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Effectiveness of exercise therapy to improve strength of abdominal muscles on middle aged women who effect of lumbar hyper lordosis

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Abstract

The purpose of this study was to assess the effect of exercise therapy for improvement of abdominal muscles strength. The data were considered in relation to recommended levels of exercise therapy can be effective helping to improve abdominal muscle's strength in middle aged women who had hyper lordosis deformity. 20 middle aged women. 10 were experimental group (affected by hyper lordosis deformity with lower back pain) and 10 were control group (affected by hyper lordosis with lower back pain). The sample was collected through non-random sampling method. To assess the strength of the abdominal muscles, two tests were used to evaluate the subjects before (pretest) the beginning of the program, the first and the last of each month (posttest). The push up test is used as a general test of strength. The results of the study revealed that most of the middle age women were found under excellent category in abdominal muscular strength. William exercises therapy had positive effect on Abdominal muscular strength of middle aged women from pretest to post test after three month. Dissimilarity in abdominal muscular strength among middle aged women of experimental and control group was observed after implication of three month William exercises therapy.

Keywords: William exercises, hyper lordosis, lower back pain. Muscular strength

1. Introduction

The normal spine is structurally balanced for best flexibility and support of the body's weight. once viewed from the side. It has three curves. The traditional body part spinal curvature is between forty to seventy degrees with an apex placed at the L3-4 interspace these curves add harmony to stay the body's center of gravity aligned over the hips and pelvis. Spinal deformity within which the lower back curves to a fault inward, often referred to as hyperlordosis.

In the scenario of body part spinal curvature muscles of the erectors of spine and hip flexors are become short and stiff abdominal muscles musculus Abdominus, Internal oblique and External oblique) and hip extensors are become weak or stretches. The muscular imbalance leads to knocking down the pelvis within the front of the body, making the lordotic within the spine. For treatment of hyperlordosis, the patient will enroll in an exceedingly therapy program wherever exercises will be done, beneath the steering of a healer, so as to strengthen the muscles and to extend the vary of motion. Doing exercises to boost posture are typically the primary intervention.

Williams flexion exercises additionally referred to as Williams body part flexion exercises, or just Williams exercises are a group or system of connected physical exercises meant to reinforce body part flexion, avoid body part extension, and strengthen the abdominal and striated muscles. The goals of doing these exercises is providing lower trunk stability by actively developing the gluteus maximums, hamstring and abdominal, muscles. Moreover as the exercises outlined will accomplish a correct balance between the skeletal muscle and therefore the skeletal muscle group of bodily properly muscles.

Hosseinfar *et al.* (2017) [5] ended that each body part stabilization and routine therapy cause decreasing in pain, disability, and alter body part spinal curvature in patients with chronic LBP. Gordon and Bloxham (2016) [4] reviewed that a general exercise programme that mixes muscular strength, flexibility and aerobic fitness is useful for rehabilitation of non-specific chronic low back pain. Increasing core muscular strength will assist in supporting the body

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part spine. up the flexibility of the muscle-tendons and ligaments within the back will increase the vary of motion and assists with the patient's practical movement. cardiopulmonary exercise will increase the blood flow and nutrients to the soft tissues within the back, up the healing method and reducing stiffness that may end in back pain. Levine, horny Walker and Larry (1997) [6] unconcealed that dominant for pre-test scores, post-test mean muscle strength within the experimental cluster was found to be considerably bigger than within the management cluster. However, there have been no variations in mean post-test girdle tilt or body part spinal curvature between the teams. Karimi and Rahnama, (2016) [7] ended that hydrophathy exercises in conjunction with onto land exercisescan improve body part spinal curvature and pain in patients with sciatic pain. Therefore, it will be suggested as a modality for these patients. It will be ended that combined exercises will scale back spinal curvature abnormalities and scale back the pains ensuing from abnormalities like sciatic back pain investigated during this study. Combined exercises in water andland will be used as complementary exercises to cut back the fatigue caused by style of exercise and its monotony, andincrease exercise effectiveness in keeping with quantity of pain.

Some researchers have examined the connection between back pain and changes within the angle of the body part spine (Berlemann, *et al.*, 1999 and Lin, Jou, and Yu, 1992) [14, 15]. increased spinal curvature has been advocated because the major reason behind bodily property pain.

radiculopathy, and side pain (Lin, Jou, and Yu, 1992 and Cailliet, 1995) [15]. Excessive spinal curvature results in increase compression of the enation joint and increase anterior shear force at the lumbosacral junction (Berlemann, *et al.*, 1999 and Neumann, 2009) [14, 17].

Similarly, Heino, Godges, and Carter (1990) [18] examined the connection between hip extension vary of motion, standing girdle tilt, depth of body part spinal curvature, and abdominal force. They found that there's a weak relationship between variables. No relationship was found among clinical variables unremarkably determined by physical therapists throughout a standing bodily property analysis of the lumbopelvic advanced (Heino, Godges, and Carter, 1990) [18]. González-Gálvez, Gea-García, and Marcos-Pardo (2019) [8] urged that strengthening instead of stretching can be a lot of relevant for spinal curvature and each qualities square measure necessary for spinal curvature. it's necessary to conduct a lot of irregular controlled trials to assess the results of strengthening and/or stretching program on spinal curvature and unfit angle and to

determine the kind of the exercise that's higher for maintaining the mesial disposition among traditional ranges.

Low back pain (LBP) has been connected with measurement, postural, muscular, and quality characteristics (Kim, 2006) [1]. body part spinal curvature may be a key feature in maintaining mesial balance (Been and Kalichman (2014) [2]. it's one in all the foremost necessary components of the spinal pillar that includes a special importance thanks to the distinctive position and having an instantaneous contact the pelvis (Fatemi, *et al.*, 2015) [3]. Mesial balance or "neutral upright mesial spinal alignment" may be a bodily property goal of surgical, technology and therapy intervention (Been and Kalichman (2014) [2].

The body part spinal curvature serves to supply strength against the compressive forces of gravity (Morningstar, 2003; Swärd, Eriksson and Peterson, 1990) [10]. a traditional body part spinal curvature protects the posterior spinal ligament system from excess strain (Cyriax, 1978) [11]. and acts as a damper throughout abrupt applied vertical forces (Hultman, Saraste, and Ohlsen, 1992) [13]. Gracovetsky (1986) [12] has illustrated that due to body part curve, a person's will raise regarding three times his weight. Therefore, it's obvious, the role of body part curve in biomechanics, and performance of human.

Importance of this article is knowing about human back and lumbar spine. This article answer to important questions such as what is lordosis deformity? How lordosis deformity is happening? What is exercise therapy and William exercises? How William exercises effect on body strength in lordosis deformity.

The aim of the present study was to assess the effectiveness of exercise therapy to improvement of body strength on lumbar hyper lordosis. William exercise has been shown positively influence of improve body strength.

2. Methodology

2.1 Selection of Subjects

A total of twenty middle aged women employed in the Isfahan Refinery oil industry, were selected as the subject for the present investigation.. These middle aged women were found affected by hyper lordosis. These selected subjects were divided into experimental group (N=10) and control group (N=10) for the purpose of study.

The subjects with hyper lordosis were identified in the clinic under the supervision of the physician. Subjects with Hyper lordosis were all with back muscular pain, that had previously also been diagnosed by a doctor.

Table 1: Training Programme

Exercise	Type of exercise	Time allocated	Repetition	Recovery between Exercise
Exercise no.1 Posterior pelvic tilt	Strength exercise	40 second	Depend on ability	2 and half minutes
Exercise no.2 Single knee to chest stretch	Strength exercise	40 second	Depend on ability	2 and half minutes
Exercise no.3 double knee to chest	Strength exercise	40 second	Depend on ability	2 and half minutes
Exercise no.4 standing lumbar flexion	Endurance exercise	40 second	Depend on ability	2 and half minutes
Exercise no.5 partial sit-up	Endurance exercise	40 second	Depend on ability	2 and half minutes
Exercise no.6 Partial diagonal sit-up	Endurance exercise	40 second	Depend on ability	2 and half minutes

Table 2: Frequency, Density and Intensity of exercises

Time allocated	In first month six exercises the time which allocated is 40 sec and the time for one day is about an hour and twenty minutes.
	In second month of six exercises the time which allocated is 40 sec and the time for one day is about an hour and twenty minutes.
	In third month of six exercises the time which allocated is 40 sec and the time for one day is about an hour and twenty minutes.
	six exercises of the first month include one set

Organization based on sets(for three times a week)	Six exercises of the second month include one set
	Six exercises of the third month include one set
Intensity	The intensity of the first month during one months is the 40%
	The intensity of the second month during one months is the 70%
	The intensity of the third month during one months is the 100%

2.2 Instrumentation

Purpose: the push up test is used as a general test of strength and endurance. **Procedure:** Measures abdominal muscular strength and endurance of the abdominals and hip-flexors, important in back support and core stability. Determining muscle endurance and upper strength. **Equipment required:** Depending on which protocol you use, you will need a floor mat, metronome (or audio tape, clapping, drums), stopwatch, wall, chair. **Procedure:** A standard push up begins with the hands and toes touching the floor, the body and legs in a straight line, feet slightly apart, the arms at shoulder width apart, extended and at a right angle to the body. Keeping the back and knees straight, the subject lowers the body to a predetermined point, to touch some other object, or until there is a 90-degree angle at the elbows, hold the same position whatever you can. Time allocated is maximum 40 second. Three repetitions will be performed. Best trial will be counted. **Scoring:** Timed Test: A common version of the push up test is to measure the maximum number of push up in a set time, such as one or two minutes.

2.3 Statistical Analysis

To assess the effectiveness of exercise therapy on abdominal muscular strength of middle aged women suffering from back muscular pain (lumbar hyper lordosis), mean, standard deviation and repeated measure ANOVA were computed with the help of SPSS 16.0. The level of significant was set at .05 level of confidence.

3. Results

To examine the effectiveness of exercise therapy on abdominal muscular strength of middle aged women among experimental and control groups, Mean, SD and ANOVA were calculated and data pertaining to this has been presented in Table 3 to 4.

Table 3: Descriptive Statistics of abdominal muscular strength during pre, 1- month, 2- months and 3 -Months duration of experimental and control group

Group	Duration								Change
	Pre test		One month		2 months		3 months		
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	
Experimental (N=10)	5.50	1.84	15.90	2.60	21.70	3.30	28.40	3.50	22.90
Control (N=10)	4.90	2.02	14.70	3.33	21.70	3.53	30.08	3.58	25.18
Total (N=20)	5.20	1.91	15.30	2.98	21.70	3.33	29.60	3.66	24.40

Table 1 reveals that experimental group had a gain of 22.90 degrees change from pretest to 3 months (pre 5.50; post 28.40) in abdominal muscular strength. In case of control group which had gained 25.18 degrees change from pretest to 3 month (pre 4.90; post 30.08) in case of abdominal muscular strength. Irrespective of the groups on the whole, an increase of 24.40 degree change from pre to 3 months observed (pre 5.20; 3 months 29.60)

Table 4: Repeated measure Anova on abdominal muscular strength during pre, one month, 2 months and 3 months duration

Source of Variance	Sum of Squares	df	Mean Square	F-ratio
Change	6387.40	3	2129.13	724.24
Change * Group	37.35	3	12.45	4.24
Error(Change)	158.75	54	2.94	

Significant at .05 level, $F_{(3, 54)} = 2.79$

Table 2 reveals that there was highly significant increase in mean degree values ($F=724.24$; $p=.001$) in case of abdominal muscular strength. However, when group wise comparison was made, again repeated measure ANOVA revealed a significant difference between the experimental and control groups ($F=4.24$; $p=.001$).

4. Discussion

Experimental group had gained of high degrees change from pretest to 3 months in abdominal muscular strength. In case of control group which had also gained high degrees change from pretest to 3 month. In case of abdominal muscular strength.. Irrespective of the groups on the whole, an increase of degrees change was observed from pre to 3 months in the abdominal muscular strength of middle aged women. It means, the significant change in mean degree values was observed between experimental group and control group in abdominal muscular strength among middle aged women after applying the William exercise therapy. It showed the improvement in back pain symptoms. When the repeated measure ANOVA was applied, significant difference existed among middle aged women of experimental and control groups in their abdominal muscular strength from pretest to three month William exercises. There was highly significant increase in mean degree values of abdominal muscular strength. However, when group wise comparison was made, again repeated measure ANOVA revealed a significant difference between the experimental and control groups.

5. Conclusions

1. Most of the middle age women were found under excellent category of Abdominal muscular strength.
2. William exercises therapy had positive effect on Abdominal muscular strength of middle aged women from pretest to post test after three month.
3. Dissimilarity in abdominal muscular strength among middle aged women of experimental and control group was observed after implication of three month William exercises therapy.
4. Middle aged women had significant difference in their abdominal muscles strength between the experimental and control groups of middle aged women
5. Irrespective of the groups of middle aged women on the whole had a gain of change from pretest to third months in abdominal muscular strength.

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