IMPACT OF SWISS BALL AND THERABAND EXERCISE WITH PRANAYAMA PRACTICES ON CORE STRENGTH AMONG MIDDLE AGED WOMEN.

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ABSTRACT

The purpose of the study was to find out the impact of swiss ball and theraband exercise with pranayama practices on core strength among the middle-aged women such as abdominal strength and lower back strength. To achieve this purpose of the study, forty-five middle aged women from Kakching, Manipur were selected as subjects at random. The subjects aged was ranged from 40 to 55 years. The selected subjects were divided into three groups of fifteen subjects each, such as swissball with pranayama (group I), theraband exercise with pranayama (group II) and group III acted as control. Training for the subject were five days per week of twelve weeks. Control group was not exposed to any specific training but they were participated in regular activities. The core strength was assessed by abdominal strength and lower back strength were selected as variables. The pre and post - tests data were collected on selected criterion variables prior to and immediately after the training program. The pre and post-test scores were statistically examined by the dependent 't' test and analysis of co-variance (ANCOVA). The level of significant was fixed at 0.05 level. It was concluded that the swiss ball training group had shown significantly improved in abdominal strength and lower back strength. However, the control group had not shown any significant improvement on abdominal strength and lower back strength.

Keywords: *Core strength, Pranayama, Swissball, Theraband exercise, , abdominal strength and lower back strength.*

INTRODUCTION

Core strength is the provision of muscular control around the lumbar spine to maintain functional stability. The abdominal and core regions are very important in terms of overall body stabilization and sport performance due to the ability to generate or transmit power between the upper and lower extremities. Recently, core training has received a great deal of attention and has become an essential part of training programs. Strengthening core involves more than just one exercise – it involves a variety of movements designed to strengthen the entire mid-section of the body, so that it can twist, flex, extended, and bend as needed, with adequate force, and without pain.

Pranayama is the regulation of the breath through certain techniques and exercises. Pranayama means control and regulation of breath. "Prana" is a Sanskrit word, which means "Vital Force". It also signifies "life" of breath. Äyana, means the control of the pran so pranayama means the control of the vital force (Prana) by concentration and regulated breathing.

Swiss ball develops abdominal muscles, stabilizes lower back as well as improving posture. There are many different names for the swiss ball namely, exercise ball, gym ball, fitness ball, stability ball, gymnastic ball, yoga ball, body ball, physio ball.

Theraband also known as resistance bands are simply latex tubes or bands that are used for low impact strength training exercises and physical therapy. It is a resistance band that can be an excellent

tool for people who want to train at home, travel, stretch, rehabilitate or for those just want to add variety to their exercise program. It comes in different resistance levels that are determined by the color and thickness of the band. They provide resistance during strength exercises, assistance during flexibility exercises and in some cases can assist in stability.

METHODOLOGY

The purpose of the study was to find out the impact of swiss ball and theraband exercise with pranayama practices on selected core strength among the middle-aged women such as abdominal strength and lower back strength. To achieve this purpose of the study, forty-five middle aged women from Kakching, Manipur were selected as subjects at random. The subjects age was ranged from 40 to 55 years. The selected subjects were divided into three groups of fifteen subjects each, such as swiss ball with pranayama (group I), theraband exercise with pranayama (group II) and control group (group III). Group I and Group II underwent training for five days per week of twelve weeks. Group III acted as a control in which they did not undergo any special training program. All the subjects of three groups were tested on selected core strength parameters such as abdominal strength and lower back strength at prior to and immediately after the training programmed by using sit up and reverse plank test. The analysis of covariance (ANCOVA) was used to analysis the significant difference, if any in between the groups. The level of significant to test the "F" ratio obtained by the analysis of covariance was tested at 0.5 level of confidence, which was considered as an appropriate.

Training Program

During the period of training, the experimental groups underwent five days per week of twelve weeks. The duration of training was planned for 60 minutes that is 6:00a.m to 7:00 a.m. in the morning session. The experimental groups trained at the same time of the day in the morning session, five days a week throughout the study. Experimental group-I performed swiss ball with pranayama practice, experimental group-II performed theraband exercise with pranayama practice and group-III acted as control. To determine the training load, the subjects were assessed for their exercise heart rate in response to various work outs, proposed repetition and set. After completion of twelve weeks of training, the participants were retested.

Swiss ball with pranayama

Experimental group-I performed as swiss ball with pranayama practice five days per week for twelve weeks. The swiss ball training practice consisting of inclined plank, crossover crunch, triceps dip, hip extension and pelvic tilt.

Theraband exercise with pranayama

Experimental group-II performed as theraband exercise with pranayama practice five days per week for twelve weeks. The theraband exercise training practice consisting of front squat, chest press, kneeling crunch, overhead shoulder press and abdominal crunch.

Experimental design and Statistical technique

Pre and post- test random group design was used as experimental design. A paired "T" test was used to determine differences within the group from pre- test to post- test. The collected data were analyzed statistically through analyze of covariance (ANCOVA) to find out the significance difference. However, the Scheffe's post hoc test used to determine paired mean differences, if any, whenever the obtained 'F' ratio value was found to be significant for adjusted post- test means. In all cases, the level of confidence was fixed at 0.05 for significance.

ANALYSIS OF THE DATA

Analysis of Abdominal Strength

The descriptive analysis of the data showing mean and standard deviation, mean difference, "t" ratio and percentage of change on abdominal strength of swissball with pranayama, theraband exercise with pranayama and control group are presented in table – A(I).

Table- A(I)

Descriptive Analysis of the Data on Abdominal Strength of Experimental and Control Groups.

Training Group	Test	Mean	Standard Deviation	Mean Difference	Percentage of change	"t" ratio
Swissball with Pranayama	**Pre**	10.73	1.09	2.87	26.74	31.53
	Post	13.60	1.29			
Theraband with Pranayama	**Pre**	10.53	0.99	2.27	21.55	14.78
	Post	12.80	1.08			
Control Group	**Pre**	10.67	1.17	0.13	1.21	1.47
	Post	10.80	1.01			

Table t-ratio at 0.05 level of confidence for 14 (df) = 2.15

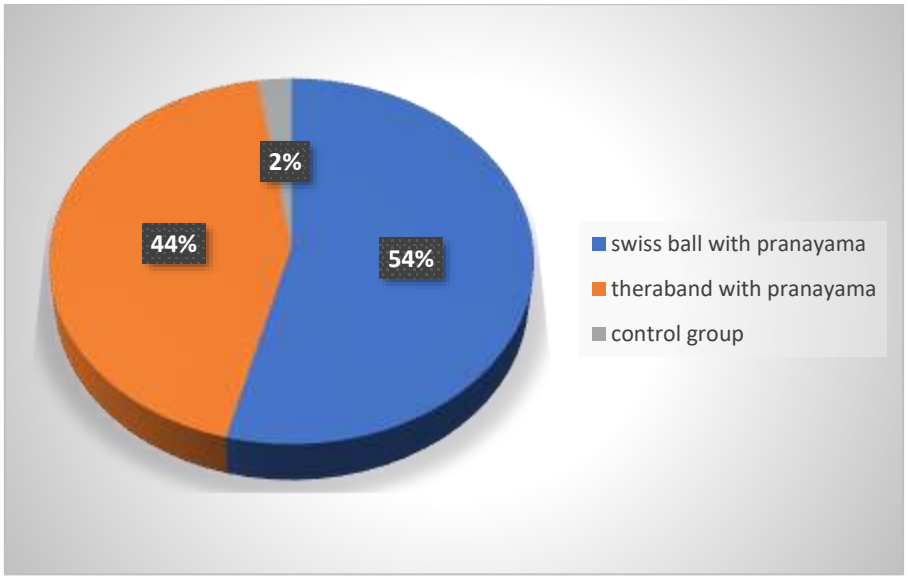
Table- A(I) shows that the mean, standard deviation, and mean difference values of the pre and post test data collected from the experimental and control groups on abdominal strength. Further, the collected data was statistically analyzed by paired "t" test to find out the significant differences if any between the pre and post data. The obtained "t" values of swissball with pranayama, theraband exercise with pranayama are 31.53 and 14.78 respectively which are greater than the required table value of 2.15 for significance at 0.05 level for 14 degrees of freedom. It revealed that significant differences exist between the pre and post-test means of experimental groups on abdominal strength.

The result of the study also produced 26.74% of changes in abdominal strength due to swissball exercise, 21.55% of changes in abdominal strength due to theraband exercise and 1.21% of changes in control group.

The percentage of changes on abdominal strength of experimental and control groups is graphically represented in figure (I).

Figure (I)

Pie Diagram Showing the Percentage of Changes on Abdominal Strength of Experimental and Control Groups.



The pre and post test data collected from the experimental and control groups on abdominal strength was statistically analysed by using analysis of covariance and the results are presented in table A(II).

Table – A(II)

Analysis of Covariance of The Data on Abdominal Strength of Adjusted Post Mean Test Scores of Experimental and Control Groups.

	Swissball With Pranayama	Theraband Exercise with Pranayama	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained "F" ratio
Adjusted Post Mean	13.51	12.90	10.77	BG	61.91	2	30.95	152.56*
				WG	8.32	41	0.20	

*Significant at .05 level of confidence.

(The table value required for significance with degrees of freedom 2&41 is 3.23)

The adjusted post-test means on abdominal strength of swissball exercise, theraband exercise and control groups are 13.51, 12.90 and 10.77 respectively. The obtained "F" value of 152.56 on abdominal strength was greater than the required table value of 3.23 of 2, 41 df at 0.05 level of confidence. It reveals that significant differences exist between the adjusted post -test means of experimental and control groups on abdominal strength.

Since, the obtained "F" value in the adjusted post- test means is found to be significant, the Scheffe's test is applied as in table- A(III).

Table -A(III)

Scheffe's Post Hoc Test for the differences among Paired Means of Experimental and Control Groups on Abdominal Strength.

Swissball exercise with Pranayama	Theraband exercise with Pranayama	Control Group	Mean Difference	Confidence Interval
13.51	12.90		0.61*	0.35
13.51		10.77	2.74*	
	12.90	10.77	2.13*	

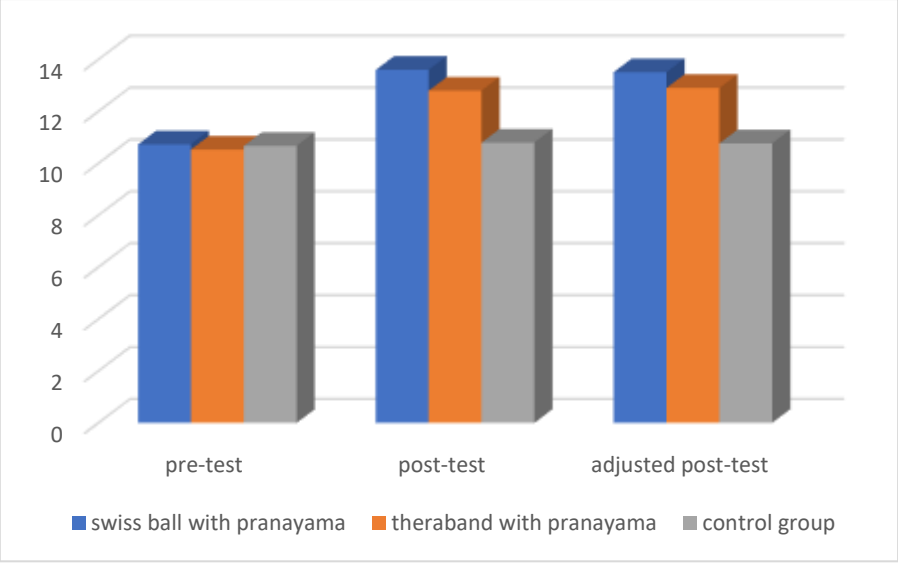
*Significant at 0.05 level

As shown in table -A(III) the Scheffe's post hoc analysis proved that significant mean differences existed between swissball exercise and theraband exercise groups, swissball exercise and control groups and theraband exercise and control groups on abdominal strength. Since, the mean differences 0.61, 2.74 and 2.13 are higher than the confidence interval value (0.35).

Hence, it was concluded that due to the impact of swissball and theraband exercise with pranayama practice on abdominal strength of the subjects was significant improved. However, swissball with pranayama practice were better than theraband exercise with pranayama practices.

Figure (II)

Bar diagram Showing the Mean Values on Abdominal Strength of Experimental and Control Groups.



Analysis of Lower Back Strength

The descriptive analysis of the data showing mean and standard deviation, mean difference, "t" ratio and percentage of change on lower back strength of swissball with pranayama, theraband exercise with pranayama and control group are presented in table – B(I).

Table -B(I)

Descriptive Analysis of the Data on Lower Back Strength of Experimental and Control Groups.

Training Group	Test	Mean	Standard Deviation	Mean Difference	Percentage of change	"t" ratio
Swissball with Pranayama	**Pre**	36.80	4.85	3.40	9.24	17.87
	Post	40.20	4.71			
Theraband with Pranayama	**Pre**	36.46	5.15	2.87	7.87	21.50
	Post	39.33	5.08			
Control Group	**Pre**	34.60	3.54	0.20	0.57	1.87
	Post	34.80	3.36			

Table t-ratio at 0.05 level of confidence for 14 (df) = 2.15

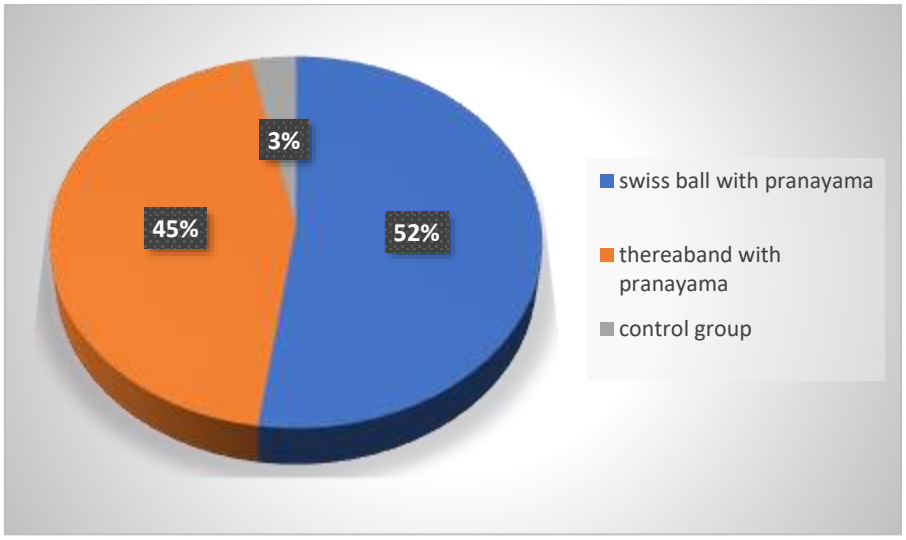
Table- B(I) shows that the mean, standard deviation, and mean difference values of the pre and post test data collected from the experimental and control groups on lower back strength. Further, the collected data was statistically analyzed by paired "t" test to find out the significant differences if any between the pre and post data. The obtained "t" values of swissball with pranayama, theraband exercise with pranayama are 17.87 and 21.50 respectively which are greater than the required table value of 2.15 for significance at 0.05 level for 14 degrees of freedom. It revealed that significant differences exist between the pre and post-test means of experimental groups on lower back strength.

The result of the study also produced 9.24% of changes in lower back strength due to swissball exercise, 7.78% of changes in lower back strength due to theraband exercise and 0.57% of changes in control group.

The percentage of changes on lower back strength of experimental and control groups is graphically represented in figure (III).

Figure (III)

Pie Diagram Showing the Percentage of Changes on Lower Back Strength of Experimental and Control Groups.



The pre and post test data collected from the experimental and control groups on lower back strength was statistically analysed by using analysis of covariance and the results are presented in table B(II).

Table – B(II)

Analysis of Covariance of the Data on Lower Back Strength of Adjusted Post Mean Test Scores of Experimental and Control Groups.

	Swissball With Pranayama	Theraband Exercise with Pranayama	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained "F" ratio
Adjusted Post Mean	39.38	38.84	36.10	BG	88.25	2	44.12	142.88*
				WG	12.66	41	0.31	

Significant at .05 level of confidence.

(The table value required for significance with degrees of freedom 2&41 is 3.23)

The adjusted post-test means on lower back strength of swissball exercise, theraband exercise and control groups are 39.38, 38.84 and 36.10 respectively. The obtained "F" value of 142.88 on lower back strength was greater than the required table value of 3.23 of 2, 41 df at 0.05 level of confidence. It reveals that significant differences exist between the adjusted post -test means of experimental and control groups on lower back strength.

Since, the obtained "F" value in the adjusted post- test means is found to be significant, the Scheffe's test is applied as in table- B(III).

Table -B(III)

Scheffe's Post Hoc Test for the differences among Paired Means of Experimental and Control Groups on Lower Back Strength.

Swissball exercise with Pranayama	Theraband exercise with Pranayama	Control Group	Mean Difference	Confidence Interval
39.38	38.84		0.54*	0.51
39.38		36.10	3.28*	
	38.84	36.10	2.74*	

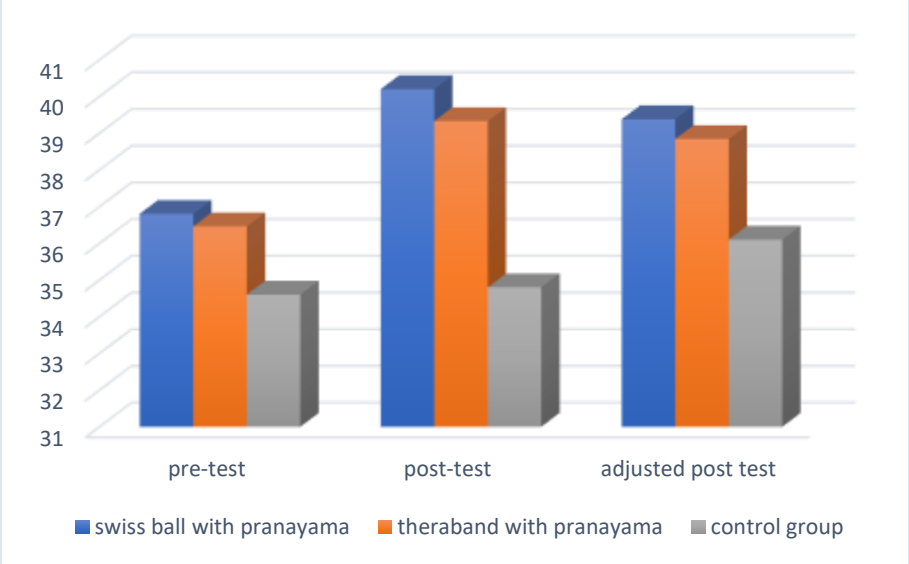
*Significant at 0.05 level

As shown in table -B(III) the Scheffe's post hoc analysis proved that significant mean differences existed between swissball exercise with pranayama and theraband exercise with pranayama groups, swissball exercise and control groups and theraband exercise and control groups on lower back strength. Since, the mean differences 0.54, 3.28 and 2.74 are higher than the confidence interval value (0.51).

Hence, it was concluded that due to the impact of swissball and theraband exercise with pranayama practice on lower back strength of the subjects was significant improved. However, swissball with pranayama practice were better than theraband exercise with pranayama practices.

Figure (IV)

Bar diagram Showing the Mean Values on Lower Back Strength of Experimental and Control Groups.



DISCUSION

The finding of the present study was that there was significance improvement on abdominal strength and lower back strength due to the impact of swissball with pranayama and theraband exercises with pranayama practices among middle aged women. Swissball with pranayama practices had better improvement than theraband exercise with pranayama on both abdominal strength and lower back strength after twelve weeks of training. The study was well supported by the previous research study.

Aarti & Peeyoosha (2015) conducted with the objective to study the comparative effect of 5week training program between Mat, Swiss ball and theraband exercises on abdominal girth and skin fold thickness. The results reflected that 5-week exercise program on mat, swiss ball and theraband are equally effective in reducing abdominal fat.

Cug Mutlu (2012) investigated the effects of swiss ball training on knee joint reposition sense (knee proprioception), core muscle strength and dynamic balance in sedentary collegiate students. The result showed that a significant effect on knee proprioception and core muscle strength after swiss ball training. He concluded that a swiss ball instability training program using body weight as resistance can give prolonged improvements in joint proprioception and core strength which would add to general health and performance.

Pelin Aksen-Cengizhan et al., (2018) studied core exercises include exercises to train muscles that control and stabilize the movements of the abdomen, waist, and hip. To compare core exercises with Theraband and Swiss Ball in terms of core stabilization and balance performance. No difference was found between groups in terms of pre-test values. While the weight and body mass index values decreased in all groups, the balance and core stabilization test scores increased significantly.

Sekendiz et al., (2010) investigated the effects of Swiss ball core strength training on trunk extensor (abdominal)/flexor (lower back) and lower limb extensor (quadriceps)/flexor (hamstring) muscular strength, abdominal, lower back and leg endurance, flexibility and dynamic balance in sedentary women. The results support the fact that Swiss ball core strength training exercises can be used to provide improvement in the aforementioned measures in sedentary women. In conclusion, this study provides practical implications for sedentary individuals, physiotherapists, strength and conditioning specialists who can benefit from core strength training with Swiss balls.

CONCLUSION

1. It was concluded that due to the impact of swissball and theraband exercise with pranayama practice on abdominal strength of the subjects was significantly improved.
2. It was concluded that due to the impact of swissball and theraband exercise with pranayama practice on lower back strength of the subjects was significantly improved.
3. Swissball with pranayama practice was better than theraband exercise with pranayama practices on abdominal strength.
4. Swissball with pranayama practice was better than theraband exercise with pranayama practices on lower back strength.

We can conclude that by giving the swissball with pranayama practice and theraband exercise with pranayama practices, the core strength of middle age women can be improved. So, it is recommended to use such kind of training.

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