EFFECTIVENESS OF BACK STRENGTHENING EXERCISES ON LOW BACK PAIN AMONG POST MENOPAUSAL WOMEN IN SELECTED VILLAGE, KANAYAKUMARI DISTRICT

DISSERTATION SUBMITTED TO
THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE
DEGREE OF MASTER OF SCIENCE IN NURSING
COMMUNITY HEALTH NURSING
APRIL 2014

CERTIFICATE

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ACKNOWLEDGEMENT

I wish to express my humble thanks to **"God Almighty"** for his endless grace, love, care and blessings showered on me to complete and in presenting this dissertation successfully.

I express my sincere gratitude to the **management** of St. Xavier's Catholic College of Nursing for the encouragement at each level of this study.

At the outset, I express my honest and sincere gratitude to **Rev. Fr. Dominic M. Kadacha Dhas** correspondent and **Rev. Fr. Dr. Maria William** co-correspondent of St.Xaviers catholic college of nursing for giving me the precious opportunity to be a part of this esteemed institution.

I express my heart full gratitude to **Dr. A. Reena Evency, M.Sc.(N)., Ph.D. (N)., Principal**, St. Xavier's Catholic College of Nursing, Chunkankadai, for her valuable support, suggestions and direction for complete the study in a successful way.

I express my sincere thanks to my clinical guide **Mrs. Lours Bemi, M.Sc(N)., Lecturer and Head Of the Department**, in department of Community Health Nursing, for her constant support, suggestions and encouragement at each level of this study.

I express my respectful thanks to **Mr. A. George Joe Kumar, M.Sc(N).,** Vice principal and my Class Co-ordinator, St. Xavier's Catholic College of Nursing, Chunkankadai, for his valuable suggestions and continuous support which made my study smooth and successful.

I extend my thanks to **Dr. A. Judie, M. Sc., (N), Ph. D., (N), Dean** of SRM College of Nursing for her best guidance in the path of research activities.

It is the most pleasant time to express my sincere and exclusive thanks to **Ms. Iyarine, M.Sc (N) and Ms.Lija, M.Sc(N)**, Tutors Department of Community Health Nursing for their innovative and constant effort to ensure the best quality in my work, which helped me to do my study in a successful way.

I also take the opportunity to express my special thanks to **Mrs. Selestine Mary and Mrs. Sweety,** Librarians, St. Xavier's Catholic College of Nursing, Chunkankadai, for helping me to review and for extending library facilities throughout the study.

I am very grateful to All Faculty Members of St. Xavier's Catholic College of Nursing, Chunkankadai, for their help and continuous support whenever needed.

I express my sincere gratitude to **Dr. Pethuru M.B.B.S, MD** (community medicine), Sree Mookampika Institute Of Medical Science, for validating the tool, constant guidance and valuable suggestions.

I extend my thanks to the **Dissertation Committee Members** for their healthy criticism, supportive suggestions which moulded the research.

I take this opportunity to thank all the **Experts** of community department who have done the content validity and valuable suggestion in the modifications of the tool.

I extend my sincere thanks to **Dr. Immanuel, Ph.D.,** Biostatistician, for his support and guidance in statistical analysis and interpretation of data.

I extend my deep sense of gratitude and thanks to the **panchayath President, in Keezhkulam** for their cooperation in completion of the study.

I wish to express my sincere thanks to the **Participants** of this study, post menopausal women in Keezhkulam panchyath for their cooperation.

I extend my immense and heartfelt gratitude to all my **teachers** who taught me the concepts of nursing.

I express special thanks to **Shalom computer centers** for their excellent and untiring effort in materializing my dissertation work.

I would like to express my deep felt gratitude to my family members and friends for their fruitful prayers, endless patience, inspiration and support throughout this endeavor.

(BINO SHINY AJ)

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ABSTRACT

A quasi experimental study was conducted to evaluate the effectiveness of back strengthening exercises on low back pain among post menopausal women in selected villages, Kanayakumari district.

The quasi experimental pre-test post-test control group design was adopted and the post menopausal women from Arasakulam village (study group) and Vizhunthayambalam village (control group) were chosen for the study. 60 samples were selected by purposive sampling technique. The level of low back pain was assessed by using modified Oswestry low back pain disability questionnaire. Back strengthening exercise was administered for Study group. Post test done on fourth week of the data collection period. The data gathered were analyzed by descriptive and inferential statistical method and interpretations were made on the basis of the objectives of the study.

During pretest, in Study group none of them had minimal low back pain, 9(30%) had moderate low back pain, 16(53.33%) had severe low back pain, 5(16.66%) had crippled low back pain and none of them had bed bound. In Control group, none of them had minimal low back pain, 10 (33.33%) had moderate low back pain, 17(56.66%) had severe low back pain 3(10%) with crippled low back pain, none of them with bedbound. During post test, in Study group 19(63.33%) had minimal low back pain, 7(23.33%) had moderate low back pain, 2(6.66%) had severe low back pain and 26.66%) had crippled low back pain. In Control group, none of them had minimal low back pain, 10(33.33%) had moderate low back pain, 17(56.66%) with severe low back pain, and 3(10%) crippled low back pain. The mean score on level of low back pain among post menopausal women in Study group were 49.93 in pre test and 19.73 in post test respectively. The paired‘t’ value for low back pain were 10.74^{*} which is significant at $p < 0.05$. It shows that back strengthening exercise was effective in reducing the level of low back pain. Hence the research hypothesis h_1 is accepted. In Control group the mean score on level of low back pain among post menopausal women were 48 in pre test and 48 in post test respectively. The estimated paired‘t’ value for low back pain were 0.26 which is not significant at $p < 0.05$. The data findings showed that there was no significant

association between the post test level of low back pain among post menopausal women with their demographic variable such as age, education, occupation, income, religion, dietary pattern, type of delivery, number of children, age of menopause and type of menopause at $p>0.05$ level. Hence hypothesis H_3 is not accepted.

INTRODUCTION

CHAPTER 1
INTRODUCTION

Human life constitutes various specific stages, in which both men and women have to pass through. Each stage of human life is very important and unique in nature as certain physical development takes place in its own way. Every stage of life is interconnected with the other, according to physical growth takes place in a natural process. It is a fact that there is a slightly different stage of womanhood in comparison to manhood.

Menstruation is the bodily process that marks the beginning of womanhood. It also stays with her for a greater part of her life. Woman's first period is known as menarche and it normally occurs at the age of 10-17 years.

Female reproductive function is governed by hormonally regulated cycles called menses. Female reproductive abilities start during adolescence, with the onset of menses. Reproductive abilities decline around the 5^{th} decade, when the frequency of ovulation diminishes and the menstrual cycle becomes shorter and more irregular. From menarche a woman gets her regular period roughly each month until she reaches menopause.

Menopause is the most important life stage in women. It marks the end of menstruation leading to women aging process when she cannot become pregnant. In other words, it is the physiological cessation of the menstrual cycle associated with advancing age. It is a natural process that happens to every woman as she grows older and not due to medical problem, disease or illness.

Menopause usually occurs between the ages of 45 to 55 years, marking the end of the adulthood period. It is caused by changes in sex hormone levels. The ovaries gradually become less responsive to follicle stimulating hormone and luteinizing hormone, the ovulation and the menstrual cycle become irregular, eventually ceasing.

A woman can say she has entered menopause when she did not have periods for a full year. Physiological, psychological, emotional problems arise after menopause due to

the hypo estrogen status. It should be managed by planning a good health program strategy, which involves lifestyle modification.

Background of the study

Women are undergoing many stages in their lives. The stages are puberty, pregnancy, lactation and menopause. Menopause is one of the most important life stages. Menopause is an event that typically occurs in women during their last 40s or early 50s and it signals the end of the fertile phase of women life. Menopause literally means the end of monthly cycles from the Greek word pause (cessation) and the root men (monthly).

The International Menopause Society (IMS), a non-profit association, was created in 1978 in Jerusalem during the second Menopause Congress and it currently has members in 62 countries. IMS has designated October 18 as World Menopause Day. The main objective of IMS is to conduct many researches related to menopause and to improve the awareness regarding the menopausal symptoms.

Menopause affects every woman and as the large baby boom generation reaches midlife and beyond, and UN precedence number of women are now post menopausal. In United States an estimated 6000 women reach menopause every day. In addition, more women live beyond the age of 65 years. In western world a woman life expectancy is estimated at 79.7 years. Today a woman who reaches age 54 can expect to reach age 84.3. About two thirds of the total US population is expected to survive to age 85 or longer.

The word ‘menopause’ was coined specifically for human females, where the end of fertility is traditionally indicated by the permanent stopping of monthly menstruation. The date of menopause in females is medically defined as the time of last menstrual period, in those women who have not had a hysterectomy. In **India** and the **Philippines,** the median age of natural menopause is considerably earlier at 44 years. The average age of natural menopause in Australia is 51.7 years.

Each woman experiences menopause. The term ‘menopause’ means permanent cessation of menstruation at the end of reproductive life due to loss of ovarian follicular activity. Natural or physiological menopause a part of a woman is normal aging process. It is the result of the eventual depletion of almost all of oocytes and ovarian follicles in the ovaries. These causes increase circulating follicle stimulating hormone and luteinizing hormone levels because there are a decreased number of oocytes and follicles responding these hormones and producing estrogen. This decrease in the production of estrogen leads to the menopausal symptoms of hot flashes, insomnia and mood changes.

Menopause is a normal change in women’s life. Peri menopause means physical clues that approaching menopause may starts years before your final menstrual period. Post menopause is menstrual cycle stopped permanently at least the time before 1 year. Post menopausal symptoms vary in every woman.

Post menopause is applied to women who have not experienced a menstrual bleed for a minimum of 12 months, assuming that they do still have a uterus, and are not pregnant or lactating. Whether it is during or after menopause, a woman is likely to experience health problem physically and psychologically.

Post menopausal period brings a lot of changes in the body of women and most of that leads to troublesome symptoms like skeletal problems such as back pain, osteoporosis, joint and muscle pain. Symptoms of genitourinary instability are bleeding, urinary frequency, itching, and dryness and those of vasomotor instability are hot flushes including night sweats, and sleep disturbance. Psychological symptoms are memory loss, irritability, mood disturbance, and fatigue.

Nearly 40 million United States (US) women pass the average age of natural menopause is 51. Although the US census bureau in the year 2000 reported, it does not provide the exact number of women over age 51. It does not report women of age 55 and older can all be assumed to be post menopause. An estimate 75% of women assumed to be post menopausal. Among women age 40 to 45, an estimated 5% has experienced natural menopause based primarily on data from the study of women health across the

nation. An estimation of 25% women from 45-55 years old comes in the next oldest category.

World Health Organization estimated that by the end of 2015, there will be 130 million elderly women in India, necessitating substantial amount of care. By 2025, the number of post menopausal women is expected to go up to 1.1 billion. Life expectancy for women worldwide is 65 years.

Recent survey conducted by the Institute for Social and Economic Change (ISEC) in Bangalore has reported as nearly 4% of Indian women has already entered menopause within the age of 29-34 years and 8% at 30 years. According to the report of World Health Organization 60% of the post menopausal women has mild post menopausal symptoms, 20% of them severe post menopausal symptoms and 20% of them no post menopausal symptoms

Viana, S.P. (2006) revealed that 80% of post menopausal women experience no change in their quality of life and 75% of the post menopausal women experience that they loss in their attractiveness. Most of the women (62%) reported positive attitudes towards the menopause. In another study, most women view menopause as inconsequential. The community based study reported that 10% of pre and post menopausal women reported feelings of despair, irritability or fatigue during the menopause.

Hormone imbalance plays a major role in women bone and joint health. When her hormones become imbalanced during post menopause, she will often experience low back pain. In order to manage the problem of post menopause, she could adopt various physical, psychological measures.

Physiological aspects involve hormone therapy administering both estrogen and progesterone. Nutrition management like eating more calcium diet helps in preventing some of the long term effects that are linked to estrogen deficiency.

Psychological aspects include counseling to help the women to overcome their problems like depression or anxiety, conflict and anger. Communication skill helps women to share her feelings and problems with her partners for further course of action.

Self care becomes very important in the process of managing post menopausal symptoms. There are various aspects where self care plays a vital role in handling menopause such as hot flushes, decreasing vaginal discomfort. She regulates herself optimizing the level of sleep, eating well, and exercise regularly to overcome the problems.

There is no need of medical treatment for post menopause. Instead, treatment focuses on reliving the signs, symptoms in preventing or lessening chronic conditions that occur with ageing. Drug treatments include hormone therapy, low dose anti depressants related to the class of drugs called selective serotonin, re uptake inhibitors to decrease hot flushes by up to 60 percent and birth control pills. And other complementary treatment methods include exercises, yoga, massage, acupuncture and biofeedback.

Back pain, a globally health problem currently affects more than 200 million people worldwide. Among that 80% of them are menopausal women. In India back pain is very significant. The number of menopausal women is about 43 million, among them 65-70% women between 45-65 years have been found to have back pain and all women over 65 years have been found to have low back pain. Bangalore statistics report shows that almost 1 in 3 women over the age of 50 years combat osteoporotic low back pain.

Exercises help in building and maintaining the bone density and mass. The exercise program for post menopausal women should include endurance exercise, strengthening exercise and balancing exercise. Out of these, exercise weight bearing and resistance exercises are effective in increasing the bone mineral density of the spine in post menopausal women.

Back strengthening exercises can help to strengthen the spinal column and supporting muscles, ligaments and tendons. Most of the exercises focus not only the back but also the abdominal muscles and hip muscles. These strong core muscles can

provide back pain relief because they provide strong support for the spine, keeping it in alignment and facilitating movement that extend or twist the spine.

Women can enjoy a good quality of life after menopause even without the support of hormones. Research indicates that post menopausal women, who engaged in the comprehensive exercise program, get benefit and enjoy a good quality life.

Significance and Need for the study

Low back pain is growing as a public health problem throughout the world. The prevalence of back pain around the globe is 60% to 80%. 1 in 3 women over the age of 50 years has back pain. In India for about 30 million women are suffering with back pain. In Bangalore, the back pain is the highest among post menopausal women with the age of 50 to 70 years.

50% of menopause women over 50 years in US has back pain during their lifetime. Approximately 28 million people suffer from back pain in US, 80% of cases were post menopausal women. 90% of women gain weight during the menopause and 50% women experience fracture due to osteoporosis which is developed during menopause. These all are the leading causes of back pain.

In Finland, it was found that menopause women with age of 45 to 64 years are the most significant in the case of back pain. Low back pain is a common problem for community based women. It is characterized by both pain and disability.

According to the North American menopause society, a study was conducted by Family and Child Nursing, University of Washington, US for pain symptoms during the menopausal transition and early post menopausal period. Data was collected from the participants who provided data during the late reproductive, early and late menopausal transition stages or post menopause (n=292). The result revealed that women experience slight rise in back pain with age and a significant increase during the early and later menopausal transition stage and early menopause and lower overnight urinary cortical levels were associated with more severe back pain.

The most remarkable demographic change observed in the new millennium is the increased life expectancy of women in India. It has estimated that by the end of 2015, there will be 130 million elderly women in India, necessitating a substantial degree of care.

A study was conducted for the relationships between the factors influencing low back pain in post menopausal women. It was conducted with postmenopausal women (n=134) in Korea in 2006. Bone mineral density in the lumbar spine, back pain status, menopausal symptoms and health habits were assessed. Participant's mean age was 59 years. About 70% of them experienced back pain of more than one day during the week prior to the survey and 35% suffered back pain daily. Women with back pain reported more severe menopausal symptoms than those without back pain.

Ahn. S et al conducted a study to find prevalence of low back pain among post menopausal women. This study reported that prevalence of low back pain was 67.5% and the pain was daily in one out of three women.

Vogt MT et al also determined a high prevalence of back pain among post menopausal women. Moreover they established a relationship between these symptoms and reduce physical health and more functional limitation. This study showed that almost 15% had daily activities limitations, and 5% were at least one day in bed in the previous 6 months, a number that collaborates to the economic burden caused by these symptoms.

Many orthopedic surgeons and physical therapists recommend to do exercise for 10 to 30 minutes, 1 to 3 times a day which is effective in primary and secondary prevention of low back pain. Regular exercise can help in building and maintaining bone density. Grubbs said that back strengthening exercise helps to reduce low back pain among post menopausal women.

Hyoung HK (2008) conducted an experimental study to identify effects of a strengthening exercise program for the lower back in older women with chronic low back pain. The experimental group consisted of 16 older women and the control group with 14 members had experienced low back pain for at least 3 months. The intervention was carried out 8 weeks, exercise was done 3 days a week and on one day education was also

given. The study result showed that low back pain and disability can be relived through a strengthening program.

Sinaki,M et al (1989) conducted a prospective study on efficacy of back strengthening exercise on the strength of back extensors among fifty healthy post menopausal women volunteers, aged 40 to 65 years. The findings revealed that the strength of the back extensors was significantly increased ($p < 0.001$) in the exercise group with conventional back extension exercise.

As per review mentioned above, the researcher personally identifies that the post menopause women have back pain and it can be reduced by exercise. During home visit the researcher has found many post menopausal women suffering with low back pain. So the researcher has selected this study.

Statement of the problem

A quasi experimental study to evaluate the effectiveness of back strengthening exercises on low back pain among post menopausal women in selected village, Kanyakumari district.

Objectives of the study

- To assess and compare the pre and post level of low back pain among post menopausal women in study and control group.
- To evaluate the effectiveness of back strengthening exercise on low back pain among post menopausal women in study group.
- To determine the association between post test level of low back pain among post menopausal women with their selected demographic variables in study and control group.

Research hypothesis

H_1: There is a significant difference in the pre and post test level of low back pain among post menopausal women in study group and control group.

H_2: There is a significant difference between the post test level of low back pain among post menopausal women in the study and control group.

H_3: There is a significant association between post test level of low back pain among post menopausal women with selected demographic variables in the study and control group.

Assumption

Level of low back pain may be reduced with the help of back strengthening exercise on post menopausal women.

Operational definitions

1. Evaluate:

Evaluation refers to identification of difference between pre test and post test level of low back pain and it finds the effectiveness of back strengthening exercise on low back pain among post menopausal women as measured by modified Oswestry low back pain disability questionnaire.

2. Effectiveness:

Effectiveness is the significant reduction in the level of low back pain among post menopausal women in study group and it can be measured by comparing with control group.

3.Back strengthening exercises:

Back strengthening exercises is a type of exercise that may help to reduce low back pain and strengthen the lower back of post menopausal women which should be done every day for 30 minutes. It can be given 15 minutes in the morning and 15 minutes in the evening from morning 7.15 am to 8.30 am and evening 5 pm to 6.15 pm respectively.

4. Low back pain:

Low back pain refers to moderate and severe pain in the lumber region as measured by numerical pain rating scale.

5. Post menopausal women:

Post menopausal women are the women whose menstrual cycle has been stopped permanently before 1 year.

Delimitations

The study was delimited to,

- Data collection period of 4 weeks.
- Post menopausal women with low back pain.
- Post menopausal women with age group of 45 to 60 years.

Projected outcome

The findings of the study will help the post menopausal women to practice back stretching exercises which help them to be free from low back pain. It also helps the postmenopausal women to teach the exercises to the person who are suffering for a prolonged period of low back pain, thus promoting a quality care. By the regular practice of these exercises post menopausal women prevent the sickness and disability.

Conceptual framework

Conceptual framework is a whole of interrelated concepts or abstracts that are assembled together in some rational scheme by virtue of their relevance to common theme. A conceptual model provides for logical thinking for systemic observation and interpretation of observed data. The model also gives direction for relevant questions on phenomena and points out solutions to practical problems as well as serves as a spring board for the generation of hypothesis to be used.

Shirly chapter 1975 states, "the conceptual frame work formalizes the thinking process so that others may read and know the frame of reference basis to research problem."

The conceptual framework which suits the present study is based on **General System Theory of Von Ludwig Bertalanffy (1968) as explained by Newby (1996).**

According to Von Ludwig Bertanlanffy,a system is composed of a set of interactive elements and gets each system distinct from environment in which it exits. In all the systems activities can be resolved into an aggregation of feedback circuits such as input, throughput and output. The feedback circuits helps in maintenance of an intact system.

Present study aims at evaluating the effectiveness of back strengthening exercise on low back pain among postmenopausal women. Conceptual framework of this study is based on the system model.

The model consists of three phases:

1) Input

It is the energy transformed by the system. It refers to the target groups with their character such as age, education, occupation, income, religion, dietary pattern, type of delivery, number of children, age and type of menopause and the assess level of low back

pain among post menopausal women in study and control group with modified Oswestry low back pain disability questionnaire.

2) Throughput

It is a process that occurs at some point between the input and output process, which enables the input to be transferred as output in such a way that it can be readily used by the system.

According to Von Ludwig Bertanlanffy throughput is defined as the process by which the system processes output and release output.

In this study the throughput refers to administration of back strengthening exercise to the post menopausal women in study group.

3) Output

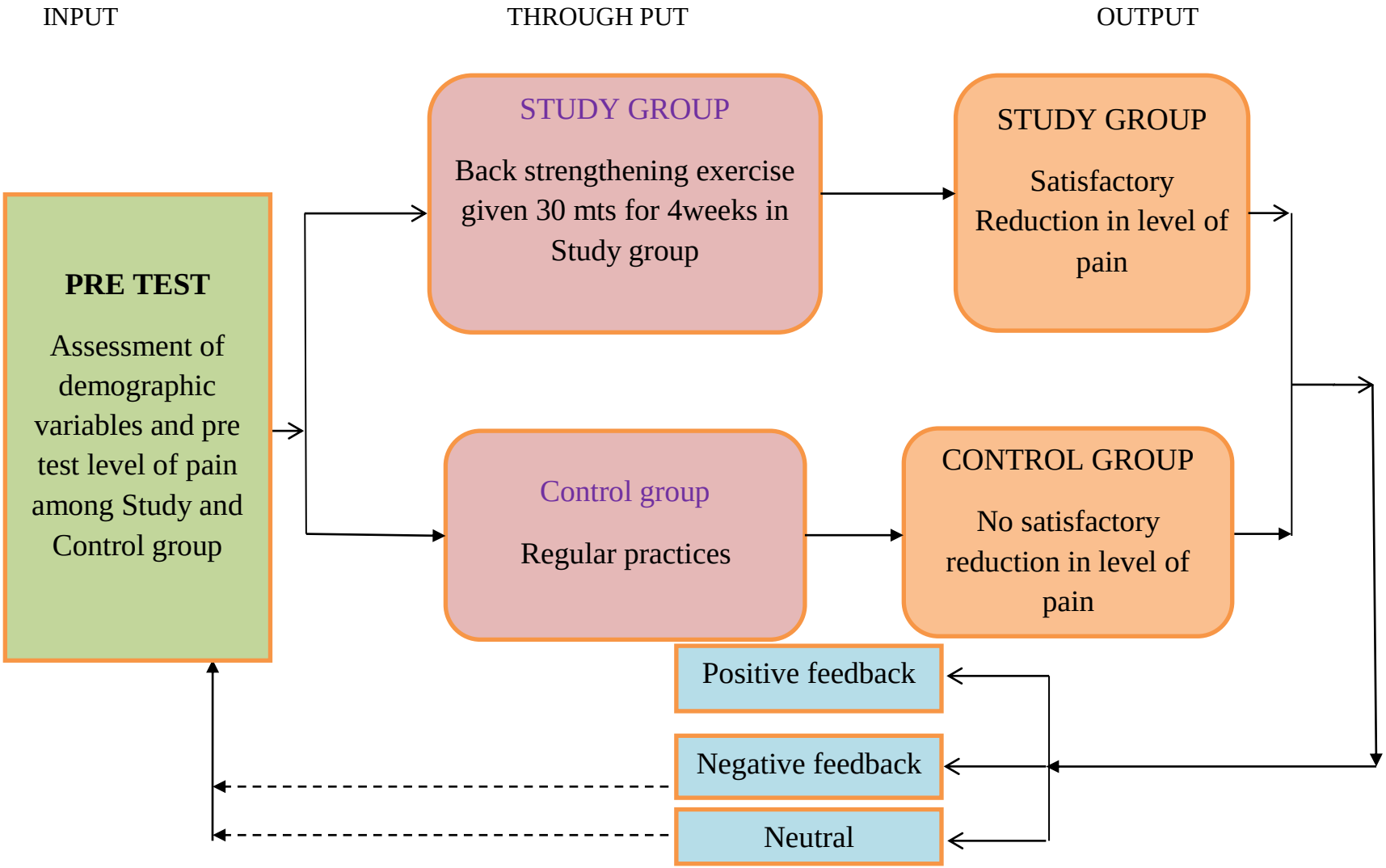
According to the system theory, "output refers to the energy, matter, or information that leaves the system". In the present study, "output is considered as the evaluation of back strengthening exercise on low back pain among postmenopausal. It will be received in the form of post test level of low back pain among post menopausal women by modified Oswestry low back pain disability questionnaire.

4) Feedback

According to this system theory feedback refers to the output that is returned to the system and it allows it to monitor itself overtime to a steady state known as equilibrium or homeostasis. Feedback may be positive, negative, or neutral

For the present study feedback was related to evaluate the effectiveness of back strengthening exercise on low back pain among post menopausal women will be obtained by testing of hypotheses.

- Relationship between pre test and post test level of low back pain among post menopausal women by modified Oswestry low back pain disability questionnaire.
- Association between post test level of low back pain among post menopausal women with selected demographic variables between the study and control group.



Conceptual framework based on launching Von Ludwig Bertanlanffy (1965) as citied Chiristien paula and Kenny general System theory

Fig.1.1

REVIEW OF LITERATURE

CHAPTER-II

REVIEW OF LITERATURE

The present study reveals the practice of stretching exercise among postmenopausal women and their knowledge about practice of exercise that is essential to prevent back pain among postmenopausal women. The related literature for the study is presented in the following sections:

The Research studies are divided into 4 sections.

Section A : Studies related to prevalence of postmenopausal symptoms.

Section B : Studies related to importance of exercise for low back pain.

Section C : Studies related to back strengthening exercise for chronic low back pain.

Section D : Studies related effectiveness of back strengthening exercise for low back pain among post menopausal women.

Section A: Studies related to prevalence of postmenopausal symptoms:

Marinheiro, P.F et al (2013) conducted a study regarding association of back pain with hypovitaminosis D in post menopausal women with low bone mass in Brazil. The study included demographic data, 25 OHD determinations, newitt/ cummings questionnaire on back pain, and vertebral fracture identified thought X- ray evaluation. The study was conducted among 9354 post menopausal women. The study result revealed that the age median was 67 (60-85 years old) and age at menopause was 49 (18-72 years). Hypovitaminosis D was found in 22.5% of the subject, 15.3% of them had vertebral fracture, 67.5% of them with back pain and 14.8% had limitation their daily activities. The study concluded hypovitaminosis was related to back pain to its severity and to difficulty in perform daily activities.

Bairly, et al (2009) conducted a qualitative study regarding prevalence of menopausal symptoms and quality of life after menopause in women from Department of

Pharmacology, Kasturba Medical college, Manipal, south India. This study was carried out to establish the age of menopause and prevalence and symptoms of menopause. In this study they selected 352 post menopausal women from the outpatient clinic of obstetrical and gynecological department of Dr.TMAPai hospital. The menopause Specific Quality of Life questionnaire tool was used to collect data. The result revealed that the mean age at menopause was 48.7 years which is four years more than the mean menopause age for Indian women. Most frequent symptoms were aching in muscles and joints, feeling tired, poor memory, lower back pain and difficulty in sleeping.

Haizal, M.N et al (2009) conducted a study to document the common menopausal symptoms and quality of life in indigenous women of Sarawak in Malaysia. The study was conducted face to face interview using the Menopausal specific Quality of life questionnaire. Totally 276 women aged between 40 to 65 years were participated. The study raveled that the mean age at menopause of post menopausal women was 47 to 58 years. The common symptoms reported were 82.6% of them had muscle and joint pain 77.5% of them had lack of energy and 77.2% of them had low back pain. Peri menopausal women (n= 114) experienced the most physical and psychosocial symptoms, while post menopausal women (n= 102) experienced more sexual symptoms. The study concluded that the peri menopausal women had the most significant decrease in quality of life followed by post menopausal women and premenopausal women.

Sagar, A.B et al (2002) conducted a cross sectional study of menopausal symptoms, and perceptions about menopause among women at a rural community in Kerala. The study was conducted among 106 postmenopausal women staying more than 6 months at Anjarakandy. The study revealed that the mean age of menopause was 48.26 years. Prevalence of symptoms among women were emotional problems (crying spells, depression, irritability) 90.7%, headache 72.9%, lethargy 65.4%, dysuria 58.9%, forgetfulness 57%, musculoskeletal problems (joint pain, muscle pain) 53.3%, sexual problems (decreased libido, dyspareunia) 31.8%, genital problems (itching, vaginal dryness) 9.3%, and changes in voice 8.4%. Only 22.4% of women knew the correct cause of menopause. This study stated that all the menopausal women were suffering from one or more number of menopausal symptoms.

Kuller, L.H et al (2002) designed a community based study of post menopausal white women with back and leg pain in Department of Orthopedic surgery, Pennsylvania. A convenience sample of 573 white women enrolled in the observational study. The study revealed that almost half of the women (49%) had low back pain in that 8% of them had only low back pain and 41% of them had both low back pain and leg pain. The study concluded that low back pain radiates into hip, buttock, and leg is relatively common in post menopausal women living in community.

Section B: Studies related to importance of exercise for low back pain:

Macchi, C et al (2012) designed observational cohort study to as community based exercise program is a strong predictor to reduce the back pain in older adults. 392 older adults age between 50-88 years with chronic pain were participated in program for 12 months. Exercise program given for one hour twice weekly. The study concluded that presence of depressive symptoms, poor self related health and adherence to adaptive physical activity program were the best predictors of improved pain status, with adherence being the strongest predictor [ratio:13.88(95% CI:8.17,23.59)] better physical function, longer pain duration and positive of the trainer were all positively associated with adherence to adaptive physical activity whereas poor self related health and future distance from the gym were inversely associated.

Koes, B.W et al (2009) determined meta analysis exercise therapy for non specific acute, sub acute, and chronic low back pain versus no treatment and other conservative treatment in Canada. Randomized controlled trails evaluating exercise therapy on low back pain and measuring pain, function, return to work and global improvement outcomes. 61 randomized control trials (6390 participants) met inclusion criteria. In this study mean low back pain reduction was 13.3 points and 6.9 points for improvement of function. It revealed that for acute low back pain exercise therapy was effective.

Tomlinson, G et al (2005) conducted systematic review on strategies for exercise therapy to improve outcomes in chronic low back pain in Canada. Randomized controlled trails evaluating exercise therapy in population with chronic low back pain. 43

trials of 72 exercise treatment and 31 comparison groups were included. High dose exercise programs better than low dose exercise program (1.5 points) the study concluded that exercise therapy that consists of individually designed program including stretching or strengthening and delivered with supervision may improve pain and function in chronic non specific low back pain.

Jennings, et al (2005) conducted a randomized, placebo controlled study to investigate the efficacy of motor control exercise for people with chronic low back pain in the George Institute for International health, Australia. The participants were 154 patients with chronic low back pain of more than 12 weeks duration. Twelve sessions of motor control exercise were conducted over 8 weeks. Pain was measured by the patient-specific functional scale and 11 point pain scale. The mean effect of exercise on activity was 1.1 points, and the mean effect on pain was 0.9 all measured on 11-point pain scales. The study concluded that the exercise intervention improved activity.

Section C: Studies related **to back strengthening exercise for chronic low back pain**:

Kim, S.J Lee, J.H &Yoon J.S (2013) determined the effect of Swiss ball stabilization exercise on pain and bone mineral density of patients with chronic low back pain. The subject of this study was 36 patients with chronic low back pain. They were divided into a conservative treatment group, floor exercise group and ball exercise group. The pain was measured by visual analogue scale and DEXXUMT which was used to observe the changes in bone mineral density. Visual analog scale score was reduced in floor exercise group and ball exercise group with treatment; it was not reduced conservative treatment group. The bone mineral density was increased in floor exercise group and ball exercise group while it was reduced conservative treatment group. Lumbar stabilization exercises using a ball are thought to be an effective interventional therapy for the alleviation of chronic low back pain and to decrease bone mineral density of patients.

Silva, F.D et al (2011) deal a quasi experimental study was conducted to determine the effect of back strengthening exercise on low back pain and functional performance among nursing students in Karnataka, South India. Among the 393 nursing

students, 237 of them identified with mechanical low back pain by using the diagnostic check list. One group pre test, post test design was used for the study. The intervention was carried out daily for 30 minutes for duration of 30 days. The severity of low back pain and functional performance before and after the intervention was assessed by using Numerical pain scale and Modified Oswestry low back pain disability questionnaire respectively. The study finding revealed that 129 (54%) students had mild low back pain and 108 (46%) had moderate low back pain. Majority of students 145 (61%) had minimal disability where as 92(39%) had moderate disability. Back strengthening exercise was found to be effective in reducing low back pain and improving the functional performance among nursing students.

Kamioka (2011) documented the effect of a lecture and stretching exercise on caregivers in nursing homes. Eighty eight female caregivers volunteered to participate in this study, and they were separated into two groups randomly. For the intervention group, guidance by an orthopedist and an exercise instructor were provided as one on job training and stretching exercises for 6 min every day were recommended follow Back Pain prevention to the caregivers. Low Back Pain Visual Analogue Scale (VAS), physical fitness, and mental and physical health were compared at baseline and immediately after the intervention. Adherence to the stretching exercises was 2.3 ± 1.3 times per week. No significant differences were seen for any outcome measurements. The high adherence group did not show a change in the Visual Analogue Scale but the low adherence group (<3 times per week) and Control group showed a tendency towards an increased score ($p = 0.06$).

Marques, A.P et al (2010) Conducted a comparative study to contras the efficacy of two exercise programs, segmental stabilization and strengthening of abdominal and trunk muscle, on pain, functional disability and activation of the transverses abdominal muscle in individual with chronic back pain. In this study sample consisted of 30 individuals randomly assigned to one of two treatment group. The program lasted 6 weeks for 30 minutes session for twice a week. The study concluded both treatment were effective in relieving pain and improving disability ($p<0.001$). Superficial strengthening does not improve transverses abdominal muscle activation capacity.

Keating, JL& Slade SC (2006) designed systematic review to determine the trunk strengthening exercises for chronic low back pain in Australia. They included thirteen high quality randomized controlled trails. Two independent reviewers followed Cochrane back review group and quorum statement guidelines complete this systematic review. The result of the study was trunk strengthening is more effective than no exercise on long term low back pain (SMD 0.95)[0.35-1.55] intensive trunk strengthening is more effective than less intensive on function (pooled SMD: short term, 0.58[0.22-0.94]); long term 0.77[0.33-1.20]). Trunk strengthening compared with aerobic exercises, showed no clear benefit of strengthening

Choi, Y.J et al (2005) determine the comparative study to effect of lumber stabilization exercises and lumbar dynamic strengthening exercises in patient with chronic low back pain in Korea. In this study patients suffering non specific low back pain for more than 3 months were included prospectively and randomized into lumbar stabilization exercise group 11 or lumber dynamic strengthening exercise group 10. Exercises were performed 1 hour, twice weekly, for 8 weeks. The strength of the lumbar extensors was measured at various angle ranging from 0 to 72degree at intervals of 12 degree used a MedX. The visual analog scale and Oswestry low back pain disability questionnaire were used to measure the severity of low back pain and functional disability before and after the exercise. The study concluded that both lumbar stabilization and dynamic strengthening exercise strengthen the lumber extensors and reduced low back pain. The improvements were significantly greater in the lumbar stabilization exercise group.

Section D: Studies related effectiveness of back strengthening exercise among post menopausal women:

Tuzun, H et al (2010) conducted a study to determine the effect of different short term exercise programs on menopausal symptoms, psychological health, and quality of life in postmenopausal women in Turkey. Forty two women were chosen from volunteering postmenopausal women aged 45-60 years and experiencing menopause naturally were included in the study. They were randomly divided into aerobic exercise and resistance exercise group. The women exercised 3 days per week for 8 weeks under

supervision of physiotherapist. Before and after the training, lipid profiles were measured and menopausal symptoms, psychological health, depression, and quality of life were assessed through questionnaires. The study concluded that both exercise groups, no significant changes in lipid profile were observed. Resistance exercise and aerobic exercise were found to have a positive impact on menopausal symptoms, psychological health, depression and quality of life.

Lauber, D et al (2007) deal a longitudinal study was different effect of strength versus power training on bone mineral density in post menopausal women. After 2 years significant between group differences were detected for bone mineral density (PT, -0.3%; ST, -2.4%; $P<0.05$) and bone area (PT, 0.4%; ST,-0.9%;$p <0.05$) at the lumbar spine. The result showed that power training may be superior for maintaining bone mineral density in post menopausal women.

Jamsa, T et al (2005) conducted a randomized controlled study was to assess the effect of high impact exercise on the bone mineral density of premenopausal women. The study population consisted of a random population based sample of 120 women from a cohort of 5,161 women, aged 35-40 years. Bone mineral density was measured on the lumbar spine, proximal femur, and distal forearm, by dual energy X-ray absorptiometry at baseline and after 12 months. Thirty nine women for study group and 41 women in the control group. The study result showed there is significant change in the exercise group compare with control group (7.3% vs -0.6%; $p=0.015$). this study indicates that high impact exercise is effective in improving bone mineral density in the lumbar spine and upper femur in premenopausal women.

Kalender W.A et al (2005) deal longitudinal study the exercise maintains bone density at spine and hip. Forty eight fully compliant women with no medication or illness affecting bone metabolism participated in the exercise group and 30 women served as non training controls. Bone mineral density was measured by broad ultrasound. Pain frequency and intensity were assessed by questionnaire. At 3 years between group differences relative to exercise group 4.1% $p< 0.00$. The study concluded 3 year exercise program was successful to maintain bone mineral density at the spine.

Winters, K.M et al (2005) conducted a long term exercise using weighted vests prevents hip bone loss in post menopausal women. Eighteen post menopausal women who had participated in a 9 month exercise intervention volunteered for long term trail. Nine of the original group engaged in jumping exercise three times per week for 32 weeks of the year over a period of 5 years. Nine of the original controls were active but not enrolled in the exercise program. The BMD was assessed by dual energy X- ray absorptiometry after 5 years. For exercisers, changes in BMD were + 1.54% but control group BMD was decreased. The study concluded that 5 year exercise maintain the hip BMD by preventing significant bone loss in older post menopausal women.

Engelke, k et al (2004) deal benefits of 2 years of intense exercise on bone density, physical fitness in early post menopausal women. the study population comprised 50 fully compliant women. The group training sessions per week and home training sessions per week were performed by study group. Bone mineral density was measured at the lumbar spine [x-ray] and qualitative computer tomography. After 26 months, significant exercise effect determined as bone mineral density [EG = +0.7% VS CG =-2.3%]. The study suggests that exercise program improve the bone mineral density.

Miilunpalo, S.E et al (2004) conducted the randomized control trails study to determine the exercise for health for early post menopausal women in Finland. Twenty eight post menopausal women aged 50 – 60 were participated in the study. Based on this study early menopausal women could benefit from 30 minutes of daily waking and weekly twice exercise program. The study revealed that stretching training program preserve bone mineral density and increase muscle strength.

METHODOLOGY

CHAPTER III

RESEARCH METHODOLOGY

This chapter deals with the methodology adapted to this study. It includes Research approach, Research design, Variables, Settings, Population, Sample, Sample size, and Criteria for sample selection, Sampling technique, Description of tool, Content validity, Pilot study, Reliability, Method of data collection, Plan for data analysis and protection of human rights.

Research Approach

The researcher adopted Quantitative research approach.

Research Design

Quasi experimental pre test post test control group design was adopted to this study.

GROUP	PRE TEST	INTERVENTION	POST TEST
Experimental	O_1	X (Back strengthening exercise 30 minutes per day for 4 weeks)	O_2
Control	O_1		O_2

O_1 – Assess the low back pain before intervention

X - Back strengthening exercise for 4 weeks 30 minutes per day

O_2 – Assess the low back pain after intervention

Variables

Independent variable- Back strengthening exercise

Dependent variable- Low back pain

Setting

The study was conducted among post menopausal women with moderate and severe low back pain in Keezhkulam Panchayath under Arasakulam village, rural area which is situated 24 kilometer away from St.Xaviers Catholic College of Nursing. Total population of Arasakulam is 1006 and necessary health care facilities are available. The investigator selected control group population from Vizhunthayambalam rural area. It is 22 kilometers away from St. Xaviers Catholic College of Nursing. The total population of Vizhunthayambalam village is 1056 and necessary health care facilities are available.

Population

- **Target population**

The population under study constituted all the post menopausal women low back pain.

- **Accessible population**

All the post menopausal women with moderate and severe low back pain who were residing in Keezhkulam village at Kanayakumari.

Sample

Selected post menopausal women who fulfilled the inclusion criteria who were residing in Keezhkulam village at Kanayakumari.

Sample Size

Sample size was 60, out of which 30 samples in the control group and 30 samples in the study group.

Sampling Technique

Purposive sampling technique was used to select the sample.

Criteria for Sample Selection

Inclusion criteria

- Post menopausal women in the age group of 45 to 60 years.
- Post menopausal women who have moderate and severe low back pain who were assessed by numerical pain rating scale.
- Post menopausal women who are residing in Keezhkulam village.
- Post menopausal women who attained menopause naturally and surgically.

Exclusion criteria

- Post menopausal women who are not available at the time of data collection.
- Post menopausal women who are undergoing pharmacological treatment.
- Post menopausal women who are underwent spinal cord surgery eg. laminecotomy.

Description of the Tools

The tool used for the study consists of 3 parts.

Part I:

Structured questionnaire is made to collect the demographic variables such as age, education, occupation, income, religion, dietary pattern, type of delivery, number of children, age of menopause and type of menopause.

Part II:

The numerical pain rating scale was used.

Scores for level of pain

0 – no pain

1-3 – mild pain

4-6- moderate pain

7- 10 – severe pain

Part III:

The Modified Oswestry Low Back Pain disability index questionnaire is a golden standard tool for the Low Back Pain. Totally it has 10 items namely pain intensity, personal care, lifting, walking, sitting, standing, sleeping, social life, travelling**,** and employment

There are 10 items with 6 responses. Each response score starts from 0-5. According to the patients response the score was awarded. Simply add up the points for each section and plug it in to the following formula in order to calculate the level of low back pain: point total / 50X100=% low back pain.

The findings were interpreted as follows:

0% to 20% - minimal

21% to 40%- moderate

41% to 60%- severe

61% to 80%- crippled

81% to 100%- bed bound

Description of intervention

Procedure of back strengthening exercise

Exercise1:

Starting position: Lying face downwards, leg extended, head resting on folded arms.

Method : Raise extended legs alternately. Repeat 10 times.

Exercise 2:

Starting position: Lying face downwards, leg extended, head resting on folded arms.

Method : Keeping the feet together, raise both legs simultaneously. Repeat 10 times.

Exercise 3:

Starting position: Lying face downwards, arms stretched beyond the head.

Method : Simultaneously raise one extended arm and the opposite side leg, repeat with the other arm and leg. Repeat 10 times.

Exercise 4:

Starting position: Lying face downwards, legs extended, forehead resting on arms.

Method : Raise the head and chest, all the while keeping arms folded under the forehead. Repeat 10 times.

Content Validity

The content validity of the tool was ascertained by the expert opinion from 2 medical practitioners and 3 nursing experts. Additions or modifications suggested by experts were incorporated in the tool. The final tool was prepared as per the suggestions and advices given by the experts.

Reliability

Test retest reliability test was done and the calculated r value was 0.9 which concluded that the modified Oswestry low back pain disability questionnaire was highly reliable and Inter rater reliability test was done and the calculated r value was 0.8 for numerical pain rating scale

Pilot Study

Pilot study was conducted in Aruuvi village, after receiving a formal approval from Principal and Panchayath president. The pilot study was conducted among 6 post menopausal women 3 study group and 3 control group who were selected by numerical pain rating scale. Modified Oswestry low back pain disability questionnaire was used to identify the level of back pain. The intervention back strengthening exercises was given morning and evening 15 minutes, totally 30 minutes for 5 days. The post test was conducted on sixth day. Analysis of the data was done by using descriptive and inferential statistics. The tool was reliable and instruments were found feasible and practicable. No changes were made and researcher proceeded for main study.

Procedure for Data Collection

Table -3.1: procedure for data collection **N=60**

Data collection period	**Data collection procedure**		**Method of data collection**
	Study group n=30	**Control group n=30**	
16/06/2013	Pre test done (n=30)		Purposive sampling technique
17/06/2013		Pre test done (n=30)	
17/06/2013 to 14/07/2013	Back strengthening exercises given (30)		
14/07/2013	Post test done	Post test done	
14/07/2013		Back strengthening exercise given (30)	

After obtaining formal permission from Principal, St. Xavier's Catholic College of Nursing and the approval from Keezhkulam Panchayat president, the researcher proceeded with data collection. An informed consent was taken from all post menopausal women who had participated in the study. The Keezhkulam Panchayat has 14 wards out of this researcher selected 2nd and 6th wards as study and control group respectively. The researcher used numerical pain rating scale for identification of post menopausal women with moderate and severe low back pain. The researcher selected 30 samples for study group in Arasakulam and 30 samples for control group in Vizhunthayambalam by using purposive sampling technique. Pre test was conducted with the help of modified Oswestry low back pain disability questionnaire for study and control group. For study group the researcher gave back strengthening exercises for 4 weeks, 30 minutes per day.

The group was divided in to 3 sub groups (the time duration was 7.15 am to 8.30 am and 5 pm to 6.15 pm). At the end of the fourth week post test was conducted.

Plan for Analysis

Data collected was analyzed by using both descriptive and inferential statistics such as mean, standard deviation, chi square, and paired and unpaired‘t’ test.

Descriptive statistics

- Frequency and percentage distribution was used to analyze the demographic variables and to assess the level of low back pain.
- Mean and standard deviation was used to assess the effectiveness of back strengthening exercise on low back pain among post menopausal women.

Inferential statistics

- Unpaired‘t’ test was used to compare post test level of low back pain on control group and study group.
- Paired‘t’ test was used to compare pre test and post test level of low back pain among post menopausal women in study group.
- Chi-square test was used to find out the association of post test level of low back pain in study and control group with their selected demographic variables.

Protection of Human Rights

The proposed study was conducted after the approval of the dissertation committee of St.Xavier’s Catholic College of Nursing. Permission was obtained from the Keezhkulam village Panchayat. Informed consent was obtained from every participant before starting the data collection. Assurance was given to the study subjects regarding the confidentiality of the data collected.

DATA ANALYSIS AND INTERPRETATION

CHAPTER IV

DATA ANALYSIS AND INTERPRETAION

This chapter dealt with the analysis and interpretation of the data collected from the post menopausal women. The interpretation of tabulated data can bring to light the real meaning of findings of the study. In order to find meaningful answers to the research questions the collected data must be processed and analyzed in some orderly coherent fashion, so that patterns and relationships can be discerned. In this study the data was analyzed based on the objectives and hypotheses of the study using descriptive and inferential statistics.

PRESENTATION OF DATA

This chapter is divided into three sections,

Section A:

Distribution of the samples according to the demographic variables in study and control group.

Section B :

I. Distribution of samples in Study group and Control group according to the level of low back pain before intervention.

II.Distribution of samples in Study group and control group according to the level of low back pain after intervention.

Section c :

Testing Hypotheses.

I. Comparison of pre test and post test level of low back pain among post menopausal women in Study and Control group.

II. Comparison of post test level of low back pain among post menopausal women in Study and Control group.

III. Association between the post test level of low back pain among post menopausal women in Study and Control group with their demographic variables.

SECTION: A

DISTRIBUTION OF THE SAMPLES ACCORDING TO THE DEMOGRAPHIC VARIABLES IN STUDY AND CONTROL GROUP

Table 4.1: Frequency and percentage distribution of demographic variables of the post menopausal women in study group and control group. **N=60**

Sl. No	Demographic variables	Study Group (n=30)		Control Group (n=30)	
		F	%	F	%
1.	**Age**				
	a) 45-50 yrs	7	23.33	6	20
	b) 51-55 yrs	14	46.66	14	46.66
	c) 56-60 yrs	9	30	10	33.33
2.	**Education**				
	a) Professional degree	1	3.33	0	0
	b) Under grauate	2	6.66	1	3.33
	c) Intermediate /diplamo	1	3.33	2	6.66
	d) Higher secondary	8	26.66	16	53.33
	e) High school	4	13.33	10	33.33
	f) Middle school	12	40	1	3.33
	g) No formal education	2	6.66	0	0
3	**Occupation**				
	a) Government	2	6.66	1	3.33
	b) Private	1	3.33	1	3.33
	c) Coolie	21	70	22	73.33
	d) Business	2	6.66	2	6.66

	e) Working abroad	0	0	0	0
	f) Unemployment	4	13.33	4	13.33
4	**Income**				
	a) Below 5000	27	90	20	66.66
	b) 5001-10000	2	6.66	8	26.66
	c) Above 10000	1	3.33	2	6.66
5.	**Religion**				
	a) Hindu	9	3.33	9	30
	b) Christian	21	96.66	21	70
	c) Muslim	0	0	0	0
	d) Others	0	0	0	0
6.	**Dietary pattern**				
	a) Vegetarian	1	3.33	1	3.33
	b) Non vegetarian	29	96.66	29	96.66
7.	**Type of delivery**				
	a) Normal delivery	24	80	20	66.66
	b) Cesarean section	6	20	9	30
	c) Others	0	0	1	3.33
8.	**Number of children**				
	a) 1	3	10	4	13.33
	b) 2	15	50	18	60
	c) More than 2	12	40	8	26.66
	d) No children	0	0	1	3.33
9.	**Age of menopause**				
	a) Below 45	6	20	4	13.33
	b) 45-50	22	73.33	24	80
	c) Above 50	2	6.66	2	6.66

10	**Type of menopause**				
	a) Natural	28	93.33	29	96.66
	b) Surgical	2	6.66	1	3.33

Table 4.1 shows the distribution of samples according to the age in Study group, out of 30 samples 7(23.33%) belongs to 45-55 years of age, 14(46.66%) of them belongs to 46-50 yrs, 9(30%) belongs to 56- 60 years of age and in control group 6(20%) of them belongs to 45-50 years of age, 14(46.66%) of them belongs to 46-50 years, 10(33.33%) belongs to 56-60 years of age.

Allocation of samples according to the education in Study group out of 30 samples 1(3.33%) were professional degree, 2(6.66%) were under graduate, 1(3.33%) were intermediate, 8(26.66%) were higher secondary, 4(13.33%) were high school, 12 (40%) were middle school, 2 (6.66%) of them were illiterate and in Control group 0(0%) were professional degree, 1(3.33%) were under graduate, 2 (6.66%) were intermediate, 16(53.33%) were higher secondary, 10(33.33%) were high school, 1(3.33%) middle school, 0(0%) of them were illiterate.

Dispersion of sample according to occupation in Study group out of 30 samples 2(6.66%) were government employees, 1(3.33%) were private employees, 21(70%) were coolie workers, 2(6.66%) were business, 0(0%) were working abroad, 4(13.33%) of them were un employee and in control group 1(3.33%) were government employees, 1(3.33%) were private employee, 22(73.33%) were coolie, 2(6.66%) were doing business, 0(0%) were working abroad, 4 (13.33%) of them were unemployed.

Distribution of samples according to the monthly income in the Study group, out of 30 samples 27(90%) were below Rs.5000, 2(6.66%) of them were between 5001-10000, 1(3.33%) were to above Rs.10000 and in Control group 20(66.66%) were below Rs.5000, 8(26.66%) of them were 5001-10000, 2(6.66%) of them were above Rs.10000.

Distribution of samples according to the religion in the Study group out of 30 samples 9(30%) were Hindu, 21(70%) of them were Christian, and in Control group 9(30%) were Hindu, 21(70%) of them were Christian.

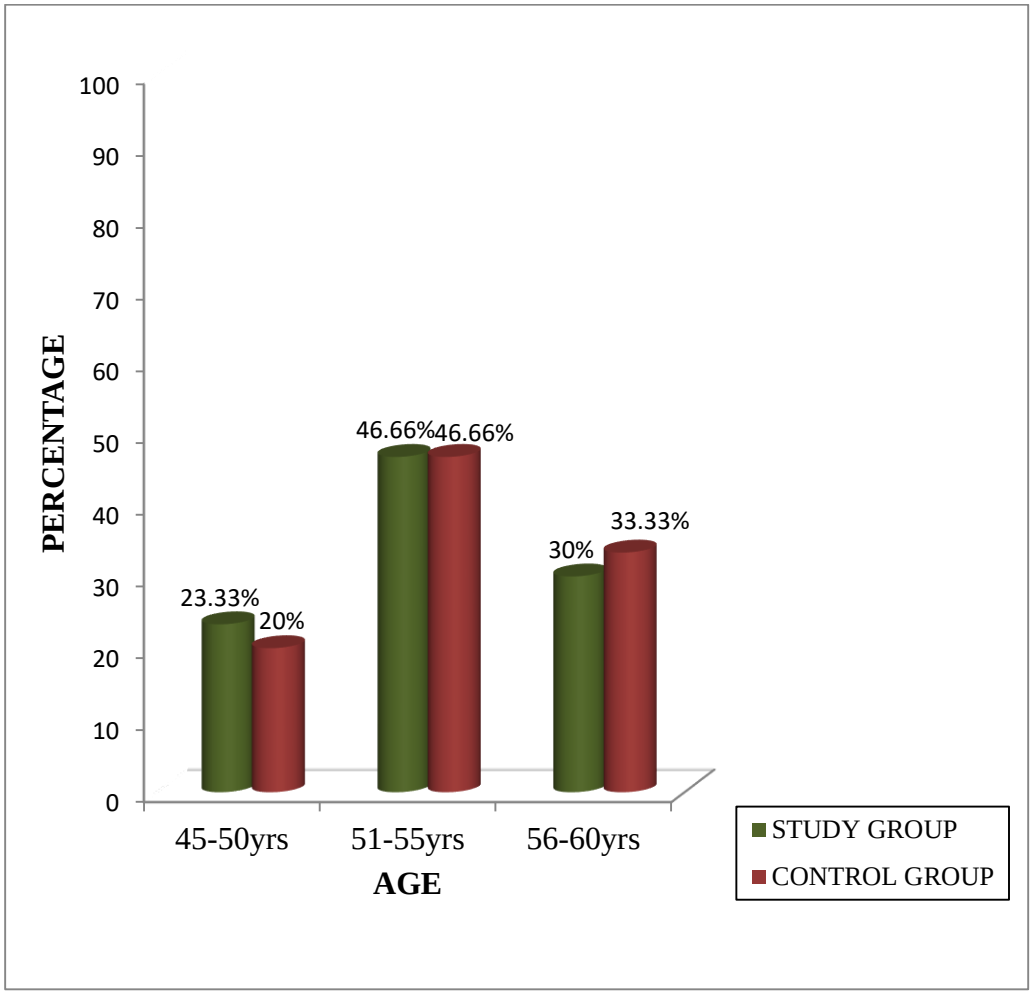
Allocation of samples according to the dietary pattern in the Study group, out of 30 samples 1(3.33%) were vegetarian 29(96.66%) of them were non vegetarian, and in Control group 1(3.33%) were vegetarian, 29(96.66%) of them were non vegetarian.

Distribution of samples according to type of delivery in the study group out of 30 samples 24(80%) had normal delivery, 6(20%) had caesarian section and in control group 20(66.66%) had normal delivery, 9(30%) had caesarian section, 1(3.33) had other type like forceps delivery.

Distribution of samples according to the number of children in Study group, out of 30 samples 3(10%) had one children, 15(50%) of them had two children, 12(40%) had three children and in Control group 4(13.33%) of them had one children, 18(60%) of them had two children, 8 (26.66%) had three children and 1(3.33%) had no children.

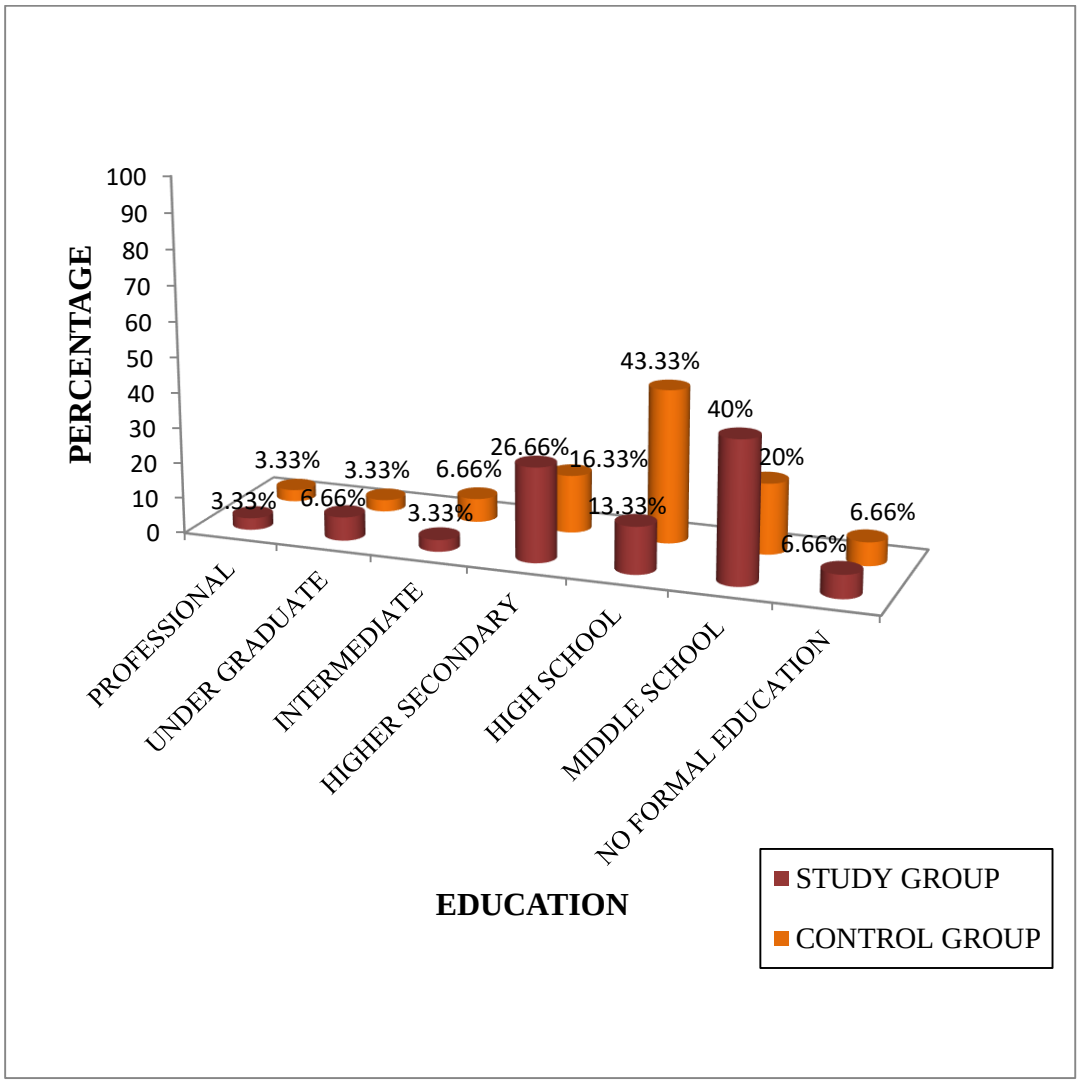
Distribution of samples according to the age of menopause in Study group, out of 30 samples 6(20%) belongs to below 45 yrs, 22(73.33%) of them belongs to 45-50 yrs, 2(6.66%) of them belongs to above 50 yrs and in Control group 4(13.33%) belongs to below 45 yrs, 24(80%) of them belongs to 45-50 yrs, and 2(6.66%) belongs to above 50 yrs.

Distribution of samples according to type of menopause in Study group, out of 30 samples 28(93.33%) had natural and 2(6.66%) had surgical menopause. In control group out of 30 samples 29(96.66%) had natural and 1(3.33%) had surgical menopause.



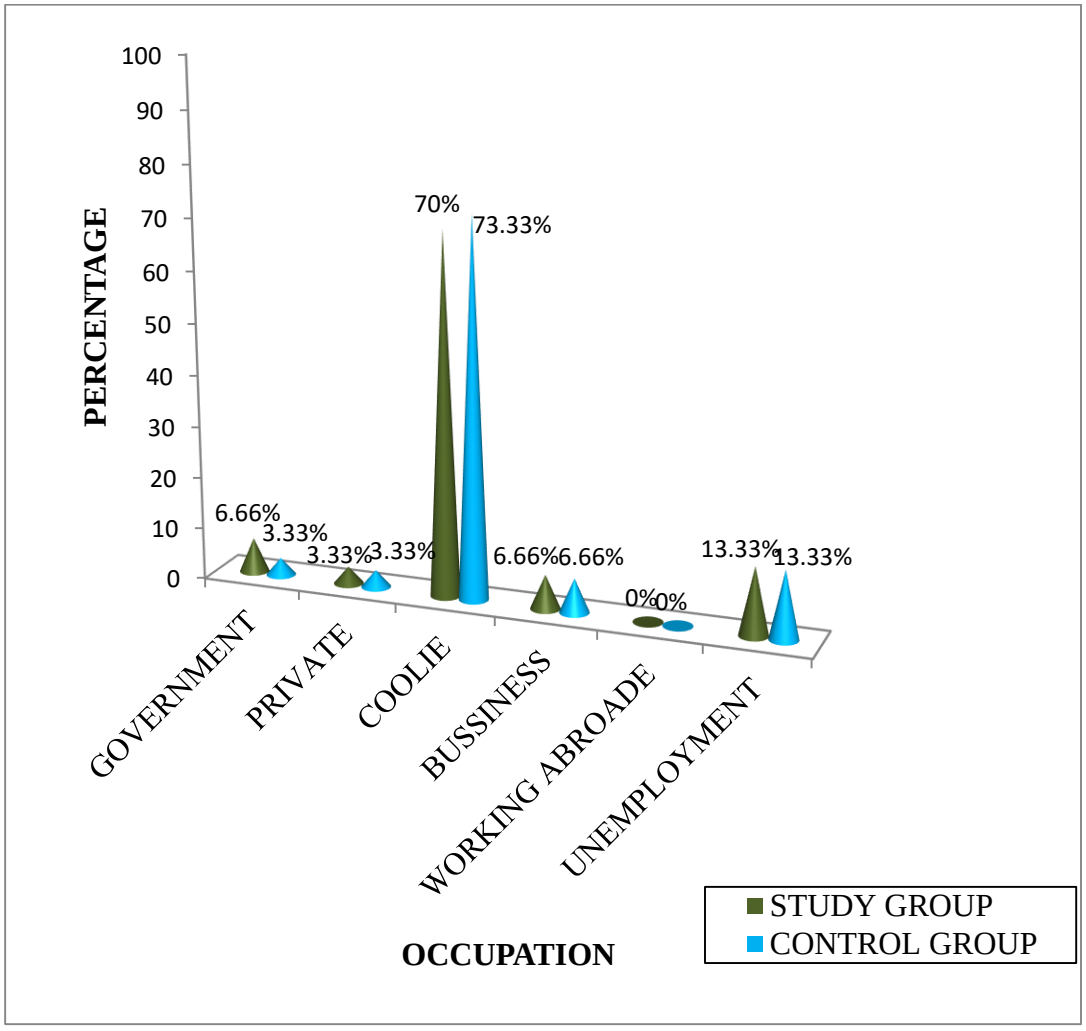
Distribution of sample according to their age

Figure- 4.1



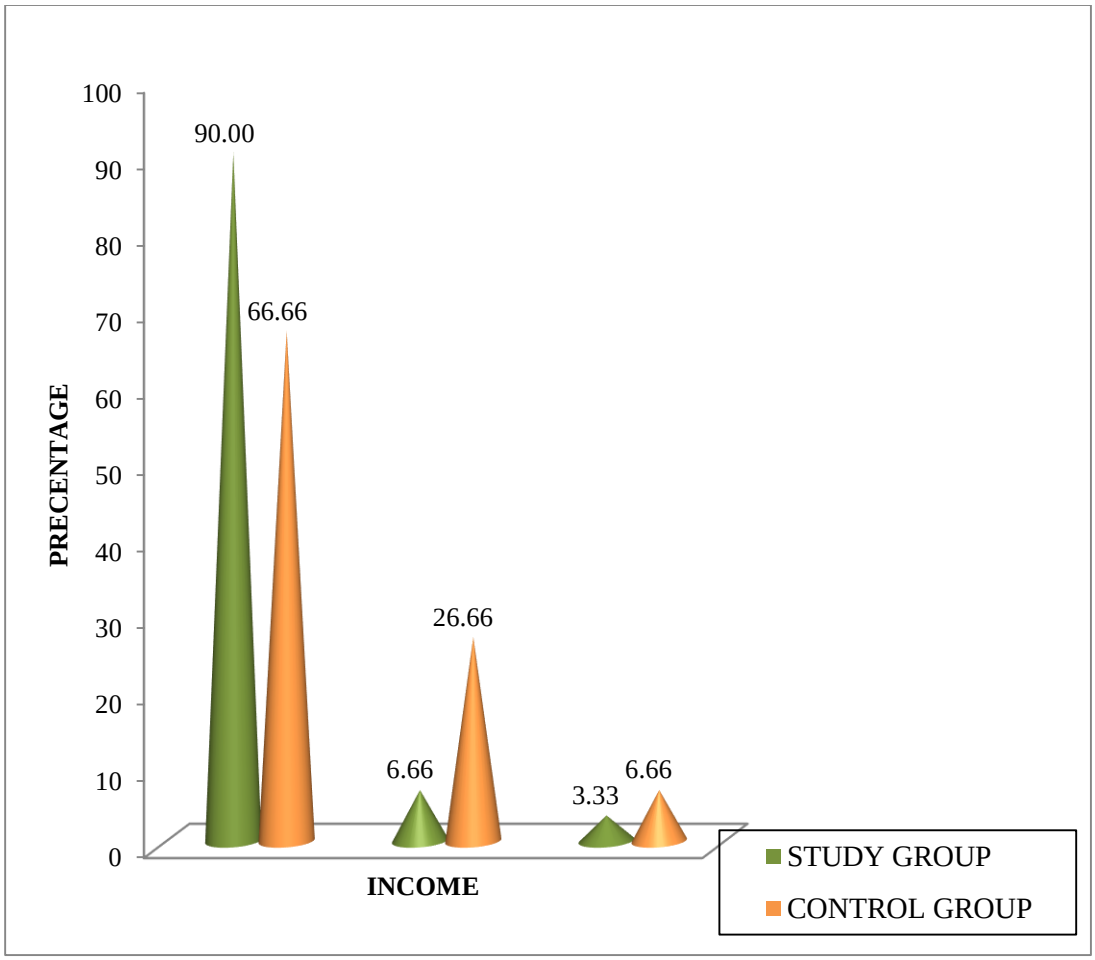
Distribution of sample according to their education

Figure- 4.2



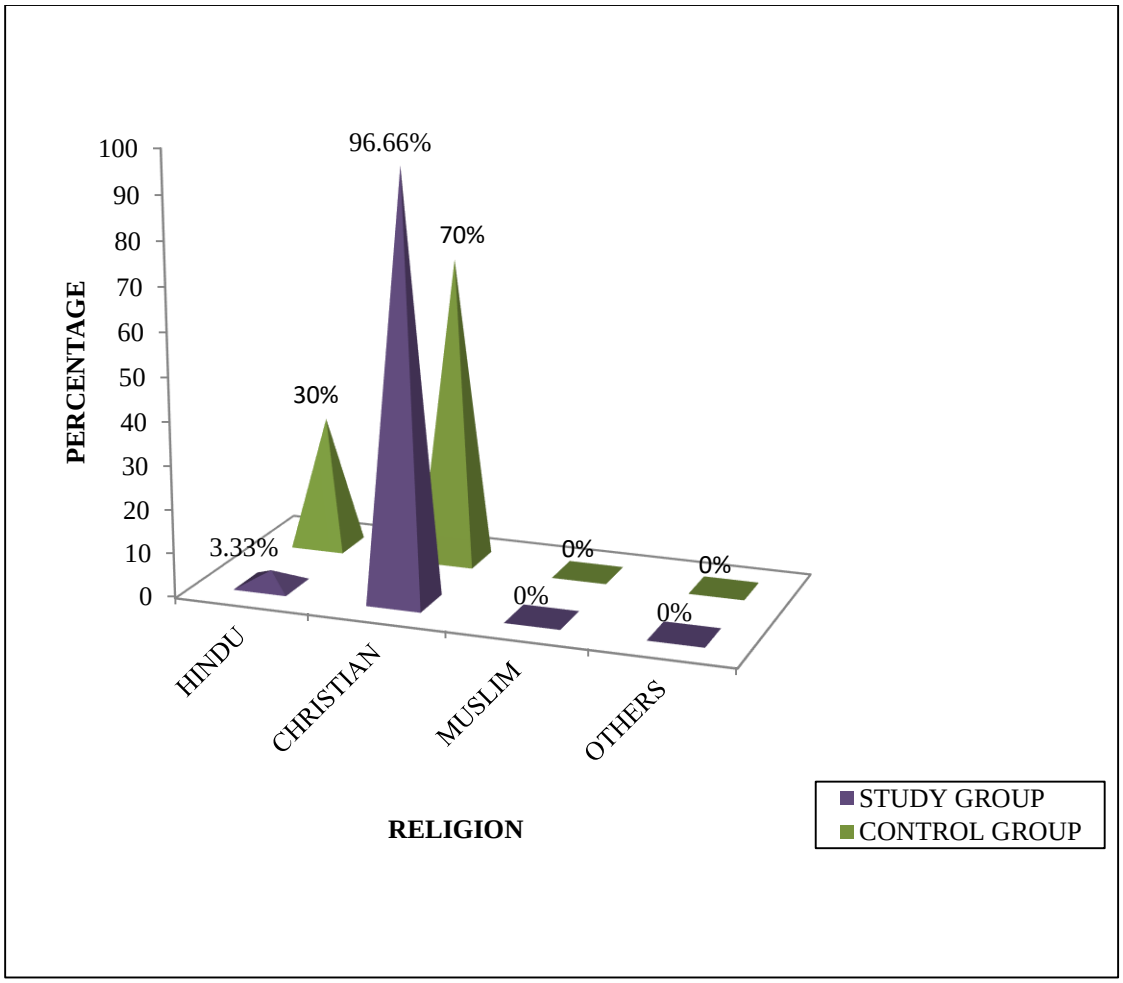
Distribution of sample according to their occupation

Figure- 4.3



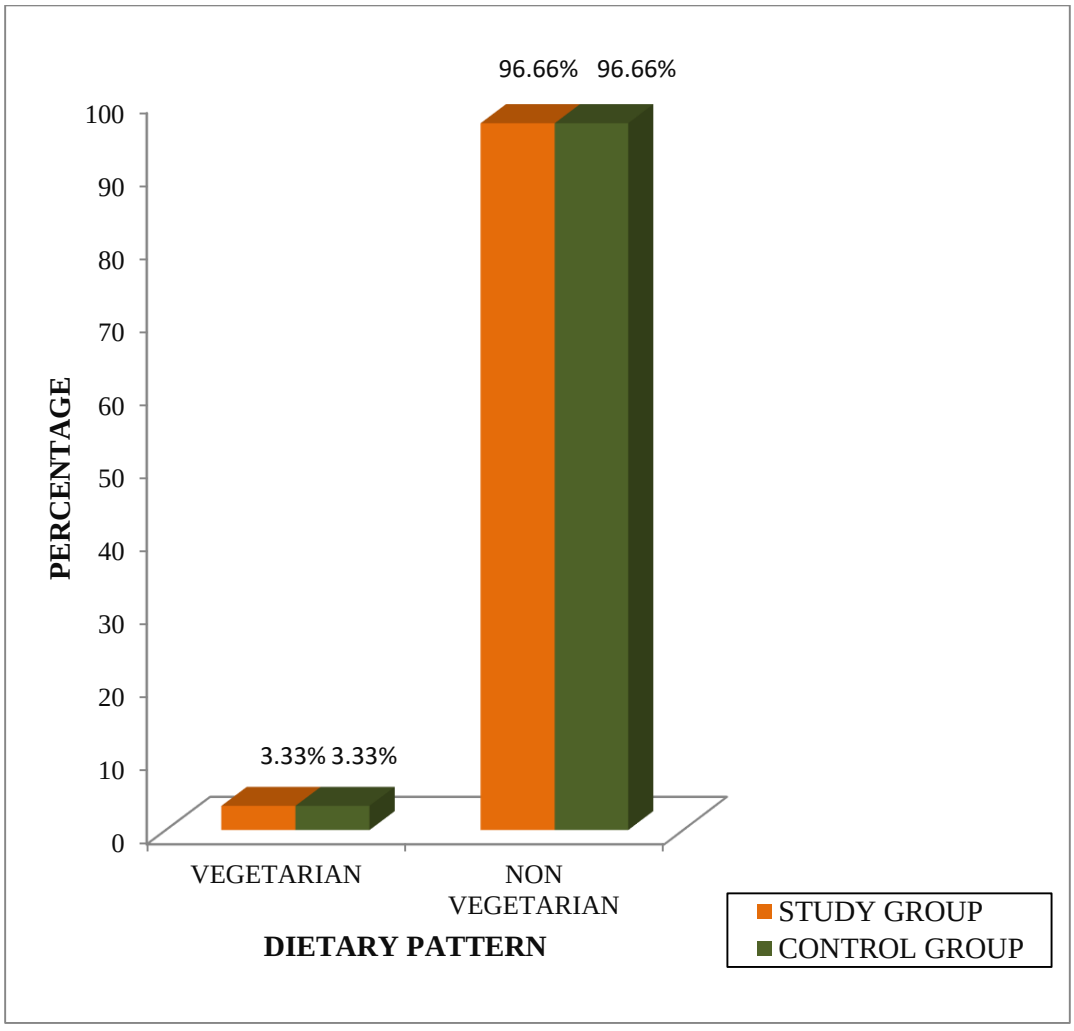
Distribution of sample according to their income

Figure- 4.4



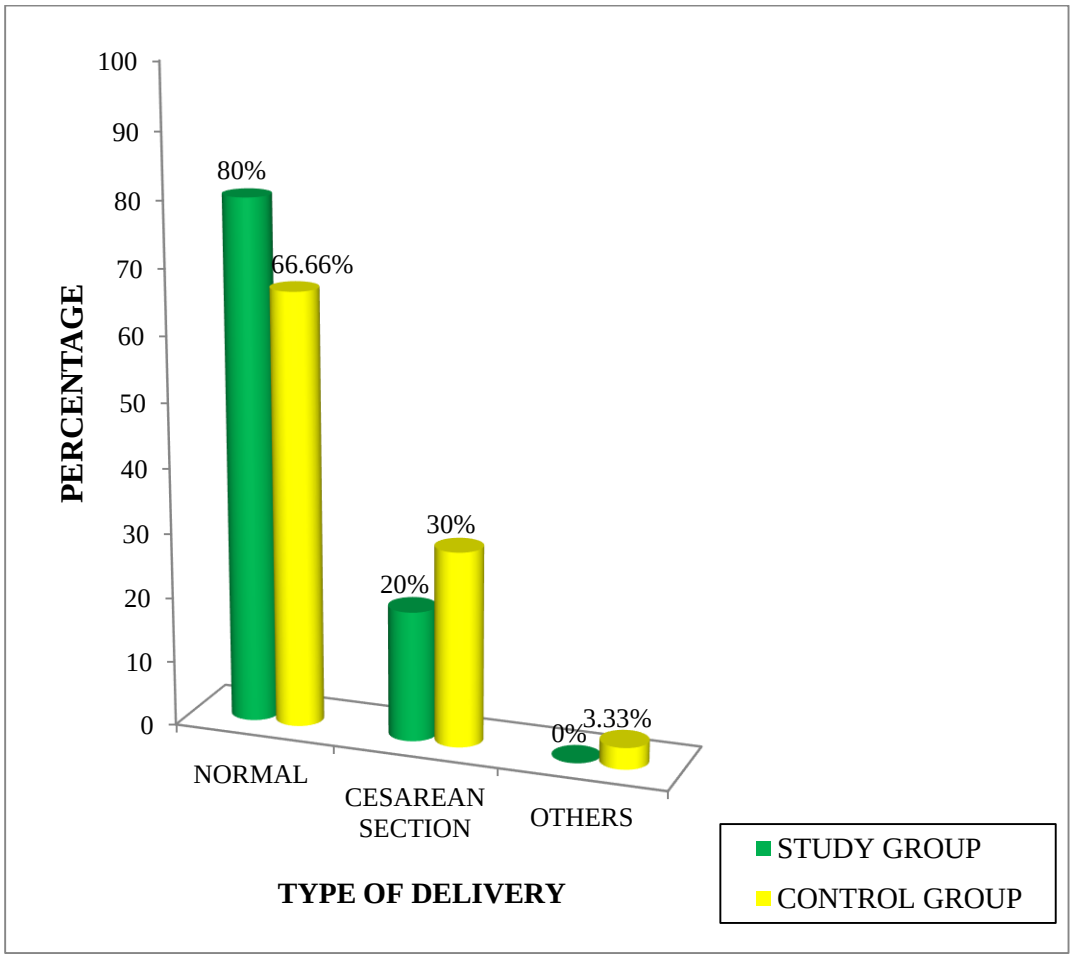
Distribution of sample according to their religion

Figure- 4.5



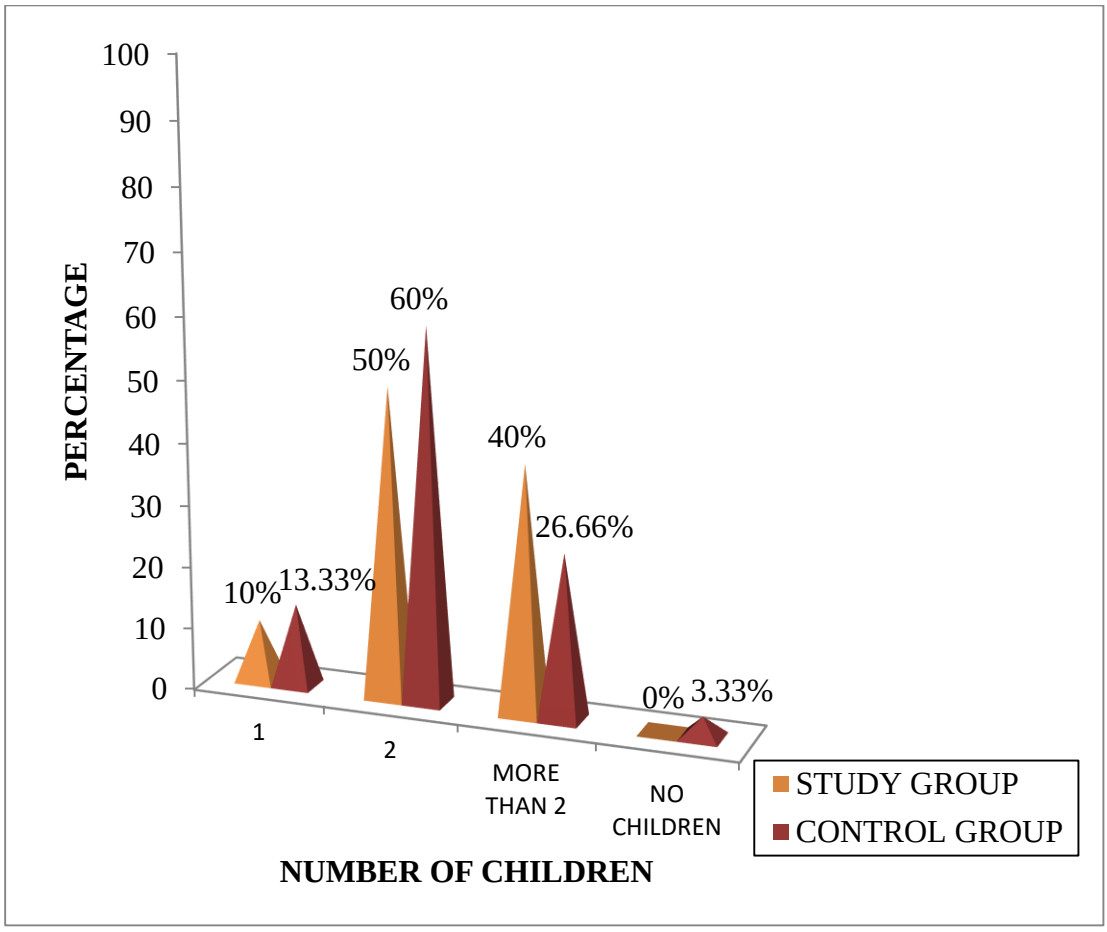
Distribution of sample according to their dietary pattern

Figure- 4.6



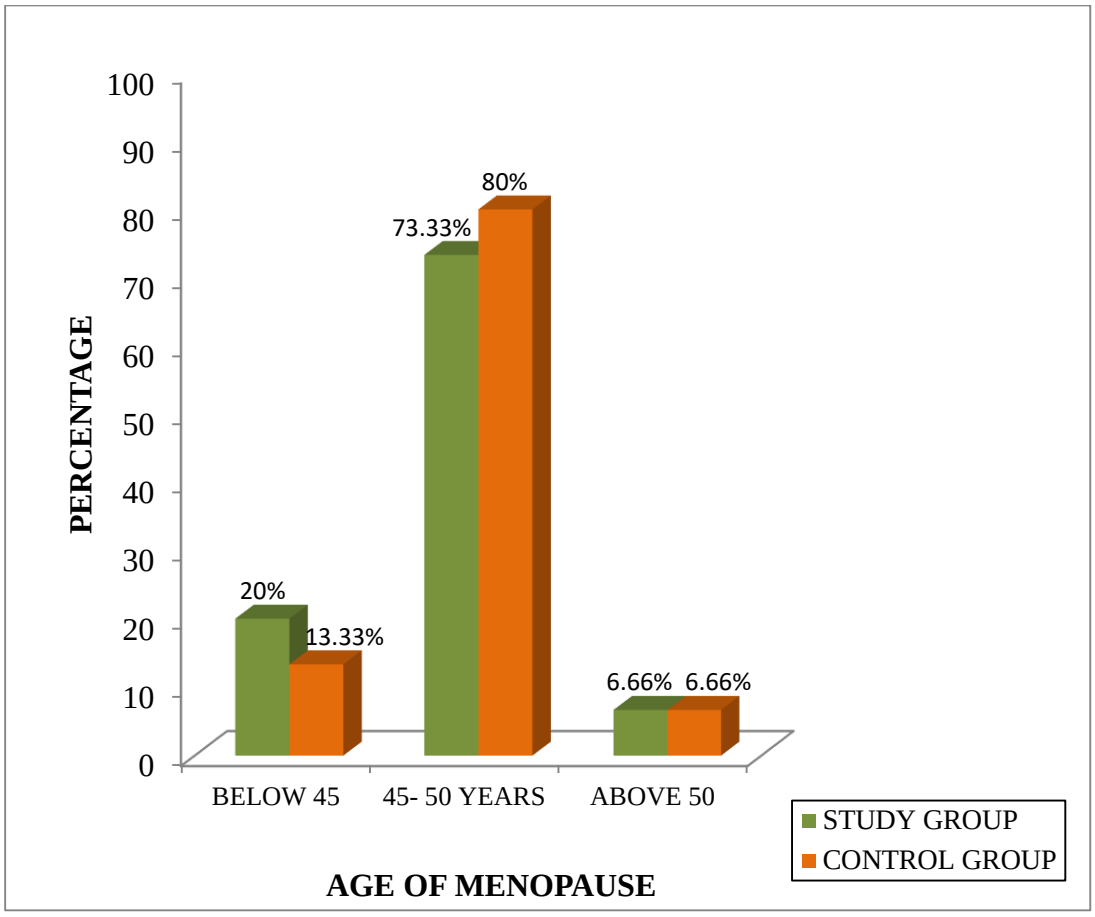
Distribution of sample according to their type of delivery

Figure- 4.7



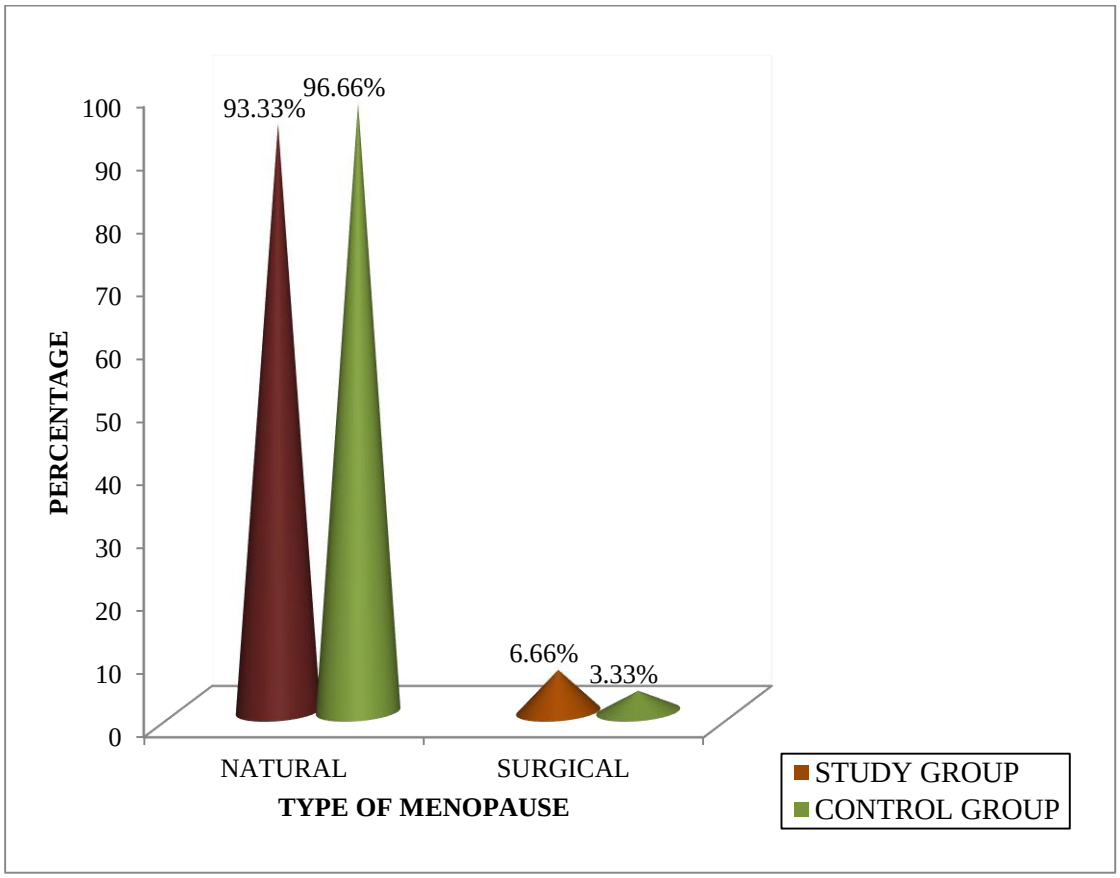
Distribution of sample according to their number of children

Figure- 4.8



Distribution of sample according to their age of menopause

Figure- 4.9



Distribution of sample according to type of menopause

Figure- 4.10

SECTION-B

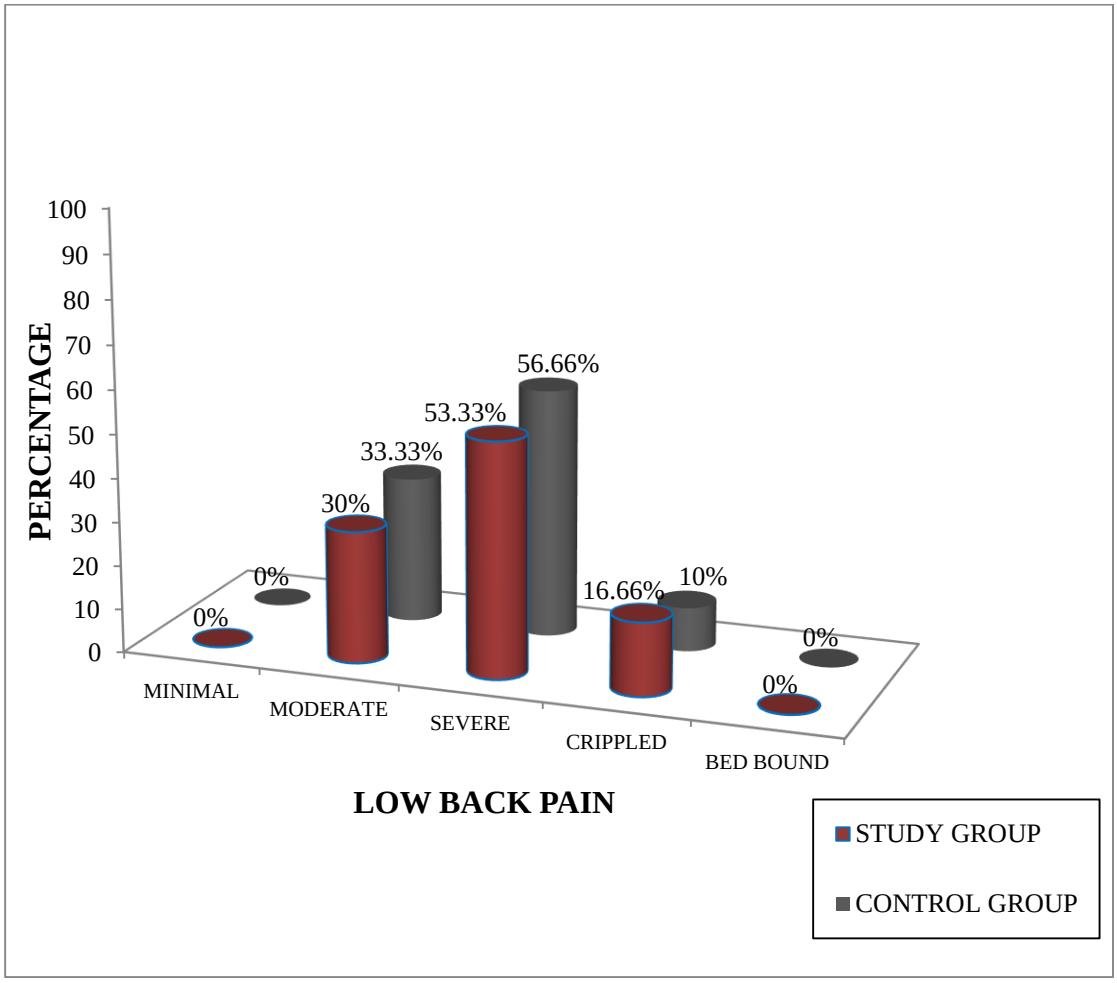
I. DISTRIBUTION OF SAMPLE ACCORDING TO THE LEVEL OF LOW BACK PAIN BEFORE INTERVENTION

Table-4.2: Frequency and percentage distribution of sample according to the level of low back pain in Study group and Control group before intervention.

N=60

S.No	Variables	Levels	Pretest			
			Study group n=30		Control group n=30	
			F	%	F	%
1	Low back pain	Minimal	0	0	0	0
		Moderate	9	30	10	33.33
		Severe	16	53.33	17	56.66
		Crippled	5	16.66	3	10
		Bed bound	0	0	0	0

Table 4.2 shows that During pretest, in Study group none of them had minimal low back pain, 9(30%) had moderate low back pain 16(53.33%) had severe low back pain, 5(16.66%) had crippled low back pain and none of them had bed bound. In Control group none of them had minimal low back pain, 10 (33.33%) had moderate low back pain, 17(56.66%) had severe low back pain, 3(10%) of them had crippled low back pain and none of them had bedbound.



Distribution of Sample according to the Level of low back pain before Intervention

Figure- 4.11

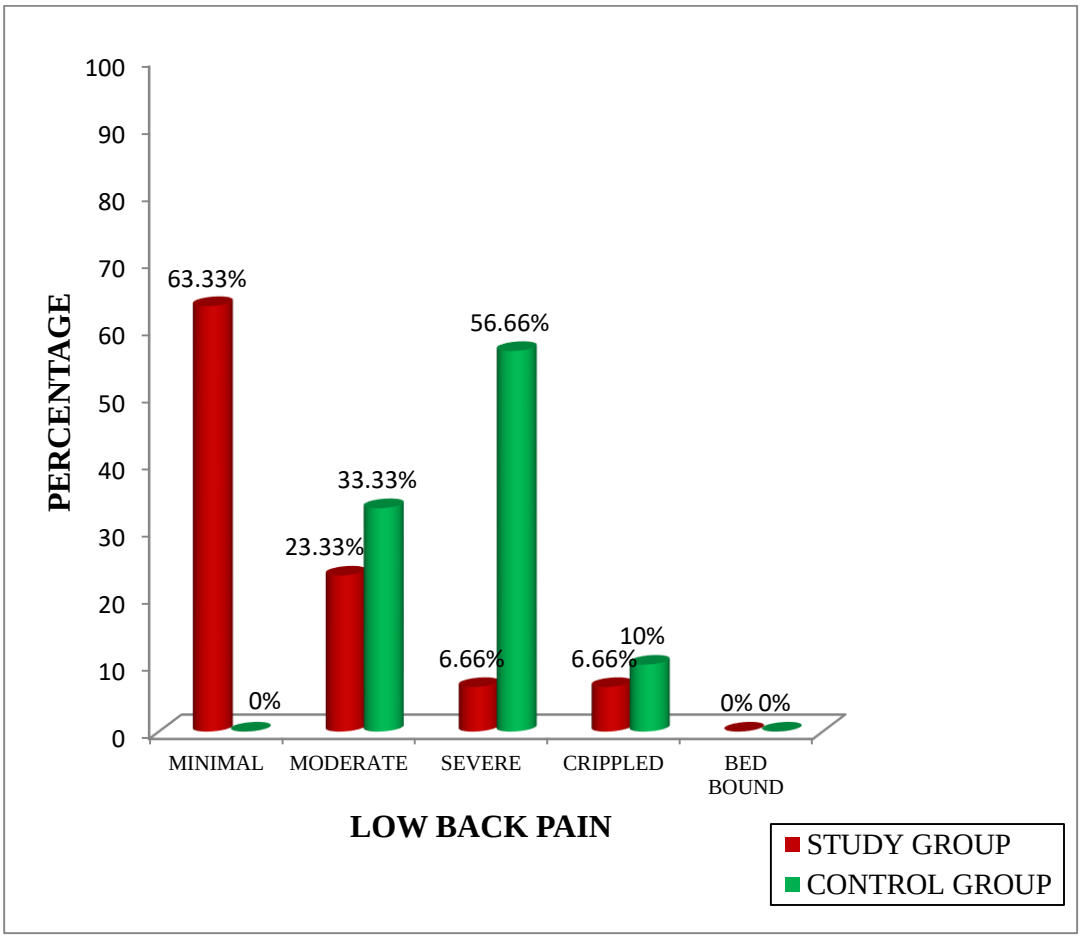
II. DISTRIBUTION OF SAMPLE ACCORDING TO THE LEVEL OF LOW BACK PAIN AFTER INTERVENTION

Table-4.3: Frequency and percentage distribution of sample according to the level of low back pain Study group and Control group after intervention

N=60

S.No	Variables	Levels	Post test			
			Study group n=30		Control group n=30	
			F	%	F	%
1	Level of low back pain	Minimal	19	63.33	0	0
		Moderate	7	23.33	10	33.33
		Severe	2	6.66	17	56.66
		Crippled	2	6.66	3	10
		Bedbound	0	0	0	0

Table- 4.3 shows that, during post test, in Study group 19(63.33%) had minimal low back pain, 7(23.33%) had moderate low back pain, 2(6.66%) had severe low back pain and 2(6.66%) had crippled low back pain. In Control group, none of them had minimal low back pain, 10(33.33%) had moderate low back pain, 17(56.66%) had severe low back pain, and 3(10%) of them had crippled low back pain.



Distribution of post menopausal women according to the Level low back pain after Intervention

Figure- 4.12

SECTION-C

TESTING HYPOTHESES

I. COMPARISON OF PRE TEST AND POST TEST LEVEL OF LOW BACK PAIN IN STUDY GROUP AND CONTROL GROUP

Table-4.4: Mean, SD and paired 't' value on pre and post test level of low back pain among post menopausal women in Study group and Control group

N=60

S. No	Variables	Group	Mean	SD	Mean difference	Df	't'
1.	Low back pain	Study group Pre test Post test	 49.93 19.73	 15.30 19.79	30.2	29	10.74*
		Control group Pre test Post test	 48 48	 13.41 13.34	0	29	0.26

Table value t=1.69, * Significant at p < 0.05 level.

Table - 4.4 represents the mean score on level of low back pain among post menopausal women in Study group 49.93 in pre test and 19.73 in post test respectively. The paired't' value for low back pain were 10.74* which is significant at $p < 0.05$. It shows that back strengthening exercise was effective in reducing the level of low back pain. Hence the research hypothesis (H_1) is accepted.

In Control group the mean score on level of low back pain among post menopausal women were 48 in pre test and 48 in post test respectively. The estimated paired ' t' value for low back pain were 0.26 which is no significant at $p < 0.05$.

II. COMPARISON OF POST TEST LEVEL OF LOW BACK PAIN AMONG POST MENOPAUSAL WOMEN IN STUDY GROUP AND CONTROL GROUP.

Table-4.5 Mean, SD and independent 't' value on level of low back pain among post menopausal women in Study group and Control group after intervention.

N=60

S. No	Variables	Group	Mean	SD	Df	't'
1.	Low back pain	Study group	19.73	19.79	58	6.54*
		Control group	48	13.34		

Table value t=1.96, * Significant at p < 0.05 level.

Table - 4.5 represents, the mean score on level of low back pain among post menopausal women in post test Study group was 19.73 and 48 in Control group. The estimate't' values was 6.54* which is significant at p < 0.05. It shows that back strengthening exercise was effective in reducing the level of low back pain. Hence the research hypothesis (H_2) is accepted.

III. ASSOCIATION OF THE POST TEST SCORES OF LOW BACK PAIN AMONG THE STUDY GROUP AND CONTROL GROUP WITH THE DEMOGRAPHIC VARIABLES.

N=60

S. No	Demographic variables	Study group(n:30)			Control group(n:30)		
		Df	χ^2	Table Value	Df	χ^2	Table Value
1.	Age	8	5.29	15.50	8	2.04	15.50
2.	Education	24	13.27	36.41	24	4.30	36.27
3.	Occupation	20	4.2	31.41	20	7.16	31.41
4.	Income	8	2.76	15.50	8	2.37	15.50
5.	Religion	12	4.74	21.02	12	1.26	21.02
6.	Dietary pattern	4	0.59	9.48	4	2.65	9.48
7.	Type of delivery	8	8.93	15.50	8	4.24	15.50
8	Number of children	12	5.09	21.02	12	8.87	21.02
9	Age of menopause	8	3.33	15.50	8	2.95	15.50
10	Type of menopause	4	8.20	9.48	4	1.20	9.48

In Study group on considering the age, chi-square score was 5.29, In Control group chi- square score was 2.04 the table value at degrees of freedom 8 was 15.50. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering the education, chi-square score was 13.27, In Control group chi- square score was 4.30, the table value at degrees of freedom 24 was 36.41. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering the occupation, chi-square score was 4.2, In Control group chi- square score was 7.16, the table value at degrees of freedom 20 was 31.41. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering the income, chi-square score was 2.76, In Control group chi- square score was 2.37, the table value at degrees of freedom 8 was 15.50. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering the religion, chi-square score was 4.74, In Control group chi- square score was 1.26, the table value at degrees of freedom 12 was 21.02. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering the years of dietary pattern, chi-square score was 0.59, In Control group chi- square score was 2.65, and the table value at degrees of freedom 4 was 9.48. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering if any type of delivery, chi-square score was 8.93, In Control group chi- square score was 4.24, the table value at degrees of freedom 8 was 15.50. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering the number of children, chi-square score was 5.09, In Control group chi- square score was 8.87, the table value at degrees of freedom 12 was 21.02. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering age of menopause, chi-square score was 3.33, In Control group chi- square score was 2.95, the table value at degrees of freedom 8 was 15.50. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

In Study group on considering the type of menopause, chi-square score was 8.20, In Control group chi- square score was 1.20, the table value at degrees of freedom 4 was 9.48. Since the chi -square scores was lower than the table value, there was no association with the Low Back Pain.

DISCUSSION

CHAPTER-V

DISCUSSION

This chapter deals with the discussion of the data analyzed based on the objective and hypothesis of the study. The problem stated was "A quasi experimental study to evaluate the effectiveness of back strengthening exerciSes on Low Back Pain among post menopausal women in selected villages, Kanyakumari district". The discussion was based on the objectives of the study and the hypotheses mentioned in the study.

Demographic variables of the Study group and Control group:

The demographic profile in the study group, 7(23.33%) of them belongs to 45-50 years of age, 14(46.66%) of them belongs to age of 46-50 yrs, 9(30%) belongs to age of 56- 60years. 1(3.33%) was professional degree, 2(6.66%) were under graduates, 1(3.33%) was intermediate, 8(26.66%) were higher secondary, 4(13.33%) were high school, 12 (40%) were middle school, 2 (6.66%) of them were no formal education. 2(6.66%) were government employees, 1(3.33%) was private employee, 21(70%) were coolie workers, 2(6.66%) were doing business, none of them was working in abroad, 4(13.33%) of them were unemployed. 27(90%) were below Rs.5000, 2(6.66%) of them were between 5001-10000, 1(3.33%) was to above Rs.10000. 9(30%) were Hindu, 21(70%) of them were Christian. 1(3.33%) was vegetarian 29(99.66%) of them were non vegetarian. 24(80%) of them had normal delivery, 6(20%) had caesarian section. 3(10%) had one children, 15(50%) of them had two children, 12(40%) had three children, 6(20%) belongs to below 45 yrs, 22(73.33%) of them belongs to 45-50 yrs, 2(6.66%) of them belongs to above 50 yrs, 28(93.33%) had natural menopause and 2(6.66%) had surgical menopause.

In the control group, 6(20%) of them belong to age of 45-50 years, 14(46.66%) of them belongs to age of 46-50 years, 10(33.33%) belongs to age of 56-60 years, 0(0%) was professional degree, 1(3.33%) was under graduate, 2(6.66%) were intermediate, 16(53.33%) were higher secondary, 10(33.33%) were high school, 1(3.33%) was middle school, 0(0%) of them was no formal education. 1(3.33%) was government employee,

1(3.33%) was private employee, 22(73.33%) were coolie workers, 2(6.66%) were doing business, 0(0%) was working abroad, 4(13.33%) of them were unemployed. 20(66.66%) of them were below Rs.5000, 2(6.66%) of them were above Rs.10000. 9(30%) were Hindu, 21(70%) of them were Christian, 1(3.33%) was vegetarian, 29(96.66%) of them were non-vegetarian. 20(66%) had normal delivery, 9(30%) had caesarian section. 1(3.33%) had other method. 4(13.33%) of them had one children, 18(60%) of them had two children, 8(26.66%) had three children and 1(3.33%) had no children. 4(13.33%) belongs to below 45 yrs, 24(80%) of them belongs to 45-50 yrs, and 2(6.66%) belongs to above 50 yrs. 29(96.66%) had natural and 1(3.33%) had surgical.

The first objective was to assess and to compare the pre test and post test level of Low Back Pain among post menopausal women in study and control group:

During pre test, in study group none of them had minimal low back pain, 9(30%) had moderate low back pain 16(53.33%) had severe low back pain, 5(16.66%) had crippled low back pain and none of them had been bed bound. In control group none of them had minimal low back pain, 10 (33.33%) had moderate low back pain, 17(56.66%) with severe low back pain, 3(10%) of them with crippled low back pain, none of them with bed bound.

During post test, in study group 19(63.33%) had minimal low back pain, 7(23.33%) had moderate low back pain, 2(6.66%) had severe low back pain and 2(6.66%) had crippled low back pain. In control group none of them had minimal low back pain, 10(33.33%) had moderate low back pain, 17(56.66%) with severe low back pain, and 3(10%) had crippled low back pain.

The mean score on level of low back pain among post menopausal women in study group is 49.93 in pre test and 19.73 in post test respectively. The paired ‘t’ value for low back pain was 10.74^{*} which is significant at $p < 0.05$. It shows that back strengthening exercise was effective in reducing the level of low back pain. Hence the research hypothesis (H_1) is accepted.

In control group the mean score on level of low back pain among post menopausal women was 48 in pre test and 48 in post test respectively. The estimated paired ' t' value for low back pain was 0.26 which is no significant at $p < 0.05$.

Hyoung, HK (2008) conducted a nonequivalent control group pre test and post test experimental study to identify effects of a strengthening exercise program for the lower back in older women with chronic low back pain. The experimental group consisted of 16 older women and the control group consisted of 14 and all of whom had experienced low back pain for at least 3 months. The intervention was carried out 8 week period, exercise was done 3 days a week and on one day education was also given. The study result showed that pain and disability scores decreased significantly in the experimental group compared to the control group. Flexibility life satisfaction and lumbar muscle strength scores increased significantly in the experimental group compared to the control group. Low back pain and disability can be relived through a strengthening program.

Based on General system theory of Von Ludwing Bertalanffy, the first phase was input. The researcher assessed the demographic variable in pre test level of pain among study group and control group. Second phase was through put, here the investigator gave intervention to study group. Then compare the pre test and post test level of low back pain among post menopausal women in study group and control group. Based on the calculation, study group showed changes in the level of pain than control group.

The second objective was to evaluate the effectiveness of back strengthening exercise on low back pain among post menopausal women.

The mean score on level of low back pain among post menopausal women in post test study group was 19.73 and 48 in control group. The estimate't' value was 6.54* which is significant at $p < 0.05$. It shows that back strengthening exercise was effective in reducing the level of low back pain.

Hence the research hypothesis (H_2) stated earlier denotes that there is a significant difference in the post test level of low back pain among post menopausal women in study group and control group was retained at $p<0.05$ level. The hypothesis is accepted.

About the result supported by **Manthorpen, R et al (2000)** conducted the prospective randomized study to compare the effect of dynamic strength back exercise with home training program among 57 years old women with chronic low back pain. Through the survey 74, 57 years old women those with chronic low back pain were selected the Nordic questionnaire for this program. The participants were randomly assigned to either dynamic back strength exercise at the fit center and a home training program. The study revealed that both training groups manifested significant improvement at the 3 and 12 month follow up examination. The home training program was as effective as the supervised dynamic back strengthening training program and yielded lasting improvement after at least 1 year of adherence.

Based on the theory, third phase was output. Here the study group shows reduction in the level of pain and the control group shows no reduction in the level of pain.

The third objective was to associate the post test level of Low Back Pain among post menopausal women with their selected demographic variables in study and control group.

The data findings showed that there was no significant association between the post test level of low back pain among post menopausal women with their demographic variable such as age, education, occupation, income, religion, dietary pattern, type of delivery, number of children, age of menopause and type of menopause at $p>0.05$ level. Hence hypothesis H3 is not accepted.

This chapter dealt with the discussion of the study with reference to the objective and supportive studies. All the three objectives have been obtained and the two hypotheses were accepted in this study.

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

CHAPTER -VI

SUMMARY, CONCLUSION, LIMITATIONS,

NURSING IMPLICATIONS AND RECOMMENDATIONS

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

Summary

This study was undertaken to assess the effectiveness of back strengthening exercises on low back pain and quantitative research approach was used. Quasi experimental Study pre test post test control group design was adopted to evaluate the effectiveness of back strengthening exercises on low back pain among post menopausal women. The study was conducted in Keezhkulam village. The purposive sampling technique was used to select 30 samples for control group and 30 samples for study group. Data collection was done by using the numerical pain scale and modified Oswestry Low Back Pain Disability Questionnaire. Back strengthening Exercises were administered for study group. Post test was done on fourth week of data collection period. The datas gathered were analyzed by descriptive and inferential statistical methods and interpretation was done on the basis of the objectives of the study.

Findings

The major finding of the study was summarized as follows,

The demographic profile in study group, 7(23.33%) of them belongs to 45-50 years, 14(46.66%) of them belongs to age of 46-50 yrs, 9(30%) belong to age of 56- 60 years. 1(3.33%) was professional degree, 2(6.66%) were under graduates, 1(3.33%) was intermediate, 8(26.66%) were higher secondary, 4(13.33%) were high school, 12 (40%) were middle school, 2 (6.66%) of them were no formal education. 2(6.66%) were government employees, 1(3.33%) was private employee, 21(70%) were coolie workers, 2(6.66%) were doing business, none of them was working abroad, 4(13.33%) of them

were unemployed. 27(90%) were below Rs.5000, 2(6.66%) of them were 5001-10000, 1(3.33%) was to above Rs.10000. 9(30%) were Hindus, 21(70%) of them were Christian. 1(3.33%) was vegetarian 29(99.66%) of them were non-vegetarians. 24(80%) had normal delivery, 6(20%) had caesarian section. 3(10%) had one children, 15(50%) of them had two children, 12(40%) had three children 6(20%) belongs to below 45 yrs, 22(73.33%) belongs to 45-50 yrs, 2(6.66%) of them belongs to above 50 yrs, 28(93.33%) had natural and 2(6.66%) had surgical.

In control group 6(20%) of them belong to age of 45-50 years, 14(46.66%) of them belongs to age of 46-50 years, 10(33.33%) belongs to age of 56-60 years, none of them was professional degree, 1(3.33%) was under graduate, 2(6.66%) were intermediates, 16(53.33%) were higher secondary, 10(33.33%) were high school, 1(3.33%) were middle school, none of them of them was no formal education. 1(3.33%) was government employee, 1(3.33%) was private employee, 22(73.33%) were coolie workers, 2(6.66%) were doing business, 0(0%) was working abroad, 4(13.33%) of them were unemployed. 20(66.66%) were below Rs.5000, 2(6.66%) of them were above Rs.10000. 9(30%) were Hindus, 21(70%) of them were Christian, 1(3.33%) was vegetarian, 29(96.66%) of them were non-vegetarians. 20(66%) had normal delivery, 9(30%) had caesarian section. 1(3.33%) had other method. 4(13.33%) of them had one children, 18(60%) of them had two children, 8(26.66%) had three children and 1(3.33%) had no children. 4(13.33%) belongs to below 45 yrs, 24(80%) of them belongs to 45-50 yrs, and 2(6.66%) belongs to above 50 yrs. 29(96.66%) had natural and 1(3.33%) had surgical.

During pretest, in study group none of them had minimal low back pain, 9(30%) had moderate low back pain, 16(53.33%) had severe low back pain, 5(16.66%) had crippled low back pain and none of them had bed bound. In control group, none of them had minimal low back pain, 10(33.33%) had moderate low back pain, 17(56.66%) had severe low back pain 3(10%) with crippled low back pain, none of them with bed bound.

During post test, in study group 19(63.33%) had minimal low back pain, 7(23.33%) had moderate low back pain, 2(6.66%) had severe low back pain and 26.66%)

had crippled low back pain. In control group, none of them had minimal low back pain, 10(33.33%) had moderate low back pain, 17(56.66%) with severe low back pain, and 3(10%) had crippled low back pain.

The mean score on level of low back pain among post menopausal women in study group was 49.93 in pre test and 19.73 in post test respectively. The paired 't' value for low back pain was 10.74^{*} which is significant at $p < 0.05$. It showed that back strengthening exercise was effective in reducing the level of low back pain. In control group, the mean score on level of low back pain among post menopausal women was 48 in pre test and 48 in post test respectively. The estimated paired't' value for low back pain was 0.26 which is no significant at $p < 0.05$.

The data findings showed that there was no significant association between the post test level of low back pain among post menopausal women with their demographic variable such as age , education, occupation, income, religion, dietary pattern, type of delivery, number of children, age of menopause and type of menopause at $p>0.05$ level. Hence hypothesis H3 is not accepted.

Conclusion

From the results of the study, it is concluded that back strengthening exercise was effective in low back pain among post menopausal women. These exercises were not only cost effective but also easy to follow. Compare to pharmacological therapy, the exercise has fewer side effects. The post menopausal women also feel very happy and comfort while providing back strengthening exercise. Post menopausal women can educate other post menopausal women in order to create awareness about the problems. Therefore the investigator feels that, more importance should be given for back strengthening exercises to reduce the low back pain.

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.

Nursing service:

Nursing person should develop in depth knowledge about post menopausal women's physical problems. Nurses should be knowledgeable regarding the benefits of back strengthening exercises in reducing low back pain among post menopausal women. Community nurses should promote and encourage back strengthening exercise among post menopausal women.

Nursing education:

The nurse educators need to be equipped with adequate knowledge regarding back strengthening exercise. Nursing students should receive adequate training regarding these exercises. Conduct workshops or conferences for students regarding the use of back strengthening exercises, in day today nursing practice. Strengthen the curriculum for nurses to extend their knowledge and skills in areas of various strengthening exercise modalities.

Nursing administration:

Nursing administrator can influence the quality of nursing care in hospital by planning and supervising health education in different level administrative staff. They should understand the need of post menopausal women. Nursing administrator can organize conferences, seminars and workshops for nurses working in community to encourage a positive attitude on back strengthening exercise.

Nursing research:

Nurses should conduct research for further clarifications of the benefits and optimal association of back strengthening exercises. Encourage conducting further research on the effect of back strengthening exercises. Disseminate the findings of research through conferences, seminars and publishing in nursing journals.

Recommendations

The following steps can be undertaken to strengthen the study:

- A similar study can be conducted among large samples.
- A similar study can be conducted among post natal mothers who underwent cesarean section with Low Back Pain.
- A similar study can be conducted by giving the exercise for a long period.
- The similar exercises can be educated to the industrial workers who are at risk of getting Back Pain.

Limitations

Since there were very few studies done on the effectiveness of back strengthening exercises on low back pain among post menopausal women, the investigator had difficulties in collecting the study materials for the review.

REFERENCES

REFERENCE

TEXT BOOKS REFERENCE

1) Basavanthappa, B.T. (2007). Nursing Research. New Delhi: Jaypee Publications.
2) Black. (2008). Medical surgical nursing. New Delhi: Elsevier publishe.
3) Brunner. (2004). Medical surgical nursing. Philadelphia: Lippincott publishers.
4) Bhasker, N. (2012). Midwifery and Obstetrical Nursing. Bangalore: Emmess Medical Publications.
5) Cole, H. (1997). The Low Back Pain handbook. New Delhi; Jaypee publishers.
6) Dutta, D.C. (2012). Text book of Gyneaecology. Kolkatta: New central book agency.
7) George, J. B. (2011). Nursing Theories. New Delhi: Pearson Publications.
8) Kothari, C.R. (2010). Research Methodology. New Delhi: New Age International Publishers.
9) Likis, F.E. (2006). Womens gynecologic health. America : Jones and bartlett publishers.
10) Munro, B.H. (2005).Statistical Methods For Health Care Research. New Delhi: Lippincott Publications.
11) Martin, E. A. (2005). Oxford Concise Medical Dictionary. 6th edition. Noida: Oxford University Press.
12) Perry, B.L. (1999). Maternity Nursing. Philadelphia: Mosby publications.
13) Padubidri, V.G. (2006). Text book of gynecology: Newdelhi.
14) Polit, D.F Beck, C.T. (2008).Nursing Research Generating and assessing Evidence practice.8th edition. New Delhi; wolkersklumer Pvt Ltd.
15) Ramsden et al. (2000) Gynecology illustrated: Landon.
16) Sundar Rao.(2009). Introduction to Biosttatistics and Research methods. New Delhi

JOURNALS REFERENCE

17) Fatima, A.R. Nair, R.R. (2011). Effect of back strengthening exercise on low back pain among nursing students. Indian Journal of continuing nursing education.
18) Mary. L. (2009). Jacobson's progressive muscle relaxation exercise. The nurse international August-September.
19) Munmun, M. (2013). Taking health issues. Nightingale nursing times.
20) Nayak. (2008). Problems of menopause. Health action.
21) Swain. (2009). Managing menopause. Health action.
22) Punita, E. (2012). Experimental research design. Indian Journal of continuing nursing education..

NET REFERENCE

23) http://www.ncbi.nim.nih.gov/pubmed/10995045
24) http://www.ncbi.nim.nih.gov/pubmed/17550916
25) http://www.ncbi.nim.nih.gov/pubmed/15221206
26) http://www.ncbi.nim.nih.gov/pubmed/15746294
27) http://www.ncbi.nim.nih.gov/pubmed/9509822
28) http://www.ncbi.nim.nih.gov/pubmed/18171491
29) http://www.ncbi.nim.nih.gov/pubmed/15159265
30) http://www.ncbi.nim.nih.gov/pubmed/12137611.1
31) http://www.ncbi.nim.nih.gov/pubmed/19374677
32) http://www.ncbi.nim.nih.gov/pubmed/18779757
33) http://www.ncbi.nim.nih.gov/pubmed/19281589
34) http://www.ncbi.nim.nih.gov/pubmed/16461178
35) http://www.ncbi.nim.nih.gov/pubmed/2972594
36) http://www.jmidlifehealth.org/article.asp?issn=0976-7800
37) http://www.ncbi.nim.nih.gov/pubmmed/15867409

38) http://www.ncbi.nim.nih.gov/pubmed/19892856
39) http://www.ncbi.nim.nih.gov/pubmed/15867410
40) http://www.ncbi.nim.nih.gov/pmc/articles/PMC3604220
41) http://www.ncbi.nim.nih.gov/pubmed/15867410
42) http://www.ncbi.nim.nih.gov/pubmed/23828186
43) http://www.ncbi.nim.nih.gov/articles/PMC3274640/
44) http://www.ncbi.nim.nih.gov/pubmed/2916912
45) http://www.ncbi.nim.nih.gov/pubmed/16884344
46) http://www.ncbi.nim.nih.gov/pubmed/23202842
47) http://www.ncbi.nih.gov/pmc/articles/PMC2972594/
48) http://www.Aliba.com
49) http://www.livestrong.com/article/165474
50) http://www.ncbi.nlm.nih.gov/pubmed/12145370
51) www.ncbi.nlm.nih.gov/pmc/articles/pmc3047664
52) www.ideafit.com/fitness-library/strength-training-best-for-reducing-low-back-pain
53) http://dx.doi.org/10.1590/s1809-2950 201100 200003
54) http://www.hindawi.com/journals/ori/2010/274261
55) media.wix.com/ugd/dae3c7-e76b31ee07ac33793ed pdf

ANNEXURES

ANNEXURES- I

St. XAVIER'S CATHOLIC COLLEGE OF NURSING

Chunkankadai, Nagercoil,
Kanyakumari District,
Tamil Nadu - 629 003.

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E-mail : xaviers_nursing@yahoo.com
reenaevancy@yahoo.com
Website : www.xaviersnsg.edu.in

Dr. A. REENA EVENCY, M.Sc. (N)., Ph.D.,
Principal

06.05.2013

To

The Panchayat President,
Keezhkulam Panchayat,
Keezhkulam,
Kanyakumari Dist.

Respected Madam/ Sir,

Miss. Bino Shiny A.J, is a student of M. Sc., Nursing programme from the Clinical Speciality, Community Health Nursing in our college. She is conducting a study on **'An experimental study to evaluate the effectiveness of Back strengthening exercise on low back pain among postmenopausal women in selected village, Kanyakumari district'.**

This is for the research project to be submitted to the Tamilnadu Dr. M.G.R Medical University in Partial fulfillment of university requirement for the award of M.Sc., Nursing Degree and will be beneficial in understanding and improving the health of the postmenopausal women.

As a part of her study she needs to observe the effect of back strengthening exercise on low back pain among postmenopausal women. So permission may kindly be granted for her to conduct the study at your panchayat. She will abide by the rules and regulations of your Panchayat.

Thanking you,

Yours faithfully,

PRINCIPAL
ST. XAVIER'S CATHOLIC COLLEGE OF NURSING
CHUNKANKADAI
NAGERCOIL - 629 003
K. K. DIST.

ANNEXURES- II

A. Viswanathan
President

Phone : off : 04651 - 204381
Cell : 9443595335

KEEZHKULAM TOWN PANCHAYAT
KEEZHKULAM - P.O., Pin : 629 193.
VILAVANCODU TALUK
Kanyakumari District.

கடிதம் 94/2013 அலுவலகம் 13/6/2013

Date .....

அனுப்பு

[illegible]

13/6/2013

PRESIDENT
TOWN PANCHAYAT
KEEZHKULAM

ANNEXURES- III

LETTER SEEKING EXPERTS OPINION FOR THE VALIDITY OF THE TOOL

From,

Ms. Bino shiny A.J ,

M.Sc. Nursing II year,

St. Xavier's Catholic college Of Nursing,

Chunkankadai.

To,

Respected Sir/ Madam,

Sub: Requisition to expert opinion and suggestion for the content validity.

I Bino shiny A.J, M.Sc. Nursing II year student of St.Xavier's Catholic College Of Nursing, Chunkankadai, have selected the following topic, "A quasi experimental study to evaluate the effectiveness of back strenthening exercise on low back pain among post menopausal women in selected village, Kanayakumari district" for my dissertation to be submitted to Tamilnadu Dr. M.G.R. Medical University in the partial fulfillment of the requirement for award of Master of science in Nursing.

I request you to go through the items and give your valuable suggestions and opinions to develop the content validity of the tool. Kindly suggest modifications, addition and deletions if any in the remarks column.

Thanking You,

Place: Chunkankadai. Yours sincerely,

Date: Bino shiny AJ.

ENCLOSURE:

1. Problem statement, objectives, and hypothesis of the study.
2. Demographic profile.
3. Numerical pain rating scale.
4. Evaluation Performa.

ANNEXURES- IV

VALIDITY

CRITERIA CHECK LIST FOR VALIDATION OF THE TOOL

INSTRUCTION:

Kindly give your suggestions regarding the accuracy, relevance and appropriateness of the content. Kindly (✓) against specific columns.

VALIDATION OF DEMOGRAPHIC VARIABLES.

Item	Very relevant	Relevant	Need for modification	Not relevant	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

VALIDATION OF PAIN SCALE SCORING.

Item	Very relevant	Relevant	Need for modification	Not relevant	Remarks
1					
2					
3					
4					

VALIDATION FOR MODIFIED OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE

Item	very relevant	relevant	need for modification	not relevant	Remarks
minimal disability					
moderate disability					
severe disability					
crippled					
bed bound					

EVALUATION CRITERIA CHECKLIST FOR VALIDATION

INSTRUCTIONS:

The expert is requested to go through the following criteria for evaluation. Three columns are given for responses and a column for remarks. Kindly please tick mark (✓) in the appropriate columns and give remarks. Interpretation column: Column I – meets the criteria.

Column II - Partially meets the criteria.

Column III – does not meet the criteria.

S. NO	CRITERIA	1	2	3	REMARKS
1.	Scoring -adequacy. -clarity. -simplicity.				
2.	Content -logical sequence. -adequacy. -relevance.				
3.	Language -Appropriate. -clarity. -simplicity.				
4.	Practicability -easy to score. -precise. -utility.				

Signature:

Any other suggestion:

Name:

Designation:

Address:

ANNEXURES-V

LIST OF EXPERTS VALIDATED THE TOOL

1. Dr. D. Pethuru M.B.B.S,. M.D(Community Medicine).
Assistant professor,
Mookambiga Medical College and Hospital,
Kulaseharam,
Nagercoil – 629001.

2. Dr.Blessed, M.B.B.S., M.D(Community Medicine),
Professor,
C. S. I. Medical College,
Karakonam,
Trivandrum.

3. Dr. Judie, M.Sc.(N) P.hd (N),
Dean,
S.R.M College of Nursing,
Chennai.

4. Mrs. S.Margrete Ranjitham, M.Sc.(N),
Principal,
Nehru College of Nursing,
Vallioor.

5. Mrs.G. Feby, M.Sc., (N)
Vice principal,
Thasiah College of Nursing,

Marthandam.

ANNEXURES-VI

Reg. No. : L-27876 Cell : 9443301096

S.M. PHYSIOTHERAPY CLINIC

Near Rajive Junction,
Thenkapattanam Road, Karungal - 629157,
Kanyakumari Dist.

Physiotherapist :-
***Dr.*M. Sebas Godson** *BPT, MPT, D.Acu, DMT, MIAP.*
***Dr.*Miracle S. Godson** *BPT*

Date : 01.03.2013

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Ms. Binoshiny A.J,** II Year M.Sc(N), St. Xavier's Catholic College of Nursing, Chunkankadai has undergone training in Back Strengthening Exercise under my guidance from 01.02.2013 to 28.02.2013. During the period of training she was attentive and understood various techniques to the needed extent.

I wish her all success in future.

Dr. S. Godson
1/3/13

S.M. PHYSIOTHERAPY CLINIC
Reg.No. L-27878
Karungal-629157
NEAR RAJIV JUNCTION

ANNEXURE VII

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certified that the dissertation paper titled "**A quasi experimental study to evaluate the effectiveness of back strengthening on low back pain among post menopausal women in selected village, Kanyakumari district" by Ms. Bino shiny A J**, has been checked for the accuracy and correctness of English language usage and that the language used in the tool is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose.

13/1/14

Signature

V. Sumitha, MA. MPhil

Assistant Professor of English

UNIVERSAL College of Engg.

and Technology, Vallioor

ANNEXURE VII

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certified that the dissertation paper titled "**A quasi experimental study to evaluate the effectiveness of back strengthening on low back pain among post menopausal women in selected village, Kanyakumari district" by Ms. Bino shiny A J,** has been checked for the accuracy and correctness of Tamil language usage and that the language used in the tool is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose.

Signature

G.AUDALIN MADHURAM M.A.B.Ed,
P.G.ASSISTANT IN TAMIL,
ST.JOSEPH HR SEC.SCHOOL,
THIRITHUVAPURAM.

ANNEXURE IX

INFORMED CONSENT

I ———————— am living in Arasakulam village. Since I am having moderate/severe Low Back Pain, I am willing to be a participant to involve in the study to evaluate the effectiveness of back strengthening exercise, without any compulsion. I came to know through the researcher that the exercises are harmless and easy to follow.

Yours Sincerely,

ANNEXURES-X

TO WHOMSOEVER IT MAY CONCERN

Certified that the dissertation paper titled " **An experimental study to evaluate the effectiveness of back strengthening exercise on low back pain among post menopausalwomen in selected villages, Kanyakumari District"** done by **Ms.Bino Shiny A.J**, has been checked for the accuracy in statistical analysis and interpretation and was apt for the purpose .

Signature

Dr. G. IMMANUEL
Assistant Professor
Centre for Marine Science & Technology
Manonmaniam Sundaranar University
Rajakkamangalam - 629 502
K. K. District, Tamilnadu, India

ANNEXURES -XI

SECTION- I

DEMOGRAPHIC DATA

INSTRUCTIONS: The investigator will ask the items listed below and place the tick against the response given by the respondent.

1. Age in year
    a) 45- 50
    b) 50- 55
    c) Above 55
2. Education
    a) Profession degree, PG& above
    b) Graduate
    c) Intermediate or post high school/ diploma
    d) High school
    e) Middle school
    f) Primary school
    g) Illiterate
3. Occupation
    a) Government
    b) Private
    c) Coolie
    d) Business
    e) Working abroad
    f) Un employed
4. Economic status (per month)
    a) Below 3000
    b) 5 000- 10 000
    c) Above 10 000
5. Religion
    a) Hindu
    b) Christian
    c) Muslim
    d) Others

6. Dietary pattern
    a) Vegetarian
    b) Non- vegetarian

DATA ABOUT MENOPAUSE

1. Type of delivery

    a) Normal delivery
    b) Cesarean section
    c) others

2. Number of children

    a) 1
    b) 2
    c) More than 2
    d) No children

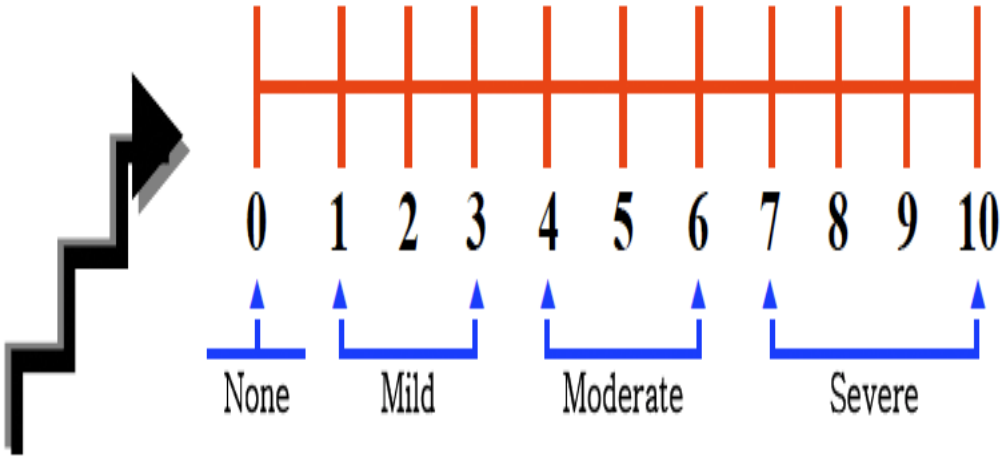
3. Age of menopause
    a) Below 45
    b) 45-50
    c) Above 50

4. Type of menopause
    a) Natural
    b) surgical

SECTION- II

Instructions

The investigator will explain the level of pain listed below and clients have to encircling what she is experiencing.



NUMERICAL PAIN RATING SCALE

SCORING

0 no pain

1-3 mild pain (nagging, annoying, interfering with daily activities in daily living)

4- 6 moderate pain (interferes significantly with ADLs)

7-10 severe pain (disabling, unable to perform ADLs)

SECTION- III

MODIFIED OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE

INSTRUCTION

This questionnaire has been designed to give us information as to how your back is affecting your ability to manage in everyday life. Please answer every question by placing a mark on the line that best describes your condition today.

S.NO	ITEMS	SCORE
1	**PAIN INTENSITY** The pain is mild and comes and goes. The pain is mild and does not very much. The pain is moderate and comes and goes. The pain is moderate and does not very much. The pain is severe and comes and goes. The pain is sever and does not very much.	0 1 2 3 4 5
2	**PERSONAL CARE** I do not have to change the way, I wash and dress myself to avoid pain. I do not normally change the way I wash or dress myself even though it causes some pain. Washing and dressing increases my pain, but I can do it without changing my way of doing it. Washing and dressing increases my pain, and I find it necessary to change the way I do it. Because of my pain I am partially unable to wash and dress without help. Because of my pain I am completely unable to wash or dress without help.	0 1 2 3 4 5
3	**LIFTING** I can lift heavy weights without increased pain. I can lift heavy weights but it causes increased pain. Pain prevents me from lifting heavy weights off of the floor, but I can manage if they are conveniently positioned . Pain prevents me from lifting heavy weights off	0 1 2 3

	of the floor, but I can manage light to medium weight s if they are conveniently positioned. I can lift only very light weights. I can not lift or carry anything at all.	 4 5
4	**WALKING** I have no pain when walking . I have pain when walking, but I can still walk my required normal distance. Pain prevents me from walking long distance. Pain prevents me from walking intermediate distance. Pain prevents me from walking even short distance. Pain prevents me from walking at all.	 0 1 2 3 4 5
5	**SITTING** Sitting does not cause me any pain. I can only sit as long as I like providing that I have my choice of seating surface. Pain prevents me from sitting for more than 1hour. Pain prevents me from sitting for more than ½ hour. Pain prevents me from sitting for more than 10minutes. Pain prevents me from sitting at all.	 0 1 2 3 4 5
6	**STANDING** I can stand as long as I want without increased pain. I can stand as long as want but my pain increases with time. Pain prevents me from standing for more than 1hour. Pain prevents me from standing for more than ½ hour. Pain prevents me from standing for more than 10minutes. I avoid standing because it increases my pain right away.	 0 1 2 3 4 5
7	**SLEEPING** I get no pain when I am in bed I get pain in bed, but it does not prevent me from sleeping well.	 0 1

	Because of pain, my sleep is only ¾ of my normal amount Because of my pain, my sleep is only ½ of my normal amount. Because of my pain, my sleep is only ¼ of my normal amount. Pain prevents me from sleeping at all.	2 3 4 5
8	**SOCIAL LIFE** My social life is normal and does not increase my pain. My social life is normal, but it is increases my leve of pain. Pain prevents me from participating in more energetic activities. Pain prevents me from going out very often. Pain has restricted my social life to my home. I have hardly and social life because of Pain.	0 1 2 3 4 5
9	**TRAVELING** I get no increase pain when traveling. I get some pain while traveling, but none of my usual forms of travel make it any worse. I get increased pain while traveling, but it does not cause me to seek alternative forms of travel. I get increased pain while travelling which causes me to seek alternative forms of travel. My pain restricts all forms of travel except that which is done while I am lying down. My pain restricts all forms of travel.	0 1 2 3 4 5
10	**EMPLOYMENT/HOME MAKING** My normal job/ home making activities do not cause pain. My normal job/ home making increase my pain, but I can still perform all that is required of me. I can perform most of my job/home making duties ,but pain prevents me from performing more physically stressful activities. Pain prevents me from doing anything but light duties. Pain prevents me from doing even light duties. Pain prevents me from performing any job or homemaking chores.	0 1 2 3 4 5

INTERPRETATION

0% - 20% Minimal disability.

21%-40% moderate disability.

41%-60% severe disability.

61%-80%crippled.

81%-100% bed-bound.

பகுதி I

தனி மனித விபரம்

குறிப்பு : ஆய்வாளர் கேட்கும் கீழே கொடுக்கப்பட்டுள்ள ஒவ்வொரு தனிமனித விபரங்களுக்கும் சரியான பதிலில் சரி (√) செய்யவும்.

1. வயது

   அ. 45 – 50

   ஆ. 51 – 55

   இ. 55 – க்கு மேல்

2. கல்வித்தகுதி

   அ. தொழில் சார்ந்த படிப்பு

   ஆ. முதுகலை பட்ட படிப்பு

   இ. பட்டப்படிப்பு டிப்ளமோ கல்வி

   ஈ. மேல்நிலைப் பள்ளி

   உ. உயர்நிலைப்பள்ளி

   ஊ. நடுநிலைப்பள்ளி

   எ. ஆரம்ப கல்வி

   ஏ. படிப்பறிவு இல்லாதவர்

3. தொழில்

   அ. அரசு வேலை

   ஆ. தனியார் வேலை

   இ. கூலி வேலை

   ஈ. சுயதொழில்

   உ. வெளிநாட்டில் வேலை

4. மாத வருமானம்

அ. ரூ.5000 –க்கு கீழ்

ஆ. ரூ. 5000 – 10000

இ. ரூ.10000 – க்கு மேல்

5. மதம்

அ. இந்து

ஆ. கிறிஸ்தவம்

இ. இஸ்லாம்

ஈ. பிற

6. உணவு பழக்க வழக்கம்

அ. சைவம்

ஆ. அசைவம்

இறுதி மாதவிடாய் பற்றிய குறிப்புகள்

1. பிரசவத்தின் வகைகள்
அ. இயற்கையான பிரசவம்

ஆ. அறுவை சிகிட்சை

இ. பிற முறைகள்

2. குழந்தைகளின் எண்ணிக்கை

அ. 1

ஆ. 2

இ. 2 – க்கு மேற்பட்ட

ஈ. குழந்தைகள் இல்லை

3. இறுதியாக மாதவிடாய் வந்த காலம்

   அ. 45 வயதுக்கு கீழ்

   ஆ. 45 – 50

   இ. 50 வயதுக்கு மேல்

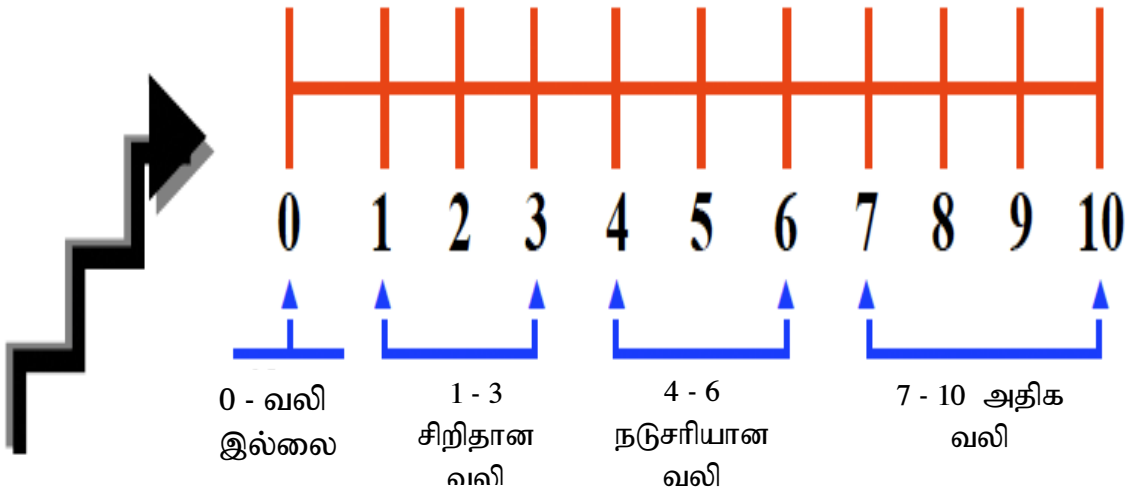
4. மாதவிடாய் சுழற்சி நிற்கும் வகைகள்

   அ. இயற்கையான

   ஆ. அறுவை சிகிட்சை

பகுதி – II

குறிப்பு : உங்களுடைய வலியின் அளவை கீழே வட்டமிடவும்



பகுதி III

குறிப்பு : இந்த வினாக்கள் தினசரி வாழ்க்கையில் மனிதனுடைய முதுகு பகுதியை பாதிக்கின்ற விஷயங்களை எடுத்துரைக்கும் வண்ணமாக வரையப்பட்டுள்ளது. தயவு செய்து கீழே கொடுக்கப்பட்ட ஒவ்வொரு வினாக்களுக்கும் இன்றையதினம் உங்கள் உடல் ஆரோக்கியத்தை விளக்கும் விதமாக பதில் அளிக்கவும்.

வரிசை எண்	தனியொரு விவரம்	குறியீடு
1.	**வலி அளவு**	
	❁ அடிக்கடி வந்துபோகும் சிறிதளவு வலி	0
	❁ எப்போதும் இருக்கும் சிறிதளவு வலி	1
	❁ அடிக்கடி வந்துபோகும் சராசரியான வலி	2
	❁ எப்போதும் இருக்கும் சராசரியான வலி	3
	❁ அடிக்கடி வந்துபோகும் கடுமையான வலி.	4
	❁ எப்போதும் இருக்கும் கடுமையான வலி	5
2	**சுய பராமரிப்பு**	
	❖ வலியை குறைக்க நான் என் வழிமுறைகளை மாற்ற தேவையில்லை	0
	❖ எந்த வலியாக இருந்தாலும் நான் என் துணி துவைக்கும் முறைகளை மாற்ற மாட்டேன்	1
	❖ துணி துவைத்தல் என்னுடைய வலியை அதிகரிக்கிறது. ஆனால் எனக்கு செய்ய முடியும், என்னுடைய முறைகளில் மாற்றம் இன்றி.	2
	❖ துணி துவைத்தல் என்னுடைய வலியை அதிகரிக்கிறது. அதனால் நான் என்னுடைய வழிமுறைகளை மாற்றுவது நல்லது என்று உணர்கிறேன்.	3
	❖ என்னுடைய வலியின் காரணமாக பிறரின் சிறு உதவியில்லாமல் என் துணிகளை துவைக்க முடியவில்லை	4
	❖ என்னுடைய வலியின் காரணமாக முழுமையாக பிறர் உதவியில்லாமல் என்	5

	துணிகளை துவைக்க முடியவில்லை.	
3.	**தூக்குதல்** ❖ அதிக அளவு எடைகளை என்னால் வலியை அதிகரிக்காமல் தூக்க முடிகிறது. ❖ அதிக அளவு எடைகளை என்னால் தூக்க முடியும் ஆனால் இது அதிக வலியை ஊருவாக்குகிறது. ❖ வலியின் காரணமாக அதிக எடையை என்னால் தரையிலிருந்து தூக்க முடியாது. ஆனால் அந்த எடையை சரியான இடத்தில் வைத்தால் என்னால் தூக்கமுடியும். ❖ வலியின் காரணமாக அதிக எடையை என்னால் தரையிலிருந்து தூக்க முடியாது. ஆனால் அதை சரியான முறையில் வைத்தால் என்னால் பாதி அளவு எடையை தூக்க முடியும். ❖ என்னால் மிக சிறிய அளவு எடைகளை மட்டுமே தூக்க முடியும். ❖ என்னால் எந்த எடையையும் தூக்கவோ அல்லது தூக்கி எடுத்து செல்லவோ முடியாது.	0 1 2 3 4 5
4	**நடத்தல்** ❖ நான் நடக்கும்போது வலிக்காது. ❖ நான் நடக்கும்போது வலியிருக்கும். ஆனால் நான் எனக்கு தேவையான அளவு தூரத்திற்கு நடக்க முடியும். ❖ என்னுடைய வலி நான் அதிக தூரம் நடப்பதை தடுக்கிறது. ❖ என்னுடைய வலி நான் அதிக தூரம் நடப்பதை தடுக்கிறது. ❖ என்னுடைய வலி நான் ஓரளவு தூரம் நடப்பதை தடுக்கிறது. ❖ வலியின் காரணமாக என்னால் நடக்கவே முடியவில்லை.	0 1 2 3 4 5
5	**உட்கார்தல்** ❖ உட்கார்தலால் எனக்கு எந்த வலியும் வருவதில்லை ❖ எனக்கு உட்காருவதற்கு தகுந்த இடம் அமைந்தால் உட்கார்ந்து கொண்டே இருப்பேன். ❖ வலியின் காரணமாக 1 மணி நேரத்திற்கு மேல் என்னால் உட்காரமுடியாது. ❖ வலியின் காரணமாக ½ மணி நேரத்திற்கு மேல்	0 1 2 3

	என்னால் உட்காரமுடியாது. ❖ வலியின் காரணமாக 10 நிமிடத்திற்கு மேல் என்னால் உட்காரமுடியாது. ❖ வலியின் காரணமாக என்னால் உட்காரவே முடியாது.	4 5
6	**நிற்தல்** ❖ வலி வரமால் என்னால் அதிக நேரம் நிற்க முடியாது. ❖ என்னால் அதிக நேரம் நிற்க முடிகிறது. ஆனால் என் வலியின் அளவு நேரம் செல்ல செல்ல அதிகரிக்கிறது. ❖ வலியின் காரணமாக என்னால் 1 மணி நேரத்திற்கு மேல் நிற்க முடியாது. ❖ வலியின் காரணமாக என்னால் ½ மணி நேரத்திற்கு மேல் நிற்க முடியாது. ❖ வலியின் காரணமாக என்னால் 10 நிமிடத்திற்கு மேல் நிற்க முடியாது. ❖ என் வலியின் காரணமாக நிற்பதை தவிர்க்கிறேன்.	0 1 2 3 4 5
7	**தூக்கம்** ❖ நான் படுக்கையில் இருக்கும்போது எனக்கு வலி இருக்காது. ❖ நான் படுக்கையில் இருக்கும்போது எனக்கு வலி வருகிறது. ஆனால் அது நான் தூங்குவதை தடுக்காது. ❖ வலியின் காரணமாக நான் சராசரி தூக்கத்தில் இருந்து ¾ பங்கு தான் தூங்குகிறேன். ❖ வலியின் காரணமாக நான் சராசரி தூக்கத்தில் இருந்து ½ தான் தூங்குகிறேன். ❖ வலியின் காரணமாக நான் சராசரி தூக்கத்தில் இருந்து ¼ தான் தூங்குகிறேன். ❖ என்னுடைய வலி என்னுடைய தூக்கத்தை தடுக்கிறது.	0 1 2 3 4 5
8	**சமுதாய வாழ்வு** ❖ என்னுடைய சமுதயா வாழ்க்கை சரியாக உள்ளது. அது என்னுடைய வலியை உயர்த்தாது. ❖ .என்னுடைய சமுதாய வாழ்க்கை சரியாக உள்ளது. ஆனால் அது என்னுடைய வலியின் அளவை அதிகரிக்கிறது. ❖ என்னுடைய வலியானது நான் கடுமையான வேலைகளை செய்வதை தடுக்கிறது. ❖ வலியின் காரணமாக எனக்கு வெளியில்	0 1 2 3

	அடிக்கடி போவது கஷ்டமாக உள்ளது. ❖ வலியின் காரணமாக என்னடைய சமுதாய வாழ்க்கை வீட்டில் கட்டுப்படுத்தப்பட்டுள்ளது. ❖ வலியின் காரணமாக எனக்கு சிறிதளவு கூட சமுதாய வாழ்வு இல்லை.	4 5
9	**பயணம்** ❖ நான் பயணம் செய்யும்போது எனக்கு வலி அதிகரிக்கிறது. ❖ எனக்கு பயணம் செய்யும் போது சிறிது வலி வரும் ஆனால் சாதாரண பயணம் அந்த வலியை கூட்டாது. ❖ எனக்கு பயணம் செய்யும்போது வலி வரும் ஆனால் அது வேறுவிதமாக பயணத்தை தேடாது. ❖ எனக்கு பயணம் செய்யும்போது வலி வரும். ஆனால் நான் வேறுவிதமான பயணத்தை தேடுவேன். ❖ என்னுடைய வலி எல்லாவிதமான பயணத்தையும் தடுக்கிறது. ஆனால் படுத்து பயணம் செய்வதை தவிர. ❖ என்னுடைய வலி எல்லாவிதமான பயணத்தையும் தவிர்க்கிறது.	0 1 2 3 4 5
10	**தொழில் / வீடு பராமரிப்பு** ❖ என்னுடைய சாதாரண வேலையினால் எனக்கு வலிவராது. ❖ என்னுடைய சாதாரண வேலை என்னுடைய வலியை அதிகரிக்கிறது. ஆனால் என்னுடைய வேலைகளை என்னால் செய்ய முடியும். ❖ என்னால் சாதாரண வீட்டு வேலைகளை செய்ய முடியும். ஆனால் வலியின் காரணமாக உடலை பாதிக்கிற வேலைகளை என்னால் செய்யமுடியாது. ❖ வலியின் காரணமாக எனக்கு சிறிய வேலைகளை மட்டுமே செய்ய முடியும். ❖ வலியின் காரணமாக என்னால் எந்த வேலையும் செய்ய முடியாது. ❖ வலியின் காரணமாக என்னால் எந்த ஒரு சிறு வேலையையும் செய்ய முடியாது.	0 1 2 3 4 5

ANNEXURES-XII

PROCEDURE OF BACK STRENGTHENING EXERCISES

INTRODUCTION:

Good morning everybody. I am the student of St. Xavier's Catholic College of Nursing. Back strengthening exercise can be a really helpful for back pain especially lower back pain. Back pain in postmenopausal women in common so doing exercise is essential.

BENEFITS:

- Improved blood circulation and relief for an aching back.
- These exercises can be done by anyone: children, women, adults and even seniors, who can choose to do those exercises they find comfortable.
- Back strengthening exercise can also help to provide relief from a chronic back pain.
- Longer muscles provide relief from lower back pain and ease away the aches.
- It helps to improve the bone density.
- It mainly strengthens the back muscles.

PROCEDURE OF BACK STRENGTHENING EXERCISE

Exercise1:

Starting position: Lying face downwards, legs extended, head resting on folded arms.

Method : Raise extended legs alternately. Repeat 10 times.

Exercise 2:

Starting position : Lying face downwards, leg extended, head resting on folded arms.

Method : Keeping the feet together, raise both legs simultaneously. Repeat 10 times.

Exercise 3:

Starting position: Lying face downwards, arms stretched beyond the head.

Method : Simultaneously raise one extended arm and the opposite side leg, repeat with the other arm and leg. Repeat 10 times.

Exercise 4:

Starting position: Lying face downwards, legs extended, forehead resting on arms.

Method : Raise the head and chest, all the while keeping arms folded under the forehead. Repeat 10 times.

ANNEXURE XIII

FORMULAS USED FOR DATA ANALYSIS

DESCRIPTIVE STATISTICS

Mean $\overline{x} = \frac{\sum x}{N}$

Standard deviation $s = \sqrt{\frac{\sum(x-\overline{x})^2}{n-1}}$

INFERENTIAL STATISTICS

Independent 't' test $t = |x_1 - x_2| \Big/ \sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}}$

$$s = \sqrt{\frac{(n_1-1){s_1}^2+(n_2-1){s_2}^2}{n_1+n_2-2}}$$

Paired 't' test $t = \overline{d}\sqrt{n} \Big/ s$

$$s = \sqrt{\sum\left(d-\overline{d}\right)^2 \Big/ n-1}$$

Chi-Square test $$x^2 = \sum \frac{(o-e)^2}{e}$$

ANNEXURES-XIV

PHOTOGRAPHS