

## Influence of bosu med ball exercises on selected motor fitness variables among active school Basketball players

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### ABSTRACT

The purpose of the study was to find out the influence of bosu med ball exercises on selected motor fitness variables among active school basketball players. To achieve the purpose of the study thirty school girl basketball players were selected randomly as subjects from Pasumpon Thever High School, Mamsapuram, Virudhunagar District, Tamilnadu state, India and their age ranged from 12 to 15 years. The subjects divided into two groups in equal numbers (N=15). Group I underwent bosu med ball exercises and group II acted as control group who did not attended any special training other than their daily school schedule curriculum. The duration of the training period was restricted into six weeks. The selected criterion motor fitness variables abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength were assessed by sit ups, isometric back strength, stroke balance stand test, plank test, sit & reach, well sit test and pushups test respectively. The collected data from the two groups prior to and after the experimental treatments on abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength were statistically analyzed by using the statistical technique of dependent 't' test and analysis of covariance (ANCOVA). In all the cases level of confidence was fixed at 0.05. The result of the study indicated that bosu med ball exercises group had shown significantly improved in motor fitness variables among active school basketball players. However the control group did not shown any significant improvement on selected variables such as abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength.

**Keywords:** 1.Bosu Med Ball Exercises, 2.Abdominal strength, 3.Back strength, 4.Balance, 5.core strength, 6.Flexibility, 7.leg strength, 8.shoulder strength and Basketball players

### Introduction

A bosu balance trainer, or bosu ball as it is often called, is a fitness training device, invented in 1999 by David Weck, consisting of an inflated rubber hemisphere attached to a rigid platform measuring 24. 6 x 24. 6 x 6 inches. There is an evidence to show that both that is multidirectional BOSU ball balance training tools are effective in terms of improving balance in basketball players but there are fewer studies comparing the effectiveness of these two measures in basketball player. So as to provide the best available training and improve skills. (1&2). Basketball is a multidirectional sport that involves explosive activities such as sprinting, rapid changes of direction and jumping; all which occur in a confined area amid multiple

competitors (3). Recently various forms of balance exercises have become a part of both athletic training & rehabilitation (4). Unstable surface training or bosu ball training has become popular in the past few years as a supplementary workout for competitive athletes. Balance is one of the important co-ordination abilities in the field of sport in general & basketball in particular (5). Women's basketball began in the winter of 1892 at Smith College. Senda Berenson, an instructor at Smith, taught basketball to her students, hoping the activity would improve their physical health (6).

## II. Statement of the problem

The purpose of this study was to find out the influence of bosu med ball exercises on selected motor fitness variables among active school basketball players

## III. Methodology

The purpose of this study was to find out the influence of bosu med ball exercises on selected motor fitness variables among school basketball players. To achieve the purpose of the study thirty school girl basketball players were selected randomly as subjects from Pasumpon Thever High School, Mamsapuram, Virudhunagar District, Tamilnadu state, India and their age were ranged from 12 to 15 years. The school girl basketball players were assigned at random into two groups of each fifteen (N=15). Group-I underwent bosu med ball exercises and Group-II acted as control group who did not attend any special training other than their regular daily school schedule curriculum. The duration of the training period was restricted to six weeks for three alternative days per week. The selected criterion motor fitness variables abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength were assessed by sit-ups, isometric back strength test, stroke balance stand test, plank test, sit & reach, well sit test and push-ups test respectively. The pre and post data were collected before and after the training period. The dependent variables abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength were tested by standardized tests abdominal strength, isometric back strength, stroke balance stand test, plank test, sit & reach, well sit test and push-ups test. The pre and post tests data were collected on selected criterion variables prior and immediately after the training program. The pre and post-test scores were statistically examined by the Analysis of Co-Variance (ANCOVA) for selected variable. The level of significance was fixed at .05 level of confidence, which was considered as appropriate.

## VI. Analysis of the data

The influence of bosu med ball exercises on selected motor fitness variables among active school basketball players were analyzed and presented below.

### 4.1 Abdominal strength

The t-test on abdominal strength (sit-up test) of the pre and post test scores of bosu med ball exercise group and control group have been analyzed and presented in table 4.1.

**TABLE-4.1**

**THE PRE TEST AND POST TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON ABDOMINAL STRENGTH TEST**

<b>group</b>	<b>Pre mean</b>	<b>Post mean</b>	<b>MD</b>	<b>t-values</b>
Experimental	<b>16.46</b>	<b>24.66</b>	<b>8.2</b>	<b>4.88</b>
<b>Control group</b>	<b>16.13</b>	<b>16.26</b>	<b>0.13</b>	

\*Significant at .05 level. (The table value required for 0.05 level of significance with df 14 is 2.14)

The table-4.1 shows that the pre-test mean value of experimental group and control group on abdominal strength are 20.66 and 19.46 respectively and the post test means are 25.80 and 20.00 respectively. The obtained dependent t-ratio values between the pre-and post test means of bosu med ball exercises group and control group are 17.69 and 1.42 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. From the above table the dependent 't'-test values of abdominal strength between the pre and post tests means of experimental groups were greater than the table value 2.14 with df 14 at .05 level of confidence, it is concluded that experimental group had significant improvement in the abdominal strength compared to control group.

#### 4.2 back strength

The t-test on back strength (isometric back strength test) of the pre and post test scores of bosu med ball exercise group and control group have been analyzed and presented in table 4.2.

**TABLE-4.2**

**THE PRE TEST AND POST TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON BACK STRENGTH TEST**

<b>group</b>	<b>Pre mean</b>	<b>Post mean</b>	<b>md</b>	<b>t-values</b>
Experimental	<b>57.00</b>	<b>92.46</b>	<b>35.46</b>	<b>3.73</b>
<b>Control group</b>	<b>56.86</b>	<b>56.93</b>	<b>0.07</b>	

\*Significant at .05 level. (The table value required for 0.05 level of significance with df 14 is 2.14)

The table-4.2 shows that the pre-test mean value of experimental group and control group on back strength are 57.00 and 56.86 respectively and the post test means are 92.46 and 56.93 respectively. The obtained dependent t-ratio values between the pre-and post test means

of bosu med ball exercises group and control group are 3.73 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. From the above table the dependent 't'-test values of back strength between the pre and post tests means of experimental groups were greater than the table value 2.14 with df 14 at .05 level of confidence, it is concluded that experimental group had significant improvement in the back strength compared to control group.

#### 4.3 balance

The t-test on balance (stroke stand balance test) of the pre and post test scores of bosu med ball exercise group and control group have been analyzed and presented in table 4.3.

**TABLE-4.3**  
**THE PRE TEST AND POST TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON BALANCE TEST**

group	Pre mean	Post mean	md	t-values
Experimental	<b>14.46</b>	<b>30.86</b>	<b>16.4</b>	<b>5.14</b>
<b>Control group</b>	<b>14.06</b>	<b>15.46</b>	<b>1.4</b>	

\*Significant at .05 level. (The table value required for 0.05 level of significance with df 14 is 2.14)

The table-4.3 shows that the pre-test mean value of experimental group and control group on balance are 14.46 and 14.06 respectively and the post test means are 30.86 and 15.46 respectively. The obtained dependent t-ratio values between the pre-and post test means of bosu med ball exercises group and control group are 5.14 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. From the above table the dependent 't'-test values of balance between the pre and post tests means of experimental groups were greater than the table value 2.14 with df 14 at .05 level of confidence, it is concluded that experimental group had significant improvement in the balance compared to control group.

#### 4.4 core strength

The t-test on core strength (sit –up test) of the pre and post test scores of bosu med ball exercise group and control group have been analyzed and presented in table 4.4.

**TABLE-4.4**  
**THE PRE TEST AND POST TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON CORE STRENGTH TEST**

group	Pre mean	Post mean	MD	t-values
Experimental	<b>88.60</b>	<b>135.73</b>	<b>47.13</b>	<b>3.22</b>
<b>Control group</b>	<b>88.26</b>	<b>89.26</b>	<b>1.00</b>	

\*Significant at .05 level. (The table value required for 0.05 level of significance with df 14 is 2.14)

The table-4.4 shows that the pre-test mean value of experimental group and control group on core strength are 88.60 and 88.26 respectively and the post test means are 135.73 and 89.26 respectively. The obtained dependent t-ratio values between the pre-and post test means of bosu med ball exercises group and control group are 3.22 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. From the above table the dependent 't'-test values of core strength between the pre and post tests means of experimental groups were greater than the table value 2.14 with df 14 at .05 level of confidence, it is concluded that experimental group had significant improvement in the core strength compared to control group.

#### 4.5 flexibility

The t-test on flexibility (sit & reach test) of the pre and post test scores of bosu med ball exercise group and control group have been analyzed and presented in table 4.5.

**TABLE-4.5**  
**THE PRE TEST AND POST TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON FLEXIBILITY TEST**

group	Pre mean	Post mean	md	t-values
Experimental	<b>13.93</b>	<b>22.60</b>	<b>8.67</b>	<b>5.68</b>
<b>Control group</b>	<b>13.86</b>	<b>14.06</b>	<b>0.20</b>	

\*Significant at .05 level. (The table value required for 0.05 level of significance with df 14 is 2.14)

The table-4.5 shows that the pre-test mean value of experimental group and control group on flexibility are 13.93 and 113.86 respectively and the post test means are 22.60 and 14.06 respectively. The obtained dependent t-ratio values between the pre-and post test means of bosu med ball exercises group and control group are 5.68 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. From the above table the dependent 't'-test values of flexibility between the pre and post tests means of experimental groups were greater than the table value 2.14 with df 14 at .05 level of confidence, it is concluded that experimental group had significant improvement in the flexibility compared to control group.

#### 4.6 leg strength

The t-test on leg strength (wall sit test) of the pre and post test scores of bosu med ball exercise group and control group have been analyzed and presented in table 4.6.

**TABLE-4.6**  
**THE PRE TEST AND POST TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON LEG STRENGTH TEST**

group	Pre mean	Post mean	md	t-values
Experimental	<b>42.66</b>	<b>82.06</b>	<b>39.4</b>	<b>4.86</b>
<b>Control group</b>	<b>42.60</b>	<b>43.86</b>	<b>1.26</b>	

\*Significant at .05 level. (The table value required for 0.05 level of significance with df 14 is 2.14)

The table-4.6 shows that the pre-test mean value of experimental group and control group on leg strength are 42.66 and 42.60 respectively and the post test means are 82.06 and 43.86 respectively. The obtained dependent t-ratio values between the pre-and post test means of bosu med ball exercises group and control group are 17.69 and 1.42 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. From the above table the dependent 't'-test values of leg strength between the pre and post tests means of experimental groups were greater than the table value 2.14 with df 14 at .05 level of confidence, it is concluded that experimental group had significant improvement in the leg strength compared to control group.

#### 4.7 shoulder strength

The t-test on shoulder strength (push –up test) of the pre and post test scores of bosu med ball exercise group and control group have been analyzed and presented in table 4.7.

**TABLE-4.7**  
**THE PRE TEST AND POST TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON SHOULDER STRENGTH TEST**

group	Pre mean	Post mean	md	t-values
Experimental	<b>7.26</b>	<b>12.53</b>	<b>5.27</b>	<b>4.05</b>
<b>Control group</b>	<b>7.13</b>	<b>7.63</b>	<b>0.5</b>	

\*Significant at .05 level. (The table value required for 0.05 level of significance with df 14 is 2.14)

The table-4.7 shows that the pre-test mean value of experimental group and control group on shoulder strength are 20.66 and 19.46 respectively and the post test means are 25.80 and 20.00 respectively. The obtained dependent t-ratio values between the pre-and post test means of bosu med ball exercises group and control group are 17.69 and 1.42 respectively. The table

value required for significant difference with df 14 at 0.05 level is 2.14. From the above table the dependent 't'-test values of shoulder strength between the pre and post tests means of experimental groups were greater than the table value 2.14 with df 14 at .05 level of confidence, it is concluded that experimental group had significant improvement in the shoulder strength compared to control group.

Analysis of covariance (ANCOVA) on shoulder strength of experimental and control groups have been analyzed and presented in table 4.8

**TABLE 4.8**  
**ANALYSIS OF COVARIANCE (ANCOVA) ON SHOULDER STRENGTH TEST OF**  
**EXPERIMENTAL GROUP AND CONTROL GROUP**

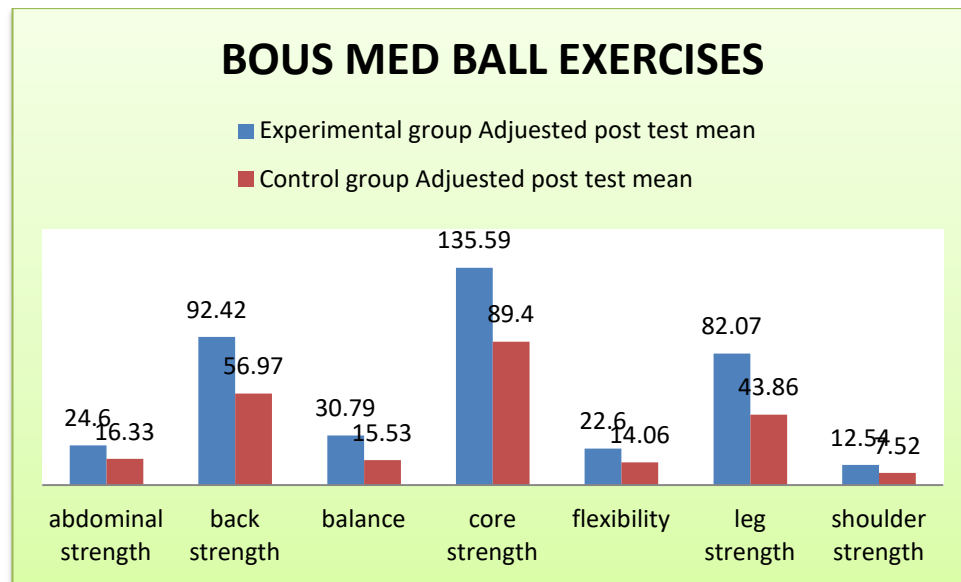
Test variables /	Adjusted Post Test Means		S of V	Sum of squares	Ddf	Mean square	F - ratio
	Experimental Group	Control group	B	W	1	27	
Abdominal strength	24.60	16.33	B	512.78	1	512.78	25.95
			W	533.62	27	19.76	
Back strength	92.42	56.97	B	9422.13	1	9422.13	22.39
			W	11362.24	27	420.82	
Balance	30.79	15.53	B	1744.67	1	1744.67	27.64
			W	1704.17	27	63.11	
Core strength	135.59	89.40	B	15995.17	1	15995.17	18.45
			W	23405.65	27	866.87	
Flexibility	22.60	14.06	B	546.09	1	546.09	31.20
			W	472.53	27	17.50	
Leg strength	82.07	43.86	B	10948.52	1	10948.52	23.00
			W	12850.69	27	475.95	
Shoulder strength	12.54	7.52	B	189.07	1	189.07	16.13
			W	316.60	27	11.72	

\* Significant at 0.05 level. (The table value required for significance at 0.05 levels with df 1 and 17 is 4.21)(B-between, W- within)

Table 4.8 shows that the adjusted post test means values on Abdominal strength, Back strength, Balance, Core strength, Flexibility, Leg strength and Shoulder strength. The obtained F- ratio of 25.95, 22.39, 27.64, 18.45, 31.20, 23.00 and 16.13 for adjusted post test mean is greater than the table value 4.21 with df 1 and 27 required for significance at 0.05 level of confidence. The results of the study indicate that there is a significant mean difference exist between the adjusted post test means of bosu med ball exercise and control groups on Abdominal strength, Back strength, Balance, Core strength, Flexibility, Leg strength and shoulder strength.

**Figure 4.1.1**

The bar diagram shows the mean values of adjusted post test on Abdominal strength, Back strength, Balance, Core strength, Flexibility, Leg strength and shoulder strength test of bosu med ball exercise group and control group.



**Figure 4.1.1 : Adjusted post test mean values of bosu med ball exercise and control groups on abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength**

## V. Conclusions

1. There was significant improvement on **abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength** due to the influence of bosu med ball exercise basketball players

2. There was significant improvement on abdominal strength, back strength, balance, core strength, flexibility, leg strength and shoulder strength due to the influence of bosu med ball exercise basketball players. And other than help for physiotherapy doctor using injury person, public's fitness health help, social health science method function of technology also in values for physical education and sports coach very help for higher performances in a day work out balances improvement.

3. However the control group had not shown any significant improvement on any of the selected variables.



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