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ORIGINAL ARTICLE

COMPARATIVE STUDY BETWEEN MAT, SWISS BALL AND THERABAND EXERCISES ON REDUCING ABDOMINAL OBESITY AMONG COLLEGE GOING FEMALE STUDENTS

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S.Ramachandran[1], C.J.Sivadharsini[2], Jibi Paul[3]

Author:
[1,3]Pofessor, Faculty of Physiotherapy, Dr.MGR. Deemed to be University, Chennai, Tamilnadu, India.
Corresponding Author:
[2]B.P.T. Graduate, Faculty of Physiotherapy, Dr.MGR. Deemed to be University, Chennai, Tamilnadu, India.
Mail id: shivadharshini189@gmail.com

ABSTRACT

Background of the study: Obesity refers to a condition of excessive amount of body fat. The commonly known obesity are Central Obesity which occur due to the excess accumulation of fat in abdominal area. Various exercise have been designed for obesity but in particular exercise designed for abdomen are using mat, swiss ball and theraband exercise. Hence the study was to evaluate the effect by comparing mat, swiss ball and theraband exercise on abdominal obesity. **Methodology:** It was an experimental study with comparative pre-post type. Study setting was conducted at Faculty of physiotherapy A.C.S Medical college and hospital, Chennai. 30 Subjects were randomly allocated equaly in to three groups. The sudy conducted for a duration of 12 weeks. Abdominal obesity female students ranges between the age of 18yrs-25yrs were selected for the study. Mat, Swiss ball, Theraband were used as materials for the study. Group A received mat exercise, Group B received swissball exercise and Group C received Theraband exercise. Body Mass Index (BMI), Waist circumferences were outcome measures for this study. **Result:** On comparing Mean values of Group A, Group B & Group C; the Body Mass Index (BMI) shows significant decrease in the Post test Mean values. MAT Exercise with Group A shows mean value of 24.44 which is less effective than Theraband Exercise Group C value of 26.13 and Swiss Ball Exercise Group B with value of 40.09 shows significant difference between the group with $P \leq 0.001$. On comparing Mean values of Group A, Group B & C on Waist Circumference shows significant decrease in the Post test Mean values; On MAT Exercise shows 95.50 which is lower mean value than Theraband Exercise Group C with 96.00 and Swiss Ball Exercise Group B with 96.50 shows significant difference between the group with $P \leq 0.001$. **Conclusion:** The study concluded that BMI and waist circumference of Group A shows better reduction when compared to Group B and C.

Keywords: Body Mass Index, Waist Circumference, Obesity, Exercise Mat, Swissball, Theraband

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INTRODUCTION

The term obesity is defined as cluster of non-communicable diseases called "New World Syndrome" creating an enormous socio-economic and public health burden in poorer countries. Abdominal obesity is also known as central obesity is where excessive abdominal fat around the stomach and abdomen has built up to the extent that it is likely to have negative impact on health [1].

Visceral fat is composed of several adipose depots including mesentric epididymal white adipose tissue (EWAT) and prenatal fat. An excess of visceral fat called central obesity the "Pot Belly"or "Bear Belly" effects in which the abdomen protrudes excessively. The body type is known as "apple shaped as Opposed to pear shaped" in which the fat particularly develop in the hip region and buttock region [2].

The obese are at increased risk for cardio-vascular diseases and type 2 diabetics however, somewho are affected with metabolic abnormalities. The regular exercise would have a value rather than on scientific evidence and to reduce the risk for metabolic disease through numerous mechanism [3].

The regular exercise would have a value rather than on scientific evidence and to reduce the risk for metabolic disease through numerous mechanism. There are various exercise have been designed for obesity such as aerobics exercise , yoga, palates etc [4].

Aim of study: The aim of the study is to compare the effect of mat, Swiss ball and theraband exercise on reducing abdominal obesity among college going female students.

Need of the study: The obesity refers to the condition of having an excessive amount of body fat .The upper body fat is particular of carried with in the abdomen various exercise have been designed for obesity such as aerobics exercise, pilates ,yoga,and others. Obesity also reduced by mat exercises,swiss ball and theraband exercises.The study aim is to compare the effect of mat ,swiss ball, theraband exercises on abdominal obesity patients.

METHODOLOGY

It was an experimental study with comparative pre-post type. Study setting was conducted at Faculty of physiotherapy A.C.S Medical college and hospital, Chennai. 30 Subjects were randomly allocated equaly in to three groups. The sudy conducted for a duration of 12 weeks. Abdominal obesity female students ranges between the age of 18yrs -25yrs were selected for the study. Mat, Swiss ball, Theraband were used as materials for the study. Group A received mat exercise, Group B received swissball exercise and Group C received Theraband exercise. Body Mass Index (BMI), Waist circumferences were outcome measures for this study.

Procedure : subject with 30 abdominal obesity female were selected and they were divided into two group and each group contain 10 members.

GROUP A: MAT EXERCISES

1.Plank Exercise:

Position: Quadriped position initially or an exercise mat. Technique: From the starting position the patient drops the buttock on the legs and extend the arms the a child

position.Then with palms and toes bearing the enhance weight, the head and trunk are from the plank and this is repeated. Progression: 5-10 times per session and can be progressed to 15-20 times as the patient gains confidence.

2.Scissor Kicks :

Position: Supine lying in an exercises mat with legs fully extended and arms resting near the trunk . Technique: Alternate legs are raised at a time in such a way that it resembles a scissoring action the knees should not flex.

Progression: 20-25 times and then can be progressed 30-40 times per session .Thus exercise help to strengthen the obliques.

3.Crunch Exercise:

Crunches are performed to strengthening the core musculature. Position: Supine lying on a mat is the starting position. Technique: The knees are flexed in such a way that crook lying position attained .Hands are clapped around the chest or behind the neck.The patient tries to lift the shoulders from the floor and hold the position for a peak time. Progression: Initially performmed 8-10 times as the core gains strength the same can be repeated to 15-20 times.

4.Oblique Crunch Exercise :

Position: Initially the position is side lying with one leg on the other and the knees slightly bent.Technique: In this position , the patient tries to lift one shoulder,trying to lateral rotate the trunk and the position is held for a peak time. Progression: Initially performed 8-10 times as the core gains strength , the same can be repeated to 15-20 times.

GROUP B: SWISS BALL EXERCISES

1.Plank on Swiss Ball: Subjects lie in prone position with fore arm supported on swiss ball.

2.Back Extension on Swiss Ball:

Subjects lie on prone lying swiss ball will be kept under abdomen. Arm should clasped behind head. Subjects is instructed to trunk flexion and extension. This exercises is repeated for 5 times per day.

3.Swiss Ball Crunch:

Subject will be allowed in supine lying where swiss ball under lumbo sacral region with 90 degree of knee flexion, Arms should kept along body crossed on top of the chest.Lowering the torso into stretch position with stationary neck will be starting position.Subjects will be instructed to flex the hip by contracting abdomen and getting back into starting position.

4.Exercise Ball Abdominal Curl Up In Supine: Subjects will be allowed in supine lying where leg should placed on swiss ball.Hands are clasped in chest region .Subjects is allowed to lift the trunk upward until the shoulder region off, from the floor.

GROUP C: THERABAND EXERCISES

1.Theraband Abdominal Crunch In Supine:

The subjects is asked to lie back and knees bent with the elbows straight and lift the shoulder blades off the floor.The subjects is asked to hold 10 seconds and then relax practiced twice a day for 10 days.

2.Therabandabdominal Oblique Crunch In Supine:

After attaching the ends of the band on the object .The subject is asked to extend one arm in front and grasp the middle of loop,by keeping elbows straight .The subject is asked to

hold 10 sec and then relax practised twice a day for 10 days .

3.Theraband Trunk Rotation In Sitting:

The patient is askedto lifting the chair grasp the one end of the band and the other band at chest level. And asked to rotate the shoulders. The subjects is asked to hold for 10 sec and then relax practised twice a day for ten days.

4.Theraband Trunk Extension in Long Sitting: The patient is asked to sit in long sitting grasp the both end of bands with the hands at the chest .The patient should keep the lumbar spine straight by extending the hips .The subjects is asked to hold 10 seconds and then relax practised twice a days for 10days.

GROUP A: MAT EXERCISE

Fig.1 Plank Exercise

Fig.2 Scissor Kicks

Fig. 3 Crunch Exercise

Fig 4 Oblique Crunch Exercise

GROUP B: SWISS BALL

Fig. 5 Plank On Swiss Ball

Fig. 6 Back Extension on Swiss Ball

Fig. 7 Swiss Ball Crunch

Fig .8 Exercise ball abdominal curl-up in supine

GROUP C: THERABAND EXERCISE

Fig.9 Theraband Abdominal Crunch in supine

Fig.10 Theraband Abdominal Oblique Crunch in supine

Fig.11 Theraband Trunck Rotation in sitting

Fig.12 Theraband Trunk Extension in long sitting

Data Analysis : The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) Version 24. One way ANOVA includes of following test (Test Homogeneity of variance, ANOVA , post Hoc test Tukey HSD) (Multiple comparison) was adopted to find statistical difference between three groups .

MULTIPLE GROUP COMPARISON		MEAN DIFFERENCE	STANDARD ERROR	SIGNIFICANCE
GROUP A	GROUP B	-.79300	1.11	.761*
	GROUP C	-1.44600	1.11	.412*
GROUP B	GROUP A	.79300	1.11	.761*
	GROUP C	-.65300	1.11	.830*
GROUP C	GROUP A	1.44600	1.11	.412*
	GROUP B	.65300	1.11	.830*

Table 1: comparison of pre test body mass index (bmi) using one anova multiplecomparison post hoc tukey hsd test between group a, group b and group c

MULTIPLE GROUP COMPARISON		MEAN DIFFERENCE	STANDARD ERROR	SIGNIFICANCE
GROUP A	GROUP B	-3.11	1.02	.014**
	GROUP C	-1.65	1.02	.243*
GROUP B	GROUP A	3.11	1.02	.014**
	GROUP C	1.41	1.02	.366*
GROUP C	GROUP A	1.69	1.02	.243*
	GROUP B	-1.41	1.02	.366*

Table2: Comparison of Post Test BMI score using One ANOVA multiple comparison Post Hoc Tukey HSD Test between Group A, Group B and Group C

TEST	GROUP A		GROUP B		GROUP C		df		F value	significance
	MEAN	S.D	MEAN	S.D	MEAN	S.D	df1	df2		
PRE	28.74	2.96	29.54	2.03	30.19	2.42	2	27	.836	.444*
POST	24.44	2.42	27.55	2.20	26.13	2.26	2	27	4.59	.019**

Table 3: Comparison of Pre & Post Body Mass Index (BMI) values using Test of Homogeneity of Variance & One way Anova Test between Group A , Group B and Group C

MULTIPLE GROUP COMPARISON		MEAN DIFFERENCE	STANDARD ERROR	SIGNIFICANCE
GROUP A	GROUP B	-1.00	3.42	.954*
	GROUP C	-.500	3.42	.988*
GROUP B	GROUP A	1.00	3.42	.954*
	GROUP C	.500	3.42	.988*
GROUP C	GROUP A	.500	3.42	.988*
	GROUP B	-.500	3.42	.988*

Table 4: Comparison of Pre test Waist Circumference using One ANOVA multiple comparison Post Hoc Tukey HSD Test between Group A , Group B and Group C

MULTIPLE GROUP COMPARISON		MEAN DIFFERENCE	STANDARD ERROR	SIGNIFICANCE
GROUP A	GROUP B	-8.30	3.13	.035**
	GROUP C	-2.70	3.13	.669*
GROUP B	GROUP A	8.30	3.13	.035**
	GROUP C	5.60	3.13	.194*
GROUP C	GROUP A	2.70	3.13	.669*
	GROUP B	-5.60	3.13	.194*

Table 5: Comparison of Post Test Waist Circumference Score using One ANOVA multiple comparison Post Hoc Tukey HSD Test between Group A , Group B and Group C

TEST	GROUP A		GROUP B		GROUP C		df		F value	significance
	MEAN	S.D	MEAN	S.D	MEAN	S.D	df1	df2		
PRE	95.50	6.15	96.50	8.36	96.00	8.25	2	27	.043	.958*
POST	85.70	5.77	94.00	8.09	88.40	6.97	2	27	3.64	.040**

Table 6: Comparison of Pre & Post Waist Circumference score using Test of Homogeneity of Variance & One Anova Test between Group A , Group B and Group C

RESULTS

On comparing Mean values of Group A, Group B & Group C on Body Mass Index (BMI) shows significant decrease in the Post test Mean values, but MAT Exercise in Group A shows mean value 24.44, which has the Lower Mean value is effective than Theraband Exercise in Group C shows mean value 26.13 and followed by Swiss Ball Exercise in Group B shows mean value 40.09 at $P \leq 0.001$.

On comparing Mean values of Group A, Group B & Group C on Waist Circumference shows significant decrease in the Post test Mean values, but MAT Exercise in Group A shows mean value 95.50, which has the Lower Mean value is effective than Theraband Exercise in Group C with mean value 96.00 and followed by Swiss Ball Exercise in Group B with mean value 96.50 at $P \leq 0.001$.

DISCUSSION

The present study was to compare the effects of twelve week training program for reducing abdominal obesity between Group A with Mat with Group B with Swiss ball and Group C with Theraband exercise.The purpose of this study was take an indepth look at the use of weight control behaviours among overweight and obese people Overweight adolescent were less likely to engage in vigrous physical activity or to report healthy eating patterns behaviours that create positive implication for weight management. In the present study age group of 18-25 years which are divided into three group. And each group assigned 10 members i.e Group A with Mat exercise contain 10 members, Group B Swiss ball contain 10 members and Group C with Theraband exercise contain 10 members.

Metabolic health risk was considered to include only categories of BMI, Hence keeping the objective the present study into consideration waist circumference and BMI measurement are considered as more valid and reliable outcome measures. The most important findings of the study is to measure the abdominall obesity demonstrated a strong

response to effect of the mat, swiss ball and theraband exercise by reducing abdominal fat[5].

Mat exercise which was performed to reduce abdominal obesity and strengthens the abdominal muscles and the subjects showed significant reduction in abdominal fat.

Swiss ball exercise are performed on unstable surface the level of muscle activity increases and in order to stabilize the spine muscle co-activation takes place. The subjects shows better benefit in the study. Performing curl up and back extension on swiss ball be a better method of strengthening core muscle and resulting in increases the muscle activity[6,7].

The theraband exercise which is performed on reducing abdominal fat could be because of the elastic resistance which does not rely on gravity and that it provides continuous tension to the muscle being trained. Another unique benefit could be the elastic resistance offers a linear variable resistance. Resistance training requires more energy expenditure as a result it helps in reducing and breaking of the abdominal fat. Maintanence of negative net energy balance promotes weight loss. Hence theintensity of exercise has to be increased progressively which was done in present study[8,9].

In table 3 it reveals the Mean, Standard Deviation (S.D), Homogeneity variance, ANOVA test, degree of freedom(df), F -value & P value of the Pre & Post BMI score between Group A, Group B & Group C in post test weeks. This table shows that there is no significant difference in pre test values of the BMI score between Group A, Group B & Group C. This table shows that there is in pre test weeks ($P > 0.05$) a significant difference in post test values of the BMI score between Group A, Group B & Group C in post test weeks ($P \leq 0.05$).

In table 6 reveals the Mean, Standard Deviation (S.D), Homogeneity variance, ANOVA test, degree of freedom(df),F -value & P valve of the Pre & Post waist circumference score between Group A, Group B & Group C in post test weeks. This table shows that there is no significant difference in pre test values of the waist circumference between Group A, Group B & Group C in pre test weeks $P > 0.05$.

This table shows that there is a significant difference in post test values of the waist circumference between Group A ,Group B & Group C in post test weeks $P \leq 0.05$.

The outcome measure of the study group namely mat, swiss ball,and theraband exercise group showed significant difference. When compared to pre and post test. The stastics shows effectiveness of Group A with Mat exercise which reduce the abdominal obesity. Thus present study was hypothesized that the mat exercise showed more effective than the theraband and the Swiss ball.

Ethical Clearance: Ethical clearance has obtained from Faculty of Physiotherapy, DR. MGR Educational and Reasearch Institute, Chennai to conduct this study with reference number: IV B/ PHSIO/ IRB/ 2017-2018 dated 08/01/2018.

Conflict of interest: There was no conflict of interest to conduct this study.

Fund for the study: It was a self financed study.

CONCLUSION

The result of the study concluded that 12 weeks exercises program on mat, Swiss ball and theraband exercises are constitute to reduce in abdominal obesity.

On comparing the post mean value of BMI and waist circumference of Group A shows significant reduction when compared to Group B and C. Hence this study suggest that mat exercises more effective /beneficial to abdominal obesity patient.

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