66	4	13.33
	d)Transporting crackers to wear house within factory.	6	20	5	16.66
5.	Income in rupees per month				
	a) 3,000-4,000	7	23.66	4	13.33
	b) 4,001-5,000	13	43.33	16	53.33
	c) 5,001-6,000	9	30	8	26.66
	d) 6,001 and above	1	3.33	2	6.66
6.	Nutritional status(according to body mass index)				
	a) Underweight	2	6.66	4	13.33
	b) Normal weight	7	23.66	6	20
	c) Over weight	11	36.66	12	40
	d) Obese	10	33.33	8	26.67
7.	Type of family				
	a) Joint family	13	43.33	12	40
	b) Nuclear family	15	50	17	56.67
	c) Single	2	6.66	1	3.33
8.	Years of suffering with low back pain disability				
	a) 6 months to 1 year	1	3.33	2	6.67
	b) More than 1 to 2 years	6	20	7	23.33
	c) More than 2 to 3 years	6	20	6	20
	d) More than 3 to 5 years and above	17	56.66	15	50
9.	Years of working in factory				
	a) 6 months to 1 year	4	13.33	5	16.67
	b) More than 1 year to 2 years	6	20	4	13.33
	c) More than 2 years to 3 years	9	30	9	30.00
	d)More than 3 years to 5 years and above	11	36.66	12	40.00

Table 1: depicts the frequency and percentage distribution of demographic variables such as age, Educational status, Marital Status, Nature of the work, Income in rupees per month, Nutritional status, type of family ,years of suffering with low back pain disability ,and years of working in fireworks factory.

With regard to the age of women with low back pain disability out of 60 samples,3(10%) were between the age group of 25-30 years, 8(26.67%) were between the age group of 31-35 years,8(26.67%)were between the age group of 36-40 years,11(36.66%) were between the age group of 41-45years in the experimental group. Whereas in control group 5(16.66%) were between the age group of 25-30 years, 7(23.66%) were between the age group of 31-35 years, 9(30%) were between the age group of 36-40 years, 9(30%) were between the age group of 41-45years .

In relation to marital status out of 60 samples, 19(63.33%) were married, 6(20%) were unmarried,3(10%) were widow and 2(6.66%) were divorced in the experimental group. Whereas in control group 17(56.66%) were married, 8(26.66%) were unmarried,4(13.33%) were widow and 1(3.33%) were divorced .

With respect to educational status out of 60 samples,7(23.33%) were uneducated, 10(33.33%) were completed primary school education, 11(36.67%) were completed middle school education, and 2(6.67%) were completed secondary school education in the experimental group. Whereas 5(16.66%) were among uneducated, 11(36.67%) were completed primary school education, 11(36.67%) were completed middle school education and 3 (10%) were completed secondary school education in the control group.

On analysis of nature of work out of 60 samples 14 (46.66%) were filling chemicals in empty crackers, 3(10%) were labeling individual cracker pieces and assembling, 7(26.66%) were packing crackers and keeping them as bundles and

6(20%) were transporting crackers to wear house within factory in the experimental group. Whereas in control group 16(53.33%) were filling the chemicals in empty crackers, 5(16.66%) were labeling individual the cracker pieces and assembling, 4(13.33%) were packing crackers and keeping them as bundles and 5(16.66%) were transporting crackers to wear house within factory in the.

With respect to income in rupees per month out of 60 samples, 7(23.66%) were earning between 3,000-4,000, 13(43.33%) were earning 4,001-5,000, 9(30%) were earning 5,001-6,000 and 1(3.33%) were earning 6,001 and above in the experimental group. Whereas in control group 4(13.33%) were earning between 3,000-4,000, 16(53.33%) were earning 4,001-5,000, 8(26.66%) were earning 5,001-6,000 and 2(6.66%) were earning 6,001 and above in the control group.

On analysis of nutritional status out of the 60 samples, 2(6.66%) were underweight, 7(23.66%) were noted as normal weight, 11(36.66%) were overweight and 10(33.33%) were obese in the experimental group. Whereas in control group 4(13.33%) were underweight, 6(20%) were normal weight, 12(40%) were overweight and 8(26.67%) were obese.

With regard to family type out of 60 samples, 13(43.33%) were in the joint family, 15(50%) were in the nuclear family, 2(6.66%) were living single in the experimental group. Whereas in control group 12(40%) were in the joint family, 17(56.67%) were in the nuclear family, 1(3.33%) were living single in the.

With regard to years suffering with low back pain, out of the 60 samples, 1(3.33%) were suffering from 6 months to 1 years, 6(20%) were suffering for more than 1 to 2 years, 6(20%) were suffering for more than 2 to 3 years, 17(56.66%) were suffering for more than 3 to 5 years and above in the experimental group. Whereas in control group 2(6.67) were suffering for more than from 6 months to

1 years, 7(23.33%) were suffering more than 1 to 2 years,6(20%) were suffering more than 2 to 3 years, 15(50%) were suffering more than 3 to 5 years and above.

With regard to years of working in factory with low back pain out of 60 samples, 4(13.33%) were working for 6 months to 1 year,6(20%) were working for more than 1 year to 2 years, 9(30%) were working for more than 2 years to 3 years, 11(36.66%) were working for more than 3 years to 5 years and above in the experimental group. Whereas 5(16.67%) were working for the period of 6 months to 1 year,4(13.33%) were working for more than 1 year to 2 years, 9(30%) were working more than 2 years to 3 years,12(40%) were suffering for more than 3 years to 5 years and above.

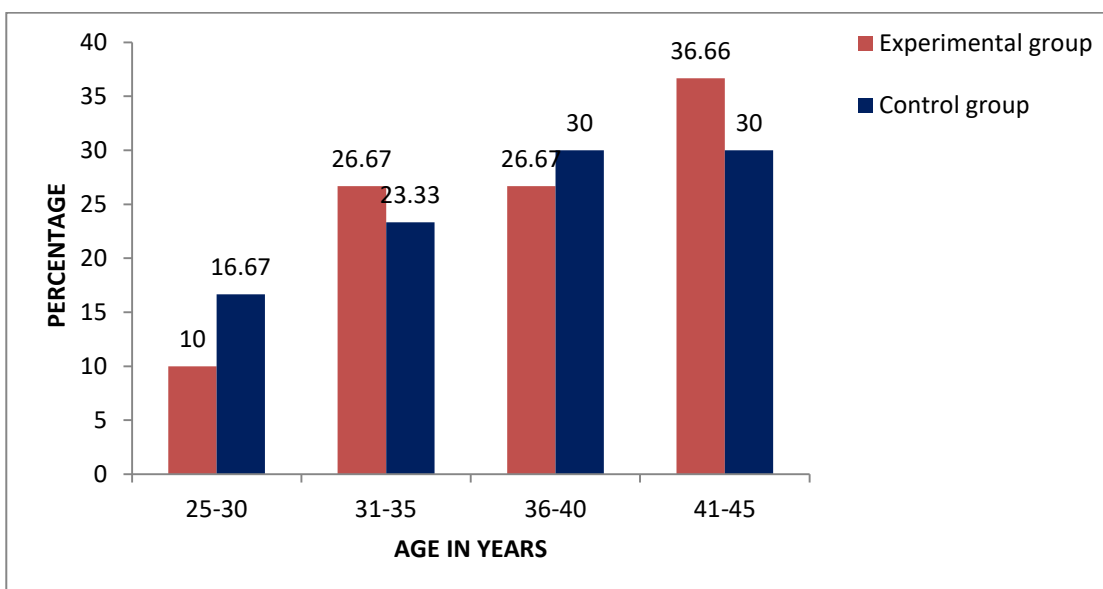


FIGURE 4: Percentage distribution of demographic variable of age in years in experimental and control group.

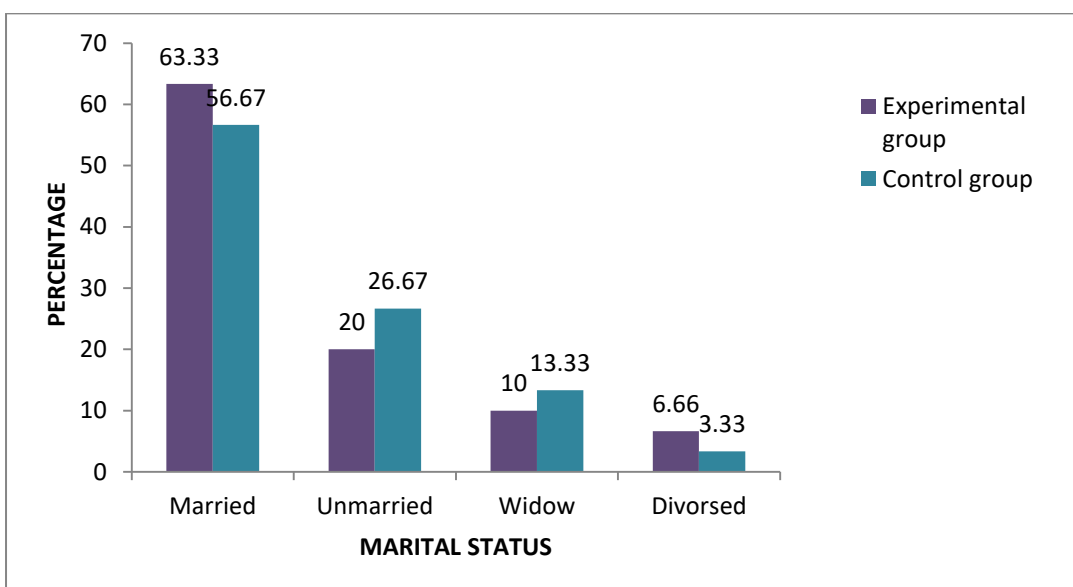


FIGURE 5: Percentage distribution of demographic variables of marital status in experimental and control group.

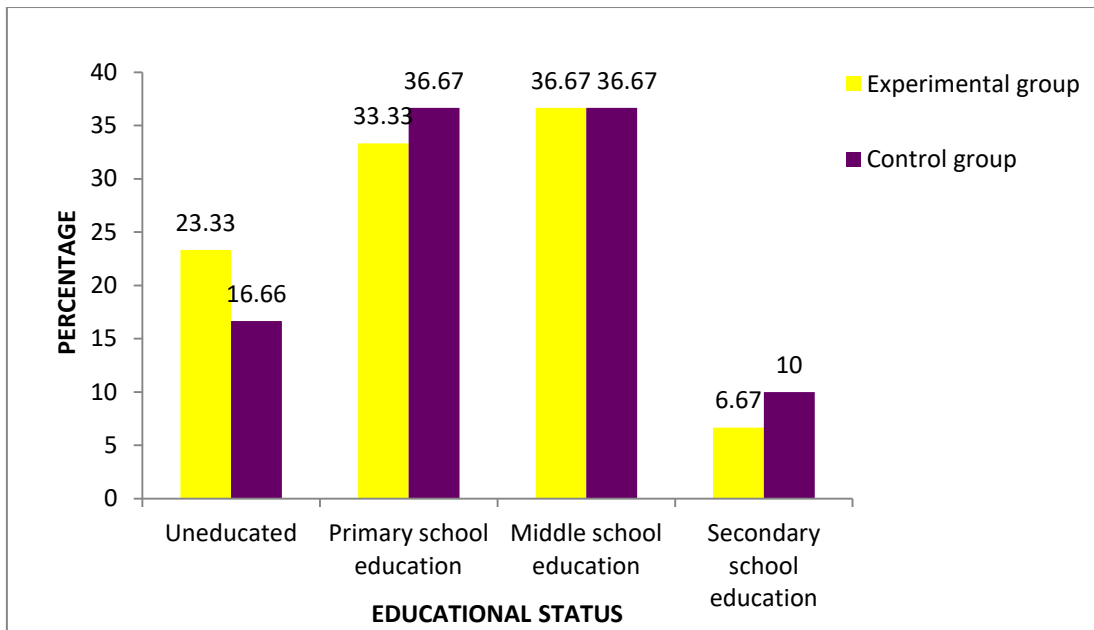


FIGURE 6: Percentage distribution of demographic variables of educational status in experimental and control group.

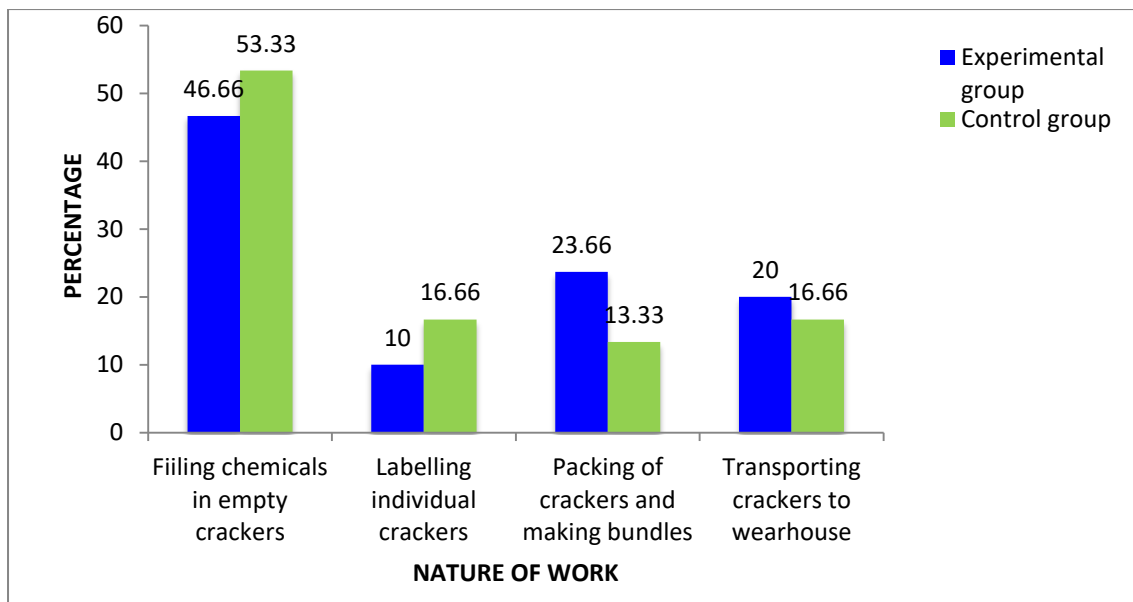


FIGURE 7: Percentage distribution of demographic variables of nature of work in experimental and control group.

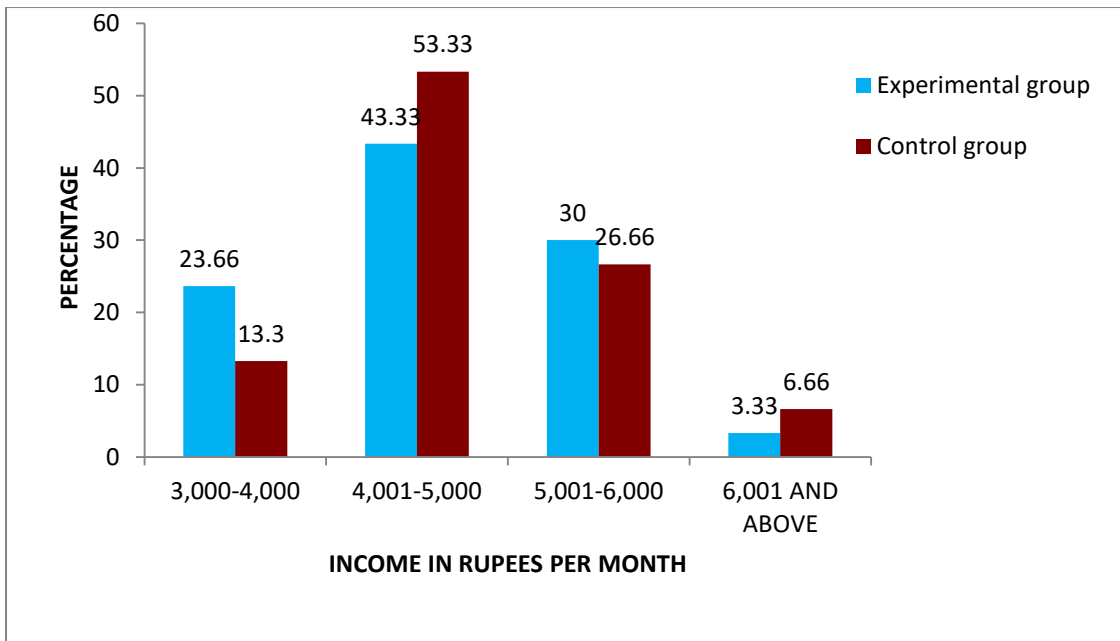


FIGURE 8 : Percentage distribution of demographic variables of income in rupees per month in experimental and control group.

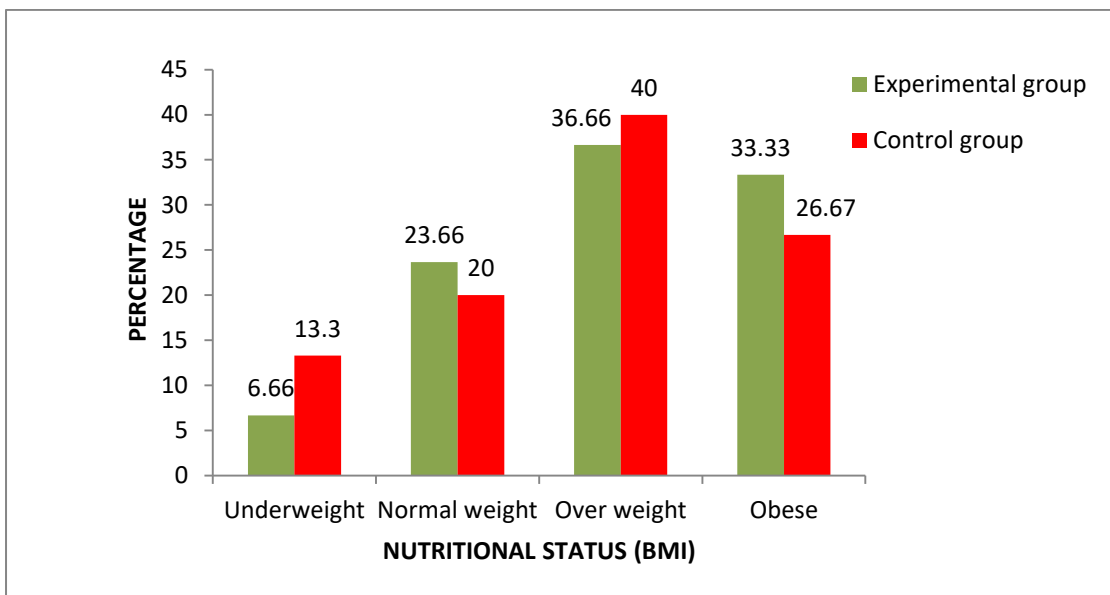


FIGURE 9 : Percentage distribution of demographic variables of nutritional status in experimental and control group.

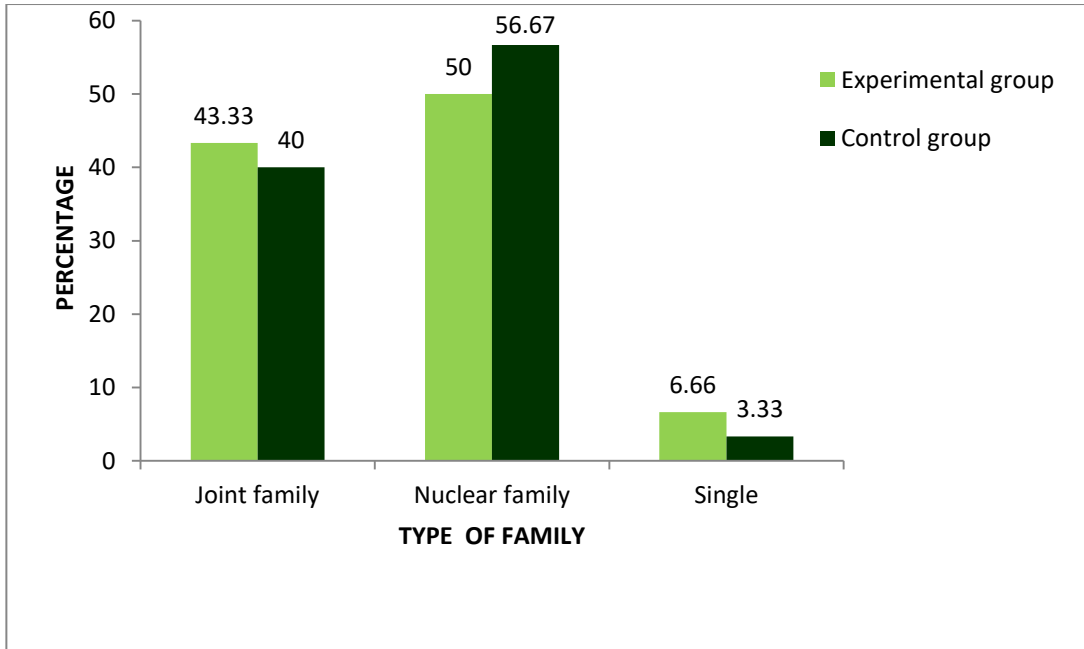


FIGURE 10 : Percentage distribution of demographic variables of type of family in experimental and control group.

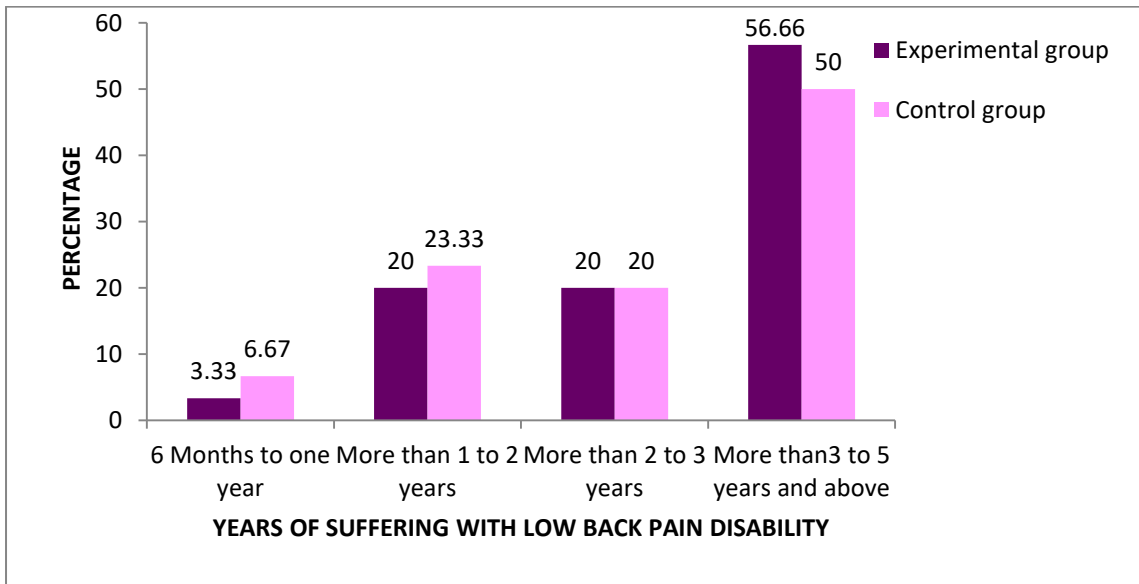


FIGURE 11: Percentage distribution of demographic variables of years of suffering with low back pain disability in experimental and control group.

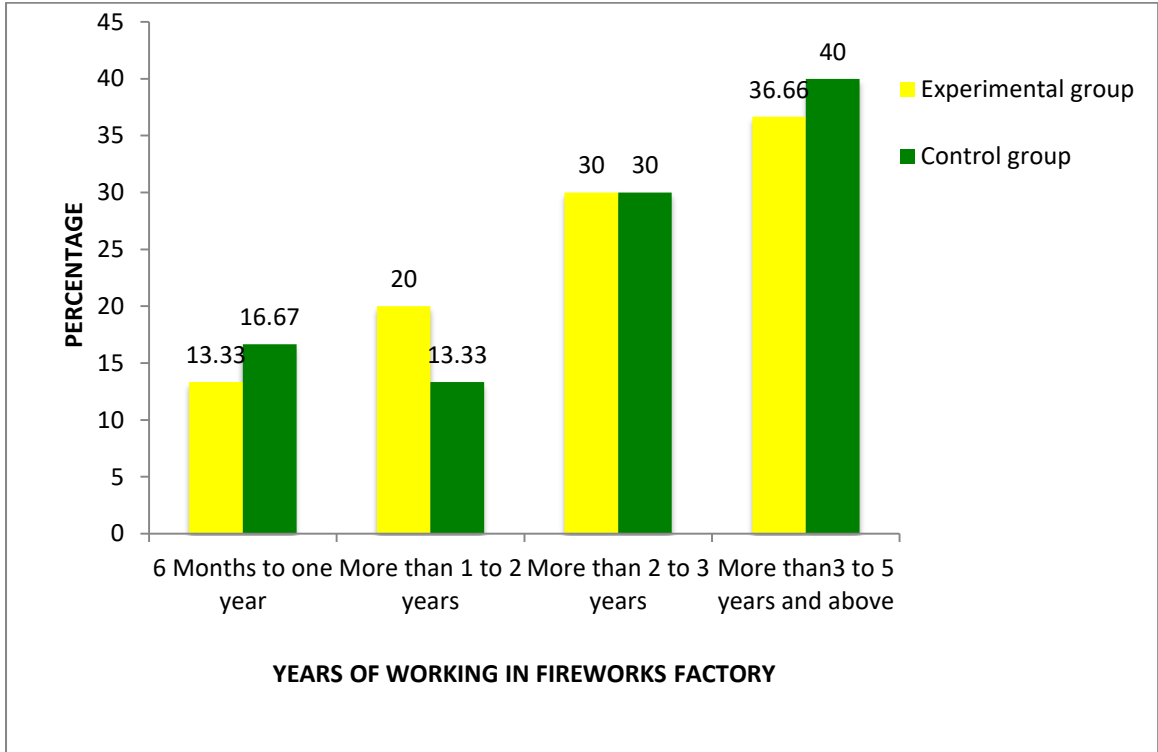


FIGURE 12: Percentage distribution of demographic variables of years of Working in fireworks factory in experimental and control group.

**SECTION II: ASSESSMENT OF LEVEL OF LOW BACK PAIN DISABILITY
AMONG WOMEN IN EXPERIMENTAL AND CONTROL GROUP.**

Table 2: Assessment of frequency and percentage distribution of pre-test level of low back pain disability among women in experimental and control group.

(N=60)

S.NO	Level of low back pain disability	Pre-test			
		Experimental group (n=30)		Control group (n=30)	
		f	%	f	%
1	Mild level of disability	2	6.67	3	10
2	Moderate level of disability	27	90	27	90

Table 2: depicts the pre-test level of low back pain disability among women in the experimental group and control group.

It is evident from the above table that in the among the experimental group, 2(6.67%) had mild level of disability, 27(90%) had moderate level of disability and 1(3.33%) had severe level of disability. It is also evident from the above table that in the pre-test among the control group, 3(10%) had mild level of disability, 27(90%) had moderate level of disability and none of them had severe level of disability.

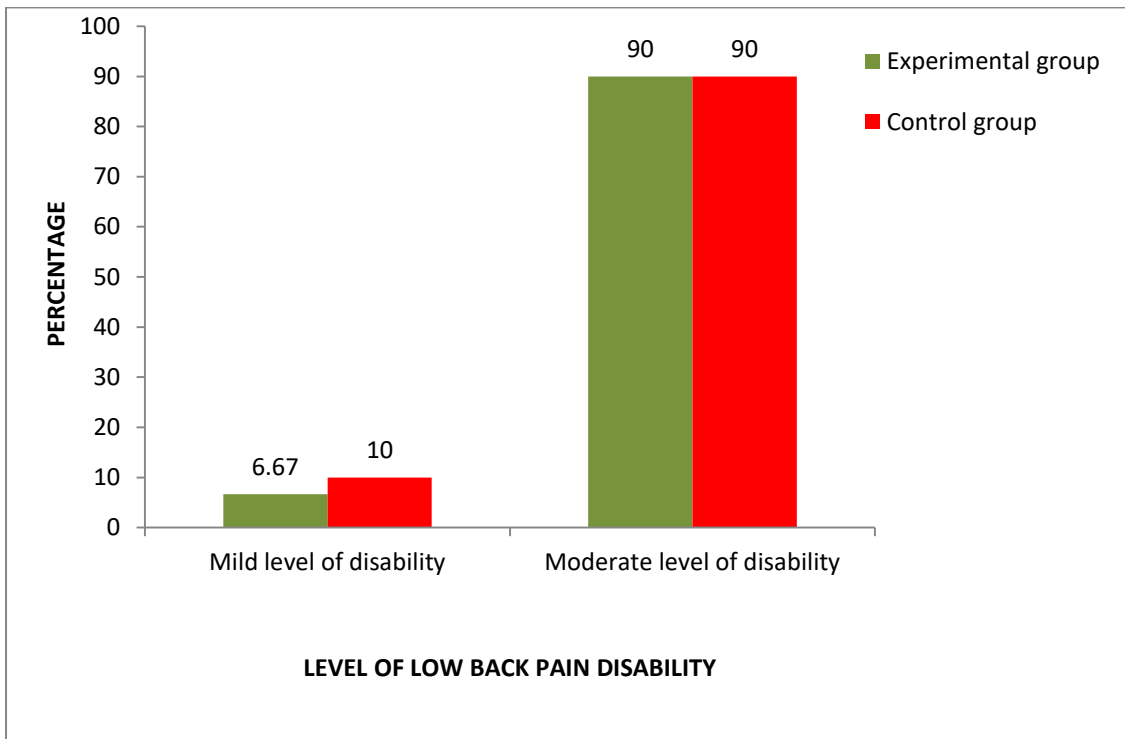


Figure 13: Assessment of frequency and percentage distribution of pre-test level of low back pain disability among women in experimental and control group.

Table 3: Assessment of frequency and percentage distribution of post test level of low back pain disability among women in experimental and control group on day 10.

(N=60)

S.No	Level of low back pain disability	Experimental group		Control group	
		Day 10		Day10	
		F	%	f	%
1	No disability	00	00	00	00
2	Mild level of disability	9	30	2	6.67
3	Moderate level of disability	21	70	28	93.33
4	Severe level of disability	00	00	00	00

TABLE 3: depicts the post-test on 10th day level of low back pain disability among women in the experimental group and control group.

It is evident from the above table that in the post-test on 10th day among the experimental group, 9(30%) had mild level of disability, 21(70%) had moderate level of disability and none of them had severe level of disability. It is evident from the above table that in the post-test on 10th day among the control group, 2(6.67%) had mild level of disability, 28(93.33%) had moderate level of disability and none of them had severe level of disability.

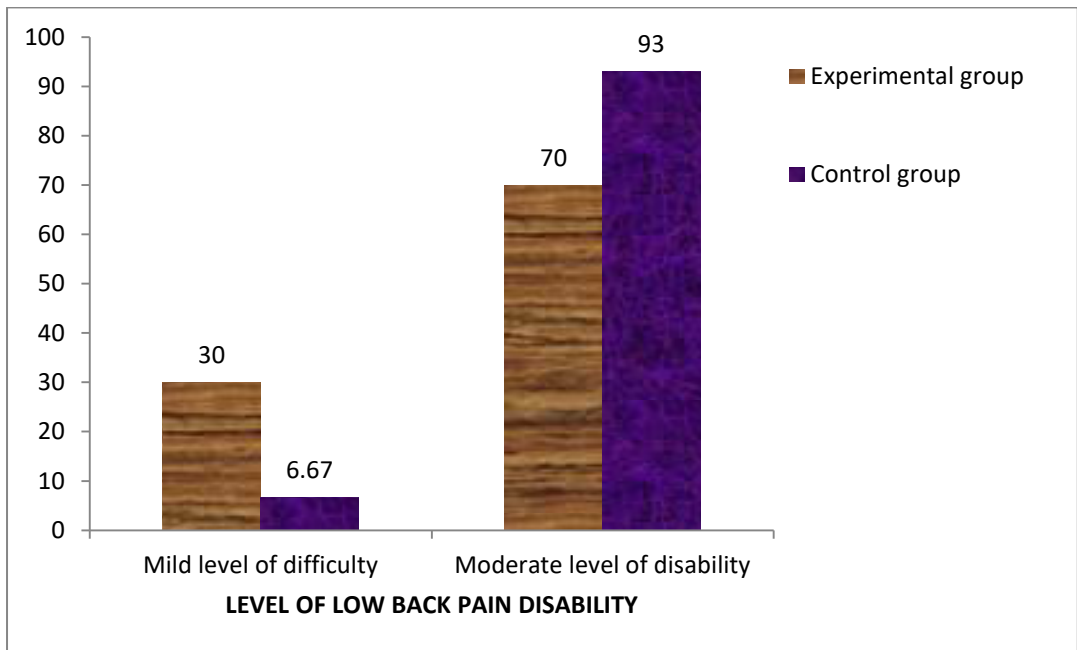


FIGURE 14: Assessment of frequency and percentage distribution of level of low back pain disability among women in experimental and control group on day 10.

Table 4: Assessment of frequency and percentage distribution of post test level of low back pain disability among women in experimental and control group on day 21.

(N=60)

S.No	Level of low back pain Disability	Experimental group		Control group	
		Day 21		Day 21	
		f	%	f	%
1	No disability	00	00	00	00
2	Mild level of disability	18	60	0	00
3	Moderate level of disability	12	40	30	100
4	Severe level of disability	0	0	0	00

Table 4: depicts the post-test on 21st day level of low back pain disability among women in the experimental group and control group.

It is evident from the above table that in the post test on day 21 among the experimental group, 18(60%) had mild level of disability, 12(40%) had moderate level of disability and none of them had severe level of disability. It is also evident from the above table that in the post test on day 21st among the control group nobody fell under, mild level of disability, severe level of disability , 30(100%) had moderate level of disability.

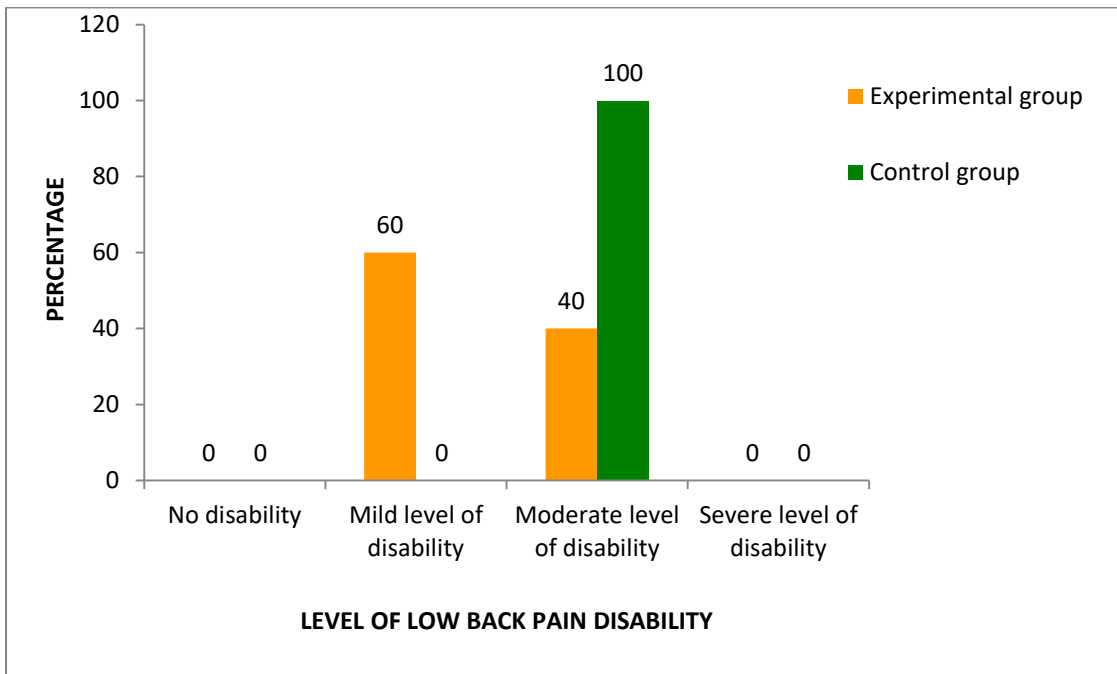


Figure 15: Assessment of frequency and distribution of post test level of low back pain disability among women in experimental and control group on post test day 21.

SECTION-III: COMPARISON OF LEVEL OF LOW BACK PAIN DISABILITY AMONG WOMEN IN THE EXPERIMENTAL AND CONTROL GROUP.

Table-5: Comparison of mean pre test level of low back pain disability among women in experimental group and control group.

(N=60)

S.NO	Group	Pre-test		Mean difference	't' test value
		Mean	SD		
1	Experimental group	29.63	5.09	1.17	0.893 p value=0.3756
2	Control group	30.80	5.06		

S*=Significant

NS=Not significant

P<0.05

The above table depicts the comparison of mean and standard deviation of pre-test level of low back pain disability in experimental group and control group.

In the experimental group mean pre-test value was 29.63 and SD was 5.09 and In control group mean pre-test value was 30.80 and SD was 5.06 .Their mean difference is 1.17, and the calculated "t" value was 0.893 which shows that there was not a significance difference in the pre-test level of low back pain disability among experimental group and control group at p<0.05 level

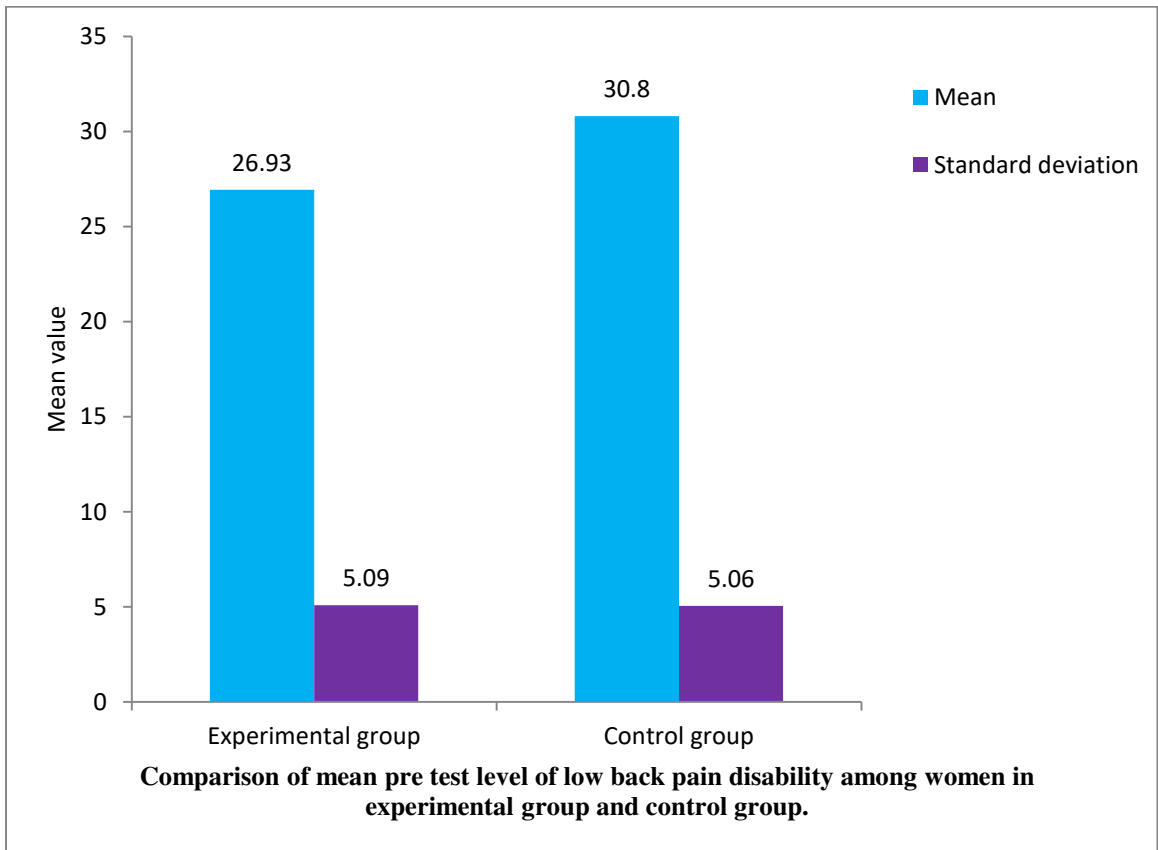


Figure 16: Comparison of mean pre-test level of low back pain disability among women in experimental group and control group.

Table-6: Comparison of mean pre test and post test on day 10th level of low back pain disability among women in experimental group and control group.

(N=60)

S.NO	Group	Pre-test		Post test on day 10		Mean difference	't' test value
		Mean	SD	Mean	SD		
1	Experimental group	29.63	5.09	22.96	4.84	6.66	13.74 (0.001)S*
2	Control group	30.80	5.06	31.43	5.02	0.63	0.89 (0.512)NS

S*=Significant

NS=Not significant

P<0.05

The above table depicts the comparison of mean and standard deviation of pre-test and post-test on day 10 level low back pain disability in experimental group and control group.

In the experimental group mean pre-test value was 29.63 and SD was 5.09 and the mean post-test on day 10 value was 22.96 and SD was 4.84. Their mean difference was 6.66. The calculated "t" value was 13.74 which shows that there was a significance difference in the pre-test and post-test level of low back pain disability among experimental group at $p < 0.05$ level.

In control group mean pre-test value was 30.80 and SD was 5.06 and the Mean post-test on day 10 value was 31.43 and SD was 5.02. Their mean difference was 0.63. The calculated "t" value was 0.89 which shows that there was no significance difference in the pre-test and post-test level of low back pain disability among control group at $p < 0.05$ level.

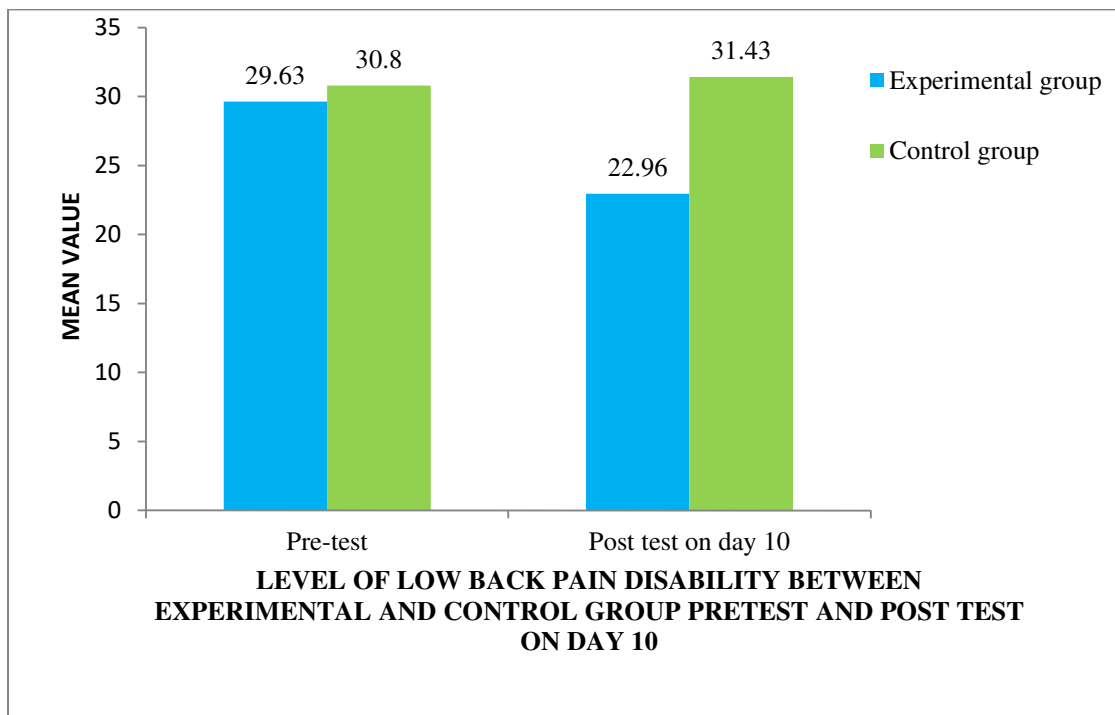


Figure 17: Comparison of mean pre test and post test on day 10th level of low back pain among women in experimental group and control group.

Which shows that, there was a significance difference in the pre-test and post test day 21 level of low back pain disability among control group but the level of pain has increased in group at $p < 0.05$ level.

Hence the stated research hypothesis, “ H_1 : Mean post test level of low back pain disability among women in experimental group will be significantly lower than the mean pre test level of low back pain disability in experimental group”. So, the research hypothesis was accepted and null hypothesis was rejected.

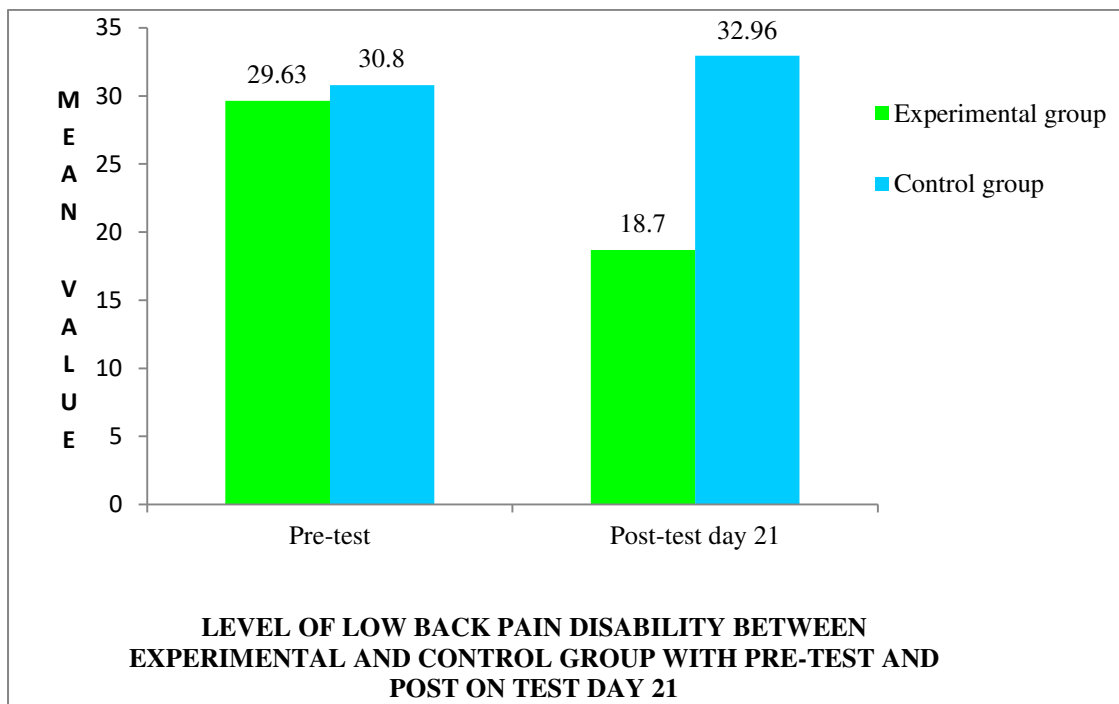


Figure 18: Comparison of mean pre test and post test day 21 level of low back pain disability among women in experimental group and control group.

Table 8: Comparison of mean post test level of low back pain disability on day 10th and 21st among women in experimental group and control group .

(N=60)

S.NO	Group	Post-test on day 10		Post test on day 21		Mean difference	't' test value
		Mean	SD	Mean	SD		
1	Experimental group	22.96	4.84	18.70	4.50	4.26	8.85 (0.001) S*
2	Control group	31.43	5.02	32.96	4.16	1.53	1.75 (0.091) NS

S*=Significant

NS=Not significant

P<0.05

The above table depicts the comparison of mean and standard deviation of post test on day 10 and day 21 level of low back pain disability in experimental and control group.

In experimental group the mean post test day 10 values was 22.96 and SD was 4.84 and the mean post test day 21 values was 18.70 and SD was 4.50. Their mean difference was 4.26. The calculated "t" value was 8.85.

Whereas, in control group mean post test day 10 value was 31.43 and SD was 5.02 and the mean post -test day 21 value was 32.96 and SD was 4.16. Their mean difference was 1.53. The calculated "t" value was 1.75.

Which shows that there was a not significance difference in the day 10 and day 21 level of low back pain disability among women in control group.

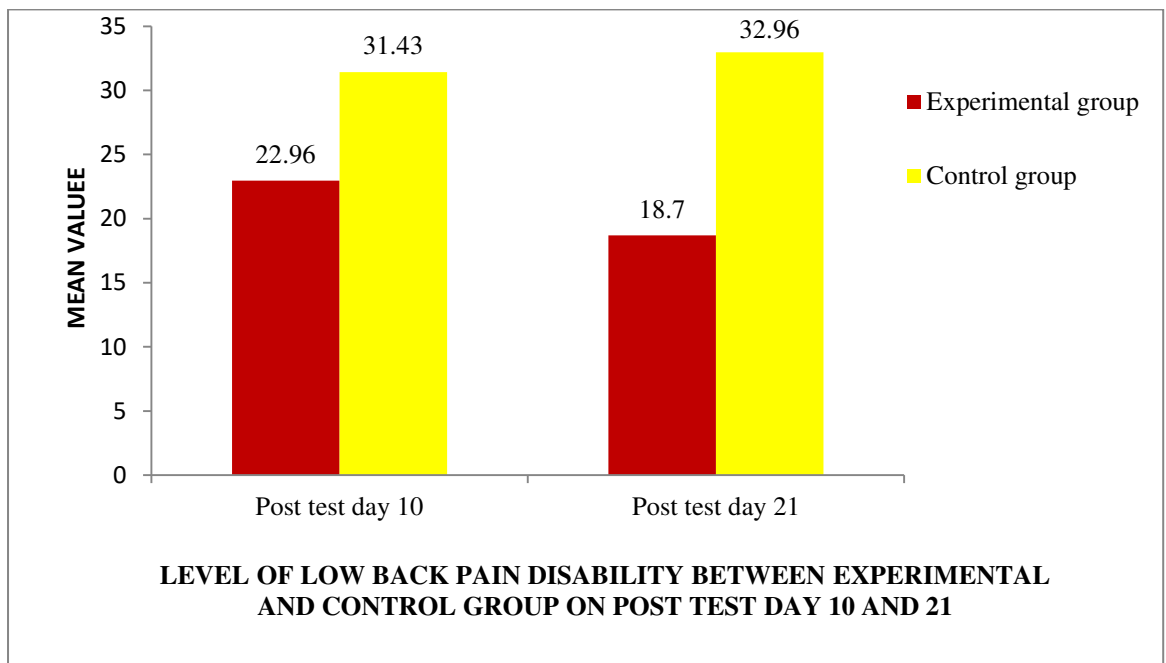


Figure 19: Comparison of mean post test level of low back pain disability on day 10th and 21st among women in experimental group and control group.

Table-9: Comparison of mean post test level of low back pain disability among women between experimental group and control group on day 10 and 21.

(N = 60)

S.NO	Post test day	Experimental Group		Control group		Mean difference	't' Test value
		Mean	S.D	Mean	S.D		
1.	Day 10	22.96	4.84	31.43	5.02	8.47	6.66
2.	Day 21	18.70	4.50	32.96	4.16	14.26	12.76

S: Significant

Significance=0.001

P<0.05

The above table depicts the comparison of mean and standard deviation of post-test on day 10 and 21 level of low back pain disability between the experimental and control group.

The mean post-test day 10th value for experimental group was 22.96 and SD was 4.84, for control group the mean post-test on 10th day value was 31.43 and SD was 5.02. Their mean difference was 8.47. The calculated "t" value was 6.66.

The comparison of mean and standard deviation of post-test on 21st day level of low back pain disability between the experimental and control group.

The mean post-test on day 21st day value for experimental group was 18.70 and SD was 4.50, for control group the mean post-test day 21st values was 32.96 and SD was 4.16. Their mean difference was 14.26. The calculated "t" value was 12.76.

Which shows that there was a significance difference in the effectiveness of lumbar stabilization exercises between experimental and control group at p<0.05 level.

Hence, the stated research hypothesis,“H₂:Mean post test level of low back pain disability among experimental group will be significantly lower than the mean post test level of low back pain disability among control group”. So, the research hypothesis was accepted and null hypothesis was rejected.

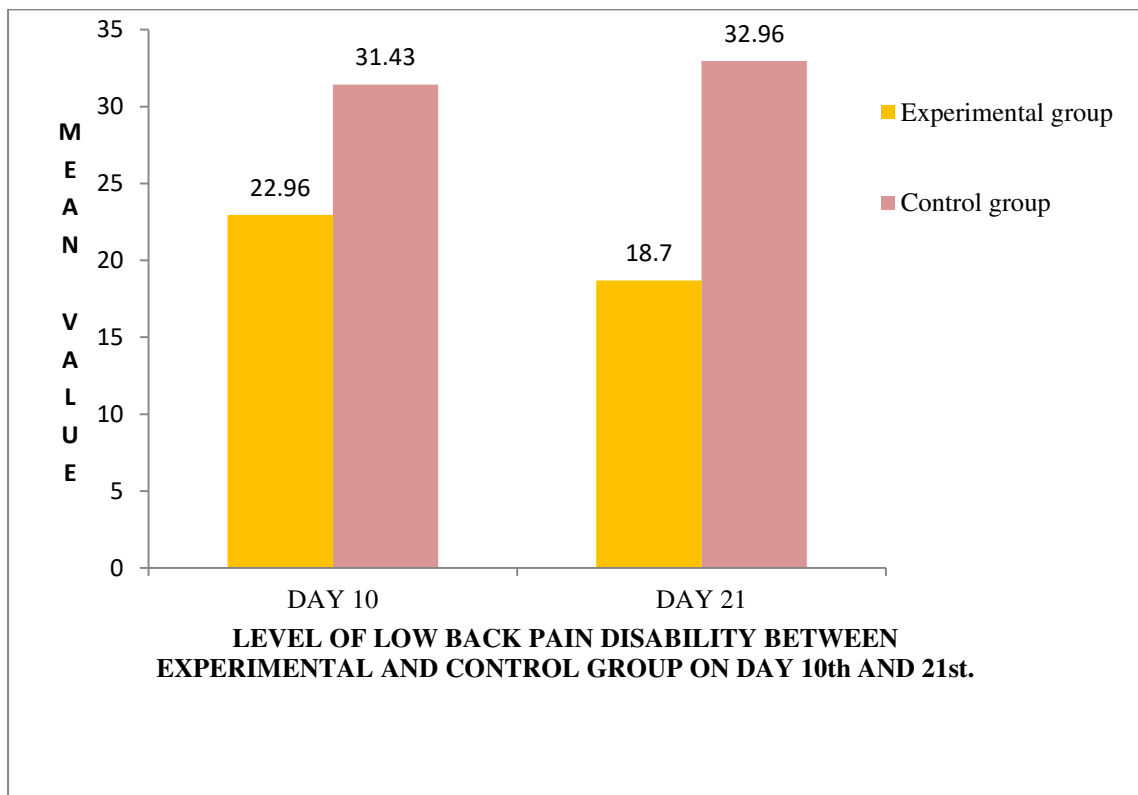


Figure 20: Comparison of mean post test level of low back pain disability among women between experimental group and control group on day 10 and 21.

**SECTION IV: ASSOCIATION OF POST TEST LEVEL OF LOW BACK PAIN
DISABILITY AMONG WOMEN IN EXPERIMENTAL AND CONTROL GROUP
WITH THEIR SELECTED DEMOGRAPHIC VARIABLES.**

TABLE 10: Association of post test level of low back pain disability among women in experimental group with their selected demographic variables.

(n=30)

S. No	Demographic Variable	Level of low back pain disability								χ^2
		No disability		Mild level of disability		Moderate level of disability		Severe level of disability		
		f	%	f	%	f	%	f	%	
1.	Age in yrs									
	a) 25 – 30	-	-	3	10	0	-	-	-	8.35
	b) 31 - 35	-	-	7	23.3	1	3.3	-	-	df-3
	c) 36 – 40	-	-	5	16.6	3	10	-	-	S*
	d) 41 – 45	-	-	3	10	8	26.6	-	-	-
2.	Marital status									
	a) Married	-	-	11	36.6	8	26.6	-	-	0.31
	b) Unmarried	-	-	4	13.3	2	6.6	-	-	df-3
	c) Widow	-	-	2	6.6	1	3.3	-	-	0.916
	d) Divorced	-	-	1	3.3	1	3.3	-	-	NS
3.	Educational status									
	a) Uneducated	-	-	3	10	4	13.3	-	-	2.24
	b) Primary school education	-	-	6	20	4	13.3	-	-	df-3
	c) Middle school education	-	-	7	23.3	4	13.3	-	-	0.53
	d) Secondary school education and above	-	-	3	10	0	-	-	-	NS

4.	Nature of work									
	a) Filling chemicals in empty crackers	-	-	4	13.3	0	-	-	-	
	b) Labeling of the individual cracker pieces of the parts and assembling	-	-	6	20	0	-	-	-	9.02
	c) Packing of the crackers bundle and keeping them as bundles	-	-	5	16.6	4	13.3	-	-	df-3 0.048 S*
	d) Transporting the crackers and bundle to wear house within factory	-	-	3	10	8	26.6	-	-	
5.	Income in rupees per month									
	a) 3,000-4,000	-	-	3	10	4	13.3	-	-	2.43
	b) 4,001-5,000	-	-	9	30	4	13.3	-	-	df-3
	c) 5,001-6,000	-	-	5	16.6	4	13.3	-	-	0.511
	d) 6,001 and above	-	-	1	3.3	0	-	-	-	NS
6.	Nutritional status(according to body mass index)									
	a) Underweight	-	-	2	6.6	0	-	-	-	9.1
	b) Normal weight	-	-	7	23.3	0	-	-	-	df-3
	c) Over weight	-	-	7	23.3	4	13.3	-	-	0.04
	d) Obese	-	-	2	6.6	8	26.6	-	-	S*
7.	Type of family									
	a) Joint family	-	-	9	30	4	13.3	-	-	0.80
	b) Nuclear family	-	-	8	26.6	7	23.3	-	-	df-2
	c) Single	-	-	1	3.3	1	3.3	-	-	0.741 NS

8.	Years of suffering with low back pain									
	a) 6 months to 1 year	-	-	4	13.3	0	-	-	-	9.02 df-3 0.048 S*
	b) More than 1 to 2 years	-	-	6	20	0	-	-	-	
	c) More than 2 to 3 years	-	-	5	16.6	4	13.3	-	-	
	d) More than 3 to 5 years and above	-	-	3	10	8	26.6	-	-	
9	Years of working in factory									
	a) 6 months to 1 year	-	-	4	13.3	0	-	-	-	9.02 df-3 0.048 S*
	b) More than 1 year to 2 years	-	-	6	20	0	-	-	-	
	c) More than 2 years to 3 years	-	-	5	16.6	4	13.3	-	-	
	d) More than 3 years to 5 years and above	-	-	3	10	8	26.6	-	-	

NS = Non Significant,

S*=Significant

P<0.05

Table 10: reveals the chi-square test to associate the post test level of low back pain disability with their selected demographic variables in the experimental group. While analyzing the statistical significance at (P<0.05) level it shows that there was significant association of the level of low back pain disability related with the selected demographic variables like age, nature of work, nutritional status, years of suffering with low back pain disability and years of working in factory. But, there is no association was found in marital status, type of family, income and educational status at p<0.05 level. Hence, the research hypothesis was accepted and null hypothesis was rejected.

Table 11: Association of post test level of low back pain disability among women in control group with their selected demographic variables.

(n=30)

S No.	Demographic Variable	Level of Low back pain disability				χ^2
		Less than median		More than median		
		f	%	f	%	
1.	Age in years					
	a) 25 – 30	5	16.66	0	0	
	b) 31 - 35	3	10	4	13	8.53
	c) 36 – 40	3	10	6	20	df-3
	d) 41 – 45	2	6.66	1	3.33	S*
2.	Marital status					
	a) Married	6	20	11	36.66	2.51
	b) Unmarried	5	16.66	3	10	df-3
	c) Widow	2	6.66	2	6.66	0.538
	d) Divorced	0	0	1	3.33	NS
3.	Educational status					
	a) Uneducated	2	6.66	3	10	2.42
	b) Primary school education	6	20	5	16.66	df-3
	c) Middle school education	3	10	8	26.66	0.540
	d) Secondary school education and above	2	6.66	1	3.33	NS

4.	Nature of work					
	a) Filling chemicals in empty crackers	8	26.66	8	26.66	1.53
	b) Labeling of the individual cracker pieces of the parts and assembling	2	6.66	3	10	df-3
	c) Packing of the crackers bundle and keeping them as bundles	2	6.66	2	6.66	0.681
	d) Transporting the crackers and bundle to wear house within factory	1	3.33	4	13	NS
5.	Income in rupees per month					
	a) 3,000-4,000	2	6.66	2	6.66	0.92
	b) 4,001-5,000	7	23.33	9	30	df-3
	c) 5,001-6,000	3	10	5	16.66	0.893
	d) 6,001 and above	1	3.33	1	3.33	NS
6.	Nutritional status(according to body mass index)					
	a) Underweight	3	10	1	3.33	9.1
	b) Normal weight	4	13	2	6.66	df-3
	c) Over weight	4	13	8	26.66	0.04
	d) Obese	2	6.66	6	20	S*
7.	Type of family					
	a) Joint family	7	23.33	5	16.66	0.931
	b) Nuclear family	5	16.66	12	40	df-2
	c) Single	1	3.33	0	0	0.881
						NS

8.	Years of suffering with low back pain					
	a) 6 months to 1 year	2	6.66	0	0	10.61
	b) More than 1 to 2 years	7	23.33	0	0	df-3
	c) More than 2 to 3 years	1	3.33	5	16.66	0.028
	d) More than 3 to 5 years and above	3	10	12	40	S*
9.	Years of working in factory					
	a) 6 months to 1 year	4	13	1	3.33	11.08
	b) More than 1 year to 2 years	3	10	1	3.33	df-3
	c) More than 2 years to 3 years	3	10	6	20	0.019
	d) Above 3 years to 5 years and above	3	10	9	30	S*

NS = Non Significant,

S*=Significant

P<0.05

Table 11: reveals the chi-square test to associate the post test level of low back pain disability with the selected demographic variables in the control group. While analyzing the statistical significance at (P<0.05) level it shows that there was significant association of the post test level of low back pain disability related with the selected demographic variables like age, nutritional status, years of suffering with low back pain disability and years of working in factory. But there is no association was found in marital status, type of family, income and educational status, nutritional status at p<0.05 level. Hence the research hypothesis” There will be a significant association between the post test level of low back pain disability among women with their selected demographic variable in experimental group and control group”.was accepted and null hypothesis was rejected.

CHAPTER V

DISCUSSION

This chapter deals with the discussion of the result of the data analysis to assess the effectiveness of lumbar stabilization exercises on low back pain disability among women working in fireworks factory of selected villages in Tirunelveli district.

The discussion is based on the objectives of the study and the hypotheses specified in the study.

MAJOR FINDINGS OF THE STUDY WERE

*With regard to the age of women with low back pain out of 60 samples, 3(10%) were between the age group of 25-30 years, 11(36.66%) were between the age group of 41-45 years in the experimental group. Whereas 5(16.66%) were between the age group of 25-30 years, 9(30%) were between the age group of 41-45 years in control group.

*In relation to marital status out of 60 samples, 19(63.33%) were married in experimental group. Whereas 17(56.66%) were married in the control group.

*With respect to the educational status out of 60 samples, 7(23.33%) were uneducated, 11(36.67%) were completed middle school education. Whereas 5(16.66%) were uneducated, 11(36.67%) were completed middle school education in the control group.

*On analysis of nature of occupation out of 60 samples studied 14(46.66%) were filling chemicals in empty crackers, 3(10%) were labeling individual cracker pieces and assembling. Whereas 16(53.33%) were filling chemicals in empty crackers, 5(16.66%) were labeling individual cracker pieces and assembling in the control group.

*With respect to income per month in rupees out of 60 samples,7(23.66%) were earning between 3,000-4,000,13(43.33%) were earning 4,001-5,000, 9(30%) were earning 5,001-6,000 and 1(3.33%) were earning 6,001 and above in the experimental group. Whereas(13.33%) were earning between 3,000-4,000,16(53.33%) were earning 4,001-5,000,8(26.66%) were earning 5,001-6,000 and 2(6.66%)were earning 6,001 and above in the control group.

*On analysis of the nutritional status out of the 60 samples,2(6.66%) were underweight,11(36.66%) were overweigh in the experimental group. Whereas 4(13.33%) were underweight,12(40%) in the control group.

*With regard to family type out of 60 samples, 13(43.33%) were in the joint family,15(50%) were in the nuclear family in the experimental group. Whereas 12(40%) were in the joint family,17(56.67%) were in the nuclear family in the control group.

*With regard to years of working in the factory out of 60 samples, 1(3.33%) were suffering from 6 months to 1 years, 17(56.66%) were suffering more than 3 to 5 years and above in the experimental group. Whereas in control group 2(6.67) were suffering from 6 months to 1 years,15(50%) were suffering more than 3 to 5 years and above.

*With regard to years suffering with the low back pain disability out of 60 samples,4(13.33%) were suffering for 6 months to 1 year, 11(36.66%) were suffering more than 3 years to 5 years and above in the experimental group. Whereas in control group 5(16.67%) were suffering for 6 months to 1 years,12(40%) were suffering more than 3 years to 5 years and above.

1. First objective was to assess the pre-test and post test level of low back pain disability among women in experimental group and control group.

During pre test, in the experimental group 0(00%) had no difficulty at all, 2(6.67%) had minimal, 27(90%) had fair level of difficulty and 1 (3.33%) had very difficulty. Post test on day 10 revealed, 0(00%) had no disability, 9(30%) had minimal disability, 21(70%) had moderate level of difficulty and none of them had severe level of difficulty. Post test-2 showed 0(00%) had no disability at all, 18(60%) had minimal disability, 12(40%) had moderate level of disability and none of them had severe level of disability .Hence lumbar stabilization exercises reduced the level of low back pain disability among experimental group.

2. Second objective was to find out the effectiveness of lumbar stabilization exercises on low back pain disability among experimental group.

The comparison of mean and standard deviation of pre-test and post-test on day 10 level low back pain disability in experimental group. In the experimental group mean pre-test value was 29.63 and SD was 5.09 and the Mean post-test on day 10 value was 22.96 and SD was 4.84. Their mean difference was 6.66 The calculated “t’ value was 13.74 which shows that there was a significance difference in the mean pre-test and post-test level of low back pain disability among experimental group at $p < 0.05$ level.

The comparison of mean and standard deviation of pre-test and post test on day 21 level of low back pain disability in experimental group.

The mean pre-test value was 29.63 and SD was 5.09 and the mean post-test value on day 21 was 18.70 and SD was 4.50. Their mean difference was 10.93. The calculated “t’ value was 10.93. which shows that there was a significance difference in

the pre-test and post-test day 21st level of low back pain disability among experimental group at $p < 0.05$ level.

Hence the stated research hypothesis, “ H_1 : Mean post test level of low back pain disability among women in experimental group will be significantly lower than the mean pre test level of low back pain disability in experimental group”. So, the research hypothesis was accepted and null hypothesis was rejected.

The study was supported by **Eric M et al,(2010)** conducted a randomized control trial to compare the effectiveness of two specific treatments in urban clinic of Uganda among 60 patients. Two specific treatment approaches for patients with low back pain(LBP) disability was used which included Lumbar stabilization exercises and general aerobic exercises. The functional status questionnaire (FSQ), the short form the McGill pain questionnaire,(SF-MPQ),and passive straight leg raising(SLR) were administered at initial examination and following 3 weeks treatment program. The Lumbar stabilization exercises group demonstrated statistically significant improvement in low back pain scores at ($p < 0.05$).The study concluded that Lumbar stabilization exercises are more effective than the general aerobic exercises for low back pain disability cases.

3. To compare the pre and post test level of low back pain disability among the women in experimental group and control group.

The comparison of mean pre test level of low back pain disability in the experimental group was 29.63 and SD was 5.09 and for control group the mean pre-test value was 30.80 and SD was 5.06.Their mean difference is 1.17, and the calculated “t’ value was 0.893 which shows that there was not a significance difference in the pre-test level of low back pain disability among experimental group and control group at $p < 0.05$ level

The comparison of mean and standard deviation of post-test on day 10 and 21 level of low back pain disability between the experimental and control group. The mean post-test day 10th value for experimental group was 22.96 and SD was 4.84. Their mean difference was 4.26, For control group the mean post-test on 10th day value was 31.43 and SD was 5.02. Their mean difference was 1.53. The calculated “t’ value was 6.66. Which shows that there was a significance difference in the effectiveness of lumbar stabilization exercises between experimental and control group at $p < 0.05$ level.

The comparison of mean and standard deviation of post-test on 21st day level of low back pain disability between the experimental and control group. The mean post-test on day 21st day value for experimental group was 18.70 and SD was 4.50, for control group the mean post-test day 21st value was 32.96 and SD was 4.16. Their mean difference is 14.26. The calculated “t’ value was 12.76. Which shows that there was a significance difference in the effectiveness of lumbar stabilization exercises between experimental and control group at $p < 0.05$ level.

Hence the stated research hypothesis, “ H_2 : Mean post test level of low back pain disability among experimental group will be significantly lower than the mean post test level of the low back pain disability among control group”. So, the research hypothesis was accepted and null hypothesis was rejected.

The study was supported by **Shameer, (2008)** a study was conducted on the effectiveness of Lumbar stabilization exercises on low back pain disabilities among adults in . The investigator used pre-experimental designs, two group pretest and post test design by selecting samples through non probability purposive sampling technique. The experimental and control group were assessed for pre test level of low back pain using Quebec low back pain disability scale. Lumbar stabilization exercises

were administered to the experimental group but no exercises were given to control group for three weeks. The obtained mean difference between group were 2.8 and “t” value was 7.68($p < 0.05$) was significant. Therefore the null hypothesis was rejected and it was concluded that lumbar stabilization exercises are effective in reducing low back pain disability.

4. Fourth objective was to associate the post test level of low back pain disability among women with their selected demographic variables in experimental group and control group.

Chi-square test to associate the post-test level of low back pain disability with the selected demographic variables in the experimental group. While analyzing the statistical significance at ($P < 0.05$) level it shows that there was significant association of the post-test level of low back pain disability with the selected demographic variables like age, nature of work, nutritional status, years of suffering with low back pain and years of working in factory except marital status, type of family, income and educational status at $p < 0.05$ level. Hence, the research hypothesis was accepted and null hypothesis was rejected.

The chi-square test to associate the post test level of low back pain disability with the selected demographic variables in the control group. While analyzing the statistical significance at ($P < 0.05$) level it shows that there was significant association of the post test day 21st level of low back pain disability related with the selected demographic variables like age, nutritional status, years of suffering with low back pain and years of working in factory except marital status, type of family, income and educational status, nutritional status at $p < 0.05$ level. Hence, the research hypothesis was accepted and null hypothesis was rejected.

The study was supported by **O F Khodian et al,(2000)** conducted a cross sectional descriptive study in Norway on the prevalence of low back pain disability among workers working in industrial and various offices. Hundred workers were participated in this study, the questionnaire was administered to participants regarding social and demographic characteristics such as age, job history, frequency of low back pain, and factors predisposing to (LBP) disability. The prevalence of low back pain was highest among industrial workers (69%) and cleaners and aids (42%). Heavy physical work, age, poor posture were the most frequent activities reported to be associated with low back pain. So, the study concluded that health education on posture and correct lifting technique can be introduced to reduce the burden of (LBP) disability among the workers.

From the above analysis and interpretations, the hypothesis (H₁), “Mean post test level of low back pain disability among women in experimental group was significantly lower than the mean pre test level of pain in experimental group.”(H₂): Mean post test level of low back pain disability among women in experimental group was significantly lower than the mean post test level of pain among control group.(H₃): There was significant difference between mean pre test and post test level of low back pain disability in control group.(H₄): There was significant association in the post test level of low back pain disability among women with their selected demographic variable among women in experimental group was accepted.

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMENDATIONS AND LIMITATIONS

This chapter deals with summary of the study findings, conclusion drawn, implications, recommendations and limitations of the study.

SUMMARY

This study was undertaken to assess the effectiveness of lumbar stabilization exercises on low back pain disability among women working in fireworks factory of selected villages at Tirunelveli district.

Low back ache is the most common cause of activity limitation in people younger than 45 years, the second most frequent reason for visits to the physician, the fifth-ranking cause of admission to hospital, and the third most common cause of surgical procedures. Recurrence rate of low back ache is high (40 to 70%). As the age increases, the incidence of recurrent low back ache also increases. Non specific low back ache is defined as low back pain not attributed to recognizable, known specific pathology.(E.g. Severe infection, tumor, osteoporosis, arthritis, fracture, cauda equine syndrome etc . Recurrent low back ache is defined as a new episode of low back pain after a symptom free period for 6 months, but not exacerbation of chronic low back ache .**Damian hoy et al,(2012)**.

Lumbar extension exercises suggested by McKenzie is a popular treatment for Low Back Pain among physical therapists. Lumbar extension exercises targets specifically lumbar paraspinals muscles. It increases strength and endurance of the

lumbar paraspinal muscles. McKenzie suggested that Extension exercises increase the lumbar extension range and produce extension stress. According to McKenzie, it produces the centralization of pain. The centralization phenomenon occurs when a movement or position results in the migration of symptoms from an area of distal in the buttocks or lower extremity to a location more proximal or closer to the midline of the lumbar spine. It also increases cartilaginous repair and self-sealing phenomenon.

McKenzie,(2017)

THE OBJECTIVES OF THE STUDY WERE:

- ❖ To assess the pre and post test level of low back pain disability among women in experimental group and control group.
- ❖ To find out the effectiveness of lumbar stabilization exercises on low back pain disability among experimental group.
- ❖ To compare the pre and post test level of low back pain disability among the women in experimental group and control group
- ❖ To associate the post test level of low back pain disability among women with their selected demographic variables in experimental group and control group.

HYPOTHESES

H₁: Mean post test level of low back pain disability among women in experimental group will be significantly lower than the mean pre test level of pain in experimental group.

H₂: Mean post test level of low back pain disability among experimental group will be significantly lower than the mean post test level of pain among control group.

H₃: There will not be significant difference between mean pre test and post test level of low back pain disability in control group.

H₄: There will be a significant association in the post test level of low back pain disability among women with their selected demographic variable among women in experimental group.

THE ASSUMPTIONS WERE:

- ✓ Low back pain disability may produce discomfort, restlessness, and irritation.
- ✓ Most of the women working in fire factory are experiencing pain in the back and disability.
- ✓ Lumbar stabilization exercises may help in alleviating discomfort and relieving low back pain disability.

THE REVIEW OF LITERATURE COLLECTED FOR THE STUDY PROVIDED A STRONG BASIS FOR THE STUDY

A Review of literature refers to the process in which the investigator examines the strength and weakness of the appropriate scholarly publications.

Review of literature of the present study is arranged in the following headings.

SECTION A: Studies related to prevalence of low back pain disability among women.

SECTION B: Studies related to effects of low back pain disability among women.

SECTION C: Studies related to treatment modalities of low back pain disability.

SECTION D: Studies related to effect of lumbar stabilization exercises on reduction of low back pain disability.

Researcher adopted the Faye G. Abdellah's (1960) helping art of the clinical nursing theory, which focused patient centered approach as the basis for her typology

of 21 nursing problems, it directed action towards the explicit goal this theory has 3 sections.

- Health care need
- Problem solving approach
- Health care need management

The research design selected for this study was quasi experimental pre-test and post test control group design. The study was conducted in selected villages Varaganoor(experimental group) and Maiparai village (control group) at Tirunelveli. The tool used for data collection consisting of demographic variables like age, type of family, nutritional status, income, marital status, educational status, occupation ,years of suffering with low back pain, years of working in fireworks factory etc.

The Modified Quebec scale was used to assess the level of low back pain disability among women working in fireworks factory.

The tool was validated by five experts consisting of four nursing experts and one medical expert and the reliability of the tool was confirmed by test retest method. The value of the reliability was $r=0.9$, and hence the tool was highly reliable. The pilot study was conducted and the findings revealed that the tool was feasible and practicable to conduct the main study. The main study was conducted in Varagnoor (experimental group) and Maiparai (control group) village. Sixty patients were selected by using non-probability purposive sampling technique.

FINDINGS

The data was collected and analyzed by using descriptive and inferential statistics. The findings revealed that the calculated 't' test value was 12.76 which

shows that there was a high statistical significant difference in the post-test level of low back pain disability between the experimental group and control group of the samples at $p < 0.05$ level. Hence the research hypothesis stated that, the mean post-test level of low back pain disability among the samples in experimental group was significantly lower than the mean post-test level of low back pain among the patients in the control group was retained at $p < 0.05$ level.

Data findings revealed that there was statistically significant association of the level of low back pain disability related with the selected demographic variables like age, nature of work, nutritional status, years of suffering with low back pain disability and years of working in factory among women in experimental group and control group with their selected demographic variables at $p < 0.05$ level.

CONCLUSION

From the result of the study, it was concluded that administration of lumbar stabilization exercises to reduce low back pain disability was effective in reducing the low back pain disability. Therefore the investigator felt that more importance should be given to lumbar stabilization exercises to reduce low back pain disability.

IMPLICATIONS

The researcher has derived the following implications from the study results which are of vital concern to the field of nursing service, nursing administration, nursing education and nursing research.

Implications for Nursing Practice:

1. Nursing personnel should develop sound knowledge about the low back pain disability among working women in fireworks factory.

2. Nurses should promote and encourage lumbar stabilization exercises to reduce low back pain disability.
3. Nursing personnel should develop sound knowledge regarding the uses of lumbar stabilization exercises to reduce low back pain disability.

Implications for Nursing Education:

1. The Nurse educators need to be equipped with adequate knowledge regarding lumbar stabilization exercises to reduce low back pain disability.
2. Nursing students should receive adequate training regarding the principles of lumbar stabilization exercises to reduce low back pain disability.
3. Conduct workshops or conferences for students regarding the use of lumbar stabilization exercises to reduce low back pain disability.
4. Strengthen the curriculum for nurses to excel them in knowledge and skill in areas of lumbar stabilization exercises to reduce low back pain disability.

Implications of Nursing Administration:

1. Nurses should assist in implementing public health awareness Campaigns aimed at promoting lumbar stabilization exercises to reduce low back pain disability.
2. Nurses should provide knowledge, resources and leadership for establishing public health policies that focus on lumbar stabilization exercises to reduce low back pain disability.
3. Nurses should conduct continuing nursing education regarding the effects of lumbar stabilization exercises to reduce low back pain disability.

Implications for Nursing Research:

As a nurse researcher,

1. Nurses should conduct research to further clarify the beneficial effects of lumbar stabilization exercises to reduce low back pain disability.
2. Encourage further research to be conducted for reducing the low back pain disability by giving lumbar stabilization exercises.
3. Disseminate the findings of the research through conferences, seminars and publishing in nursing journals.

LIMITATIONS:

1. Since there were very few studies done on the effectiveness of lumbar stabilization exercises to reduce low back pain disability, the investigator had a lot of difficulties in collecting the study materials for the review.
2. Due to slow effectiveness of exercise over three weeks time samples may not cooperate well, hence motivation is needed.

RECOMMENDATIONS:

The following studies can be undertaken to strengthen the studies regarding effectiveness of lumbar stabilization exercises to reduce low back pain disability.

1. A Longitudinal study to assess the effectiveness of lumbar stabilization exercises to reduce low back pain disability.
2. A study to assess the effectiveness of lumbar stabilization exercises to reduce low back pain disability among workers in fireworks factory.
3. A study to assess the knowledge regarding effectiveness lumbar stabilization exercises to reduce low back pain disability among staff nurses working in orthopaedic ward.

4. A comparative study to assess the effectiveness of lumbar stabilization exercises and yoga on reduction of low back pain disability among bus drivers.
5. A experimental study to assess the effectiveness of lumbar stabilization exercises on reduction of low back pain disability among software company workers.

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APPENDIX -A



SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

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Sankarankovil (Tk), Tirunelveli (Dt), Ph. : 04636 - 260950, Fax : 04636 - 260377.
E - Mail : srikrncon@yahoo.com Web : sriknaiducollegeofnursing.org

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE DATA COLLECTION FOR RESEARCH PROJECT

26.02.2018

To

The Block Medical Officer,
Primary Health Center,
Tiruvengadam – Varaganoor (village)
Sankarankovil (TK), Thirunelveli (dt),

Respected Madam / Sir,

Ms.Uma Maheswari is a bonafide student of our college studying in M.Sc (N) programme. As a partial fulfillment of the university requirement for the award of the M.Sc (N) degree, she needs to conduct research project

Her chosen research project is as follows 'A study to assess the effectiveness of lumbar stabilization exercise to reduce low back pain among women working in fireworks factory – Tirunelveli District.'

She will abide by the rules and regulation of the primary health center and adhere to primary health center policies during her period of data collection from 26-02-2018 to 31-03-2018. Permission may kindly be granted to her for conduction of the study at your villages and PHC.

Further details of the proposal project will be furnished by the student personally, confidentiality will be ensured in the research project.

Thanking you

Yours faithfully

Place :

Date :

[Signature]
Principal
Sri K. Ramachandran Naidu
College of Nursing
K.R. Naidu Nagar - 627 753, Karivalam (Via)
Sankarankovil (Tk.) Tirunelveli Dt.

[Signature]
MEDICAL OFFICER
GOVT. PRIMARY HEALTH CENTRE
THIRUVENGADAM-627719
TIRUNELVELI-DISTRICT



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26.02.2018

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE DATA COLLECTION FOR RESEARCH PROJECT

To

The Block Medical Officer,
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Respected Madam / Sir,

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Further details of the proposal project will be furnished by the student personally, confidentiality will be ensured in the research project.

Thanking you

Place :

Date :

Yours faithfully

Principal

**Sri K. Ramachandran Naidu
College of Nursing**
K.R. Naidu Nagar - 627 753, Karivalam (Via)
Sankarankovil (Tk), Tirunelveli Dt.



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E - Mail : srikrmcon@yahoo.com Web : srikrnaiducollegeofnursing.org

26.02.2018

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE DATA COLLECTION FOR RESEARCH PROJECT

To

The Managing Director,
Rajareshe Fireworks Factory,
Tiruvengadam - Varaganoor (Village),
Tiruvengadam (TK), Thirunelveli (dt),

Respected Madam / Sir,

Ms.Uma Maheswari is a bonafide student of our college studying in M.Sc (N) programme. As a partial fulfillment of the university requirements for the award of the M.Sc (N) II Year degree, she needs to conduct research project

Her chosen research project is as follows 'A study to assess the effectiveness of lumbar stabilization exercise to reduce low back pain disability among women working in fireworks factory - Tirunelveli District.'

She will abide by the rules and regulation of the fire factory and adhere to the factory policies during her period of data collection from 26-02-2018 to 31-03-2018. Permission may kindly be granted to her for conduction of the study at your factory.

Further details of the proposal project will be furnished by the student personally, confidentiality will be ensured in the research project.

Thanking you

For RAJARESHE FIREWORKS FACTORY

Place :

Date :


Partner

Yours faithfully



Principal

Sri K. Ramachandran Naidu
College of Nursing
K.R. Naidu Nagar - 627 753, Karivalam (Via)
Sankarankovil (Tk.) Tirunelveli Dt.



SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

Approved by Govt. of Tamilnadu and Indian Nursing Council / T.N.C
Affiliated to the Tamilnadu Dr. M.G.R. Medical University

K.R. Naidu Nagar - 627 753, Paruvakudi Village, Post Bag No.1, Karivalam (via)
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E - Mail : srikncon@yahoo.com Web : sriknmaiducollegeofnursing.org

26.02.2018

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE DATA COLLECTION FOR RESEARCH PROJECT

To

The Managing Director,
AVM Pyrotech,
Tiruvengadam - Maiparai (Village),
Tiruvengadam (TK), Thirunelveli (dt),

Respected Madam / Sir,

Ms.Uma Maheswari is a bonafide student of our college studying in M.Sc (N) programme. As a partial fulfillment of the university requirements for the award of the M.Sc (N) degree II Year, she needs to conduct research project

Her chosen research project is as follows 'A study to assess the effectiveness of lumbar stabilization exercise to reduce low back pain disability among women working in fireworks factory - Tirunelveli District.'

She will abide by the rules and regulation of the fire factory and adhere to the factory policies during her period of data collection from 26-02-2018 to 31-03-2018. Permission may kindly be granted to her for conduction of the study at your factory.

Further details of the proposal project will be furnished by the student personally, confidentiality will be ensured in the research project.

Thanking you

Place :

Date :

For AVM PYROTECH


PARTNER

Yours faithfully


Principal

Sri K. Ramachandran Naidu
College of Nursing
K.R. Naidu Nagar - 627 753, Karivalam (Via)
Sankarankovil (Tk.) Tirunelveli Dt.

APPENDIX-B

LETTER SEEKING EXPERTS OPINION FOR THE VALIDITY OF TOOL

From

M.Uma Maheswari

M.sc(N) II year

Sri.k. Ramachandran naidu college of nursing

Sankarankovil (TK), Thirunelveli (dt)

To

Respected Sir/Madam

Subject: Request for opinion and suggestions of expert for establishing content validity of research tool.

I am II yr M.sc Nursing student studying (Medical surgical Nursing) at sri.k.Ramachandran naidu college of nursing, Sankarankovil, under Tamilnadu Dr.MGR medical university, I am working on dissertation titled **“A study to evaluate the effectiveness of lumbar stabilization exercises on low back pain disability among women working in fireworks factory of selected villages at Tirunelveli District”** The dissertation has to be submitted to Dr.MGR Medical university, in partial fulfillment of university requirement for award of master of nursing degree. I humbly request you to kindly validate the tool and give your valuable suggestions. Your prompt opinions and suggestions will be approval

Thanking you

Place

Yours faithfully

Date

M.Uma Maheswari

Enclosures:

- Content validity certificate
- Statement of problems, objectives of the study, operational definitions, methodology
- Research tool

APPENDIX-C

LIST OF EXPERTS FOR CONTENT VALIDITY

MEDICAL EXPERT:

Dr.Balasugumar, MS,

Orthopaedic surgeon

Shifa hospital

Tirunelveli District

NURSING EXPERTS:

Prof.Chandrakala, M.Sc(N).Phd(N)

Principal

Vellammal College Of Nursing

Madurai

Prof.Devakirubai, M.Sc(N).Ph.D(N)

Professor

Sacred Heart College Of Nursing

Madurai

Mr.Murugavel,M.Sc(N),

Reader

Alma College Of Nursing

Mammalapuram

Kerala

Mrs.Priyadarshini,M.Sc(N)

Reader

KG College Of Nursing, Coimbatore

CONTENT VALIDATION CERTIFICATE


I here by certify that I validated the tool of M.UMA MAHESWARI II year Msc.Nursing student of Sri.K Ramachandran Naidu college of nursing who is undertaking the following study.

‘A study to assess the effectiveness of lumbar stabilization exercise to reduce low back pain among women working in fireworks factory . (Tirunelveli District).

Place *Tirunelveli*

Date *1-02-2018*

Designation and address


signature of the expert
DR. T. BALASUBRAMANIAN, M.S.(Ortho)
Reg. No. 81793
Consultant Arthroscopy & Trauma Surgeon,
Fellowship in Arthroscopy (UK)

CONTENT VALIDATION CERTIFICATE

I here by certify that I validated the tool of M.UMA MAHESWARI II year Msc.Nursing student of Sri.K Ramachandran Naidu college of nursing who is undertaking the following study.

*A study to assess the effectiveness of lumbar stabilization exercise to reduce low back pain disability among women working in fireworks factory . (Tirunelveli District).

Place MADURAI

Date 21/6/18

Designation and address


PROFESSOR X

HEAD OF THE DEPT,

MEDICAL-SURGICAL NURSING

SARADY HEART NSQ. COLLEGE

MADURAI-20



signature of the expert

APPENDIX-D

**CERTIFICATE OF ENGLISH EDITING TO WHOM SO EVER
IT MAY CONCERN**

This is to certify that the dissertation work "A study to evaluate the effectiveness of Lumbar stabilization exercise on low back pain disability among women working in fireworks factory of selected villages at Tirunelveli District." done by Mrs.M.Uma Maheswari. M.Sc (Nursing) in Sri K. Ramachandran Naidu College of Nursing, Sankarankovil (Tk), Tirunelveli-627 753, is edited for English language appropriateness by K. THIRU ARUL SELVI
P.G. ASST. ENGLISH


Signature
25/6/18

K. THIRU ARUL SELVI, M.A., M.Phil., B.Ed.
P. G. ASST. IN ENGLISH,
GOVT. HR. SEC. SCHOOL,
POOVANATHAPURAM,
VIRUDHUNAGAR DIST

APPENDIX-E

**CERTIFICATE OF TAMIL EDITING TO WHOM SO EVER IT
MAY CONCERN**

This is to certify that the dissertation work "A study to evaluate the effectiveness of Lumbar stabilization exercises on low back pain disability among women working in fireworks factory of selected villages at Tirunelvel District." done by Mrs.M.Uma Maheswari.M.Sc (Nursing) in Sri K. Ramachandran Naidu College of Nursing, Sankarankovil (Tk), Tirunelveli-627 753, is edited for Tamil language appropriateness by K. SUBBU RAO
P. G. Asst in Tamil.


Signature 25/6/18

K. SUBBURAJ, M.A., B Ed., M.Phil.,
Post Graduate Asst in Tamil
Govt. Higher Secondary School
Vembakottai-626 131. Virudhunagar Dt.

APPENDIX-F

INFORMED CONSENT

Good Morning,

I, Mrs. M.UMA MAHESWARI, M.Sc. Nursing 2nd year (Medical Surgical Nursing) student of Sri.K.Ramachandran Naidu College of Nursing, conducting a **“A study to assess the effectiveness of lumbar stabilization exercises to reduce low back pain disability among women working in fireworks factory of selected villages at Tirunelveli District.”** in a partial fulfillment of the requirement for the degree of M.Sc. Nursing under The Tamilnadu Dr.M.G.R. Medical University. The women suffering from low back pain disability will be given lumbar stabilization exercise twice a day, for thirty minutes each time (morning 9 am and evening 5 pm) for three weeks. Low back pain disability level will be assessed by modified Quebec low back pain disability scale on 10th and 21st day of study.

I assure you that information obtained will be kept confidential. So, I request you to kindly co operate with me and participate in this study by giving your frank and voluntary consent.

Thank you.

APPENDIX-G
SECTION - A
SAMPLE NO:
DEMOGRAPHIC VARIABLES

It consists of structured interview schedule. It has questions related to demographic data of a patient.

1.Age in years

- a) 25 – 30
- b) 31 - 35
- c) 36 – 40
- d) 41 – 45

2.Marital status

- a) Married
- b) Unmarried
- c) Widow
- d) Divorced

3.Educational status

- a) Uneducated
- b) Primary school education
- c) Middle school education
- d) Secondary school education and above

4.Nature of work

- a) Filling chemicals in empty crackers
- b) Labeling individual cracker pieces and assembling
- c) Packing of crackers and keeping them as bundles
- d)Transporting crackers to warehouse within factory

5)Income in rupees per month

- a) 3,000-4,000
- b) 4,001-5,000
- c) 5,001-6,000
- d) 6,001 and above

6) Nutritional status(according to body mass index)

- a) Underweight
- b) Normal weight
- c) Over weight
- d) Obese

7)Type of family

- a) Joint family
- b) Nuclear family
- c) Single

8)Years of suffering with low back pain

- a) 6 months to 1 year
- b) More than 1 to 2 years
- c) More than 2 to 3 years
- d) More than 3 years and above

9)Years of working in factory

- a) 6 months to 1 year
- b) More than 1 year to 2 years
- c) More than 2 years to 3 years
- d) More than 3 years and above

SECTION: B

MODIFIED QUEBEC BACK PAIN DISABILITY SCALE					
S. NO	ACTIVITY	NO DISABILITY (0)	MILD LEVEL OF DISABILITY (1)	MODERATE LEVEL OF DISABILITY (2)	SEVERE LEVEL OF DISABILITY (3)
1.	PAIN ON:				
a)	Standing up for 20-30 minutes				
b)	Sitting in a chair for several hours				
c)	Walking upstairs, downstairs and uneven ground				
2.	MAXIMUM DISTANCE OF WALKING				
a)	Walking upto 500mt				
b)	Walking more than 501mt to 1KM				
c)	Walking several KM				
3.	SLEEPING				
a)	Turning over bed				
b)	Sleeping through night				
c)	Getting out of bed				
4.	HOUSE KEEPING ACTIVITIES				
a)	Washing clothes				
b)	Reaching upto high shelves to take things				
c)	Pulling or pushing heavy weight				
5.	PERSONAL CARE				
a)	Dressing				
b)	Bathing				
c)	Putting on socks (pantyhose)				
6.	POSITIONS				
a)	Squatting				
b)	Bending forward to pick up				

	things				
c)	Twisting trunk				
7.	RECREATION				
a)	Drawing rangoli pattern over the porch.				
b)	Gardening and home craft				
c)	Playing traditional game dayam(dice)				

SCORING INTERPRETATION:

S.NO	LEVEL OF DISABILITY	SCORE
1	No disability	0
2	Mild level of disability	1-21
3	Moderate level of disability	22-42
4	Severe level of disability	43 -63

APPENDIX-I

INTERVENTIONAL GUIDE FOR LUMBAR STABILIZATION

EXERCISES

Lumbar Stabilization Exercise, when practiced for two times a day (9am and 5pm), 30 minutes each time, continuously for three weeks has been found to be effective in reduction of low back pain disability by strengthening the back muscle and increasing the back muscle flexibility. Generally these exercise attempt to strengthen the abdomen and improve lower back mobility, strength, endurance and enhance flexibility in the hip.

Samples will be advised to assemble in common hall, they will be given complete knowledge about steps of exercise. Oral consent will be obtained from each sample. Next, exercise will be demonstrated by the investigator, and samples will be instructed to follow the investigator. Ongoing instruction will be given. privacy will be provided and rights of samples will be maintained.

THE STEPS OF LUMBAR STABILIZATION EXERCISES

1. QUADRICEPS STRETCH

Samples will be advised to:

- Lie down on stomach.
- Attach a towel or rope to foot



- Pull foot towards buttocks and hold in position for 1 minutes .
- Do the same exercise 2 times over each side.
- Relaxation – 1 minute

2. HIP FLEXOR STRETCH

Samples will be instructed to:

- Kneel down with one knee on the ground.
- Raise same side arm and take back, causing pelvis to shift forward and back to extend.



- After Holding for 20-30 seconds repeat steps 2 times each side.
- Switch to other side and repeat the same procedure
- Relaxation – 1 Minutes

3. ABDUCTOR STRETCH

Samples will be instructed to:

- prop the inside of one ankle up on the table.
- Raise the arm of opposite side and lean towards the side they are stretching..



- Hold for 20-30 seconds.
- Switch over to other side leg and repeat the same process 2 times on each side.
- Do 1 set per sessions.
- Do 2 sessions per day.
- Relaxation – 1 minute.

4. HAMSTRING STRETCH

Samples will be instructed to:

- Prop the back of heel up on the table keeping back straight.
- Lean forward at hips.



- Keep back relaxed and hold for 20-30 seconds.
- Repeat 2 times each side.
- Do 2 sessions per day. Relaxation 1 minute.

5. DYNAMIC HAMSTRING STRETCH

Samples will be instructed to:

- Stand straight.



- Keep knees at 90 degree angle.
- Kick up until stretch is felt.
- Repeat 10 times each side.
- Do 2 sets per day.
- Relaxation -1 minute.

6. SUPINE BUTT LIFT WITH ARMS AT SIDE

Samples will be instructed to:

- Lie on back with feet flat on floor and hips and knees bent to 90 degree angle along with palms facing down at sides.
- Draw in abdominal muscles and maintain throughout exercise.



- Raise butt off the floor by using gluteus and hamstring muscle until their torso are in line with thigh, hold for 3-5 seconds.
- Repeated 20-30 times.
- Do 2 sets per day.
- Relaxation 1 minute

APPENDIX - H
SECTION - A

மாதிரி எண்:
புள்ளி விவரங்கள்

1. **வயது ஆண்டுகளில்**
 1. 25 - 30
 2. 31 - 35
 3. 36 - 40
 4. 41 - 45

2. **திருமணநிலை**
 1. திருமணமானவர்
 2. திருமணமாகாதவர்
 3. விவாகரத்தானவர்
 4. தனிமைப்படுத்தப்பட்டவர்

3. **கல்வி**
 1. படிப்பறிவின்மை
 2. அடிப்படைக்கல்வி
 3. இடைநிலைக்கல்வி
 4. மேல்நிலைக்கல்வி மற்றும் அதற்கு மேல்

4. **தொழில்**
 1. மருந்து அடைப்பது
 2. லேபிள் ஓட்டுவது
 3. பட்டாசுகளை பேக்கிங் செய்து அவற்றை இருப்புகளாக வைத்துக் கொள்ளுதல்
 4. பட்டாசுகளை குடோனில் சேமித்தல்.

5. **வருமானம் (ரூபாய் / மாதம்)**
 1. 3,000 - 4,000
 2. 4,001 - 5,000
 3. 5,001 - 6,000
 4. 6,001-க்கு அதிகமாக.

6. ஊட்டச்சத்து நிலை (உடல் நிறை குறியீட்டின் படி)

1. சாதாரண எடைக்கும் கீழ்
2. சாதாரண எடை
3. அதிகமான எடை
4. உடல் பருமன்

7. குடும்பத்தின் நிலை

1. கூட்டுக்குடும்பம்
2. தனிக்குடும்பம்
3. தனியாக இருப்பது

8. முகுது வலி இருக்கும் ஆண்டுகள்

1. 6 மாதம் முதல் 1 வருடம் வரை
2. ஒரு வருடத்திற்கு மேல், இரண்டு ஆண்டுகள் வரை
3. இரண்டு ஆண்டுகளுக்கும் மேலாக, மூன்று ஆண்டுகள் வரை
4. மூன்று ஆண்டுகள் மற்றும் அதற்கும் மேலாக

9. வேலை பார்க்கும் வருடங்கள்

1. 6 மாதம் முதல் 1 வருடம் வரை
2. ஒரு வருடத்திற்கு மேல், இரண்டு ஆண்டுகள் வரை
3. இரண்டு ஆண்டுகளுக்கும் மேலாக, மூன்று ஆண்டுகள் வரை
4. மூன்று ஆண்டுகள் மற்றும் அதற்கும் மேலாக

APPENDIX - J

இடுப்பு நிலைப்படுத்துவதன் பயிற்சி குறிப்புகள்

1. இடுப்பு, தொடை மற்றும் முழங்கால் தசை பயிற்சி

பயிற்சியாளர்கள் பின்பற்ற வேண்டியவை :

- * வயிறு தரையில் படுமாறு படுக்க வேண்டும்.
- * ஒரு கயிறால் ஏதாவது ஒரு காலை கட்ட வேண்டும்.
- * கட்டிய காலை அதே பக்கம் உள்ள கையால் முன் நோக்கி இழுக்க வேண்டும்.
- * அதே நிலையில் ஒரு நிமிடம் இருக்க வேண்டும்.
- * இதே பயிற்சியை அடுத்த காலிலும் செய்ய வேண்டும்.
- * ஒரே கால் பகுதியில் இரண்டு முறை செய்ய வேண்டும்.
- * ஓய்வு ஒரு நிமிடம் எடுக்க வேண்டும்.

2. இடுப்பு தசைகள் நீட்சி பயிற்சி

பயிற்சியாளர்கள் பின்பற்ற வேண்டியவை

- * ஒரு முழங்காலை மடித்து தரையில் ஊன்றியும், மற்றொரு முழங்காலை மடித்து பாதம் தரையில் ஊன்ற வேண்டும். ஊன்றி இருக்குமாறும், உடம்பை நேராக வைக்க வேண்டும்.
- * மடித்த முழங்காலின் பக்கமுள்ள கையை தூக்கி பின்புறமாகவும் மற்றும் இடுப்பை முன்புறமாகவும் வளைக்கவும்.
- * 20-30 நொடிகள் அதே நிலையில் இருக்கவும்.
- * ஒவ்வொரு புறமும் இருமுறை தொடர்ந்து செய்ய வேண்டும்.
- * ஒரு நிமிடம் ஓய்வு எடுக்கவும்.

3. கை, கால்களை அகல விரித்து செய்யும் நீட்சி பயிற்சி

பயிற்சியாளர்கள் பின்பற்ற வேண்டியவை

- * நேராக நின்று வலது காலை தரையில் வைத்து மற்றொரு காலை பக்கவாட்டில் இடுப்பு அளவிற்கு தூக்கி பக்கத்தில் உள்ள மேஜை மீது நேராக நீட்டவும்.

- * இடது கை வலது தொடையிலும், வலது கை மேல் நோக்கியும் தூக்கியவாறு பக்கவாட்டில் வைத்திருக்கிற காலை நோக்கி இடுப்பு பகுதியோடு சேர்ந்து சாயவும்.
- * 20-30 நொடிகள் அதே நிலையில் இருக்கவும்.
- * மேற்கூறியவாறு அடுத்த புறம் உள்ள காலை வைத்துச் செய்யவும்.
- * ஒரு நேரத்திற்கு இரு முறை செய்யவும். ஒவ்வொரு காலை வைத்து செய்யவும்.
- * ஒரு நாளைக்கு இரண்டு தடவை செய்யவும்.

4. தொடை மற்றும் முழங்கால் தசை நீட்சி பயிற்சி
பயிற்சியாளர்கள் பின்பற்ற வேண்டியவை

- * நேராக நின்று வலது காலை தரையில் வைத்தும், மற்றொரு காலை நேராக இடுப்பு அளவிற்கு உயர்த்தி பக்கவாட்டில் உள்ள மேஜை அல்லது நாற்காலி மீது நேராக நீட்டவும்.
- * இடுப்பு பகுதியை முன்புறமாக வலைத்து தூக்கி வைத்திருக்கும் காலை நோக்கி சாயவும்.
- * 20-30 நொடிகள் அதே நிலையில் இருக்கவும்.
- * 1 நேரத்திற்கு இரு முறை செய்யவும்.
- * 1 நிமிடம் ஓய்வு எடுக்கவும்.

5. தொடை தசையை நீட்டி, மடக்கி நீட்சி பயிற்சி
பயிற்சியாளர்கள் பின்பற்ற வேண்டியவை

- * நேரான நிலையில் நிற்க வேண்டும்.
- * ஒரு காலை இடுப்பு வரை தூக்கி முழங்காலை நேராக நீட்டி பாதம் தரையை நோக்கியவாறு நிற்க வேண்டும்.
- * மடக்கிய முழங்காலை தொடைப்பகுதிக்கு நேராக முடிந்த அளவுக்கு மேல் நோக்கி தூக்கி நேராக நீட்டவும்.
- * இப்பயிற்சியை ஒரு காலுக்கு 10 முறை ஒவ்வொரு முறையும் செய்ய வேண்டும்.
- * 1 நிமிடம் ஓய்வு எடுக்கவும்.

6. சீராக படுத்து பிட்டம் தூக்கி கை பக்கவாட்டு நிலை பயிற்சி
பயிற்சியாளர்கள் பின்பற்ற வேண்டியவை

- * நேராக படுத்து இரண்டு பாதத்தையும் தரையில் படுமாறு வைத்து, முழங்காலையும் இடுப்பையும் 90° வைக்கவும்.
- * உள்ளங்கை இரண்டையும் நேராக தரையில் வைக்கவும்.
- * உள்ளங்கையை தரையில் ஊன்றி, வயிறு இடுப்பு பிட்டம் ஆகிய மூன்று பகுதிகளையும் மேல் நோக்கி தூக்கி நிறுத்தவும்.
- * 3-5 நொடிகள் அதே நிலையில் இருக்க வேண்டும்.
- * 20-30 முறை இப்பயிற்சியை ஒவ்வொரு முறையும் செய்ய வேண்டும்.
- * 1 நிமிடம் ஓய்வு எடுக்கவும்.

SECTION - B

மாற்றியமைக்கப்பட்ட கியூபேக் முதுகு வலியால் ஏற்படும் இயலாமையின் தன்மை அறியும் அட்டவணை					
வ.எண்	செயல்பாடு	இயலாமை (0)	இயல்பான லேசான நிலை (1)	இயலாமைக்கான மிதமான நிலை (2)	கடுமையான நிலை (3)
1.	வலியின் தன்மை நிலை				
அ.	20-30 நிமிடங்கள் வரை நிற்கும் போது அதன் நிலைபாடு				
ஆ.	பல மணி நேரம் ஒரு நாற்காலியில் அமர்ந்து இருக்கும் போது அதன் நிலைபாடு				
இ.	மாடிப்படையில் ஏறி இறக்கும் போதும் மற்றும் சமம் உள்ள தரையில் நடக்கும் போதும்				
2.	நடைபயிற்சி தூரம்				
அ.	500 மீட்டர் வரை நடைபயிற்சி செய்யும் போது				
ஆ.	500 மீட்டருக்கும் மேல் 1 கி.மீ வரை				
இ.	பல கி.மீ மேல் நடக்கும் போது				
3.	தூக்கம்				
அ.	திரும்பி படுக்கும் போது அதன் நிலைபாடு				
ஆ.	இரவு முழுக்க தூங்குதலின் அதன் நிலைபாடு				
இ.	படுக்கையில் இருந்து தூங்கி எழுதலின் நிலைபாடு				

4.	வீட்டு பராமரிப்பு நடவடிக்கைகள்				
அ.	துணி துவைக்கும் போது அதன் நிலைபாடு				
ஆ.	அலமாரியில் மேலே உள்ள பொருட்களை எட்டி எடுக்கும் போது அதன் நிலைபாடு				
இ.	அதிக எடையுள்ள பொருள்களை தூக்கும் போது அதன் நிலைபாடு				
5.	தன்னை தானே பாதுகாத்தல்				
அ.	ஆடை அணியும் போது				
ஆ.	குளிக்கும் போது				
இ.	உள் ஆடைகளை குனிந்து அணியும் போது				
6.	நிலை				
அ.	குத்தவைத்து அமரும் போது				
ஆ.	வளைந்து குனிந்து பொருளை எடுக்கும் பொழுது				
இ.	உடல் மற்றும் இடுப்பை திருப்பும் போது				
7.	பொழுதுபோக்கு நடவடிக்கை				
அ.	வாசலில் கோலம் வரையும் போது				
ஆ.	தோட்டம் மற்றும் வீடு பராமரிப்பின் போது				
இ.	தாயம் மற்றும் பல்லாங்குளி விளையாடும் போது				

APPENDIX-I

INTERVENTIONAL GUIDE FOR LUMBAR STABILIZATION

EXERCISES

Lumbar Stabilization Exercise, when practiced for two times a day (9am and 5pm), 30 minutes each time, continuously for three weeks has been found to be effective in reduction of low back pain disability by strengthening the back muscle and increasing the back muscle flexibility. Generally these exercise attempt to strengthen the abdomen and improve lower back mobility, strength, endurance and enhance flexibility in the hip.

Samples will be advised to assemble in common hall, they will be given complete knowledge about steps of exercise. Oral consent will be obtained from each sample. Next, exercise will be demonstrated by the investigator, and samples will be instructed to follow the investigator. Ongoing instruction will be given. privacy will be provided and rights of samples will be maintained.

THE STEPS OF LUMBAR STABILIZATION EXERCISES

1. QUADRICEPS STRETCH

Samples will be advised to:

- Lie down on stomach.
- Attach a towel or rope to foot



- Pull foot towards buttocks and hold in position for 1 minutes .
- Do the same exercise 2 times over each side.
- Relaxation – 1 minute

2. HIP FLEXOR STRETCH

Samples will be instructed to:

- Kneel down with one knee on the ground.
- Raise same side arm and take back, causing pelvis to shift forward and back to extend.



- After Holding for 20-30 seconds repeat steps 2 times each side.
- Switch to other side and repeat the same procedure
- Relaxation – 1 Minutes

3. ABDUCTOR STRETCH

Samples will be instructed to:

- prop the inside of one ankle up on the table.
- Raise the arm of opposite side and lean towards the side they are stretching..



- Hold for 20-30 seconds.
- Switch over to other side leg and repeat the same process 2 times on each side.
- Do 1 set per sessions.
- Do 2 sessions per day.
- Relaxation – 1 minute.

4. HAMSTRING STRETCH

Samples will be instructed to:

- Prop the back of heel up on the table keeping back straight.
- Lean forward at hips.



- Keep back relaxed and hold for 20-30 seconds.
- Repeat 2 times each side.
- Do 2 sessions per day. Relaxation 1 minute.

5. DYNAMIC HAMSTRING STRETCH

Samples will be instructed to:

- Stand straight.



- Keep knees at 90 degree angle.
- Kick up until stretch is felt.
- Repeat 10 times each side.
- Do 2 sets per day.
- Relaxation -1 minute.

6. SUPINE BUTT LIFT WITH ARMS AT SIDE

Samples will be instructed to:

- Lie on back with feet flat on floor and hips and knees bent to 90 degree angle along with palms facing down at sides.
- Draw in abdominal muscles and maintain throughout exercise.



- Raise butt off the floor by using gluteus and hamstring muscle until their torso are in line with thigh, hold for 3-5 seconds.
- Repeated 20-30 times.
- Do 2 sets per day.
- Relaxation 1 minute