



BHARATHIAR NATIONAL JOURNAL OF
PHYSICAL EDUCATION AND EXERCISE SCIENCES
BNJPEES

DOUBLE – BLIND REFERRED JOURNAL



From the Editors' Desk

Whilst we are striving hard to manage the new normal post Covid pandemic, there is a great realisation on health fitness and wellness. The department of Physical Education, Bharathiar university with societal responsibility publishes this 12th volume of 'The Bharathiar National Journal of Physical Education and Sports Sciences'. In spite of the pandemic break the editorial team had put in tremendous efforts to bring out this volume of research works and articles.

The Bharathiar National Journal of Physical Education and Exercise Science (BNJPEES) is an open access quarterly journal, double blind refereed journal with ISSN – 0976-3678 which publishes original articles, commentary, editorials, review articles and case reports covering recent innovative high quality researches on sports published by the Department of Physical Education, Bharathiar University Coimbatore since June 2010. The purpose of this journal is to enrich the field of physical education and sport with literary base dynamic latest research and articles. The field of sport and physical education with its dynamic nature needs a literary back up to keep the masses informed of the latest changes that are happening across this field. Since the Sports Climate is experiencing a wide range of change and is very much essential that we stretch ourselves to meet the key challenges on sports and games. Since the inception of the new editorial team from 2019, the journal has been upgraded online to increase the vicinity across the globe and provide a wider citation opportunity scaling up research heights. The journal has been indexed with google scholar, world cat, core and road.

We appreciate the research scholars for stepping forward to get their works published in our university journal. Volume 12 has brought out 40 articles in total out of the 73 articles submitted. After thorough plagiarism check using Ithenticate and Turnitin, the articles are subjected to a double blind referee system for review. Based on the reviewers report the articles are accepted. Being a quarterly journal in this volume we have four issues of 10 articles each. We are also working hard towards quality control of the articles in par with the international standards.

From the editorial desk we submit to you that BNJPEES, with immense pleasure is working for the development of research in the field of Physical education and sports sciences which is the need of the hour. We encourage the authors to submit evidence based realtime research results which would benefit the society.



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Publisher's Desk

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**BHARATHIAR NATIONAL JOURNAL OF PHYSICAL
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Comparative study on flexibility and balance between dancer and non-dancer boys

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Abstract

Dance is a form of art that normally involves rhythmic movement of the body and accompanied with music. The author being a dancer in fervour and passion as well as an aspirant of the profession Physical Education strived to conduct the study bearing the title of Comparative Study on Balance and Flexibility between Dancer and Non-Dancer Boys. The researcher selected 30 boys who are regularly involved in 15 Dancer and 15 Non-dancer boys rather sedentary on the basis of purposive stratified random sampling from Bharathiar University students as the subjects of his study. He incorporated Sit and Reach test for assessment of Flexibility and Stork Stand Balance for assessment of tests Balance respectively. With respect to data analysis initially descriptive statics like mean SD and range and further paired sample T test was conducted to ascertain the degree of difference between the means with the help of SPSS soft ware. Data analysis proved significant difference between the Dancer and Non-dancer Boys both with respect to flexibility and Balance. In both the cases the Dancer boys proved to be better though the differences were not statistically significant. Thus, the author arrived at the conclusion that dance involving passion, strength, stamina, enthusiasm, rhythm, amusement and many more could be a wonderful fitness activity similar to other fitness activities like jogging, running, cycling, swimming etc..

Keywords: Flexibility, Balance, Dancer, Non-dancers Boys, Bharathiar University Students.

Introduction

Dancer: A Moving

Dance is full of the athleticism of sports. For example, did you know that the amount of energy needed to perform a full ballet routine is around the same as the amount of energy needed to play two full football games or run eighteen miles? If that's not "physical exertion," I don't know what is! A dancer needs to be strong, and they need to be strong in every single one of their muscle groups. Dance is a workout, and not an easy one! Dance involves many of the same things that other sports do. This includes (but is not limited to) activities like: stretching, jumping, and running. It takes a lot of strength and skill as a dancer to make what you do look effortless. Moving on to the

"skill" portion of the definition of sport, it's hard to claim that dance doesn't take skill in the same way that other sports do. Dancers can do things that some other athletes couldn't even dream of doing! Just like any sport, dance takes plenty of practice to hone your skills. If someone has put in years and years to dance, it's fair to say they have as much legitimacy as anyone who's put the same number of years into a sport like football. In fact, the kinds of skills that are needed for a dance form like ballet are very popular with many football players. (Steve McLendon,).

Statement of the Problem

The purpose of the study was to compare the flexibility and balance between dancer and non-dancer boys.

Methodology

Selection of subjects

The study was based on the comparison of flexibility and balance on dancer and Non-dancer Boys. Fifteen dancer and fifteen Non-dancer Boys was selected as subjects, and their age ranged between 20 to 23 years.

Selection of variables

As per the availability of literature and the personal knowledge of the investigator, the following variables were selected for the present of study.

TABLE I Selection of variables and Test items

S.NO	VARIABLES	TEST ITEMS
1	Flexibility	Sit and Reach Test
2	Balance	Stork Stand Balance

Statistical analysis

To compare the flexibility and balance between dancers and Non-dancer independent "t" test was used. The level of significance was set at 0.05 level of confidence.

The table II reveals the computation of t ratio on Flexibility and Balance between dancer and non-dancer. The mean value of flexibility for dancer and non-dancer were 23.8 and 21.5 respectively.

The mean value of balance for dancer and non-dancer were 29.01 and 25.83 respectively. Since, it was found to be statistically significant.

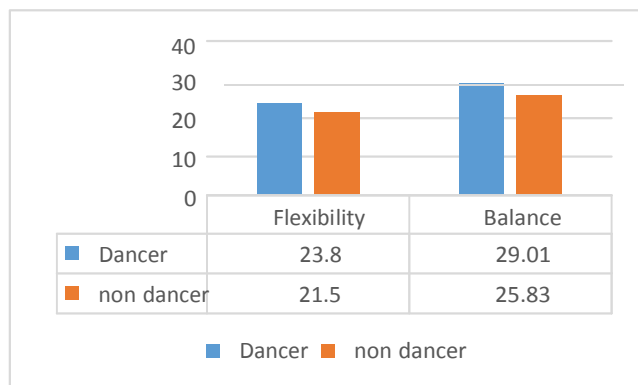
From the result it is speculated that there is significant difference flexibility and balance between dancer and non-dancer.

Discussion on Findings

In this phase of the project report the tables of statistical calculations and related discussion have been presented. Studies report that Dancer has been shown to have a positive effect in human life. A good starting point is to design exercises in which dancers are encouraged to jump in a neutral position without emphasizing artistic skill, but instead simply focusing on jumping higher. Once the dancers have gained greater understanding of how to elevate themselves, they can bring correct dance technique back into the movements while trying to maintain as much height as possible". An Italian study in 2006 has shown that dance is a very good exercise for heart patients compared to other aerobic exercises.

TABLE II Summary of means and independent t test for comparison of flexibility and balance on dancer and non-dancer

S. No	Variables	Groups	Numbers	Mean	SD	"T" ratio
1	Flexibility	Dancers	15	23.8	2.42	6.057*
		Non-dancers Boys	15	21.5	2.18	
2	Balance	Dancers	15	29.01	8.78	3.846*
		Non-dancers Boys	15	25.83	8.12	



Conclusion

1. It was concluded that there was a significant mean difference in flexibility between dancer and non-dancer.
2. It was concluded that there was significant mean difference in balance between dancer and non-dancer.
3. Further it was concluded that the dancers possess better flexibility than Non-dancer.
4. Further it was concluded that the dancer possesses better balance than Non-dancer.

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Conflict of interest

None of the authors have any conflicts of interest to declare.

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Dance and walking: towards resurgence to healthy life during Covid lockdown

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Abstract

Health is important asset for human kind. And non-impact exercise can really advisable to promote cardiac health during the Covid-19 lockdown. The purpose of this study was to find out the effect of dance and walking exercise on Resting Heartrate (RHR), VO₂ max and Body Mass Index (BMI). To achieve the purpose forty-five females (mean age was 30 ± 1.3 years, BMI 26.37 ± 1.36) were purposively selected and divided in to Bharathanatyam dance group (BD, n=15), Health related walkers (HW, n=15) and Control Group (n=15) from Jaffna, Sri Lanka. Bharathanatyam (BD) dancers had been dancing 90 to 120 min per day; 3 days per week over a period of minimum 12 weeks. and health walkers were walking 40-60 min (Covers 4-5 KM) /3 time / week/over the period of 12 weeks. Data were collected on resting heart rate (RHR) using Palpating the radial artery for full one minute for each subject, VO₂ max by Queen's step test [McArdle et al. (1972)] and BMI by Adolphe quetelet formula. Each test conducted on one day after another day. The collected data were subjected to statistical treatment using paired sample "t" test to find out the training effect. In all the cases 0.05 level of confidence was fixed to test the significance, which was considered as appropriate. The result shows that Bharathanatyam Dancers and walking exercise are positively influence on RHR, VO₂ max and BMI. Hence it was concluded that, less impact physical activity such as bharathanatyam dance and walking are best choice to maintain safest health status during covid lockdown.

Keywords: Resting Heartrate, BMI, VO₂ max, Bharathanatyam

Introduction

Frequent technological advancement in all aspects reduces the human efforts that mainly affects the health status. Covid lockdown is another reason that leads to sedentary behaviour such as long-time sitting, too much eating and physical inactivity contributes harmfully to cardiometabolic health of the peoples which leads to premature mortality. (Dempsey PC. et.al. 2014). Physical inactivity is considered a risk factor for developing non- communicable disease such as cardiovascular disease, diabetes, osteoporosis, and other hypokinetic diseases (Dempsey PC, et.al. 2014). Exercise is an important approach to prevent chronic diseases and promote lifelong health of the peoples. Heart and respiratory system are key functional system which mostly affected by physical inactivity and sedentary lifestyle. The cardiorespiratory system plays an important role

in providing the energy required by different body systems for metabolism. Hence the cardiorespiratory health and endurance are most important for human kind to extend healthy life. Therefore, short and long duration exercises are necessary to improve cardio respiratory system physiologically and physically.

Dance is an aesthetic graceful action, and its unique form of movement that inspires creativity, motivation, self-discipline, and self-awareness. It is more than a physical activity which strengthen the body and mind. Through dance, movement is transformed into a purposeful phrase of action that encompasses physical, emotion, and cognition. Dance uses "the movement of the body in its reactions to the environment" (Vanleena, et.al.1996). Every dance, no matter what style, has something in

common. It not only involves flexibility and body movement, but also contribute to cardiovascular health, strength and neurological health.

Regular dance practice improves great strength, kinesthetic awareness, control over weight and balance in motion, and endurance which is developed by prolonged dance training. The dance training also develops awareness of space, a strong sense of rhythm, and an appreciation of music. Grace, fluidity, and harmony of body are also frequently desired in the dance training. Therefore, the dancing activity make the physique beauty.

Walking is a cyclic open kinetic physical activity which reduces the sedentary behavioural diseases. And, improves the body enormously on cardiorespiratory endurance, VO₂ max, Muscle tonus, and reduces lower back pain. The bicyclic activity has huge benefits and good alternative for sedentary peoples. Walking exercise moves the body's bigger postural and stability muscles which can increase energy expenditure above the resting state, and improves physical health by improving cardiac fitness, postural muscle strength and physical performance. Also, an important tool to prevent accumulation of fat. Regular walking stimulates metabolic activity, thereby controlling body weight and prevent from hypokinetic diseases. Multiple advantages are founded from walking interventions (Hanson S, Jones A. 2015) including changes in waist circumference (Lin YP et.al.2018), improvements in aerobic fitness (Serwe KM et.al. 2011), reduction in body fat and improvements in overall health (Amiri H et.al. 2013).

Bharatanatyam: is a sacred traditional dance form codifies into a series of rules determining the gestures used to depict different themes and emotions. It is oldest of all classical dance forms in India and Sri Lanka. The general Etymology of Bharathanatyam is BHAVA (expression) + RAga (music) + TAAla(rhythm) + NATYAM (dance). The variety and style of the dance and musical accompaniment provide to the people tastes and performing them. Many learn as a hobby and few make it as a profession. Whether taken as a hobby or a profession it certainly contributes to huge health benefits.

VO₂ max is the amount of oxygen utilize by one kilogram of muscle in one minute. The long Term Bharathanatyam dance and walking exercise can help to make the muscles that expand the lungs stronger and more efficient which can increase the expansion of breathe in more air with increase number of capillaries around the alveoli enabling to absorb oxygen in the blood quicker (Sabaanath,S. 2014). Exercise at various tempo increases the body tissues utilizing oxygenated blood, capillary density and improvement in lymphatic flow.

Physical inactivity causes overweight and obesity that increases blood pressure. High blood pressure is the main reason for heart attack and strokes. And excess pound of weight also increases rate of high cholesterol, high blood sugar, and heart disease. Resting Heartrate is a best tool to assess cardiac health. And, cardiorespiratory endurance is an ability of the heart and lungs and muscles works effectively over an extended period of time. The aerobic nature of activity is a best way to improve cardiorespiratory endurance. Hence, the bharathanatyam dance and walking exercise are the finest activity that meliorate the cardiac system and postural muscle strength. Bharathanatyam dance and walking exercise strengthen muscles at the back that supports to promote quality human movement and reduces the back injuries.

Walking and bharathanatyam dance are the best functional exercise which perfectly activate the postural muscles such as gluteus and lower back muscles. The weakness of lower back and gluteal muscles are the main reason for fatigued reciprocal inhibition due to the long sitting hours during covid lockdowns. This may cause upper gluteal syndrome or athletic hernia which mainly due to gluteal amnesia. Doing less impact exercise such as bharathanatyam dance and walking exercise specially strengthen the isometric strength of the postural muscle thus lead to efficient human movements and healthier life.

Objective of the Study

Healthiness is precious asset in 21st century. For keeping up the health status, less impactful physical exercise is important. In

modern scenario peoples are spends more time in setting. Thus, may harm the postural muscles which lead to postural muscle weakness and injury. And also physical inactivity is another cause to affect the cardiac health and human performance. Most of the peoples are not aware the benefits of walking and traditional bharathanatyam dance. The bharatha sage created bharathanatyam dance as traditional dance with comprehensive scientific background. Further, peoples cannot hit the playfields and gyms to stay healthy during covid lockdown. Hence the less impact exercise such as dance and walking are the best option to sedentary peoples during lockdown. Therefore, the present study intent to assess the effects of dancing and walking exercise on Resting heartrate, VO2 max, and BMI among sedentary population.

Methods

To achieve the purpose forty-five females (mean age was 30 ± 1.3 years, BMI 26.37 ± 1.36) were purposively selected and divided in to Bharathanatyam dance group (BD, n=15), Health related walkers (HW, n=15) and Control Group (n=15) from Jaffna, Sri Lanka. Bharathanatyam (BD) dancers had been dancing 90 to 120 min per day; 3 days per week over a period of minimum 12 weeks. and health walkers were walking 40- 60 min (Covers 4-5 KM) /3 time / week/over the period of 12 weeks. Data were collected on resting heart rate (RHR) using Palpating the radial artery for full one minute for each subject, VO2 max by Queen's step test [McArdle et al. (1972)] and BMI by Adolphe quetelet formula. Each test conducted on one day after another day. The collected data were subjected to statistical treatment using paired sample "t" test to find out the training effect. In all the cases 0.05 level of confidence was fixed to test the significance, which was considered as appropriate.

Results

The table I shows the pre and post test result of the resting heartrate among experiment and control group. The baseline (pre-test) data of the all three groups are nearly same and after the intervention the resting heartrate has been

significantly improved to dance and walking group.

The table II shows the pre and post test result of the VO2 Max among experiment and control group. The baseline (pre-test) data of the all three groups are nearly same and after the intervention the VO2 Max has been significantly improved to dance and walking group. The average VO2 max value of the participants after the training is 50 ml/kg/min, which means all the participants are having above average VO2 max level. This is the indication of good health status of the participants.

The table III shows the pre and post test result of the BMI among experiment and control group. The baseline (pre-test) data of the all three groups are nearly same and after the intervention the BMI has been significantly improved to dance and walking group. Further the BMI value of the control group continually increasing. Which means physical inactivity increases the bodyweight (increasing 0.4 BMI rises 1 Kg body weight).

Discussions

Physical inactivity during the Covid lockdown leads to low level of energy expenditure and prolonged sitting or standing in a most of the day. Increasing sedentary lifestyle link with low level of physical movement which potentially affects the healthy life. Intermittent low impact exercise help people reduce the risk of hypokinetic disease and premature death rate. Low impact joyful exercise is appropriate to sedentary peoples to get involve easily and improving physical activity adherence. Walking and dancing are the less impact exercise which peoples can easily adapted and thus diminish sedentary lifestyle. The nature of the activity leads the participants perform with joyful and minimize overstress to the joints. High stressful activity loads the resistance on the joints which increases the high level of cortisol secretion. Physical and mental stress increases cortisol level in the blood.

Variable	Group	Period of Test	Mean	SD	SE	"t"
Resting heartrate	Bharathanatyam Dance	Pre-test	71.4	2.16	0.55	9.28*
		Post test	68.3	2.13	0.56	
	Walking	Pre-test	71.93	2.31	0.6	7.07*
		Post test	68.0	2.24	0.58	
	Control	Pre-test	71.87	2.23	0.58	0.41
		Post test	72.0	2.3	0.6	

*Significant at .05 level of confidence. with df (1, 14) is 2.14

Variable	Group	Period of Test	Mean	SD	SE	"t"
VO2 Max	Bharathanatyam Dance	Pre-test	47.7	0.84	0.22	9.41*
		Post test	50.20	1.09	0.28	
	Walking	Pre-test	47.50	0.90	0.23	8.75*
		Post test	50.21	1.81	0.28	
	Control	Pre-test	47.50	1.07	0.28	0.31
		Post test	47.60	1.33	0.34	

* Significant at .05 level of confidence. with df (1, 14) is 2.14

Variable	Group	Period of Test	Mean	SD	SE	"t"
BMI	Bharathanatyam Dance	Pre-test	26.30	1.15	0.29	14.39*
		Post test	24.08	1.16	0.30	
	Walking	Pre-test	26.37	1.34	0.34	10.84*
		Post test	24.21	1.27	0.32	
	Control	Pre-test	25.93	1.36	0.35	0.8
		Post test	26.3	1.43	0.37	

*Significant at .05 level of confidence. with df (1, 14) is 2.14

The hormone cortisol is insulin resistance which increase the accumulation of adipose tissue thus leads to narrowing and hardening the arteries wall. Narrowing arteries causes the blood to pumped forcefully that strains the heart. So, the heart rate, VO₂ max, and BMI are the best indicators for assessing general fitness of the sedentary peoples.

Past thirty years maximal aerobic capacity (VO₂max) has gear up as a powerful predictor of unhealthy outcomes such as cardiac disease and all type of non-communicable disease (Keteyian SJ, et.al. 2008., Myers J, et.al. 2002). During the lockdown, gyms are ceased and peoples can't tie-up their shoes for outdoor sports. So, non-impact homemade exercises are advisable to hold the fitness, healthy body weight as well as mental equilibrium.

Dance involves greatest efficient movement of the body, usually rhythmic graceful action to music that use to express thoughts. The classic dances are performed to social interaction or presented in a spiritual or performance setting. The finding supports to the objective of the study, that the dance as an activity promote aerobic and physical working capacity. Thus, lead to improve the health status of the participants. The dance movements may be sometimes without significance in themselves. But the bharathanatyam is a prominent feature of the aesthetic, artistic and graceful form of dance also enhances the fitness. The performance of the dancer is depending on duration, intensity and frequency of dance they undergo. However, regular dance training is essential to maintain and develop the dancer's fitness. The energetic demands during the dancing sessions stands in very high rather than walking. Bharathanatyam dance movements uses larger postural muscles that need higher rate of energy to perform combination of isometric and isotonic movement. In bharathanatyam dance, the fundamental and foremost essential movement is aria mandi (toe opened half squat) which uses combination of isometric

and isotonic movement in both sides. Thus, improves the reciprocal inhibition of the lower body. The long time sitting during Covid lockdown mainly affect the reciprocal inhibition that lead to poor muscular performance. Muscular efficiency and effectiveness are the main key to improve VO₂ max and Cardiorespiratory endurance. Dance practice increases requirements for oxygen. Because oxygen defuse in skeletal muscle are increased due to extended period of dance practice, thus speedup removal of metabolites and carbon dioxide (Sabaanath,S. 2018). Therefore, low impact exercise such as bharathanatyam dance and walking exercise highly appreciable to improve the base level physical performance.

Walking is the idyllic form of physical activity which to improve health and fitness for non-sportive population (Hardman AE and Morris JN, 1998). It is low impact open kinetic exercise progressively strengthen the cardiac health as well as postural muscle strength. The literature indicates that changes in cardiorespiratory endurance, VO₂ max are directly related to the subject's initial fitness level and the frequency, intensity and duration of the training programme. Some aerobic type of activities is close association with VO₂ max (Hemple and wells, 1985). It has been shown that arm work performed above the head produces a higher VO₂ max than the work performed bellow head level, due to an increased sympathetic tone (Parker et-al 1989). During the bharathanatyam dance practice dancers moves their hands above the head, thus may also leads to have higher VO₂ Max than the walkers in the present study. Bharathanatyam dance has huge potential to promote physical and physiological qualities. During the dance practice the dancers are sitting half squat position and moving upper body in different planes. Thus, may increase the energy cost of the working muscle and increase the strength of the weakest postural muscles such glute, hamstring, abdominal muscles and piriformis etc.

According to Hamilton et.al (1989) aerobic dance and continues training can be intense enough to promote aerobic capacity. The improvement in cardiovascular fitness is depends on mode, frequency, duration, intensity, and rate of progression of exercise (Kirkendall DT & Calabrese LH-1983). Finally, any activity in aerobic nature extended up to 30-40 min in a moderate intensity is more than enough to keep the safest health status. However, the nature of activity should not stress too much to the joints and physiological system.

Conclusions

The simple recommendation can be provided based on the previous literature and present result that the bharathanatyam Dance and walking exercise are the simplest joyful activity which enrich the basic fitness in respect to RHR, VO₂ max and body weight during covid lockdown. Hence it was recommended that non-impact exercise such as dance and walking are the first and foremost activity need to undergo by sedentary peoples to resurgence to healthy life during any lockdown circumferences.

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Impact of speed based skill training after ankle weight resistance training on selected physical and skill performance of men footballers

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Abstract

The study was designed to know about the importance of speed based skill training after ankle weight resistance training on selected physical and skill performance of men footballers. In order to achieve the study, 40 men footballers were selected from Bharathiar university department and affiliated colleges, of Bharathiar university coimbatore, their age ranged between 18 and 25 years. The selected population were divided into two equal groups consist of 20 each. The group I (n=20) was considered as experimental group and group II (n=20) was considered as control group. The investigators did not made any attempt to equate the group. The control group was not given any treatment and the experimental group was given speed based skill training after ankle weight resistance training for three days per week, for a period of twelve weeks. Explosive power was assessed by standing broad jump test and unit of measurement was in meters and kicking ability was assessed by warner soccer test and unit of measurement was in meters. The collected data on selected physical and skill performance variables was analyzed by using 't' test at 0.05 level of confidence. The result of the present study explored that the explosive power and kicking ability significantly improved due to the speed based skill training after ankle weight resistance training on selected physical and skill performance of men footballers.

Keywords: Speed based skill training, ankle weight resistance training, explosive power and kicking ability

Introduction

Ankle weight are a convenient and cheap method of adding resistance to your leg and abdominal workout resistance training also know as strength or weight training is an external part any exercise region. Ankle weights are commonly used during a variety of exercises with the goal of enhancing the benefits of the workout. While there are certainly benefits to the use of these training aids, their advantages are limited to certain targeted areas. Some of the more common uses of ankle weights may actually hurt rather than help. Ankle weights do make the large muscles of the lower body, such as quads, gluteus and hamstrings, work harder to perform exercises that you normally do. Used as part of your strength training program, they can be an effective tool. For those who may not have access to free weights or machines to build strength, they can be

a helpful addition to that part of your workout. Going out and buying ankle weights to enhance your exercise routine is one option for building strength, but it does come with potential negatives. To improve the quality of a cardiovascular program, there are other options out there. Running or walking up and down stairs, or taking your jog to an area where there are hills to run are both solid options for providing the additional challenge you seek.

The main benefit derived from the use of ankle weights comes when they are used for strength training targeted at the larger muscles of the legs. For someone who is performing leg lifts or knee raises of different kinds for the purpose of strengthening the lower body, ankle weights work like free weights for the legs. Even at two or five pounds, there is a tangible benefit to the leg

muscles when adding weight to those exercises. Developing speed makes ever more frequent use of the various technical exercise carried out with a ball. This is so because the ball makes the exercise more interesting, and brings them closer to match play. This helps to maintain the player's zest for the training work (ARPAĐ CSANADI 1965).

The modern concept of speed embraces those abilities which make it possible for football players to execute the most suitable action for a given situation as rapidly as possible. In some circles speed is often considered in a very narrow sense, as if it only consisted of speed in running. The ability to run fast is, of course, an indispensable weapon in a player's armoury, but is not sufficient in itself. There are players who can run fast, but who have great difficulty in starting, stopping, or changing direction. And how often a favourable situation arises where a player quickly grasps the situation, but is slow to act and so fails to exploit the opportunity.

But there is need for speed in football for other reasons, too. We must not disregard the fact that speed is the basis of taking-off effectively, that it is the basis of elasticity. Of course, we must not overestimate the role of sheer physical speed either. A halfback may very well recognize quickly what the simplest solution would be to anticipate the forward's attempt to break away, but be incapable, technically, of the rapid action the situation requires.

The quick recognition of a situation that has materialized, the rapid forwarding of impulses along the nerve tracks to initiate the necessary action, and the speedy execution of the concrete action itself is a valuable attribute. These qualities are necessary during every moment of play, from the first to the last. Practical experience shows that the standard of speed capacity of certain, usually not well prepared, players fluctuates greatly. In principle, they execute identical movements more slowly at the end of the playing time than at the beginning, or when they must make use of their speed capacity again at short intervals. A well-prepared player, who also possesses suitable so-called speed endurance, is able to execute certain movements over nearly

the same duration of time, both at the beginning of the playing period, and at the end.

Many experts regard speed as a capability which is "inborn", one which cannot be developed. It is true that the extent to which it can be developed is not nearly so great as that of endurance or strength, but with correct training the speed of thinking, the ability of the nerve tracks to conduct stimuli may be stepped up, the suitability of the muscles and joints for carrying out the commands may be improved (ARPAĐ CSANADI 1965).

Methodology

In order to achieve the study, 40 men footballers were selected from Bharathiar university department and affiliated colleges, of Bharathiar university coimbatore, their age ranged between 18 and 25 years. The selected population were divided into two equal groups consist of 20 each. The group I (n=20) was considered as experimental group The group II (n=20) was considered as control group. The investigators did not made any attempt to equate the group. The control group was not given any treatment and the experimental group was given speed based skill training after ankle weight resistance training for three days per week, for a period of twelve weeks.

Design

The evaluated physical and skill parameters, Explosive power was assessed by standing broad jump test and unit of measurement was in meters and kicking ability was assessed by warner soccer test and unit of measurement was in meters. The parameters were measured at baseline and after 12 weeks of speed based skill training after ankle weight resistance training were examined.

Training Program

The training program was lasted for 60 minutes per session in a day, 3 days in a week for a period of twelve weeks duration. These 60 minutes included 5 minutes warm up and 5 minutes warm down remaining 35 minutes consists of 15 minutes ankle weight resistance

training and 20 minutes for speed based skill training. Every two weeks of training 5% of intensity was increased from 65% to 75% of work load. The training load was increased from the maximum working capacity of the subjects during the pilot study. The collected data on above mentioned parameter due to impact of speed based skill training after ankle weight resistance training was analyzed by using 't' test to find out the significant improvement between pre and post. In all cases the criterion for statistical significance was set at if 0.05 level of confidence ($P < 0.05$).

Table - I reveals that the computation of 't' ratio between mean of pre and post test on explosive power of men footballers. The mean values of pre and post test of experimental group and control were 2.50, 2.78, 2.38 and 2.44 respectively. Since, the obtained 't' ratio 12.57 *and 1.82, the required table value 2.09, for the degree of freedom 1 and 19 at 0.05 level of confidence. The results clearly indicated that the explosive power significantly improved for experimental group when compared to control group.

Table - II reveals that the computation of 't' ratio between mean of pre and post test on kicking ability of men footballers. The mean values of pre and post test of experimental group and control were 38.14, 38.31, 34.77 and 34.50 respectively. Since, the obtained 't' ratio 12.05 *and 1.77, the required table value 2.09, for the degree of freedom 1 and 19 at 0.05 level of confidence. The results clearly indicated that the kicking ability significantly improved for experimental group when compared to control group.

The following bar diagram shows the mean values of pre test and post test on explosive power of experimental group and control group.

Discussions on Findings

The results of the study indicated that the selected physical and skill performance such as explosive power and kicking ability were improved significantly after twelve weeks of speed based skill training after ankle weight resistance training.

Table – I Computation of 't'- ratio between pre and post test means of experimental group and control group on explosive power (in meters)				
Group		Mean	Standard deviation	t- ratio
Experimental Group	Pre test	2.50	0.280	12.57*
	Post test	2.78		
Control Group	Pre test	2.38	0.059	1.82
	Post test	2.44		
Significant at 0.05 level of confidence (2.045)				

Table – II Computation of 't'- ratio between pre and post test means of experimental group and control group on kicking ability				
Group		Mean	Standard deviation	
Experimental Group	Pre test	38.14	0.177	12.05*
	Post test	38.31		
Control Group	Pre test	34.77	0.268	1.77
	Post test	34.50		

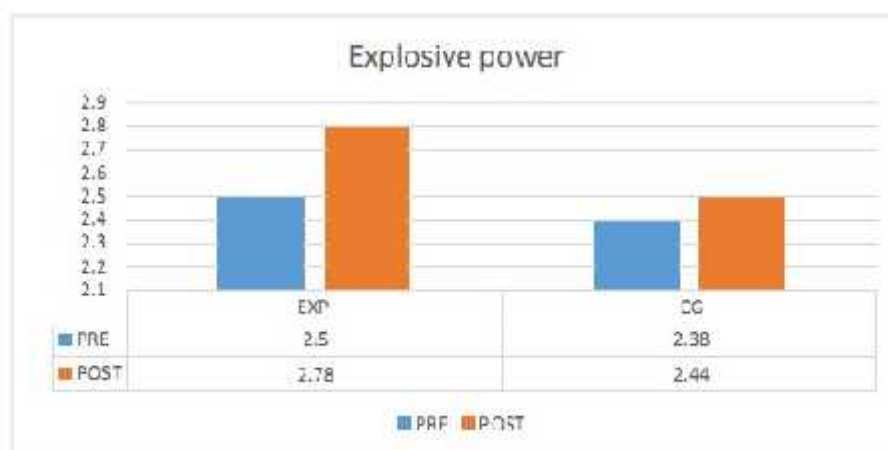


Figure1

The changes in the selected parameters were attributed the proper planning, preparation and execution of the training package given to the students. The findings of the present study had similarity with the findings of the investigations referred in this study. UfukSekir. (2003) investigated the effects of isokinetic exercise on strength, joint position sense and functionality in recreational athletes with functional ankle instability (FAI). Jullien., et.al (2008) studied the A Short Period of Lower Limb Strength Training Improve Performance in Field-Based Tests of Running and Agility in Young Professional Soccer Players. Wimmeret al (2011) studied the Speed Training Drills with Ankle Weights. Training with a string ladder wearing ankle weights will help improve foot speed and agility. Saltzman, et al (2004) studied the effect of Agility Ankle Prosthesis Misalignment on the Peri-Ankle Ligaments In the Agility total ankle replacement system, motion is constrained by the implant's articulating surfaces and the peri- ankle ligaments Mohanasundaram (2013)

S.A.Q training had significant effect on agility. Rajkovic, (2014) confirm a positive influence of SAQ training on certain parameters of speed and explosiveness of football players. Manikandan (2014) there was a significant difference on selected motor fitness components such as speed and leg strength between SAQ drills group and control group. Subramainiam (2014) there was a significant improvement in the speed and breath holding time for plyometric training group when compared with the control group.

Milanovic (2013) SAQ training is an effective way of improving agility, with and without the ball, for young soccer players and can be included in physical conditioning programme. Haldankar (2014) recommended soccer-specific strength training programs for twelve weeks as part of pre-season training programme for young soccer players. Thomas (2005) specific testing and training procedures for each speed component should be utilized when working with elite players.

Conclusions

1. It was concluded that twelve weeks of speed based skill training after ankle weight resistance training produced significant improvement over explosive power of college men footballers.
2. Twelve weeks of speed based skill training after ankle weight resistance training produced significant improvement over kicking ability of college men footballers.
3. Further, it was concluded that speed based skill training after ankle weight resistance training is appropriate training period to bring out desirable changes over physical and skill performance variables.

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Chocolate Milk: A Pre-Exercise Drink

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Abstract

Purpose: The purpose of this study is to examine the effect of chocolate milk as a pre-exercise supplement in field setting in male participants. At this end of the investigation, we tested the effects of commercially-available drinks on glucose in a field-based experiment with male participants. **Methods:** eleven male participants have volunteered for this experiment. Measure included in this study is glucose level. Participants were requested consume chocolate milk before the start of the exercise. After 20 (twenty) minutes from the consumption of chocolate milk, the participants were instructed to do exercise for 45 (forty-five) minutes. **Results:** A 2 (group) × 4 (time) repeated measures ANOVA showed there was a significant interaction of glucose score between groups. At the beginning the glucose level for both groups (Test I), glucose level is increased almost 11.24% in Test II which is taken after 20 minutes from the Test I. Test III which is taken immediately after exercise 45 minutes from the glucose level is increased 5.70% when compared to no drink. Test IV is taken immediately after 20 minutes of rest the glucose level is increased 7.14% compared no drink. **Conclusion:** This is the first study comparing the impact of Chocolate Milk as pre exercise drink on male participants in field base experiments. Chocolate Milk had a more positive effect on glucose should be considered as pre-exercise drink. Doing with more participants and longer days of experiments will give a clear evidence in futuristic research.

Keywords: Pre-exercise supplements, Chocolate milk, Glucose and A 2 (group) × 4 (time) repeated measures ANOVA

Introduction

Milk may be the superior option for retaining fluid and therefore a preferred recovery drink. The combined factors of CM's nutrient profile promote the drink as an excellent post-exercise supplement for replenishing muscle glycogen, building muscle, and re-establishing positive fluid balance. Additionally, CM provides a low-cost, readily available option when compared to other supplements that may provide the same physiological impacts. There are, however, a number of limitations to the existing research. First, the studies have been primarily limited to highly controlled laboratory settings. Ferguson-Stegall, et.al. (2011), Rustad PI et.al.,(2016) Chocolate Milk (CM) had a more positive effect on strength development and should be considered an appropriate post-exercise recovery supplement for adolescents when compared to

carbohydrate drinks (Born et.al., (2019). the effect chocolate milk solution (CMS) and a raw milk solution had on less discomfort and lower extremity induced delayed onset of muscle soreness (DOMS) Hatchett et.al. (2016). Consumption of chocolate milk act as a post-exercise drink appears to be maximum for exercise recovery and may it reduce the indices of muscle damage. Pritchett and Pritchett (2012). Studies suggest that chocolate milk is an effective recovery aid between two exhausting exercise bouts Karp et.al.(2006).

Research Methods Participants

Participants were recruited from Namaskrihanpatti, a village near to sivakasi when researcher expressed his view 10 participants

volunteered for this study. The participants who were volunteered for this study have zero lactose tolerance. The study was explained clearly to the participants before beginning of the experiments. The participants age range between 18 to 25 years. Before the beginning of the study all participants provided written consent form.

Protocol

In order to achieve the purpose of the study, the volunteered participants were requested to assemble in play ground around 6 'O' clock in the morning. It has been instructed that the participants should come in proper attire for exercise. After all the participants were assembled once again the researcher explained about the experiments and the test would be taken. No participants had a phobia of needles as the study consist taking blood samples with needles.

Collection of Data

To get the appropriate data, there were four times test would be taken for this experiment. After reaching the ground, all the participants were underwent for the test.

Measure Heart Rate

To measure heart rate with help of pulse oximeter were used for this study.

Measure Glucose level

To measure heart rate Glucometer were used for this study Test measures. The experiments required two days to get the data to fulfill this study. In day one and day two the testing procedure will be the same. On day two, the participants were requested to drink Cavin's chocolate milk which was readily available in market.

After the Test I the participants were requested to take active rest after 20 minutes test II will be taken. Followed that second Test, The participants were requested to undergo physical exercise for 45 minutes. Immediately after the completion 45 minutes of exercise, test III would take and test IV would take 15 minutes after Test III.

On day two between Test I and Test II commercially available (cavins chocolate milk) flavor chocolate milk drink given to the participants.

Experimental design and Statistical Technique:

Statistical Analysis Statistical testing was conducted using Microsoft excel, using an alpha level of $p < 0.05$ for all analyses. Training variables glucose level were analyzed using 2x4 Repeated measures of ANOVA. A two- factor (2x4) analysis of variance was conducted to evaluate the effects of the chocolate milk on glucose level of male participants. The two independent variables in this study are chocolate milk and testing at four different times (Test I, Test II, Test III & Test IV) on the glucose level. The dependent variable is the score on the glucose measure, with higher scores indicating higher levels of glucose.

A two- factor (2x4) analysis of variance was conducted to evaluate the effects of the chocolate milk on glucose level of male participants. The two independent variables in this study are chocolate milk and testing at four different times (Test I, Test II, Test III & Test IV) on the glucose level. The dependent variable is the score on the glucose measure, with higher scores indicating higher levels of glucose. From this table the mean value of consumption of Chocolate milk drinks were 97.09, 109.09, 92.45 & 94.00 respectively and the mean value of No drinks were 97.82, 96.82, 87.18 & 87.27 respectively. The interaction between chocolate drink and test was statistically significant as the obtained value 3.370 was greater than the critical value is 2.72 As the interaction between chocolate drink and test was significant, we chose to ignore the two main effects, that is, difference between Chocolate milk drink and no Drink for the length of the test.

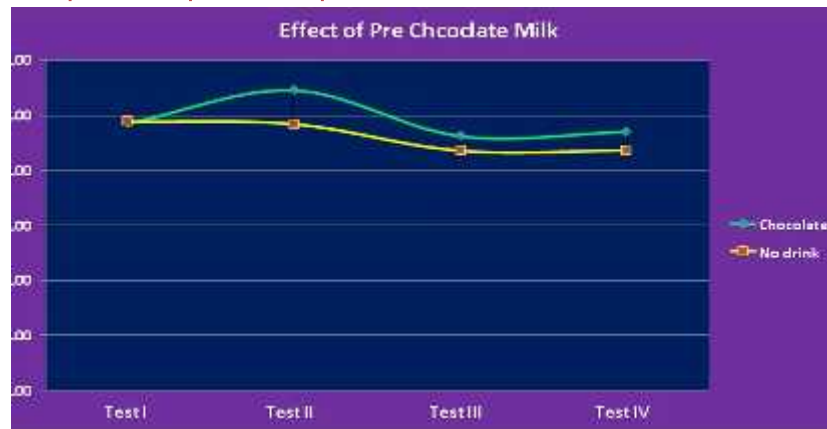
As shown in figure the glucose level is increased almost 11.24% in Test II which is taken after 20 minutes from the Test I. Test III which is taken immediately after exercise 45 minutes from the glucose level is increased 5.70% when compared to no drink. Test IV is taken immediately after 20 minutes of rest the glucose level is increased 7.14% compared no drink.

Test I	Test II	Test III	Test IV
At the start of the experiment	20 minutes after start	45 minutes after the exercise TEST II	After 15 minutes from the TEST III

Table I

A TWO- FACTOR (2x4) ANALYSIS OF VARIANCE FOR GLUCOSE LEVELS

Sessions								Source of Variation	SS	df	MS	F	F crit
Chocolate Milk (Mean & STDEV)				No Drink (Mean & STDEV)				Chocolate drink	762.2841	1	762.2841	16.368*	3.96
Test I	Test II	Test III	Test IV	Test I	Test II	Test III	Test IV	Test	2530.125	3	843.375	18.109*	
								Chocolate drink xTest	470.8523	3	156.9508	3.370*	2.72
97.09	109.09	92.45	94.00	97.82	96.82	87.18	87.27	Within	3725.636	80	46.57045		
±3.67	±7.66	±6.27	±7.56	±7.04	±7.12	±7.51	±6.87	Total	7488.898	87			



GRAPH I Effect of pre chocolate milk

Conclusions

It clear evident form this experiment drinking chocolate milk increase the glucose level which in turn, it may improve the fitness or delayed the fatigue stage.

Recommendations for further studies

With the experience gained in this study and from the finding of the study. The investigator makes the following recommendations for further studies.

1. Similar studies may be conducted by selecting physiological variables.
2. The similar study may be conducted by taking other variables like blood and biochemical variables
3. The same study may be conducted on the players at different levels and on both sex.
4. It may be recommended to carry out similar study with women in different society.

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Authors' contributions

The study was designed and analyzed by PP and data were collected by NL. AJ provides medical assistance and equipment. Manuscript preparation was undertaken by MR. All authors read and approved the final manuscript.

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None of the authors have any conflicts of interest to declare.

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Be active with physical activity on Covid-19 self-quarantine days

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Abstract

World widely peoples are self-quarantine due to the spreading of COVID-19 Virus. The peoples are inactive in their home it may be affect their body and mind such as depression, stressed, gaining body weight, reducing joints movements and health issues. The aim of this present study was to recommend activity for children and adult to stay active in their home by doing exercise, practicing yogasanas, dancing, and playing to maintain their health..

Keywords: Coronavirus Disease, Physical activity, Yoga.

Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus (WHO). COVID-19 is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. COVID-19 is now a pandemic affecting many countries globally (WHO). COVID-19 report in India according to Ministry of health and family welfare (MoHFW) report on April, 27, 2020 there is 20835 active cases out of that 6148 cases were cured and discharged to their home and 872 COVID-19 infected patients were death so far (MoHFW).

The Government of India confirmed that India's first case of Coronavirus disease 2019 on 30 January 2020 in the state of Kerala, when a university student from Wuhan travelled back to the state (Ward & Alex, 24 March 2020).

Indian government announce self-quarantine to prevent from COVID 19 on 24 March, the Government of India under Prime Minister Narendra Modi ordered a nationwide lockdown for 21 days, limiting movement of the entire 1.3 billion population of India as a

preventive measure against the 2020 coronavirus pandemic in India (Gettleman, Jeffrey; Schultz, Kai (2020). As the end of the lockdown period approached, state governments and other advisory committees recommended extending the lockdown. On 14 April, Modi extended the nationwide lockdown until 3 May, with a conditional relaxation after 20 April for the regions where the spread has been contained (PM Modi announces, 2020).

Many people are duly heeding the official advice to self-isolate and stay at home, but these actions will negatively affect people's physical activity behaviours, with more time spent sitting watching screens and a subsequent impact on physical health, well-being, sleeping patterns and quality of life (Hammami, Harrabi, Mohr, & Krusturp, (2020).

Physical activity is defined as 'bodily movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure (US Department of Health and Human Services 1996). Physical activity has a major impact on health. Some effects are well established; as a major component of energy

expenditure, physical activity has a great influence on energy balance and body composition (Miles, 2007). Due to the self-quarantine the peoples are inactive in their home it may be leads to affect their health. For that purpose the present paper aimed to provide a recommendation to maintain their health during this self-quarantine days.

Physical activity recommendation by WHO

Children and Adolescents aged 5-17 years

Physical activity / day: 60 minutes of moderate to vigorous- intensity

3 times / week: physical activity for strengthening muscle and bones.

Adults aged 18-64 years

Physical activity / day: 150 minutes of moderate to vigorous- intensity or 75 minutes of Vigorous intensity

2 or more days / week: physical activity for muscle strengthening activities should be done involving major muscle groups.

Yoga for Children 3-6 years

According to Ministry of Women and Child Development, Government of India in collaboration with Ministry of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) Yoga for children 3- 6 Years. Practicing Yoga can help improve flexibility, strengthen muscles and improve balance.

AYUSH formed each movements with activity or posture name (animal names, tree names) to stimulate children curiosity. Before Yoga practicing do Loosening and strengthening joints practices such as Neck Movement (Road Cross Movement), Hands up & down(Fly with your wings), Shoulder rotation, Back Movement forward and backward (Touch the sky & floor), Back twisting movement (pass the ball to other), Back side bending (See-saw Movement).

Asana and Posture names

Guidelines: 2-3 Asanas for each series. Children stay up to 10 seconds in the final stage of any asana. Also the total time for the children yoga session should be not more than minutes.

Common Yoga Protocol

According to Minsitry of AYUSH recommended following asanas such as

Home based activity: Climbing in the stairs, Calisthenics Dancing, Asanas, gymnastics, Skipping, Own body exercise, push-up, Squat, Stationary cycling, Pull-ups, Plank, Jumping jacks, One leg standing, T-stand, Hopping, Dribbing ball with hand, walking on balance beam, Walking on a Line, Abdominal Crunches, Lunges, Walking etc.

Standing postures	Sitting postures	Prone & Supine postures	Pranayama and Krida practices
Tadasana (Palm tree posture), Vrikshasana (Tree posture), Ashvasanchalan (horse riding posture), Parvatasana (Mountain posture), Trikonasana (Triangle posture).	Marjari Asana (Cat), Ustrasana (Camel), Shashankasana (rabbit), Mandukasana (Frog), Vakrasana (Twisting), Gimukhasana (Cow), Simhasana (Roaring lion)	Prone Postures: Makarasana (Crocodile), Bhujangasana (Cobra), Dhanurasana (Bow), Balasana (Child). Supine postures: Setubandhasana (Bridge), Matsyasana (Fish), Shavasana (star fish)	Deep Breathing, Bhrumari Krida practices: Rain clap, Flower clap, Special Clap, Laughing practice, freeze movement

Standing postures	Sitting postures	Prone & Supine postures	Pranayama
Tadasana, Vrksasana, Padahasthasana, Ardha cakrasana, Trikonasana	Bhadrasana, Vajrasana, Ardha Ustrasana, Ustrasana, Sasakasana, Vakrasana	Prone Posture: Makarasana, Bhujangasana, Slabhasana Supine posture: Setubandhasana, Uttanapasasana, Ardhalasana, Pavanamuktasana, Savasana	Nadisodhana, Sitali, Bhramari

Conclusion

The physical activity and yoga practice helps people for maintain their health during stay at home. Due to the lockdown the people may be stressed, inactively, children may be more addict in mobile phones and Television and adults have chance to reduce their joints movements in their home. It leads The physical activity helps to activate both mind and body. The activities for children helps to improve their fundamental movement skills and their fitness level. The activities for adults helps to prevent from the gaining weight, because gaining weight leads to heart disease also it improve balancing abilities. So we recommend that physical activity such as minor games, indoor traditional games, walking, own body weight exercise, dancing, singing these kind of activity helps people to active while stay at home also stay at home helps to prevent from COVID-19. Stay home-stay active- stay healthy.

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Effect of circuit training on selected physical fitness variables and skill performance among medium pace cricket bowlers in Coimbatore district

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Abstract

The purpose of the study was to find out the effect of circuit training on selected physical fitness variables and skill performance among inter collegiate level medium pace cricket bowlers. It was hypothesized that there would be significant differences on selected physical fitness variables and skill performance due to the effect of circuit training among inter collegiate level cricket players. For the present study the 30 inter collegiate level cricket players from Coimbatore district, Tamilnadu were selected at random and their age ranged from 18 to 23 years. For the present study pre test – post test random group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent circuit training and Group 'B' has not undergone any training. The data was collected before and after six weeks of training. The data was analyzed by applying dependent't test. The level of significance was set at 0.05. The circuit training had positive impact on Speed, Muscular Strength, Leg Explosive Power and Bowling Accuracy among inter collegiate level medium pace cricket bowlers.

Keywords: Circuit Training, Physical Fitness Variables and Skill Performance, Cricket Players.

Introduction

Coronavirus disease (COVID-19) is an Cricket is one of the world's major team sports in terms of regular international games. It is a bat-and-ball sport similar to the game of baseball, generally played outdoors on natural grass fields. Bowling action is explosive in nature; whereby a large amount of force must be generated over a very short period of time. Orchard et al. Discussed that fast bowlers have consistently been identified as the category of cricket players at the greatest risk of injury. Bowling action is a highly skilled activity, which is acquired over years of fine tuning. Equally from a neuro-muscular perspective, the bowling action is a complex activity and optimal performance is a result of highly tuned inter-muscular and intra-muscular coordination, which is governed by the central nervous system. It has been shown by Karppinen that recently modern training techniques and in particularly strength training, has been perceived

to be a major contributing factor to the recent injuries sustained at a national level.

During bowling in cricket, the internal rotators of the shoulder are involved in the acceleration phase of the arm through concentric contractions, whereas the external rotators are involved during the deceleration phase. During the bowling action's acceleration phase, the external rotators are contracted eccentrically in order to decelerate and control arm and any external shoulder rotation weakness could contribute to impingement syndrome. The presence of an imbalance between the agonist and antagonist groups is one of the major risk factors for developing shoulder injuries such as dislocation and impingement, with a deficiency in the external rotator strength possibly resulting in an injury. In addition to the technical skills required to perform, cricketers also need to possess a high level of fitness, thus making them susceptible to overuse injuries as a result of

repetitive training. The upper extremities account for 25% and 22% of injuries in schoolboy and provincial cricket players, respectively. Further, during a match many bowlers are placed to field, thus having a tendency to develop “thrower’s arm” and other injuries. Aginsky et al. also concluded that bowlers with a front-on bowling action are more susceptible to injuries of the shoulder as compared to side-on action.

Statement of the Problem

The purpose of the study would be to find out the effect of circuit training on selected physical fitness variables and skill performance among inter collegiate level medium pace cricket bowlers.

Delimitations

1. The study was delimited to the men cricket player the age group of 18 to 25 years from Coimbatore district.
2. The period of the training programme was delimited to 6 weeks.
3. The independent variables would be circuit training only.
4. The study would be conducted on dependent variables such as
5. Physical fitness variables – Speed, Muscular Strength and Leg Explosive Power.
6. Skill Performance Variables– Skill Test.

The study would be limited in the following aspects:

1. The socio-economic status would not be taken into consideration
2. The environmental and climatic conditions would not be taken into consideration for this study.
3. Instructions regarding diet would be given, but whether they are would be following or not is not controlled.
4. Certain factors like life style, personnel habits would not be taken into consideration for this study.

Materials and methods

Selection of the subjects

The purpose of the study is to find out the effect of circuit training on selected physical fitness variables and skill performance among inter collegiate level medium pace cricket bowlers. It was decided to selected trained students because untrained may get negative effects. So investigator selected cricket player as subjects and they were allowed to participate in their routine physical education classes. For this purpose 30 students from the Coimbatore district. Age of the subjects was ranged between 18 to 25 years.

TABLE – I Selection of the Variables

S. No	Variable	Tests	Measuring Units
PHYSICAL FITNESS VARIABLES			
1	SPEED	50 yard dash	In seconds
2	SHOULDER MUSCULAR STRENGTH	Push- ups	In counts
3	LEG EXPLOSIVE POWER	Standing broad jump	In Centimeter
SKILL PERFORMANCE VARIABLES			
4	SKILL TEST	Bowling accuracy	In points

Limitations

Variable	Group	Test	Mean	S.D	DM	DM	‘t’
SPEED	Experimental Group	Pre Test	8.25	0.15	0.56	0.10	5.60*
		Post Test	7.69	0.40			
	Control Group	Pre Test	8.24	0.16	0.03	0.019	
		Post Test	8.21	0.17			
SHOULDER MUSCULAR STRENGTH	Experimental Group	Pre Test	25.85	2.32	4.70	0.56	8.39*
		Post Test	30.55	2.18			
	Control Group	Pre Test	25.65	2.30	0.30	0.41	
		Post Test	25.95	2.01			
LEG EXPLOSIVE POWER	Experimental Group	Pre Test	1.60	0.10	0.15	0.03	5.00*
		Post Test	1.75	0.12			
	Control Group	Pre Test	1.58	0.11	0.01	0.05	
		Post Test	1.59	0.14			
BOWLING ACCURACY	Experimental Group	Pre Test	15.50	1.43	3.55	0.38	9.34*
		Post Test	19.05	2.03			
	Control Group	Pre Test	15.30	1.21	0.01	0.06	
		Post Test	15.20	1.16			

* Level of significant was fixed at 0.05 with Table value 2.09

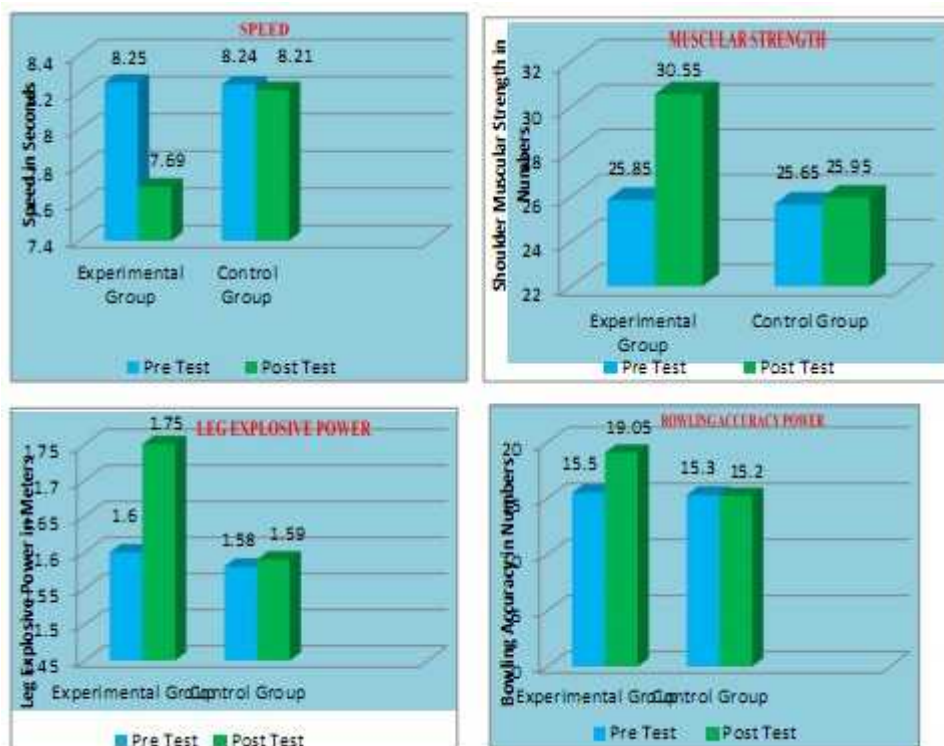


FIGURE: Bar diagram showing the mean values of experimental and control groups of pre and post test on physical fitness variables skill performance medium pace bowlers

Statistical Techniques

The collected data on physical and skill performance variables were statistically examined to the test. The various hypotheses formulated by the researcher for dependent 't' ratio was used. 't' ratio was the difference between the mean, standard deviation and standard error of the difference between the means.

Training Program

Based on the literature available and the opinion of the experts the following training details were determined on the skill performance training.

Duration of the training	–
6 weeks	
Number of days per week	--
5 days	
Number of session per day	–
1 session	
Duration of session	–
60 minutes	

Discussion on Findings

The prime intention of the researcher is to analyze the circuit training on selected physical fitness components and skill performance variables of medium pace bowler.

The results of the study indicate that the experimental group had significantly influenced in fitness variables namely speed, shoulder muscular strength, leg explosive power and skill performance variables namely bowling accuracy. The experimental group underwent systematic circuit training over 6 weeks duration. The control group had not shown significant improvement on any of the selected variables.

Discussion on Hypothesis

The first hypothesis stated that there may be significant difference due to the circuit training on selected physical fitness components of medium pace bowlers among their baseline to post treatment.

The second hypothesis stated that there may be significant difference due to the circuit training on selected skill performance variables of

medium pace bowlers among their baseline to post treatment.

Conclusion

From the statistical analysis of the data with the limitation imposed by the experimental conditions the following conclusions were drawn.

- It was concluded that the experimental group had significant improvement on physical fitness and skill performance variable namely speed, shoulder muscular strength, leg explosive power and bowling accuracy.
- It was concluded that the control group had insignificant difference on physical fitness and skill performance variable namely speed, shoulder muscular strength, leg explosive power and bowling accuracy.

Recommendations for further Research

1. A similar study may be conducted on players of Indian cricket team to assess their level in the selected variables.
2. A similar study may be conducted on different games and sports.
3. A similar study may be conducted for difference age groups and also for women cricketers.
4. A similar study may be conducted in greater detail to assess changes on psychological and biochemical variables.
5. It is suggested that programme of similar type for various levels like university, state and national can be prepared with varied intensity, load and duration.

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Realize the effect of bear walk and frog jumps on muscular strength and flexibility of school children

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Abstract

The aim of the study was to investigate the realize the effect of bear walk and frog jumps on selected strength parameter Muscular strength and Flexibility underwent school boys students in the age group of 13 to 16 on health related physical fitness. To attain this purpose, 30 male school students were randomly selected as subjects from C.M.S. Higher Secondary School, Srivilliputtur, Virudhunagar District studying in various classes. The age of the subjects were ranged from 13 to 16 years. The subjects were formed a two group of 15 subjects each, in which group - I underwent Bear walk training and frog jump training for three days per week for eight weeks and group - II acted as control group who were not undergo any type of training programme. The chosen criterion variables such as Muscular Strength and Flexibility were measured before and after the training period. The collected data were statistically analyzed by using Analysis of Covariance (ANCOVA). From the obtained results the study was found that there was a significant improvement on Muscular Strength and Flexibility for bear walk and frog jump group when compared with the control group.

Keywords: Bear Walk, Frog jumps, Muscular Strength, Flexibility

Introduction

. Fitness and health have a vital role in the society for preparing a healthy nation. Physical education and sports play a vital role to develop fitness and create awareness of health to every individual. In the modern society lack of physical activities and diseases are very common among the people. In the contemporary scenario, studies have been conducted for analyzing the merits of various physical fitness training programmes. National and state governments have realized the importance of including the dimension of physical fitness in to the school and college curriculum.

Physical Education in every school was previously considered to be an extracurricular activity and was pushed to the back seat, where as now it is accepted as major and co-curricular activities in the modern curriculum. This indicates that education has to take the responsibility of all-round development of the students by means of physical activity and the teachers have to make

use of it to develop and maintain a physically fit body, a sound mind and a socially desirable outlook of the students. One of the major drawbacks of our education system is that we do not pay much attention towards the development of physical capabilities of the student. With the increasing attention given to academic pursuit, there has been a decline in proper attention to the inherent physical virtues. As a result, the students face problems such as obesity, poor health, and postural deformities.

Gross motor skills have an important part of the healthy development of children's on all ages. In fact the gross motor activities were not only get the children's moving and active, its allow them to release the much needed energy. It was also responsible for helping children regulate the perceptual and sensory needs. One of the easiest ways to add this type of activity to the children's daily routine was with animals walks. Animal

walks are simple and fun exercises that anyone can do to get a quick dose of gross motor play in their day. Simply put, they are exercises that resemble the animals they are named for. Some of the animal's walks have classic instructions that are known throughout early childhood and physical development experts, such as the bear walk and frog jumps.

Health-related physical fitness consists of those components of physical fitness that have a relationship with good health. The components are commonly defined as flexibility and muscular strength. Prior to the last forty years the distinction between health related physical fitness and skill related physical fitness was not typically made. When tests of physical fitness are administered in school, medical and other settings should be arranged for measuring the health related physical fitness components. Lab and field tests of health related physical fitness involve some type of performance such as running, stretching, or doing a specific muscle exercise. Because body composition (also referred to as relative leanness) is not a performance measure, some questions its inclusion as a component of health-related physical fitness. Possessing good health-related fitness is related to lower risk of illness and improved quality of life. Health Related Physical Fitness serves several purposes including educating students about various component of physical fitness. Tremendous changes in the field of health related fitness has been made in the present century, due to the modern techniques and technology it helps to provide students, parents and teachers with information concerning the fitness of children and youth, providing a basis for the development of personal exercise programme and motivating the students to improve their fitness levels and exercise habits. Health Related Physical Fitness of High School children are significantly associated with certain physical activity behaviors of their childhood and their parent's attitude towards physical activity. In the modern lifestyle, most of the children spend their leisure time with television and computer. Some of the modern cultured parents will not allow their children to spend time in play ground. They tightened their schedule hard for tuition and studies.

Dependent Variables

Health Related Physical Fitness Components

1. Muscular Strength
2. Flexibility

Independent Variables

1. Bear Walk and frog jumps

Methodology

The aim of the study was to investigate the realize the effect of bear walk and frog jumps on selected strength parameter Muscular strength and Flexibility underwent school boys students in the age group of 13 to 16 on health related physical fitness. To achieve this purpose, 30 male school students were randomly selected as subjects from C.M.S Higher Secondary School, Srivilliputtur, Virudhunagar district, studying in various classes. The age of the subjects were ranged from 13 to 16 years. The subjects were formed a two group of 15 subjects each, in which group - I underwent bear walk and frog jumps training for three days per week for eight weeks and group - II acted as control group who were not undergo any type of training programme. The chosen criterion variables such as Muscular Strength and Flexibility were measured before and after the training period. The collected data were statistically analyzed by using Analysis of Covariance (ANCOVA).

Training Programme:

Bear Walk:

Start from the normal standing position. Bend over to the ground and put both hands placed on the ground. Then walk forward with the same leg and arm. So move the right arm and right leg forward at the same time. Then move the left arm and left leg at the same time. Then continuously move forward with repeat the same action.

Frog Jumps:

Start from the full squat position. Place the hands between the knees on the floor. Jump forward with the feet and land with the hands on the ground. Repeat the action for move forward.

For the purpose of this study work should be done with sufficient speed for a given period of 10 minutes bear walk and 10 minutes of frog jumps for first week to fourth week of training

period. 15 minutes of bear walk and 15 minutes of frog jumps for fifth week to eighth week.

Results and Discussion

Muscular strength

Summary of statistics for the pre-test and post-tests on sit-ups of experimental group and control group.

Muscular strength was the important component of health related physical fitness. The research scholar realized the effect of bear walk and frog jumps training programmes to health related physical fitness components. The mean and standard deviation of bear walking and frog jumps training group in pre test was 21.68 and 3.74. After the training post-test was taken, the result shows that it is increased to 24.34 and 4.58 respectively. The mean and standard deviation of control group in pre-test was 21.29 and 2.65. After the training post-test was taken, the result shows that it is increased to 21.35 and 2.03 respectively. This illustrates the improvement of abdominal muscular strength of the subjects. It also shows an improvement. The above result indicates that there is an improvement in the abdominal musculoskeletal strength (abdominal muscular strength endurance) due to the practice of bear walk and frog jump training.

Figure 1 represent the pre and post test data of muscular strength of bear walk and frog jump group and control group. As compared to bear walking and frog jump group and control group, bear walk and frog jump group was more effective and gives better results for the improvement of abdominal strength endurance.

The dependent t-test values between pre-test and post-test means of bear walk and frog jumps group and control group sit-ups were 11.28 and 0.90 respectively. Since the obtained t-value of experimental groups are greater than the table value. The Analysis of Covariance on sit-ups of bear walk and frog jump group and control group have been analyzed and presented in table-I.

From the table-I, the adjusted post-test mean values of sit-ups for bear walk and frog jumps group and control group are 26.54 and 21.67 respectively. The obtained 'F'-ratio for adjusted post-test mean is 6.87 which are more than the table value 2.64 at 0.05 level of confidence. Hence the obtained 'F' ratio is significant at 0.05 level of confidence.

Flexibility

The summary results for the pre and post tests on sit and reach of experimental group and control group.

Flexibility is another component of health related physical fitness. In the case of sit and reach test, the mean and standard deviation of pretest values of bear walk and frog jump group was 21.81 and 4.42. After training, post-test results shows that the mean and standard deviation of bear walk and frog jump training group was increased to 26.33 and 4.55 respectively. This indicate that there is an improvement in sit and reach due to the bear walk and frog jump group.

Figure 2 represent the pre and post test data of flexibility of bear walk and frog jump group and control group.

Test	Bear walk and Frog jump Group	Control Group
Pre-Test Mean ± SD)	21.68 ± 3.74	21.29 ± 2.65
Post-Test (Mean ± SD)	24.34 ± 4.58	21.35 ± 2.03
't' test	11.28*	0.90
* Significant at 0.05 level.		

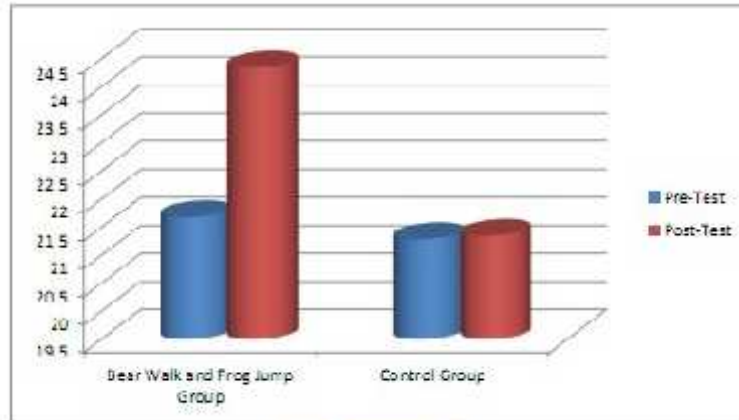


Figure 1. (Muscular Strength)

Table 1 Analysis of covariance on sit-ups of bear walk and frog jump group and control group

Adjusted post-tests means		Sources of Variance	Sum of Squares	Df	Mean of Squares	'F' Value
Bear Walk and Frog Jump Group	Control Group					
26.54	21.67	Between	860.44	2	430.22	6.87*
		Within	1753.32	28	62.61	

* Significant at 0.05 level of confidence

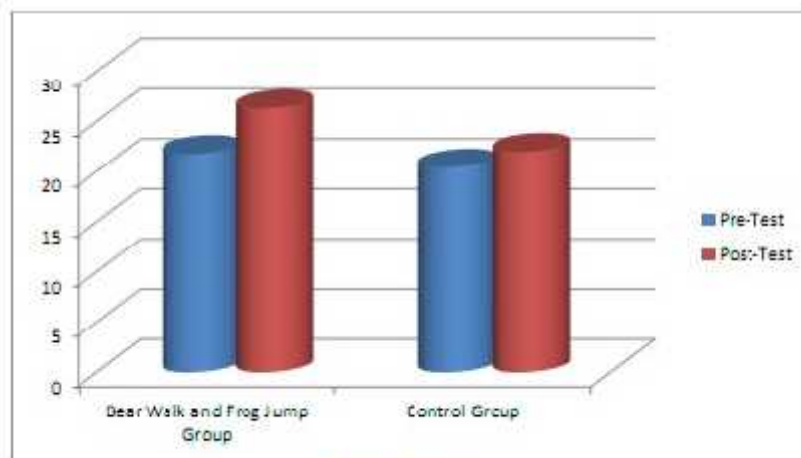


Figure 2 (Flexibility)

Table 2 Analysis of covariance on sit and reach of bear walk and frog jump group and control group

Adjusted post-tests means		Sources of Variance	Sum of Squares	df	Mean of Squares	'F' Value
Bear Walk and Frog Jumps Group	Control Group					
25.43	21.22	Between	797.93	2	398.97	15.24*
		Within	733.08	28	26.18	

* Significant at 0.05 level of confidence

As compared to control group, there is an increase in performance in experimental groups. The result shows that bear walk and frog jump training group is better than control group. It indicates that bear walk and frog jumps training helps to improve flexibility (extensibility) of the low-back and posterior thighs. Thus it helps to the improvement of health related physical fitness. The analysis of dependent t- test on the data obtained for sit and reach of the pre-test and post-test of bear walk and frog jump group and control group have been analyzed and presented in Table-2.

From the Table- 2, the dependent t-test values between pre-test and post-test means of bear walk and frog jump group and control group on sit and reach were 13.12 and 1.38 respectively. Since the obtained t-value of experimental groups are greater than the table value 1.672 with df 28 at 0.05 level of confidence. It was concluded that bear walk and frog jump group had significant improvement in the performance of sit and reach test. However, the control group has no significant improvement on the performance of sit and reach test. The analysis of covariance on sit and reach of bear walk and frog jump and control group have been analyzed and presented in table 2

From the Table 2 the adjusted post-test mean values of sit and reach for bear walk and frog jump group and control group were 25.43 and 21.22 respectively. The obtained 'f'-ratio for adjusted post test mean is 15.24, which is more than the Table value 2.645 with df 2 and 28 required for significance at 0.05 level of confidence. Hence the obtained 'f' ratio is significant at 0.05 level of confidence.

Discussion on Findings

The result of this study reveals the benefits of bear walking and frog jump training programme which was suitable and enjoyable for school going children. In this study, bear walk and frog jump training programme were included to measure the health related physical fitness components of muscular strength and flexibility. The result of the test items can be a significant aid in the prescription of exercise programmes for school children's to development of physical fitness. Attained scores of various items can be used to

identify strength and weakness within students. Those who are weak in each test items should receive special attention and be strongly encouraged to improve the specific components through the selected fitness training programme. Every physical education programme should have an established set of reasonable fitness objectives for the students. Test results can help to determine the degree to which those objectives are being met.

Obtained result explained that bear walk and frog jump training significantly improved the muscular strength of school children and the control group has no significant improvement on the muscular strength.

It is concluded that bear walk and frog jumps training group had significant improvement in the performance of sit and reach and the control group has no significant improvement on the performance of sit and reach. The study reveals that bear walk and frog jumps training group was better than that of control groups. Therefore bear walk and frog jumps training was more effective to improve the muscular strength and flexibility.

Conclusion

The following conclusions were drawn from the results of the study. This study reveals that the muscular strength and flexibility has significantly improved due to the influence of the bear walk and frog jump training among the school children.

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Effect of balance training on agility in adolescent volleyball players

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Abstract

To study the effect of active, intensive and dynamic balance training on improving the agility of young volleyball players and comparing effectiveness of the training with gender difference. Study design was a one group pre-post-test design. Based on inclusion and exclusion criteria, 30 young healthy volleyball players in the age group of 17 to 23 years from Agricultural College and research Institute, Thanjavur, Tamilnadu. There were 15 boys and 15 girls. Anthropometric measurements were taken and Body Mass Index (BMI) was calculated for every participant. All the children underwent structured intensive balance training for 4 weeks (6 days/week). Pre and post training t-test of agility assessment was done. Paired t-test applied to see the difference in the performance pre and post training in agility. Unpaired t-test was applied to compare between the pre and post values of the male and female population. Paired t-test, pre and post values of t-test of agility showed significant difference ($p < 0.05$) and unpaired t-test was applied to compare between the pre and post values of male and female population, whereas when compared between boys and girls it did not show clinically significant difference. As per statistical analysis using paired t-test, balance training has a significant impact in improving agility of the young volleyball players. When compared within the groups using unpaired t-test, there was no statistically significant change seen in performance in both boys and girls, but clinically girls showed improvement in agility. Study shows that balance training is effective in improving agility. Clinically females performed better than males but change in performance was not statistically significant. Hence, it can be concluded that balance training is equally effective in improving agility for both genders.

Keywords: Volleyball, Agility test, Balance training

Introduction

As per Donatelli A and Kenji Carp, agility is defined as “a skill-related component of physical fitness that relates to the ability to rapidly change the position of the entire body in space with speed and accuracy”.

It is an outcome of a mixture of quick reflexes, coordination, balance, speed, reaction time, strength and neuromuscular control, whereas balance is the ability to maintain the center of gravity within the base of support during stationary as well as dynamic tasks. Agility is an outcome of balance, strength and coordination mainly. Change in any of these key factor components is responsible for agility, cause change in the ‘agility’ of an individual. The trainability of agility skills must depend upon the balance training being one of the components.

The balance training program in the study had several reaction-time tasks which were simultaneously performed while challenging the balance by changing the base of support and varying the surface, namely foam and firm surface.

Balance relies upon the integration of afferent impulses, its perception and integration in the central nervous system and an effective motor efferent control generated by the CNS and carried out by the motor system. The afferent system mainly consists of visual, vestibular and the somatosensory system. The somatosensory system comprises of the peripheral receptors that detect any change in posture and position of the body, called as the ‘Proprioceptors’. The efferent system is mainly the musculoskeletal system and

requires adequate Range of Motion (ROM), muscle strength, muscle torque and power production potential as well as endurance. A game of volleyball needs good aerobic strength, anaerobic strength and quick changes of direction in order to chase the ball. Quick and accurate force generation potential is needed for a well-timed and well spotted volley or smash. A player is in constant need of change of direction, speed and change of body posture, all within the confines of the volleyball court and hence needs an effective acceleration and deceleration through space in a very short period of time repetitively for a good performance. According to a study by Gouttebarga V et al., a volleyball player must be able to change direction, sometimes in mid-air in a split second to adjust to the ball. Rapid and sometimes swift movements are required in volleyball as you adjust the body position to the ball.

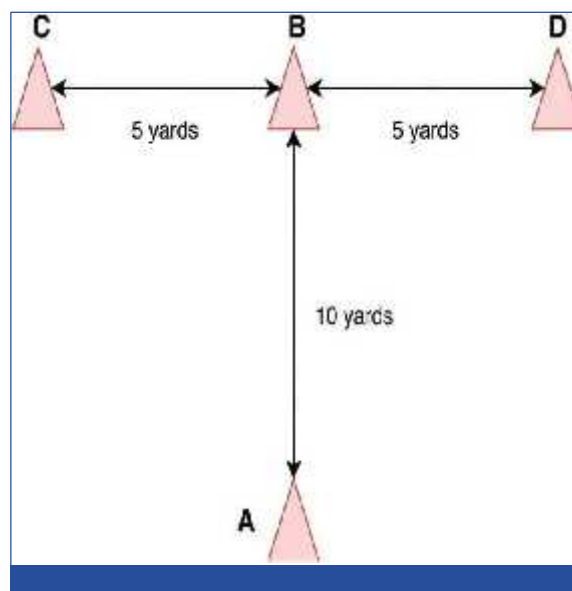
Improving agility can aid in the improvement of the performance of a player by training the ability to accelerate, decelerate, and adjust the body position effectively in the shortest time possible. Agility training can also help in reducing the lower limb injuries as the kinematic chain is trained to face the challenge of sudden changes in direction and force. Balance training included activities like single leg stance, single leg squats, single leg stance with reach outs which could have an effect on lower limb strength, neuromuscular.

Materials and Methods

This is one group pre-post-test study design. Study was conducted in 30 young healthy volleyball players in the age group of 17 to 23 years from Agricultural College and research Institute, Thanjavur, Tamilnadu. After departmental review and ethical approval, a total of 45 players were screened and 30 of them fulfilled the inclusion and exclusion criteria and were selected for the study by convenient sampling, consisting of 15 females and 15 males. The demographic data, name, gender, age, residential address, parent's contact and the anthropometric measurements height, weight, BMI were taken by universally accepted standard measures. T-test of agility was carried out twice in the duration of the study at the beginning of the

balance training protocol and after the completion of the protocol, at the end of four weeks. The players were thoroughly explained about the procedure of the t-test of agility, and a demonstration of the same was given for their clarity. Each player performed the test three times to yield the best possible performance of the player, making sure that an adequate rest period was provided in between the successive trials. The best of the three trials was considered for the statistical analysis.

After pre-test, four weeks of balance training was given to the players. Players were trained for five days a week for four weeks, once a day. Post training the t-test of agility was repeated in the same manner. The scores of t-test were recorded and were used for data analysis.



Balance Protocol

The balance protocol was designed after taking a baseline measurement of the players. Their performance was correlated with the balance training protocols considered effective in the literature. A final protocol was designed using both the available information. The protocol was divided into a weekly regime with stepladder progression every week. The describes the balance protocol given for four weeks to the participants. In 1st and 3rd week, the participants performed the exercises on firm surface. The same exercises were performed in the 2nd and

the 4th week as a progression of the challenge by doing them on the foam. The exercises were explained and demonstrated to the participants. The exercise program was closely supervised in order to maintain a good form for all the four weeks.

The t-test of agility was repeated on the players in the similar manner after completion of four weeks of balance training. The readings were recorded and used for data analysis.

Statistical Analysis

Data was then analysed using Microsoft excel and SPSS. The pre and post training scores were compared using paired t-test as the data passed the test of normality.

Results

The shows the comparison between the mean scores of agility of the two groups' pre and post balance training. It shows that there was a significant difference in the means of scores of agility test pre and post balance training ($p < 0.005$) indicating improvement in agility post dynamic balance training.

The improvement was seen more in females as compared to males. The change in the means for pre and post-test performance for males and females is statistically not significant as $p > 0.05$. But the clinical observation of their performances showed greater improvements for females than males. Values indicate that the females showed better response to training than the males.

Table – 1 Training Programmer

Week 1, Firm surface	Week 2, Foam surface	Week 3, Firm surface	Week 4, Foam surface
Tandem standing ball catch and throws 20 reps, 2 sets	Tandem standing ball catch and throws 20 reps, 2 sets	Single leg stance-ball catch and throws 20 reps, 2 sets	Single leg stance- ball catch and throws 20 reps, 2 sets
One leg cone touch in multiple directions	One leg cone touch in multiple directions	Single leg rowing 10 reps, 2 sets	Single leg rowing 10 reps, 2 sets
Single leg squats and reach outs	Single leg squats and reach outs	Single leg standing with reach outs maintaining knee extension	Single leg standing with reach outs maintaining knee extension
Single leg standing and balancing a book on head for 20 seconds	Single leg standing and balancing a book on head for 20 seconds	-	-

Table – 2 Demographic data of the participants

Group	N	Mean Age	Average Weight (kg)	Average Height (cm)	Average BMI
Males	15	19.48	45.65	154.89	19.02
Females	15	21.23	48.83	151.59	21.23

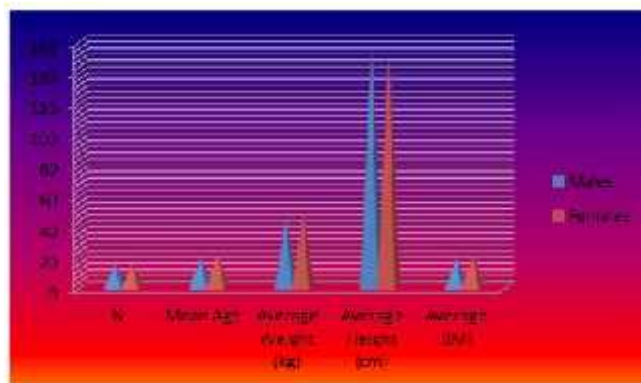


Fig 1: Comparison of mean time to complete agility t-test-pre and post training.

Discussion

Balance training and agility drills are the essential parts of the professional sports conditioning. It is important in enhancing the performance of the players and reducing the risk of injury. Agility is the crucial component for an athlete for optimal performance. This study mainly considers two important factors of balance and agility: effect of progressive dynamic balance training in improving agility being the first goal and comparing how balance training impacts across the genders in order to change their training needs.

A study by McLeod TC et al., on effects of neuro-muscular training on balance in high school basketball players suggests that neuro muscular training had definite effect in improving balance and agility. Neuromuscular training with tandem standing on firm and foam surface, stability exercises etc improved proprioception and balance.

A study published by Saraswat A et al., suggests that four weeks of progressive balance training has an effect in improving agility and dynamic stabilisation. High school basketball players in age 15-20 years showed significant change in performance after four weeks of progressive balance training which included training with key components like hop to reach, single leg standing and activities with single leg standing. Craig BW discussed the neuron physiology of the agility and suggested that changes in agility are due to the adaptation of neural pathways.

Training with progressive dynamic activities lead to improved activation of proprioceptors and overall motor recruitments directing towards improved agility.

Conclusion

Dynamic balance training is effective in improving agility in young volleyball players. Training is equally effective on both the genders. But clinical improvement shows that females have better scope of improvement with dynamic balance training.

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Consequence of Aerobic and Folk Dance on Respiratory Rate and Breath Holding Time Among Obese School Boys

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Abstract

The study was to find out the consequence of aerobic and folk dance on respiratory rate and breath holding time among obese school boys. Two hundred and eighty eight boys were chosen at random basis and their age ranged between 14 and 16 years from Chennai, Tamil Nadu. They were screened for Body Mass Index measured (Weight (kg)/Height (m²)) on basis of BMI guidelines given by World Health Organization. After Body Mass Index analysis one hundred class-I obesity (30.0-34.9) school boys were randomly from the available 139 subjects in the category of class-I obesity selected and their age ranged between 14 and 16 years from Chennai City, Tamil Nadu, India. They were assigned into four equal groups. Each group consisted of twenty five subjects. The four groups were are namely Group I as Experimental Group I -(Aerobic Dance), Group II as Experimental Group II -(Folk Dance), Group III as Experimental Group III (Aerobic and Folk Dance combination), and Group IV as Control group. In this study respiratory rate and breath holding time were selected as variables. The selected variables were tested through stop watch (John, 1987) in beats per minute and stop watch and nose clip (Fox & Mathews) in seconds. Pre and post test was conducted before and after the twelve weeks, weekly five days- per day 60 minutes of experimental training. The collected data were statistically analyzed Analysis of Covariance (ANCOVA) and Scheffe's post hoc test. In all cases 0.05 level of significance was fixed to test the hypotheses. The result of the study shows that there was significant improvement on respiratory rate and breath holding time consequence by the three experimental groups namely the aerobic dance, folk dance and its combination of dance (aerobic and folk) training group among obese boys.

Keywords: Aerobic Dance, Folk Dance, Respiratory Rate, Breath Holding Time and Obese School Boys.

1. Introduction

The problems are of a larger magnitude in developing countries like India. Rising prevalence of obesity in India may be due to various factors such as sedentary life-style, unhealthy eating habits, increasing urbanization, mechanization of jobs and transportation facility, dependency development on mass media for leisure, adopting less physically active lifestyles and consuming more "energy-dense, nutrient-poor" diets (Bundred et al. 2001).

According to Ramya Kannan (2010) Chennaities are less aware of obesity and children have poor knowledge on balanced and healthy diet. Children in the 8 to 16 age group had

lack of knowledge of obesity and hardly had any physical activity during the day. Changing life styles and eating habits are causing obesity in children and scientifically, excess body fat in children is the cause for many clinical and biochemical abnormalities.

"Obesity is defined as an excess accumulation of body fat. Traditionally, overweight and obesity have been evaluated by anthropometric measurement of weight-for-height" (F. Xavier Pi-Sunyer, 2000).

The most common approach measure of obesity is the Body Mass Index (BMI) BMI= Weight (kg)/ Height (m²). The BMI individuals who

scored, below 18.5, 18.5-24.9, 25.0-29.9, 30.0-34.9, 35.0-39.9 and above 40 were considered as underweight, underweight, overweight, obesity class I, obesity class II and obesity class III respectively (WHO, 2000).

Dance is a popular physical activity of people of all ages. It is both a physical activity and a performing art that gives participants an opportunity for aesthetic expression through various combination of physical movement (Deboraha, 2010).

“Aerobic dance is a popular mode of exercise for improving and maintaining cardio respiratory fitness” (Wilmoth, 1986).

“A typical aerobic dance workout consist of 8 to 10 min of stretching, calisthenics and low intensity exercise. This is followed by 15 to 5 min of either high or low impact aerobic dancing at the target training intensity” (Russell, 1983).

“Folk dance is a form of dance developed by a group of people that reflects the traditional life of the people of a certain country or region. As for as Indian is concern folk dance may mean dance by the small holders and agricultural labors, because the rural population in India is more than 85 percent of total and so The majority of the people belongs to the rural areas folk dance is the art of the village folk” (Aakriti Sinha, 2006).

Respiratory rate indicates the lung capacity. Regular participation in aerobic activity such as jogging, cycling and distance swimming reduce the respiratory rate (Ganong, 1997).

It is the duration of time through which one can hold the breath without inhaling and exhaling after a deep inhalation. Endurance type of training will improve the breath holding time. The breath holding time is measured to the nearest second (Strukic, 1981).

Statement of the problem

The study was to find out the consequence of aerobic and folk dance on respiratory rate and breath holding time among obese school boys.

Hypothesis

It was hypothesized that there would be a significant improvement on respiratory rate and

breath holding time due to the aerobic dance and folk dance and its combination of dance training among obese school boys.

Review of Related Literature

Farah et al. (2017) analyzed the association between physical activity and heart rate variability (HRV) in adolescents with and without abdominal obesity. This cross-sectional study included 1152 boys (age: 17 ± 1 years). HRV measures of time and frequency domains (balance sympathetic-vagal-LF/HF) were evaluated, as well as total physical activity, commuting physical activity, leisure-time physical activity, and abdominal obesity. All physical activity domains were associated with better RMSSD, PNN50, and LF/HF in normal weight adolescents ($p < 0.05$), whereas in adolescents with abdominal obesity only leisure-time physical activity was associated with better PNN50 ($b = 0.174$, $p = 0.035$) independent of age, period of the day, body mass index, and blood pressure. In conclusion, higher leisure-time physical activity, but not total and commuting physical activity levels, was associated with improved HRV in adolescents with abdominal obesity.

Methodology

The was to find out the consequence of aerobic and folk dance on respiratory rate and breath holding time among obese boys. Two hundred and eighty eight boys were chosen at random basis and their age ranged between 14 and 16 years from Chennai, Tamil Nadu. They were screened for Body Mass Index measured (Weight (kg)/Height (m²)) on basis of BMI guidelines given by World Health Organization. After Body Mass Index analysis one hundred class-I obesity (30.0-34.9) school boys were randomly from the available 139 subjects in the category of class-I obesity selected and their age ranged between 14 and 16 years from Chennai City, Tamil Nadu, India. They were assigned into four equal groups. Each group consisted of twenty five subjects. The four groups were are namely Group I as Experimental Group I -(Aerobic Dance), Group II as Experimental Group II -(Folk Dance), Group III as Experimental Group III

(Aerobic and Folk Dance combination), and Group IV as Control group. In this study respiratory rate and breath holding time were selected as variables. The selected variables were tested through stop watch (John, 1987) in beats per minute and stop watch and nose clip (Fox & Mathews, 1981) in seconds. Pre and post test was conducted before and after the twelve weeks, weekly five days- per day 60 minutes of experimental training.

Prescription of Intensity

The karvonen formula was used to prescribe the intensity (Target Heart Rate Zone) for each individual. The intensity of the exercise was increased once in three weeks by 5% of the maximum heart rate (Swain & Leutholtz, 2007).

Ratings of Perceived Exertion Method

In the lights of limitations associated with using Heart rate for setting exercise intensity, consider using a combination of heart rate and rating perceived exertion in developing prescription for the subjects. The rating perceived exertion can be used instead of HR, or in combination with HR, to monitor training intensity and to adjust the exercise prescription for conditioning effects (Birk & Birk, 1987).

Statistical Techniques

The collected data were statistically analyzed Analysis of Covariance (ANCOVA) was applied, If the mean difference was significant the pairs of adjusted final group mean was tested for significance by applying Scheffe's post hoc test. In all cases 0.05 level of significance was fixed to test the hypotheses.

Results and Discussion

The results presented in table-III indicated that the difference among pre test, post test scores and adjusted means scores of respiratory rate of the subjects were statistically treated using ANCOVA and F value were 0.94, 53.82 and 55.52 respectively. It was found that obtained F value on pre test scores were not significant at 0.05 level of confidence as these were lesser than the required table F value of 2.70 and the

obtained F Values on post-test and adjusted means were significant at 0.05 level of confidence as these were greater than the required table F value of 2.70.

The results also presented in table-III indicated that the difference among pre test, post test scores and adjusted means scores of breath holding time of the subjects were statistically treated using ANCOVA and F value were 1.13, 71.69 and 101.61 respectively. It was found that obtained F value on pre test scores were not significant at 0.05 level of confidence as these were lesser than the required table F value of 2.70 and the obtained F Values on post-test and adjusted means were significant at 0.05 level of confidence as these were greater than the required table F value of 2.70.

Farah et al. (2017) examined higher leisure-time physical activity was associated with improved HRV in adolescents with abdominal obesity.

The multiple mean comparison proved that there was significant differences exists between the adjusted means of aerobic dance training group (ADTG) and folk dance training group (FDTG), aerobic dance training group (ADTG) and control group, folk dance training group (FDTG) and control group, combination of aerobic and folk dance training group (CAFDTG) and control group, folk dance training group (FDTG) and combination of aerobic and folk dance training group (CAFDTG), aerobic dance training group (ADTG) and combination of aerobic and folk dance training group (CAFDTG) the mean difference were greater than the required confidence interval 1.13 and 1.29.

Comparing means of the four groups, experimental group-III (combination of aerobic and folk dance training group) was found better significant improvement on respiratory rate and breath holding time then the experimental group-I aerobic dance training group, experimental group-II folk dance training group and control group.

Hence the research hypothesis was accepted and null hypothesis rejected.

Table-I				
Training Programme for Experimental Group I- Aerobic Dance and Experimental Group II Folk Dance Training Groups				
Weeks	Aerobics Dance Training Group	Folk Dance Training Group	Duration	Load
I to III Weeks	Warming up Aerobic Dance On Spot Marching Touch Out V Step Side to Side Warming down	Warming up Folk Dance Oyilattam Kolattam Karagattam Warming down	5 minutes 45 minutes 10 minutes	2 sets x 2 repetitions intensity of 60% Rest in between sets (2 minutes)
IV to VI Weeks	Warming up Aerobic Dance Grapevine Front Kick Side Kick A Step Cross Over Step Warming down	Warming up Folk Dance Kummi Oyilattam Kolattam Warming down	5 minutes 45 minutes 10 minutes	3 sets x 2 repetitions intensity of 65% Rest in between sets (2 minutes)
VII to IX Weeks	Warming up Aerobic Dance Step Touch V Step Grapevine Front Kick Knee and Arm Lift Warming down	Warming up Folk Dance Karagattam Kolattam Kummi Warming down	5 minutes 45 minutes 10 minutes	3 sets x 3 repetitions intensity of 70% Rest in between sets (2 minutes)
X to XII Weeks	Warming up Aerobic Dance On Spot Marching Side Kick A Step Touch Out Step Touch Warming down	Warming up Folk Dance Kolattam Oyilattam Kummi Warming down	5 minutes 45 minutes 10 minutes	3 sets x 3 repetitions intensity of 75% Rest in between sets (2 minutes)

Table-II				
Training Programme for Experimental Group III - Combination of Aerobic and Folk Dance Training Group				
Weeks	Day I & III	Day II & IV	Day V	Load
I to III	Warming up Aerobic Dance On Spot Marching Step Touch Touch Out V step Side to Side Warming down	Warming up Folk Dance Karagattam Kolattam Kummi Warming down	Warming up Aerobic and Folk Dance On Spot Marching Step Touch V step Karagattam Kolattam Warming down	5 minutes 45 minutes 2 sets x 2 repetition Intensity of 60% Rest in between sets (2 minutes) 10 minutes
IV to VI	Warming up Aerobic Dance Grapevine Front Kick Side Kick A Step Cross Over Step Warming down	Warming up Folk Dance Kummi Oyilattam Kolattam Warming down	Warming up Aerobic and Folk Dance Front Kick Side Kick Cross Over Step Kummi Oyilattam Warming down	5 minutes 45 minutes 3 sets x 2 repetition Intensity of 65% Rest in between sets (2 minutes) 10 minutes
VII to IX	Warming up Aerobic Dance Step Touch V Step Grapevine Front Kick Knee and Arm Lift Warming down	Warming up Folk Dance Karagattam Oyilattam Kolattam Warming down	Warming up Aerobic and Folk Dance Front Kick Side Kick A Step Kummi Oyilattam Warming down	5 minutes 45 minutes 3 sets x 3 repetition Intensity of 70% Rest in between sets (2 minutes) 10 minutes
X to XII	Warming up Aerobic Dance Touch Out V Step Side Kick A Step Side to Side Warming down	Warming up Folk Dance Oyilattam Kolattam Kummi Warming down	Warming up Aerobic and Folk Dance Power Walk Side Kick A Step Oyilattam Kummi Warming down	5 minutes 45 minutes 3 sets x 3 repetition Intensity of 75% Rest in between sets (2 minutes) 10 minutes

Variables	Test	Mean				SV	SoS	df	MS	Obtained F
		Ex.Grp I	Ex.Grp II	Ex.Grp III	Con. Grp					
Respiratory Rate (Beats per Minute)	Pre	22	21.72	21.76	22.12	B	19.00	3	0.92	0.94
						W	94.24	96	0.98	
	Post	19.56	20.60	18.32	21.88	B	171.95	3	57.32	53.82*
						W	102.24	96	1.06	
	Adjusted	19.53	20.66	18.36	21.81	B	163.073	3	54.36	55.52*
						W	93.018	95	0.98	
Breath Holding Time (Seconds)	Pre	31.88	31.32	31.68	31.28	B	6.28	3	2.09	1.13
						W	178.56	96	1.86	
	Post	35.44	33.72	36.68	31.00	B	453.95	3	151.32	71.69*
						W	202.64	96	2.11	
	Adjusted	35.21	33.87	36.59	31.17	B	391.454	3	130.48	101.61*
						W	121.995	95	1.28	

*Significant at 0.05 level of significance for 4 and 96 (df) = 2.70, and 95 (df) = 2.70

Variable	Ex-Grp - I (ADTG)	Ex-Grp - II (FDTG)	Ex-Grp - III (CAFDTG)	Control Group	MD	CI
Respiratory Rate (Beats per Minute)	19.53	20.66	-	-	1.13*	1.13
	19.53	-	-	21.81	2.28*	
	-	20.66	-	21.81	1.15*	
	-	-	18.36	21.81	3.45*	
	-	20.66	18.36	-	2.29*	
	19.53	-	18.36	-	1.16*	
Breath Holding Time (Seconds)	35.21	33.87	-	-	1.34*	1.29
	35.21	-	-	31.17	4.04*	
	-	33.87	-	31.17	2.69*	
	-	-	36.59	31.17	5.41*	
	-	33.87	36.59	-	2.72*	
	35.21	-	36.59	-	1.37*	

*Significant

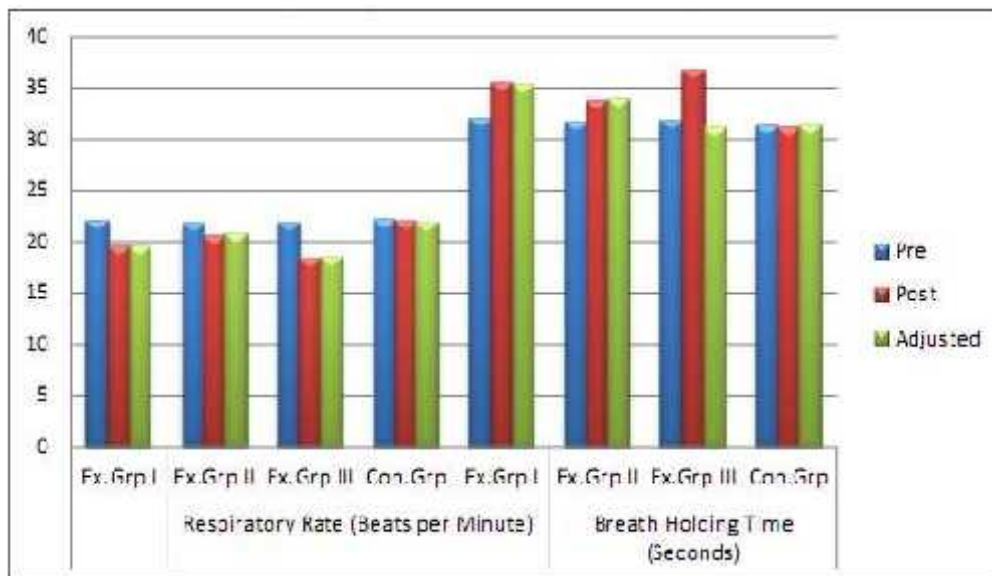


Figure-1 Bar Diagram Shows on Pre, Post and Adjusted Means of Respiratory Rate and Breath Holding Time

Conclusion

The result of the study showed that there was a better significant improvement on respiratory rate and breath holding time consequence by the three experimental groups namely the aerobic dance and folk dance and its combination of dance (aerobic and folk) training group among obese boys. The combination of aerobic and folk dance training group proved to be better than the isolated aerobic and folk dance training groups in improving on respiratory rate and breath holding time among obese school boys.

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Conflict of interest

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Effects of suryanamaskar practice and resistance training programme on selected physical health and mental health components among college level men handball players

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Abstract

The purpose of the study was to find out the effect of suryanamaskar practice with resistance training programme on selected physical health and mental health components on college level men handball players. To achieve the purpose of the study, sixty men handball players were selected randomly from affiliated college for Bharathiar University, Coimbatore. The subjects aged from 20 to 25 years. The selected subjects were divided into two equal groups namely experimental and control groups of 30 subjects each. The training period was limited to twelve weeks and for six days per week. The suryanamaskar practice with resistance training programme was selected as independent variables and flexibility, body composition, resting pulse rate, stress and anxiety were selected as dependent variables and it was measured by sit and reach, skin fold caliber, resting pulse rate, questionnaire and questionnaire. All the subjects were tested two days before and immediately after the experimental period on the selected dependent variables. The obtained data from the experimental group and control group before and after the experimental period were statistically analyzed with dependent 't'-test to find out significant improvements. The level of significance was fixed at 0.05 level confidence for all the cases. Significant improvement was found on flexibility, body composition, resting pulse rate, stress and anxiety of experimental group due to the effect of suryanamaskar practice with resistance training programme when compared to the control group.

Keywords: Flexibility, Body Composition, Resting Pulse Rate, Stress and Anxiety.

Introduction

Yoga, today is a subject of worldwide curiosity. This is definitely, a entirely new and remarkable phenomenon in the long history of Yoga. In the past, Yoga used to have a very limited entreaty. Those who recognize it were very few and fewer still practiced it. It was a finding reserved for the preferred ones. They were usually women of not this world. Their main attentiveness was in the world hereafter. In order to study yoga one had to renounce the world of accomplishment, aspiration and pleasure.

Yoga is no more observed as a discipline to be followed only by those who have set 'emancipation' as the highest goal of their life. All cultivated and uncultivated people find yoga to be useful. Refutation is no longer a pre-complaint to the study of yoga. Yoga has come out of its secret

'beating place'. It has crossed the restrictions of its land of origin, and has spread practically to the nook and turning of the world. The acceptance of yoga has not been stalled by the diversity of religious beliefs, languages or terrestrial conditions.

The asanas aim at a consistently integrated system of neuro-muscular is always consciously followed by their relaxation. At every step, a mental association is established with the physical actions, so that the unsounded reserves and power of the mind one harnessed for achieving a perfect physical culture of the body. (Dhirendra Brahmachari, 1966).

Resistance Training

Resistance training is well established effective methods of exercise for developing muscular fitness. The primary goals of resistance training as improving muscular strength and endurance and other benefits includes increases in bone mass, reduced blood pressure, increase muscle and connective tissue cross sectional area and reduced body fat. Although modern technology has reduced much of the need for high levels of force production during activities of daily living, it is recognized in both the scientific and medical communities that muscular strength is a fundamental physical trait necessary for health, functional ability, and enhanced quality of life. Therefore, exercise include skeletal muscle growth and accompanying gains in strength expression are areas of interest not only for the competitive athlete wishing to enhance performance but also for non-competitive individuals who simply wish to alter their body composition or increase their capacity to perform tasks requiring muscular effort.

Resistance exercise is a type of exercise that has gained popularity over the last decade. Resistance training is any exercise that causes the muscles to contract against an external assistance with the expectation of increases in strength, tone, mass and endurance. The external resistance can be dumbbells, rubber exercise tubing, own body weight, bricks, bottles of water or any other object that causes the muscles to contract. This training works the muscles of the body and is most beneficial when all the ranges of motion are included. Athletes are not just made but they are born, too. Strength, power and endurance may be due in part to the distribution of fiber types within an individual's muscles. Muscles have a mixture of two basic types of fibers, fast twitch and slow twitch. Fast twitch fibers are capable of developing greater forces and contracting faster and have greater anaerobic capacity. In contrast, slow twitch fibers develop force slowly, can maintain contractions longer and have higher aerobic capacity. The genes largely determine whether the person have more of one kind of muscle fiber or another.

Criterion Variables	Test Items	Unit Measurements
Flexibility	Sit and reach	Centi Meters
Body Composition	Skin fold caliber	In mm
Resting pulse rate	Resting pulse rate	Numbers/Beat per min
Stress	Questionnaire	Score in numbers
Anxiety	Questionnaire	Score in numbers

Group	Design of the Training
Experimental Group	suryanamaskar practice with resistance training
Control Group	Did not do any Specific Training
Training Duration	60 Minutes
Training Session	6 Days a week
Total Length of Training	Twelve weeks

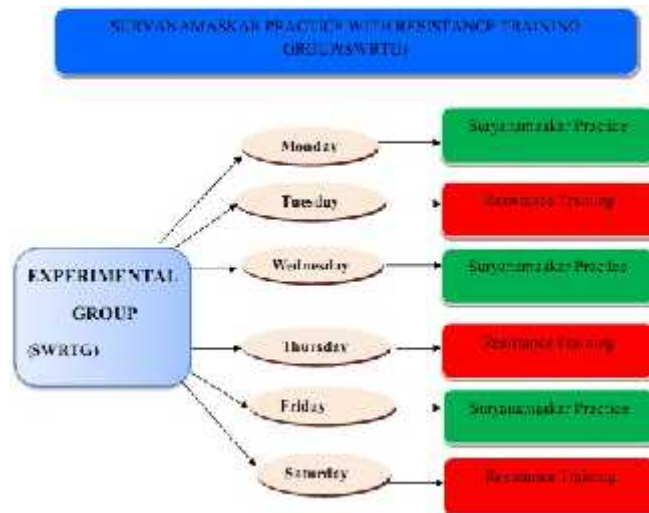


CHART-1 Experimental treatment adopted for experimental group

TABLE- I Progression of load for experimental group (SWRTG)

Weeks	Suryanamaskar Practice (Monday, Wednesday, Friday)	Duration(5+15+30+10 = 60 min)	Load
I to IV	Warming up 1000M Walking / Jogging Suryanamaskar Practice Warming down	5 minutes 15 minutes 30 minutes 10 minutes	
V to VIII	Warming up 2000 M Walking /Jogging Suryanamaskar Practice Warming down	5 minutes 15 minutes 30 minutes 10 minutes	8 to12rep x 3 sets
IX to XII	Warming up 3000 M Walking /Jogging Suryanamaskar Practice Warming down	5minutes 15 minutes 30 minutes 10 minutes	12 to15 rep x 4 sets
Weeks	Resistance Training (Tuesday, Thursday, Saturday)	Duration(5+15+30+10 = 60 min)	Load
I to IV	Warming up 1000M Walking / Jogging Wall push ups v-sit ups trunk lifts half squat Warming down	5 minutes 15 minutes 30 minutes 10 minutes	4 to 8rep x 2 sets
V to VIII	Warming up 2000 M Walking /Jogging Knee push ups Crunches Tummin lying leg lifts Flutter kicks Warming down	5 minutes 15 minutes 30 minutes 10 minutes	8 to12rep x 3 sets
IX to XII	Warming up 3000 M Walking /Jogging Push ups 90 degree leg scissors Incline sit ups Combined trunk Warming down	5minutes 15 minutes 30 minutes 10 minutes	12 to15 rep x 4 sets

Methodology

For the purpose of this study, altogether sixty men handball players were chosen on random basis from affiliated colleges for Bharathiar University, Coimbatore. Their age group ranges from 20 to 25 years. They were divided into two groups of 30. The Experimental group would undergo suryanamaskar practice with resistance training programme. The second group Control group. Pre – test and post –test would be conducted. Treatment would be given for twelve weeks. It would be find out finally the effect of suryanamaskar practice with resistance training programme on the handball players in scientific methods. The selected tests were measured by units for testing (Table 1):

Training Programme

The following schedule of training was given for the suryanamaskar practice with resistance training programme group.

Experimental Design

The experimental group was given suryanamaskar practice with resistance training exercises after taking an initial test. After the initial test selected suryanamaskar practice with resistance training exercises were given for twelve weeks in all days except Sunday. The time of practice was from 6.00A.M to 7.00 A.M. The control group were not participating in any of the special training programme. However they were allowed to participate in their regular education classes in the college as per their curriculum.

Statistical Technique

The achieved data since the experimental group and control group previously and subsequently the experimental dated were statistically evaluated with dependent t-test to discovery obtainable significant development. The level of significance was secure at 0.05 level of confidence for all the cases.

Table – II Mean and dependent 't' – test for the pre and post tests on flexibility, body composition, resting pulse rate, stress and anxiety of experimental group

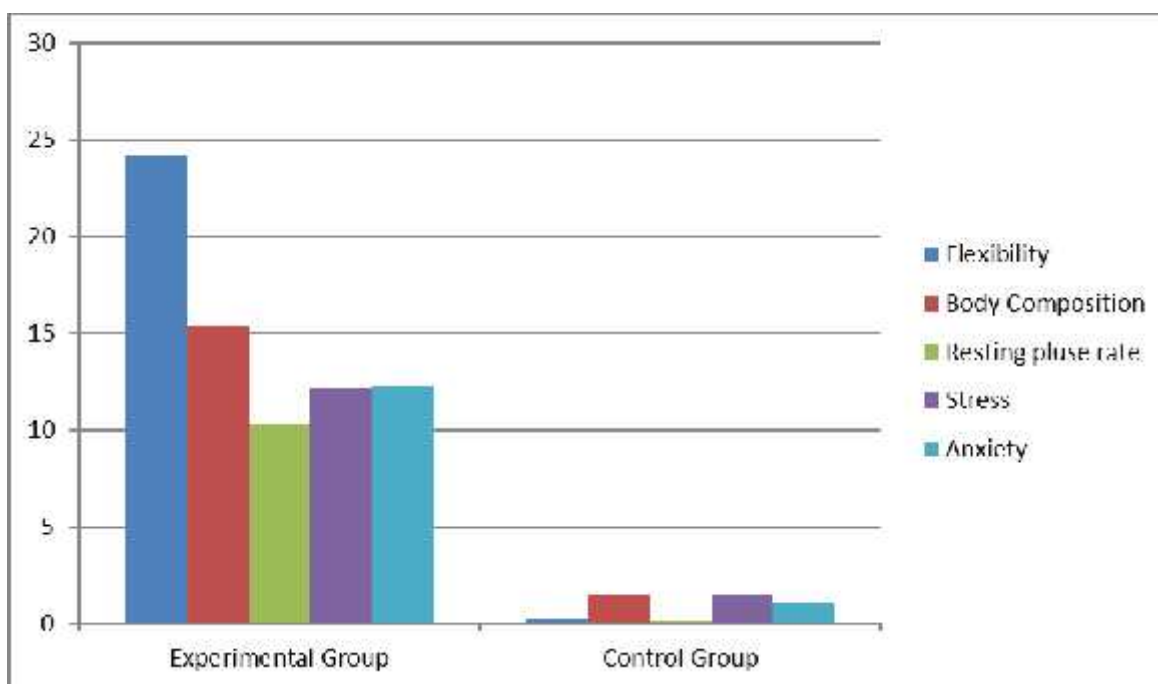
S. No	Variables	Pre test Mean± SD	Post test Mean± SD	Diff	SE	't' – ratio
1.	Flexibility	28.50 ± 2.72	31.90 ± 2.89	-3.4	0.14	24.18*
2.	Body Composition	33.26 ± 1.80	27.97 ± 1.67	5.28	0.19	15.40*
3.	Resting pulse rate	77.70 ± 2.46	75.20 ± 2.81	2.5	0.24	10.27*
4.	Stress	29.0 ± 6.76	26.29 ± 6.55	2.70	0.22	12.13*
5.	Anxiety	32.33 ± 3.85	29.33 ± 4.10	3	0.24	12.27*

*Significance at 0.05 level of confidence

TABLE – II Mean and dependent 't' – test for the pre and post tests on flexibility, body composition, resting pulse rate, stress and anxiety of control group

S.No	Variables	Pre test Mean± SD	Post test Mean ± SD	Diff	SE	't' – ratio
1.	Flexibility	26.90 ± 3.37	26.83 ± 3.47	0.06	0.39	0.17
2.	Body Composition	33.70 ± 2.37	34.35 ± 2.81	0.64	0.23	1.49
3.	Resting pulse rate	77.56 ± 2.37	77.53 ± 2.81	0.03	0.22	0.14
4.	Stress	28.25 ± 7.06	28.00 ± 7.30	0.25	0.18	1.43
5.	Anxiety	32.70 ± 3.06	32.36 ± 3.76	0.33	0.39	1.08

*Significance at 0.05 level of confidence

**Figure 1**

Results and Discussions

The effect of independent variables on each criterion variables was considered by dependent 't' – test on the data achieved for flexibility, body composition, resting pulse rate, stress and anxiety. The pretest and post- test means of experimental group and control group have been analyzed and existing in Table II&III.

The table II and III, shows that, the obtained 't'–ratio between the pre and post-test means of experimental group were 24.18,15.40,10.27,12.13,12.27 and control group were 0.17,1.49,0.14,1.43,1.08 respectively. The table values required for significant difference with df 1,29 at 0.05 level of confidence. Since the obtained 't' – ratio value of experimental and control group on flexibility, body composition, resting pulse rate, stress and anxiety were greater than the table value 2.045, it was concluded that

the suryanamaskar practice followed by resistance training had significantly improved flexibility, body composition, resting pulse rate, stress and anxiety of experimental group.

The pre and post- test mean value of experimental and control group on flexibility, body composition, resting pulse rate, stress and anxiety were graphically represented in the figure 1.

Discussion on Findings

The finding of the study reveals that the suryanamaskar practices followed by resistance training group cause significant improvement in their physical health and mental health components. In the view of control group there was no significant improvement in their physical health and mental health variables. The findings of the study Bauman A, Owen N. (2003), Chen KM (2008), Roubenoff (1999) in their study, they stated that regimen physical fitness with obstacle course training exercise developed physical fitness variables.

Conclusions

It was concluded that improvement of flexibility, body composition, resting pulse rate, stress and anxiety was found significantly on experimental group due to the effect of regimen physical fitness followed by obstacle course training when compared to the control group.

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