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Effect of hula hoop on core muscle strength

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Abstract

Objective: To study the effect of hula hoop on the strength of core muscle groups in normal individual

Design: Experimental study

Setting: Department of musculoskeletal department, Dr. APJ Abdul Kalam College of Physiotherapy, Pravara Institute of Medical Sciences, Loni,

Method: By convenient sampling method 30 females (age-20-25) were selected and a six week trial with weighed hula hoop was done. Where they first started with 2 min of hooping progressing to 15 minutes with breaks by six weeks they were assessed pre and post by kraus weber test and waist circumference and hip circumference.

Result: This experimental study of six weeks gave a result that hula hoop has effect on lower abdominals, psoas major, back extensors and also helps in decreasing the waist and hip circumference by up to 2 inches in a fun filled way.

Conclusion: The study concludes that with use of hula hoop there is increase in core muscle strength of upper and lower abdominals and back extensors and also helps in decreasing waist circumference and hip circumference.

Keywords: Hula hoop, core muscles, kraus weber, waist circumference and hip circumference

1. Introduction

Core is “a central distinct from the enveloping part by a difference in nature” as defined by Merriam Webster [1].

A box with the abdominal in front, para spinals and gluteal in the back, the diaphragm as the roof, and the pelvic floor and hip girdle musculature as the bottom has been described as a “core”. It has been further divided into inner and outer unit. For good core strength, it must work as a unit to stabilize the body and spine [2] Trunk is a kinetic chain which connects all the parts of body together as a whole. Any problem or weakness to any one part can cause pain or injury to the other part. Anatomically, the core is an integrated functional unit of lumbo-pelvic-hip complex and the thoracic and cervical spine. It is a muscular corset that gives integrity and support to the body unit [3]

The inner unit provides the joint stabilization to the spine. If the inner unit doesn't give proper support to the spine, pelvis, and joint then these structures are placed under undue stress which leads to many injuries. Basically, inner unit consist of transverses abdominus, multifidus, pelvic floor and diaphragm. Transversus abdominus (TA) is the most deepest and innermost layer of all abdominal muscle. It can be considered as the body's personal weight belt as when the TA contracts it causes hoop tension around the midsection like corset. TA will, contract before extremities will move, if working properly, according to Diana Lee. The abdominal wall is supported by the transversus abdominis has an important role in maintenance of posture, allows trunk movement (flexion, extension, lateral flexion) and is responsible for raising intra-abdominal pressure. Multifidus lies deep in the spine which provides joint stabilization at each segmental level. Each vertebrae needs stiffness and stability to work effectively to reduce degeneration of joint structures. Pelvic floor muscles are important for the pelvic floor and the inner unit to work properly. By doing simple yet important exercise we can tighten and tone the muscle groups, prevent or diminish incontinence and pelvic dysfunction [3]. Diaphragm plus each of these three muscles, is the target of inner unit conditioning. The walls of cylinder are formed by transversus abdominis

while the base and lid are formed by the pelvic floor and diaphragm respectively [3]. The outer unit musculature system aids in movement and function. Next, the prime movers of the core muscle i.e. the outer unit muscle and extremities such as the internal oblique, external oblique, rectus abdominus, back, legs, shoulder girdle etc. consist of exercises that allow multi-joint-plane activities. The Rectus Abdominal, the most superficial muscle group of the core, area helps to flex the spine. The Rectus Abdominus works with all of the other core muscles to stabilize the pelvis when walking. The location of the internal and external oblique is on the core area. When the oblique are activated only on one side of the body they work to rotate the trunk and laterally flex the body. When they contract on both sides simultaneously, they function in flexing the vertebral column and compressing the abdominal wall [4]. When the inner and outer unit works together as a cohesive unit it improves daily living by reducing the risks of joint injuries, ligamentous and muscular strain and low back pain [5]

The benefits of good core muscle strength is it improves posture, balance and peripheral mobility, increases endurance, strength and patients have less chance of injury. Core strength also helps in decreasing or prevention of low back pain, it enhances performance, and increases flexibility [1].

The importance of core muscle strengthening are it provides strong basis for all human movement, if the core is strong and stable, all other movement are more efficient and more effective, poor core stability means that power is wasted [1]

Hooping is cardio without counting. Hooping improves core strength, tones your stomach, arms, thighs and hips. It is a low-impact, high-energy workout that can burn upto 400-600 calories in an hour. It is beneficial as a practice body, healing energy, back pain relief, mental benefits, bone health, joint flexing and mood enhancing [6]

Therefore this study is conducted to evaluate the effect of hula hoop on the strength of core muscle groups in normal individual.

2. Methodology

Materials- Hula hoop, measuring tape, bed, pillow, book, pen, timer, consent form

Method-30 Participants fulfilling the inclusion(Healthy females, the age of 20-25,one week of pre training prior to use the hula hoop) and exclusion (Professional hula-hoop

player, Low back pain, Participants with ankle sprain, Athletes, Participants with abdominal pain Participants who underwent surgery) criteria are selected for this study. Every participant will be given instruction on how to perform the activity and then consent form is filled. The participants are then pre assessed with Krauss Weber test and waist circumference and hip circumference. In this study 30 participants will perform hula hooping for 5 days per week for a period of six weeks. The training programs will start with 2 minutes in first week, progressing to 6 minutes; then 14 minutes in second week and 15 minutes from third week to sixth week [7]. In the last 3 weeks the session will be for 30 min which will be divided into 5 minutes of hula hooping followed by break of 5 minutes. Then the patient will again be assessed with Krauss weber test and then data analysis will be done to check its effect. The hula hoop used is 1.250 kg.

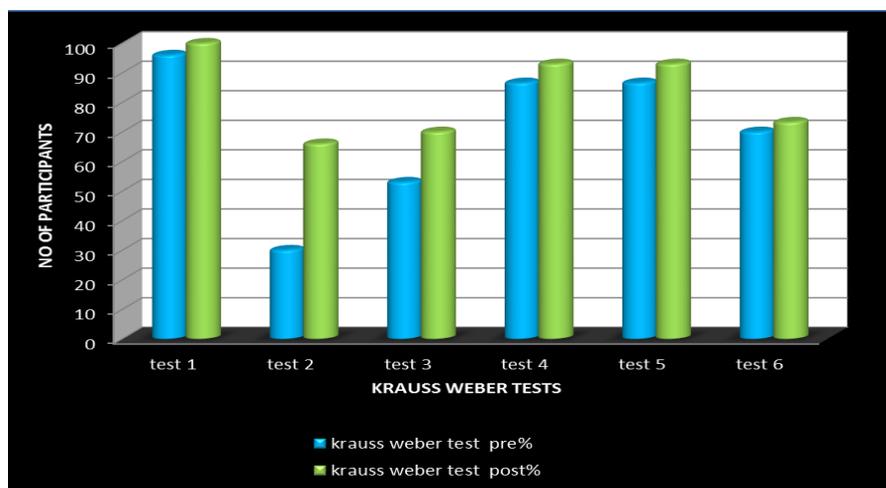


Fig 1: Subject practicing Hula Hoop

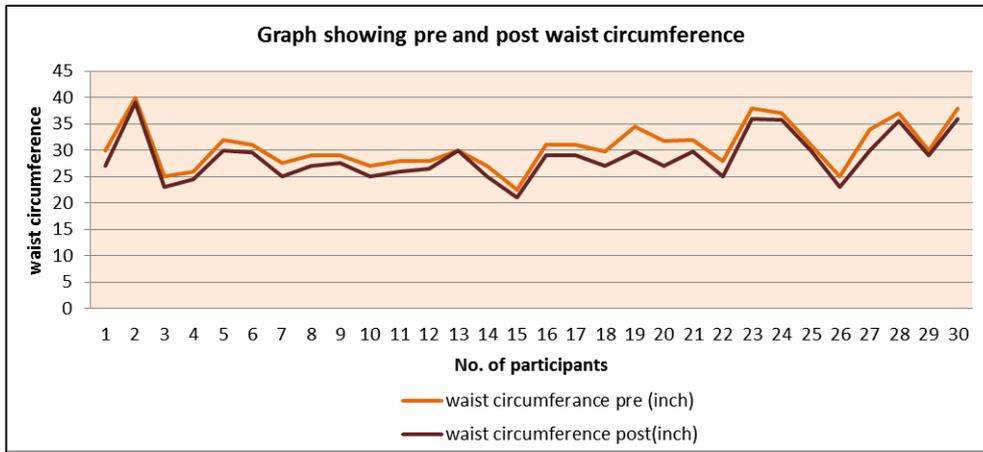
Krauss-Weber is used as the measurement unit to check the core muscle strength. The Kraus-Weber test is composed of five strength items and one flexibility item (Kraus & Hirschland, 1953). A failure of the total test if there is failure of any one of the six items [8].

Waist-to-Hip circumference is another method used. Waist Circumference is measured at the narrowest point below the ribs or halfway between the lowest ribs and the iliac crests. Whereas hip circumferences is measured at the level of the anterior superior iliac spine, where this could be felt, otherwise at the broadest circumference below the waist [9]

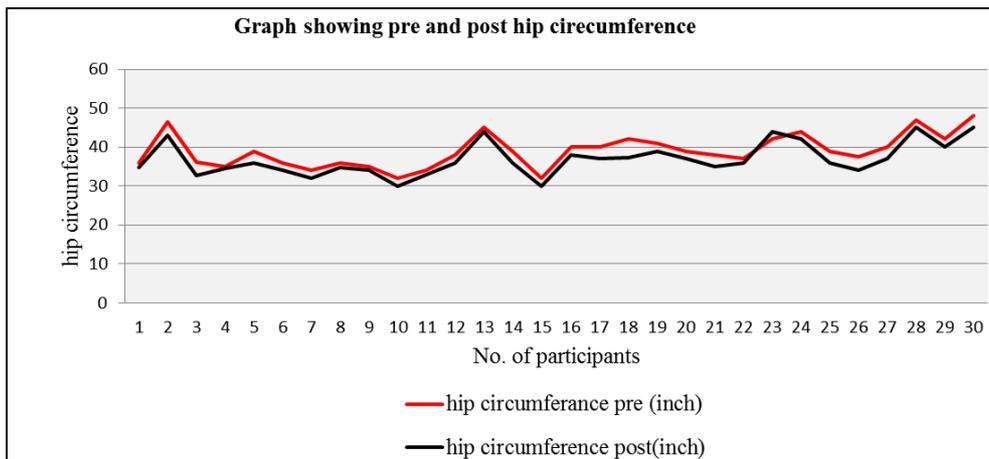
2.1 Data analysis and results



Graph 1: Represents Pre Percentage and Post Percentage Interpretation by Krauss Weber Test



Graph 2: Represents pre and post interpretation of waist circumference



Graph 3: Represents pre and post interpretation of hip circumference

3. Result

A total of 30 samples were taken out of which 30% showed improvement in lower abdominals and up to 2 inches of waist and hip circumference decreased.

There was only 4% (i.e. from 96% to 100%) increase seen in upper abdominals and psoas major. Similarly flexibility test by hamstring testing in test 6 showed rise from 70% to 73.3% samples.

But a significant change is observed on upper abdominals without use of psoas major. Here prior to hula hoop only 30% of the participants were able to do but post-trial of six weeks up to 66.6% of the participants could perform this test.

Now in test 3 where the strength of lower abdominal muscles along with psoas major muscle is checked. Here also pre-test result showed 56% of participants were able to perform the test and post-trial 70% could do it without difficulty.

For upper back muscles and lower back muscle initially 86% of the subjects could perform but after working out for six weeks the percentage increased to up to 93%. Proving that hula hoop also has significant effect on back extensor muscles.

The waist circumference and hip circumference also showed improvement as on an average up to 2 inches decrease was seen in the subjects after the trial.

Hence this experimental trial of six weeks gave a result that hula hoop has effect on lower abdominals, psoas major, back extensors and also helps in decreasing the waist and hip circumference in a fun filled way.

4. Discussion

The 3 elements of muscle performance –strength, power and endurance –can be enhanced by some form of resistance exercise. Muscle strength is a broad term referring to the ability of contractile tissue to produce tension and a resultant force based on the demand placed on the muscle. The use of resistance exercises help in improving and maintaining the level of fitness enhance performance and also reduce the risk of injury ^[10]

All the core muscles, need to constantly and synergistically contract and release to maintain the motion of the hula hoop. Also, hula hoop abdominal training is similar to a plank in which it is not a hypertrophy (muscle building) exercise as much as it is a muscular endurance exercise. The focus on both of these exercises is to isometrically contract these core muscles while maintaining proper practice for as long as possible ^[11]

Spinning a hula hoop enhances the core muscles, including gluteus, thighs, abs and lower back muscles that help in supporting and stabilizing your posture. The rhythmic movement, all over workout is a low impact way to balance muscle tone throughout the core. The push pull mechanism keeps the hoop up, thus stretching the muscles and introduces movement to spine that helps bring nutrients to the intervertebral discs ^[12]

In this study as the weighed hula hoop swirl around the waist, close kinematic movement occurs over the spine, pelvic, hip and back extensor muscle groups. There is a continuous resistance provided over these muscles by the

weighed hula hoop which causes co-contraction of the abdominals and back extensors thus strengthening them.

When the hula hoop moves around the waist there is concentric contraction of the core muscles and eccentric contraction of back extensors and vice versa. Isometric contractions are observed over the hamstrings to hold the ring over the waist and prevent it from dropping.

However, this study showed that there was a significant difference seen lower abdominal muscle strength and back extensors.

The waist circumference and hip circumference also showed improvement as on an average up to 2 inches decrease was seen in the subjects after the trial.

5. Conclusion

The study concludes that weighed hula hoop increases the strength of core muscle especially the lower abdominals and back extensors and also benefits in decreasing waist and hip circumference.

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