Effect of Selected Physical Exercises on Performance Improvement of Female Beginner Basketball Players of Don Bosco High School Gambella Town

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Abstract: The main objective of this study was to investigate the effect of selected physical exercises on performance improvement of female beginner basketball players of Don Bosco High School Gambella Town. For this study thirty female beginner basketball players were selected from Don Bosco High School as a subject and their age was 16-17 years old. All selected players were participated in a scheduled training program three days per week for 12 weeks. The parameters selected for the study were speed, flexibility, agility, endurance, straight, speed test. Pre, during and post training test were conducted for all thirty subjects on selected physical fitness and basketball performance skill variables and the score were recorded. Computerized statistical package software (SPSS) paired sample t-test was used to analyze the data. The level of significance was set at p ≤ 0.05%. Selected physical fitness and basketball skill performance results showed that the study units were significantly improved from pre to during and pre to post training test. The mean difference of 35m run and T-test were improved by 0.411 and 0.26 second respectively. The mean difference of sit and reach was increased by -9.7 and -3.93, the same way the mean difference indicated that, improvement was observed in sit-ups by -4.66 pre to post-test each. There was also improvement in both push up test. Mean differences of push up increased by -9.03 point pre to post-test each. This study also proved that the use of strength, speed, endurance, flexibility and agility exercises were helpful in enhancing the performance of beginner basketball players.

1. INTRODUCTION

Today's sports and recreation activities have become more and more competitive, with this increased competitive nature comes an increase in the desire to improve performance. Many techniques have been used over the years in an attempt to enhance performance and thus improve success. One of the most important aspects of performance enhancement, other than the skill is the ability to produce power (Ebben et al., 1998). Moreover, the high intensity movements of basketball players are closely related to the development of strength, speed and agility (Hedrick, 1993; Castagna et al., 2007; Meckell et al., 2009). Explosive strength, take-off power, speed, and agility are abilities that make an important contribution to efficient movement with and without the ball, thus play an important role in basketball technique and tactics (Erculj et al., 2010). The level of these abilities, that is, the 2 motor potential, is most often measured using various motor tests with and without the ball (Colli et al., 1987). In basketball practice, motor tests are the most suitable and applicable because they are implemented in conditions similar to those of training or competition (Erculj et al., 2010). Therefore, to attain optimum performance in activities where speed is the main factor, above mentioned components should be woven together. Physical performance in basketball is measured as the product or outcome of standardized motor tasks requiring speed endurance, agility exercise, mobility and explosive strength. At the elite level, research has identified the intermittent high-intensity exercise as predominant and fitness improvements to this activity pattern have further been defined as power endurance (Thomas et al., 2000; Trinicetal et al., 2001; Siegleretal et al., 2003). In elite basketball games, available time motion analysis research shows that adult athletes performed per game 105 high-intensity bouts (85% maximum heart rate, HR) while covering a distance of 991m (in high-intensity) executing 50-60 changes in speed and direction and 40-60 maximal jumps (McInnes et al., 1995; Janeira et al., 1998).
2. Selection of subjects

The Study Design
Complete randomized design (CRD) was used in this study. 30 female beginner basketball players with age of 16 and 17 were selected from Don Bosco High School students. The experiment consists of exercises which was include warming up, jogging, push up, crunch, sprint, jumping jacks, shuttle run, sit up, half squat thrust stretching, and cooling down with moderate intensity for three days (Monday, Wednesday and Friday) per week for 12 consecutive weeks. 65 minutes are allotted for each session of training. The pre-test, during training test and post-test on selected physical fitness parameters such as, push up, sit up, sit and reach test, Illinois agility running and 35M sprint run will be administered for selected female subjects. The primary data was from experimental variables using pre-test, during training test and post-test on selected physical fitness parameters. The secondary data was collected from different written materials like journals, prior researches, published books and other documented materials.

The study population was from Don Bosco High school grades 9 and 10 female students. There are 160 students in grades 9 and 10 of Don Bosco High School. Using purposive sampling techniques 30 (thirty) female students was selected from the total population of 160 students for experimental study. A subject who fulfill the health history questionnaire and whose age is between 16-17 was included for this study. In addition the subjects who have any recent physical injury and medical condition restricted by physician and whose age fewer than 16 and above 17 were not be the part of this study.

The purposive sampling techniques were used to select 30 female beginners’ basketball players from Don Bosco High School as study of subjects. The sample was 30 female subjects between the age of 16 and 17 years from Don Bosco High School student (grades 9 and 10), Gambella town. Ethiopia Quantitative data was collected through the appropriate performance tests, such as 35M dash to measure speed, T-test for flexibility, agility, and Sit up for muscular endurance and Vertical jump for power after giving training for these basketball players. The data was collected by the investigator of this study with the help of one Assistant data recorder.

3. Procedure and Analysis of Data

Exercise Training Protocol: The selected subjects were in single group to know the effect of selected physical fitness exercise training on performance improvement of female beginner basketball players at Don Bosco high school will be based on those skills related speed, strength, endurance, agility, and flexibility exercises. Both groups was engage in conditional exercises for one week. In the second week, one group was beginning skill related exercise training program the other groups continue to play the game fitness training program. After one week conditioning exercise, one group was begin performing exercise such as, Jogging, sprinting, and other group was begin performing exercises such as Illinois, push up, sit and reach, 35m speed running, and sit up, flexibility, basketball game and squat up. The duration of exercise was taken 65 minutes with the frequency of three days per week. It will include 15 minute of warm up and stretching, 30 minute of main activity, 10 minute of cool 23 dawn and 10 mintes for resting time. The training was performed with intensity of HR max 55-69%. The weekly training program was on Monday, Wednesday and Friday for 12 consecutive weeks (three months). Time schedule for training of each day was from 4.30 P.M to 5.35 P.M (evening sessions).

Methods and Procedures of Data Collection: Quantitative data was collected through the appropriate performance tests, such as 35M dash to measure speed, T-test for flexibility, agility, and Sit up for muscular endurance and Vertical jump for power after giving training for these basketball players. The data was collected by the investigator of this study with the help of one Assistant data recorder.

Performance Test Analysis: The tests administered in order to know the performance test analysis of all 30 subjects. Test Results was recorded before training (pre-test) during training test and after the intervention of two months training (post-test).

4. RESULTS AND DISCUSSION

The purpose of this study was to find out the selected type of physical exercises on performance improvement of female beginner basketball players of Don Bosco High School Gambella Town. To achieve the purpose of the study 30 female beginner basketball players were selected from Don Bosco High School as study subject and their ages were 16-17 years. The parameters selected for this study was speed, agility, power, muscular endurance, accuracy throw and field goal speed test. The pre, during and post-test were conducted for all thirty participants on selected physical fitness and performance skill variables and the score were recorded. The collected data were analyzed by paired sample T-test. The results for each fitness variables are discussed below.

Table 1. The mean and standard deviation values of push up (sec) and sit up (sec) of female beginner Basketball players (physical fitness parameters).
Mean ± SD

<table>
<thead>
<tr>
<th></th>
<th>PT</th>
<th>DT</th>
<th>POT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU</td>
<td>21.63 ± 4.26</td>
<td>25.4 ± 3.34</td>
<td>30.66 ± 3.45</td>
</tr>
<tr>
<td>SU</td>
<td>21.06 ± 5.74</td>
<td>25.73 ± 6.32</td>
<td>33.86 ± 7.74</td>
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</tbody>
</table>

Values are mean ± standard deviation, PT = pre test, DT = during test, POT = post test.

The above table showed that there was improvement in pushup and sit up test for study group. The mean difference revealed that there was an improvement in the performance of fitness parameters due to exercises in which they were engaged in. The mean value of Pushup of study units were increased from pre to post test, in pre-test performance was 21.63 sec but after 12 weeks training it was recorded as 30.66 sec. The sit up test was improved by 33.86 second. The rationale behind the improvement in physical fitness performance was due to the exercise that they took in the training schedule. The results clearly showed that regular participation in speed and agility exercise can improve performance of female beginner basketball players.

Table 2: The mean and standard deviation values of 35m sprint run (sec) and agility of female beginner Basketball players (physical fitness parameters)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>PT</th>
<th>DT</th>
<th>POT</th>
</tr>
</thead>
<tbody>
<tr>
<td>35m run</td>
<td>5.90 ± 0.06</td>
<td>5.65 ± 0.05</td>
<td>5.48 ± 0.85</td>
</tr>
<tr>
<td>Agility</td>
<td>21.88 ± 0.63</td>
<td>20.13 ± 0.63</td>
<td>18.05 ± 0.49</td>
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</tbody>
</table>

Values are mean ± standard deviation, SD = standard deviation, PT = pre-test, DT = during test, POT = post-test.

The above table 2 showed that there was improvement of 35m run test and Agility for subjects. The mean difference showed that there was improvement over the pre-test due to 12 week training program. The mean value of 35m run of study units was increased from pre to post test, in pre-test 5.90m and in post-test 5.48 m. In the same way the improvement was observed in sit ups performance from pre to post-test i.e. 5.90 to 5.48. The rationale behind the improvement in 35m run were due to the exercises that took in the training schedule. The measure clearly showed that regular exercises training program can have great effect on their speed on 35m run in female beginner basketball player.

Table 3: The mean and standard deviation values of Sit and reach and BMI test of female beginner Basketball players (performance parameters)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>PT</th>
<th>DT</th>
<th>POT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit and Reach</td>
<td>24.3 ± 4.75</td>
<td>28.26 ± 4.63</td>
<td>34.03 ± 4.97</td>
</tr>
<tr>
<td>BMI</td>
<td>18.87 ± 0.64</td>
<td>18.09 ± 0.58</td>
<td>17.28 ± 0.69</td>
</tr>
</tbody>
</table>

Values are mean ± standard deviation, SD = standard deviation, PT = pre-test, DT = during test, POT = post-test.

The Above Table 3 measurement results indicated that there was an improvement in both Sit and reach test among beginner basketball players. Sit and reach increased from 24.3 to 34.03 point and body mass index test also increased from 18.87 to 17.28 number of count. If we measure the mean difference for sit and reach it was recorded 0.9 and for body mass index test it was observed 1.58 from pre to post test. This showed that because of exercises there was great improvement in performance of beginner basketball players.

Table 4: The mean difference value and significance level of each test results in study group

<table>
<thead>
<tr>
<th>Study Variables</th>
<th>Parameters(x)</th>
<th>Parameters(y)</th>
<th>MD (x-y)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>35m run (sec)</td>
<td>POT</td>
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<td>0.41</td>
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<tr>
<td>Agility-test (sec)</td>
<td>POT</td>
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<tr>
<td>Sit and reach(cm)</td>
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<td>PT</td>
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</tr>
<tr>
<td>Sit-ups</td>
<td>POT</td>
<td>PT</td>
<td>1.28</td>
<td>0.000</td>
</tr>
<tr>
<td>Pushup</td>
<td>POT</td>
<td>PT</td>
<td>3.03</td>
<td>0.000</td>
</tr>
<tr>
<td>BMI test</td>
<td>POT</td>
<td>PT</td>
<td>1.58</td>
<td>0.000</td>
</tr>
</tbody>
</table>

MD = mean difference, PT = pre training test which is taken before training and, DT = during training test which was measured at the middle of training weeks (6 th week) POT = post training test measured at the 12 th week of training.
The above Table 4 showed the overall results of each test. It includes the mean difference from one test to another and the significance of post-tests in reference to the pre-tests. More significance improvement was recorded in all players. This was due to the training program in which they were engaged in. The significant change in the students’ performance was an evident for the positive effect of training program on their explosive strength, speed endurance and agility exercise. Generally, the test result of this study revealed that strength, speed, endurance and agility exercises are useful to enhance the performance of beginner basketball players. This is consistent with the findings of (Kukuric et al., 2009).

A research conducted on effects of complex training on selected exercise strength of legs extensors in junior basketball players by (Kukuric et al., 2009) showed sticking to the training program, regular and permanent performance of the explosive strength, speed endurance and agility exercises three day per week in a period of twelve weeks and graduating in raising the level of training loading in each stage of training program (adapting and rippling in training loading) led to a remarkable improvement in the level of some special physical characteristics and its effect on the skilful abilities of the basketball players.

5. SUMMARY AND CONCLUSIONS

This study assessed and tried to investigate the effect of selected physical exercises on performance improvement of female beginner basketball players of Don Bosco High School Gambella Town Ethiopia. These subjects were selected from grade 9 and 10 with age of 16 to 17 years old. Major finding of this investigation are the effect of selected physical exercise on performance improvement of female beginner basketball performance through the exercising of strength, speed, endurance, flexibility and agility exercise.

The training schedule was arranged in the first semester for twelve weeks. The intensity for exercise was low to moderate, for three days per week (Monday, Wednesday and Saturday) after their regular classes. The effect of selected physical exercise on performance improvement of female beginner basketball players lack strength, speed, endurance, agility exercises and flexibility test were seen on enhancing the performance of female beginner basketball players. All the components (35m run, Illinois test, sit and reach, sit-ups, pushup and endurance test) were tested before, during and post. Data was analyzed using computerized statistical package software (SPSS) paired sample T-test. The level of significance was set at 0.05%. Test results from pre training to post training showed significant improvement in all the aforementioned components. The improvement was observed and recorded from pre-test to during test and then to post test.

The investigator noticed that the improvement of the variables is due to the vital role of agility, strength, speed, flexibility, and endurance test training leads to the improvement of the special physical abilities as well as improving in skilful performance. Agility, strength, speed, flexibility and endurance test mean difference were the evidence for the effect of exercise training in improving the performance skill of female beginner basketball players.

6. CONCLUSIONS

In light of the results of the study and the limits of the sample and the framework of statistical treatments used, the following points were concluded: To see the selected physical exercise on performance improvement of female beginner basketball players lack strength, speed, endurance, flexibility and agility exercises have significant effects on the improvement of female beginner basketball players’ physical fitness and performance skills.

Regular participation in physical activity had a significant effect of selected physical exercise on the improvement and enhancement of physical fitness performance on female beginner basketball players.

The performance of selected physical exercise strength, speed endurance and agility exercises in the direction of the work of skill leads to improvement in the level of skilful performance of female beginner basketball players.

The time of the application of the proposed program for strength, speed, endurance flexibility and agility exercises is appropriate to assess the special physical abilities and skilful performance of the female beginner basketball players.

Based on the findings of this study, the following points are recommended to investigate more on the relationship of explosive strength, speed endurance and agility exercises and performance of beginner basketball players:

In order to make the same participation of female in basketball player, it is necessary to do further research in the area of basketball performance and different type of exercise. The proposed training program including the strength, speed endurance and agility exercises should be a part of physical preparation of female beginner basketball players, because of their significant influence on raising the level of the player physically and skillfully.

It is necessary to raise awareness among trainers with the effect of selected physical exercises
importance of the strength, speed, endurance, flexibility and agility exercises in raising the physical fitness and skillful performance of female beginner basketball players. Moreover, studies should be conducted in the same area on different samples in terms of age and gender.

6. REFERENCES


