

Assessment of Cardiovascular Fitness amongst College Students Involved in Sport Activities and Dance

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ABSTRACT

Purpose- To provide an appropriate measure of cardiovascular fitness. The YMCA 3minute step test is based on how quickly your heart rate recovers following a short bout of exercise. Hence the purpose was to provide a submaximal measure of endurance fitness between the students who are involved in sport activities and dance.

Methodology- According to simple random sampling 40 participants were included in the study after screening for the inclusion criteria. Thereafter the Participants were divided into 2 groups. 20 participants included in sports group and 20 in dance group. They were explained the purpose of the study and the procedure involved in the study. Informed Consent was obtained and a YMCA 3minute step test was done. Heart rate measures were recorded in both the groups of population. Data analysis was done at the end of the study.

Results – 12 students in the sports group had a good to above average fitness level, and 3 students in dancing group had a above average fitness. No student in dance had a good fitness. Further 7 students in dance had a average fitness compared to 2 students in sports who had average fitness. 6 students involved in sports had below average to very poor fitness and 10 students involved in dance had their fitness in this category.

Conclusion- It was concluded from the results obtained that the students involved in sport activities had a significantly good

cardiovascular fitness than students involved in dance.

Key words- cardiovascular fitness, sports, dance, YMCA 3minute step test.

INTRODUCTION

Physical fitness can be defined as a set of attributes that people have or achieve which can be categorized into Health-related Physical fitness and skill related Physical fitness. [1] Health-related physical fitness consists of those components of physical fitness that have a relationship with good health. The components are commonly categorized as body composition, cardiovascular fitness, flexibility, muscular endurance, and strength. [2]

Cardiovascular fitness is the health-related component of physical fitness that relates to ability of the circulatory and respiratory systems to supply oxygen during prolonged physical activity. Cardiovascular fitness is also called as cardiovascular endurance, aerobic fitness and cardio-respiratory fitness. A person's ability to deliver oxygen to the working muscles is affected by many physiological parameters, including heart rate, stroke volume, cardiac output, and maximal oxygen consumption. [2]

Physical activity can be defined as any bodily movement created by skeletal muscles where energy is produced. [3] The benefits of various Physical Activities on

Cardiovascular fitness include lowering of blood pressure, improve the blood flow, improve workout efficiency, lower cholesterol, decrease risk of heart disease, stroke and diabetes, promote other heart-healthy habits.

There are various types of physical activities that human beings can gain advantages from. It can be categorized into sports, conditioning, occupational, housework, or any other exercise, and also need to be structured, arranged, and organized in such a way that it would well serve the health purpose.^[1] One such activity is Dance.

Dancing is a well-liked and the most common type of physical activity among girls. Therefore, dance participation may be important to build health among youth.^[4] Dance is a type of physical activity accompanied with music of a certain tempo, rhythm and dynamics. It is performed in many different cultures and can make a significant contribution to the healthy-living agenda.^[5] Dance, with a structured and repetitive movement increases heart and breathing rates, thus enhancing the body's ability to take in, transport and use oxygen.^[6]

Because physical activity is increasingly executed in an organized manner, sport's role in society has become increasingly important over the years, not only for the individual but also for public health.^[7] Sport's main purposes are to promote physical activity and improve motor skills for health and performance and psychosocial development. Participants also gain a chance to be part of a community, develop new social circles, and create social norms and attitudes.^[7] Participation in sports activities has positive impacts on the fitness of the person. It increases the energy and stamina, helps control blood pressure, improves the blood lipid profile (cholesterol) helps to burn extra calories to maintain an ideal weight. Cardiovascular disease, also called heart disease, is an overarching term for a variety of diseases of the heart and blood vessels. These diseases

or conditions can include coronary heart disease, stroke, hypertension, and heart failure.^[8]

Dancing and sports are types of moderate to high intensity aerobic activities and they have positive effects on the cardiovascular system. Most of the studies conclude that engaging into dance and sports improves the cardiovascular fitness. As aerobic/anaerobic capacity increases, general metabolism rises, muscle metabolism is enhanced, hemoglobin rises, buffers in the bloodstream increase, venous return is improved, stroke volume is improved, and the blood bed becomes more able to adapt readily to varying demands.^[9] Participation in various dance and sports activities have shown to reduce the incidence of hypertension and can also reduce the cholesterol levels which can decrease the risk of developing CVD. There is lack of study conducted to assess the cardiovascular fitness amongst dancers and sport players. So this study is undertaken to observe and compare the cardiovascular fitness amongst the students involved in dance and sports activities.

AIM:

- To assess cardiorespiratory fitness in students involved in sport activities and dance.

OBJECTIVES OF THE STUDY:

- To measure cardiovascular fitness amongst the students involved in dance.
- To measure cardiovascular fitness amongst the students involved in sports.
- To provide an assessment of cardiovascular fitness in both the groups of population.

METHODS AND MATERIALS

Participants were screened for the inclusion criteria. Informed consent was obtained from the Participants after having told the Purpose of the study and the procedure involved in the study. The Sampling method used was Simple Random Sampling and a Sample Size of 40

Participants was categorized into two groups. One was the Students involved in dance and Second group was students involved in Sports. 20 Participants were included in each group of Population. Participants included in the study were Both men and women, Participants within the age group of 18- 25 years in Dr. APJ Abdul Kalam College of Physiotherapy, Students involved in dance (classical, western, Zumba, hip hop) for at least more than 6 weeks, 3 days/ week for 40-60 minutes, Students involved in sports (football, cricket, badminton, long tennis) for at least 6 weeks, 3 days/week for 40-60 minutes. Participants who were excluded were, Participants below the age group of 18 or above the age group of 25, Participants having preexisting respiratory conditions or symptoms like breathlessness, Participants having other cardiac conditions or chest pain while doing other exercises, Participants having a history of Congenital heart diseases or heart surgeries.

PROCEDURE

The Physical Activity Readiness Questionnaire (PARQ) was obtained from the Participants to rule out the symptoms like chest pain, dizziness, blood pressure, and other heart conditions. The step height was checked (12 inches) and metronome was set at 96 beats per minute.

Demonstration of the test was given to the Participants before starting the test.

Procedure- Demonstration by alternating stepping cadence was given to the Participants. In time with the beat step one foot up on the bench (1st beat), step up with the second foot (2nd beat), step down with one foot (3rd beat), and step down with other foot (4th beat). The Participants were allowed to Practice the stepping to the metronome cadence which was set at 96 beats per minute (4 clicks = one step cycle) for a stepping rate of 24 steps per minute. The participant stepped up and down on the platform at the given rate for a total of 3 minutes. The participant had to immediately stop on completion of test and they were to sit down. Starting within 5 seconds, the HR of the participant was calculated for one complete minute.

Scoring- The total one- minute post exercise heart rate is the subjects score for the test.

RESULT

Sr. No	Level Of Cardiovascular Fitness	Number Of Students Involved In Sports	Number Of Students Involved In Dance
1	GOOD	3 (15%)	0 (0%)
2	ABOVE AVERAGE	9 (45 %)	3 (15%)
3	AVERAGE	2 (10%)	7 (35%)
4	BELOW AVERAGE	4 (20%)	4 (20%)
5	POOR	1 (5%)	5 (25%)
6	VERY POOR	1 (5%)	1 (5%)

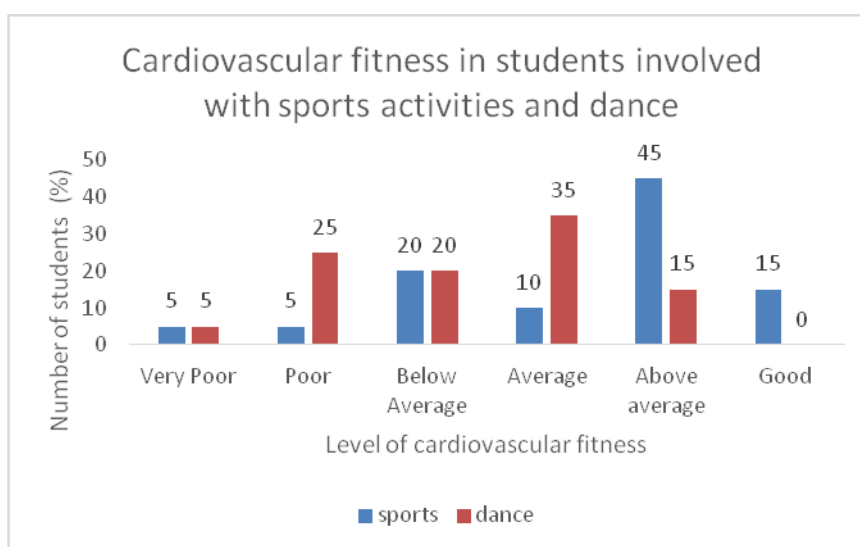


Figure 1: Cardiovascular fitness in students involved in sports activities and dance

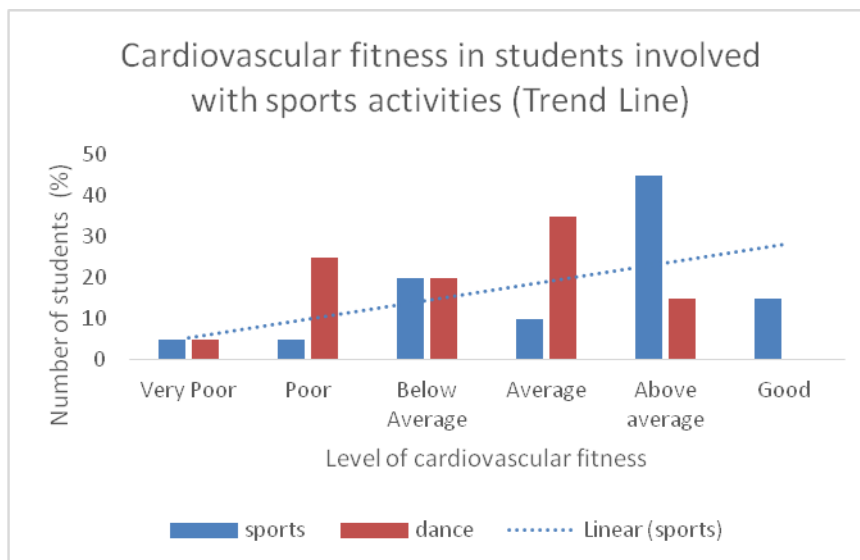


Figure 2: Cardiovascular fitness in students involved with sports activities (Trend Line)

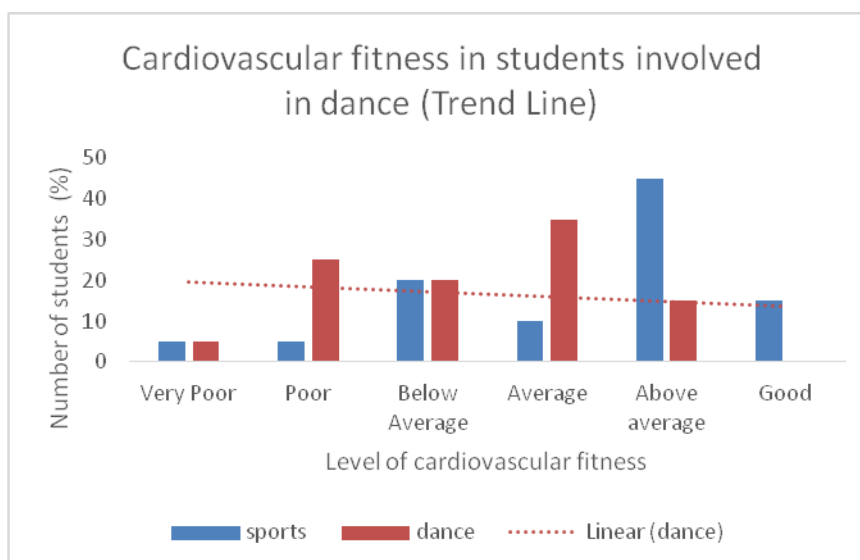


Figure 3: Cardiovascular fitness in students involved in dance (Trend Line)

GROUP A (Number of students involved in Sports) – The results suggest that there were 3 students (15%) out of 20 who had a good Cardiovascular fitness. 9 students (45%) had an above average fitness. 2 students (10%) who have an average fitness level. 4 students (20%) who fall in the below average Category and only 1 student (5%) having poor and very poor levels of fitness each.

GROUP B (Number of Students involved in dance) – The results suggest that there were no students involved in good category of fitness. 3 students (15%) have an above average fitness while 7 students (35%) out

of 20 had an average range of cardiovascular fitness. 4 students (20%) had below average level of cardiovascular fitness. 5 students (25%) who were having poor level of fitness and only 1 student (5%) suggestive of very poor level of cardiovascular fitness.

COMPARISON- On Comparing both the groups it is depicted that 12 students (60%) involved in sports have a fitness level in the good to above average category while no students involved in dance have a good fitness while only 3(15%) of them have an above average fitness level. On the other hand 7 students (35%) in the dancing group

have an average fitness while only 2 students (10%) in sports group fall in that category. Results further suggest that 6 students (30%) involved in sports have a below average to very poor fitness levels and this number increases to 10 (50%) when it comes to students involved in dance.

DISCUSSION

Results depict that there are no students involved in Sports as well as Dance who have an excellent range of Cardiovascular fitness, as it is only been seen in the professional athletes. Professional athletes often have a lower resting heart rate than others. The resting heart rate of an athlete may be considered low as compared to the general Population. That is likely because exercises strengthen the heart muscles. It allows it to pump greater amount of blood with each heartbeat. Hence more oxygen is also going to the muscles. This also means that heart would beat fewer times per minute at rest and during the exercises than it would in nonathletes.

Further the results suggest that 12 Students (60%) out of 20 involved in Sports have fitness levels ranging from good to above average category however only 3 students (15%) out of 20 involved in dance have an above average fitness with no student falling under the good fitness levels. This may be the suggestive of a good heart rate recovery in students involved in sports Compared to the students involved in dance. Heart rate recovery is defined as the decrease in heart rate at 1 minute after the cessation of exercise. What happens to the heart rate during exercise has long been considered to be due to the combination of Parasympathetic withdrawal and Sympathetic activation. The fall in the heart rate after exercise has been shown to be a function of the reactivation of the Parasympathetic nervous system.

Hence the effects of the Parasympathetic reactivation would be the factors causing a good recovery in sports. On the cessation of high physical activity,

heart rate decreases rapidly and more quickly than the arterial blood pressure. Thus, a rapid reduction in heart rate is a factor of good recovery in sports. Following moderate and longer periods of dynamic exercises, however a sharp fall in heart rate does not reach the previous resting values but continues to decrease slowly in an exponential manner over many minutes and longer depending upon the duration and intensity of exercise. During this period, there is a coordinated cardiac vagal-Sympathetic interaction, which ensures that there is sufficient cardiac output to prevent circulatory collapse whilst the dilated muscle vascular beds recover.^[10] Possibly, the students who are involved in sports have an established aerobic capacity to deal with an occurring lack of oxygen. A healthier heart can maintain the same cardiac output with a low heart rate by having a larger stroke volume.

One of the causes of having 7 dancers (35%) in the average level of cardiovascular fitness and only 2 students (10%) involved in sports in this category is that the dancers are not involved in the high intensity aerobic activities like the students involved in sports do. There are 10 students (50%) involved in dance who have below average to very poor fitness levels and only a count of 6 students (30%) involved in sports who fall into this category as the dancers do not focus much on the Cardiovascular training. Dance is moreover focused to increasing the flexibility than the cardiovascular endurance. On the other hand Students who are involved in Sports undergo a Sport Specific Cardiovascular training.

CONCLUSION

The Present study concluded, that the cardiovascular fitness levels of the students involved in sports is significantly good than the students involved with dance.

Acknowledgement: None

Conflict of Interest: None

Source of Funding: None

Ethical Approval: Approved

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How to cite this article: Malshe R, Gunjal SB. Assessment of cardiovascular fitness amongst college students involved in sport activities and dance. *International Journal of Science & Healthcare Research*. 2021; 6(2): 302-307. DOI: <https://doi.org/10.52403/ijshr.20210454>
