Effect of Selected Physical Fitness Exercises on Cardiovascular and Muscular Endurance of 16-19 Years Male Students

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Abstract: The study was conducted to investigate the effect of physical fitness on improving cardiovascular endurance and muscular endurance of 16-19 years male students of Indian high school Dubai. In purposive sampling technique forty male students from students of Indian high school Dubai were selected as study subjects and their age range was 16-19 years with average age 17.3 years. All selected subjects were participated in selected physical fitness exercise for 12 consecutive weeks, i.e. 3 days per week 60 minutes duration per day. Pre, during and post training tests were conducted on cardiovascular and muscular endurance. Primary data was collected from experimental study subjects. The data collected from the study subject were analyzed using SPSS version 20 software. The data pertaining to cardiovascular endurance and muscular endurance were analyzed by repeated measure ANOVA to determine the difference between initial and final mean of subjects. According to analyzed data mean difference value boosted in push up performance by 18.50rep/min after 12 weeks aerobic exercise. In sit up test 16.02rep/min increments were observed. But in RHR and EHR17.13beats/min and 12.02beats/min decrements were observed throughout the study period respectively. The result obtained in this study indicated that there were significant improvements in cardiovascular endurance and muscular endurance but in the case of heart rate there was reduction. Based on these findings, it can be concluded that selected physical fitness exercise has positive effect on improvement of cardiovascular and muscular endurance of the subjects. The researcher recommended that to be beneficiary from selected physical fitness exercise the exercise training program needs to be life long term.

INTRODUCTION

Physical fitness is nowadays considered as one of the most important health markers in childhood (Ortega et al., 2008). Consequently, in the last decades several countries have been promoting physical fitness improvement among young people in different ways (USDHHS, 1990 Schools are mainly attempting to increase the pupils’ health level by using measures such as the improvement of their physical fitness through physical education (PE) (Ministerio de Education Ciencia, 2006). It has been concluded that the health promotion policies and physical activity programs should be designed to improve physical fitness, where strength and cardiovascular endurance are the most important health-related physical fitness components (Ortega et al., 2008). It is known that planning long-term fitness programs is the best way to improve these components (Donney et al., 2009). Nonetheless, in the PE setting these programs cannot last the whole course or a large part of it since many curricular contents must be developed in a school year (Ministerio de Education Ciencia, 2006). Consequently, in the PE setting we need to find short-term programs that could be also effective for the increment of fitness. One of the methodologies that meet these criteria could be the circuit training (Dorso et al., 2009). The circuit training effectively reduces the time devoted to training while allowing an adequate training volume to be achieved (Alcaraz Romon et al., 2008). Moreover, it permits a greater motor engagement time Lozona et al. (2009), which is a very important requirement for the success of a PE program. In addition, this methodology has multilevel effects on fitness, especially in beginners (Alcaraz Romon et al., 2008).

PROCEDURE AND COLLECTION OF DATA

RESEARCH DESIGN

This research work was focused on experimental field study within 12 weeks of selected physical fitness exercise on cardiovascular endurance and muscular endurance. The researcher believed that 12 weeks of selected physical fitness exercise can improve the cardiovascular endurance and muscular endurance status of the participant.
Indeed the role of selected physical fitness exercise on cardiovascular endurance and muscular endurance of Indian high school Dubai beginner students. Only 40 male subjects of aged between 16 to 19 were used as a subject in low intensity exercises in the first month of the training program and moderate intensity exercises in the second and third month of the training programs. The weekly exercise program was conducted 3 times/week (Monday, Wednesday and Friday) in the morning (6:30-7:30 am) for 60 minute of each day from the beginning up to the end of the study.

Sample and Sampling Techniques

The purposive sampling technique was used to select forty (N=40) participants from 460 male students of Indian high school Dubai for the experiment regarding on the designed parameters and mechanisms. Because the age some students in Indian high school Dubai was below 16 years old and some students age was above 19 years old. To see the reliability of the designed program the researcher selected forty (40) participants whose age is between 16 and 19. The experimental parameters were; medical checkup for blood pressure, and chronic disease (heart problem, cancer, diabetes, stroke, hypertension and so on).

Experimental Measurements

Three Minutes Step Test

The YMCA 3-minute bench step test is based on how quickly heart rate recovers following a short bout of exercise.

**Purpose:** a step test provides a sub maximal measure of cardio-respiratory or endurance fitness

**Equipment required:** 12 inch (30 cm) step, stopwatch, and metronome or cadence tape.

**Procedure:** the step test was begun by the subject standing in front of the bench. When the assistance give the command start the subject started step up and down in to step box by alternating his legs. First step one foot up on the bench (1 leg up), step up with the second foot (2 leg up), step down with one foot (1 leg down), and step down with the other foot (1 leg down.)

**Scoring:** The total one-minute post-exercise heart rate is the subject's score for the test (www.topendsport.com)

**Ninety degree push-up test**

The purpose of this test is to evaluate the endurance of the arm and chest muscles of students.

Procedures: The 90 degree push-up test should be conducted as follow: Students were lied face down with the hands should be shoulder width apart and fully extend the arms. Then lower the body until the nose touches the ground or until the arms bend 90 degree and the upper arm was parallel to the floor. Students were kept their back straight and push the body off the ground with the arms. The students were pushed the arms are straight. The activity was continued without rest. The student was tried to complete as many push up as possible. The assistance was counted and recorded the total number of push-up students’ were able to perform. (Golding 1986)

**Sit-Up Test**

This is a general description of a sit-up test to measure abdominal muscle endurance (also called curl up or crunch test). The procedures and technique for this test can vary depending on which specific test you are performing.

**Purpose:** The curl up test measures abdominal muscular strength and endurance of the abdominals and hip-flexors, important in back support and core stability.

**Equipment required:** flat, clean, cushioned surface, stop watch, recording sheets, pen. Some variations will also require the following.

**Procedure:** The aim of this test was to perform as many sit-ups as they can in one minute. The study subjects were laid on their back with their knees bent and feet floated on the floor. The arms were folded across and the chest, and must maintain no gap between the forearms and the chest at all times. On the command ‘go,’ started the crunch by raising their upper body forward until the elbows or forearms touch the thighs and then lower the torso until the shoulder blades touches the ground. This is one complete sit up.

**Scoring:** Recorded the total number of sit ups the participants do within 3 minutes. The completion of one complete curl up (up and back) counts as one. The sit up must be performed correctly for it to be counted. (Davis, 2000)

Methods and Procedures of Data Collection

Quantitative data was collected through the appropriate cardiovascular endurance and muscular endurance fitness test measures like 3 minute step test sit up (curl up) test and push up test. The data was recorded by the researcher with the help of two assistances. The data collector was received training for two days regarding which data and information to be collected from the participants. The experimental field test was strictly administered and standardized in terms of
administration, organization and implementation conditions.

Exercise Training Protocol

Eligible subjects were selected for the study and the participant was engaged selected physical fitness exercise program. The exercise training program was consists of floor aerobic exercises like, jogging, aerobic dance, abdominals, stretching, rope jumping, football game, basketball game, volleyball game, brisk walk, warming up, cooling down for 12 weeks of study. Frequency and duration of exercise shall be 3 days in a week and up to 60 minutes per session (Fitwatch-workout planner). www.fitwatch.com/planner. The weekly exercise program was conducted on Monday, Wednesday and Friday in the morning (6:30-7:30am) from the beginning up to the end of the study. During the study period eating habits of variables were informed that the diet should be as usual pattern.

RESULTS AND DISCUSSION

The purpose of this study was to investigate the role of selected physical fitness exercise on cardiovascular endurance and muscular endurance improvement on Indian high school Dubai male students. In this study field work had been taken three times (pre, during and post). Under this heart rate and muscular endurance had been measured. The results of those variables are discussed as follow.

Step Test result and Discussion

Table 1: Mean and SD values of RHR and EHR (beats/min) of study participants under the role of selected physical fitness exercise on cardiovascular endurance and muscular endurance improvement on Mena secondary and preparatory school male students.

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>PT</th>
<th>DT</th>
<th>PoT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHR</td>
<td>79.35 ± 3.78</td>
<td>73.83 ± 2.65</td>
<td>67.33 ± 1.46</td>
</tr>
<tr>
<td>EHR</td>
<td>162.85 ± 4.04</td>
<td>153.48 ± 4.76</td>
<td>145.33 ± 7.20</td>
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</tbody>
</table>

Values mean ± SD, PT = pre training test which was taken before aerobic exercise, DT=during training test measured at 6th week of aerobic exercise, PoT= posttest which taken after 12th week of aerobic exercise training, RHR=resting heart rate, EHR=exercise heart rate

The data in table 1 showed that there were significance difference before the exercise and after 12 weeks of selected physical fitness exercise on individuals’ RHR and EHR performance.
Push up Tests Results and Discussion

Table 2. Mean push up (rep/min) of study participants under the role of selected physical fitness exercise on cardiovascular endurance and muscular endurance improvement on Indian high school Dubai male students.

<table>
<thead>
<tr>
<th>selected physical fitness exercise</th>
<th>Experimental Group Push up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable</td>
<td>PT</td>
</tr>
<tr>
<td>Push up</td>
<td>$12.33 \pm 1.83$</td>
</tr>
</tbody>
</table>

Values are mean $\pm$ SD, PT = pre training test which was taken before aerobic exercise, DT = during training test which was measured at 6th week of aerobic exercise, PoT = post test which was taken after 12th week of aerobic exercise training.

The above table showed that there was significant difference in between the pre to post test score. The improvement in performance was due to the selected physical fitness exercise in which they were engaged in Figure 2 Pre, during and Post push up (Muscular strength) test result for Indian high school dubai male students.

Sit up Test Results and Discussion

Table 3. Mean Sit up (rep/min) of study participants under the role of selected physical fitness exercise on cardiovascular endurance and muscular endurance improvement on Indian high school Dubai male students.
Values mean ± SD, PT = pre training test which was taken before aerobic exercise, DT = during training test measured at 6th week of aerobic exercise, PoT = post test which taken after 12th week of aerobic exercise training.

The data in table 3 showed that there was significance difference before the exercise and after 12 weeks of selected physical fitness exercise on individuals’ sit up performance.

The results in Figure 3 showed the improvement of sit-up performance due to the 12 weeks selected physical fitness exercise program.

Figure 3. Sit up (Muscular strength) test results of pre, during and after 12 weeks selected physical fitness exercise

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>PT</th>
<th>DT</th>
<th>PoT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit Up</td>
<td>13.58±2.32</td>
<td>24.65±2.25</td>
<td>29.60±2.16</td>
</tr>
</tbody>
</table>

Table 5. The mean difference of all parameter values between PT, DT, and PoT of participants selected physical fitness exercise program

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Parameters (I)</th>
<th>Parameters (J)</th>
<th>MD (I-J)</th>
<th>DF</th>
<th>F</th>
<th>Sig</th>
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</thead>
<tbody>
<tr>
<td>EHR</td>
<td>PT</td>
<td>DT</td>
<td>9.38</td>
<td>39</td>
<td>6.561</td>
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<tr>
<td></td>
<td>PoT</td>
<td></td>
<td>17.53</td>
<td></td>
<td>7.999</td>
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<tr>
<td>RHR</td>
<td>PT</td>
<td>DT</td>
<td>5.52</td>
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<tr>
<td></td>
<td>PoT</td>
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<td>12.03</td>
<td></td>
<td>7.485</td>
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<tr>
<td>NDPUT</td>
<td>PT</td>
<td>DT</td>
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<td>39</td>
<td>6.450</td>
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<tr>
<td></td>
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<tr>
<td>SUT</td>
<td>PT</td>
<td>DT</td>
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<td></td>
<td>PoT</td>
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<td></td>
<td>0.842</td>
<td>0.00</td>
</tr>
</tbody>
</table>

MD = mean difference, Sg = significance level, PT = pre test, DT = during test, PoT = post test, NDPUT = ninety degree push up test, SUT = sit up test
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study assessed the effect of selected physical fitness exercise on cardiovascular endurance and muscular endurance improvement on Indian high school Dubai male students.

The role of selected physical fitness exercise on the improvement of cardiovascular endurance and muscular endurance were seen. All components (RHR, EHR, muscular endurance and cardiovascular endurance) were tested before, during and after selected aerobic exercises training. Test results from pre training to post training showed improvements for all components.

As the result of the study showed the participants were able to achieve differences in their RHR and EHR which were related to cardiovascular endurance. The endurance result showed that selected aerobic exercise program such as walking jogging and aerobic dances reduced EHR.

Conclusions

Based on the major findings of the study, the following points were stated as conclusions.

- **physical fitness exercise** had a significant effect on the improvement of cardiovascular endurance. Individuals who engage in aerobic exercises could be able to enhance their cardiovascular endurance.
- RHR and EHR were significantly changed (reduced). This reduction of heart rate was due to aerobic exercise training program.
- EHR showed greater improvement over RHR following selected physical fitness exercise programs.
- **physical fitness exercise** had significant role on the improvement of muscular endurance for subjects who involved in training program.

Recommendations

By considering the major findings and conclusions of the study, it is important to state the following points as a recommendation to investigate more on the effect of selected physical fitness exercise on cardiovascular and muscular endurance of male participants.

- It is highly expected from professionals of physical education and sport and related fields to guide and evaluate the importance and values of selected physical fitness exercise on moderation of heart rate.
- The appropriate levels of physical exercises for different participants should be identified by the professionals of the field, including frequency, intensity, and duration of specific exercises.
- selected physical fitness exercise should be used to lower RHR and EHR.
- To be beneficial from selected physical fitness exercise in all dimension (physiological, psychological, and sociological) the exercise training program needs to be life long term.

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