RESEARCH ARTICLE

EFFECT OF DIFFERENT TRADITIONAL DANCES OF TIGRAY REGION ON SELECTED PHYSICAL FITNESS TRIAD ON COLLEGIATE YOUTHS

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ABSTRACT

The purpose of this study was to evaluate the affect and comparisons of traditional dances of Tigray region on selected physical fitness traits. Eighty male participants were selected purposely and were divided in to four Traditional Dance groups and each group consists of twenty participants. Pre test was conducted before the Dance training program could start and the procedure for post test was also followed after the 12-weeks traditional dance training program to see the impact of the four Tigray Traditional Dances on the selected physical fitness traits (Agility, Flexibility, Power, Speed and Strength). The degree and rate of change in the five traits of physical fitness as a result of participation in the Traditional Dance classes was statistically analyzed using SSPS with significance set at $p=0.05$. A paired t-test was used to compare the values within each group prior and after the training program. Following the 12-weeks training program, significant improvements in all fitness variables among all Traditional Dance groups were observed. In conclusion, participants can improve their physical fitness levels with the application of a systematic and well-designed traditional dance training program.

Key Words: Traditional dance, Physical fitness traits, Physical benefits.

INTRODUCTION

Fitness is the key concept for happy and healthy life. To achieve this happiness, human perform variety of activity such as doing morning or evening walk, joining gyms, swimming clubs, western dance clubs, martial arts, recreational clubs and so on, and as a result one has to spend lots of money. Out of infinite options, dance is also a approachable system to achieve the target of fitness. However many philosophers defined Dance as it encompasses knowledge in the arts and humanities, the social and behavioral sciences, and is influenced by culture (Sarai-Clark, 1989). No matter what purpose dancing has for people, it has a commonly defined as a communication through movement (Anderson, 1997; Hanna, 1999; Hanstein, 1989; Ranney, 1988). In-general an aerobic exercise, dance brings well known benefits, such as reducing the risk of cardiovascular disease, weight control and other ones commonly associated with physical fitness. In addition, a considerable effect of dancing on psychological well-being is noted. More over this a unique form of movement in dances, directs the natural way to move, which inspires creativity, motivation, self-discipline and self-awareness. In previous studies its has been noted that music, dance & rhythmic movements helps the people to become healthy and happy irrespective of age, gender, area and so on. A study by Dr Paul Dougall at Strathclyde University in 2010 concentrating on older women found that Scottish country dancers were more agile, have stronger legs and can walk more briskly than people of the same age who took part in exercises such as swimming, walking, golf and keep-fit classes. In addition an Italian study in 2006 has shown that dance is a very good exercise for heart patients compared to other aerobic exercises like cycling.

This may be partly because the patients enjoyed it much more. In same field of interest a study conducted by Dr Paul Dougall at Strathclyde University in 2010 concentrating on older women found that Scottish country dancers were more agile, have stronger legs and can walk more briskly than people of the same age who took part in exercises such as swimming, walking, golf and keep-fit classes. Similarly, a dance has shown better result in different sports fields. A report by Professor Tim Watson and Dr Andrew Garrett of University of Hertfordshire compared members of the Royal Ballet with a squad of British national and international swimmers. The dancers scored higher than the swimmers in seven out of ten areas of fitness. On the base of above mentioned research report, researchers are quest on consequence of traditional dances of Tigray (Ethiopia) on sports training program(s). Ethiopia has over 80 ethnic groups in the country, and each group has a very unique step and rhythm of dances such as Wolaytigna (Woliyta), Amharic, Afan Oromo, Tigirigna, Gurageagna, Afarigna, Sidamigna, Gambela, etc. (Tigray Tigrigna: Wikipedia, the free encyclopedia). These dances have its own unique form of movement, it is more than a mere physical movement with different combination of speed, agility, endurance as well its aesthetic nature. Through dance, movement is transformed into a purposeful phrase of action that encompasses physicality, emotion, and cognition. Dance uses "the movement of the body in its reactions to the environment" (Martin, 1965, p.1).

By considering the above facts researchers objectives of this study is to discover and correlate the effect of traditional dances (Awris, Hura, Kuda and Kunama dance) of Tigray region(Ethiopia) on selected physical fitness variables (Flexibility, Speed, Agility, Power, and Strength). The implication of such study will give information about the contribution of traditional dances in physical fitness traits, helps the individuals, athletes, coaches to incorporate

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traditional dances in their training program, and thus the researchers assumes that there will be a statistical significance between pre and post test of physical fitness traits among different dance groups.

MATERIALS AND METHODS

Study Design

Since the foremost aim of this cram is to assess the outcome of traditional dance on chosen physical fitness traits so, this study was an experimental research design involving four groups of traditional dances i.e.- Kuda, Awris, Hura and Kunama.

Participants

A sample of 80 male students were selected who are willing to participate voluntarily. The participants are free from all types of illness & injuries. They were all informed about the study and followed by signatures on voluntary participation forms. Latter on students were instructed to stop any kind of stimulants, supplement drugs or such any other kind of things. They were further instructed not to take heavy meals atleast two hours before they come for dance class, and to wear most comfortable dress during dance classes. The volunteers were divided into four groups and each group consisted of twenty subjects. The division was according to the place where they came from and in addition the desire of the participants in which they wanted to participate in the four Tigray traditional dances i.e.-Awris, Kuda, Hura and Kunama.

Dance Training Program Pictures

Picture of Kuda traditional dance

Picture of Awris traditional dance

Dance Training protocol

The dance styles used were characterized as a traditional dance of Tigray. It involved a variety of steps, such as delicate neck motion, rhythmical shoulder movement, jumping steps, courting and so on. The physical demands of the dance classes were gradually progressed, with the initial two weeks performed at a 'very light to 'light' intensity.

The program was taken twelve weeks three times per week. Each dance class consisted of warm-up, main dance and cool-down sections, with music used to increase enjoyment and aid in highlighting various movement dynamics. The warm-up lasted for 10 minutes and involved gentle joint mobility, alignment, body awareness and weight transference activities, as well as opportunities for individual choice and expression. The main dance section lasted 45 minutes and consisted of increasingly complex traditional dance movements that offered varied dynamic and expressive phrasing of the upper and lower body. These provided accumulative complexity e.g. awareness of space, directional change, and use of levels which were progressed from the warm-up and included partner dancing and social interaction. The cool-down lasted 5 minutes and involved gentle movements of the major bodily joints as well as deep and slow inhalation and exhalation respiration cycles.

Data analysis process

Pre and post test were taken in order to evaluate the effect of traditional dances on the selected physical fitness traits. Pre test measurements were conducted before the dance program was started and the post test measurements conducted after the dance training program was completed, after 12 weeks.

Physical fitness analysis technique

I. Flexibility: Measured by sit and reach test

Purpose: sit and reach test is the most common form of flexibility test; its purpose is to measure the flexibility of the hamstrings and the lower back.

Equipment required

Participants removed their shoes and sat on the floor with legs extended and were directed to keep their knees straight and toes pointing towards the ceiling. With one hand on the top of the other they exhaled and reached their hands as far long the top of the box as possible.

Picture of Hura traditional dance

Picture of Kunama traditional dance
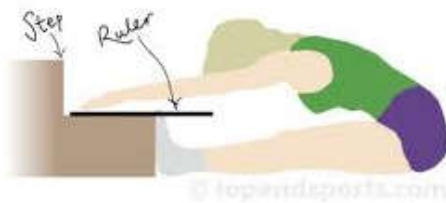
Sit and reach box about 30cm or 12 inches high (or alternatively a ruler can be used, and a step or box)

The position was held for 2 to 3 seconds released and then repeated three times. A scale (centimeter) was used to record the distance reached .Finally an average score from the three attempts was used for analysis. A higher score represented a greater level of flexibility.

II. Speed: Measured by 30m sprint test

Purpose: The aim of this test is to determine acceleration and speed.

Equipment

30m tape measure, stopwatch.

Procedure: Marked out 30 meters accurately on a flat, non-slip surface. Using a standing start, participants were run from the start line as quickly as possible to the finish line.

III. Agility: Measured by Agility cone or compass drill test

Purpose: this is a test of speed, explosion, body control and the ability to change direction (agility).

Equipment required

✓ stopwatch or timing gates,
✓ measuring tape
✓ chalk, 5 marker cones,
✓ flat non-slip surface.

Procedure: The cones are laid out, with four marker cones placed in a diamond shape, and labeled with 1, 2,3,4,5 and one in the middle. The outer cones were each placed 3 meters from the center. The participants crouched behind and with their left hand on the middle cone, facing forwards (towards cone 5). The participants then turn and run to the right and touches the cone (2) with their hand. They then turn back and run to the center cone, out to the next cone (3), back to the center, out to the next cone (4), back to the center and then finally turn and finish by running through the finish line at cone 5.

The participants were required to touch the cone with their hand at each turn. Timing starts when the hand comes off the center cone, and stops when the chest passes through the line of the final cone. Rest for three minutes, then repeat the drill, moving in the opposite direction (counterclockwise, cones in order 1-4-3-2-5).

V. Power: Measured by Vertical jump test.

Purpose: To measure the power of the leg

Equipment required
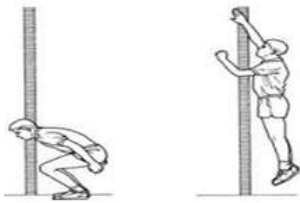
✓ measuring tape/ marked wall,
✓ chalk for marking

Procedure: the participants stand side on to a wall and reaches up with the hand closest to the wall. Keeping the feet flat on the ground, the point of the fingertips is marked or recorded. This is called the standing reach height. The participants then stands away from the wall, and leaps vertically as high as possible using both arms and legs to assist in projecting the body upwards. The jumping technique can or cannot use a countermovement. Attempt to touch the wall at the highest point of the jump. The difference in distance between the standing reach height and the jump height is the score. The best of three attempts was recorded analyzed.

VI. Strength: Measured by Chair push up test.

Purpose: This test is used to measures upper body strength and endurance.

Equipment required

✓ wall,
✓ a standard chair(approx. 46cm high),
✓ stopwatch,
✓ chalk/masking tape,
✓ even and firm floor surface

Procedure: Shoes should be worn for best grip on the floor. Place the chair against the wall then lie face up with the soles of both feet in line with the front of the chair. Mark a line on the floor with the chalk/masking tape at the level of the elbows. Stand facing the chair with the toes behind this marked line, and reach forward to place both hands shoulder width apart on the front edge of the chair. Straighten the arms, and ensure the body and legs are in a straight line, the arms should be at right angles to the body. When ready, complete as many push-ups as possible in 30 seconds. For a push-up to be counted, the subject must lower their body until their chest touches the front edge of the chair and then raise themselves back to the starting position until arms are fully extended. It is important that the body is kept in a straight line throughout the entire test. A push-up is not counted if not completed correctly.

Scoring: Record the total number of correctly completed push-ups that were performed in 30 seconds.

Result and Data Analysis

RESULTS

The degree of change in the five areas of physical fitness (agility, flexibility, power, speed and strength) as a result of participation in the Traditional dance classes was statistically analyzed using SSPS (version-16).

The above mention (table-1) represents the demographic analysis of all voluntary participants(N=80), with mean age of 21.9±1.32 Years with ranges from 19 to 25 years old boys. Their standard height is 1.71±0.65 meters, with ranges from 1.55 to 1.71 meters. The average body weight of this sample is 59.1±5.5 Kg, ranges from 46 to 75 Kg. Thus on calculating their Body Mass Index(BMI) we found on average 19.96±1.4Kg/M^2, with an range of 17.3 to 24.8Kg/M^2. Out of eighty volunteers two students are under weight. The sample of eighty volunteers are distributed into four dance team consisting twenty participants each, they have been distributed based on the desire by the volunteers.

Descriptive Statistical analysis of Kuda Traditional Dance

In kuda dance team (Table-2) the twenty students average age was 21.9±1.25 years. Their average height 1.74±0.07 meters & weight was 59.1±5.2Kilogram, thus their average BMI was 19.4±1.2. While analyzing the physical fitness components (table-3) of Kuda dance group(n=20) we found that to complete the agility drill test students took 9.7±1 sec, with minimum duration of 8.21 sec and maximum duration of 12.33 sec. There Trunk flexibility was on average 4.5±2.7 centimeters (cm), with an range from -3 cm to 9 cm. The power was analysed by vertical jump. On an average 45.3±9.97 cm, with an range of 30cm to 63cm. The next component was to analyse the speed, i.e.- time taken to complete 30 meters dash running. On an average 4.8±0.33 sec were taken to complete, with an range of 4.23 sec to 5.43 sec. the last component was to analyze the strength, i.e.- number of chair push-up in 30 seconds of intervals. The volunteers on average took 34.5±6.48 numbers with minimum of 25 and maximum of 50 push-up. After 12 weeks of dance training we found a difference in above mentioned physical fitness components. The agility was much improved, to complete the same task volunteers need less time then before, such as the average time to complete the agility task they need 7.07±0.65 seconds, with minimum of 6.27 sec and maximum of 8.75 sec. similarly the flexibility was improved as mean value of 9.3±5.12 cm with minimum of -1 to maximum of 18 cm. The third components was power, the average was 46.1±7.73, with the minimum of 37 cm and max of 63 cm of vertical jump. The fourth component was speed, volunteers took 4.66±0.29 sec to run 30 mts dash with minimum time of 4.23 to maximum of 5.11 sec. The last component was strength. The average chair push up in thirty seconds was 38.2±8.27 , with minimum of 17 and maximum of 59 push up.

Descriptive Statistical analysis of Awris Traditional Dance

The age range of this team (table-4) was between 21 to 24 years, with an average of 21.9±0.96 years. The height was between 1.6 to 1.87 meters with an average value of 1.7±0.7 meters. The body weight ranges from 51 to 67 Kg, with an average of 59.2±4.2 Kg, Thus BMI ranges between 18.7 & 21.7 Kg/M^2 with and average of 20.3±0.8 Kg/M^2. Whereas the physical fitness components (table-5) of Awris dance group(n=20) we found that to complete the agility drill test students took 8.9±1 sec, with minimum duration of 7.53 sec and maximum duration of 11.11 sec. There Trunk flexibility was on average 5.99±5.83 centimeters (cm), with an range from 0.4 cm to 27 cm. The power was analysed by vertical jump. On an average 43.6±10.73 cm, with an range of 10cm to 60cm.

Table 1. Demographic Analysis of voluntary participants

	N	Minimum	Maximum	Mean	Std. Deviation
Age(Years)	80	19.00	25.00	21.9750	1.32144
Height(Meters)	80	1.55	1.87	1.7197	.06583
Weight(KG)	80	46.00	75.00	59.0750	5.47439
BMI	80	17.30	24.80	19.9650	1.40037

Table 2. Demographic Statistics analysis of Boys Participated in Kuda Traditional Dance

	N	Minimum	Maximum	Mean	Std. Deviation
Age(years)	20	20.00	24.00	21.9000	1.25237
Height(Meters	20	1.60	1.85	1.7445	.06517
Weight(Kg)	20	46.00	67.00	59.1000	5.27057
BMI	20	17.30	22.40	19.4050	1.21286

Table 3. Descriptive Statistics of PRE & POST Test of Physical Fitness Components

	n	Minimum		Maximum		Mean		Std. Deviation	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Agility	20	8.21	6.27	12.33	8.75	9.7380	7.0750	1.00951	.65751
Flexibility	20	-3.00	-1.00	9.00	18.00	4.5100	9.3000	2.70300	5.12065
Power	20	30.00	37.00	63.00	63.00	45.300	46.100	9.97945	7.73168
Speed	20	4.23	4.23	5.43	5.11	4.8000	4.6695	.33905	.28853
Strength	20	25.00	17.00	50.00	59.00	34.500	38.200	6.48480	8.27552

Table 4. Demographic Statistics analysis of Boys Participated in Awris Traditional Dance

	N	Minimum	Maximum	Mean	Std. Deviation
Age	20	21.00	24.00	21.9000	.96791
Height	20	1.60	1.87	1.7060	.07265
Weight	20	51.00	67.00	59.1500	4.15838
BMI	20	18.70	21.70	20.3250	.84472

Table 5. Descriptive Statistics of PRE & POST Test of Physical Fitness Components

	N	Minimum		Maximum		Mean		Std. Deviation	
		Pre	Post	Pre	Post	Pre	Post	Pre	post
Agility	20	7.53	4.84	11.11	9.09	8.9025	7.5590	1.03452	.90616
Power	20	10.00	1.00	60.00	27.50	43.6000	9.8500	10.73803	7.06381
Flexibility	20	.40	37.00	27.50	63.00	5.9950	47.8500	5.83821	7.65214
Strength	20	16.00	4.13	44.00	5.07	33.9500	4.5835	5.85325	.29021
Speed	20	4.23	22.00	5.48	47.00	4.8385	35.5500	.34428	5.88016

Table 6. Demographic Statistics analysis of Boys Participated in Hura Traditional Dance

	n	Minimum	Maximum	Mean	Std. Deviation
Age	20	19.00	25.00	22.0000	1.48678
Height	20	1.65	1.87	1.7275	.05999
Weight	20	51.00	75.00	58.9000	7.15909
BMI	20	17.30	24.80	19.7050	1.79897

Table 7. Descriptive Statistics of PRE & POST Test of Physical Fitness Components

	N	Minimum		Maximum		Mean		Std. Deviation	
		Pre	Post	Pre	Post	Pre	post	Pre	post
Agility	20	8.24	6.75	12.28	10.63	10.1100	8.37	1.17840	1.23423
Flexibility	20	-1.00	.00	10.00	20.50	5.3800	8.3750	2.53369	5.58405
Power	20	30.00	33.00	48.00	53.00	39.8000	10.4500	6.14389	5.24028
Speed	20	4.33	4.27	5.76	5.63	5.0485	43.7500	.40201	.37129
Strength	20	12.00	20.00	44.00	51.00	28.9000	4.7870	7.81968	8.02283

The next component was to analyse the speed, i.e.- time taken to complete 30 meters dash running. On an average 4.83±0.34 sec were taken to complete, with an range of 4.23 sec to 5.43 sec. the last component was to analyze the strength, i.e.- number of chair push-up in 30 seconds of intervals. The volunteers on average took 33.95±5.85 numbers with minimum of 16 and maximum of 44 push-up. After 12 weeks of dance training, we found a difference in above mentioned physical fitness components. The agility was much improved, to complete the same task volunteers need less time then before, such as the average time to complete the agility task they need 7.55±0.90 seconds, with minimum of 4.84 sec and maximum of 9.09 sec. similarly the flexibility was improved as mean value of 9.9±7.06 cm with minimum of 1cm to maximum of 27.5 cm. The third components was power, the average was 47.85±7.65, with the minimum of 37 cm and max of 63 cm of vertical jump. The fourth component was speed, volunteers took 4.58±0.29 sec to run 30 mts dash with minimum time of 4.13 to maximum of 5.07 sec.

The last component was strength. The average chair push up in thirty seconds was 35.55±5.88, with minimum of 22 and maximum of 47 push up.

Descriptive Statistical analysis of Hura Traditional Dance

The hura dance volunteers average age was 22±1.48 years, with minimum age of 19 and maximum of 25 years. Their average height is 1.72±0.05 meters, their weight is 58.9±7.15 Kg, ranges between 51 to 75 Kg. As per the calculation their average BMI was 19.7±1.79 Kg/M^2. though it ranges from 17.3 to 24.8 Kg/M^2. On analyzing their physical fitness components (table-7) before the dance training start we discover that the to complete the agility task they took 10.11±1.17 sec, with minimum time of 8.24 to maximum of 12.28 sec. their trunk flexibility was ranges between -1 to 10 cm, with an average of 5.38±2.53cm. The third component was speed. To cover the distance of thirty meters, on average they took 5.05±0.4 sec, which is ranging between 4.33 to 5.76 sec. The last component was strength. Within 30 sec, on an average the volunteers took 28.9±7.8 push-up with a range of 12 to 44 pushups. Surprisingly after 12 week of Hura dance training the agility of same group found improvement. To complete the same agility task, they took on average 8.37±1.23 sec, with an range of 6.75 to 10.63 sec. The trunk flexibility was much improved with an average of 10.45±5.58 cm, with a range of 0 cm to 20.5 cm. The third component was power, with is anlysed by vertical jump. We have seen that their power was on average was 43.75±5.24 cm, with a arrange of 33 to 53 cm. The fourth component was speed. On average the mean time to cover thirty meter run was 4.78±0.37sec, with a rang of 4.27 to 5.63 sec. The last component is strength. On an average it was 33.05±8.02 push up with in thirty seconds. It was ranging between 20 to 51 push up in thirty seconds.

Descriptive Statistical analysis of Kunama Traditional Dance

As seen in previous dance team, in this Kunama Traditional dance team volunteers (table-8) age was ranges between 20 to 25 years with an average of 22.1±1.58 years. Their average height was 1.7±0.06 meters with a range between 1.55 & 1.82 meters. The body weight was on average 59.15±5.3 Kg, with a range between 50 to 69 Kg. Thus their BMI was 20.42±1.4 Kg/M^2, with a range between 18.4 to 22.7 Kg/ M^2.

The Kunama traditional dance group's pre test agility average was 9.74±0.96 sec with a range between 7.96 to 11.29 sec. their trunk flexibility was measured was between -4 to 10.5 cm, with an average of 2.62±3.08 cm. The power of vertical jump was an average of 42.05±8.87 cm, with a range between 15 to 57 cm. The speed for thirty meters dash run was covered in 4.53±0.32 sec, as an average. And it ranges between 3.94 to 5.31 sec. The strength of arm was measured by pushups. Within thirty seconds on average 36.2±6.5 push up was made with a range between 24 to 49 pushups. After a 12 week of kunama traditional dance we found that the agility of same group found improvement. To complete the same agility task, they took on average 7.58±0.92 sec, with an range of 6.39 to 10.57 sec. The trunk flexibility was much improved with an average of 7.43±3.74 cm, with a range of 2 cm to 15 cm. The third component was power, which was analyzed by vertical jump. We have seen that their power was on average was 47.15±7.17 cm, with a arrange of 35 to 62 cm. The fourth component was speed. On average the mean time to cover thirty meter run was 4.49±0.33sec, with a rang of 3.82 to 5.16 sec. The last component is strength. On an average it was 38.05±6.09 push up with in thirty seconds. It was ranging between 27 to 47 push up in thirty seconds.

Data Analysis

From the above result, the data has further analyzed and tried to find outcome few of the following outcome of effect of each traditional dances on each physical fitness variable.

Flexibility

On analyzing the first component, i.e- change in trunk flexibility after performing 12 weeks dance program, which was analyzed by sit, and reach test. From the above mentioned graph (Graph-1) its clear to understand that though the participant of Awris dance team achived remarkable change in flexibility(15cm) but on an average Hura traditional dance team achived highest flexibility i.e.- 5.12±4.7 cm, where as Awris traditional dance participants achived least improvement in flexibility.i.e.- 3.86±4.7 cm
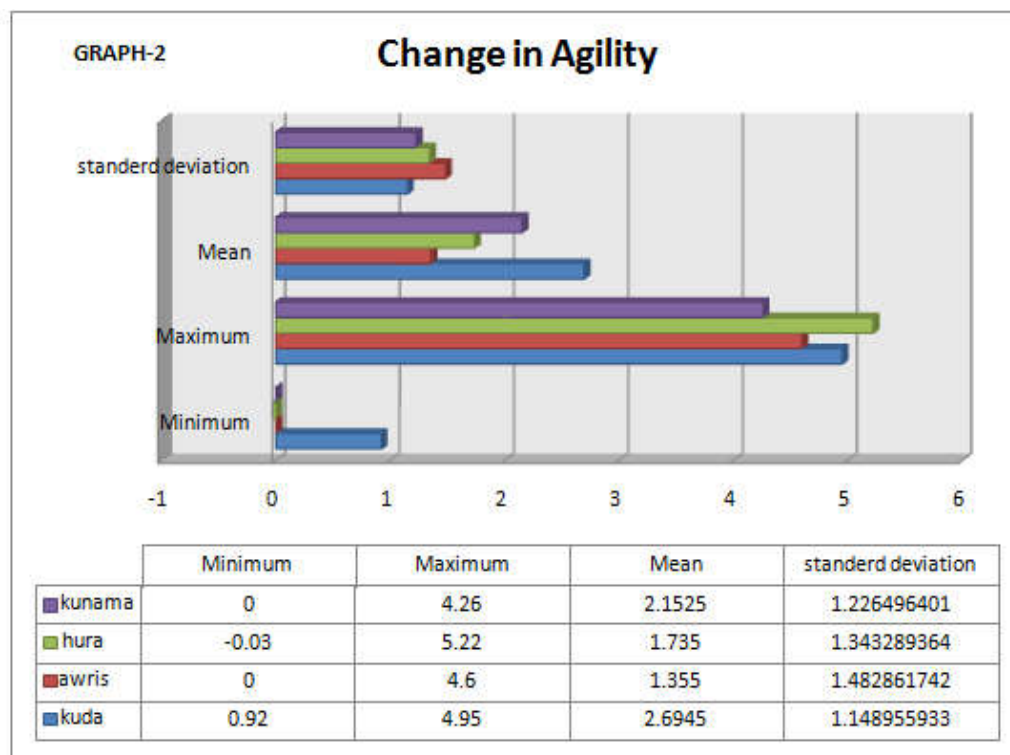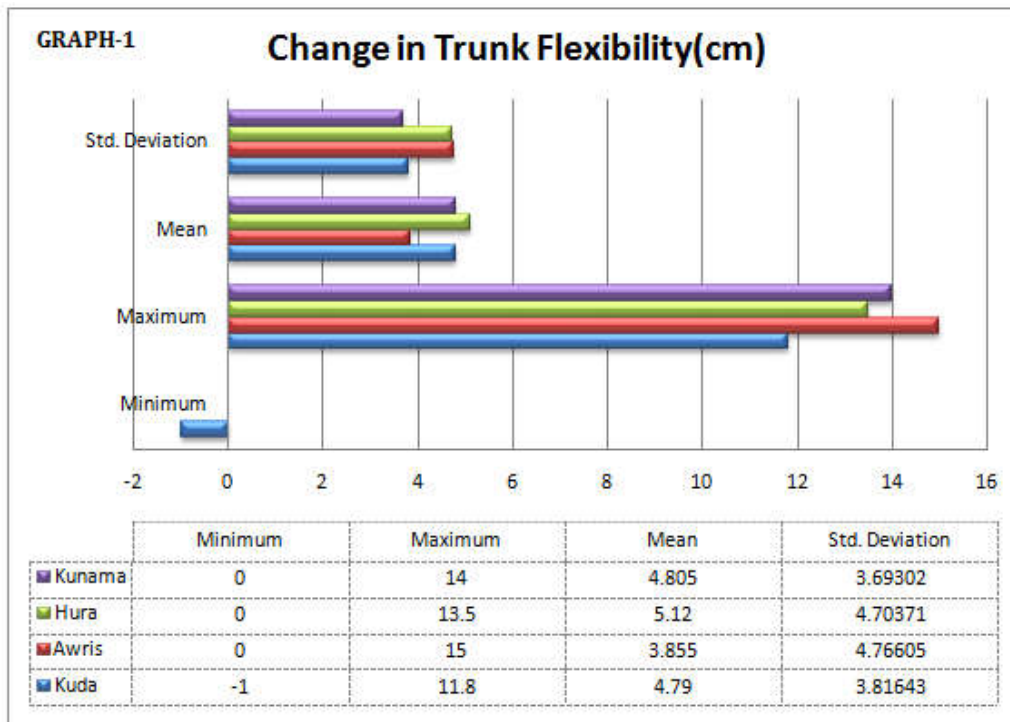
Agility

When we tried to analyze the change in agility (Graph-2) after 12 weeks of training, via different traditional dances, we found that there is significant changes in agility were noted in all traditional dances.

Table 8. Demographic Statistics analysis of Boys Participated in Hura Traditional Dance

	N	Minimum	Maximum	Mean	Std. Deviation
Age	20	20.00	25.00	22.1000	1.58612
Height	20	1.55	1.82	1.7010	.06017
Weight	20	50.00	69.00	59.1500	5.31408
BMI	20	18.40	22.70	20.4250	1.40446

Table 9. Descriptive Statistics

	N	Minimum		Maximum		Mean		Std. Deviation	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Agility	20	7.96	6.39	11.29	10.57	9.7465	7.5850	.95513	.92341
Flexibility	20	-4.00	2.00	10.50	15.00	2.6200	7.4250	3.08521	3.74262
Power	20	15.00	35.00	57.00	62.00	42.0500	47.1500	8.87026	7.17653
Speed	20	3.94	3.82	5.31	5.16	4.5375	4.4935	.32206	.33555
Strength	20	24.00	27.00	49.00	47.00	36.2000	38.4500	6.55021	6.09983

GRAPH-1 — Change in Trunk Flexibility(cm)

	Minimum	Maximum	Mean	Std. Deviation
Kunama	0	14	4.805	3.69302
Hura	0	13.5	5.12	4.70371
Awris	0	15	3.855	4.76605
Kuda	-1	11.8	4.79	3.81643

GRAPH-2 — Change in Agility

	Minimum	Maximum	Mean	standerd deviation
kunama	0	4.26	2.1525	1.226496401
hura	-0.03	5.22	1.735	1.343289364
awris	0	4.6	1.355	1.482861742
kuda	0.92	4.95	2.6945	1.148955933

The participants were improved their agility skills by reducing the time. For Kunama traditional dance, there was a change maximum of 4.26 sec with a mean 2.15±1.23 sec. where as in Hura traditional dance there was a change of minimum – 0.3 sec to 5.22 sec with a variation of 1.74±1.34 sec. In Awris a change of maximum 4.96 sec aith an average 1.36±1.48 sec. Overall we found maximum change in Kuda Traditional dance. The participants were took minimum 0.92 sec with max 4.95 sec with an average 2.69±1.14 sec less to complete the agility task.

Power

The power has been analyzed by vertical jump. On analyzing the difference by vertical jump, we found that. On analyzing the third component we found that is power by testing the vertical jump we discover few interesting data. Unlike the other component here the change in vertical jump data is heterogeneous, with wide range. In Kunama traditional dances we found that the rate of change in range of vertical jump-power is between -3 cm to 31 cm with an average of 5.1± 7.32 cm. which was found best as compared to other group.

Change in Power

GRAPH-3

	Minimum	Maximum	Mean	standerd deviation
■ Kunama Traditional Dance	-3	31	5.1	7.326
■ Hura Traditional Dance	-4	11	3.95	3.804
■ Awris Traditional Dance	0	27	4.25	5.784
■ Kuda Traditional dance	-15	15	0.8	7.068

Change in Speed

Graph-4

	Minimum	Maximum	Mean	standerd deviatation
■ Kunama Traditional Dance	-0.6	1.04	0.044	0.446405527
■ Hura Traditional Dance	-0.31	1.12	0.2605	0.340718668
■ Awris Traditional Dance	-0.06	0.63	0.255	0.225143229
■ Kuda Tradition Dance	-0.74	0.99	0.1315	0.400608419

Rate of Change in Strength

GRAPH-5

	Minimum	Maximum	Mean	standerd deviatation
■ Kunama Traditional Dance	-8	16	2.25	5.250313274
■ Hura Traditional Dance	-2	15	3.65	4.522167622
■ Awris Traditional dance	-10	6	1.6	3.515379743
■ Kuda Traditional Dance	-8	15	3.7	5.601691474

In Hura it was ranges between -4 to 11 cm, with a mean range between 3.95±3.8 cm, in Awris dance group it was ranges between 0 to 27 cm with an average of 4.25±5.78 cm, in this team there is no negative impact in either of participants. In Kuda dance group, the change in power ranges between -15 to 15 cm with an average is 0.8±7.06 cm. thus in this group we found that this team has suffered a loss of power.(i.e.- vertical jump) and we cant suggest to dance with Kuda rhythm as we found biggest negative impact.

Speed

The change in speed (graph-4) was analyzed by time taken to cover thirty meter by sprinting. The data are heterogeneous in nature, and changes are also not so significant as seen in other components. In Kunama dance group, the rate of speed improvement was recorded between -0.6 sec to 1.04 sec, with an average of 0.044±0.44 sec, and in Kuda dance group it was -0.74 to 0.99 sec with an average of 0.1315±0.4 sec. In Hura traditional dance the improvement was ranges between -0.31 sec to 1.12 sec with an average of 0.26±0.34 sec, which was the best among other team. Similarly Awris was had a good with improvement range -0.06 to 0.63 sec, with an average of 0.255±0.225 sec, but less then Hura dance team.

Strength

On analyzing the change in strength (Graph-5), i.e.- number of push-ups in thirty seconds, we found that the rate of improvement in strength in kunama Traditional dances team was ranged between -8 to 16 push-ups with an average of 2.25±5.25, where as Hura its was ranging between -2 to 15 with an average of 3.65±4.52. In awris dance team it was ranges between -10 to 6 with an average of 1.6±3.5, and kuda dance team improvement was -8 to 15 pushups, with an average of 3.7±5.60 push up.

Test of significance

To analyze the test of significance of each physical fitness variables we conducted paired student T-test of data of pre test and posttest. The significance is set as P=0.05.

The basic objective of this study was to find out the influence of Tigray traditional dances for the physical fitness development in the field of sport arena. This is first kind of experiment which has been conducted, as till dated we didn't found any information, data or any related articles in internets, local books, magazines, research articles etc. To conduct such kind of experiment our departmental & college research ethical committee has permitted. Thus to start this study we gathered 80 (eighty) healthy i.e. free from any kind of injuries, disease, as well from audio, visual, physical, cognitive impairment volunteer. We explained the procedure of the experiments and properly instructed about their food and dressing habits and took signature of voluntary participation form. We took pre test data of BMI, age, and were divided into four different groups as per their willingness. Then we took pre data of physical fitness components and for next 12(twelve) weeks we gave them to dance for 3days a week for 1 hour session, and took post test data of same physical fitness components.

On observing the effect of each traditional dance of Tigray, we discovered that in Kuda tradition dance can improve agility component minimum of 0.92 sec, and on average of 2.69 sec±1.148 sec, whereas on power, speed & strength the impact was bit negative. In Awris traditional dance we found that can improve flexibility and power components as compared to other traditional dances, where as negative effect has seen in speed and strength. In kanama traditional dance we got good point to found that flexibility and agility components are much better then other dances. But the Hura dance found to be the safest and more effective to improve overall all components of physical fitness among each members of the team, with negligible negative effect. Out of all physical fitness components, all types of traditional dances shows high improvement in flexibility components, this may be because generally boys are least bother about flexibility training and thus each types of dance, more or less improved their flexibility components. And least improvements seen in agility and speed components, as may be that all dances have their own rate, rhythm & sharpness in movement, which probably hindering the learning ability of improvement of speed and agility.

Pre-test & post data ; Student T test	Agility	Flexibility	Power	Speed	Strength
Kuda traditional dance	0.000	0.000	0.619	0.161	0.008
Awris traditional dance	0.001	0.002	0.004	0.000	0.056
Hura traditional dance	0.000	0.000	0.000	0.003	0.007
Kanama traditional dance	0.000	0.000	0.006	0.664	0.070

The stastical data says that in Kuda traditional dance, the power & speed data are insignificant, where as the data in strenrth the Awris and Kanama traditional dance data are insignificance and also in kunama traditional dance the speed component are insignificant. The rest of data are significant at the level of P= 0.05.

DISCUSSION

Ethiopia is very well known for sports and games. In long and middle distance running, this nation has contributed a lot. Moreover its know that to perform better in any sports and games competition physical fitness development is must. Ethiopia is know for its rich heritage culture, and having more than 80 ethnics, and each have their own way of dance, music & cultural life-style. Tigray is one of the nine regions, of Ethiopia with has enrich cultural background.

The power and strength components has widest range as chance of possibility is the physical build-up has variation among the participants. In our study we have seen there are few students whose basal metabolic Index (BMI) is less then 18 kg/M^2, thus we can consider that malnourished as a factor. On analyzing the test of significance of the data and to evaluate the hypothesis, of each selected physical fitness components on different Traditional dances of Tigray. we found that our hypothesis is partially accepted, i.e.- our null hypothesis is rejected on power component for Kuda traditional dance, speed for Kuda & Kanama traditional dance and strength component for Awris & Kanama traditional dance. Though large number of study from entire world speak as limitless benefits. For example, a report by Professor Tim Watson and Dr Andrew Garrett of University of Hertfordshire compared members of the Royal Ballet with a squad of British national and

international swimmers. The dancers scored higher than the swimmers in seven out of ten areas of fitness, where as our subjects belongs to same professional activity, i.e. education. Similarly, an Italian study in 2006 has shown that dance is a very good exercise for heart patients compared to other aerobic exercises like cycling. This may be partly because the patients enjoyed it much more, in same manner, moreover a recent study done in Perth Western Australia by Debbie Duignan (WA Alzheimers Association) explored the use of Wu Tao Dance as a therapy for people with dementia. It was shown that Wu Tao, dance therapy that works to balance energy in the body, similar to T'ai chi, helped to reduce symptoms of agitation in people with dementia. As like previous article even this study conducted by Dr Paul Dougall at Strathclyde University in 2010 concentrating on older women found that Scottish country dancers were more agile, have stronger legs and can walk more briskly than people of the same age who took part in exercises such as swimming, walking, golf and keep-fit classes. According to the results of several research studies whose results were compiled into a report by the President's Council on Physical Fitness and Sports, exercises like dancing can actually help ward off disease. One study showed that stress hormones that suppress the immune system is reduced during moderate physical exercise and that the effect is cumulative over time. This means that by dancing just a few days a week, people may be able to weather the cold and flu season unscathed (Wendy InnesI January 30, 2012).

Recommendation

We believe that this type of study is first of its kind, thus there are many scope to do further research on different age group, gender, occupational society. Many study suggest that dances are good for oldies, thus even this dances should be analyzed and find the effect of old age people on their physiological, psychological, social and other changes. During our study we didn't found any such bad effect thus we can recommended that dance can be utilized as a fitness maintenance workout for the off session time for players, more over further research are needed in this field.

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