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Research Article

Anthropometric profile of volleyball players at different level of contests: In reference to south Gondar Woredas team and project players

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ABSTRACT

The purposes of this study were to determine the anthropometric characteristics of elite and beginner South Gondar volleyball players and to identify the differences in the anthropometric profile between the players at different level of volleyball contests. A sample of 52 subjects, which includes 26 each, inter-project level (n = 26, mean ± SD: Age 16.42 ± 0.47 years, height 162.04 ± 6.14 cm, weight 58.44 ± 4.42 kg, and body mass index [BMI] 18.34 ± 1.86) and inter-club level (n = 26, mean ± SD: Age 21.42 ± 0.46 years, height 171.08 ± 4.14 cm, weight 64.22 ± 4.36 kg, and BMI 21.42 ± 2.18) male volleyball players, was selected for the present study. The purposive sampling technique was used to select the subjects. All the subjects were assessed for height, weight, lengths, circumferences, diameters, and skin fold thicknesses. An independent samples t-test revealed that inter-club volleyball players had significantly higher height ($P < 0.05$), arm length ($P < 0.05$), upper leg length ($P < 0.05$), and lower leg length ($P < 0.05$) as compared to inter-project level volleyball players. The inter-club level volleyball players were also found to have significantly greater elbow diameter ($P < 0.05$), shoulder diameter ($P < 0.05$), hip diameter ($P < 0.05$), knee diameter ($P < 0.05$),calf circumference ($P < 0.05$), chest circumference ($P < 0.05$), upper arm circumference ($P < 0.05$), and fore arm circumference ($P < 0.05$). Inter-club volleyball players had significantly greater biceps ($P < 0.05$), triceps ($P < 0.05$), subscapular ($P < 0.05$), and suprailiac skinfold ($P < 0.05$) as compared to basketball players.

Keywords: Anthropometric, Club, Contest, Project, Volleyball

INTRODUCTION

Anthropometric characteristics are related to a player's profile and might be used to predict a player's success. Anthropometric characteristics of players has been an interest of sports trainers, exercise scientists, physical education, and sport medicine professionals for years and many of them assumed the practicing players might be expected to exhibited structural and functional characteristics that are specifically favorable for the sport (Milicerowa, 1973). In addition, anthropometric measurements and morphological characteristics play an important role in determining the success of a sportsperson (Wilmore and Costill, 1999; Keogh, 1999). Volleyball belongs to sport activities in which anthropometric characteristics of its participants influence the level of sport performance. It was established that volleyball players compared to most other athletes have distinctive anthrop-morphological characteristics (Ercolessi, 1999; Jankovic *et al*., 1995; Ugarkovic, 2004). An athlete's anthropometric characteristics represent important prerequisites for successful participation in any given sport (Gualdi-Russo and Zaccagni, 2001). Body height, being the most characteristic trait of volleyball players, is significantly conditioned genetically (Milicerowa, 1973). Many previous studies have evaluated anthropometric profile of volleyball player (Bandyopadhya, 2007; Gabbett and Georgieff, 2007; Bayios *et al*., 2006; Duncan *et al*., 2006; Gaurav *et al*., 2010, Hadzic *et al*., 2012; Petroski *et al*., 2013; Gaurav and Singh, 2014). Therefore, the purpose of this study was to compare the anthropometric characteristics of volleyball players at different match level (i.e., between clubs and at club level).

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MATERIALS AND METHODS

Subjects

A sample of 52 subjects, which includes 26 each, at club level (n = 26, mean ± SD: Age 16.42 ± 0.47 years, height

162.04 ± 6.14 cm, weight 58.44 ± 4.42 kg, and body mass index [BMI] 18.34 ± 1.86) and inter-project level (n = 26, mean ± SD: Age 21.42 ± 0.46 years, height 171.08 ± 4.14 cm, weight 64.22 ± 4.36kg, and BMI 21.42 ± 2.1) male volleyball players, was selected for the present study. The purposive sampling technique was used to select the subjects. The club level subjects were selected from different volleyball clubs of North Gondar and Gondar city administration of Ethiopia, and inter-project level subjects were selected from different projects found in Gondar town.

Methodology

The subjects were assessed for circumferences, height, weight, lengths, diameters, and skinfold thickness. Stature was measured using a standardized wall mounting stadiometer (measuring range – 200 cm, least count – 0.5 cm, MIndiart, New Delhi, India). The body mass was measured to the nearest 0.1 kg using calibrated digital scale in kilogram (Adam equipment Co, Ltd, Milton Keynes, UK) and its capacity was 150 kg. The scale was checked using standardized weights in regular intervals and checked whether it was reading zero or not before measured.

BMI was calculated by the following formulae: BMI (kg/m^2) = (Body weight in kg)/(height in meters^2). Girths and lengths were taken with the steel tape to the nearest 0.5 cm while widths and diameters of body parts were measured using sliding caliper. Skin folds thicknesses were assess using skinfold caliper.

Statistical analysis

Values are presented as mean values and SD. Independent samples t-test was used to test if population means estimated by two independent samples differed significantly. The level of significance was set at 0.05. Data were analyzed using SPSS Version 20.0.

RESULTS

Table 1 depicts the demographic characteristics of inter-club and inter-project level volleyball players. The mean age of inter-club players was 21.42 years and inter-project was 16.42 years. The mean height of inter-club was 171.08 cm and inter-project was 162.04 cm. The mean weight of inter-club was 64.22 kg and inter- project was 58.44 kg. The mean BMI values of inter-club were 21.42 and inter-project were 18.34. The results indicated than inter-club players had more height and weight than inter-club volleyball players.

Table 2 show the comparison of length measurements of inter-club and inter-project level volleyball players. It is evident from the results that significant differences were found between inter-club and inter-project level volleyball players with regard to arm length ($P < 0.05$), upper leg length ($P < 0.05$), and lower leg length ($P < 0.05$). The inter-club players had better lengths measurements than inter-project volleyball players.

Table 3 shows the comparison of diameter measurements of inter-club and inter-project level volleyball players. The results indicated that inter-club players had significantly greater elbow diameter ($P < 0.05$), shoulder diameter ($P < 0.05$), hip diameter ($P < 0.05$), and knee diameter ($P < 0.05$) as compare to inter-project volleyball players.

Table 4 show the comparison of circumference measurements of inter-club and inter-project level volleyball players. The results indicated that inter-club players had significantly greater calf circumference ($P < 0.05$), chest circumference ($P < 0.05$), upper arm circumference ($P < 0.05$), and fore arm circumference ($P < 0.05$) as compare to inter-project volleyball players.

Table 5 shows the comparison of skin folds measurements of inter-club and inter-project level volleyball players. The results indicated that significant differences were found between inter-club and inter-project level volleyball players with regard to biceps ($P < 0.05$), triceps ($P < 0.05$), subscapular ($P < 0.05$), and suprailiac skinfold ($P < 0.05$), respectively. The inter-club had significantly greater skinfolds thickness as compare to inter-club volleyball players.

DISCUSSION

In the present study, the anthropometric measurements of the volleyball players have been evaluated in relation to their

Table 1: Demographic characteristics of inter-club and inter-project level volleyball players

Variables	Inter-project volleyball Players (n=26)		Inter-club volleyball Players (n=26)		t-value	Sig.
	Mean	SD	Mean	SD		
Age (years)	16.42	0.47	21.42	0.46	34.204	0.000*
Height (cm)	162.04	6.14	171.08	4.14	167.591	0.000*
Body weight (kg)	58.44	4.42	64.22	4.36	45.147	0.000*
BMI (kg/m^2)	18.34	1.86	21.42	2.18	0.048	0.878

*Significant at 0.05 level

competition level (i.e., inter-club and inter-project). This study indicates the existence of differences between inter-club and inter-project players. The overall results show that inter-club volleyball players were taller and heavier as compared to the inter-project volleyball players. Body height, being the most characteristic trait of volleyball players, is significantly conditioned genetically (Milicerowa, 1973). The mean height of the inter-club volleyball players (178.06 ± 6.14 cm) and inter-project volleyball players (174.06 ± 6.14 cm) in the present study is greater than the volleyball players of West Bengal, India (173.10 ± 4.19 cm) reported by Bandyopadhya (2007).

Table 2: Comparison of length measurements of inter-club and inter-project level volleyball players

Variables	Inter-club Volleyball		Inter-project volleyball		*t*-value	Sig.
	Players (*n*=26)		Players (*n*=26)			
	Mean	SD	Mean	SD		
Arm length (cm)	80.06	3.7	76.06	3.7	4.583	0.000*
Leg length (cm)	94.36	15.98	90.36	15.98	1.062	0.292
Upper leg length (cm)	51.75	6.54	47.75	6.54	2.597	0.011*
Lower leg length(cm)	41.83	3.53	37.83	3.53	4.803	0.000*

*Significant at 0.05 level

Table 3: Comparison of diameter measurements of inter-club and inter-project level volleyball players

Variables	Inter-club volleyball		Inter-project volleyball		*t*-value	Sig.
	Mean	SD	Mean	SD		
Elbow diameter (cm)	7.33	0.57	6.33	0.57	7.389	0.000*
Shoulder diameter (cm)	43.31	2.09	38.31	2.09	10.158	0.000*
Hip diameter (cm)	29.83	1.93	28.83	1.93	2.194	0.032*
Knee diameter (cm)	9.98	0.87	8.98	0.87	4.861	0.000*

*Significant at 0.05 level

Table 4: Comparison of circumference measurements of inter-club and inter-project level volleyball players

Variables	Inter-club volleyball		Inter-project volleyball		*t*-value	Sig.
	Players (*n*=26)		Players (*n*=26)			
	Mean	SD	Mean	SD		
Calf circumference(cm)	33.25	3.02	30.25	3.02	4.218	0.000*
Thigh circumference (cm)	48.92	8.46	45.92	8.46	1.505	0.137
Chest circumference (cm)	86.61	10.27	80.61	10.27	2.478	0.016*
Upper arm circumference (cm)	26.33	2.35	23.33	2.35	5.406	0.000*
Fore arm circumference (cm)	25.08	3.7	22.08	3.7	3.441	0.001*

*Significant at 0.05 level

Table 5: Comparison of skin folds measurements of inter-club and inter-project level volleyball players

Variables	Inter-club volleyball		Inter-project volleyball		*t*-value	Sig.
	Players (*n*=26)		Players (*n*=26)			
	Mean	SD	Mean	SD		
Biceps (mm)	4.53	1.13	6.53	1.13	7.486	0.000*
Triceps (mm)	6.97	2.4	10.97	2.4	7.082	0.000*
Subscapular (mm)	9.11	2.21	12.11	2.21	5.749	0.000*
Suprailiac (mm)	9.08	3.59	14.08	3.59	5.911	0.000*
Calf (mm)	7.92	2.23	8.92	2.23	1.899	0.062

*Significant at 0.05 level

In volleyball, teams compete by manipulating skills of spiking and blocking high above the head. Therefore, the presence of tall players is an indispensable factor in the success of a team (Gaurav *et al*., 2010). In this study, the inter-club volleyball players had significantly greater arm length, upper leg length, and lower leg length than inter-project volleyball players because anthropometric characteristics are almost exclusively genetically determined; therefore, length and breadth measurements cannot be changed with training (Norton and Olds, 2001). On the other hand, inter-club volleyball players had significantly greater all the diameters.

The results indicated that the inter-club volleyball players had significantly greater calf circumference, chest circumference, upper arm, and forearm circumference than the inter-project volleyball players. The findings of the present study are in line with the study of Gaurav and Singh (2014) evaluated the differences in anthropometric characteristics of volleyball players in relation to their performance level (i.e., inter-university and inter-college). They observed that inter-university players had better anthropometric measurements as compared to inter-club volleyball player. In case of skin fold measurements, the inter-project volleyball players had significantly greater skinfolds thickness as compare to inter-club volleyball players. The skinfold thickness of four sites, biceps, triceps, subscapular, and suprailiac, of volleyball players in the present study was more than those of reported by Bandyopadhyay (2007). The skinfold thickness is significantly higher in the inter-club volleyball players group, indicating that the inter-project volleyball players had a greater quantity of subcutaneous fat deposition.

CONCLUSION

It is concluded that various anthropometric measurements have clear impact on the competition level of volleyball players.

The skin fold thickness is significantly higher in the project volleyball players group, indicating that the project volleyball players had a greater quantity of subcutaneous fat deposition.

In this regard, Woreda Volleyball Players had significantly greater chest circumference, upper arm, and forearm circumference than the project volleyball players. In addition, the Woreda Volleyball Players had significantly greater arm length, upper leg length, and lower leg length than project volleyball players. Moreover, Woreda Volleyball team Players were taller and heavier as compared to the project volleyball players.

Recommendations

In selecting the physical exercises while designing the training program, it is recommended that the form of exercise should have on the anthropometric variables.

Significant differences existed among U-17 volleyball project players of different playing positions. Coaches should use this information to determine the type of anthropometric measurements that are needed.

The selection and training process should emphasis on their anthropometric measurements for the betterment of the result.

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Research Article

RSA performance gain out of training?

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ABSTRACT

The study was ultimately aimed at comparing the effect of resistance training, plyometric, and resistance training plus plyometric exercise on linear speed and repeated sprinting ability (RSA) performance. A completely randomized block design of experimental research was employed so as to compare the effect of 4 weeks resistance training, plyometric training, and combined training (resistance + plyometric) on linear speed over 40 m dash and 6*35 m RSA total time performance development. A total of 36 U20 male soccer players participated in the study protocol. The players were assigned in three different treatment groups designated as resistance group (RG), plyometric group, and combined group (CG). Then, the performance gain level for each treatment group was analyzed by comparing the pretest performance score with the posttest score using paired sample *t*-test and Cohen's d. the Cohen's d value ranges between 0.724 and 7.386. The difference in performance gain level among the three treatment (training) groups was analyzed using one-way ANOA with a subsequent *post hoc* test. Using paired sample t-test, all the three training groups achieved a significant level of performance gain in linear speed and RSA. With one-way ANOVA, it is found that the performance gain level in linear speed among the three groups was significant $F(2, 33) = 11.758$, $P > 0.001$, $\eta p^2 = 0.416$. The plyometric and CGs achieved a significantly greater speed performance than the RG. However, there was no significant difference among the groups in RSA performance gain. Thus, it was concluded that plyometric exercises are the most effective kind of training to impact speed qualities for soccer players. Using plyometric exercises alone or combining with resistance training is by far better than resistance training alone to improve linear speed or RSA performance with youth soccer players.

Keywords: Plyometric, Repeated sprinting ability, Resistance, Speed, Training

INTRODUCTION

Success in soccer, which can be equated with higher winning rate and being able to be champions with trophy, is the ultimate in today's soccer (Bradley *et al*., 2013). Accounting to their work (method) of training, coaches with the higher winning rate or number of trophies are highly sought by clubs or national teams with huge money deals. The highly commercialized sport, soccer, attracts big business enterprises (i.e., Media and companies) because of the expected money gain which is guaranteed for winning teams and clubs. All these, however, rely on the players' level of performance. Thus, the resulting business gain or loss is highly dependent on the players' level of performance (Bangsbo *et al*., 2006). Still performance in contemporary soccer is the result of varied factors or there are numerous performance parameters.

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The psychological make-up (i.e., level of motivation, aggression, confidence, perseverance, and winning mentality), physical fitness (aerobic and anaerobic fitness), and technical-tactical ability are ingredients which enable a player to be capable of playing soccer with its demand and modern essence (Alghannam, 2013; Bradley *et al*., 2013; Durate *et al*., 2012). It is well-established that an optimal level with the required balance among the factors (performance parameters) is too important. For example, though aerobic fitness is necessary to a certain level, anaerobic fitness is the most important and highly sought physical fitness (Barnes *et al*., 2014). Basically, the most frequent anaerobic actions including sprinting, acceleration, jumping, charging, and change of direction accounts only smaller portion of the players' activity profile (Barnes *et al*., 2014; Girard *et al*., 2011). However, the most decisive phases or moments of goal scoring or defending highly rely on anaerobic fitness qualities of the players (Faude *et al*., 2012). To this end, the concern of developing and maintaining anaerobic fitness is the ultimate of coaches and strength and conditioning specialists.

Soccer specific anaerobic fitness including linear speed and repeated sprinting ability (RSA) are fitness segments (Gabbett, 2016; Haugen *et al*., 2014; Nedelec *et al*., 2015; Schimpchen *et al*., 2015), which can be determined by different factors such as genetic make-up (endowed muscle fiber type), maturity (Aughey *et al*., 2016), and training (Bompa and Haff, 2009). In some way, linear speed and RSA are associated or accounted to overall weekly training load. On the other way, the development of soccer related speed quality is connected with soccer specific exercises in the form of small-sided games (SSG) (Eniseler *et al*., 2017). Other findings reported the most effective method to develop linear speed or RSA is simply by having repeated sprinting exercises (Cipryan *et al*., 2017; Taylor *et al*., 2015).

Strength and conditioning experts recommend there to be resistance training to cultivate speed and performance related fitness qualities for soccer (Ullrich *et al*., 2018). Some other recent findings recommend plyometric exercise for a better adaptive response in terms of speed development (Hammami *et al*., 2016). It is also a common recommendation and approach to have plyometric exercises in the microcycles of the competition period so as to maintain speed and speed related soccer fitness (Ramirez-Campillo *et al*., 2015). However, regardless of all these, the effect that resistance training had on speed and RSA and plyometric training had on speed or RSA is not compared and studied. Moreover, the effect that a combined training (resistance exercise plus plyometric exercise in each session) had on linear speed and RSA is not clearly known. Thus, a study that compares resistance training, plyometric training, and combined training is worthy of investigation. Therefore, this study was done to show the effect that resistance training and plyometric exercise had on speed or RSA when they are used alone (isolated). In addition, the study aimed at revealing how a combined training regimen of resistance exercise plus plyometric affects speed and RSA. Thus, different training intervention as resistance training, plyometric training, and combined training has been compared against speed and RSA performance improvement. As such it was hypothesized that all these training methods can significantly improve linear speed and RSA without significant differences among.

METHODS

True experimental design has been used for this research. A randomized block design with three treatment groups named as resistance group (RG), plyometric group (PG), and combined group (CG) with a different treatment or training regimen as outlined the procedure section were used. First players were grouped based on their main playing position then randomly assigned into the treatment groups. The players in the common playing positions such as center backs, fullbacks, holding midfielders, outside midfielders, attacking midfielders, and strikers were randomly assigned to the three intervention groups. Thus, the randomization was after grouping of the players as different position players are expected to have a certain fitness qualities which they are believed to be better than other position players. All the players were informed about the purpose and they were volunteer to participate. Comparison of the effect and effect magnitude of each training regimen on performance gains of some selected physical fitness parameters as linear speed over 40 m and RSA total time has been done.

Participants

Thirty-six U20 outfield soccer players' 17 ± 3.212 years of age and 55 ± 3.580 kg of body weight were participants of the study. The researcher has made these trainees the study participant purposely because of convenience, familiarity and they are the one at the age level to have the predisposition for sport specific physical fitness development. All of the participants were informed to have only their team based normal soccer training and the study intervention exercise in their respective group which were both guided by the coach. The soccer specific training was the same for all the groups as the players were from the same team.

Experimental Procedure

Since the ultimate of the study is to compare different exercise/training regimens to improve linear speed and RSA, three different groups for different training intervention were used. In each treatment group 12 players from each position assigned randomly. The first group was having resistance training for about 4 weeks. For this, the group was designated as RG. The second group, the PG, was having plyometric trainings for about 4 weeks in addition to the common soccer specific training. The third group, named the CG, received both resistance and plyometric training combined in each of the intervention sessions. Thus, each group was having their intervention specific training sessions 3 times a week and the same soccer specific training together 3 times a week.

A week before the intervention, each group was assessed in terms of their linear speed and RSA performance the same way they were tested in the post-test. Based on their pretest result, it was confirmed that there was no any significant difference among the groups in terms of their linear speed and RSA total time performance score. A summary of the intervention training and the training program or protocol employed is outlined here under [Tables 1 and 2].

Testing Methods

40 m dash linear speed was used to test sprinting speed. To test 40 m dash linear sprinting speed, each participant was given three trials and the best time score was taken as a score for analysis. For RSA total time measure, the participants tested

using the 6*35 test protocol. This test involves sprinting over 35 m for about 6 times with 30 s recovery time between each sprint. The time in second for each of the six sprints was summed up to get the RSA total time score.

Method of Analysis

Using the Statistical Package for the Social Sciences (SPSS) version 23, paired sample *t*-test and one-way ANOVA with a *post hoc* test was used. After identifying the significance level in difference, Cohen's d and partial eta-squared (ηp^2) were used to estimate the effect size of the intervention. For the overall analysis, the critical value was set to be 0.05.

RESULTS

The analysis was made using mean, standard deviation, paired sample *t*-test, and one-way ANOVA with *post hoc* test. Effect size was also considered using Cohen's and partial eta-squared (ηp^2).

The descriptive statistics shows the performance score of the RSA (6*35 m) total time that each intervention group scored. The RG had a mean value of 41.015 s to the test, while the PG had a mean score of 41.372 in the pre-test [Table 3]. The mean pre-test score of the CG is 40.798 s. Despite the different figures, there was no a significant difference among the three groups in their pre-test performance score [Appendix A]. The post-test score, however, was 39.148, 38.154, and 37.095 s for the RG, PG, and CG, respectively.

In terms of linear sprinting speed over 40 m, 6.155, 6.179, and 6.133 s were taken by the RG, PG, and CG each to cover the distance during the pretest [Table 3]. With this score, there was no significant difference among the groups [Appendix A], which can be accounted to the methodological approach of employing block randomization. However, the post-test score for the RG, PG, and CG was 5.275, 5.093, and 5.122 s, respectively [Table 3].

The RG achieved a statistically significant performance increment in 40 m dash linear speed, $t\,(11) = 10.309$, $P < 0.001$, ES = 2.976 and in 6*35 m RSA performance $t\,(11) = 2.509$, $P = 0.029$, ES = 0.724 after the intervention training. The PG also achieved a significant linear speed performance gain after the training, $t\,(11) = 16.204$, $P < 0.001$, ES = 4.678. The same way, the PG has a significant RSA performance gain as the pre-post difference is significant, $t\,(11) = 6.298$, $P < 0.001$, ES = 1.818. The CG achieved a significant performance increment in both linear speed, $t\,(11) = 25.586$, $P < 0.001$, ES = 7.386 and RSA, $t\,(11) = 9.710$, $P < 0.001$, ES = 2.803 [Table 4]. In terms of mean difference, the PG achieved the

Table 1: The intervention training regimen and exercise prescriptions

Week	Resistance group			Plyometric group			Combined group		
	Exercise	Repetition	Set	Exercise	Repetition	Set	Exercise	Repetition	Set
Week 1	Leg extension	7	3	Jump to box	7	3	Jump t	7	3
	Squat rock	4	3	Tuck jumps	4	3	leg extension	4	3
	Lunge	6	3	Bounding with rings	6	3	Tuck jumps	6	3
	Seated calf raise	6	3	Lateral hurdle jump	6	3	Squat rock	6	3
	Calf raise	8	3	Single leg lateral hops	8	3	Single leg lateral hops	8	3
Week 2	Leg extension	6	3	Jump to box	6	3	Jump to box	6	3
	Squat rock	6	3	Tuck jumps	6	3	Leg extension	6	3
	Lunge	8	4	Bounding with rings	8	4	Bounding with rings	8	4
	Seated calf raise	8	4	Lateral hurdle jump	8	4	Lunge	8	4
	Calf raise	8	4	Single leg lateral hops	8	4	Depth jumps	8	4
Week 3	Leg extension	10	3	Tuck jumps	10	3	Jump to box	10	3
	Squat rock	10	4	Bounding with rings	10	4	Squat rock	10	4
	Lunge	10–12	4	Lateral hurdle jump	10–12	4	Bounding with rings	10–12	4
	Seated calf raise	10–12	4	Single leg lateral hops	10–12	4	Lunge	10–12	4
	Calf raise	10–12	4	Depth jumps	10–12	4	Depth jumps	10–12	4
Week 4	Leg extension	10–12	4	Tuck jumps	10–12	4	Jump to box	10–12	4
	Squat rock	10–12	4	Bounding with rings	10–12	4	Squat rock	10–12	4
	Lunge	10–12	4	Lateral hurdle jump	10–12	4	Single leg lateral hops	10–12	4
	Seated calf raise	10–12	4	Single leg lateral hops	10–12	4	Lunge	10–12	4
	Calf raise	10–12	4	Depth jump	10–12	4	Depth jumps	10–12	4

Table 2: The 4 weeks training program

Day	Week 1	Week 2	Week 3	Week 4
Monday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Tuesday	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• \Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG
Wednesday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Thursday	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG
Friday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Saturday	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG	• Resistance training for the RG • Plyometric training for the PG • Combined training for the CG
Sunday	Rest	Rest	Rest	Rest

Table 3: Descriptive statistics of pre- and post-test score of speed and RSA

	RSA total Pre			RSA total Post			40 m speed Pre			40 m speed Post		
	RG	PG	CG	RG	PG	CG	RG	PG	CG	RG	PG	CG
Mean	41.015	41.372	40.798	39.148	38.154	37.095	6.155	6.179	6.133	5.275	5.093	5.122
SD	2.548	2.609	2.147	2.730	3.102	1.509	0.247	0.228	0.123	0.137	0.073	0.072
Minimum	38.190	36.700	36.950	36.050	34.420	34.270	5.800	5.920	5.920	5.100	5.000	5.020
Maximum	44.620	44.460	43.630	44.080	44.710	40.240	6.680	6.680	6.330	5.590	5.240	5.230

Descriptive statistics of pre- and post-test score of speed and RSA (in seconds)

greatest linear speed gain (mean difference is 1.88). In this case, the RG and CG have a mean difference of 0.880 and 1.87, respectively. With that of RSA the PG still had the greatest gain with a mean difference of 3.217 s, when the RG and CG had 1.867 and 0.381 s each [Table 4].

RSA total time measure or performance gain difference is not statistically significant among the three groups of the RG, PG, and CG, though each grouped has showed significant performance improvement after their respective training. However, linear speed performance gain level was significantly different among the three groups $F(2, 33) = 11.758$, $P > .001$, and $\eta p^2 = 0.416$ [Table 5].

After testing the difference in performance gain among the three training methods, *post hoc* test (Benferroni) was used to have multiple comparisons. This way, each group was compared one another pair wise. The mean time taken by the PG to cover the 40 m dash is visibly smaller [Figure 1].

With the *post hoc* result, it is found that the RG linear speed performance gain is significantly lower than both the PG ($P < 0.001$) and the CG ($P = 0.002$). However, there is no a significant difference in 40 m linear sprinting speed performance gain between the PG and CG. Thus, the plyometric training group and the combined training group are superior in linear speed gains than the resistance training group [Table 6].

DISCUSSION

The ultimate of the study was identifying the kind of training regimen that can help to get the most out of training based on 40 m linear sprinting speed and 6*35 m RSA performance test score. For this, three intervention groups designated as RG, PG, and CG were used for different intervention and to make subsequent comparison. Therefore, the effect of resistance exercises, plyometric exercises and the combined training (resistance plus plyometric exercise) on linear speed and RSA were compared.

The study revealed that resistance training, plyometric training or the combination of resistance and plyometric training can improve linear speed and RSA performance. Here with this study, it is found that plyometric exercises or the combination of resistance and plyometric exercises in each session can yield a greater linear speed performance increment than resistance exercise alone. This can be accounted to the kind of muscle contraction caused during resistance and plyometric exercise. The speed of movement was not considered in this study. However, speed of movement when doing resistance training is one factor to impact the transfer of strength gained from resistance training to speed performance (Blazevich and Jenkins, 2002). With that of plyometric exercise the movement is inherently fast and explosive using own body weight. This is the kind of muscle contraction too necessary during sprinting. However, with that of resistance training, the focus is on generating the maximum possible contraction repeatedly without a due consideration of speed of movement

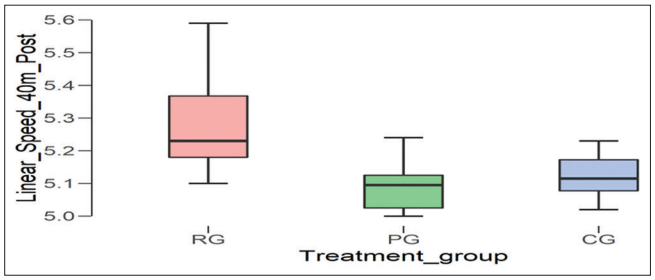

Figure 1: Diagrammatic view of the mean time taken to cover 40 m dash

Table 4: Paired sample *t*-test comparing the pretest score with the post-test for each group

Treatment group			*t*	df	*P* value	Mean difference	Cohen`s d
RG	RSA pre	RSA post	2.509	11	0.029	1.867	0.724
	40 m speed	40 m speed	10.309	11	<0.001	0.880	2.976
PG	RSA pre	RSA post	6.298	11	<0.001	3.217	1.818
	40 m speed	40 m speed	16.204	11	<0.001	1.087	4.678
CG	RSA pre	RSA post	9.710	11	<0.001	0.381	2.803
	40 m speed	40 m speed	25.586	11	<0.001	0.040	7.386

Table 5: ANOVA result of the three training methods (groups) based on their post-test performance score

Performance measures		Sum of squares	df	Mean square	F	Sig.	ηp^2
RSA total post	Between groups	25.306	2	12.653	1.961	0.157	
	Within groups	212.889	33	6.451			
	Total	238.195	35				
Linear speed 40 m post	Between groups	0.231	2	0.115	11.758	0.000	0.416
	Within groups	0.324	33	0.010			
	Total	0.554	35				

Table 6: *Post hoc* result (multiple comparison) of 40 linear speed post score

(I) Treatment group	(J) Treatment group	Mean difference (I-J)	SE	Sig.	95% Confidence interval	
					Lower bound	Upper bound
RG	PG	0.18250*	0.04043	0.000	0.0805	0.2845
	CG	0.15333*	0.04043	0.002	0.0514	0.2553
PG	RG	−0.18250*	0.04043	0.000	−0.2845	−0.0805
	CG	−0.02917	0.04043	1.000	−0.1311	0.0728
CG	RG	−0.15333*	0.04043	0.002	−0.2553	−0.0514
	PG	0.02917	0.04043	1.000	−0.0728	0.1311

or rate of force generation. With resistance training, the muscle mostly accustomed to force generation regardless of rate of force generation or explosiveness. On the contrary, plyometric exercises are mainly explosive which is meant there is quick force generation. Thus, explosiveness with force generation can cause the muscle to adapt to the ability of quick force generation, which can help to be speedy enough (Behm *et al*., 2017). Thus, the significant difference in linear speed with the three training regimens is convincing and acceptable.

As a training intervention, the significant performance increment in linear speed and RSA is inherent with all the intervention groups of RG, PG, and CG. Still the existence of non-significant RSA total time performance score among the groups can be accounted to different factors. RSA can rely to other physiological factors as aerobic capacity (da Silva *et al*., 2010) to an extent. The physiologic burden of each bout needs to be counted during the recovery between sprints as it relies on the aerobic capacity of clearing lactate to enable the muscle to produce the required force during the subsequent sprints. However, RSA more relates with anaerobic fitness of strength and explosive power (Kenney, Wilmore and Costill, 2015; Lopez-Segovia *et al*., 2015). Here, it needs to be recalled that all the intervention trainings are mainly anaerobic exercises, which can impact the anaerobic adaptation. Findings in this regard showed that RSA performance measures as RSA mean time and most commonly RSA total time depends on aerobic fitness (da Silva *et al*., 2010) and anaerobic fitness (Dardour *et al*., 2014; Lopez-Segovia *et al*., 2015). Thus, for the performance gain in RSA total time to be low may be the negligence of aerobic fitness development and appropriate training regimens to impact in addition. Future researches on the area can benefit by considering the consideration and acknowledgement of the effect of aerobic capacity on RSA performance or the effect of RSA performance enhancement targeting interventions.

This superior improvement in the RG can be attributed to adaptations such as increases in the thickness, fascicle length, and pennation angle of knee flexor and extensor muscles (Ullrich *et al*., 2018). A number of study findings goes in parallel with this study as plyometric or plyometric plus resistance training can positively affect performance of lower limbs (Ozbar *et al*., 2014; Ramirez-Campillo *et al*., 2018; Ramirez-Campillo *et al*., 2016; Ullrich *et al*., 2018).

CONCLUSION

Resistance training, plyometric or combination of resistance, and plyometric exercises can significantly improve linear speed and RSA performance level. A 4-week additional trainings of resistance, plyometric, or combination of the two in addition to a normal soccer specific training can significantly improve linear speed and RSA total time performance.

Linear speed over 40 m dash can be improved more by plyometric or combination of plyometric exercise with resistance training than resistance training alone.

RSA performance improvement can be equally developed by resistance training, plyometric exercise, or by the combination of resistance and plyometric exercise equally if aerobic fitness improvement is not considered.

Recommendation

When the focus is improvement of pure linear speed, the inclusion and/or addition of plyometric exercises is too important. The inclusion of plyometric training in the preparation period and as well during the competitive period is therefore, ought to be considered. Players who lack linear speed can highly benefit from plyometric training regimen or the addition of plyometric exercises with soccer specific trainings. Youth or promising youngsters who are at a stage with the predisposition to develop linear speed are advised to consider the inclusion of plyometric exercises.

Interventions or trainings which target RSA total time performance need to have plyometric or (combination of plyometric with resistance) trainings with a due consideration of incorporating exercises which can improve aerobic capacity or fitness as well.

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APPENDIX

Appendix A: The ANOVA result comparing the pre-test result of the three groups (RG, PG, and CG)

Performance measures		Sum of squares	df	Mean square	F	Sig.
Linear speed 40 m Pre	Between groups	0.013	2	0.006	0.148	0.863
	Within groups	1.409	33	0.043		
	Total	1.422	35			
RSA total Pre	Between groups	2.011	2	1.006	0.168	0.846
	Within groups	197.006	33	5.970		
	Total	199.017	35			

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Research Article

Personality and self-confidence among girls and boys sportsperson

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ABSTRACT

Personality may be described as the most characteristic integration of an individual's structure, modes of behavior attitudes, capacities, abilities, and aptitudes. Most theorists agree that personality is an internal, mental, and emotional pattern of response to the environment – a pattern of thought, feeling, and behavior that affects every aspect of a person's life. Personality can also be defined in terms of characteristics (traits) of the individual which is directly observable in the behavior. It is quality that makes a person stand out from other; it is whatever makes a person unique.

INTRODUCTION

In a rapidly developing psychological field, different psychologists on diverse fields, for example, clinical, experimental, educational, interpersonal, occupational, and vocational many other have made different, temporary, and semi popular factor analytical experiments for misusing personality of person.

Basavanna (1971) studied self-confidence as an attribute of self-concept. An inventory developed for the purpose of measuring self-confidence was standardized using traditional psychometric procedures on a group of 300 students.

Statement of the Problem of the Study

The problem formulated for the present study was to find out the difference of personality traits and self-confidence among girls' sportspersons and boys' sportsperson.

Hypothesis

1. There is a significant deference in personality traits among girls' sportsperson and boys' sportspersons.
2. There is a significant difference in self-confidence level among girls' sportspersons and boys' sportspersons.

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METHODOLOGY

The sample of the study consists of total 100 sportspersons drawn randomly made two sex groups one girls group and boys group equally in Kalaburagi District. There were an equal numbers of samples. The respondents were administered 16 personality factors scale and self-confidence scale to determine the extent of personality and self-confidence levels between the girls group and boys group of sportspersons.

Tools

Following standardized questionnaires were used in the present study to measure personality traits:

1. Chattel's 16 PF questionnaires consist of 105 items.
2. Self-confidence scale.

Data Analysis

Table 1 indicates that girls' sportspersons have relatively high score than the boys' sportspersons significant at 0.01 levels. This says that girls' sportspersons are out going, worm, and easygoing, are kind, participative and likes people, abstract tinkers, trusty, balance minded, relaxed, practical, and hard to tool dominative good leadership than boys' sportspersons.

Table 2 shows that the girls' sports persons are score low and the boys' sportspersons are score higher than girls' players but low score indicates high level of self-

Table 1: Personality factors of girls and boys of Kalaburagi district

Factors	Girls		Boys		*t*-value
	Mean	SD	Mean	SD	
A	6.26	1.44	3.95	1.47	8.31**
B	6.03	1.5	3.71	1.91	7.4**
C	6.53	1.79	3.88	1.32	8.68**
E	6.25	1.36	3.98	1.28	9.01**
F	6.45	1.75	3.9	1.61	7.83**
G	5.68	1.17	4.1	1.8	5.79**
H	5.26	1.02	4.9	2.42	1.04*
I	4.5	1.09	5.73	1.2	5.68**
L	4.33	1.09	5.66	1.14	6.1**
M	4.35	1.2	5.43	1.14	6.02**
N	3.96	1	4.5	1.09	312**
O	4.06	1.25	4.98	1.61	3.31**
Q1	5.58	1.69	4.15	1.92	5.54**
Q2	6.16	1.04	4.5	1.12	7.2**
Q3	6	1.85	5.03	1.65	3.59**
Q4	4.48	1.15	5.1	1.55	2.46**

Significant level 0.01 level

confidence and high score indicates low self-confidence, so the girls' sportspersons are more confident than the boys' sportspersons.

Table 2: Self-confidence

Groups	Mean	*n*	SD	*t*-value
Girls	32.40	50	4.54456	8.97**
Boys	39.30	50	2.33212	

CONCLUSION

The following conclusions:

1. There is significant difference in the personality traits among girls and boys sportspersons of Kalaburagi District.
2. There is significant difference in self-confidence level among girls' and boys' sportspersons.

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Research Article

Importance of health, fitness, and wellness

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ABSTRACT

Health and physical fitness have a key role in the life of men from time immemorial. The progress of the Nation lies in the hands of the people, who are healthy and physically fit. Every individual should develop physical fitness for a happy and effective living. A sport is an activity in our lives where pursuits of different movement achieved through the total investigation of neuromuscular coordination. In this modern era, we can see that each and every individual directly or indirectly related to sports. Modern Physical Education commonly known as there is sports where pursuit of discipline freely formed such as also fitness and physical moment.

Keywords: Physical fitness, Health

INTRODUCTION

Health and physical fitness have a key role in the life of men from time immemorial. The progress of the Nation lies in the hands of the people, who are healthy and physically fit. Every individual should develop physical fitness for a happy and effective living. To get physical fitness, one has to involve in physical activities. Physical activity is essential for the development of wholesome personality of a child which would depend on the opportunities provided for wholesome development of the mental, physical, social, and spiritual aspects. Hence, a well-organized and properly administered physical education programmed for school children is very essential. Physical activity throughout the ages has been acclaimed for health and recreation. It provided fun and enjoyment. It also provided youthful exuberance and the elderly care. Physical activity and movements are as old as human existence. It played numerous roles from struggle for existence to struggle for excellence.

Thousands of Indian regularly practices yoga, a mind-body therapy originally developed in ancient India that has been gaining popularity in the United States since the 1960s. Yoga interweaves three main components: Physical postures, breathing techniques, and meditation and relaxation. While yoga has not been proven as a cure for any particular disease, regularly practicing yoga offers women many potential health benefits.

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WHAT IS YOGA

What is yoga is the question which comes to mind for anybody thinking of starting yoga. Yoga is an ancient system developed over the centuries by the Sages of India. Yoga is a system of training of mind, body, and spirit for purification of soul and attaining oneness with the supreme consciousness. The goal of yoga is to calm the mind, ensure better coordination of mind and body so that we live a healthy life and experience spiritual growth.

PRIMARY COMPONENTS OF FITNESS

The four primary components (also known as the components of health related fitness) that are important to improved physical health are as follows: Cardio respiratory capacity is the ability of the body to take in oxygen (respiration), deliver it to the cells (circulation), and use it at the cellular level to create energy (bioenergetics) for physical work (activity). In fitness, we also refer to cardiorespiratory capacity as aerobic capacity. This capacity includes aerobic endurance (how long), aerobic strength (how hard), and aerobic power (how fast). Some of

the long-term adaptations of cardiorespiratory training are: Decreased resting heart rate, decreased risk of cardiovascular disease, improved endurance, increased stroke volume, and cardiac output.

SECONDARY COMPONENTS OF FITNESS

The secondary components of fitness (also known as the components of performance-based fitness) are involved in all physical activity and are necessary for daily functioning. Athletes experience different levels of success depending on how well these secondary fitness components are developed. Although the primary components of fitness are thought to be the most important, we should not ignore the secondary components because of their importance in the completion of daily tasks.

HEALTH AND WELLNESS

Health is a dynamic process because it is always changing. We all have times of good health, times of sickness, and maybe even times of serious illness. As our lifestyles change, so does our level of health.

BENEFITS OF PHYSICAL ACTIVITY

As fitness professionals, we spend a great deal of time inspiring and assisting others in their pursuit of improved health. Education is an important aspect of this. We must promote the benefits of regular activity and help people understand why they should be active.

ACTIVITY GUIDELINE

Health Canada introduced Canada's Physical Activity Guide to Healthy Active Living to help Canadians make wise choices about physical activity as a way to improve health. Scientists say you should accumulate 60 min of physical activity every day to stay healthy or improve health.

CONCLUSION

A sport is an activity in our lives where pursuits of different movement achieved through the total investigation of neuromuscular coordination. In this modern era, we can see that each and every individual directly or indirectly related to sports. Modern Physical Education commonly known as there is sports where pursuit of discipline freely formed such as also fitness and physical moment.

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Research Article

Yoga and its contribution to the world

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ABSTRACT

There are some misconceptions in regard to yoga prevalent especially among some sections in the west. Yoga is not magic or a feat of any kind, physical or mental. It is neither drill nor frill. Yoga is subjective science based on a sound philosophy and deep psychology. Its spiritual mental or physical important cannot be separated from each other. It is proposed to place before all seekers, the main principles that underlie the gospel of the Bhagavad-Gita in its aspect of practice or the Yoga of Meditation. Yogic asana are a cure and a prevention of many diseases, especially that of stomach or digestion. It is means by which the delicate balance of the bodily humors of Kaff, Vata, and Pita is maintained. Yoga is the simplest form of relaxation, thus the horror of psycho-somatic diseases does not loom large on those who practice yoga daily.

Keywords: Diseases, Meditation, Yoga

INTRODUCTION

Vedic Period

There are some misconceptions in regard to yoga prevalent especially among some sections in the west. Yoga is not magic or a feat of any kind, physical or mental. It is neither drill nor frill. Yoga is subjective science based on a sound philosophy and deep psychology. Its spiritual mental or physical important cannot be separated from each other. It is proposed to place before all seekers, the main principles that underlie the gospel of the Bhagavad-Gita in its aspect of practice or the Yoga of Meditation. It is well-known to everyone that this celestial gospel, the Divine Song of the Lord, is a massage that is communicated to mankind as a whole; and it is much more than merely a historical occurrence in the context of the Mahabharata, as most people would regard it to be.

The Bhagavad-Gita has a multi-faceted significance. It is a social message, a political gospel; it is a historical narrative an epic of the greatest conceivable magnificence and also the enunciation of a spiritual principle and the most valuable instruction on the way of life in general that can be applied equally without exception to every human being. Of the numerous worlds that repeatedly occur in the scriptural and spiritual literature in Sanskrit, "Yoga" seems to be carrying a place of prominence. It has been given the status of separate system of philosophy amongst the six prominent systems of the Hindu philosophy. In fact, it is regarded as a branch of the snaky system which is less orthodox than yoga itself. The world "yoga" comes from "yuj" root in Sanskrit which means "union," Pathanjali, the author of this system, interpreted yoga to mean the act of "fixing or concentrating the mind in abstract mediation." Oxford Dictionary regards it, "As a Hindu system of philosophic mediation and asceticism designed to affect the reunion of the devoted soul with the universal soul." Even then yoga seems to mean so many things to so many people because through the ages it has been used in variety of ways Pathanjali thinks that yoga is effected by preventing the modifications of Citta or the thinking principle, by keeping the mind in its unmodified state a state clear as crystal when uncolored by contact with other substances and by the practice of vairagaya a state of abstinence or non-attachment that is complete suppression of the passions. Lard Sri Krishna in the Gaeta says that yoga is a way by which a person can discharge his duties efficiently with mental equilibrium and body poise.

The yogic Dr. Sampurnan and gives an exalted status of "spiritual kamadhenu (the mythical cow that bestows

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everything when asked) all given." The sage Vyase in Bhasya claims that yoga is essentially "a meditative trainee." Thus, yoga has taken different meanings through the ages. In fact the system of yoga appears to be a mere contrivance for getting rid of all thought, or at least for concentrating the mind with the utmost intensity on nothing in particular. It is a strange compound of mental and bodily exercises, consisting of unnatural restraint forced and painful postures twisting and contortions of the limbs suppressions of the breadth and utter absence of mind. Although the yoga, enunciated by Pathanjali professes to affect union with the universal sprit by means such as these, it should be observed that far more severe austerities and self-imposed physical mortification are popularly connected with the yoga system.

As to the date of organ of yoga nothing can be said which certainly. However, claims have been made that it is as old as the Hindu culture itself. We have no other Historical source except widely scattered references to yoga in the ancient Sanskrit literature. Excavations at Mohenjo-Daro reveal that yoga was practiced in India as early 3000 BC. Most of the Vedic literature is supposed to have been written some time in 2100 BC, where yoga has been frequently referred to as "a way of life," afterward in Upanishads numbering 180. Out of these ten are said to be very old and very important, have explained the philosophy, laws principles governing yoga. The knowledge and wisdom which these Upanishads were. The Bagwig Gita which was written approximately in 400 BC contains ample discussion on yoga and its practices. It considers yoga as the only means of renunciation and emancipation. In Ramayana and Mahabharata ages yoga has been understood to have reached all and sundry and much has been written on the yogic exercises and concentration of mind. During the middle ages, many yogis of name and fame have been mentioned in the books of history. Here Pathanjali has been thought to be one of the leading most yogis. This should, then be understood that Pathanjali was not the profounder the yoga system but only a treatise classifier or codifier. It is also said that this Pathanjali was responsible for bringing yoga into the status of a science and many treatises written by this yogi are freely available now poets lake Kabir, Surdas, Tulsidas, Nadeve, etc., have much talked about yoga in their poems and songs many saints such as Guru Nanak stressed the need for yoga only as a way of life but not as a an austere discipline of penance. All this shows that yoga as a celebrated philosophy originated in India and thus remained as a part of religious duty for every Hindu.

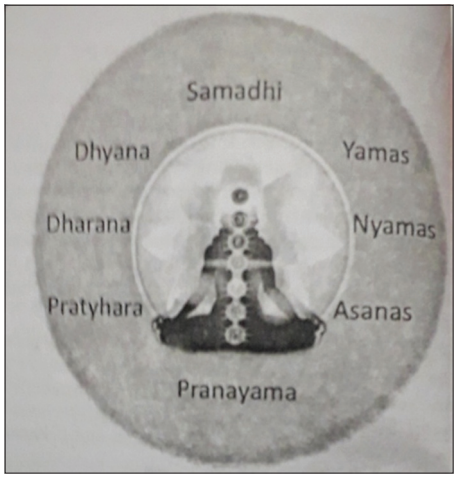
Muslim and Mughal Period

The greatest set back to yoga, of course, came during the Muslim and the Mughal periods but; now only the east but the not the west is practically willing to seek refuge in of life as a means yoga way of getting rid of the stresses, strains, and created by the modem tensions, science and civilization.

TYPES OF YOGA

Yoga has never been used in a narrow sense, rather it is all pervading no aspect of life seems to be devoid of yogic – approach for the welfare of the humanity during its existence. It the aim of yoga is the "union of the individual soul with the supreme soul with the supreme soul," it can be understood that there are many ways and methods to effect that union. Hence, yoga is of numerous types depending on one's inclination, resources, and capacity. The main types of yoga are Gyan yoga, Karma yoga, Ashtang yoga, Raja yoga, Hath yoga, Kundli yoga, and Sama yoga. All lead to the same destination salvation or union with Supreme Being.

ELEMENTS OF YOGA



These elements are means of mental concentration. They should be considered as the stepping-stones to find achievement. We enumerate hem as follow:

1. Yama (for balance)
2. Niyama (for religious observance)
3. Asana (for postures)
4. Pranayama (for suppression of the breath or breathing in a peculiar way
5. Prathyahara (for restraint of the senses)
6. Dharana (for steadying of the mind)
7. Dhyana (for contemplation)
8. Samadhi (trance).

The first five make external yoga while the other three internal yoga. All of these elements have further sub-divisions according to Pathanjali there are five yams, that is, Ahimsa (non-violence), Satya (truth), Asteya (conquest of the island of steadying), Aprigraha (non-receiving), and Brahamcharya (celibacy). Then come Niyamas they are no doubt indispensable and their importance cannot be under-estimated but it seems that much stress has not been laid on their observance; Niyams are also five in number, that is, Shauch (regularly obeying the call of nature or

cleanliness) Santosh (contentment), Tapas (penance), Swadhaya (self-study), and Ishavar paridhan (good –consciousness). Asnas (postures) are incalculable in number. They are as man in number as there are species of birds and animals. For physical vigor, mental poise and spiritual upliftment all these asanas, advisably done with Pranayama, are significantly important. Many of the pictures are said to be curative in nature they have medicinal effect on the various physiological functions of the human organism pranayama is in fact a part of upasana or devotion. It three phases, that is, Purak (inhalation), Rechak (Exhalation), and Kumbhak (suppression of the breath). After the adoption of the correct posture one aims at synchronizing inhalation-exhalation process to such an extent that there is natural and automatic suppression of the breath. This state is called pranayam. Prayahar is restraining the senses which are gateways of knowledge. In fact pratyahar simply means bringing back, that is, bring the senses back from the sensual pleasures which are often the cause of mental distraction and bodily pains because from the spiritual point of view the cause of all troubles in the world are desires and the senses are stimulants of worldly desires. When senses have been controlled, through it is considerably difficult, there is an attempt to steady one's mind.

To these yogis call "Ddar" which means steadying and concentrating one's on particularly nothing. After the mind has been steadied the real contemplation (Dhayan) starts. At this state there is neither smooth flow of deep thinking neither hampered nor distorted. This state of body and mind can be compared to the smooth flow water in a stream which is never disturbed whether the waves are too big or too small. The state of mind which originates in Dhayan now does not culminate in Samadhi or profound meditation, the highest state of yoga where there is neither dark nor nougat, neither dark nor light, neither pleasure nor pain, etc. Dhayan, Dharma and Samadhi all the three together make Sanyam (restraint or control). Profound mention enables the jiva to merge with the Brahma.

We have seen the yoga is not something ordinary physical exercise or a way of worship. It is a means through which not only does one enjoy the blessing of this life possessing good health but also mitigate e pains and sufferings of death.

It is erroneous to think that yoga was mean for the people of antiquity only. Rather modern man needs yogic practices more than the ancient man did simply because the modern would which is getting madder every day in the pursuit of materialistic philosophy and sensual pleasures, is a conglomeration of psychic tensions and physical tribulations. Yoga originated in India and spread to many parts of the west, especially Europe and America, where people are readily embracing it as a means of main army mental equilibrium and peace. There are now a day's more yogic centers in America than we find in India. A lot of research is being conducted on the effect of yogic exercises on the body and mind but there are higher stages in yoga where scientific experimentation especially that in the laboratory, cannot intrude on, these stages are purely personal. In Tibet, every Lama takes it to be his duty to practice yogic exercises every day and they think that Tibet is ahead of India now in this respect.

TYPES OF BANDHAS

Bandha's are yogic techniques of controlling involuntary organs connected with the nervous system. Their effects on the groups of nerves are remarkable. They possess a great curative value in many physical ailments and disorders. Their psychological and physiological value cannot be underestimated. In yoga four Bandha has are popular and are practiced by yoga experts.

Banda means to lock, close–off, to stop. In the practice of a Banda, the energy flow to a particular area of the body is blacked.

When the Bandha is released, this causes the energy to flood more strongly through the body with an increased pressure.

There are four types of Bandhas:

- Jalandhara Bandha – Chin lock
- Uddiyana Bandha – Lifting of the Diaphragm
- Mula Bandha – Anal lock
- Maha Bandha – Practice of all three Bandhas at the same time.

In general, the breath is held during practice of the Bandhas. Mula Bandha and Jalandhara Bandha can be performed after the inhalation as well as after the exhalation. Uddiyana Bandha and Maha Bandha are only performed after the exhalation.

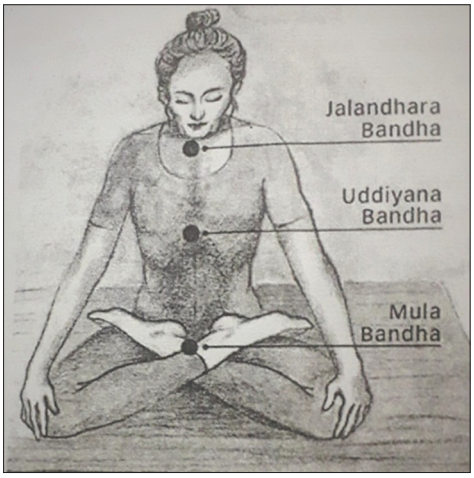
Benefits

As the Bhandhas momentarily stop the flow of blood, there is an increased flow of fresh blood with the release of Bhandha, which flushes away old, dead cells. In this way, all the organs are strengthened, renewed, and rejuvenated and circulation is improved.

Bandhas are also beneficial for the brain centers, the Nadis, and the Chakras. The energy channels are purified, blockages released and the exchange of energy is improved. Bandhas alleviate stress and mental restlessness and bring about inner harmony and balance.

Caution

Before attempting to perform the Bandhas, the breathing techniques of the previous levels must have been practiced regularly for a long period of time.



Before proceeding with the breath exercise in this and the following levels, first read, and study the explanation given for the relevant Bandhas and Mudras as they are incorporated into the breathing techniques.

To Modern Man Yoga Decidedly Provides the Following Benefits

1. Yogic asana are a cure and a prevention of many diseases especially that of stomach or digestion.
2. It is means by which the delicate balance of the bodily humors of Kaff, Vata, and Pita is maintained.
3. Yoga is the simplest form of relaxation, thus the horror of psycho-somatic diseases does not loom large on those who practice yoga daily.
4. Yoga has a hygienic effect. Exercises such as Neti, Dhoti, and Meoti are meant for cleansing various organs of the body.
5. For mental poise and peace yoga is a must.
6. To accomplish spiritual tasks, it is necessary to stimulate higher processes of the brain from which yoga helps us to a great extent.
7. There has cropped up great controversy about the effect and efficacy of breathing exercises in yoga but it should be understood that yoga helps in regularity, the breathing mechanism and increasing vital capacity.
8. It is a means to the achievement of salvation after death. Science cannot.
9. Corroborate this presumption.
10. It is the most economical activity.

In India lot of money is being spent on the research on yoga. It is again becoming popular every day. Centers are being opened everywhere to attract people to the practice of yoga. These big centers at Bombay, Calcutta, Chennai, etc., make people conscious that salvation of humanity lies in yoga.

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Research Article

Higaonon dances: Their implications to cultural identity peace and development

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ABSTRACT

This study presents an ethnographic overview of the Higaonon culture, as shown in their traditional dances, their beliefs, values, and customs. It presents the Higaonon dances which explore the role of the tribe as an agent of culture preservation that is gradually diminishing due to modern influences in society. Observations and interviews were the two primary methods used to gather the data. The descriptive method was also utilized to describe the meaning, movements of the arms, and the step patterns which reflect their cultural identity. Entry protocols with the tribal leaders and local government officials were properly observed. Results of this study show that there are seven traditional dances of the Higaonon, namely, Anahaw, Binanog, Kag Malaki, Kasabana, Kapangamote, Saut, and Talapak. Furthermore, it reveals that the Higaonon dancers have common costumes, accessories, adornment, and accompaniment used in different dances. Their costume used only three colors that will identify their tribe and culture. These are the Red, White, and the Black. Moreover, the Higaonon used "gong" and "tambol" for their accompaniment in all their dance presentations. The dancers used almost the same step patterns and variations of their arm and hand movements which connote different meanings as being emphasized in each dance.

Keywords: Cultural identity, Development, Higaonon dances, Indigenous people, Peace

INTRODUCTION

Cultural heritage is central to protecting the identity of the nation. It will bring an irrefutable connection to the past – to certain social values, beliefs, customs, and traditions, and deepen the sense of unity, belonging, and national pride. However, with the advent of technology and social media, there is a threat for the rich cultures to be forgotten by the new generation. Thus, the Department of Physical Education of MSU-IIT, Iligan City, Philippines, conducted a study about the traditional dances of thes tribal people in Iligan City to preserve their culture, as can be seen in their traditional dance.

The Higaonon's vanishing ancestral traditions and customary laws are used to define dances as their social relationships and values which promote efficiency for economic development; hence, it is important to preserve the almost forgotten culture of these minority groups. Preservation of Higaonon culture is very important to incorporate such an essential part of our history into our general national development process.

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Peace and development in the community would therefore depend on the understanding of the culture, the adaptation of its elements for political, educational, and economic development as well as its strengths for social integration (Datu Soong).

This study presents an ethnographic overview of the Higaonon culture which emphasized a radical duality between the sacred and their world view, beliefs, values, and customs that they define their own forms of governance, as well as their customary laws and norms. This will present a compilation of the Higaonon dances and explore their role as an agent of preservation of cultural knowledge that is no longer practiced in its traditional contexts.

Likewise, this study explores the traditional dances of the Higaonon of Iligan City which show their own identity and distinction in terms of the arm and body movements and the color of their costume. This will add to the rich compilation of indigenous dances that are introduced in schools and performing groups in the country. Through the documented dances of the Higaonon, the identity of the said tribe will be more understood, respected, and appreciated which will contribute to peace and development in the region.

The Higaonon and other cultures alike will be made to realize how important it is to have a culture of their own as characterized in their almost forgotten dances which are worthy of promotion and preservation. The results of this study will ignite the interest of teachers, researchers, choreographers, and local government to enhance the promotion and popularization of the Higaonon culture, as well as to bridge the cultural gap.

MATERIALS AND METHODS

Descriptive method was also utilized to describe the costumes and adornment, accessories and props, musical accompaniment, dance steps, and patterns, as well as the characteristics and body movements that are inherent in the dance and how it relate to their culture. This method used also describes the dance description, background or origin, dance steps, arm/hand movements, musical accompaniments, costumes, adornment, accessories, and props that are inherent in the dance.

Before the conduct of this study, a consultative meeting was done with the NGO's in the city, the principal and teachers of Rogongon Agricultural High School, and representatives from the local government. As practiced by the natives, a ritual was performed to ask permission from the environmental spirits before the conduct of this study. The researchers were asked to bring the necessary food/materials to be used in the ritual.

To gather authentic information regarding the culture of the Higaonon all over Mindanao, the researchers also went to Tourism Office in Malaybalay, Bukidnon City, and interviewed the officers and employees: Information regarding the Higaonon tribe in Region 10 and their different indigenous dances, as well as its meaning adornment, costumes, and accompaniment.

During this presentation, the researchers interviewed the native, men and women as young as 15 years old and as old as 86 years old. Interviews were done in a casual conversation so that the data will be gathered directly from the native to come up with an authentic cultural representation. A video camera was used to record the dances and to make sure that all movements, dance patterns, and steps, including the dancers' facial expressions, were documented for further analysis and interpretation. The dances were analyzed, interpreted, and documented based on Francisca Reyes Aquino's notations, dance patterns, and symbols. The documentation was also based on their fundamental characteristics, such as their historical background, beliefs, traditions, and customary laws.

RESULTS AND DISCUSSION

Dance Costumes

The costume of the male dancers is made of a polo shirt with a combination of striped black, white, and red colors. The color of the pants is red, decorated with a white rick rack tailored at the edge of the bottom part. Male dancers also wear a headdress called "Tubao" which is made of cloth originally designed for them with the same combination of the designated colors for the Higanon tribe.

Female costume comprises blouse at waist length or just below the breast with bell shape sleeves at elbow length with a combination of three prescribed Higaonon colors (red, white, and black). There is one button at the back as the opening. The blouse is accented by the same design or cutting horizontally along the neckline, along the lower part of the sleeve, and along the abdominal line. The lower part of the blouse is decorated with a rick-rack white or red color tailored on its edge sleeve and the blouse itself. The skirt is ankle-length and shirred skirt of the same color of the blouse, or red or white floweret's design accented by the same cutting, horizontally along with the knee and the lower leg to the ankles. The lower part of the skirt at the edge is decorated by a rick rack of white or red color. Likewise, the dancers wear a headdress named "Balading" put around the head with the decorations like a ball just hanging around the head. This headdress is made up of thread with different colors that will match the colors prescribed for their tribe.

Accessories

The accessories worn by the dancers include the necklace, earrings, bracelets, and anklets made of beads with the three prescribed Higaonon colors the same with that of their costume. The dancers used the same accessories with those of other Higaonon Tribe in the different places of Mindanao, but it varies with the color as prescribed by its origin. The color of the beads used for their accessories will harmonize with the color of their costume. The dancers also wear a headdress made of thread that matches the color of their costume. These are specifically described below:

- Balading: Is the headdress worn by female dancers around the head and hang down. These are made of thread the same color as their costume. For other Higaonon tribe, these are dangling earrings made of beads.
- Baklaw: Is a bracelet made of similar beads and the same color as their costume. The dancers may wear several "baklaw" on their hands.
- Lumbong: Is a headdress made of carefully chosen threads and beads to match the color of the dress as designated by their tribe, put together in strands and in intricate designs and color combination with a ball at the end of every strand. For other Higaonon tribe, the headdress is called "Balading."
- Salay: Is the necklace used by the dancers made of beads and the same color combination of the lumbong and their costume with different designs, sizes, or styles.
- Singgil: Is an anklet used by female dancers made of similar beads and colors as used in the accessories of the other dances.

- Baklaw: This is a bracelet made from similar beads as the girls' accessories with the same combination of colors with their costumes. The Baklaw for male dancers is bigger than that for female dancers.
- Pakot: Is a belt used by the female dancers made of beads of the same color of their costume.
- Salay: Is a necklace wider than the salay used by the female dancers but are made of similar beads, designs, and color combination.
- Tangkulo or Tubao: Is a male headdress made of cloth white or red adorned with tassels on its edge or the use of a neckerchief.
- Tikos: Is an anklet made of beads used by male performers with the same combination of colors on their prescribed costume.

Musical Accompaniment

The musical accompaniment used in all the dances performed was "Agong or Gong" and Tambol. The Agong or Gong is made of brass which produces sounds when struck. The high cost "agong" prompts the use of indigenous materials such as cane, bamboo, and wood and the like during the dance practice. It is hanged and suspended tied by rope in four posts. Each gong is held by one player, usually in the left hand, while he or she strikes it with a wooden stick. Oral traditions maintain that the best-sounding gongs in the past contained gold in the alloy mixture, which added to an instrument's value.

Dances

In general, the dances of the Higaonon in Rogongon are pantomimic and ritualistic in nature. Their daily activities, planting, harvesting, gathering of cassava, and honey, as reflected in their dances, are performed during festivals, weddings, social gatherings, and other tribal celebrations. These are the following:

- Anahaw: This is a religious dance performed by male Higaonon. Dancers hold Anahaw leaves or dried coconut leaves in each hand. Arms are bent in front at chest level. Dancers shake the leaves throughout the performance. Dancers may be in a line or a circle formation. They move counterclockwise with a side step or small jumps. This is performed every night of a full moon. The male performers are called Talawtawan or acolytes. An altar or Talapnay is prepared on which offerings of betel nut or Tiladand small pieces of red cloth are placed. The shaking of the Anahaw leaves is to drive evil spirits. The circular formation signifies unity in the destruction of evil spirits. The dance lasts until the performers feel that their prayers have been heard. This may take an hour.
- Binanog: This is a courtship dance performed during weddings and other tribal celebrations. The dance imitates the movements of a male hawk courting a female hawk. According to the Higaonon when the male dancer succeeds in touching the female dancer's handkerchief with his hand or when the female dancer stops dancing, the datu of the Higaunon will announce the marriage of the two dancers. Male dancers twist their mouth while dancing. The twisted mouth symbolizes the presence of enchanted spirits or Kokok in the male dancers who may be able to hypnotize the female dancer into allowing the male dancer to touch her handkerchief or stopping the dance.
- Kagmalaaki: This is a dance about a love triangle. The two young men Higaonon were in love with one Higaonon lady. Both of them made a proposal and promised to marry her. Fortunately, one of them was accepted. However, the other suitors refuse to accept his flight, yet he fought for his right. He fought each other and stabbed him to death, so he won the fight, but the lady refused his proposal to accept him. With his depression, he stubbed her and stubbed himself too. According to the Higaonons, this story happened before in their community. This dance is performed for entertainment during festivals and other tribal celebrations.
- Pagpangamuran: The "Pagpangamuran" is a courtship dance of the Higaonon Tribe of Iligan City. It depicts the action of a man courting a woman. Throughout the dance, the man is shown displaying his affection to the girl; however, his pleadings are not accepted because of the conservative culture of the group.
- Saut: The dance depicts the movements of a combat or an imaginary duel. It is performed by two males Higaonon. Dancers hold a spear or lambitanin one hand and a shield or Kalasag on the other hand. Dancers face each other throughout the dance and move around pretending to hit one another. Dancers skip and execute chasing steps while moving around each other.
- Talapak: Talapakis an occupational dance that depicts planting rice. The dance is performed by a male and female Higaonon. The male dancer holds a long bamboo stick or buntong or kali in both hands. This is shaken and pointed to the ground all throughout the dance. The female dancer carries a basket or abunan with one arm. She stands behind the male dancer and follows him whenever he goes. Dance movements portray digging of the ground and planting of rice. This dance uses step close step with the left arm of the girl holds the basket tied at the hip and right hand as if getting seeds from the basket and put it on the ground as if planting. The boy is holding a small pointed bamboo or stick as if digging the ground while moving around using step close step. Talapak is performed during wedding feasts or any special gathering.
- Tinulalang: The dance depicts the movement of a tiny bird who stays in the riverside to watch and catch fishes, especially the evening or midnight. This is performed during festivals and other gatherings or celebrations. The dance is also classified as an entertainment dance of the tribe.

CONCLUSION

Based on the findings of the study, the researchers were able to conclude that Higaonon dances are artistic manifestations of preserving the culture of the tribe with its well-coordinated rhythmic movements expressing the people's beliefs and way of life. Strengthening and preserving these dances, beliefs, and traditions is very important for these people to be recognized in the community and local government for their continued respect and support. To reiterate, dance cultural heritage will contribute to peace and development in the locality.

Recommendation

The following is the recommendations drawn from the findings of the study: (1) The Higaonon youth should be taught and should practice their native dances to appreciate and preserve their rich cultural heritage; (2) Higaonon dances should be introduced in schools together with other Indigenous dances to give importance to the existence of the Higaonon tribe; (3) the teaching of ethnic dances should emphasize the originality of the dances on its movements, dance patterns, adornment, and color prescribed by each Higaonon tribe and should have knowledge on the true meaning of the dances. They should emphasize the cultural beliefs and practices reflected in each dance to facilitate correctness in interpretation and execution; (4) the newly documented dances should be recognized in the national level, especially in the National Commission on Culture and the Arts (NCCA) and in the Philippine Folk Dance Society. These should be introduced national dance workshops for teachers for the participants to appreciate and recognize the existence of the Higaonon traditional dances; and (5) it is important to strengthen peace and order in the community for economic development and to improve their standards of living.

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Research Article

The importance of physical training in team sports

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ABSTRACT

The aim of the paper is to realize a brief theoretical description of the physical training in team sports. Physical training represents an integrated and permanent process, which present at all times in every period of the sports training. Modern team sports imply a superior physical training due to the fact that the game rhythm is steadily increasing. Defense game involves an evolved physical training. This is because the rhythm is given by the attack team, while the defense team must adapt. Another reason that supports this idea is the movement of the ball which is faster than the players. To have a better game, both in defense and attack, it is absolutely necessary for the permanent improvement of general and specific physical training hints.

Keywords: Game, Physical training, Team sports

INTRODUCTION

Physical training, the component of the sports training process, determines the performance of athletes both in the training process, determines the performance of athletes both in training and in performance, and the evolution trends of the game world-wide indicate even an increase in the importance of this factor.

In sports activity, the level of physical training is actually represented by the ability of the athlete to perform motor acts in different regimes of speed, strength, skill, resistance to achieve, individual, and collective actions that are part of the sports technique.

In some cases, the physical training has been the secret ingredient of sports training t reaching high-level performance because team sports nowadays are characterized by complex actions as receiving and passing the ball on and off, steering changes, jumping, shifting the temple when running, etc. Thus, the body of the athlete must be prepared to cope with the training requirements, to highlight an optimal evolution to achieve better results.

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The main objectives of physical training are to increase the physiological potential of the athlete and to develop his qualities to the highest level.

Physical training develops the next succession

- General physical training
- Specific physical training
- High level of movie of movie qualities.

The athletes develop the first two stages during the preparatory phase when they are building a solid base. The third phase is specific to the competitive stage when the main objective is to maintain what they have achieved and improving the necessary qualities.

The longer the first phase is, the better the performance is in the competitive state; from this point of view, physical training is a highly complex process that requires a certain methodology for its realization.

General physical training in sports training includes a unitary system of means and requirements regarding the performance of the athlete in training and competition. It enriches the general background of driving skills, ensures harmonious development without which no team sport can be practiced.

From this point of view, the general physical training is done with means and methods of a general character, borrowed from

other branches of sport, by means of transfer phenomenon, so-called non-specific means.

The main task of general physical training is to enlarge the physical training indexes so that the athlete does not encounter difficulties in making the effort actions.

The more and solid the general physical training is, the higher the level of motive qualities can be reached by the player. It is very important to highlight through general physical training. For young perspective athletes, general physical training is about the same in all branches of sports individual or training correlates with the needs of the sport and with individual characteristics of the player.

The means for general physical training are taken, adapted, and used from many sport branches or created and adapted by specialists.

In team sports, there are exercises from athletics, gymnastics, and dumb-bell that are used with frequency and bring an improvement to the techniques actions, training skills, body resistance, functional capacity to adapt to different efforts, high speeded, and improved efficiency.

With this passing of time, while the training gets better, the level of general physical training has to reach, also high standards.

At the end of the preparation phase, the share of general physical training decreases, leaving it in the place to specific physical training.

Specific physical training – it is built on the basis of general physical training. Its main objective is to continue with the players physical development according to the team sport that they have been chosen. The improvements made to the physical potential of the player lean the path to higher effort volume during training, helps in recovery, which is done much quicker.

Within the structure of modern sports training, specific physical training has an important weight since the second half of the preparatory period – toward its end – and throughout the precompetitive and competitive period.

The major role of this type of training is to make a decisive contribution to the quality training of athletes.

However, the only one cannot saturate the requirements of improving the qualities, skills required to be each sports branch, and hence, the ability of the body to cope with various specific efforts.

Between the two types of physical training, there is a relationship interdependence, both of which contribute to achieving superior sporting results by increasing the performance of the athlete and adapting the body to effort.

In the physical training process, it is assumed that, although, in very different proportion, all the motoring qualities are developing. It aims to achieve higher performance availability for each individual motive quality.

In team sports, the development of speed is influenced by the physiological growth of the player. The same as for the other qualities, the training is efficient only if it intervenes at the right age, mainly between the ages of 7 and 12 years.

The process of speed development it's complex and has to have other qualities, the training is efficient only if it intervenes at the right age, mainly between the ages of 7 and 12 years.

The process of speed development is complex and has to have other important elements, like the level of mastery of exercises and technical procedures.

For developing speed, at team-sports exercises will be preferred, from technical procedures and technical – tactical actions executed in contest conditions, game sequences, fast attacks, counterattacks, technical procedures, stacks, and dynamic games. The breaks between repetitions have to be big enough to ensure a good recovery and to be prepared for the next exercise.

Skill can be developed at younger ages. Progress is much higher than speed. The optimal periods of influence are between 6 and 10–11 years.

The importance of skill lies in the following:

- Greatly influence the learning and perfection of papers, new engines, and their stability over time.

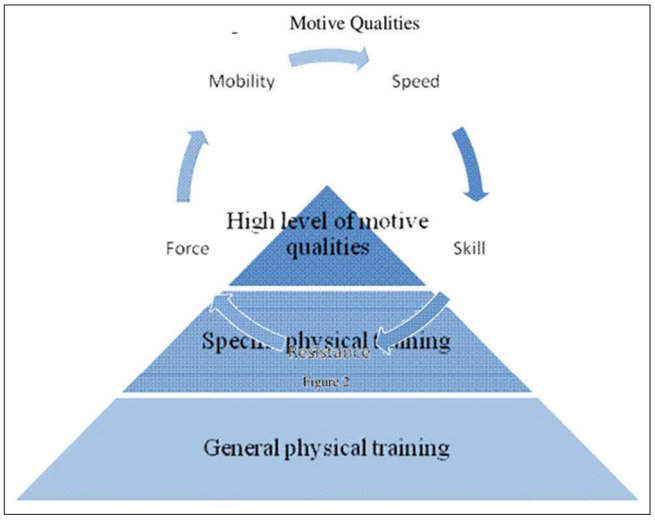

Figure 1: Components of general physical training

Table 1: Development of physical training

The phases of preparation	The preparatory phase		Competitive stage
Development stage	1	2	3
Objective	General physical training	Specific physical training	Specific improvement of motive qualities

- Promotes effective action and action under various conditions.
- Determines the movements in optimal rhythm and tempo.
- Promotes the superior capitalization of other motor skills.
- Promotes the restructuring of the movements in the training phases high performance and the training driving skills basic and applicative.
- In sports training, the following measures are required and methodical guidelines for skill development.
- The emphasis in training will be put on mastering as many numbers as possible great motor skills.
- Exercises must present a high degree of difficulty as the subject becomes accustomed to an exercise, it will increase its difficulty enhancing the demands on the precision of the movement, full-motion coordination and its components, and the spontaneity of changing the situations.
- Tong enough breaks should be provided to allow complete recovery of efforts.
- The workload in a lesson will be small; instead, it will program a large number of lessons with development goals the various components of the skill.
- The most favorable periods for skill developments are childhood, puberty, and adolescence, when the body possesses its higher plasticity than in adulthood. At 6–7 years, it can work well on balance, joint mobility, and muscle strength, which makes it possible to acquire a great number of skills motors.

Resistance, the quality that allows sustaining physical activity for long periods of time, is important in those sports that last longer than 1 min. It is necessary to have a good resistance in all team sports, from volleyball to football. The main advantage of resistance in most sports is that it helps the athlete to tolerate the demands of training and competitions. An athlete with a good base of resistance will cope much more easily with training and competitions. An athlete with a good base of resistance will cope much more easily with training, competitions, and contemporary sports.

In sports, tiredness is the number one enemy. Athletes who do not actually deal with fatigue have all the chances of poorly evolving, lose the match or the game. The tiredness also affects the power of concentration, as evidenced by the technical and tactical mistakes and the inaccuracies of execution. This explains why, at the end of a match, visible mistakes are becoming more and more numerous. Athletes who want to improve their game need to develop their capacity for resistance.

As well as the speed, the resistance – is heavily influenced genetic because the proportion of slow and fast muscle fibers determines to a good extent the potential for the resistance of an athlete. Genetic baggage and biological structure represent up to 70% of the final performance in a sport. However, the mere fact that an athlete has natural qualities for resisting physical activities does not mean that he will always be the best performer. Ethics in preparation, determination, and motivation to work hard can often fill the lack of talent.

Force is simply defined as the ability to overcome a resistance. Strength increases the level of performance and manifestation of many sports skills. All the skills that athletes have to perform to defeat different forms of resistance will gain from strength improvement. Preparing for strength not only helps the athlete to prevent injuries but also assures a strong base for subsequent phases at high performance. A misconception about strength training is that it would be profitable only for bodybuilders and weightlifters. As demonstrated in the past two decades, many athletes have improved their performance with strength training faster than insisting on the qualities specific to the sport discipline chosen.

Power training is an integral part of the training of athletes: Footballers, handball players, basketball players, etc. Nowadays, the theory has changed so much that some believe that no one can make a higher bounce or breakout without preparing the force and strong no one can throw or kick the ball without having strong arms an important place in most sports.

Force can also be combined with other factors, such as speed and endurance. In the first case, force and speed result in power, that is, the extent to which force can be generated. It is usually a quick combination, the explosive force – force of detachment at the jump. The second case, strength and resistance, is called muscle strength and defines the ability to perform many repetitions against a resistance.

In addition to improving performance and assuring injury, strength training is also beneficial for health.

The advantage of strength training can be both social and psychological, in the sense that this type of workouts sets the individual discipline and the mental determination to perform a task. Moreover, a strong person releases more self-esteem and more confidence in his own forces.

Mobility targets the amplitude of movement around a joint. Improving mobility plays a fundamental role in the training program for the young athlete, as good mobility allows it to

easily execute various moves and skills and contributes to the prevention of injuries.

The ability to perform well a wide range of moves and skills depends on the aptitude of the movement, which must be higher than it requires the specific skills of the sport. For example, to take a high kick with a ball in a soccer match, players must raise their legs to the chest level, and for this, they must have sufficient mobility. They do not have so much mobility, they will not be able to absorb and perfect the various movements practiced in this sport.

Training no mobility is also a strategy to prevent injuries. In most sports, there are repetitive movements, often of low amplitude, which can lead to muscle contractions and possibly stretches or breaks of muscles.

The development of mobility, therefore, aims not only to meet the demands of a sport but also to expand the amplitude of the movement normally required in the sport.

The best moments for stretching exercises are the end of the general warm-up, the rest interval between the exercises and the end of the training lesson.

CONCLUSIONS

- Physical training is one of the most important factors in athletic training to achieve great performance.
- Developing and training the body for activities and movements with applicative character is one of the main objectives in physical training.
- Through this training, process is being pursues strength and maintaining the good health of the players, increasing the resistance of the body.
- Through physical training, a player reaches an improvement of motor skills and an increased ability to adapt to any new process or any difficult situation to improve the technique and tactical action.
- The process aims for improving the physical fitness of speed, force, skill, and resistance.
- It being watched, getting a general degree of training as high as possible and easier entry into sports from.
- To have a better game, both in defense and attack, it is absolutely necessary the permanent improvement of general and specific physical training hints.
- With a good physical training, a team can face the attacks of the opponents without losing the pace and perform at a high level.
- A good physical training helps the players to have a better recovery after effort actions, trainings, competitions, and prevent the unfortunate injuries.
- Physical training must be done by qualified people, following a well-established training plan.

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Research Article

Effects of resistance, surya namaskar, and combined training with natural fat reduction supplementation on serum: Total protein and very-low-density lipoprotein among obese schoolchildren

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ABSTRACT

The purpose of this study was to find out the effects of resistance, surya namaskar, and combined training with natural fat reduction supplementation on serum total protein and very low-density lipoprotein among obese schoolchildren. To achieve the purpose of this study, 60 obese schoolchildren were selected from Sree Iyappa Matriculation Higher Secondary School, Sholinganallur in Chennai district, Tamil Nadu, India, which were selected as a subject at random and their age group ranged between 11 and 14 years. Female obese schoolchildren selected for this research. The selected 60 obese schoolchildren were divided into four equal groups consisting of 15 subjects each. The selection of control and experimental groups was done at random. Experimental Group I underwent resistance training for 3 days per week. Experimental Group II underwent suryana maskar training for 3 days/week. Experimental Group III underwent combined training for 3 days/week and Group IV acted as control group. All the three experimental groups had taken green tea and almond seeds as natural fat reduction supplementation. Subjects who were in the control group were not exposed to any experimental training and supplementation for the period of 12 weeks. Serum total protein and very-low-density lipoprotein were selected as dependent variables and independent variables are resistance training, surya namaskar, and combined training. The data were collected before and after the experimental treatment period in the dependent variable such as serum total protein and very-low-density lipoprotein through blood samples. Analysis of covariance (ANCOVA) and Scheffe's *post hoc* test were used in this study. It was concluded that serum total protein and very-low-density lipoprotein level were significantly decreased due to the influence of 12 weeks of resistance, surya namaskar, and combined training with natural fat reduction supplementation to compare to the control group.

Keywords: Combined training, Obesity, Resistance training, Serum total protein, Surya namaskar training, Very-low-density lipoprotein

INTRODUCTION

The prevalence of childhood obesity has been steadily increasing during the past few decades worldwide. India has the second-highest number of obese children in the world, according to the study published in the New England Journal of Medicine; according to this study, the prevalence of obesity in Indian children increased significantly during 1990–2017. Indian Journal of Endocrinology and Metabolism revealed the recent study in 2019 stated that around 5–8.8% of schoolchildren are obese in India, and if the rates increase at a pace like this, 27 million Indian children will be obese by 2030.

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Comprehensive Nutritional National Survey conducted the study during 2016–2018 in India. According to this study, the highest prevalence of overweight in adolescents was Delhi, Goa, and Tamil Nadu. For adolescents, the highest percentage of abdominal obesity was observed in Delhi (7%) and Tamil Nadu (6%). This is considered a less healthy to store body fat and is associated with metabolic syndrome. This study also revealed that, in India, 3% of school-age children and 4% of adolescents had high total cholesterol and high- and low-density lipoprotein. One-quarter of school-age children (26%) and 28% of adolescents had low high-density lipoprotein. The early onset of lipid disorders is alarming as these conditions in childhood are an elevated risk for cardiovascular diseases, diabetes in adulthood. One of the best ways to control obesity is to start at a young age through eating less and exercising more is seen as a simple solution to the problem.

EFFECT OF OBESITY ON PROTEIN METABOLISM

It is a fact that human obesity is accompanied by abnormalities in both glucose and lipid metabolism. However, it is controversial whether protein metabolism is also disturbed in overweight individuals. Some researchers have reported that moderate obesity and difference in body fat distribution are associated with abnormalities in protein metabolism and have hypothesized proteolysis, an increased rate of basal leucine turnover, and the impairment of insulin's antiproteolytic action, whereas others have found similar rates of basal leucine turnover in non-obese and obese subjects. Conflicting reports also have appeared about the effect of insulin on protein anabolism. Some studies have indicated that the insulin resistance of obesity extends to protein metabolism, whereas other reports have challenged this conclusion.

IMPORTANCE OF REGULAR EXERCISE TO PREVENT OBESITY

Regular exercise plays an important role in the prevention of obesity and related metabolic disorders. The regular exercise, along with a nutritional diet, helps to prevent obesity and related metabolic disorders. According to guidelines set by the American college of sports medicine, the obesity person needs at least 150 min (30 min, 5 times a week) of moderate-intensity physical activity that is essential to prevent further weight gain or to lose a small amount of weight. Obese children need at least 250–300 min of physical activity for weekly 5 days and daily 60 min.

Growing children need resistance training is beneficial in improving body composition, thereby is an alternative tool for the treatment of childhood obesity. Resistance exercise training in childhood obesity improved lean body mass, reduced percent body fat, increase resting metabolic rate and energy expenditure, strengthen bone density, reduce abdominal fat, and improve mental well-being.

Surya namaskar can be regarded as a moderate isotonic exercise. It can be done by children and all age groups. It is a moderate physical exercise which is linked with the breathing. It consumes calories moderately without much fatigue. Since it is an isotonic type of exercise, it does not increase the muscle tension but increases the metabolic rate. Surya namaskar training has dynamic stretches in forward and backward direction and rhythmic positive and negative pressure changes in the viscera stimulate various viceroceptors that lead to all the body systems work at the optimum level. Regular practice of surya namaskar helps to improve cardiovascular endurance, muscular endurance, flexibility, and metabolic function.

PURPOSE OF THE STUDY

The purpose of this study was to find out the effects of resistance, surya namaskar, and combined training with natural fat reduction supplementation on serum total protein and very-low-density lipoprotein among obese schoolchildren.

METHODOLOGY

To achieve the purpose of this study, 60 obese schoolchildren were selected from Sree Iyappa Matriculation Higher secondary school, Sholinganallur in Chennai district, Tamil Nadu, India, which were selected as a subject at random and their age group ranged between 11 and 14 years. Female obese schoolchildren selected for this research. The selected 60 obese schoolchildren were divided into four equal groups consisting of 15 subjects each. The selection of control and experimental groups was done at random. Experimental Group I underwent resistance training with natural fat reduction supplementation for 3 days per week. Experimental Group II underwent surya namaskar training with natural fat reduction supplementation for 3 days/week. Experimental Group III underwent combined training with natural fat reduction supplementation for 3 days/week and Group IV acted as a control group. Subjects who were in the control group were not exposed to any experimental training and supplementation for a period of 12 weeks. The pre- and post-test were conducted in the dependent variables such as serum total protein and very-low-density lipoprotein the collection of blood sample in the obese

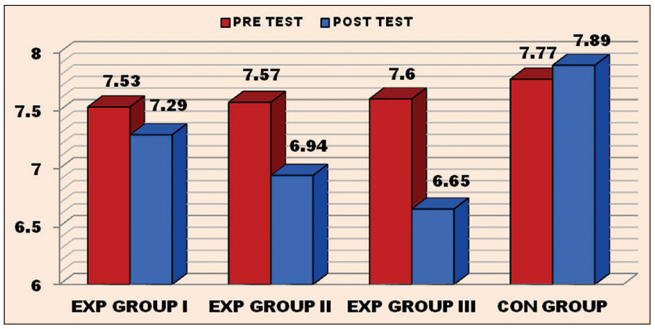

Figure 1: Bar diagram showing pre- and post-means of serum total protein

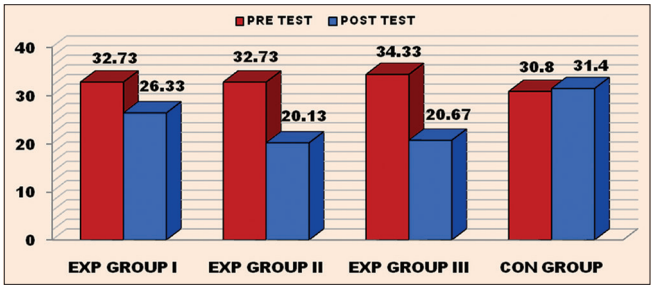

Figure 2: Bar diagram showing pre- and post-means of very-low-density lipoprotein

Table 1: Computation of analysis of covariance on serum total protein (scores in gms/dl)

Means	Experimental Group I	Experimental Group II	Experimental Group III	Control group	SV	SS	df	MS	F
Pre-test	7.53	7.57	7.60	7.77	B	0.51	3	0.17	0.93
					W	10.31	56	0.18	
Post-test	7.29	6.94	6.65	7.89	B	12.95	3	4.32	22.14*
					W	10.91	56	0.19	
Adjusted post-test	7.36	6.98	6.66	7.77	B	10.21	3	3.40	39.24*
					W	4.77	55	0.09	

*Significant. F ratio for 3 and 56=2.77 and 3 and 55=2.77 (0.05 level)

Table 2: Computation of analysis of covariance on very-low-density lipoproteins (scores in mgs/dl)

Means	Experimental Group I	Experimental Group II	Experimental Group III	Control group	SV	SS	df	MS	F
Pre-test	32.73	32.73	34.33	30.80	B	94.05	3	31.55	1.51
					W	1163.60	56	20.78	
Post-test	26.33	20.13	20.67	31.40	B	1269.93	3	423.31	9.94*
					W	2386	56	42.41	
Adjusted post-test	26.29	20.09	19.70	32.46	B	1539.42	3	513.14	14.08*
					W	2005.11	55	36.46	

*Significant. F ratio for 3 and 56 = 2.77 and 3 and 55 = 2.77 (0.05 level)

schoolchildren before and after the 12 weeks of the experimental period. Analysis of covariance (ANCOVA) was used to find out the significant differences between the pre-test and post-test for serum total protein and very-low-density lipoprotein. *Post hoc* test was used to find out the paired means differences groups.

ANALYSIS OF DATA

Result on Serum Total Protein

The following table illustrated the statistical results to the effects of resistance training, surya namaskar, and combined training with natural fat reduction supplementation on serum total protein of obese schoolchildren and ordered adjusted means the groups under study.

DISCUSSION ON THE FINDINGS OF TOTAL PROTEIN

In this work, the analysis of covariance of total protein was carried out in three different experimental groups with the inclusion of resistance training, surya namaskar, and combined training with natural fat reduction supplementation. The same analysis was carried out in another group called the control group without the inclusion of training. From these analyses, it was found that the results obtained from the experimental groups had significant decreases in the total protein from its higher level to moderate when compared with one from the control group. This was due to the influence of resistance training, surya namaskar, and combined training with natural fat reduction supplementation in the analysis of experimental groups. It was interesting to note that the results obtained from Experimental Group III had more significant effect then Experimental Group I, Experimental Group II, and control group on the decreased total protein. Further, the results obtained from Experimental Group II had a significant influenced total protein than control group.

RESULT ON VERY-LOW-DENSITY LIPOPROTEIN

The following tables illustrated the statistical results to the effects of resistance training, surya namaskar, and combined training with natural fat reduction supplementation on very-low-density lipoprotein of obese schoolchildren and ordered adjusted means the groups under study.

DISCUSSION ON THE FINDINGS OF VERY-LOW-DENSITY LIPOPROTEINS

From these analyses, it was found that the results obtained from the experimental groups had significant decreases in the very-low-density lipoproteins from its higher level to moderate when compared with one from the control group. This was due to the

influence of resistance training, surya namaskar, and combined training with natural fat reduction supplementation in the analysis of experimental groups. It was interesting to note that the results obtained from Experimental Group III had more significant effect then Experimental Group I and control group on the decreased very-low-density lipoproteins. Further, the results obtained from Experimental Group II had a significant influenced very-low-density lipoproteins than Control Group. The finding of this study was in agreement with the findings of Santwana Mondal, *et al*., (2014), investigated Blood sugar and lipid profile adaptations to yoga therapy. This study revealed that very-low-density lipoprotein significantly decreased due to yoga therapy. Since the results obtained from the analysis of covariance combined training with natural fat reduction, supplementation is one of the better training methods to reduce the very-low-density lipoproteins.

CONCLUSIONS

Within the limitation of this study, the following conclusions were drawn. It was concluded that 12 weeks resistance, surya namaskar, and combined training with natural fat reduction supplementation help to reduced serum total protein and very-low-density lipoprotein level significantly in the obese schoolchildren. But particularly, the combined training group had significantly decreased serum total protein and very-low-density lipoprotein level in the obese schoolchildren than resistance and surya namaskar training groups.

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Research Article

Effects of resistance, surya namaskar, and combined training with almond supplementation on serum calcium and serum chloride among overweight schoolchildren

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ABSTRACT

The purpose of this study was to find out the effects of resistance, surya namaskar, and combined training with almond supplementation on serum calcium and serum chloride among overweight schoolchildren. To achieve the purpose of this study, 60 overweight schoolchildren were selected from Sree Iyappa Matriculation Higher secondary school, Sholinganallur in Chennai district, Tamil Nadu, India, which were selected as subject at random and their age group ranged between 11 and 14 years. Female overweight schoolchildren selected for this research. The selected 60 overweight schoolchildren were divided into four equal groups consisting of 15 subjects each. The selection of control and experimental groups was done at random. Experimental Group I underwent resistance training with almond supplementation for 3 days/week. Experimental Group II underwent surya namaskar training with almond supplementation for 3 days per week. Experimental Group III underwent combined training with almond supplementation for 3 days/week and Group IV acted as control group. Subjects who were in the control group were not exposed to any experimental training and supplementation for a period of 12 weeks. Serum calcium and serum chloride were selected as dependent variables and independent variables are resistance training, surya namaskar, and combined training. The data were collected before and after the experimental treatment period in the dependent variable such as serum calcium and serum chloride through blood samples. Analysis of covariance (ANCOVA) and Scheffe's *post hoc* test were used in this study. It was concluded that serum calcium and serum chloride level were significantly decreased due to the influence of 12 weeks of resistance, surya namaskar, and combined training with almond supplementation to compare to the control group.

Keywords: Combined training, Overweight, Resistance training, Serum calcium, Serum chloride, Surya namaskar training

INTRODUCTION

The prevalence of childhood obesity has been steadily increasing during the past few decades worldwide. According to the report by the World Health Organization (2019), the worldwide prevalence of childhood obesity has increased. An estimated 38.2 million children under the age of five years were overweight or obese. Over 340 million children and adolescents aged 5–19 were overweight or obese in 2016. The prevalence of overweight and obesity among children and adolescents aged 5–19 has risen dramatically from just 4% in 1975 to just over 18% in 2016. Almost half of the children under five who were overweight or obese in 2019 lived in Asia.

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Obesity and overweight are an increasingly prevalent nutritional disorder among children and adolescents in the world. Obesity is certainly a factor for developing Vitamin D deficiency and hypercalcemia. Calcium is an important mineral in our body throughout lifetime for bone growth, bone strength, maintaining proper hormone levels and optimal functioning of nerves, muscles, and the brain. The calcium level is usually very carefully controlled by the body. However, certain medications and conditions can result in high blood calcium levels. Hypercalcemia leads to complications such as bone loss and fractures, kidney stones, kidney failure, hypertension, and bradycardia which were commonly found as a result of long-standing untreated high calcium levels.

High salt intake is associated with an increased risk of obesity in both children and adults. Chloride is an ingredient in sodium chloride, which is table salt. Chloride is one of the most important electrolytes in the blood. It helps keep the

amount of fluid inside and outside of your cells in balance. It also helps maintain proper blood volume, blood pressure, and pH of body fluids. Research published in the Archives of International Medicine in the Us in 2011 clearly indicated that a high intake of sodium, common salty food, and processed food, and low intake of potassium and calcium leads to significantly higher risk of cardiovascular diseases. High level of sodium in the body leads to increase chloride content in blood leads to imbalance of electrolytes. Metabolic disorder in overweight children managed through different physical exercises. In this study, own body weight resistance training, surya namaskar training, and combination of resistance and surya namaskar training implemented for overweight schoolchildren.

PURPOSE OF THE STUDY

The purpose of this study was to find out the effects of resistance, surya namaskar, and combined training with almond supplementation on serum calcium and serum chloride among overweight schoolchildren.

METHODOLOGY

To achieve the purpose of this study, 60 overweight schoolchildren were selected from Sree Iyappa Matriculation Higher secondary school, Sholinganallur in Chennai district, Tamil Nadu, India, which were selected as subject at random and their age group ranged between 11 and 14 years. Female overweight schoolchildren were selected for this research. The selected 60 overweight schoolchildren were divided into four equal groups consisting of 15 subjects each. The selection of control and experimental groups was done at random. Experimental Group I underwent resistance training with almond supplementation for 3 days per week. Experimental Group II underwent surya namaskar training with almond supplementation for 3 days/week. Experimental Group III underwent combined training with almond supplementation for 3 days/week and Group IV acted as control group. Subjects who were in the control group were not exposed to any experimental training and supplementation for a period of 12 weeks. The pre- and post-test were conducted in the dependent variables such as serum calcium and serum chloride the collection of the blood sample in the overweight schoolchildren before and after the 12 weeks of the experimental period. Analysis of covariance (ANCOVA) was used to find out the significant differences between the pre-test and post-test for serum calcium and serum chloride. *Post hoc* test was used to find out the paired means differences the groups.

ANALYSIS OF DATA

Result on Serum Calcium

The following table illustrated the statistical results to the effects of resistance training, surya namaskar, and combined training with almond supplementation on serum calcium of overweight schoolchildren and ordered adjusted means the groups under study.

DISCUSSION ON THE FINDINGS OF CALCIUM

In this work, the analysis of covariance of calcium was carried out in three different experimental groups with the inclusion of resistance training, surya namaskar, and combined training with natural fat reduction supplementation. The same analysis was carried out in another group called the control group without the inclusion of training. From these analyses, it was found that the results obtained from the experimental groups had significant decreases in the calcium from it higher level to moderate when compared with one from the control group. It was interesting to note that the results obtained from Experimental Group III had more significant effect then Experimental Group I, Experimental Group II, and control group on the decreased calcium. Further, the results obtained from Experimental Group II had a significant influenced on calcium than the Experimental Group I and control group. Since the results obtained from the analysis of covariance combined training with natural fat reduction supplementation is one of the better training methods to reduce the calcium.

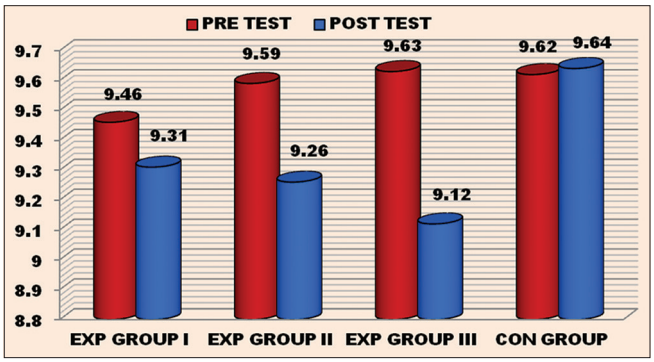

Figure 1: Bar diagram showing pre- and post-means of serum calcium

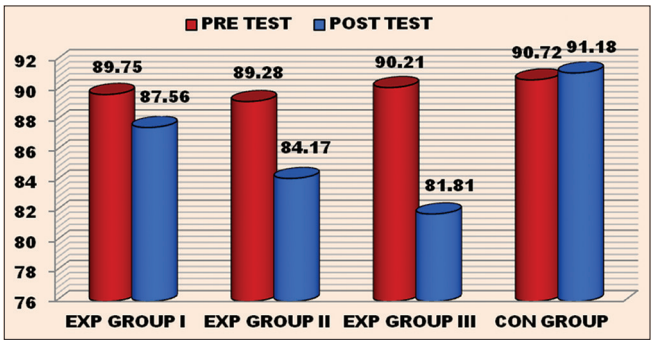

Figure 2: Bar diagram showing pre- and post-means of serum chloride

Table 1: Computation of analysis of covariance on serum calcium (scores in mgs/dl)

Means	Experimental Group I	Experimental Group II	Experimental Group III	Control group	SV	SS	Df	MS	Obtained F ratio
Pre-test	9.46	9.59	9.63	9.62	B	0.28	3	0.09	1.20
					W	4.40	56	0.08	
Post-test	9.31	9.26	9.12	9.64	B	2.12	3	0.71	8.66*
					W	4.57	56	0.08	
Adjusted post-test	9.41	9.24	9.08	9.60	B	2.23	3	0.74	33.36*
					W	1.22	55	0.02	

*Significant. F ratio for 3 and 56=2.77 and 3 and 55=2.77 (.05 level)

Table 2: Computation of analysis of covariance on serum chloride (Scores in mmol/l)

Means	Experimental Group I	Experimental Group II	Experimental Group III	Control group	SV	SS	df	MS	F ratio
Pre-test	89.75	89.28	90.21	90.72	B	17.15	3	5.72	0.56
					W	574.83	56	10.27	
Post-test	87.56	84.17	81.81	91.18	B	750.86	3	250.29	21.16*
					W	662.50	56	11.83	
Adjusted post-test	87.72	84.64	81.66	91.69	B	679.39	3	226.46	30.45*
					W	408.98	55	7.44	

*Significant. F ratio for 3 and 56 = 2.77 and 3 and 55 = 2.77 (0.05 level)

RESULT ON SERUM CHLORIDE

The following tables illustrated the statistical results to the effects of resistance training, surya namaskar, and combined training with almond supplementation on serum chloride of overweight schoolchildren and ordered adjusted means the groups under study.

DISCUSSION ON THE FINDINGS OF CHLORIDE

In this work, the analysis of covariance of chloride was carried out in three different Experimental groups with the inclusion of resistance training, surya namaskar, and combined training with natural fat reduction supplementation. The same analysis was carried out in another group called the control group without the inclusion of training. From these analyses, it was found that the results obtained from the experimental groups had significant influences in the chloride. The finding of this study is in agreement with the findings of Maughan et.al. (2009) who had done research on water and salt balance of well-trained swimmers in training. He was concluded that chloride has significantly decreased due to the physical exercises. Lara *et al*. (2016) investigated interindividual variability in sweat electrolyte concentration in marathoners. This study concluded that sodium, potassium, and chloride level were decreased due to physical exercise. Since the results obtained from the analysis of covariance in very good agreement with the earlier results, it was worthwhile to mention that combined training with natural fat reduction supplementation is one of the better training methods to reduce the chloride.

CONCLUSIONS

Within the limitation of this study, the following conclusions were drawn. It was concluded that 12 weeks resistance, surya namaskar, and combined training with almond supplementation help to reduce serum calcium and serum chloride level significantly in the overweight schoolchildren. But particularly, the combined training group had significantly decreased serum calcium and serum chloride in the overweight schoolchildren than resistance and surya namaskar training groups.

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Research Article

Development of T-scale of chair sit and reach test of male senior citizens

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ABSTRACT

Context: Chair sit and reach test is a test in Senior Fitness Test which is widely used to test lower back flexibility in senior citizens. A T-scale is a helpful tool which can be used in the assessment and comparison of the person based on the performance on the test. **Aims:** The aim of the study was to develop a T-scale in regard to chair sit and reach test for male senior citizens. **Setting and Design:** Scale development. **Methods and Materials:** This paper is a follow-up on the work done by Rikli and Jones in which more than 2000 senior citizens participated. **Statistical Analysis used: Results:** A T-scale has been constructed in regard to chair sit and reach test for male senior citizens. **Conclusion:** T-scale is a good normative reference and can be useful in the assessment, comparison, and evaluation of the person based on his performance in the chair sit and reach test.

Keywords: Chair sit and reach test, Male senior citizens, Senior fitness test, T-scale

INTRODUCTION

Chair sit and reach test is a highly reliable reliable ($R = 0.92$) and moderately valid ($r = 0.76$) test of lower body flexibility for male senior citizens.[1] Chair sit and reach test is part of the Senior fitness Test[2] which is a widely used test to assess functional fitness in male senior citizens.[3-5]

The chair sit and reach test in the senior fitness test is a modification of the more common Sit and reach test[6] and back saver sit and reach test[7] all of which measure lower body flexibility.

The chair sit and reach test is part of many fitness test batteries including the Senior Fitness Test, since maintaining the hamstring and lower back flexibility may avert possible acute and chronic musculoskeletal injuries,[8,9] posture related disabilities, and minimize the risk of falls.[9]

After taking a chair sit and reach test, the score made on the test should be compared against the test norms based on the age category he is in. Test norms consist of data that make it possible to determine the relative standing of an individual who has taken a test.

One of the ways to deliver normative standards is by constructing a t-scale.

According to Merriam Webster "T" Scale is a scale of expressing the results of all tests in comparable forms as standard scores.[10] By convention "T" scale has a mean of 50 and a total of ten standard deviation, five on either side of the mean. "T" scale is considered most appropriate for national level norms construction. "T" scale normally ranges from 20 to 80; this represents a range of three standard deviations on either side of the mean. One of the advantages of "T" scale is the two standard deviation cushion above and below this range is advantageous in that it precludes the possibility of encountering future scores that cannot be placed on the scale.[11]

SUBJECTS AND METHODS

The T-scale was constructed by fallowing the four-step procedure explained in the text.[12] To calculate the T-scale value the Standard Deviation was multiplied by 5 and divided by 50. Then, the mean was placed in the center (50 T-scale)

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and the attained T-scale value was added in the positive direction of and subtracted in the negative direction until a 100 point T-scale was constructed. However, in this case, the standard deviations and means for different age categories of chair sit and reach test were obtained from Rikli and Jones.[13] For the test administration of chair sit and reach test see here.[14]

RESULTS

According to Table 1, T-scale 100 = 24.6, T-scale 90 = 19.8, T-scale 80 = 15, T-scale 70 = 10.2, T-scale 60 = 5.4, T-scale 50=0.6, T-scale 40 = −4.2, T-scale 30 = −9, T-scale 20 = −13.78, and T-scale of 10 = −18.6

According to Table 2, T-scale 100 = 23, T-scale 90 = 18.4, T-scale 80 = 13.8, T-scale 70 = 9.2, T-scale 60 = 4.6, T-scale 50 = 0, T-scale 40 = −4.6, T-scale 30 = −9.2, T-scale 20 = −13.8, and T-scale of 10 = −18.4

According to Table 3, T-scale 100 = 22.6, T-scale 90 = 18, T-scale 80 = 13.4, T-scale 70 = 8.8, T-scale 60 = 4.2, T-scale 50 = −0.4, T-scale 40 = −5, T-scale 30 = −9.6, T-scale 20 = −14.2, and T-scale of 10 = −18.8

According to Table 4, T-scale 100 = 22.4, T-scale 90 = 17.7, T-scale 80 = 13, T-scale 70 = 8.3, T-scale 60 = 3.6, T-scale 50 = −1.1, T-scale 40 = −5.8, T-scale 30 = −10.5, T-scale 20 = −15.2, and T-scale of 10 = −19.9

According to Table 5, T-scale 100 = 23, T-scale 90 = 18, T-scale 80 = 13, T-scale 70 = 8, T-scale 60 = 3, T-scale 50 = -2, T-scale 40 = -7, T-scale 30 = −12, T-scale 20 = −17, and T-scale of 10 = −22

According to Table 6, T-scale 100 = 18.6, T-scale 90 = 14.4, T-scale 80 = 10.2, T-scale 70 = 6, T-scale 60 = 1.8, T-scale 50 = −2.4, T-scale 40 = −6.6, T-scale 30 = −10.8, T-scale 20 = −15, and T-scale of 10 = −19.2

Table 1: T-scale of chair sit and reach test for 60–64 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	24.6	75	12.6	50	0.6	25	−11.4
99	24.12	74	12.12	49	0.12	24	−11.88
98	23.64	73	11.64	48	−0.36	23	−12.36
97	23.16	72	11.16	47	−0.84	22	−12.84
96	22.68	71	10.68	46	−1.32	21	−13.32
95	22.2	70	10.2	45	−1.8	20	−13.8
94	21.72	69	9.72	44	−2.28	19	−14.28
93	21.24	68	9.24	43	−2.76	18	−14.76
92	20.76	67	8.76	42	−3.24	17	−15.24
91	20.28	66	8.28	41	−3.72	16	−15.72
90	19.8	65	7.8	40	−4.2	15	−16.2
89	19.32	64	7.32	39	−4.68	14	−16.68
88	18.84	63	6.84	38	−5.16	13	−17.16
87	18.36	62	6.36	37	−5.64	12	−17.64
86	17.88	61	5.88	36	−6.12	11	−18.12
85	17.4	60	5.4	35	−6.6	10	−18.6
84	16.92	59	4.92	34	−7.08	9	−19.08
83	16.44	58	4.44	33	−7.56	8	−19.56
82	15.96	57	3.96	32	−8.04	7	−20.04
81	15.48	56	3.48	31	−8.52	6	−20.52
80	15	55	3	30	−9	5	−21
79	14.52	54	2.52	29	−9.48	4	−21.48
78	14.04	53	2.04	28	−9.96	3	−21.96
77	13.56	52	1.56	27	−10.44	2	−22.44
76	13.08	51	1.08	26	−10.92	1	−22.92

Table 2: T-scale of chair sit and reach test for 65–69 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	23	75	11.5	50	0	25	−11.5
99	22.54	74	11.04	49	−0.46	24	−11.96
98	22.08	73	10.58	48	−0.92	23	−12.42
97	21.62	72	10.12	47	−1.38	22	−12.88
96	21.16	71	9.66	46	−1.84	21	−13.34
95	20.7	70	9.2	45	−2.3	20	−13.8
94	20.24	69	8.74	44	−2.76	19	−14.26
93	19.78	68	8.28	43	−3.22	18	−14.72
92	19.32	67	7.82	42	−3.68	17	−15.18
91	18.86	66	7.36	41	−4.14	16	−15.64
90	18.4	65	6.9	40	−4.6	15	−16.1
89	17.94	64	6.44	39	−5.06	14	−16.56
88	17.48	63	5.98	38	−5.52	13	−17.02
87	17.02	62	5.52	37	−5.98	12	−17.48
86	16.56	61	5.06	36	−6.44	11	−17.94
85	16.1	60	4.6	35	−6.9	10	−18.4
84	15.64	59	4.14	34	−7.36	9	−18.86
83	15.18	58	3.68	33	−7.82	8	−19.32
82	14.72	57	3.22	32	−8.28	7	−19.78
81	14.26	56	2.76	31	−8.74	6	−20.24
80	13.8	55	2.3	30	−9.2	5	−20.7
79	13.34	54	1.84	29	−9.66	4	−21.16
78	12.88	53	1.38	28	−10.12	3	−21.62
77	12.42	52	0.92	27	−10.58	2	−22.08
76	11.96	51	0.46	26	−11.04	1	−22.54

Table 3: T-scale of chair sit and reach test for 70–74 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	22.6	75	11.1	50	−0.4	25	−11.9
99	22.14	74	10.64	49	−0.86	24	−12.36
98	21.68	73	10.18	48	−1.32	23	−12.82
97	21.22	72	9.72	47	−1.78	22	−13.28
96	20.76	71	9.26	46	−2.24	21	−13.74
95	20.3	70	8.8	45	−2.7	20	−14.2
94	19.84	69	8.34	44	−3.16	19	−14.66
93	19.38	68	7.88	43	−3.62	18	−15.12
92	18.92	67	7.42	42	−4.08	17	−15.58
91	18.46	66	6.96	41	−4.54	16	−16.04
90	18	65	6.5	40	−5	15	−16.5
89	17.54	64	6.04	39	−5.46	14	−16.96
88	17.08	63	5.58	38	−5.92	13	−17.42
87	16.62	62	5.12	37	−6.38	12	−17.88
86	16.16	61	4.66	36	−6.84	11	−18.34
85	15.7	60	4.2	35	−7.3	10	−18.8
84	15.24	59	3.74	34	−7.76	9	−19.26
83	14.78	58	3.28	33	−8.22	8	−19.72
82	14.32	57	2.82	32	−8.68	7	−20.18
81	13.86	56	2.36	31	−9.14	6	−20.64
80	13.4	55	1.9	30	−9.6	5	−21.1
79	12.94	54	1.44	29	−10.06	4	−21.56
78	12.48	53	0.98	28	−10.52	3	−22.02
77	12.02	52	0.52	27	−10.98	2	−22.48
76	11.56	51	0.06	26	−11.44	1	−22.94

Table 4: T-scale of chair sit and reach test for 75–79 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	22.4	75	10.65	50	−1.1	25	−12.85
99	21.93	74	10.18	49	−1.57	24	−13.32
98	21.46	73	9.71	48	−2.04	23	−13.79
97	20.99	72	9.24	47	−2.51	22	−14.26
96	20.52	71	8.77	46	−2.98	21	−14.73
95	20.05	70	8.3	45	−3.45	20	−15.2
94	19.58	69	7.83	44	−3.92	19	−15.67
93	19.11	68	7.36	43	−4.39	18	−16.14
92	18.64	67	6.89	42	−4.86	17	−16.61
91	18.17	66	6.42	41	−5.33	16	−17.08
90	17.7	65	5.95	40	−5.8	15	−17.55
89	17.23	64	5.48	39	−6.27	14	−18.02
88	16.76	63	5.01	38	−6.74	13	−18.49
87	16.29	62	4.54	37	−7.21	12	−18.96
86	15.82	61	4.07	36	−7.68	11	−19.43
85	15.35	60	3.6	35	−8.15	10	−19.9
84	14.88	59	3.13	34	−8.62	9	−20.37
83	14.41	58	2.66	33	−9.09	8	−20.84
82	13.94	57	2.19	32	−9.56	7	−21.31
81	13.47	56	1.72	31	−10.03	6	−21.78
80	13	55	1.25	30	−10.5	5	−22.25
79	12.53	54	0.78	29	−10.97	4	−22.72
78	12.06	53	0.31	28	−11.44	3	−23.19
77	11.59	52	−0.16	27	−11.91	2	−23.66
76	11.12	51	−0.63	26	−12.38	1	−24.13

Table-5: T-scale of chair sit and reach test for 80–84 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	23	75	10.5	50	−2	25	−14.5
99	22.5	74	10	49	−2.5	24	−15
98	22	73	9.5	48	−3	23	−15.5
97	21.5	72	9	47	−3.5	22	−16
96	21	71	8.5	46	−4	21	−16.5
95	20.5	70	8	45	−4.5	20	−17
94	20	69	7.5	44	−5	19	−17.5
93	19.5	68	7	43	−5.5	18	−18
92	19	67	6.5	42	−6	17	−18.5
91	18.5	66	6	41	−6.5	16	−19
90	18	65	5.5	40	−7	15	−19.5
89	17.5	64	5	39	−7.5	14	−20
88	17	63	4.5	38	−8	13	−20.5
87	16.5	62	4	37	−8.5	12	−21
86	16	61	3.5	36	−9	11	−21.5
85	15.5	60	3	35	−9.5	10	−22
84	15	59	2.5	34	−10	9	−22.5
83	14.5	58	2	33	−10.5	8	−23
82	14	57	1.5	32	−11	7	−23.5
81	13.5	56	1	31	−11.5	6	−24
80	13	55	0.5	30	−12	5	−24.5
79	12.5	54	0	29	−12.5	4	−25
78	12	53	−0.5	28	−13	3	−25.5
77	11.5	52	−1	27	−−13.5	2	-26
76	11	51	-1.5	26	-14	1	-26.5

Table-6: T-scale of chair sit and reach test for 85–89 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	18.6	75	8.1	50	−2.4	25	−12.9
99	18.18	74	7.68	49	−2.82	24	−13.32
98	17.76	73	7.26	48	−3.24	23	−13.74
97	17.34	72	6.84	47	−3.66	22	−14.16
96	16.92	71	6.42	46	−4.08	21	−14.58
95	16.5	70	6	45	−4.5	20	−15
94	16.08	69	5.58	44	−4.92	19	−15.42
93	15.66	68	5.16	43	−5.34	18	−15.84
92	15.24	67	4.74	42	−5.76	17	−16.26
91	14.82	66	4.32	41	−6.18	16	−16.68
90	14.4	65	3.9	40	−6.6	15	−17.1
89	13.98	64	3.48	39	−7.02	14	−17.52
88	13.56	63	3.06	38	−7.44	13	−17.94
87	13.14	62	2.64	37	−7.86	12	−18.36
86	12.72	61	2.22	36	−8.28	11	−18.78
85	12.3	60	1.8	35	−8.7	10	−19.2
84	11.88	59	1.38	34	−9.12	9	−19.62
83	11.46	58	0.96	33	−9.54	8	−20.04
82	11.04	57	0.54	32	−9.96	7	−20.46
81	10.62	56	0.12	31	−10.38	6	−20.88
80	10.2	55	−0.3	30	−10.8	5	−21.3
79	9.78	54	−0.72	29	−11.22	4	−21.72
78	9.36	53	−1.14	28	−11.64	3	−22.14
77	8.94	52	−1.56	27	−12.06	2	−22.56
76	8.52	51	−1.98	26	−12.48	1	−22.98

Table 7: T-scale of chair sit and reach test for 90–94 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	17.9	75	7.15	50	−3.6	25	−14.35
99	17.47	74	6.72	49	−4.03	24	−14.78
98	17.04	73	6.29	48	−4.46	23	−15.21
97	16.61	72	5.86	47	−4.89	22	−15.64
96	16.18	71	5.43	46	−5.32	21	−16.07
95	15.75	70	5	45	−5.75	20	−16.5
94	15.32	69	4.57	44	−6.18	19	−16.93
93	14.89	68	4.14	43	−6.61	18	−17.36
92	14.46	67	3.71	42	−7.04	17	−17.79
91	14.03	66	3.28	41	−7.47	16	−18.22
90	13.6	65	2.85	40	−7.9	15	−18.65
89	13.17	64	2.42	39	−8.33	14	−19.08
88	12.74	63	1.99	38	−8.76	13	−19.51
87	12.31	62	1.56	37	−9.19	12	−19.94
86	11.88	61	1.13	36	−9.62	11	−20.37
85	11.45	60	0.7	35	−10.05	10	−20.8
84	11.02	59	0.27	34	−10.48	9	−21.23
83	10.59	58	−0.16	33	−10.91	8	−21.66
82	10.16	57	−0.59	32	−11.34	7	−22.09
81	9.73	56	−1.02	31	−11.77	6	−22.52
80	9.3	55	−1.45	30	−12.2	5	−22.95
79	8.87	54	−1.88	29	−12.63	4	−23.38
78	8.44	53	−2.31	28	−13.06	3	−23.81
77	8.01	52	−2.74	27	−13.49	2	−24.24
76	7.58	51	−3.17	26	−13.92	1	−24.67

According to Table 7, T-scale 100 = 17.9, T-scale 90 = 13.6, T-scale 80 = 9.3, T-scale 70 = 5, T-scale 60 = 0.7, T-scale 50 = −3.6, T-scale 40 = −7.47, T-scale 30 = −12.2, T-scale 20 = −16.5, and T-scale of 10 = −20.8

CONCLUSION

- A T-scale has been developed in regard to chair sit and reach test for male senior citizens.
- The developed scale is a good normative reference in regard to chair sit and reach test for male senior citizens.

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Research Article

Development of T-scale of back scratch test of male senior citizens

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ABSTRACT

Context: Back Scratch Test is a test in Senior Fitness Test which is widely used to test upper body flexibility in senior citizens. A T-scale is used when wanting to know the relative standing of a person of based on the performance on the test. **Aims:** The aim of the study was to develop a T-scale in regard to Back Scratch Test for male senior citizens. **Setting and Design:** Scale development. **Materials and Methods:** This paper is a follow-up on the work done by Rikli and Jones in which more than 2000 male senior citizens participated. **Results:** A T-scale has been constructed in regard to Back Scratch Test for male senior citizens. **Conclusion:** T-scale is a good normative reference and can be useful in the assessment, comparison, grading, and evaluation of the person based on his performance in the Back Scratch Test.

Keywords: Back scratch test, Male senior citizens, Senior fitness test, T-scale

INTRODUCTION

Back scratch test is a test in the Senior Fitness Test[1] a widely used functional fitness assessment test in female senior citizens.[2-5] Back Scratch Test is a field test that is employed to assess the upper body flexibility.[6] This component of fitness is important in tasks such as combing ones hair, reaching for a seat belt, scratching an itch, and reaching out for things that are high above.

Abduction, adduction, and internal and external rotation involve measuring the distance between the middle fingers of the two this test involves a combination of shoulder hand. The subject reaches behind the head with one hand and behind the back with another hand.[1]

After taking a Back Scratch Test, the score made on the test should be compared against the test norms based on the age category a person is in. Test norms consist of data that make it possible to determine the relative standing of an individual who has taken a test.

One of the ways to deliver normative standards is by constructing a t-scale.

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According to Merriam Webster "T" Scale is a scale of expressing the results of all tests in comparable forms as standard scores.[7] By convention "T" scale has a mean of 50 and a total of ten standard deviation, five on either side of the mean.

"T" scale is considered most appropriate when the population varies exceedingly in their characteristics. "T" scale normally ranges from 20–80; this represents a range of three standard deviations on either side of the mean. One of the advantages of "T" scale is the two standard deviation cushion above and below this range is advantageous in that it precludes the possibility of encountering future scores that cannot be placed on the scale.[8]

METHODOLOGY

The T-scale was constructed by fallowing the four-step procedure explained in the text.[9] To calculate the T-scale value, the standard deviation was multiplied by 5 and divided by 50. Then, the mean was placed in the center (50 T-scale) and the attained T-scale value was added in the positive direction of and subtracted in the negative direction until a 100 point T-scale was constructed. However, in this case, the standard deviations and means for different age categories of back scratch test were obtained from work done by Rikli

and Jones.[10] For the test administration of back scratch test see here.[11]

RESULTS

According to Table 1, T-scale 100 = 20.6, T-scale 90 = 15.8, T-scale 80 = 11, T-scale 70 = 6.2, T-scale 60 = 1.4, T-scale 50 = −3.4, T-scale 40 = −8.2, T-scale 30 = −13, T-scale 20 = −17.8, and T-scale of 10 = −22.6

According to Table 2, T-scale 100 = 20.4, T-scale 90 = 15.5, T-scale 80 = 10.6, T-scale 70 = 5.7, T-scale 60 = 0.8, T-scale 50 = −4.1, T-scale 40 = −9, T-scale 30 = −13.9, T-scale 20 = −18.8, and T-scale of 10 = −23.7

According to Table 3, T-scale 100 = 20, T-scale 90 = 15.1, T-scale 80 = 10.2, T-scale 70 = 5.3, T-scale 60 = 0.4, T-scale 50 = −4.5, T-scale 40 = −9.4, T-scale 30 = −14.3, T-scale 20 = −19.69, and T-scale of 10 = −24.1

According to Table 4, T-scale 100 = 19.9, T-scale 90 = 14.8, T-scale 80 = 9.7, T-scale 70 = 4.6, T-scale 60 = −0.5, T-scale 50 = −5.6, T-scale 40 = −10.7, T-scale 30 = −15.8, T-scale 20 = −20.9, and T-scale of 10 = −26

According to Table 5, T-scale 100 = 21.3, T-scale 90 = 15.9, T-scale 80 = 10.5, T-scale 70 = 5.1, T-scale 60 = −0.3, T-scale 50 = −5.7, T-scale 40 = −11.1, T-scale 30 = −16.5, T-scale 20 = −21.9, and T-scale of 10 = −27.3

According to Table 6, T-scale 100 = 17.8, T-scale 90 = 13, T-scale 80 = 8.2, T-scale 70 = 3.4, T-scale 60 = −1.4, T-scale 50 = −6.2, T-scale 40 = −11, T-scale 30 = −15.8, T-scale 20 = −20.6, and T-scale of 10 = −25.4

According to Table 7, T-scale 100 = 16.8, T-scale 90 = 12, T-scale 80 = 7.2, T-scale 70 = 2.4, T-scale 60 = −2.4, T-scale 50 = −7.2, T-scale 40 = −12, T-scale 30 = −16.8, T-scale 20 = −21.6, and T-scale of 10 = −26.4

Table 1: T-scale of back scratch test of 60–64 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	20.6	75	8.6	50	−3.4	25	−15.4
99	20.12	74	8.12	49	−3.88	24	−15.88
98	19.64	73	7.64	48	−4.36	23	−16.36
97	19.16	72	7.16	47	−4.84	22	−16.84
96	18.68	71	6.68	46	−5.32	21	−17.32
95	18.2	70	6.2	45	−5.8	20	−17.8
94	17.72	69	5.72	44	−6.28	19	−18.28
93	17.24	68	5.24	43	−6.76	18	−18.76
92	16.76	67	4.76	42	−7.24	17	−19.24
91	16.28	66	4.28	41	−7.72	16	−19.72
90	15.8	65	3.8	40	−8.2	15	−20.2
89	15.32	64	3.32	39	−8.68	14	−20.68
88	14.84	63	2.84	38	−9.16	13	−21.16
87	14.36	62	2.36	37	−9.64	12	−21.64
86	13.88	61	1.88	36	−10.12	11	−22.12
85	13.4	60	1.4	35	−10.6	10	−22.6
84	12.92	59	0.92	34	−11.08	9	−23.08
83	12.44	58	0.44	33	−11.56	8	−23.56
82	11.96	57	−0.04	32	−12.04	7	−24.04
81	11.48	56	−0.52	31	−12.52	6	−24.52
80	11	55	−1	30	−13	5	−25
79	10.52	54	−1.48	29	−13.48	4	−25.48
78	10.04	53	−1.96	28	−13.96	3	−25.96
77	9.56	52	−2.44	27	−14.44	2	−26.44
76	9.08	51	−2.92	26	−14.92	1	−26.92

Table 2: T-scale of back scratch test of 65–69 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	20.4	75	8.15	50	−4.1	25	−16.35
99	19.91	74	7.66	49	−4.59	24	−16.84
98	19.42	73	7.17	48	−5.08	23	−17.33
97	18.93	72	6.68	47	−5.57	22	−17.82
96	18.44	71	6.19	46	−6.06	21	−18.31
95	17.95	70	5.7	45	−6.55	20	−18.8
94	17.46	69	5.21	44	−7.04	19	−19.29
93	16.97	68	4.72	43	−7.53	18	−19.78
92	16.48	67	4.23	42	−8.02	17	−20.27
91	15.99	66	3.74	41	−8.51	16	−20.76
90	15.5	65	3.25	40	−9	15	−21.25
89	15.01	64	2.76	39	−9.49	14	−21.74
88	14.52	63	2.27	38	−9.98	13	−22.23
87	14.03	62	1.78	37	−10.47	12	−22.72
86	13.54	61	1.29	36	−10.96	11	−23.21
85	13.05	60	0.8	35	−11.45	10	−23.7
84	12.56	59	0.31	34	−11.94	9	−24.19
83	12.07	58	−0.18	33	−12.43	8	−24.68
82	11.58	57	−0.67	32	−12.92	7	−25.17
81	11.09	56	−1.16	31	−13.41	6	−25.66
80	10.6	55	−1.65	30	−13.9	5	−26.15
79	10.11	54	−2.14	29	−14.39	4	−26.64
78	9.62	53	−2.63	28	−14.88	3	−27.13
77	9.13	52	−3.12	27	−15.37	2	−27.62
76	8.64	51	−3.61	26	−15.86	1	−28.11

Table 3: T-scale of back scratch test of 70–74 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	20	75	7.75	50	−4.5	25	−16.75
99	19.51	74	7.26	49	−4.99	24	−17.24
98	19.02	73	6.77	48	−5.48	23	−17.73
97	18.53	72	6.28	47	−5.97	22	−18.22
96	18.04	71	5.79	46	−6.46	21	−18.71
95	17.55	70	5.3	45	−6.95	20	−19.2
94	17.06	69	4.81	44	−7.44	19	−19.69
93	16.57	68	4.32	43	−7.93	18	−20.18
92	16.08	67	3.83	42	−8.42	17	−20.67
91	15.59	66	3.34	41	−8.91	16	−21.16
90	15.1	65	2.85	40	−9.4	15	−21.65
89	14.61	64	2.36	39	−9.89	14	−22.14
88	14.12	63	1.87	38	−10.38	13	−22.63
87	13.63	62	1.38	37	−10.87	12	−23.12
86	13.14	61	0.89	36	−11.36	11	−23.61
85	12.65	60	0.4	35	−11.85	10	−24.1
84	12.16	59	−0.09	34	−12.34	9	−24.59
83	11.67	58	−0.58	33	−12.83	8	−25.08
82	11.18	57	−1.07	32	−13.32	7	−25.57
81	10.69	56	−1.56	31	−13.81	6	−26.06
80	10.2	55	−2.05	30	−14.3	5	−26.55
79	9.71	54	−2.54	29	−14.79	4	−27.04
78	9.22	53	−3.03	28	−15.28	3	−27.53
77	8.73	52	−3.52	27	−15.77	2	−28.02
76	8.24	51	−4.01	26	−16.26	1	−28.51

Table 4: T-scale of back scratch test of 75–79 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	19.9	75	7.15	50	−5.6	25	−18.35
99	19.39	74	6.64	49	−6.11	24	−18.86
98	18.88	73	6.13	48	−6.62	23	−19.37
97	18.37	72	5.62	47	−7.13	22	−19.88
96	17.86	71	5.11	46	−7.64	21	−20.39
95	17.35	70	4.6	45	−8.15	20	−20.9
94	16.84	69	4.09	44	−8.66	19	−21.41
93	16.33	68	3.58	43	−9.17	18	−21.92
92	15.82	67	3.07	42	−9.68	17	−22.43
91	15.31	66	2.56	41	−10.19	16	−22.94
90	14.8	65	2.05	40	−10.7	15	−23.45
89	14.29	64	1.54	39	−11.21	14	−23.96
88	13.78	63	1.03	38	−11.72	13	−24.47
87	13.27	62	0.52	37	−12.23	12	−24.98
86	12.76	61	0.01	36	−12.74	11	−25.49
85	12.25	60	−0.5	35	−13.25	10	−26
84	11.74	59	−1.01	34	−13.76	9	−26.51
83	11.23	58	−1.52	33	−14.27	8	−27.02
82	10.72	57	−2.03	32	−14.78	7	−27.53
81	10.21	56	−2.54	31	−15.29	6	−28.04
80	9.7	55	−3.05	30	−15.8	5	−28.55
79	9.19	54	−3.56	29	−16.31	4	−29.06
78	8.68	53	−4.07	28	−16.82	3	−29.57
77	8.17	52	−4.58	27	−17.33	2	−30.08
76	7.66	51	−5.09	26	−17.84	1	−30.59

Table 5: T-scale of back scratch test of 80–84 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	21.3	75	7.8	50	−5.7	25	−19.2
99	20.76	74	7.26	49	−6.24	24	−19.74
98	20.22	73	6.72	48	−6.78	23	−20.28
97	19.68	72	6.18	47	−7.32	22	−20.82
96	19.14	71	5.64	46	−7.86	21	−21.36
95	18.6	70	5.1	45	−8.4	20	−21.9
94	18.06	69	4.56	44	−8.94	19	−22.44
93	17.52	68	4.02	43	−9.48	18	−22.98
92	16.98	67	3.48	42	−10.02	17	−23.52
91	16.44	66	2.94	41	−10.56	16	−24.06
90	15.9	65	2.4	40	−11.1	15	−24.6
89	15.36	64	1.86	39	−11.64	14	−25.14
88	14.82	63	1.32	38	−12.18	13	−25.68
87	14.28	62	0.78	37	−12.72	12	−26.22
86	13.74	61	0.24	36	−13.26	11	−26.76
85	13.2	60	−0.3	35	−13.8	10	−27.3
84	12.66	59	−0.84	34	−14.34	9	−27.84
83	12.12	58	−1.38	33	−14.88	8	−28.38
82	11.58	57	−1.92	32	−15.42	7	−28.92
81	11.04	56	−2.46	31	−15.96	6	−29.46
80	10.5	55	−3	30	−16.5	5	−30
79	9.96	54	−3.54	29	−17.04	4	−30.54
78	9.42	53	−4.08	28	−17.58	3	−31.08
77	8.88	52	−4.62	27	−18.12	2	−31.62
76	8.34	51	−5.16	26	−18.66	1	−32.16

Table 6: T-scale of back scratch test of 85–89 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	17.8	75	5.8	50	−6.2	25	−18.2
99	17.32	74	5.32	49	−6.68	24	−18.68
98	16.84	73	4.84	48	−7.16	23	−19.16
97	16.36	72	4.36	47	−7.64	22	−19.64
96	15.88	71	3.88	46	−8.12	21	−20.12
95	15.4	70	3.4	45	−8.6	20	−20.6
94	14.92	69	2.92	44	−9.08	19	−21.08
93	14.44	68	2.44	43	−9.56	18	−21.56
92	13.96	67	1.96	42	−10.04	17	−22.04
91	13.48	66	1.48	41	−10.52	16	−22.52
90	13	65	1	40	−11	15	−23
89	12.52	64	0.52	39	−11.48	14	−23.48
88	12.04	63	0.04	38	−11.96	13	−23.96
87	11.56	62	−0.44	37	−12.44	12	−24.44
86	11.08	61	−0.92	36	−12.92	11	−24.92
85	10.6	60	−1.4	35	−13.4	10	−25.4
84	10.12	59	−1.88	34	−13.88	9	−25.88
83	9.64	58	−2.36	33	−14.36	8	−26.36
82	9.16	57	−2.84	32	−14.84	7	−26.84
81	8.68	56	−3.32	31	−15.32	6	−27.32
80	8.2	55	−3.8	30	−15.8	5	−27.8
79	7.72	54	−4.28	29	−16.28	4	−28.28
78	7.24	53	−4.76	28	−16.76	3	−28.76
77	6.76	52	−5.24	27	−17.24	2	−29.24
76	6.28	51	−5.72	26	−17.72	1	−29.72

Table 7: T-scale of back scratch test of 90–94 years age category

T-scale	T-score	T-scale	T-score	T-scale	T-score	T-scale	T-score
100	16.8	75	4.8	50	−7.2	25	−19.2
99	16.32	74	4.32	49	−7.68	24	−19.68
98	15.84	73	3.84	48	−8.16	23	−20.16
97	15.36	72	3.36	47	−8.64	22	−20.64
96	14.88	71	2.88	46	−9.12	21	−21.12
95	14.4	70	2.4	45	−9.6	20	−21.6
94	13.92	69	1.92	44	−10.08	19	−22.08
93	13.44	68	1.44	43	−10.56	18	−22.56
92	12.96	67	0.96	42	−11.04	17	−23.04
91	12.48	66	0.48	41	−11.52	16	−23.52
90	12	65	0	40	−12	15	−24
89	11.52	64	−0.48	39	−12.48	14	−24.48
88	11.04	63	−0.96	38	−12.96	13	−24.96
87	10.56	62	−1.44	37	−13.44	12	−25.44
86	10.08	61	−1.92	36	−13.92	11	−25.92
85	9.6	60	−2.4	35	−14.4	10	−26.4
84	9.12	59	−2.88	34	−14.88	9	−26.88
83	8.64	58	−3.36	33	−15.36	8	−27.36
82	8.16	57	−3.84	32	−15.84	7	−27.84
81	7.68	56	−4.32	31	−16.32	6	−28.32
80	7.2	55	−4.8	30	−16.8	5	−28.8
79	6.72	54	−5.28	29	−17.28	4	−29.28
78	6.24	53	−5.76	28	−17.76	3	−29.76
77	5.76	52	−6.24	27	−18.24	2	−30.24
76	5.28	51	−6.72	26	−18.72	1	−30.72

CONCLUSION

- A T-scale has been developed in regard to back scratch test for male senior citizens.
- The developed scale is a good normative reference in regard to back scratch test for male senior citizens.

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Research Article

Performance analysis of volleyball players – Telangana Universities

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ABSTRACT

The aim of this paper was to study the performance of Volleyball players in Telangana Universities. Here, the performance of players in lines of, anthropometrical variables such as height and arm length how they play a significant and essential role in Volleyball players. In this, we focused on psychological variables such as speed (50 mt run in s), arm strength, and arm strength, anthropometrical such as height and arm length, psychological variables such as self-confidence and aggression, performance variables such as service, spiking, and blocking. From the analysis, results and discussions, it was observed that players who are taller and having more self-confidence than others shown high performance in case of psychological variables, anthropometrical variables, etc. In this study, finally, it was also found that among all variables, in rank and on the performance wise, anthropometrical variables such as height and arm length play a significant role. This kind of analysis and study of performance helps to all the sports and physical education people at all the levels.

Keywords: Physical fitness, Speed, Endurance, Arm length, Self-confidence, Aggression, service, Spiking, Blocking ANOVA test

BACKGROUND

In the past few decades, sports have gained tremendous popularity all over the globe. The popularity of sports is still increasing at a fast pace and this happy trend is likely to continue in the future also. When one looks at the history of the modern Olympic Games one sees that the number of sports for which competitions are held at Olympic the Games has increased steadily. The total number of participating countries and sport men has also increased steadying addition to Olympic sports, indigenous sports have also become popular in each country. Several new sports such as sky-diving, skating, and motor racing have also come into existence and are quite popular with the masses. The press and electronic media are giving much more coverage to sports and have become effective medium to carry sports to millions and millions of people around the world. Sports have become an important social and cultural activity of the modern world which is being given the rightful place it deserves by the nations and societies of the world.

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Sports serve as vital social and cultural functions the importance of which can hardly be exaggerated. The contribution of sports toward the overall welfare of the human society may be capsule in the following points:

1. Sports help in the all-around development of human personality.
2. Provide ample and healthy means for recreation and relaxation of human mind and body.
3. Sports are effective for rehabilitation and social adjustment of the injured, sick, and handicapped.
4. Provide opportunities for social interaction thereby fostering peace and understanding among different people, nations, races, religions, etc.
5. Perform preventive and curative functions for several diseases and ailments inflicting human body and mind.
6. Provide healthy and socially acceptable opportunities for the people and nations to complete against each other there by touching heights of excellence of human endeavor and attainment.

Keeping in mind the aims, organization and means of sports activities the sports are classified into several areas, for example, performance sports, and adventure sports each area of sports caters to the requirements and demands of a

particular section of the society. The area of performance sports has gained much more publicity and importance than the other areas. It has its own structure and organization, cadre of functionaries, and a science which exclusively deals with this area. The principal aim of performance sports is to prepare sports persons for giving high sports performance.

REVIEW OF RELATED LITERATURE

As we know that sports, physical education Volleyball sports have gained tremendous popularity all over the globe. Motivated by this fact, in sports and physical education a study is making on Physical Anthropometrical Psychological and Performance of Volleyball players in Universities of Telangana region, India. From earlier studies, such as Muthu Kurumbathevar Bose (1999), conducted an analytical study of physical and performance variables, of university and state men Hockey players, playing, and different playing surfaces. Samuel Sabu (1999) conducted a study on Comparative Analysis of selected physical and psychological characteristics of men soccer players playing at different field of positions. Angyan *et al*. (2002) measured the trends in prevention oriented physical education. The process of this study was to measure selected anthropometrical characteristics, motor abilities, and cardiorespiratory function of medical students. Quarrie *et al*. (2004) conducted a study on anthropometrical and physical performance characteristics of New Zealand Rugby players of different ages and both sexes. Bossone *et al*. (2005) conducted a study on cardiovascular responses to exercise in elite ice hockey players. High-performance ice hockey requires unique strength and endurance, which are facilitated by training. However, Mc Carthy and Kelly conducted a study on aggression, performance variables and anger self-report high hockey players. This study partially replicated a former one showing a relationship between aggression and performance among hockey players Timgabbet (2007). The aim of his study was to determine whether physiological, anthropometric, and skill test results could discriminate between junior volleyball players of varying ability. Koley, Singh, Sandhu (2010), in their study, anthropometric and physiological characteristics on Indian inter-university volleyball players. The purpose of this study was of two-folds, first, to evaluate the anthropometric profile of Indian inter-university volleyball players and, second, to search the correlation of body mass index, % body fat, hand grip strength (right dominant), and Vo_2max. With other anthropometric characteristics studied understanding of the physical and psychological aspects of athletes will provide useful information and guidelines which may be helpful to coaches and athletes.

METHODOLOGY

In the section, the technique adopted for the selection of subjects, selection of variables, collection of data, and statistical techniques to be employed for the analysis of the data have been described.

Objectives of the Study

The study has been planned with the following objectives:

1. To study the difference of the physical fitness variables such as speed, endurance, and arm strength of Volleyball players from various universities in Telangana region.
2. To study the difference of anthropometrical variables such as height and arm length of Volleyball players from various universities in Telangana region.
3. To study the difference of psychological variables such as self-confidence and aggression of Volleyball players from various universities in Telangana region.
4. To study the difference of performance variables such as service, spiking, and blocking of Volleyball players from various universities in Telangana region.

Selection of Subjects

To conduct this study, altogether 96 of University men volleyball players were selected as subjects, who participated in the central zone inter university volleyball competition held at Gwalior during the year 2013 representing their respective universities were chosen as subjects. The age of the players was between 18 and 28 players. As per the game formation in volleyball, there are six zones, namely, I zone, II zone, III zone, IV zone, and V zone, 16 players were selected as subjects. The players were selected from the eight universities detailed team below from each zone, that is, Osmania University, Hyderabad Kakatiya University, Warangal Satavahana University, Karim Nagar, Jawaharlal Nehru Technological University, Hyderabad, Telangana University, Nizamabad, Palamuru University, Mahbubnagar National Institute of Technology, and Warangal Mahatma Gandhi University, Nalgonda. From each team, 12 players were selected as target group.

Selection of Variables

The research scholar in this study selected certain physical variables, anthropometric variables, psychological variables, and performance variables which were considered as the essential components for the game of volleyball. Taking into consideration of importance of the following variables were selected for the comparison.

Hyphothesis

To find out the significant differences among physical, anthropometric, psychological, and performance variables, setting up the following hypotheses. The statistical hypothesis was defining as "There may be a significant difference among the spikers and blockers with request and blockers with respect to their physical variables" clearly it is mentioned below.

1. Significant difference among the physical fitness variables such as speed, endurance, and arm strength of

Volleyball players from various universities in Telangana region.
2. Significant difference among of anthropometrical variables such as height and arm length of Volleyball players from various universities in Telangana region.
3. Significant difference among of psychological variables such as self-confidence and aggression of Volleyball players from various universities in Telangana region.
4. 4 Significant difference among of performance variables such as service, spiking, and blocking of Volleyball players from various universities in Telangana region.

Significance of the Study

Modern competitive sports of today demand emphasis on the training of physical and psychological aspects of sports. The high level of performances seen in competitive sports is nothing but perfect optimum harmonious development of one's physical, psychological preparedness, and technical preparation. It is believed that superior athletic performance has benefited from knowledge about the physiology and biomechanics of human activity. However, understanding of the physical and psychological aspects of athletes will provide useful information and guidelines which may be helpful to coaches and athletes.

Tools Used

1. One self-confidence inventory (ASCI) Angiotribe self-confidence inventory.
2. Second one is for testing of aggression (SCAT) test AVC CARRAN test has been used as tools of study.

RESULTS AND DISCUSSION OF THE STUDY

The section deals with tabulation, analysis of data and results of a study. In this study, for a better understanding of the physical fitness related, physiological, anthropometrical, and performance variables among Volleyball players of selected universities in Telangana region. Mean, Standard Deviation, test for means *t*–value, and ANOVA techniques were taken up and p- values are considered in this study and employed separately for all variables. This entire statistical analysis work done by SPSS-20.

From the table, it shows that there is a significance of speed test on the Volleyball players among all the universities, clearly OU players shows more significance than all other universities in the region the players since $P = 0.02$. Endurance test, clearly OU players, shows more significance than all other universities in the region. Thus, it can be inferred that there is a significant difference among all the players since $P = 0.003$. Similarly, arm strength test SU players show significance in the region. Thus, it can be inferred that there is a significant difference among all the players since $P = 0.0045$. Table reveals that there is a significance of height test on the Volleyball players among all the universities, clearly OU players shows more significance than all other universities in the region since $P = 0.0023$

There is a significance of arm length test on the Volleyball players among all the universities, clearly OU players show

Table 1: Comparison of Mean±SD scores among Volleyball Players of Universities in Telangana region

Variables	OU	KU	SU	JNTU	MGU	TU	PU	NITW	*P*-value
Speed(m)	6.36±0.05	7.02±0.22	7.06±0.03	7.11±0.06	7.13±0.13	7.16±0.13	7.17±0.12	7.26±0.03	0.02
Endurance (mt)	3087.50 ±71.11	2991.67 ±104.08	2862.50 ±891.66	2762.50 ±190.84	2750. ±175.81	2658.33 ±205.42	2629.17 ±163.01	2608.33 ±114.48	0.003
Arm Strength (cm)	19.25±2.42	18.00±2.13	17.83±1.59	17.75±2.26	17.58±1.98	17.42±2.27	16.17±2.12	15.33±1.87	0.0045
Height (cm)	184.92±5.98	179.58±4.40	175.33±4.38	173.92±3.03	173.75±1.66	173.67±1.44	173.58±1.83	173.42±2.07	0.0023
Arm Length (cm)	78.50±3.12	76.50±4.03	76.08±3.90	75.75±4.49	75.25±5.12	74.92±4.72	74.75±4.43	74.42±4.23	0.022
Self-Confidence	31.08±1.68	29.08±1.56	28.33±2.57	27.50±2.11	27.42± 2.15	27.33±2.81	27.25±2.34	26.67±2.46	0.003
Aggression	16.75±1.54	15.42±1.44	14.92±1.83	14.50±1.73	14.25±1.29	14.17±1.27	13.92±1.98	13.83±1.99	0.004
Service	11.83±0.39	11.00±0.74	10.50±0.80	10.25±0.62	10.17±0.83	9.92±1.88	9.92±0.67	9.75±0.97	0.003
Blocking	11.17±0.94	10.67±1.07	10.00±1.35	9.75±1.22	9.75±1.06	9.67±1.07	9.58±1.31	9.50±1.31	0.0011
Spiking	72.33±1.37	69.92±1.51	69.50±1.78	69.33±1.83	69.33±1.83	69.17±1.75	69.08±1.73	69.00±1.65	0.01

P-values significant at 0.05

more significance than all other universities in the region. Thus, it can be inferred that there is a significant difference among all the players. Table reveals that there is a significance of self-confidence test on the Volleyball players among all the universities, clearly KU players show more significance than all other universities in the region. Thus, it can be inferred that there is a significant difference among all the players.

The table reveals that there is a significance of aggression test on the Volleyball players among all the universities, clearly TU players show more significance than all other universities in the region. Thus, it can be inferred that there is a significant difference among all the players.

From Table 1, in case of service test, among all the universities, clearly OU players show more significance than all other universities in the region. Thus, it can be inferred that there is a significant difference among all the players. Table reveals that there is a significance of spiking test on the Volleyball players among all the universities, clearly OU players show more significance than all other universities in the region. Thus, it can be inferred that there is a significant difference among all the players. Furthermore, in blocking test on the Volleyball players among all the universities, OU players show more significance than all other universities in the region. Thus, it can be inferred that there is a significant difference among all the players since $p = 0.01$.

CONCLUSIONS

Following all the above sections, some conclusions were drawn in support of primary source data tabulation, results analysis, and discussions. Thus, we observed that players who are taller and having more self-confidence than others shown high performance in case of psychological variables, anthropometrical variables, etc.

In this study, finally among all the psychological variables, anthropometrical, psychological, performance variables in rank on the performance wise of players, anthropometrical variables such as height and arm length plays a significant and essential role. In this study, finally among all the variables, anthropometrical variables such as height and arm length play a significant and essential role in Volleyball game. Finally, from the entire study, here we offer some future recommendations to researchers for their interest accordingly.

Recommendations of the Study

- In the present study, we projected on study of the physical, anthropometrical, and psychological and performance variables of Volleyball players in Telangana Universities. The same study may be extended to other geo graphical regions in India.
- In the study, we focused on Volleyball players, capture into an account even if researchers' interest in other games they may go by the same for further studies with some more advanced parameters.

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Research Article

Conceptual understanding about physical education and sports among the rural and urban students of government degree colleges in Vizianagaram district of Andhra Pradesh

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INTRODUCTION

India is a sports-mad country where many prominent sportspersons are hugely popular and even worshipped, but despite that, youngsters seem to prefer "watching" to "playing." While at least 50% of sports-crazy individuals actively participate in sports or choose sports as a career in other parts of the world, only 1% out of 62% of youngsters "interested in sports" end up choosing sports as a career option. India is expected to become the 4th largest economy by 2025, only after the United States, China, and Japan, contributing about 5.5–6% to the world GDP. While most of these developed countries face the risk of an aging workforce, India is expected to have a very favorable demographic profile. It is estimated that by the year 2020, the population of India would have a median age of 28 years only as against 38 years for the US, 42 years for China, and 48 years for Japan. This "demographic dividend" offers a great opportunity. The Government of India makes a significant investment in programs for the youth through various Ministries/Departments. In addition, the State Governments and a number of other stakeholders are also working to support youth development and to enable productive youth participation in sports and physical activities.

India is a country of more than a billion people still it is lagging behind in medal tally at international sporting events, and we put our head down in shame. So far, sporting communities joke on the Indian sporting culture where passivism toward sports is reflected in every sporting event. Although few sports are the silver lining in otherwise dried up medal tally and only the holistic approach could be way forward. However, the million dollar question is ……. if we are really literate in terms of sports? Sports: A way of life sports has emerged as a natural child care activity and has the added advantage of delivering several benefits such as increasing physical activity and fitness, learning physical skills, and socializing with other people. Sports significantly affect the development of youth people simple because if a large amount of time they are playing sports. Those who are successful may continue with their sports through the teenage years others may try other sports activates or drop out of sports completely. India is to raise the health standard through higher physical activity. Attitude – a setting mode thinking. A mental set is held by an individual which effects the ways that the person responds to events and organizes their cognitions.

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Significance

This study may reveal the Conceptual Understanding of Physical Education and Sports among the Rural and Urban Students of Government Degree Colleges in Vizianagaram District of Andhra Pradesh. The college students at the degree college level, and it further significant that to know the ideas of the people about physical education and sports. This study may helpful in how the college-level students aware of the concept of physical education and sports. This study may be useful to government, games and sports associations, and physical education persons on the administration grounds.

OBJECTIVES

The objectives of this study were as follows:

- To know the awareness of the Physical Education and Sports among the Rural and Urban Students of Government Degree Colleges in Vizianagaram District of Andhra Pradesh

- To know the different attitudes toward Physical Education and Sports
- To know the different ideas of the college students in different accepts regarding sports
- To know the thinking of the College students about the implementation of the Physical Education and Sports policy's and schemes
- To know the success rate of the youth (men and women), those who are seriously involved in the games and sports.

METHODOLOGY

To achieve, the objectivities of the present investigation survey method would be applied undertaken. The purpose of this study is to know the Conceptual Understanding of Physical Education and Sports among college students and draw conclusions to know the people attitude toward physical education and sports. To attain, this sample survey method will be followed. One hundred students from rural area and 100 students from urban area from government college men and women were selected randomly. The questionnaire will be developed based on the investigator opinion that the data collected will be analyzed by the following table.

Table 1 shows different responses on various concepts about physical education and sports. among the urban and rural government degree college students, respectively. As per the response No 1 about the term physical education and sports 47%, 45% of the students feel that the definition and meaning of the term physical education and sports are the same and 43%, 51% of the students are differed and remaining 10%, 4% students are not respond. In response No 2 – 87 %, 89% of the college students strongly responded as per their opinion, there is a need for physical education introduced as a compulsory subject in curriculum and 7%, 5% of the students are not agreed and the remaining 6%, 6% are neutral respond. As per R-3, most of the students, they are not agree that the participating games and sports are a time-wasting 79%, 80% of the students are respond positively and 11%, 12% of the students are feeling that time-wasting factor and 10%, and 8% of the students are not decided.[4] Regarding the importance of physical activity

Table 1: Results analysis

Concept	Urban students			Rural students		
	Yes (%)	No (%)	None	Yes (%)	No (%)	None (%)
Term about physical education and sports	47	43	10	45	51	4
Need for physical education as a subject	87	7	6	89	5	6
I believed participating in games and sports is time-wasting factor	11	79	10	12	80	8
I believe that without physical activity or sporting activity, I can lead the healthy life	44	53	3	32	67	1
A sound mind in a sound body	60	17	23	69	18	13
sports persons are symbolic for – discipline	53	33	14	65	33	2
Interest participating games and sports	68	22	10	76	20	4
I strongly believe excellence in Games and sports will have better job opportunities	51	48	1	45	50	5
Rural peoples attitude toward women participating in games and sports always negative	77	23	0	85	11	4
I believed parents attitude on games and sports – effects on academic carrier	67	33	0	81	17	2
I believed in creating sporting awareness media play a major role	74	22	4	73	18	9
Recognize need for games and sports infrastructure facilities in colleges	87	13	0	55	37	8
Awareness on play field identification	53	27	20	45	50	5
General awareness of Indian national games	51	46	3	48	50	2
General awareness on national sports day	33	57	10	30	55	15
Awareness on balanced diet	63	37	0	45	47	8
Idea about follow proper diet plan	55	45	0	63	21	16
Awareness' Indian sports policies and schemes	32	51	17	30	67	3
Positive about sports as a common carrier option	72	19	9	69	19	12
Awareness on sports coaching	41	55	4	35	55	10

related to a healthy lifestyle, 44%, 32% respond negatively and 53%, 67% positively reaming 3%, and 1% not respond. As per the R-5 students 60%, 69% believed that the A Sound Mind in a Sound Body and 17%, 18% of the college students are not agreed, remaining 23%, and 13% are not sharing their opinion. In general, sportspersons are symbolic of discipline here as per the R-6, students 53%, 65% are agreed and 33%, 33% are not agreed and remaining 14%, and 2% are not respond. As per R-7 students 68%, 76% are interested to participate in games and sports and 22%, 20% are not interested remaining 10%, and 4% are not respond. As per the R-8 51%, 45% of students believe sports excellence helpful in job opportunities and 48%, 45% are not believed reaming 1%, and 5% not respond. As per the R-9, the students respond and their opinion 77%, 85% of the rural people are accepting the women participating in games and sports negative and 23%, and 11% are agreed to that. As per the R-10, in Indian, the majority of the parents are top most priority gives to the academics as per their opinion, games and sports disturb the academic carrier here as per the students responses 67%, 81% are agreed and 33%, and 17% are not agreed. As per the R-11, most of the government students are believed –74%, 73% in creating sports awareness media play a major role and 22%, and 18% not agreed. As per the R-12 87%, 55% recognize need for games and sports facilitates in colleges and 13%, and 37% are not recognize. R-13 students 53%, 45% are identified play fields and 27%, and 50 are not. As per the R-14 students 51%, 48% are having a clear idea about Hockey is Indian national game still 46%, 50% of the students are not clear. As per R-15 students only 33%, 30% are having clear idea about national sports day and 57%, and 55% are not aware of national sports day. R-16 students 63%, 45% are have clear idea about a balanced diet and 37%, and 47% not clear ideas on balance diet. R-17 good nutrition is an important part of leading a healthy lifestyle. Combined, your diet can help you to reach and maintain a healthy weight, reduce your risk of chronic diseases 55%, 63% are have clear idea and the remaining 45%, and 21% not clear. R-18 urban and rural government degree colleges only 32%, 30% are not aware of Indian sports policies and schemes. R-19 the professional sport requires a professional approach, which is only natural. However, young amateurs, who have chosen this type of career, have to pay the price from the very beginning of their way in the sport. Students 72%, 69% are positive and 19%, and 19% are not. R-20 coaches need to be confident in a wide range of skills in order to be a good coach students 41%, 35% are have clear about sports coaching reaming 55%, and 55% are not.

CONCLUSION

1. This area of survey is useful to know the attitude of the students in college regarding physical education and sports and their related accepts
2. This survey may be extended to rural and urban areas that this may helpful to know the attitudes of people toward games and sports and requirements
3. Numerous researches are required in this area.

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Research Article

Role of sports psychology in physical education

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ABSTRACT

The popularity of sport psychology in physical education is the study of the mental and emotional well-being of many games in relation to their performance, mental health, and relations with sports organization and settings. The sporting world involves intense competition and pressure to be at the peak of more games. This pressure can often drive players to overwork themselves and suffer physical, mental, and emotional burnout sports psychologists work with fitness of players to help them overcome and guard against such burnout, while also assisting them with performance improvement and building a good lifestyle.

Keywords: Ground, Physical education, Sports psychology, Sports

INTRODUCTION

Compared with the field of many sports games and physical education, competitive sports have received more attention from sports phonology. A series of sports psychological intervention technology have team use of many sports games according to john Luther, "sports psychology to an area which attempts to apply psychological facts and principal to learning performance and associated human behavior in whole field sports."

Role of sports psychology is in interdisciplinary science in education methods. It involved the study of how psychological pastors affect performance and how participation in sports and exercise psychological and physical factors. Sports physiology is the study of the psychology in flowers sports, performance, exercise, and physical activity.

ROLE OF SPORTS PSYCHOLOGY

The importance of a sports psychologist is integral members of the cooking and health care teams in widely recognized sports psychologist can teeth skills to help sports player enhance their learning process and motor skills with competitive pressure, pathological training should be an integral part of sports player for their training process. There in the best accomplishment by a good abort among the coach. Sports psychologist playing major role to improving mental confidence of sports person.

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SCOPE OF SPORTS PSYCHOLOGY

Sport psychology in a relative young field, with the first-ever sports psychology laboratory set up in 1920 in Belen. It grew in population through the 1970s and 1980s and acquired a more scientific approach to understanding the relationship between psychology and sports performance. Today, the subject draws from multiple disciplines such as biomechanics, kinesiology, physiology, and psychology to assist at taken and their coaches and supporters with the strategies required for optimal sports performance. Apart from general sports psychology, there are serves especially cared that students can focus on. There includes search to his foundation of sports psychology, clinical and counseling issues, development and social issues related to sports player, and the systemic aspect of sports consulting.

IMPORTANCE OF SPORTS PSYCHOLOGY

Understanding the Behavior

Sports psychology helps in understanding the behavior of sports person engaged in competitive sports coaches also come to know the interest attitude toward physical activity and personality of sportsperson. It does not play its sole

only in understanding of behavior but it also plays its rule of medication of behavior in various sports situations.

Learning the Good Skills

Sports psychology plays its major role in the leaning of motor skills. Learning depends on the individual level of readiness, that is, psychological reaches in children are development of necessary strength flexibility and endowment as well as the developed meant of various organ systems that they may perform monitor skills required in the activity sports psychology in also helpful in the cognitive stage.

Controlling the Emotions

Sports psychology plays a very important role in controlling the emotions of sportsperson during practice as well as competitive generally, these emotions may bring sportsperson changes in the behavior of sports person. It helps in balancing the around of conditional which further improves the performance.

Enhancement of Physiological Capacities

Sports psychology plays a very unique role in enhancement of physiological capacities his such as strength, speed, and flexibility. Motivation plays a major role in the enhancement of physical capacity of sports persons it in well-known as well an established fact that psychological capacities or power can increases physiological capacities of individuals.

Role in the Emotional Problems of Sports Person

Stress, tension, and anxiety are natural during practice period and competition or tournaments. There may be some other emotional problems such as depression, fortuities, and panic. The knowledge of sports psychology may be helpful in such situations. Techniques of relaxation and sports person who are under the problems. It can be said that sports psychology plays a very metal role in enhancing the performance of sportsperson it clean with the various mental qualities such as concentration.

POSITIVE PSYCHOLOGY IN SPORTS

It is vital to address the question what promotes excellence in performance? The researcher attempts to put forward the replay in forms of pictorial presentation the cognitive eruptions affective inputs and developed that have received. Thus, positive psychology in sports has been defined as the science of happiness and strength there fire the present research lays emphasis on the fact that sports can be an integral platform for developing positive psychology construct such as mental toughness, grit, and resiliency among sportsperson that can increase their motivation levels which in essential to target goods it in vital to mention here that research endeavorers to explain sports psychology and positive psychology have much in common.

A sports psychologist teacher mental skills for an enhanced performance and at times of poor emotional well-being provides assistance as well on the other hand a positive psychologist, works in the health model with a goal of moving for whoever the starting points, beyond he viral and into the plus scale of well-being, positive psychologist has spawned a humbler of positive can streets that can be implemented in healthy population and to improve elements of their well-being form exercises focused on positive emotions to improved performance through accomplishment level of completion there, positive psychology can be called as a part and parcel of psychology.

CONCLUSION

The paper study attempts to ascertain the importance of how sports befit form being closely engaged with positive psychology future, relationship between sports, and positive psychology explored. Understanding how two distinct disciplines work in the paper forces on culmination.

Sports psychology, that more over it enhances its scope form accusing an city, stress, burnout to developing a positive sports psychology that focuses more upon midst, strengths, grit, mental thoughtless, and resilience.

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Research Article

Impact of yoga on anxiety and self-confidence of sports players

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ABSTRACT

Yoga is an ancient health art developed and perfected over the centuries by the sages and wise men of ancient India. Yoga is an art, science, philosophy, and technique which raise the capacity of human body and mind. Mental preparation for competition is an increasingly important factor in any sport competitions. Anxiety and self-confidence may cause of the low performance of any sport player. The objective of the present study is to study the impact of yoga on anxiety and self-confidence of sport players. A sample of 100 sport players was collected by random sampling method from the various colleges of Latur district. Their age ranged between 15 and 20 years. Rekha Agnihotri's Self-Confidence Inventory was selected for administration to find out the level of self-confidence and Sinha's Anxiety Scale to rate down the anxiety level of sport players. The same sample was administered pre- and post-test before and after practice. The selected asanas along with the Surya Namaskar, Pranayama, Om Chanting, and Yoga Nidra were given training under supervision for 3 months daily (Sunday off). After the yoga training was completed, post-test was conducted. The data of pre- and post-test were observed and a great difference was found out. The statistical technique mean, S.D., and "*t*" value were used to analyze the data. In the first finding, statistically significant ($t = 9.45$, $P < 0.05$) deference was proofed which showed the higher level of self-confidence after yoga practice. In the second findings, a significant ($t = 8.28$, $P < 0.05$) positive result was obtained, that is, anxiety level was decreased after yoga practice.

Keywords: Surya Namaskar, Yoga Nidra

INTRODUCTION

Yoga is considered to be one of the most important, effective, and valuable tools available for man to overcome various physical and psychological problems. According to Kuvalayananda and Vinekar (1968), yoga includes cultivation of correct attitudes and reconditioning of the neuromuscular systems. Yoga helps the whole body to enable it to withstand greater stress and strain. Yoga proposes healthy diet and encourages the natural process of elimination, whenever it is necessary. Yoga aims at an integrated and harmonious development of all the potentialities of man.

Anxiety is an emotional state of mind where an apprehension of danger or loss or suffering is a prominent feature. It generally arises as a result of apprehension of something unknown, which seems to create conflicts, tension, and disturbances in the primitive urges. Spielberger (1966) has placed anxiety into two categories, that is, state anxiety and trait anxiety. State anxiety is a situational, which develops on account of severe demanding situation and this does not last long; whereas trait anxiety has deeper roots and it refers to inherent anxiety proneness developed due to defective socialization.

Studies conducted by Vicente Pedro (1987) and Bhushan (1998) found significant reduction in the state trait anxiety of the subjects due to regular practice of yoga. In another study, Malathi *et al*. (1998) conducted a yoga intervention study on MBBS students and tested them before and after the examination and found anxiety reduction in the students at the time of examination. Srivastava *et al*. (2004) also found significant reduction in MBBS students anxiety level as a result of yoga practice.

Self-confidence is considered as one of the motivators and regulators of behavior in a individuals everyday life (Bandura, 1986). Self-confidence is a positive attitude of oneself toward one's self concept. In general terms, "self-confidence refers to an individual's perceived ability to act effectively in a situation to overcome obstacles and to get things go all right" (Basavanna

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1975). Many researchers such as Goswami (1980), Agnihotri (1987), and Kaur (1993) have observed positive relationship between self-confidence and adjustment.

Yogic therapy is very simple, cost effective, improves fitness, lowers blood pressure, promotes relaxation and self-confidence, and reduces stress and anxiety. People who practice yoga tend to have good coordination, posture, flexibility, range of motion, concentration, sleep habits, and digestion. King, Roy, and Brownstone (1999) found that meditation enhances self-confidence, sense of well-being, and empathy; improves cognitive functions as evidenced by increased alpha wave activity and its synchronization. It also increases mental concentration and reduces susceptibility to stress and strain. Thus, meditation promotes complete health and well-being in an individual.

Hypothesis

1. There will be a difference in the levels anxiety of sport players before and after the practice of yoga.
2. The level of self- confidence of sport players will be higher after the practice of yoga.

METHODOLOGY

Sample

A sample of 100 sport players was collected by random sampling method from the various colleges of Latur district. Their age ranged between 15 and 20 years. All sport players were from social middle class.

Tools

Agnihotri's Self Confidence Inventory (ASCI)

This is developed by Rekha Agnihotri (1987). This consists of 50 items with two response alternatives, namely, "Yes" or "No." Abbreviated name ASCI has been used so that the respondent may not decipher the real purpose of the test and fake good. For each item, a score of one is assigned for a response indicative of lack self-confidence. Hence, lower the score, higher would be the level self-confidence and vice versa.

Sinha's Comprehensive Anxiety Test (SCAT) by Sinha and Sinha: It is a test available both in Hindi and in English. It covers five levels of anxiety. The test contains 90 items of manifest anxiety. It is 15–20 min test, easily administrable and scorable. For each item, a score of 1 is assigned for "Yes" response. Higher scores obtained in the test indicate greater anxiety levels.

Procedure

The same sample was administered pre- and post-test before and after practice. The selected asanas along with the Surya Namaskar, Pranayama, Om Chanting, and Yoga Nidra were given training under supervision for 3 months daily (Sunday off). After the yoga training was completed, post-test was conducted.

Table 1: Mean difference between pre-test and post-test of anxiety (n=100)

Variable	Mean diff.	SD diff.	"t" value
Anxiety	12.05	1.45	8.28
Self-confidence	9.45	0.96	9.45

**$P < 0.05$

RESULTS AND DISCUSSION

The perusal of Table 1 reveals that the mean difference between before and after practice of yoga on anxiety "t" value 8.28 is highly significant at $P < 0.05$ level. This clearly shows that yoga practice leads to a significant alleviation of anxiety level of the sport players. The results are in agreement with those reported in Shashi, Chawla, Dhar, and Katiyar (1991), Gupta and Gupta (2006), Gupta, Khera, Vempati, Sharma, and Bijalani (2006), and Jadhav and Havalappanavar (2007) who also reported decrease in state anxiety level significant at $P < 0.001$ level as result of yoga practice. Kaliappan and Shanmugam (1982) and Venkatesh *et al*. (1994) found significant reduction in state anxiety level at $P < 0.05$ level. From Table 1, it is also evident that there is a significant difference in self-confidence level of sport players before and after the practice of yoga. The mean difference 9.45, SD= 0.96, and "t" value 9.45 are highly significant at $P < 0.05$ level. This shows that yoga practice is useful in increasing the self confidence level of the sport players. Therefore, the first and second hypotheses are accepted.

CONCLUSION

It is well-known fact that success requires a great deal of patience and hard work. To achieve victory in a sport player is required to practice and train every day. As such, they need to have well enough self-confidence and less anxiety. The analyzed and interpreted findings of the study have led to the following conclusions.

This study examined the impact of yoga on anxiety and self-confidence of sport player. This study reveals that yoga practice decreases level of anxiety and increases level of confidence in sport players. It should be concluded that yoga is effective in physical education to improve the performance of sport player.

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Research Article

Analysis of knee injuries in badminton: A study

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ABSTRACT

Performance of player in the game is directly related with physical fitness of concerned player. Mere rehabilitation of injured player is not sufficient to improve the performance; it also needs good awareness, management, and training of players. Knee injuries directly affect the performance of badminton players. The present study attempts to analyze, discuss the major causes and types of knee injuries of 50 university badminton players of S.R.T.M. University region. Out of 50 incidences of knee injuries, about 60% knee injuries occurred due to jump and smash and round the head toss, followed by imperfect knowledge of skills (16%), lack of proper surface (8%), lack of proper shoes (6%), lifting (6%), and dribble (4%). MCL and LCL knee injuries are highest (70%) among badminton players. To improve the physical fitness and performance of the badminton player, investigator recommended:

01. Proper training of player under trained coaches.
02. Awareness creation about major causes and types of knee injuries
03. Development of wooden and synthetic courts with proper required infrastructure.
04. Encouragement to players for punctual exercise.

Keywords: MCL, LCL, Knee Injuries, Physical Fitness

INTRODUCTION

Badminton is a versatile game. It needs physical fitness in great extent. Badminton is vigorous and speedy movement event. Badminton is a highly exhaustive game in which the explosive movements are required to play better competitive badminton. Although the technical and tactical factors are also very important, without having the adequate or the optimum level of physical fitness, one cannot utilize his technical and tactical efficiency. The game requires enormous amount of agility and speed endurance along with reflex action and accuracy.

The previous study in badminton states that the injuries in badminton adversely affected on the performance of badminton player. Most of injured badminton players leave the practice or due to injuries they are forced forest within the competition. It affects the performance of players.

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Badminton courts are both of wooden and synthetic which has vigorous frictions that cause knee injuries. Most of the knee injuries occur in badminton competition and at the time of practice/physical training. Knee injuries adversely affect the performance of badminton players. Therefore, analysis of knee injuries in particular game enables the players and coaches to undertake remedial measures and precautions.

Within the off-season period due to overload training, the prime and assistant muscles developed strongly. However, at the same time due to concentration on development of fast movement and momentum, unfortunately, the muscles which resist the movement and momentum are less concentrated and neglected by trainer and trainee. It positively widens the possibility of injuries.

Knee injuries and their rehabilitation and management have greater challenge before players and coaches. Knee injuries joint is the most complicated joint in the human body with maximum number of ligaments and allied connected tissues to prevent various, valgus, varus hyperextension, and rotator movements. The knee injuries constitute major share in the

total number of lower limb trauma seen in physically active sportsmen.

The present study attempts to analyze causes, classification, and management of knee injuries in Badminton.

METHODOLOGY

Fifty knee injured university badminton players of S.R.T.M. University region were selected. The incidence and causes of knee injuries were noted. The medical reports of injured players such as X-ray, EMIR, and laparoscope are considered for the study. Most of the data were collected through the oral information given by injured players and documents of medical treatments. Wherever necessary, mathematical treatments have been given to collect data, so for, the area selected for the study was Latur district.

Analysis and Findings

The cause-wise classification of knee injuries in badminton is shown in Table 1 and graphically represented in Figure 1 and types of knee injuries in badminton are shown in Table 2 and graphically illustrated in Figure 2. Out 50 incidences of knee injuries, about 30% knee injuries occurred due to jump smash and round the head toss skills followed by imperfect knowledge of various skills (16%), lack of proper surface (8%), lifting and lack of proper shoes (6%), and dribble (4%) of total knee injuries in badminton.

Following graph shows distribution of causes behind 50 knee injured badminton players, Figure 2.

- MCL injuries are higher (36%) in badminton players, followed by LCL (34%), miscellaneous (14%), CFF (12%), and F.P. (4%)

Causes of Injuries

Types of Injuries

MCL – Medial collateral ligament, LCL – Lateral collateral ligament. F.P. – Fracture of patella, CFF – condylar fracture of femur. MISL – Injuries to the menisci of the knee, patella femoral syndrome (PFS), etc.

Knee injury Rehabilitation and Management

The science of rehabilitation of knee injured badminton players is different from sedentary person, since their training program is main focus and a matter of concern by the player, coaches, and physician. Extensive rehabilitation program is needed for quick recovery and return the sports field. MCL and LCL injuries are highest among knee injured badminton players, in Latur district. Immediate treatment is to apply "hydro therapy," that is, ice with compressive wrap for 20 min and repeated every 3–4 h for the first 24–48 h. It also requires restricting the movement of knee. If the player is not fit to play, he should immediately be admitted in the hospital for further treatment.

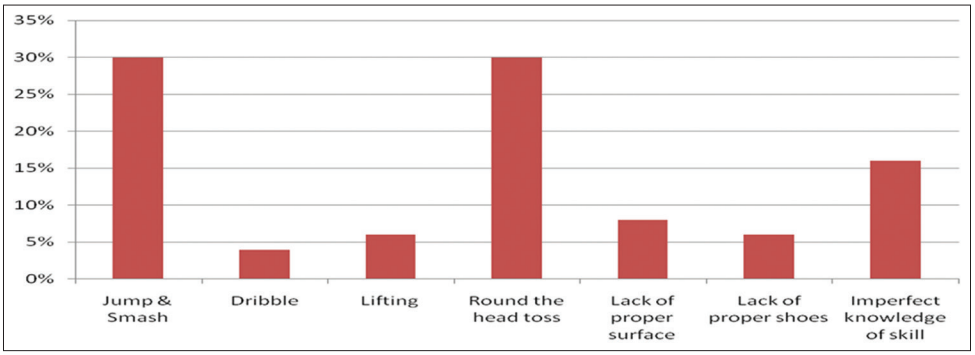

Figure 1: Percentage of injuries of badminton players and causes

Table 1: Cause-wise classification of knee injuries in badminton

	Jump and smash	Dribble	Lifting	Round the head toss	Lack of proper surface	Lack of proper shoes	Imperfect knowledge of skill	Total
No. of incidence	15	02	03	15	04	03	08	50
% to total injuries	30	4	6	30	8	6	16	100

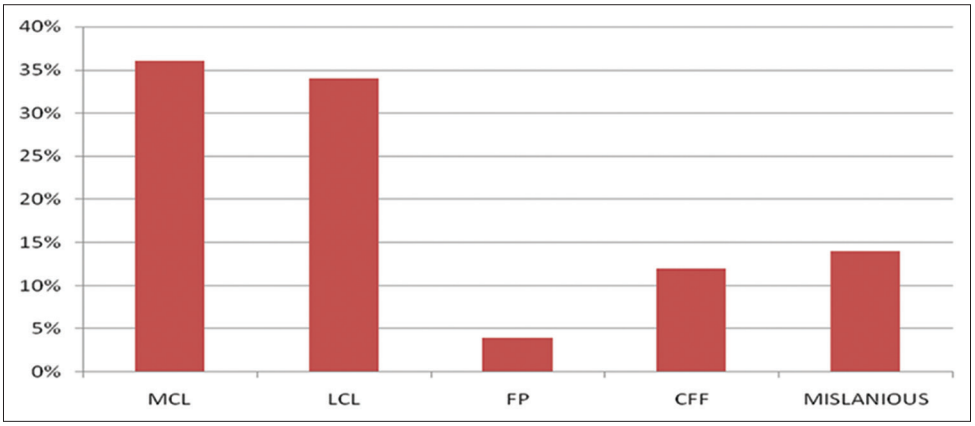

Figure 2: Percentage of injuries of university badminton players with respect to their nature

Table 2: Types of knee injuries in badminton

	MCL	LCL	FP	CFF	Mislanious	Total
Nature of knee injuries	18	17	02	06	07	50
% to total injuries	36%	34%	4%	12%	14%	100%

CONCLUSION AND RECOMMENDATION

- Give them proper training under trained coaches.
- Create knowledge of knee injuries, causes, and types in Badminton.
- Provide them well-developed badminton court with all infrastructures.
- Encourage them for punctual exercise.
- Proper exercise, lead up exercise should be scientific based.
- Follow through of concerned skill should be imported in training.
- Proper shoes with proper grip should be used within practice as well as within competition.

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Research Article

Applying 3D technology to make videos about basic techniques to teach table tennis to students majoring in physical education at Thai Nguyen University of education

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ABSTRACT

Based on a study of the program content and the status of teaching basic table tennis techniques for students of Physical Education Department at Thai Nguyen University of Education, this paper reports on the work conducted to record standard techniques using 3D technology. This serves as a means to support the teaching and learning of table tennis for students majoring in physical education.

Keywords: 3D technology, Basic techniques, Students, Table tennis, Teaching, Video Recording

RATIONALE

At present, application of advanced technologies in university teaching is increasingly popular. It makes the teaching content more specific and lively, excites learners enabling them to gain in-depth knowledge, there by promoting lesson effectiveness. The University of Education – Thai Nguyen University has made many scientific advances in teaching. Research has been done to apply video recordings for teaching technical subjects with Pixel technology. However, this is 2D technology, which only allows images to be projected onto a plane. Therefore, there are still many limitations in technical analysis. Sports are always making progress, which requires scientific exploration of the movement of the human body so that athletes can set new records. The study of teaching methods has become increasingly meaningful in perfecting movement techniques and motor behaviors. Therefore, making video tapes based on 3D technology as a means of supporting the process of teaching and learning basic table tennis techniques for students of the Physical Education Department, Thai Nguyen University of Education is very essential.

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RESEARCH METHOD

The research gained background information by reading and analyzing documents, interviewing experts, pedagogical observations, and mathematical statistics. Recording and processing data were done using software that supports video image editing.

RESEARCH RESULTS

1. Assessing the status of using the supporting means and methods in teaching and learning basic table tennis techniques of students majoring in physical education at Thai Nguyen University of Education.

The current status of the use of methods and aids for teaching and practicing basic table tennis techniques at Thai Nguyen University of Education are at three levels: Regular, occasional, and unused. These results are presented in Tables 1 and 2.

These tables show that:

- The methods often used in teaching and learning (over 50%) include analytical and explanatory methods, a practice with strict norms (100%), and a visual method (50%)

- Facilities to support the teaching these techniques are rarely used and not diverse. Only natural and indirect performance tools, including modeling and simulations, are frequently used. Media, pictures and videos are not often used.

To learn about the application of supporting means in learning basic table tennis techniques of students, the researchers interviewed students majoring in physical education at the University of Education – University Thai Nguyen who were enrolled in this class. The use of methods and supporting means to improve the quality of learning and practice is expressed in three levels: Regular, occasional, and unused. These results are presented in Table 3.

The results from Table 3 show that:
- The students mostly learn by consulting with friends, teachers, and practice by themselves during extracurricular hours.
- They rarely, if ever, consult specialized books, view photos, drawings, or learn techniques through the internet.

2. Developing video recordings of offensive and defensive techniques in table tennis for students majoring in physical education at Thai Nguyen University of Education.

I. Determine the purpose of building video discs about basic table tennis techniques for teaching and learning by students at the University of Education – Thai Nguyen University.

A. The video discs must meet the following requirements:
- They must contain a sufficient amount of information.
- They use simple and understandable language.
- They must be interesting to learners.

II. Developing a set of video discs about basic table tennis techniques.

From the above research results, the researchers proceeded to develop visual teaching materials using 3D technology to analyze basic table tennis techniques. The work was done in two stages:

Stage 1: Analyze basic table tennis techniques in accordance with the school curriculum requirements.

Stage 2: Develop ascript, organize training, record, and process images to analyze basic table tennis techniques using specialized 3D technology. These technologies included Power Director 10, Corel Video Studio Pro x4, Photoshop cs5, and CorelDraw X3.

Table 1: Current situation of using methods in teaching and learning basic table tennis techniques (*n*=24)

No.	Methods results	Level of usage					
		Regular		Occasional		Unused	
		n	%	*n*	%	*n*	%
1	Method of explanation - Illustration	24	100	0	0	0	0
2	Method of suggestion - discussion	4	16.67	14	58.33	6	25
3	Visual method	12	50	8	33.33	4	16.67
4	Practice	24	100	0	0	0	0
5	Setting and solving problems	4	16.67	6	25	14	58.33
6	Positive teaching method	2	8.33	6	25	16	66.67

Table 2: Current situation of applying supporting devices in teaching and practicing basic table tennis techniques (*n*=24)

No.	Methods Results	Level of usage					
		Regular		Occasional		Unused	
		n	%	*n*	%	*n*	%
1	Natural and indirect performance (including modeling and simulation)	24	100	0	0	0	0
2	Using visual aids (pictures, and photos)	4	16.67	18	75	2	8.33
3	Using the models	0	0	0	0	24	100
4	Using videos	6	25	15	62.5	23	12.5
5	Sense of choice	2	8.33	2	8.33	20	83.33
6	Orientation method (Amplitude and trajectory direction)	7	29.17	7	29.17	10	41.66
7	Sensory method	0	0	3	12.5	21	87.5
8	Immediate information	0	0	4	16.67	20	83.33

Table 3: The situation of using the supporting facilities for learning table tennis by students majoring in physical education at the University of Education – Thai Nguyen University (*n*=135)

No.	Methods results	Level of usage					
		Regular		Occasional		Unused	
		n	%	*n*	%	*n*	%
1	Reading and referring to specialized books	25	18.52	47	34.81	63	46.67
2	Self-practice in extra-curricular hours	40	29.63	74	54.81	21	15.56
3	Learning with friends	77	57.04	47	34.81	11	8.15
4	Learning and consulting with teachers	52	38.52	62	45.93	21	15.56
5	Using visual aids: Pictures, pictures, diagrams, etc.	16	11.85	21	15.56	98	72.59
6	Using photo discs and video clips	5	3.7	13	9.63	117	86.67
7	Learning techniques on the internet	24	17.78	38	28.15	73	54.07
8	Other means of support	20	14.81	33	24.44	82	60.74

Table 4: Interview results on disc quality and basic table tennis techniques for students majoring in physical education at the University of Education – Thai Nguyen University (*n*=125)

No.	Methods Results	Level of usage					
		Regular		Occasional		Unused	
		n	%	*n*	%	*n*	%
I	**About technical quality**						
1	The sound quality of the videos	105	84	20	16	0	0
2	Brightness of the image	98	78.4	27	21.6	0	0
3	Definition of the image	112	89.6	13	10.4	0	0
4	Processing at fast and slow speeds	115	92	10	8	0	0
5	Ability to process images	120	96	5	4	0	0
II	**About the quality of the video content**						
6	Performing proper movement techniques	125	100	0	0	0	0
7	Ability to observe clearly at technical angles	124	99.2	1	0.8	0	0
8	Analysis of the technical structure of movements	125	100	0	0	0	0
9	The level of vividness and abundance of images	125	100	0	0	0	0
10	Appropriateness level to the academic program	125	100	0	0	0	0
III	**The effect of the technical disc**						
11	Increase interest for learners	125	100	0	0	0	0
12	Improve the ability to acquire techniques	125	100	0	0	0	0
13	Improve pedagogical capacity for learners	125	100	0	0	0	0
14	Improve the ability of self-study for learners	125	100	0	0	0	0
15	Help viewers better understand the technique	125	100	0	0	0	0
16	Help viewers better remember technical details	125	100	0	0	0	0
17	Help learners overcome the mistakes they often make while learning	125	100	0	0	0	0
18	Help learners consolidate and perfect their techniques	125	100	0	0	0	0

III. Filming and image processing of basic table tennis techniques.

This consisted of three steps:

B. Stage 1: Preparation

- Tools: A table tennis table, net, table tennis ball, table tennis paddle, and four cameras.
- Implementation: Two people
- Control of technical implementation: Two students, with good table tennis technique, careful warm-up before implementation, underfull lighting, and quiet conditions.

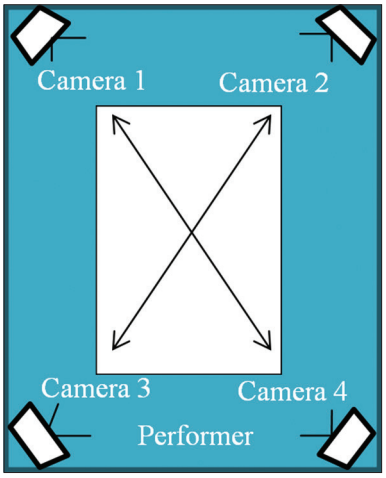

Diagram 1: Camera installation quay

C. Stage 2: Recording:

The researchers filmed each technique. This was done by polishing back and forth on the table diagonally. Requirements for the performers: The two students had to polish correctly, with equally force, and have the correct technical structure. Each technique was performed for 3–5 min, with full rest. The researchers set the camerasat four angles and the distance between the person and the camera was sufficient to include the entire body in the picture. The camera angles areas are shown in Diagram 1.

- Camera 1 – the axis was directly behind the performers.
- Camera 2 – the axis was directly behind the performers.
- Camera 3 – the axis was put from the left to the right of performers.
- Camera 4 – the axis was from the right to the left of performers.

Stage 3: Processing images of table tennis techniques in attack and defense.

After recording videos of basic table tennis techniques, the researchers processed images using the specialized 3D technology Power Director 10, Corel Video Studio Pro x4, Photoshop cs5, and CorelDraw X3.

IV. The structure of each basic table tennis technique is built as follows:

Three parts were required:

- Modeling movements.
- Analyzing techniques in three stages.
- Implementing the whole techniques at four different angles and processing speeds to show slower execution, 30–50%.
- Common mistakes and ways to overcome them in practice.

Assessing the Quality of 3D Disc Images

After completing the video disc of basic table tennis techniques, the researchers asked the Department of Physical Education to show it to all students majoring in physical education and especially those who were studying table tennis so that they could see and rate them. After the screening, the researchers conducted interviews with these students to ask them about the quality of the video discs. The results are presented in Table 4.

Table 4 shows that the disc images were of good in quality with suitable content for the physical education curriculum of students at the University of Education – Thai Nguyen University (over 90% of feedback was good). Most students found the videos very useful for basic table tennis training. The discs used the advantages of advanced technology in an innovative way.

CONCLUSION

1. Through the study, a video disc showing offensive and four basic defensive table tennis techniques was developed for physical education students at the University of Education – Thai Nguyen University. This was done in three stages of implementation followed by processing the images using 3D technology.
2. The video disc content and quality are suitable for physical education students at the University of Education – Thai Nguyen University.

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Research Article

An analytical study of injuries among Kho-Kho players and Kabbadi players of Hyderabad

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ABSTRACT

Engaging in sport and games has numerous health benefits but also carries the risk of injury. Kabbadi and Kho-Kho are indigenous sports of India. These sports are popular in India, both at competitive and recreational levels. The sample for the study consists of 50 male players, that is, 25 Kabbadi players and 25 Kho-Kho players in the age group of 18–20 years. The data are collected through questionnaire. It is concluded in Kabbadi that upper extremities injuries are 15%, lower extremities injuries are 50%, head injuries are 15%, neck injuries 10%, and vertebral column 10%. It is concluded in Kho-Kho players that lower extremities injuries are 60%, upper extremities 20%, head injuries are 5%, neck injuries 5%, and vertebral column 10%. The Kabbadi game is more prone dangerous injuries compare to Kho-Kho players. It is concluded that Kabbadi and Kho-Kho players must give good conditioning and prevention to avoid the injuries. This type of study is useful to coaches to give proper coaching for the development of motor qualities for prevention of injuries among players. Key words: Injuries, lower extremities, upper extremities, Vertebral column, etc.

INTRODUCTION

Engaging in sports activities has numerous health benefits but also carries the risk of injury. At every age, sportspersons sustain a wide variety of soft tissue, bone, ligament, tendon, and nerve injuries caused by direct trauma or repetitive stress. Different sports are associated with different patterns and types of injuries, whereas age, gender, and type of activity influence the prevalence of injuries. Sports trauma commonly affects joints of the extremities, that is, knee, ankle, hip, shoulder, elbow, wrist, and spine. The sports injuries that occur in competition or practice have loss of time for participation in sport.

According to the TRIPP model (Finch, 2006), the first step in injury research is to understand the extend of the problem. The prevalence and prevalence proportion of sport injuries have been widely investigated across sports. Unfortunately, such studies have only included groups selected by either one or more criteria, such as specific sport (Jacobsson et al., 2012), level (Hall et al., 2013), age (Scase et al., 2012), or injury type (Maselli et al., 2015).

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PURPOSE OF RESEARCH

This study was designed to assess the prevalence, distribution, and patterns of injury among Kabbadi and Kho-Kho players and compare the prevalence of injuries.

POPULATION AND SAMPLE GROUP

The sample for the study consists of 50 male players, that is, 25 Kabbadi players and 25 Kho-Kho players in the age group of 18–20 years. The data are collected through questionnaire.

RESEARCH INSTRUMENTS

Questionnaire forms were used to collect the data and were distributed to participants who regularly practice Kabbadi and Kho-Kho in Hyderabad.

1. The form included items on age, gender, length of practice, and injury diagnosis. On the questionnaire, the length of practice was categorized as follows: (1) <1 year since the beginning, (2) 1 through 3 years, and (3) more than 3 years

Table 1: Percentage of injuries among Kabbadi players

Lower extremities injuries	Upper extremities	Head	Neck	Vertebral column
50	15	15	10	10

Table 2: Percentage of injuries among Kho-Kho players

Lower extremities injuries	Upper extremities	Head	Neck	Vertebral column
60	20	05	05	10

2. Lower extremities
3. Upper extremities
4. Head
5. Neck
6. Spine

RESULTS

It is concluded in Kabbadi that upper extremities injuries are 15%, lower extremities injuries are 50%, head injuries are 15%, neck injuries 10%, and vertebral column 10%. It is concluded in Kho-Kho players that lower extremities injuries are 60%, upper extremities 20%, head injuries are 5%, neck injuries 5%, and vertebral column 10%. The Kabbadi game is more prone dangerous injuries compare to Kho-Kho players.

RESEARCH RECOMMENDATIONS

Sufficient warm-up, proper technique, correct biomechanics, proper conditioning, optimizing balance, coordination, optimizing reaction times, optimal diet, adequate rest, and positive attitude will reduce the risk of injuries. Increase your flexibility by performing dynamic warm up before practice and competition followed by static stretching post-activity. Consult a coach or physical trainer to incorporate the conditioning programs during the practice.

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Research Article

Aggressive behavior between male and female inter-collegiate kabaddi players of Raichur

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ABSTRACT

The purpose of this present study was to compare the divergence of sports aggression between male and female inter-collegiate kabaddi players of Raichur. Sixty kabaddi players (male = 30 and female = 30) who have participated in the inter-collegiate kabaddi tournament held at L.V.D. College, Raichur under the Gulbarga University, Kalaburagi (Karnataka) were randomly selected as the subjects. The age of the subjects ranged from 18 to 25 years. To find out their level of sports aggression, the Sports Aggression Inventory developed by Shrivastava and Shukla (1988) was administered on the subjects. *t*-test was used to analyze the data. Results of the study revealed an insignificant difference between male and female inter-collegiate kabaddi players of Raichur with stare to sports aggression.

INTRODUCTION

Sport competition without "aggression" is a body without soul; competition and aggression are twins. There is clear evidence that, in general, aggression is more boisterous games, may help performance because it arouses players overly to put in the harder effort, and "do or die" for the success of the team. Contrarily, there is also an indication, and valid too, that aggression committed by players in certain contexts situation or position may impel the performance of an individual's skill as well as the success of the team.

Aggression is defined as the infliction of an aversive stimulus, either physical verbal on gestural, on one person by another. Aggression is not an attitude but behavior, and most critically, it is reflected in acts committed with the intent to physical harm. This definition of aggression includes such wide-ranging acts engaged in by athlete's coaches and or spectators-as physically hitting another individual and verbal abuse.

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METHODS

Participants

For the purpose of this study, 60kabaddi players (male = 30 and female = 300) who participated in the inter-college kabaddi (Men and Women) tournament, 2018–2019, were considered as subjects. Their age ranged from 18 to 25 years.

Tool

For guaging the sports aggression level of the subjects, a questionnaire Sports Aggression Inventory developed by Srivastava and Shukla (1988) was used. It is a trendy tool being used by the sport psychologists for measuring sports aggression. It consisted of 25 statements, and each statement possesses two alternatives (Yes/No), out of which 13 items are positively keyed, and the rest of 12 items are negatively keyed. For each correct answer, 1 point was assigned. The test-retest reliability of the questionnaire for male and female were .87 and .90, respectively.

Procedure

The questionnaires were administered on the subjects during inter-college Kabaddi (Men and Women) tournament held at L.V.D. College, Raichur under the Gulbarga University, Kalaburagi (Karnataka) in the academic year 2018–2019.

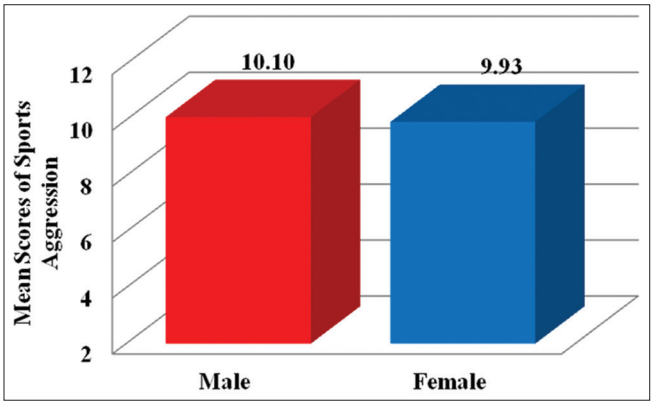

Figure 1: Difference of sports aggression between male and female inter-collegiate kabaddi players of Manipur

Table 1: Difference between male and female inter-collegiate kabaddi players of Raichur on sports aggression

Sports aggression				
Experimental groups	**Number of subjects**	**Mean**	**Standard deviation**	**Calculated *t*-value**
Male	30	10.10	2.17	0.31
Female	30	9.93	1.96	

Tabled value of "*t*" at 0.05 level of significance with 58 df = 2.00

Before the administration of the questionnaire, the investigator approached the subjects through their coaches and managers at the personal level requesting them to extend their persistent cooperation in the data collection.

Data Analysis

Mean, SD, and t-ratio were computed using Statistical Package for the Social Science (SPSS) version 16.0 to examine the significant difference between two experimental groups on the psychological parameter of sports aggression considered for the study. The results have been presented in the following Table 1.

RESULTS

It may be seen from the above table that an insignificant difference was found between male and female inter-collegiate kabaddi players of Raichur on sports aggression as the obtained value of calculated "*t*" has been reported 0.31 which is considerably lesser than the tabled value of "*t*" (2.00) at 0.05 level of significance with 58 degrees of freedom.

CONCLUSION

From the results of the study, it has been evident that the insignificant difference existed between male and female inter-collegiate kabaddi players of Raichur in regard to their level of sports aggression.

On the basis of the results obtained from the present investigation, it may be concluded that inter-collegiate male and female kabaddi players of Manipur did not significantly differ on their level of aggression. The findings also suggest that the level of aggression of these kabaddi players (male and female) was average which is effectively mandatory to be assertive in combative sports in entire and kabaddi in particular.

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Research Article

Comparison of aggression behavior between sportsmen and non-sportsmen

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ABSTRACT

The purpose of this study was to find out the comparison of aggressive behavior between sportsmen and non-sportsmen of Raichur District. The sample of the present study was conducted on 60 male subjects (30 sportsmen and 30 non-sportsmen) of Raichur district in Karnataka. The age ranged between 20 and 25 years. For the data, the aggression level was collected. An aggression test was administered to the study.

INTRODUCTION

The reliance aggression in sports has been traditionally centered round the usefulness of sports in providing an outfit for aggression and controlling violence in the society. Adjustment attempts to satisfy needs by over-coming both inner and outer abstracts and by adopting circumstances. Learning about adjustment means analyzing two things interval make-up and internal personal or social behavior. Adjustment is a dynamic process by which organizes mart their needs. Physical education and related activities satisfy many of these needs. The aggressive constructs are a complex one that there are individual differences in the invite, potential to aggress and that the aggression can also be learned or stimulated by specific situations. When aggressive energies are expressed within the rules of a sport and channeled into skill by a mature athlete, then one may witness a peaceful and inspiring performance. Aggression for aggression's sake should not be sanctioned.

It is self-defeating and debilitating to others. The outstanding athlete's enters competition with control and not with impose. The aggressive athlete will be more active, eager, strong, highly motivated, and likely to seek to vanquish any opponent. Athlete is, who is highly motivated by emotional aggression that should not be confused with the athlete who has the primary motivation but who aggression because he or she is placed in an athletic situation that demands it. Football, hockey, and boxing would be expected to attract more aggressively motivated individuals than curbing, golf, and badminton: Latter sports require their own form of aggression. Even non-physical sports have been described as fiercely aggressive.

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STATEMENT OF THE PROBLEM

A comparison of aggression behavior between of sportsmen and non-sportsmen.

Objective of the Study

The main objective of the study and sub-objective which are listed below:

- To compare the aggression behavior of psychological parameters between sportsmen and non-sportsmen of Raichur district.

METHODOLOGY

In this study, 60 male students (30 sportsmen) and 30 (non-sportsmen) male players were selected from Raichur District.

Selection of Variables

The variables selected for this study were as follows:

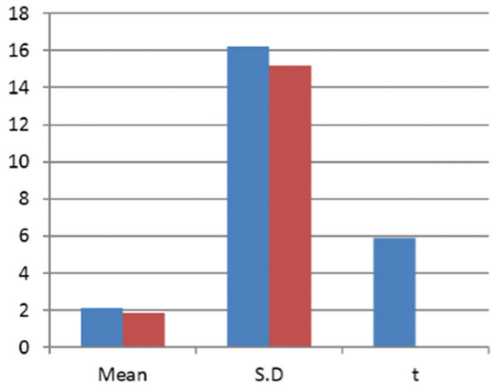
- Aggression behavior

ANALYSIS AND DISCUSSION

Table comparison of aggressive behavior of sportsmen and non-sportsmen.

Variable	Sportsmen		Non-sportsmen		SEd	*t*-ratio	Level of significant
Aggression behavior	Mean	SD	Mean	SD			
	2.06	16.43	1.83	16.54	4.45	5.05	Significant

It is evident from the table that the mean score of sportsmen having aggression was 2.06 and 1.83, respectively. The S.D of sportsmen was 16.43 and 16.54, respectively, and "*t*" value was 5.05, which was significant at 0.05 level that the score was in favor of non-sportsmen.



CONCLUSION

- A significant difference was found between the mean score of sportsmen and non-sportsmen on aggression behavior
- Non-sportsmen was significantly more aggressive than the sportsmen.

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Research Article

Motor fitness in relation to Kho-Kho players

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INTRODUCTION

The kho-kho game is being played for so many years. However, nobody has been found the benefits of playing this game on the physical, physiological, social, and mental aspect of the player. Hence, research has decided to find out the relation of playing ability with the health and motor fitness of kho-kho players. This study will enlighten the fitness of the kho-kho players and their performance in all these tests.

METHODOLOGY

Statement of the Problem

The study of the relation of kho-kho playing ability with motor fitness has done in the present research.

Objectives of the Study

The objectives of this study were as follows:

- To find out the relationship of motor fitness with the playing ability of kho-kho players
- To study the relation of kho-kho playing ability with motor-related fitness.

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Hypothesis

- It is hypothesis that there may not be a significant relation between motor fitness with playing ability of kho-kho players
- There may not be a significant relationship between kho-kho playing ability and motor-related fitness.

RESULTS

- Relationship between playing ability of 100 m. Speed, there is a negative correlation between playing ability and speed
- Relationship between playing ability of cardiovascular endurance. There is a negative correlation between playing ability and cardiovascular endurance
- Relationship between playing ability of balance. There is a positive relation between playing ability and balance
- Relationship between playing ability to stand broad jump. This indicates that there is a positive correlation between playing ability and standing broad jump
- Relationship between playing ability sit-ups. This indicates that there is a positive correlation between playing ability and sit-ups
- Relationship between playing ability and pull-ups. There is a positive correlation between playing ability and pull-ups
- Relationship between playing ability and shuttle run. There is a positive correlation between playing ability and shuttle run

Table 1: Relationship between playing skills cardiovascular endurance, speed, standing broad jump, pull-ups, shuttle run, and balance

	Playing ability	CVE	Speed	SBJ	Pull-ups	Shuttle run	Balance
Playing ability	1.000						
CVE	−5.65	1.000					
Speed	−6.20	044	1.000				
SBJ	4.22	540	390	1.000			
Pull-ups	3.85	−550	290	600	1.000		
Shuttle run	4.60	−538	360	585	500	1.000	
Balance	5.10	−438	390	330	330	390	1.000

**Significant at 0.01 level

- Relationship between playing ability and 600 m run. There is a negative correlation playing ability and 600 m run.

CONCLUSIONS

- Playing ability has a close relation in the kho-kho players
- The players of kho-kho game have a close relationship in all the motor fitness test.

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Review Article

Influence of aerobic exercises on cognitive abilities among children

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ABSTRACT

Physical education is the planned; progressive learning that takes place in school curriculum timetabled time and which is delivered to all children. Exercise is the key to sound health. The activity of exerting as muscles in various ways to keep fit. Aerobic exercise is important for children. It helps keep their heart, lungs, and blood vessels healthy. It can also help them keep or get to a healthy weight. Children who exercise tend to have better heart and lung fitness, lower levels of body fat, stronger bones and muscles, fewer symptoms of depression, and better chances of being healthy adults without chronic disease. In this article, the researcher explores the importance of aerobic exercises on developing cognitive abilities among children. Aerobic exercise at a moderate to vigorous intensity appears to promote children's effortful and goal-directed cognition and behavior.

Keywords: Aerobic exercises, Cognitive abilities, Intelligence, Memory, Physical education

INTRODUCTION

Physical activity is a broad term referring to all bodily movement that uses energy. It includes all forms of physical education and sports. It includes indoor and outdoor play and adventurous activities, cycling, jogging, and routine activities such as using the stairs, doing housework, and gardening. Physical education is the planned; progressive learning that takes place in school curriculum timetabled time and which is delivered to all children. This involves both becoming more physically competent and learning through movement. The context for the learning is physical activity, with children experiencing a broad range of activities, including aerobic exercises. Aerobic exercises determine positive biological and psychological effects that affect the brain and the cognitive functioning and promote a condition of well-being.

AEROBIC EXERCISES

Exercise is the key to sound health. The activity of exerting as muscles in various ways to keep fit. Exercise provides adequate quantity of oxygen and enables different organs of human body to function properly. There are two major types of exercises namely aerobic and anaerobic.

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The literal meaning of aerobics is oxygen. Hence, aerobic exercise can be defined as the one which involves the use of oxygen to produce energy. Aerobic activities are rhythmical exercise having large muscle groups' involvement continuously in sequential manner. Physical activities such as jogging, brisk walking, rowing, cycling, hiking or playing tennis, focus on increasing cardiovascular endurance, and swimming are aerobic exercises. Anaerobic exercises make the body to provide energy without using oxygen. High intensity workout such as jumping, weight lifting, sprinting, and short-term muscles strength exercises is categorized as anaerobic exercises.

Aerobic exercises involves moderate intensity workout. Aerobic activities performed for longer duration and involve only simple exercise and activities need more endurance. Activities performed for more than 2 min to an hour. Oxygen is used to breakdown glucose. It concentrates on strengthening and the muscles involved in respiration. It improves the circulation of blood and transportation of oxygen in the body, reduces blood pressure, and burns fat. Energy is provided by carbohydrates and fats.

Cardiovascular system is made up of our heart and blood vessels, for example, arteries, veins, and capillaries that transport blood throughout the body. Aerobic refers to how our body uses oxygen to sufficiently meet energy demands during exercise. Aerobic exercise is a moderate intensity workout that extends over a certain period of time and uses oxygen in this process. Well, in these years, the practice of aerobics has become the most happening workout trend between the youth. Not only is performing aerobic exercise interesting but also is very beneficial for health. There are diverse types of aerobics such as fitness, water aerobics, step aerobics, swimming, fitness walking, inline skating, and bicycling.

Benefits of Aerobic Exercises

The important benefits of aerobic exercises are

- It helps to control the weight and the heart operates more efficient and becomes stronger
- Augments the body's efficiency to take in oxygen and makes breathe faster and decrease the risk in developing diabetes and obesity
- It helps to reduce and regulate the body fat and increases the body muscle strength and elasticity
- Recovers mood and decreases the depression, stress, and anxiety and increases the quality of sleep that refreshes early next morning
- Helps to control blood pressure
- Sculptures muscles of the body and makes body more flexible
- Keeps our levels of body mass stable burning fat because their combined exercises.

COGNITIVE ABILITIES

Mental growth and development refer to a process responsible for the development refers to a process responsible for the development of an individual in all cognitive, mental, or intellectual abilities (interrelated to each other) such as sensation, perception, imagination, memory, reasoning, understanding, generalization, interpretation, language ability, conceptional ability, problem-solving ability, and decision-making ability.

Cognitive abilities refer to all essential mental skills that control the behavioral lifestyle of humans such as everyday routine work. Many evidences demonstrated that physical exercise affects brain plasticity, influencing cognition, and well-being (Fernandes *et al*., 2017). It has been showed that moderate intensity exercise is related to increased performance in working memory and cognitive flexibility, whereas high-intensity exercise improves the speed of information processing (Chang and Etnier, 2009).

All these aspects of mental growth and development change, growth, and mature with the increase in the age of the child due to maturation and learning. In fact maturation and learning are responsible for controlling the process of mental growth and development. Maturation helps in achieving physical growth and development specifically in terms of the organic growth of the nervous system which, in turn, helps in one's mental development.

Learning in the form of experiences and education helps the mental developmental process to reach to its optimum level. There is neither a universal pattern of mental growth for all individuals nor is the pattern same for all mental abilities. However, it can be seen that there is a cessation of mental growth in all individuals with respect to one or the other mental abilities. Latest researchers have concluded that the age of cessation of mental growth can be estimated as 20 or little before or little after 20. However, with such cessation of mental growth, development in mental power and capacity is not necessarily stopped.

INTELLIGENCE

Intelligence may be considered as a sort of mental energy, an aggregate or global mental capacity of an individual for helping him in coping with his environment in terms of adaptation and dealing with novel situations as effectively as possible. Measurement of intelligence is not possible in the same way as we measure a piece of cloth or the body temperature. However, it can be well assessed with the help of some or the other intelligence tests categorized as individual and group tests involving the use of verbal and non-verbal test material. In individual tests, we test one individual at a time but in group tests a group of individuals can be tested at a given time. In all these individual as well as group tests, we either try to make use of the verbal material, that is, language or non-verbal material for testing the intellectual level of our students. Performance tests are a typical example of such non-verbal (language-free) tests where we try to test the intelligence of a student on the basis of his performance in some intellectual tasks.

MEMORY

Memory refers to a special ability of our mind to conserve or store what has been previously learned or experienced for recollection or reproduction after sometime. In this way, (1) learning, (2) retention, and (3) recollection or reproduction, may form the essential ingredients or stages of the process of memorization. In the modern psychology, these stages have been given new names such as encoding, storage, and retrieval. Memory may be broadly classified into certain types in view of their nature and purpose served such as sensory or immediate memory, short-term memory, and long-term memory. Sensory or immediate memory refers to that memory which helps in

recalling something immediately after its perception. It has an extremely brief retention or span, that is, from a fraction of second to few seconds.

Short-term memory is also temporary, though not nearly as short-lived as immediate memory. It may have its time of retention up to 30 s or so and may be further extended through extended through rehearsals. Long-term memory, on the other hand, has an almost limitless capacity to store as well as retain one's sensory impressions. The sensory impression stored or encoded in the long-term memory are of two types – Episodic (connected with episodes and events) and Semantic (inferences or generalization reached out of the episodes and events).

INFLUENCE OF AEROBIC EXERCISES ON COGNITIVE ABILITIES FOR CHILDREN

Aerobic exercise is important for children. It helps keep their heart, lungs, and blood vessels healthy. It can also help them keep or get to a healthy weight. Children who exercise tend to have better heart and lung fitness, lower levels of body fat, stronger bones and muscles, fewer symptoms of depression, and better chances of being healthy adults without chronic disease. These are examples of good activities for adolescents are dancing, gymnastics, hiking, Jumping rope, Karate or other martial arts, riding a bicycle, rowing, running, and sports such as baseball, softball, basketball, volleyball, soccer, tennis, hockey, basketball, football, badminton or swimming, and walking.

Benefits of Aerobic Exercises for the Development of Cognitive Abilities

- Improved concentration
- Sharper focus
- Increased mental clarity and
- Increased ability to be present.

CONCLUSION

Aerobic exercises determine positive biological and psychological effects that affect the brain and the cognitive functioning and promote a condition of well-being. Aerobic exercise at a moderate to vigorous intensity appears to promote children's effortful and goal-directed cognition and behavior.

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Research Article

Sports competitive anxiety and burnout level among collegiate athletes

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ABSTRACT

The idea of competitive sport anxiety has existed for a long period of time. A great amount of research studies has been devoted to how anxiety relates to performance. This study aimed to determine the sport competitive anxiety and burnout level among collegiate athletes. A descriptive method of research was used in this study, utilizing the sport competitive anxiety test, and athlete burnout instrument as tools. Using the Slovin's formula, 167 out of a total number of 287 student-athletes were identified to participate in the study. A stratified random sampling technique was employed in gathering the data. Frequency distribution, percentage, and weighted mean were used to interpret the responses gathered. *t*-test was used for the analysis of the two independent variables, and one-way ANOVA was used to know the significant difference between the level of sports competitive anxiety and burnout of the respondents when grouped according to the respondents' profile. Findings revealed that the majority of the athletes had an average level of anxiety, while the level of burnout was at a medium level. On the other hand, when the respondents were grouped according to profile, their levels of sports competitive anxiety and burnout do not vary significantly. Taking the data findings into consideration and given the fact that signs of sport competitive anxiety and symptoms of burnout are evident across all profile variables, preventive measures need be taken to avoid possible consequences of illnesses, injuries, and dropout from both sport and/or academics. It is also recommended for the athletes to be exposed to positive cognitive and behavioral efforts, that is, coping strategies, positive self-talk, stress management skills, and relaxation techniques to manage specific demands.

Keywords: Anxiety, Burnout, Collegiate athletes, Competitive anxiety

INTRODUCTION

Student-athletes actively participate in both academics and sport simultaneously. For this reason, they have a higher possibility of demonstrating a high level of anxiety due to a variety of athletic and academic demands. Aside from a full class load, some student-athletes even set higher goals for themselves. They train harder and aspire to represent the university at the national level or even the flag of the country in elite levels of competition. These student-athletes aim and dream higher to fulfill this laudable and heroic act. It is a realization of one's patriotic contribution to his/her beloved country. In the actual tournament, there are numerous factors that affect the overall performance of an athlete which includes crowd, training, and preparation before the competition, self-esteem, individual, and/or team goals. When these factors prevail, and best performance fail on the day of competition, this emotional tension is commonly called precompetitive anxiety.

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The idea of competitive sport anxiety has existed for a long period of time. A great amount of research studies have been devoted on how anxiety relates to performance. Anxiety is an important factor of any competitive task. Without a certain level of anxiety, there cannot be a competitive performance. During the competition, there is a tendency that the level of anxiety will change by becoming higher or lower. The degree of anxiety is unique and differs from person to person. Therefore, it has to be managed and controlled.

Anxiety refers to a negative emotional response, in which an individual prepares and adjusts itself to the surroundings and is deemed necessary for its existence (Gutierrez, 2013). Some of the characteristics associated with anxiety are feelings of

worry, being apprehensive, and nervous in relation to the body's arousal to the stimulus. It was classified into two kinds as (i) trait anxiety and (ii) state anxiety. Trait anxiety is a stable and consistent set of characteristics of an individual. It is based primarily on past experience and, like personality traits, is firmly established in adulthood. On the other hand, state anxiety or precompetitive anxiety is the immediate emotional state characterized by feelings of tension and apprehension. It is an emotional reaction which involves unpleasant, consciously perceived feelings of tension related to arousal or activation of the body's nervous system (Spielberger, 2013).

Favorable outcomes in sports equate prominence, high self-esteem, and financial reward to athletes, but what these athletic achievements entail, are also great. To achieve this, athletes need to participate in rigorous daily training and compete year-round. Athletes also have to learn to cope with pressure on a continuous basis as it emanates from teachers, coaches, friends, and parents. Some of them are confused or have difficulties and do not know how to handle their anxiety. They are unable to deal with anxiety on their own and usually need help from other people around them. Some do not have the ability to identify the stressor to cope with anxiety to turn it around and come to a conclusion with positive outcomes. Any positive response will be a great advantage. The way an athlete manages and reacts to anxiety highlights one's capability to succeed in the game. However, it also appears that a certain point or level of anxiety is necessary to facilitate performance, but an increased amount will impede the same. For the most part, the coach or athletic trainer is the first point of contact that an athlete approaches and turns to when they feel anxious (Fullerton, 2010). It is for this reason that the researcher seeks to find out factual data about anxiety which may lead to burnout.

There is a huge amount of pressure experienced by student-athletes. They are exposed to a regimen of rigid and strenuous daily exercise or training routines, yet they still feel like there is no improvement in overall physical conditioning. They may begin to experience difficulties in recovering from the previous day's work out and then start to have sleep issues, being moody, and trouble with schoolwork and stress with relationships (Vickers, 2014). These are some indicators that the individual is suffering from burnout. Burnout is a serious condition characterized by chronic exhaustion and a lack of personal accomplishment. It is a state in which stress and exhaustion exist toward an individual's capability to perform. In sport, it refers to characteristics of withdrawal which may be physical, emotional, and social in forms and ways from a previously fun, fulfilling, and gratifying sport activity. Athletes who experience burnout lead to a decreased level of performance which ultimately drives an athlete toward his/her lack of interest, motivation, and active participation in the sport. Moreover, burnout impacts an athlete's overall well-being, primarily their physical and mental functioning (Defreese *et al*., 2015).

The ideas of competitive anxiety and burnout in a variety of sport and professional settings have gained enormous publicity and were given great attention. The media made an influential role in making this concept well-known in sport through controversial exposures of the sudden loss of high-profile sports personalities and the slump in the career of young talents who fail to make a huge accomplishment. A number of studies reviewed the link involved in an athlete's stress and burnout and the process that it undergoes. Reversing or at least decreasing the incidence of burnout was regarded as an important topic of discussion in many sport literature and studies. The manner in which some athletes have performed at their optimum level under the most complicated game conditions while others who are not as effective and efficient given the same competitive situation have made coaches wonder why this happens.

Determining an athlete's competitive level is key. Having this determination will enhance an athlete's performance, improve the quality of a player's overall sport experience, promote success, and avoid injuries among others. All these factors will also facilitate the complex task of a coach in evaluating talents, maximizing skills, abilities, potentials, eliminating errors, and arriving at decisions in the selection of key players who will contribute to a team's success.

This is why the researcher is eager to find out other factors concerning the improvement of sports performance, specifically at the collegiate level. As a former student-athlete and now a Swimming Coach and Physical Education Instructor, he believed that it is not just the stimulation of the bio-motor abilities of athletes that are important to achieve high performance in sports but other factors as well. Understanding the underlying concepts of sports competitive anxiety and burnout is one of the primary purposes of his study. He also believes that a better knowledge and understanding as to what issues athletes encounter and how they react when faced with anxiety is essential.

Objectives of the Study

The main focus of this study was to determine the level of competitive sport anxiety and burnout of collegiate student-athletes. Moreover, it sought to answer if there any significant difference in the respondent's levels of sports competitive anxiety and burnout when they are grouped according to profile? Finally, the output of the study will be a well-planned intervention program as deemed necessary with a focus on the overall athletic performance and wellness of the student-athletes.

MATERIALS AND METHODS

A descriptive method of research was utilized to determine the sports competitive anxiety and burn out the level of collegiate student-athletes. According to Dudovskiy (2017),

the descriptive method of research is conducted to describe characteristics and/or behavior of the sample population; such a method is, hereby, deemed as best fitting to be employed in the study.

Participants

The respondents of the study were the student-athletes who were enrolled during the school year 2017–2018 of the Polytechnic University of the Philippines. A stratified random sampling technique was employed to obtain the sample size in gathering the data. Using Slovin's Formula, it involved the division of the total population into smaller groups. One hundred sixty-seven out of a total number of 287 student-athletes were identified to participate in the study. A complete list of the student-athlete respondents was obtained from the Sports Development Program Office of Polytechnic University of the Philippines [Table 1].

The majority of the respondents were male aged 19 years old. While based on sports event, it was team sports who dominated the number of respondents. On the other hand, the majority of the respondents have had three playing years, and most of them bagged the silver rank in the previous competition (School Colleges and Universities Athletic Association, 2017).

Table 1: Frequency and percent distribution of the respondents according to age

Profile	Frequency	Percent
Age		
18 years old	13	7.8
19 years old	60	35.9
20 years old	47	28.1
21 years old	21	12.6
22 years old	19	11.4
23–24 years old	7	4.2
Sex		
Male	89	53.3
Female	78	46.7
Sports event		
Individual/dual sports	58	34.7
Combative sports	18	10.8
Team sports	91	54.5
Number of playing years		
1 year	41	24.6
2 years	44	26.3
3 years	49	29.3
4–5 years	31	18.6
No response	2	1.2
Athletic performance		
Gold	58	34.7
Silver	68	40.7
Bronze	21	12.6
Participation	20	12.0

Research Instrument

An adopted instrument, the sports competitive anxiety test (SCAT) created by Rainer Martens (1990), was used to gather the data needed. This test is a trait evaluation used specifically to identify A-trait and A-state anxiety or characteristics of personality in competitive sport situations. The athlete burnout instrument (ABI) was adopted from the athlete burnout questionnaire by Raedeke and Smith (2009) and was content validated by the Chief of the Research Management Office, the Dean of the College of Human Kinetics, and a Faculty in the Master in Physical Education and Sports program of the College of Education, Polytechnic University of the Philippines. The questionnaires were utilized to determine the level of Sports Competitive Anxiety and Burnout of the respondent student-athletes, respectively.

Procedure

Letters of request/permission were submitted to the Dean, College of Human Kinetics and Director, Sports Development Program Office, and Polytechnic University of the Philippines to seek approval for the conduct of a survey among the student-athlete respondents. On approval of the request, the survey questionnaires were individually distributed to the respondents in person with the supervision of the researcher. Students were reminded that their participation was voluntary, and they could stop answering the survey at any time they want. All information to be provided will be strictly treated with the utmost confidentiality. After retrieving the completed survey questionnaires, the data were prepared for tallying, presentation, analysis, and presentation. Frequency distribution and percentage were used to present sports competitive anxiety level for the athletes, while the weighted mean was utilized to interpret the burnout level. In addition, T-test and ANOVA were used to determine if there are significant differences in sports competitive anxiety and burnout level of athletes when grouped in terms of profile.

RESULTS AND DISCUSSION

Respondents Sports Competitive Anxiety Level

The level of sport competitive anxiety was determined as the average level in the SCAT assessment with a total score of 996 and a frequency of 129 or 77.2% [Table 2]. This implied that the competitive sport anxiety of the athletes was positive and facilitative to their performance. The athletes who performed at their peak or best performance were at their individual optimal zone of functioning (IZOF). This is an anxiety zone where an individual athlete pursues the optimum performance within the limits of this zone. However, exceeding this zone may influence performance in a negative way.

This indicated that these athletes were unable to deliver their best or peak performance. Athletes who were represented on both ends of the spectrum indicated that their level of sport competitive anxiety was debilitative. Therefore, it should not be ignored that these were areas of concern. Athletes who had higher and lower than average levels of competitive sport anxiety hindered them from performing at their peak. This was confirmed in the results of a study to control competitive anxiety that is important to achieve satisfactory performance. Anything otherwise, over or behind a certain level, is negative and not helpful (Ichraf *et al*., 2013). A study on competitive anxiety revealed that losers are athletes who exhibited higher levels of anxiety than winners (Radochonski *et al*., 2011).

There should be a collective effort from the college to address these concerns. The mere fact that sport competitive anxiety is negative, constructive, and positive endeavors has to be initiated. Proactive and open lines of communication can be facilitated among the different sports teams to support athletes. The focus is geared toward building collaborative efforts to address needs, concerns and support the well-being of the student-athletes which were reflective in their sport competitive anxiety levels. The aim is to promote and maintain an environment of camaraderie and team spirit that go along with the attainment of competitive athletic goals within respective teams.

Table 2: Respondent's scores in the sports competitive anxiety test

Score	Verbal equivalent	Frequency	Percent
<17	Low level of anxiety	24	14.4
17–24	Average level of anxiety	129	77.2
More than 24	High level of anxiety	14	8.4
Total		167	100.0

A study on competitive anxiety in young athletes conducted by Grossbard and Smith (2008) showed that anxiety experienced in a competition or performance has been identified as a key predictor of the quality and duration of an athlete's involvement in the sport and other achievement areas.

Respondents Burnout Level

Based on the results of the ABI, the level of burnout is medium, with a grand mean of 2.59. Overall, this indicated that the athletes experienced an early phase of burnout [Table 3]. According to researchers, a reduced sense of accomplishment and emotional and physical exhaustion are the first two symptoms evident in the development of burnout (Charbonneau *et al*., 2014). This finding was also validated with the subscale results in this study. A weighted mean of 2.98 represented the subscale of reduced sense of accomplishment. Many athletes had the perception that they have not achieved their goals and expectations or a lack thereof. A feeling of being inadequate, unhappy, and unsatisfied in their efforts prevailed among the athletes. The persistence to pursue and achieve more will provide them a sense of self-fulfillment. The weighted mean of 2.78 reflected the subscale of Physical and Emotional Exhaustion. These athletes had an overall low energy or feeling toward sports participation. A weighted mean of 2.77 burnout subscale of

Table 3: Respondents' burnout level

Aspect of burnout	Subscale	Weighted mean	Level
I am not contented with my accomplishment in my sports	Reduced accomplishment	2.98	Medium
I am not achieving many valuable things in my sports	Reduced accomplishment	2.63	Medium
I feel incompetent performing in my sport	Reduced accomplishment	2.60	Medium
I feel like I am not doing the best performance, whatever I do.	Reduced accomplishment	2.59	Medium
I feel I am not successful in my sports.	Reduced accomplishment	2.54	Medium
I feel physically and emotionally exhausted in my sport.	Physical/emotional exhaustion	2.78	Medium
I cannot do anything because I feel exhausted from training.	Physical/emotional exhaustion	2.72	Medium
Participation in sports keeps me feel exhausted.	Physical/emotional exhaustion	2.72	Medium
I feel that I am psychologically drained I my sports.	Physical/emotional exhaustion	2.57	Medium
I feel neglected in my sports	Physical/emotional exhaustion	2.40	Somewhat Low
I feel less efficient now in my sport unlike before.	Devaluation	2.77	Medium
It is not a big deal for me whether I do well in my sports or not.	Devaluation	2.48	Somewhat Low
I feel I am no longer affected by a loss of my team in a competition.	Devaluation	2.46	Somewhat Low
It is better to focus on other things rather than attending in my sports training and activities.	Devaluation	2.43	Somewhat Low
I am not motivated in my sports.	Devaluation	2.18	Medium
Grand mean		2.59	Medium

Sport Devaluation the "feeling of being less efficient in the sport which characterized the loss of interest, disliking the game or negativism toward performance, and "I do not care attitude."

The last three responses with a weighted mean of 2.43 were sport devaluation. The athletes felt that it is better to focus on other things rather than attending sports training and activities. A weighted mean of 2.40 represented the subscale on physical/emotional exhaustion. Athletes had the feeling of "being neglected in their sports." A weighted mean of 2.18 sport devaluation subscales, in which athletes were not motivated in their sports.

An article on Burnout in Athletes (Sitzler, 2016) revealed that rest and time away from sport are the two best methods to prevent and treat athlete burnout. A time off or break from the various pressures of their sport, even for a brief period on certain times or occasions in a year, gives an athlete the chance to deal with their school work and consider relationships that are significant towards a well-rounded and balanced life. This will provide the direction to an enhanced initiative and performance when they come back and resume the sport.

Significant Difference in Levels of Sports Competitive Anxiety and Burnout when Grouped in Terms of Profile

Results revealed that there are no significant differences in level of competitive sport anxiety and burnout when the student-athletes were grouped by profile [Table 4]. All differences were considered statistically insignificant for a probability level >0.05 ($P > 0.05$). According to age (anxiety $P = 0.435 > 0.05$) and (burnout $P = 0.313 > 0.05$), sex (anxiety $P = 0.165 > 0.05$) and (burnout $P = 0.162 > 0.05$), sports category (anxiety $P = 0.652 > 0.05$) and (burnout $P = 0.510 > 0.05$), number of years playing (anxiety $P = 0.994 > 0.05$) and (burnout $P = 0.422 > 0.05$), and rank (anxiety $P = 0.868 > 0.05$) and (burnout $P = 0.156 > 0.05$).

Table 4: Significant difference in the levels of anxiety and burnout of the respondents when grouped in terms of profile

Levels of anxiety and burnout of athletes		
Age	**F-value**	**P-value**
Anxiety	0.975	0.435
Burnout	1.198	0.313
Sex		
Anxiety	1.394	0.165
Burnout	1.405	0.162
Sports category		
Anxiety	0.429	0.652
Burnout	0.675	0.510
Number of years playing		
Anxiety	0.059	0.994
Burnout	0.976	0.422

*Significant at 0.05

In a study comparing the sports competition anxiety between volleyball and soccer male players, results indicated that there is no significant difference found between volleyball male players and soccer male players in their sports competition anxiety (Kerketta, 2015).

Similar to the results of a study according to the age of the respondents, there appeared to be no difference between novice and more seasoned players. It is important to note, however, that the differences or gap in the years of playing are only between 1 and 5 years. This study did not address "veteran" athletes who have been playing the same sport for a decade versus new athletes. There could potentially be benefits of reduced anxiety and burnout for athletes who have decades or more experience under their belts, but those cannot be addressed in this study due to the limited sample population.

Thus, it is important and necessary that the Sports Development Office should address and support all athletes, regardless of their age and years of playing. There is no need for a special program designed specifically for new athletes since they all experienced the same level of anxiety and burnout.

CONCLUSION AND RECOMMENDATION

The study aims to determine the level of competitive sport anxiety and burnout of collegiate student-athletes and find-out if there are any significant differences in the respondent's levels of sports competitive anxiety and burnout when they are grouped according to profile.

It is concluded that the level of sport competitive anxiety based on the SCAT is in average or moderate. This implied that the level of sport competitive anxiety was positive and facilitative to athletic performance. Athletes who performed at their peak or best performance were at their IZOF, an anxiety zone where an individual athlete pursues the optimum performance within the boundaries of this zone. However, athletes who scored both high and low levels of sport competitive anxiety were debilitated, or athletic performance was at a weak and poor level. This happens when the level of sport competitive anxiety is either above or behind a certain limit or boundaries to produce positive results in performance.

On burnout, the results reflected that the student-athletes experienced a medium level. This score indicated the early signs of burnout. Preventive steps or measures were deemed necessary to avoid the sport competitive anxiety and burnout scores from escalating too much higher and uncontrolled levels.

In addition, it can be concluded that since there are no significant differences in the level of competitive anxiety and burnout, they all experienced the same level of competitive anxiety and burnout regardless of their profile. Thus, prevention had always been regarded as better than cure.

Based on the findings, and given the fact that signs of sport competitive anxiety and symptoms of burnout are predictable, preventive measures need be taken to avoid possible consequences of illnesses, injuries, and dropout from both sport and/or academics.

A proposed intervention program using swimming as a cross-training activity is essential to provide a positive youth sports experience and promote the overall wellness of the student-athletes in this study. This will provide time-off or break from their sport. It will give the experience and feeling of relief by taking their thoughts away from their worries that go along with the rigorous demands of training and competition. It diverts their focus into other activities and boosts their morale. This reduces the risks of injuries as swimming is considered a low impact on the joints due to buoyancy and still improves their bio-motor abilities in the water. An evaluation of the effectiveness of the intervention program is also suggested as best practice.

Athletes have to be exposed to positive cognitive and behavioral efforts, that is, coping strategies, positive self-talk, stress management skills, and relaxation techniques to manage specific demands. Stress management requires an excellent self-awareness because knowing oneself well enables the athlete to identify and understand the stressors or root cause of their trait and state anxiety.

Since the results of SCAT revealed that the sport competitive anxiety of some athletes is high prior to competition, diaphragmatic breathing exercises, or "deep breathing" may be necessary in order to release their state anxiety and calm them down. Continuous breathing for as long as it is needed, and each time the athlete breathes out, the word "relax" is uttered in the mind's ear to relieve the tension. In cases wherein signs and symptoms of competitive sport anxiety and burnout persisted and required attention, a referral to the school counselor is suggested.

Finally, based on the results, a proposed research-based intervention program was developed to strengthen the programs for collegiate athletes. The main focus of the program is to equip the coaches with research-based findings and adequate background knowledge about their athlete's characteristics, strengths, and needs that will enable them to provide the support in the best way possible to control and manage competitive sport anxiety and burnout. Team goals are more attainable and meaningful when the overall well-being of the athletes are given top priority and achieve their optimal zone of performance. Being proactive, knowledgeable, and mindful of the levels of sport competitive anxiety and burnout of their athletes will provide a positive and pleasant athletic experience and maximize the full potential of their athletes.

The study is limited only to the Collegiate Athletes of Polytechnic University of the Philippines, Manila, Philippines. Future studies might widen the scope by including all the athletes in the State Universities and Colleges in the National Capital Region.

It is highly recommended for future researchers to conduct the same study that may deeply explore the emotional impact of bullying and how it may affect their lives in the future. Exploring the factors that affect bullying and their coping mechanism might also be considered.

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Research Article

Exploring the mental toughness and sports performance among college student-athletes

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ABSTRACT

Being mentally tough is one of the important traits that an athlete has to possess to be successful in a competitive level of competition. Thus, determining their mental strength is very essential. This study aimed to explore the level of the mental toughness of college student-athletes and to determine its association with their sports performance. Purposive sampling was used to include all the college student-athletes (n = 123) during the school year 2018. Findings revealed that the student-athletes were at moderate level of mental toughness and have very poor sports performance when it comes to overall ranking against other participating schools for the last four seasons. Furthermore, there were no significant associations between all categories of mental toughness and their sports performance. It is highly recommended for the school administration to still strengthen their intervention programs to achieve a higher level of mental toughness and to look for other factors that may affect athletes and school performance.

INTRODUCTION

Throughout the past decade, researchers are fascinated to study how psychological factors are associated with the achievement and preservation of high sports performances of the athletes. Now, it is widely recognized that the mental toughness of the key ingredients for high-level performances. Unsurprisingly, over the past decade, scholarly interest in improving mental toughness has increased (Gucciardi and Gordon, 2016). As defined by Gucciardi and Hanton (2016), mental toughness is a personal ability to consistently achieve high performance despite varying degrees of situational requirements (among athletes, mental toughness is the ability to deal with criticisms, wrong strategy, and miscalculation and still bounce back with composure and self-confidence). You can go back to the court and play with the same ideal performance after a detrimental mistake. It is the ability to remain calm, composed, and stand tall in the face of adversity and to rebound from setbacks and failures (Goldberg, 1998). Mental toughness is a shield to protect the athlete against the bullets of criticisms and to help him preserve his sanity and self-esteem (Omar-Fauzee *et al*., 2013).

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Dr. Goldberg categorized mental toughness into components, namely, (1) concentration. This is the ability to remain fully focused on the task at hand, not easily destructed; (2) confidence. This is the ability to be sure that a chosen course of action is the best; (3) pressure tolerance. This is the ability to keep calm and un-intimidated during high or low pressure; (4) motivation. This is the ability to give goals or dreams for competition, and (5) bounce back. This is the ability to recover from a setback, error, failure, and letting go.

Everyone, not only athletes, needs mental toughness because everyone is exposed to unfriendly environments. We need mental toughness because it is crucial to success. Athletes need it so they can cope with difficult circumstances and go forward and succeed. An embattled athlete should remain determined, focused, confident, and in control; otherwise, he/she will be his/her own opponent; he/she will meet his/her defeat. These pressures, stress, and struggles make an athlete grow and be a better athlete in the end. All of these can happen if he/she is mentally tough.

Good mental toughness is being established through various experiences in life and can come in various ways. It is easy to become your own worst enemy when you cannot cope with your problems. However, it is very hard to stay mentally tough

without being emotionally down to get through the situation. It never makes anything better to dwell on difficult situations, but being able to remain strong mentally would make it easier to handle and cope with.

Since seasons 90th–93rd of the National Collegiate Athletic Association (NCAA, school years 2014–2018), Jose Rizal University (JRU) has been at the lowest rank in sports performance. In spite of efforts to reverse this trend, JRU seemed to be unable to rise to the challenge.

Although there are other factors that contribute to good sports performance, such as school factor, coach factor, and athlete factor, the researchers singled out player factor, particularly their ability to cope with stress and extreme pressure. All competitions are full of stress and pressure; mentally, emotionally, and physically, so athletes must be mentally tough to face these situations.

Therefore, it is for these given situations that this paper aims to explore the level of mental toughness and sports performances of the college athletes of JRU and its association with each other. Moreover, this study is intended to help the university to enhance its existing programs and policies to support athletes in achieving sports success.

Objectives of the Study

This study aimed to explore the level of the mental toughness of the college student-athletes of the JRU and to correlate it to their sports performance. In particular, the study sought to address the following questions: (1) What is the level of mental toughness the college student-athletes in terms of concentration, confidence, pressure tolerance, motivation, and bounce back? (2) What is the sports performance level of the student-athletes during the NCAA 2014-2018 seasons? and (3) How significant is the association between the level of the mental toughness of college student-athletes and their sports performance?

MATERIALS AND METHODS

The researcher utilized the descriptive method of research, particularly survey for the athlete's level of mental toughness and document analysis for the athlete's level of sports performance. According to Dayrit and Mapa (2005), the descriptive research method utilized to characterize a situation or area of interest systematically, factually, and accurately. Purposive sampling technique was used on the administration of the questionnaire, including all the college student-athletes of the JRU during the school year 2017–2018.

Table 1 presents the profile of the senior athletes who were the respondents in this study.

A total of 123 college athletes of JRU during the school year 2017–2018 were included in the study. Among the respondents were 86 or 69.92% males and 37 or 30.10% were female. Forty-five or 36.59% were players of individual/ dual events, and 78 or 63.41% were members of team events, while 62 or 50.41% were novice and 61 or 49.60% were experienced athletes.

Research Instrument

The researcher utilized the Mental Toughness Test of Personal Performance, a 30-item Test Questionnaire that was developed by Dr. Allan Goldberg (1998) to measure the mental toughness of the respondent athletes, and a checklist to find out the sports performance of the athletes. The questionnaire is composed of two parts. The first part of the questionnaire was the profile of the respondents to determine their gender, sports event, and sports category during the skills competition. The second part of the questionnaire described in the study was their "self-ratings" on their level of mental toughness.

Procedure

On approval of the adviser and the panelists during the research proposal, a letter of permission was directly forwarded to the sports director of the University for the Survey. On its approval, the researcher personally administered the survey questionnaire to the respondents. It was explained to the respondents that the survey is purely voluntary and rest assured that all information will be kept confidential. With the help of their coaches and the team captain of the different sport events, administrations of the survey questionnaire were done during their free time. Within 2 weeks, all accomplished survey questionnaires were completely retrieved and immediately prepared for tallying, presentation, and analysis.

With the help of the statistician, the gathered data were computed using the following statistical-treatment techniques appropriate for each problem: Percentage was used to determine the population of the respondents distributed by profile variables; weighted mean was the statistical tool used to assess the responses gathered on the mental toughness of the athletes; the

Table 1: Distribution of the respondents by profile

Profile of the athletes	Frequency (%)
Gender	
Male	86 (69.92)
Female	37 (30.10)
Sport event	
Individual/dual events	45 (36.59)
Team events	78 (63.41)
Playing category	
Novice	62 (50.41)
Experience	61 (49.60)

n=123

average mean was utilized to find out the level of the mental toughness of the athletes; and on the relationship between mental toughness and sports performance, the Pearson test of correlation was utilized. This is a technique for studying the relationship between mental toughness and sports performance, continuous variables. Pearson's correlation coefficient (r) is a measure of the strength of the association between the two variables.

RESULTS AND DISCUSSION

Mental Toughness of College Student-Athletes

Table 2 shows the level of the mental toughness of the college student-athletes across all profile variables.

Results show that generally, all the categories of mental toughness across all profile variables were assessed by the athletes as moderate from 2.82 weighted mean to 3.03 weighted mean, with an average weighted mean of 2.95, with the verbal interpretation of moderate level.

These findings contradicted the results of studies of Newland *et al*. (2013) and Nicholls *et al.* (2009) that generally, males were mentally tougher than females. It only entails that JRU College student-athletes' respondents have the same level of mental toughness regardless of their sex, contrary to the other previous studies. Similarly, when it comes to sports category, the results opposed to the findings that generally less experienced or young athletes tend to possess lower levels of mental toughness as compared to those who have been competing for longer years (Jones and Parker, 2013; Cowden and Meyer-Weitz, 2015; Connaughton *et al.*, 2010; Nicholls *et al*., 2009; and Marchant *et al*., 2009). It may implied that since the respondents are only college students, they only play just for 3–4 years, where the playing experience was not that enough to achieve a higher mental toughness level. Thus, strengthening intervention programs were deem necessary to lift-up the mental toughness of the college-student-athletes given the current situation.

While on the other hand, in terms of the sports event, the finding reaffirms what Nicholls *et al*. (2009) found out that there were no significant differences in the mental toughness level among athletes, whether individual/dual or teams sport. This result would only support the claim of Bull *et al.* (2005) that mental toughness is a personality attribute and does not change even having different situations. Therefore, regardless of the event, the athletes must be treated with equal support and opportunities to develop their mental toughness to full potential.

Sports Performance of the Athletes based on School Rank

Table 3 presents the average scores in sports performance of the respondent-schools for four consecutive seasons.

Table 2: Mental toughness of the college student-athletes

	Gender		Sports event		Sports category		Average weighted mean
	Male	Female	Individual/ dual sports	Team sports	Novice	Experienced	
Concentration							
Weighted mean	2.81	2.81	2.78	2.84	2.89	2.77	2.82
Verbal interpretation	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Confidence							
Weighted mean	2.97	3.00	3.04	2.94	3.03	2.85	2.97
Verbal interpretation	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Pressure tolerance							
Weighted mean	3.03	2.99	3.12	2.94	3.03	3.02	3.02
Verbal interpretation	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Motivation							
Weighted mean	2.99	3.09	3.05	2.99	2.99	3.05	3.03
Verbal interpretation	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Bounce back							
Weighted mean	2.96	2.84	2.91	2.93	2.95	2.89	2.91
Verbal interpretation	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Average weighted mean							
Weighted mean	2.95	2.95	2.98	2.93	2.98	2.92	2.95
Verbal interpretation	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Scale: 4.50–5.00 High, 3.50–4.49 Average, 2.50–3.49 Moderate, 1.50–2.49 Low, 1.00–1.49 Poor

As shown in the table, the respondent-school had a poor sports performance for the last four seasons garnering an average score of only 194.7 average score, ranking on 10th place, or last among ten participating teams. It is very far from behind the top three schools with average scores of 638.25 San Beda College, 607.13 College of St. Benilde, and 528.58 Arellano University. This only indicates that the school respondent is consistently performing poor for the last 4 years.

According to Thelwell and Hanton (2011), to develop mental toughness, the need for a long-term systematic procedure that incorporates a multitude of essential processes that operate in a combined rather than the separate manner is necessary. Therefore, several factors and support must be put into considerations to achieve success in sports competition.

Correlation of Level of Mental Toughness to Sports Performance

Table 4 illustrates the correlation between the level of the mental toughness of college student-athletes and their sports performance for the last four seasons.

Given the generated Pearson test of correlation between sports performance and mental toughness, the table shows that concentration has an $r = 0.086$ with $P = 0.342$, confidence has an $r = 0.143$ with $P = 0.114$, pressure has an $r = 0.004$ with $P = 0.966$, motivation had an $r = 0.154$ with $P = 0.089$, and bounce back has an $r = 0.169$ with $P = 0.061$. All P-values are greater than the assumed level of relationship of 0.05; hence, the null hypotheses are accepted. This means that there is no significant association between sports performance and all categories of mental toughness. Mental toughness did not influence sports performance.

Similarly, as a whole, when it comes to the relationship between over-all mental toughness and sports performance, $r = 0.018$ with $P = 0.843$. Since P-value is greater than the assumed level of the relationship of 0.05, the null hypothesis was also accepted. This means that there was no significant relationship between sports performance and mental toughness as a whole.

These results may just indicate that regardless of whether athletes with higher mental toughness achieve higher levels of competitive participation or rank higher than those who are mentally weaker, it is not conclusive that they will likely perform better throughout the competition (Cowden, 2016). Moreover, it may not be the single main indicator of performance results, as opposed to prior assertions of other researchers. The large percentage of unexplained variation in the result of the match suggests that a variety of other factors

Table 3: Sports performance of the respondent-schools

	School	Season 90	Season 91	Season 92	Season 93	Total points	Average score	VI rank
1	AU	494	497.3	590	533	2114.3	528.58	Average 3rd
2	CSJL	354	347.8	367	386	1454.8	363.70	Low 6th
3	CSB	600	627.5	642	559	2428.5	607.13	High 2nd
4	JRU	194.5	163.8	197	223.5	778.8	194.70	Poor 10th
5	MIT	257.5	338.3	312	271	1178.8	294.70	Low 9th
6	SBC	568.5	632.5	683	669	2553	638.25	High 1st
7	SSC-R	380	320.5	295	278	1273.5	318.38	Low 8th
8	UPHSD	363	365	384.5	366	1478.5	369.63	Low 5th
9	EAC	401	332.5	297.5	313.5	1344.5	336.13	Low 7th
10	LPU	388.5	376	440	410	1614.5	403.63	Moderate 4th

550–639 -High (H), 460–549 -Average (A), 370–459 -Moderate (M), 280–369 -Low (L), 190–279 -Poor (P), JRU: Jose rizal university

Table 4: Correlation of level of mental toughness to sports performance

Correlation	Weighted mean	R – Value	Interpretation	*P*	Decision
Concentration	2.82	0.086	Very low relationship	0.342	Accept the hypothesis
Confidence	2.97	−0.143	Very low relationship	0.114	Accept the hypothesis
Pressure	3.02	0.004	Very low relationship	0.966	Accept the hypothesis
Motivation	3.03	−0.154	Very low relationship	0.089	Accept the hypothesis
Bounce back	2.91	0.169	Very low relationship	0.061	Accept the hypothesis
Overall mental toughness	2.95	0.018	Very low relationship	0.843	Accept the hypothesis

*Significant at 0.05

can also significantly contribute to the result of a competition. These could involve both the player's and the opponent's physical, technical, tactical, and other psychological aspects (Levy and Backhouse, 2009). Therefore, it could be that other factors influence sports performance of the respondents.

CONCLUSION AND RECOMMENDATION

The study endeavors to determine the level of mental toughness of the college student-athletes of the JRU and to correlate it to their sports performance in terms of school ranking.

The majority of the college student-athletes were at moderate level of mental toughness and have very poor sports performance when it comes to overall ranking against other participating schools for the last four seasons. Nevertheless, it may not be concluded that they are poor performers since low ranking performance may also be due to low number of entries in the contested events or low participation. The low performing schools do not have entries in several events because they have no athletes to contest the events. In addition, though the school-respondent has a poor ranking performance, it may not directly establish that it is due to a moderate level of mental toughness since it was found out that there was no significant relationship observed between the student-athletes' mental toughness and sports performance. It could be that other factors influence their sports performance, such as sports training programs, interventions, school financial, and policy support.

It is highly recommended for the school administration to still strengthen intervention programs to achieve a higher level of mental toughness. Thus, it is a big factor for the student-athletes to perform well during the competition. In addition to this, looking into other factors that affect athletes and school performance must take into considerations.

This study is limited only to JRU College student-athletes in Mandaluyong City, Philippines. It is greatly recommended for future researchers to widen the scope of the study by adding other variables that may affect sports performances of the athletes or including the top participating schools.

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Research Article

Incidences of sports injuries in district level footballers and cricketers of West Bengal

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ABSTRACT

The present study was conducted on district-level footballers and cricketers of West Bengal to investigate the incidences of sports injuries on an anatomical basis, at the tissue level, during training and in competition situations, and also on an occurrence basis. The footballers and cricketers of the present study participated at least at the district level (open inter-district) competition in West Bengal. Sports injuries of footballers and cricketers have been identified through injuries questionnaire. This study revealed that incidences of injuries in footballers and cricketers occur mostly in skeletal muscle and might be due to low muscle strength or ground conditions. Injuries happened more during training than in the competition period. Footballers suffered more injuries on lower extremities (72.1%), whereas the cricketers suffered proportionately in lower (46.3%) and upper (36.3%) extremities. The footballers acquired the highest incidences of injuries at foot and ankle (28.7%) followed by hip (20.9%). The cricketers suffered injuries mostly at the wrist and hand (18.5%) followed by ankle and foot (17.7%) and shoulder (13.7%). The injuries were more acute in nature than to be chronic. It is suggested that the coaches should look into this to prevent injuries to minimize the loss of player power by administering training to build up muscle strength. In the training period, the coaches and both the footballers and cricketers have to give more attention to how to prevent injuries and they require proper strategies of training plan to prevent injuries. There is a need for proper implementation of prevention strategies, and they require proper development of all fitness components.

Keyword: Acute injuries, Chronic injuries, Competition, Cricketers, Footballers, Tissues injuries, Training

INTRODUCTION

It is evident that participation in sports has increased at all levels in India, not only at the recreational level but also at a competitive level. Participation in Sports at both levels simultaneously increased sports-related injuries.[1] The risks of injury depend on the nature of games and activity pattern [2] happening more at competitive level than at recreational level.[1] Prevention is the best cure for injuries.[3] The participation at a high level carries more risk of injuries, interfering in training, and competition.[4] One of the key components of success in sports is lower rate of injury.[5] To achieve a high-level performance of a player, continuity in training is required, and injury prevention and control are required to assure good performance. It is necessary to identify, in which part of the body gets injured more and when it happens. The objective will be how quickly he returns to the play. Hence, etiology of sports injuries is very important for planning treatment facilities and prevention.[1]

Football is the most popular and organized high-intensity intermittent team game. Most researchers observed that it is highly injury prone.[2,6-9] Injury-related studies in sports are scanty in Indian literature, more specifically at non-elite class district level footballers. On the other hand, cricket is one of the most popular games, especially in India and other commonwealth countries. Globally, 104 countries play cricket. Present-day cricket has become a high-intensity game in both the T20 and ODI (1 day international consisting of 50 overs each side) format. Hence, present-day cricket is in the list of the high risk of injury-related games. Various types of injuries related research studies have already been done. However, these are too few to cover every type of population. Some research studies have already been conducted in Australia,

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England, and South Africa. Both football and cricket in India are so popular that even they are being played on the streets. Hence, studies at non-elite class district level and or urban and semi-urban levels are scanty.

Main aim of the sports injuries related studies is to minimize the rate of injuries and rapid healing/rehabilitation to send the players back to the playing ground quickly. To prevent sports injuries, the steps to be followed[10] are collection the sports injuries related data, identifying the problem and describe the findings, implementation of the plan to prevent injury on the basis of findings the information, and carry on the survey to measure the usefulness of injury prevention plans. Hence, the present study has been taken up on district-level footballers and cricketers to investigate:

1. The incidences of injuries on the basis of anatomical locations
2. The incidences of injuries at tissue level
3. The occurrence of injuries in training and in competition
4. The incidences of injuries at acute and chronic level.

METHODOLOGY

The footballers and cricketers of the present study participated at least at the district level (open inter-district) competition in West Bengal. The exclusion criteria encompass the diseases and injuries which are not related to sports. The inclusion criteria are that the volunteers must participate at least at district or state level competition and have minimum of 2 years of training in their own discipline.

The sample size was estimated following Eng, 2003.[11] Number of sportspersons estimated was $n = 40$. Keeping the dropout rate at 10%, the investigation subjects in this study were kept at ≥45. A purposive sampling technique was used for the present study. Sixty-one footballers and 46 cricketers constituted the investigation subjects. The primary variables of the present study are incidences of injuries on anatomical basis on the involvement of tissues, whether acute or chronic and on an occurrence basis (competition and training). The secondary variable of the present study is physical characteristics.

The study group was selected from the various sports academy and clubs (mostly the district level players participate) in West Bengal and some league tournaments in Kolkata. Incidences of sports injuries had been investigated following injuries questionnaire system keeping in mind the objectives of this study. The injury questionnaire was designed on the basis of previous studies [Figure 1].[12-15] The first part is to get only personal information such as name, district, age, gender, height, and weight. The second part draws games, sports, and training related information such as game, position, sports, event, highest participation, training age, and participation age. The third part has health-related information such as injuries

Name: ..... District .....

Age (in Year): ....., Gender: Male □ Female □,

Weight (in kg): ....., Height (in cm): .....

B. Games, Sports & Training Related Information:

Game: ....., Position: .....,

Sports: ....., Event: .....,

Highest Participation: ..... Participation Age: .....,

Training Age: ....., Training Duration (in hr. /day or hr. /week).....,

C. Health Related Information:

Injuries not related to sports/games....., Environmental Injuries .....,

Training induce problem (like asthma, Palpitations etc.).....

Chronic illness (if any).....

D. Injuries related Information:

D.1 - Location (Anatomical sites) of injury:

Head & Neck □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Shoulder □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Trunk □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Wrist & Hand □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Elbow □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Hip □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Thigh & Leg □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Knee □, Times (.....)	Acute □	Chronic □	Training □	Sports □
Ankle & Foot□, Times (.....)	Acute □	Chronic □	Training □	Sports □

D. 2 - Type of injury (Tissues Involved):

Skin □ & Times (.....), Muscle □ & Times (.....),

Tendon □ & Times (.....), Ligament □ & Times (.....),

Cartilage □ & Times (.....), Bone □ & Times (.....),

I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction.

Signature: ..... Date: .....

Figure 1: Injury questionnaire used in this study

not related to sports, environmental injuries, training induce problems, and chronic illness. The last and fourth part have injury-related information. This part has been further divided into two sub-parts, for example, location of injuries on the basis of anatomical sites, the injury types (acute or chronic), and injury occurrence time such as during competition or in the training period. The end portion of the last part has injuries related to information according to the involvement of tissues and declaration.

Statistical Procedure

The collected data in the form of digital scores were treated statistically to get results and to draw conclusions. The Percentage, Mean, and SD were calculated using descriptive statistics. The level of significance for the present study was set at 0.05 levels.

RESULTS

The mean and SD of age, height, and weight of the footballers and cricketers are presented in Table 1. No significant differences existed in the physical characteristics between the groups.

Incidences of sports injuries of footballers were more in lower limbs (72.1%) followed by axial (14.7%) and upper limbs

(13.2%). On the other hand, the highest percentage of injuries occurred in lower limbs (46.0%) followed by upper limbs (36.3%) and axial (17.7%) regions in cricketers [Table 2].

Regarding anatomical distribution, cricketers had the highest percentage of injuries occurred in the wrist and hand (18.5%), followed by ankle and foot (17.7%), shoulder (13.7%), trunk (12.1%), knee (9.7%), hip (9.7%), thigh and leg (8.9%), head and neck (5.6%), and elbow (4.0%). On the other hand, in the case of footballers, the highest percentage of sports injuries occurred in ankle and foot (28.7%), followed by hip (20.9%), thigh and leg (12.4%), knee (10.1%), wrist and hand (10.1%), trunk (7.8%), head and neck (7.0%), and shoulder (1.6%) [Figure 2].

Footballers suffered more injuries in ankle and foot, thigh and leg, knee, hip and head, and neck than cricketers. However, cricketers fall on more injuries in the shoulder, trunk, wrist, and hand and elbow than footballers [Figure 2], indicating that a large body parts are involved during batting, fielding, and bowling.

Skeletal muscle injuries occurred in both the cricketers and footballers. However, cartilage injuries were nil in both the groups. Regarding tissue-wise distribution, the highest percentage of trauma was observed in muscles (63.6%), followed by skin (12.7%), ligaments (10.9%), tendons (7.3%), and bone (5.5%) [Figure 3] in footballers. In cricketers, the greatest trauma was seen in muscles (67.0%), followed by ligaments (13.6%), skin (12.5%), bone (5.7%), and tendons (1.1%). Table 3 exhibited that incidences of acute and chronic injuries in footballers and cricketers were 92.2%, 7.8%, and 87.9%, 12.1%, respectively.

During training periods, 59.7% and 52.4% injuries occurred in footballers and cricketers, respectively. However, the percentage of sports injuries during competitive situations was lower than training periods in both the groups [Table 4].

Table 1: Mean and SD of physical characteristics of footballers and cricketers in this study

Games	*n*	Age (in year)		Height (in cm)		Weight (in kg)	
		Mean	SD	Mean	SD	Mean	SD
Football	61	15.25	1.19	176.16	8.01	55.49	6.35
Cricket	46	18.07	2.81	166.23	6.30	57.27	9.68

Table 2: Incidences of sports injuries in the three major body regions

Sports	Axial (%)	Upper limbs (%)	Lower limbs (%)
Football	14.7	13.2	72.1
Cricket	17.7	36.3	46.0

Table 3: The percentage distribution of acute and chronic injuries in footballers and cricketers

Games	Acute (%)	Chronic (%)
Football	92.2	7.8
Cricket	87.9	12.1

DISCUSSION

The present study was undertaken on district-level footballers and cricketers. The objective was to analyze the incidences of sports injuries at non-elite level because at the state level, national level, and even later on the international level elite players originate from this non-elite class. Injuries sustained for long time or chronic injuries might affect the performance and career of the players.

In the present study, the highest percentage of injuries was observed to be in lower limbs in footballers and proportionately on lower and upper limbs in cricketers. The same had been evidenced in footballers[2,8,16-22] and cricketers[23-26] in the previous studies on club level, high school level, and also in elite level. At non-elite level in West Bengal state, many factors might play a great role in the occurrence of injuries, such as ground conditions, lack of proper muscle strength

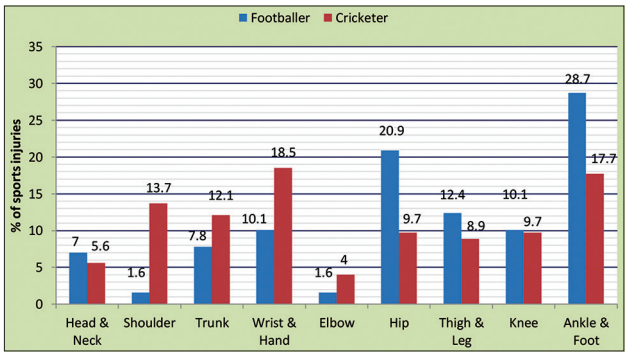

Figure 2: Anatomical locations of incidences of injuries among footballers and cricketers

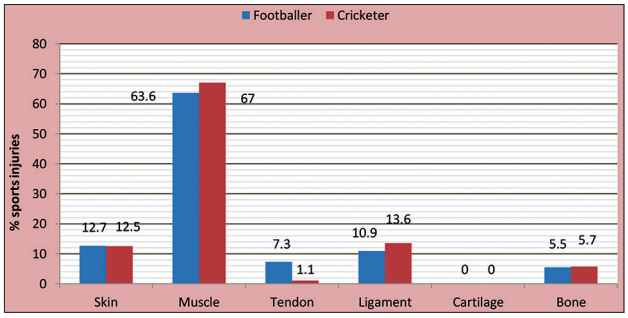

Figure 3: Tissue-wise distribution of injuries in footballers and cricketers

Table 4: Distribution of sports injuries of footballers and cricketers in competition and training periods

Games	Competitive (%)	Training (%)
Football	40.3	59.7
Cricket	47.6	52.4

due to the absence of proper conditioning halls, and also the loss of training hours due to the lack of proper rehabilitation from injuries. The most common injury location was thigh muscles, including quadriceps and hamstrings, followed by ankle and feet.[16-20] The findings clearly indicate the playing nature of football, where the involvement of lower extremities is maximum. The incidences of injuries in the present district level non-elite class football players occurred mostly in the training period as compared to the competition period. However, the studies abroad exhibited that footballers succumbed to injuries mostly in competition than in the training period.[2,9,17-19,21,22] This might have been brought about by the fact that number of competitions in our studies might be less as compared to the other studies abroad, though we did not have a concrete database of number of competitions because these players sometimes play matches out of the record and they were unable to mention the type of competition. This might be a drawback of our study. Even if we go for collecting the data regarding competition matches played by individuals, we may get a biased information.

In cricket, the greatest incidence of injuries was observed in lower limbs, followed by upper limbs and axial region. Every previous article found the highest incidence of injuries in lower limbs. However, the percentage of upper limbs and axial region injuries varied. Four similar types of studies precisely exhibited the same.[23-26] In cricket, the upper and lower limbs exhibited proportionate injuries. The movement patterns and nature of both the games are different. Activities in cricket, unlike football, the upper, and lower limbs are involved almost equally during bating, fielding, bowling, and wicket-keeping. It is evident that the young schoolboy bowlers and provincial bowlers in previous studies receive most injuries on trunk.[25] Shoulder injuries are also common in cricket, and these originate in throwing the ball at different angles and velocities with different flight,[27] especially when the internal: external rotation ratio exceeds 1.5:1. Strengthening the muscles for shoulder rotation are to be enhanced along with shoulder flexibility.

In the present study, the inclusion criteria were minimum 2 years of experience, but mostly these players are undergoing training for 4–6 years. The average entry age of the footballers and cricketers were approximately 10 and 12 years. The training hours in football and cricket were 18 h/week and 13 h/week, respectively. The total number of training days were 2076 and 1952 for footballers and cricketers, respectively.

In our study, mostly the injuries happened during training period [Table 4] in both the cricketers and footballers, unlike the studies abroad where the injuries happened in competition matches than in the training periods.

Acute injuries in cricket are high as compared to the chronic injuries whether it is training or in competitions. The bowlers get the most acute injuries, followed by the fielders.[23-26] Acute injuries, in this study, were also observed to be higher than chronic. Specifically, bowlers and fielders are mostly affected, whether it is competition or training. Depending on the game, in cricket, the wrist and hand, trunk, and shoulder were mostly affected. Bowling side quadratus lumborum asymmetries may also lead to back injuries in fast bowlers.[28]

CONCLUSION

The distribution of sports injuries depends on the nature of sports, competitions, and training procedures. From the present study, the following conclusions are highlighted.

1. District level footballers have a high risk of lower limbs injuries, and there is a need for proper implementation of prevention strategies, and they require proper development of all fitness components
2. The district-level footballers and cricketers occur mostly in skeletal muscle injuries due to insufficient growth of the muscle. The coaches should look into this to prevent injuries to minimize the loss of player power by administrating training to build up the muscle strength
3. In training period, coaches and both the footballers and cricketers have to give more attention on how to prevent injuries and they require proper strategies of training plan to prevent the injuries
4. Further studies are needed to correlate the incidences of injuries and the strength and fitness components of footballers and cricketers.

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Research Article

Investigation of the influence of COVID-19 among college students' health awareness, sports attitude, and sports behavior

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ABSTRACT

In January 2020, COVID-19 broke out in Wuhan, China. Then, the epidemic gradually spreads to the whole country and the whole world. Since there is no specific drug for treatment at present, the body's immune system becomes the last line of defense, physical exercise and health are inseparable. This survey focuses on the sports behavior of Chinese college students during the COVID-19 epidemic. The theory of planned behavior to explain that the health awareness, sports attitude, and sports behavior of college students were investigated and analyzed. The results showed that this COVID-19 epidemic had a positive impact on college students' health awareness and sports attitude, it has played a role in promoting sports behavior.

Keywords: Health awareness, Health communication, Sport attitude, Sports behavior

INTRODUCTION

According to the latest statistics of the COVID-19 (Sohrabi *et al*., 2020) epidemic released by Johns Hopkins University, by October 2020, the COVID-19 has spread rapidly around the world, with nearly 40 million infected people and more than 1.1 million dead people. The US has been confirmed over 8 million cases of COVID-19. At present, most of the researcher on the COVID-19 are in the field of medical health (Lauer *et al*., 2020; Badr *et al*., 2020), and many studies have described the clinical characteristics of COVID-19 patients (Onder *et al*., 2020).

However, during COVID-19, people's anxiety about health was unprecedented. In the absence of effective drugs to treat COVID-19, good health awareness and healthy body play an important role in the prevention of COVID-19 epidemic. Since 1985, when China launched a survey on the physical health of Chinese teenagers, the data show that the physical health of Chinese college students has been declining continuously (Ji and Chen, 2013). The decline of college students' physical health level is related to many factors, lack of physical exercise is one of the main reasons. Therefore, improving the enthusiasm of college students to participate in sports activities is the main measure to improve their physical health. This study mainly explores the relationship between health awareness, sports attitude, and sports behavior.

In the field of sports activities, the theory of planned behavior (TPB; Ajzen, 1988) [Figure 1] is used to understand the influence of factors on intentions and behaviors (Armitage, 2005; Hagger *et al*., 2002).

The previous studies have shown that TPB has been applied to various behaviors intended to cross different cultures (Chiu *et al*., 2014; Park and Lee, 2009; Yang, 2013; Yun and Park, 2010). The study explains the intention of taking part in sports among high school students in Malaysia (Chuan *et al*., 2014). It also explains the great differences in Korean sport behavior intentions (Park and Lee, 2009; Yun and Park, 2010).

Considering its usefulness between different cultures and in the following fields, TPB can be used to check and compare the changes of health awareness, sports attitude,

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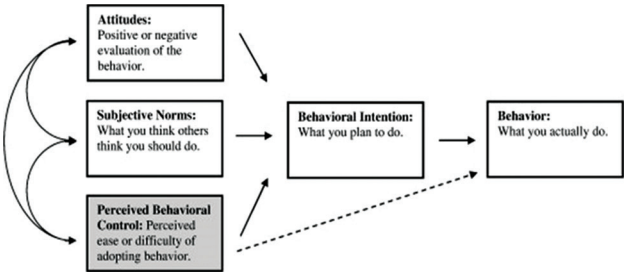

Figure 1: The theory of planed behavior model

and sports behavior of Chinese college students before and after COVID-19 epidemic. Try to put forward corresponding rationalization proposals and solutions, to improve college students' awareness of physical exercise, and to promote the sustainable development of sports behavior.

RESEARCH METHOD

This study takes Xiamen University (Malaysia) 2018 undergraduates as research samples, with the cross-sectional survey method. One hundred and seventy-six females (63.87%) and 143 men (36.13%) were investigated by stratified random sampling. With the self-made questionnaire on health awareness, sports attitude, and sports behavior of college students during COVID-19. The questionnaire consists of six dimensions and 30 questions. A total of 319 questionnaires were distributed in the form of network, 298 questionnaires were recovered, and 278 valid questionnaires, with an effective recovery of 87%.

RESULTS AND DISCUSSION

Demographic Information

A total of 278 undergraduates of Grade 2019 were investigated, including 176 females (63%) and 102 males (38%). The survey involved 29 provinces and autonomous regions. None of the respondents were infected with the COVID-19, but there were confirmed 26 (9%) cases in their communities. It indicated that the COVID-19 was highly contagious, and the infected people were widely distributed. Due to the epidemic prevention measures of local governments, 98.32% of the students were isolated at home and 1.68% were isolated at university.

Health Awareness

According to the new health standards put forward by the United Nations Health Organization, the investigation focused on physical health, social adaptation, and morality (Sharp, 1947). The survey results show that before COVID-19, college students attached importance to their health, with 56%, 40% occasionally paying attention, and 7% generally not caring about their health. About 14% will pay attention to learning health-care knowledge.

After COVID-19 happened, college students' health awareness was obviously enhanced. The number of people who pay attention to health increased to 81%, and the number of health-care knowledge is extremely active increased to 35%. Therefore, the COVID-19 has obvious external stimulating effect on improving college students' health awareness. However, there was no obvious difference before and after the COVID-19 observing hygiene habits. Compared with the standardized observation results, it was found that the hand hygiene behavior was unreliable in several studies (Boyce, 2011; Derksen *et al*., 2020).

Sports Attitude

Sports attitude is the comprehensive performance of students' cognitive evaluation and emotional experience of sports activities. Before COVID-19, 77.3% were interested in physical exercise tendency, and 22.7% were not interested in it. Explain that the charm of sports has affected most college students. However, there are still some students who are not interested, which may be due to the lack of sports facilities, poor self-quality, tired physical exercise, physical education class scores, and other reasons. After COVID-19, the number of interested people increased by 2.5%. It shows that after the COVID-19 happened, home isolation restricted people's movement to a certain extent. Because of the limited space at home, insufficient sports facilities, single form of exercise at home is boring and so on.

After the COVID-19, only 2% thought that physical exercise was not important. Explain that the epidemic situation has a positive impact on the attention of college students to physical exercise, college students are aware of the importance of physical exercise.

Sports Values

Sports values are the value judgment and orientation of sports problems. Before the COVID-19 outbreak, 61% of people agreed that physical exercise was an important means to keep healthy, and 4% of people disagreed. After the COVID-19 outbreak, the number of people who agree very much rose to 92%. The reason for this disagreement may be that, on the one hand, some students realize the importance of physical exercise to health; on the other hand, there may be some reasons such as students' experience of sports injury, their physical condition is not suitable for sports, and they think that outdoor sports are at risk of being infected with viruses. Before the COVID-19 outbreak, 65% thought that physical exercise could regulate mental health, and 32% disagreed. After the COVID-19 outbreak, the number of people who agree very much increased by 10.7%, but decreased by 20% compared with those who disagree. It fully shows that the COVID-19 has brought certain psychological pressure and anxiety to college students and has been relieved and released after physical exercise.

Sports Behavior

Sports behavior is all the external actions of people about sports (Bu, 2008). Before the COVID-19, 10.08% of students did not exercise every week, 24.37% of students exercised 3 times a week, and 4.2% of students exercised every day. After the COVID-19 the number of students who did not exercise every week decreased by 4.2%. Students who exercise 3 times a week increase by 7.56%. The number of students who exercise every day increased by 7.56%.

The comparison before and after demonstrating that college students are aware of the seriousness of the COVID-19 and begin to increase the frequency of weekly exercise.

Sports Behavior Intentions

This dimension is mainly to understand and predict college students' sports behavior. Before the outbreak, 15.97% of college students participated in physical exercise to improve their resistance, 27.73% lost weight, and 26.05% completed physical examination. It shows that before college students participated in physical exercise, they mainly lost weight and completed physical examination. After the COVID-19, the number of people who enhanced their physical resistance increased to 49.58%, while those who had other purposes decreased significantly. It fully shows that the COVID-19 actively guides college students' sports behavior intention. Corresponding to the results of health awareness dimension, the improvement of health awareness brings about a significant gain in sports behavior. After the COVID-19, the motivation of students' physical exercise mainly comes from their own passion, followed by the rigid regulations of the school, and the habit only accounts for 19.33%. The media and sport celebrity effect have little influence. Ramaeker and Petrie (2019) hold the different ideas, they found sports celebrities will encourage men to take physical exercises.

CONCLUSION

Health awareness, sports attitude, and sports behavior are all negatively correlated with BMI index. The three variables all lead to the decrease of BMI index, which makes the body healthier.

However, there is no significant correlation between sports value and sports behavior consciousness and BMI. One possible explanation is that during the current epidemic, to avoid infection, people with high sports value and awareness of sports behavior want to strengthen their body resistance against viruses. However, they pay more attention to how to prevent infection, thus reducing the number of times they go out to exercise. As a result, although individuals have a high sense of sports behavior, the actual sports decrease leads to no significant BMI change.

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Research Article

Comparison of speed and leg power among basketball players and handball women players of the Hyderabad district

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ABSTRACT

The purpose of the study is to find the speed and leg power among basketball players and handball players of the Hyderabad District. The sample for the study consists of 20 basket ball women players and 20 handball women players of Hyderabad District between the age group of 18 and 20 years. To assess the speed the 50 M Run Test and to assess the Leg Power, the standing broad jump test is conducted by the technical officials. It is concluded that handball players is having good speed and basketball players are having good leg power. The motor qualities are very much important in all sports and games for good performance. Hence, coaches must include the conditioning program to develop the physical qualities of all sports persons.

Keywords: Leg power, Motor qualities, Speed

INTRODUCTION

Basketball and handball need to possess a variety of motor fitness capabilities to be successful. Cardiovascular fitness, flexibility, agility, power, and strength are all desirable traits that can be developed with regular training. Strength training for basketball and handball should be as sports specific as possible, and your program should reflect the demands of your sport while still leaving sufficient time and energy for playing practice. Basketball and handball players need to have strong legs to perform better. Once the physical fitness is there, a player can concentrate more on other aspects of the training such as skill, speed, and power.

Purpose of the Study

The purpose of the study is to find the speed and leg power among basket players and handball players of the Hyderabad District.

Previous Studies

A.Naresh and Babaih (2013) published in the International Journal of Health, Physical Education and Computer Science in Sports conducted the Study on Agility among Sepak Takraw and basketball players. It was found in the Study Sepak Takraw Players are having better agility compare to basketball players.

Dr. Kaukab Azeem (2013) published in the Asian Journal of Physical Education and computer Science in Sports conducted the study A Comparative study of agility among Sepak Takraw and Netball Players of Hyderabad District.

Dr. K. Deepla (2014) published in the Asian Journal of Physical Education and computer Science in Sports A study of Aerobic Endurance among Foot Ball Players and Sepak Takraw Players of Hyderabad.

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METHODOLOGY

The sample for the study consists of 20 female basketball players and 20 female handball players of Hyderabad District between the age group of 18 and 20 years. To assess the speed the 50 M Run Test and to assess the Leg Power, the standing broad jump test is conducted by the technical officials.

50 M Run

Purpose

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

Table 1: The Mean values and Independent Samples Test of Standing Broad Jump between basketball players and handball players

Variables	Group	Mean±SD	t	*P* value
Standing Broad Jump	Basketball Players	2.28±0.157	3.55	0.001
	Handball Players	2.24±0.159		

*Significant at 0.05 level

Table 2: Mean values and independent samples test of 50 M run between basketball and handball players

Variables	Group	Mean	SD	t	*P* value
50 M Run	Handball Players	7.20	0.262	4.58	0.000
	Basketball Players	7.70	0.408		

*Significant at 0.05 level

Standing Broad Jump

The standing long jump, also called the broad jump, is a common and easy to administer test of explosive leg power.

Purpose

The purpose of the study was to measure the explosive power of the legs.

RESULTS AND DISCUSSION

In Table 1, the mean values of basketball players are 2.28 and handball players are 2.24. Hence, the basketball players are having good leg power compare to handball players.

In Table 2, the mean values of handball players in 50 M Run are 7.20 and basketball players are 7.70. Hence, the handball players are having good speed compare to basketball players.

CONCLUSIONS

The results of the study show that the basketball players are good in leg power and hand ball players are good in speed.

Recommendations

Similar studies can be conducted among females and in other sports and games. This study is useful to the coaches to prepare the conditioning program to improve their skills in basketball and handball.

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Research Article

A study on urban and rural children in respect of running speed

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ABSTRACT

The aim of the present study was to compare the performance of urban and rural children in respect of running speed (s) for the age ranges of 10–12 years of the subjects. To reveal the differences between urban and rural district population, 100 children from four school of West Bengal were tested. The statistical procedures were adopted for the purpose of data analysis of the present study. The mean, standard deviation, *P*-value, and the *t*-ratio were calculated for the purpose of the study. The results showed that the urban boys and rural boys and urban girls and rural girls are significantly ($t_{0.05}^{48} = 1.677$, $P < 0.05$) differences existed in speed (s) of the subjects. Therefore, urban boys are better performance in speed (s) than the rural boys of the subjects and it also revealed that the urban girls are better performance in speed (s) than the rural girls of the subjects. From the study, it also conclusion were drawn that within girls group, urban girls are better performance in running speed (s) than the rural girls group and among the group, urban girls are best performance in running speed (s), and the rural boys are lowest performance in the running speed (s) of the subjects.

Keywords: Locality, Urban and rural boys, Urban and rural girls, 10–12 years age range

INTRODUCTION

The original idea of "Urban" and "Rural" as two poles of a dichotomy was found to be unrepresentative of the rural world situation (Steward, 1958). An urban area is a human settlement with a high population density and infrastructure of build environment. Urban areas are created and further develop by the process of urbanization. Urban areas are measured for various purposes, including analyzing population density, economic statistics, and urban sprawl (https://en.wikipedia.org/wiki/Urban_area). According to researcher opinion that the urbanization is the rate of change of the proportion of the urban population and similarly, rural population grows at an equal or greater rate. On the other hand, the United Nation estimates by 2006 that more people will live in urban areas than in rural areas (Davoudi and Stead, 2002).

Rubenstein, 1990, said that the settlements which have agriculture as the predominant occupation are called rural settlements. In his view, the primary economic activity of agriculture is the dominant factor in rural settlements. Rural areas, often called the country, have a low population density and large amounts of undeveloped land.-https://en.m.wikipedia.org>wiki-01/08/2020. In general, a rural area is a geographic area that is located outside towns and cities. Typically rural areas have a low population density and small settlements. Agricultural areas are commonly rural, as are other types of areas such as forests. Different countries have varying definitions of rural for statistical and administrative purposes. Rural areas are also known as the countryside or a village in India. It has a very low population density. In rural areas, agriculture is the chief source of livelihood along with fishing, cottage industries, pottery, etc. (https://en.wikipedia.org/wiki/Rural_area).

Running speed (s) ability should not be equated with mechanical speed which is equal to the distance covered per unit of time (Mandal and Biswas, 2017). According to Barrow and Gee (1971), "Speed" is defined as one's ability to perform successive movement of the same pattern at a fast rate. "Speed may also be defined as rapidity with which a movement or successive movements of the same kind may be performed

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by an individual." The duration of the running speed is based on practical experience as well as on some research findings. Henry, 1952, found that sprinters achieve their maximum speed in about 6 s after start. Letzelter, 1975 and 1978, found that the distance over which maximum speed can be maintained as follows: At the end of – 1st s 55%; 2nd s 76%; 3rd s 91%; 4th s 95%, and the 5th s 99%. However, in competitive situation, there have many factors as wind, hydration, injury, gender, etc., can affect the performance of the running speed (s) and the other hand how we can fast run that is under our control (https://www.runnersworld.com/-Link: 05/08/2020).

Purpose of the Study

The purpose of the present study is to compare the running speed (sec) of urban and rural children in the age range of 10–12 years of the subjects.

Research Hypothesis

The hypothesis of the present study is that there would be not any significant difference in the running speed between urban and rural school children in the 10–12 years age ranges.

Significance of the Study

The result of the study may of great help to the research scholar, teachers, and also to the students for better ideas and also for further investigation.

Research Method

The method of this study consists of selection of subjects, selection of variables, criterion measures, testing method, and the statistical technique employed for data analysis of the subjects.

Sample of the Study

For the purpose of this study, 100 (n = 100) students were selected with the age ranges of 10–12 years. There were four groups as urban boys, rural boys, urban girls, and rural girls and each group consists of 25 students or subjects with the same gender, that is, in urban and rural boys group there were exist only boys subjects, in urban and rural girls group there were only girls students exist. Especially, there were also mention that in urban boys group, there were only 25 male students included, where 10 years male subjects (n = 8), 11 years male subjects (n = 8) and 12 years male subjects (n = 9) were consisted of the group. Similarly, rural boys group, urban girls group, and the rural girls group in the same way consisted the group. The subjects were selected with systematic random sampling method from different urban and rural areas of school in different district in West Bengal. The willing students of the school were considered as subjects, if they fulfill the age range criterion of the study. The researcher were collected the date of birth from the subjects and it was considered in completed age ranges as 10–12 years.

Criterion Measures

The scores of the subjects on the 50-yard dash test were used as the criterion measure for this study. The test 50-yard dash (Johnson, 1970) was adopted as the criterion measure for the variable of the running speed (s) of the subjects.

Statistical Technique

The mean, standard deviation, and the t-test were statistically used by the calculation of statistical method for the analysis of the present study. The significant level of the present study was set up at 0.05 levels. The obtained P-value is also significant for the present study.

RESULTS AND DISCUSSION OF FINDINGS

The results of urban and rural children of the schools for 10–12 years age range in respect of running speed (s) are stated in Table 1. Table 1 shows that the mean and standard deviation of urban and rural boys are 10.53 ± 0.47 and 9.02 ± 1.71 and similarly, in urban girls and rural girls are 12.59 ± 2.91 and 10.79 ± 1.49, respectively. Table 1 represents that the urban boys and rural boys group are significantly difference in means in the running speed (s) of the subjects and it also revealed that the urban girls and rural girls are significantly difference in means in the running speed (s) of the subjects.

Table 1 represent that the obtained t value are significant in speed (s) of urban and rural boys. Therefore, urban boys are better in running in speed (s) than the rural boys which are significant as $P < 0.05$. Table 1 revealed that the calculated t-value 2.7443 which is greater than the tabulated t-value 1.677 as $P < 0.05$. Hence, the urban girls are better performance in speed (s) than the rural girls according to the analysis of the data.

Figure 1 shows that the graphical presentation of urban and rural children in respect of running speed (s) of the present study. Figure 1 presents that the urban boys are better performance in speed (s) than the rural boys and the urban girls are better performance in running speed (s) than the counter part of the present study. Figure 1 also revealed that the urban girls are best performance in running speed (s) among the

Table 1: Mean ± SD, *P*-value and t-ratio of 10–12 years children in respect of speed (s)

Groups	Mean±SD	*P*-value	t-ratio
Urban Boys (n=25)	10.53±0.47	0.000093	4.266*
Rural Boys (n=25)	9.02±1.71		
Urban Girls (n=25)	12.59±2.91	0.0085	2.744*
Rural Girls (n=25)	10.79±1.49		

$T_{0.05}^{48}$=1.677; * Significant at 0.05 level

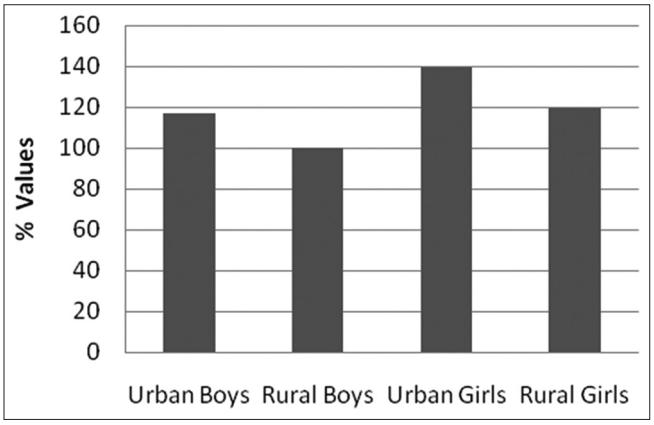

Figure 1: Graphical presentation of urban and rural children in respect of speed (s)

groups and the rural boys are lowest performance in running speed (s) in the present study.

According to the researchers like (Fenna *et al*., 2016); (Sandercock *et al*., 2011) opinion about the polish nationwide research materials that the running speed (s) of urban children is substantially better than in rural children which are similar with the present study. The investigator was obtained from the present data that the mean differences of urban and rural children in running speed (s) which is similar opinion of the researcher like Maria *et al*., 2003. Figure 1 also shows that the rural girls were better than the boys group in the performance of running speed (s) which is similar opinion with the researcher like Ciesla, 2014.

Conclusion of the study: (a) The study was confined to the age range of 10–12 years for the said group. (b) In the present study, there have four groups as urban boys, rural boys, urban girls, and rural girls, respectively. (c) Between boys group, urban boys are better than the rural boys in the performance of running speed (s). (d) Between girls group, urban girls are better performance in running speed (s) than the rural girls and (e) Among the group, urban girls are best performance in the running speed (s) and the lowest performance in the running speed (s) of the rural boys.

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Research Article

A analytical study of injuries among defenders and forward men hockey players of Telangana state in India

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ABSTRACT

Engaging in sport and games has numerous health benefits but also carries the risk of injury. Field hockey players may also develop overuse injuries from repetitive movements. Because of the low positioning of the body while playing, the lower back, groin, knee, and calf are particularly vulnerable to overuse injury. The sample for the study consists of 50 male Hockey players, that is, 25 Forward Hockey Players and 25 Defending Hockey Players in the age group of 19–22 years. The data are collected through questionnaire. It is concluded that forward hockey players the lower extremities injuries are 45%, upper extremities injuries are 25%, head and neck injuries are 15%, and Spine 15%. It is concluded that defending hockey players the lower extremities injuries are 50%, upper extremities injuries are 30%, head and neck injuries are 15%, and Spine 05%. This type of study is useful to coaches to give proper coaching for the development of motor qualities for the prevention of injuries among players.

Keywords: Injuries, Lower extremities, Spine, Upper extremities

INTRODUCTION

Engaging in sports activities has numerous health benefits but also carries the risk of injury. At every age sports persons sustain a wide variety of soft tissue, bone, ligament, tendon, and nerve injuries caused by direct trauma or repetitive stress. Different sports are associated with different patterns and types of injuries, whereas age, gender, and type of activity influence the prevalence of injuries.

Players may also sustain injuries to the head, face, shoulder, arm, thigh, and knee. This may occur with or without contact with other players, from blows from a stick or a ball, or from being run into. Common injuries include pulled muscles in the thigh and groin, blows to the thigh and sprained joints, especially in the knee, shoulder, and elbow.

Common Injuries in Field Hockey

- Ankle sprain
- Hamstring strain
- Quadriceps contusion (dead leg)
- Back pain
- Groin strain
- Anterior cruciate ligament (ACL) injuries
- Collateral ligaments injury
- Dislocated shoulder
- Medial tibial stress syndrome (shin splint)
- Fractures in the hand
- Cuts and bruises to the face or head.

Karen Murtaugh's (2001) studied that field hockey injuries field hockey are a popular sport that is played throughout the world. This research reveals that most injuries are minor and that the most common injury is an ankle sprain. Studies also suggest that men have a higher rate of injury and that they experience severe injuries more often than women. These severe injuries include trauma to the head, face, and upper limb and usually are the result of contact with the stick or ball. Consequently, many authors suggest that all players wear face and hand protection. Current International Field Hockey Federation rules recommend minimal protective equipment (e.g., mouthguard, shin, and ankle guards), and surveys indicate that many players do not wear mouthguards regularly. Looking into the future, research should focus on developing and evaluating effective strategies for injury prevention.

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Table 1: Percentage of injuries among forward hockey players

lower extremities injuries	Upper extremities	Head and neck	Spine
45	25	15	15

Table 2: Percentage of injuries among defending hockey player

lower extremities injuries	Upper extremities	Head and neck	Spine
50	30	15	05

Population and Sample Group

The sample for the study consists of the sample for the study consists of 50 male Hockey players, that is, 25 forward hockey players and 25 defending hockey players in the age group of 19–22 years. The data are collected through questionnaire.

Research Instruments

Questionnaire forms were used to collect the data and were distributed to participants who regularly practice of hockey defenders and forwards players in Telangana state.

The form included items on age, gender, length of practice, and injury diagnosis.

Lower extremities (ankle sprain, hamstring strain, quadriceps contusion [dead leg], groin strain, anterior cruciate ligament [ACL] injuries, and collateral ligaments injury) Upper extremities (Dislocated shoulder, and Fractures in the hand) (Head and Neck) (Cuts and bruises to the face or head) Spine (Back Pain).

RESULTS AND DISCUSSION

It is concluded that forward hockey players the lower extremities injuries are 45%, upper extremities injuries are 25 %, head and neck injuries are 15 %, and Spine 15%.

It is concluded that defending hockey players the lower extremities injuries are 50%, upper extremities injuries are 30%, head and neck injuries are 15%, and Spine 05%.

Research Recommendations

Sufficient warm-up, proper technique, correct biomechanics, proper conditioning, optimizing balance, coordination, optimizing reaction times, optimal diet, adequate rest, and positive attitude will reduce the risk of injuries. Increase your flexibility by performing dynamic warm up before practice and competition, followed by static stretching post activity. Consult a coach or physical trainer to incorporate the conditioning programs during the practice.

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Research Article

Effect of continuous training and circuit training for the development of aerobic fitness among long distance runners of Osmania University

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ABSTRACT

The purpose of the study is to find the Aerobic Fitness among long distance Runners of Osmania University, Hyderabad. The study is delimited to the Male Long Distance Runners of Students Studying in Degree College of Osmania University participated in the Cross country Races, Road Races, and other long distance events. The subject belongs to 19–22 years of age group. The three equivalent groups of thirty members as two experimental groups, that is, Circuit Training Group (n = 30) and Continuous training group (n = 30) and a control group (n = 30) passing through Circuit training for 12 weeks furthermore 3 days of every week. Continuous training for 12 weeks furthermore 3 days out of every week for the Group III went about as a control which has normal long distance training apart from which they were not involved in any special training. In 12 min Run Cooper Test, the Continuous Training Group has performed better than circuit training group and control group and improved in Aerobic fitness.

Keywords: Aerobic fitness, Circuit training, Continuous training

INTRODUCTION

Continuous training is a form of endurance training with interval training short to modern periods of work are alternated with short to moderate periods of rest or reduced activity. Circuit training is developed by the Scientist Morgan R.E. and Adamson G.T. at University of Leeds in the year 1957. This is Resistance to develop the motor abilities such as strength, speed, and endurance. Circuit training is a exercise "circuit" which consists of prescribed exercises which includes for the upper body, lower back, abdomen, and Lower body. It can be done with own body weight and using the resistance exercises such as Barbells and Medicine Balls.

Dr. Pradeep Kumar Lenka (2019) studied the Effect of Resistance Training and Circuit Training on selected Physical and Physiological Variables Among College Male Boxing Players, thirty male boxers were selected from Jivan Jyoti Trust Education Society who have represented an inter collegiate tournament. It has proved that resistance training and circuit training is helpful for development of physical and physiological variables among boxers.

Prof. Rajesh Kumar (2018) studied about the effect of hill training for the development of Aerobic fitness among middle and long-distance runners of Hyderabad District in India. The sample for the study consists of 45 middle and long-distance runners between the age group of 18–20 years those who have participated in many middle and long-distance events since past 3 years. The selected subjects were randomly divided into three equal groups of 15 each. Group I is experimental hill training group, Group II is experimental fartlek training group, and Group III is control group. The experimental groups were given training alternate days for 12 weeks in addition to their normal practice on other days. The control group was given routine training. The data were collected in pre-test and post-test for all groups using the 12 min run cooper test. The collected data were analyzed statistically using ANCOVA. The results of the study show that due to hill training and fartlek training there is a significant development of Aerobic fitness among experimental groups.

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Table 1: Mean, standard deviations, and one-way analysis of covariance (ANCOVA) in cooper test 12 min run of continuous training, circuit training, and control group among long-distance runners of Osmania University

Test	Continues Training	Circuit Training	Control Group	S O V	Sum of Squares	df	Mean Squares	F-ratio	*p*-value
Pre test	2391.83	2365.00	2348.33	B	28900.55	2	14450.27	1.669	0.194
Mean	102.57	90.45	85.29	W	753390.83	87	8659.66		
SD									
Post test	2678.50	2518.30	2293.33	B	2246274.02	2	1123137.01	129.92*	0.000
Mean	109.11	79.78	87.53	W	752058.46	87	8644.35		
SD									
Adjusted Mean	2657.76	2521.29	2311.07	B	1766839.30	2	883419.65	467.25*	0.000
				W	162597.46	86	1890.66		

*Significant (P<0.05).

Table 2: Sheffe's *post hoc* test for the Differences among Adjusted Means of Run Continuous, Circuit, and Control Group among Long-distance Runners of Osmania University in Cooper Test (12 Min Run)

Continues training	Circuit training	Control group	Mean difference	*p*-value
2657.76	2521.29		136.47*	0.000
2657.76		2311.07	346.69*	0.000
	2521.29	2311.07	210.22*	0.000

*Significant (P<0.05)

Table 3: Comparison of statistical results among all groups of long-distance Runners of Osmania University in 12 min run, that is, Cooper test

Name of the group	Statistical tool	Cooper 12 min run		M.I
		Pre-test	Post-test	
Continuous training group	Mean	2391.83	2678.5	11.98
	Sd	100.85	107.28	
Circuit training group	Mean	2365	2518.3	6.48
	Sd	88.94	78.44	
Control group	Mean	2348.33	2293.33	-2.34
	Sd	883.86	86.07	

METHODOLOGY

The study is confined to 90 men long-distance runners those who are attending the Athletics coaching camps at Nizam College, Osmania University Grounds, Forest College, and others grounds of Hyderabad District. The study is delimited to the male long-distance runners of Students Studying in Degree College of Osmania University participated in the cross country Races, Road Races, and other long-distance events. The subject belongs to 19–22 years of age group.

The three equivalent groups of thirty members as two experimental groups, that is, circuit training group (n = 30) and continuous training group (n = 30) and a control group (n = 30) passing through circuit training for 12 weeks furthermore 3 days out of every week. Continuous training for 12 weeks furthermore 3 days out of every week for the Group III went about as a control which has normal long-distance training apart from which they were not involved in any special training.

Continuous training of 30 members given training on weekly 3 days, that is, Monday, Wednesday, and Friday at Nizam College Grounds for 12 weeks. Circuit training of 30 members given training on weekly 3 days, that is, Tuesday, Thursday, and Saturday at Osmania University Grounds s for 12 weeks. Control group of 30 members was given general training of Athletics at Forest College.

RESULTS AND DISCUSSION

The pre-test mean 12 min run cooper test of continuous training group is 2391.83, circuit training 2365.00 and CG is 2348.33 and PT mean 12 min run test of continuous training group is 2678.50, circuit training 2518.30 and control group is 2293.33. The adjusted mean of continuous training group is 2657.76, circuit training group is 2521.29, and control group is 2311.07.

The results among the adjusted means of the continuous training are 2657.76, circuit training is 2521.29, and control group is 2311.07. It shows that continuous training mean of 2657.76 is better than circuit training mean of 2521.29 in cooper test of 12 min run test.

It shows the pre-test mean 12 min run cooper test of continuous training group is 2391.83 , circuit training 2365.00, and control group is 2348.33 and post-test mean 12 min run test of continuous training group is 2678.50, circuit training 2518.30, and control group is 2293.33.

In 12 min run cooper test, there is a significant difference between the continuous training group than circuit training group and control group.

Recommendations

The following suggestions are made for the benefit of players, coach's academicians, and sports scientists. The researcher makes a suggestion on the part of the coach to use the above said development of circuit and continuous training programs for long-distance runners. The study helps the physical educationist and coaches for selecting the athletes.

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Research Article

Evaluation of Sports Training Program of Marikina Polytechnic College as Perceived by the Coaches and Athletes

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ABSTRACT

Evaluation of sports training program should be practical and applicable to all sports. Thus, evaluating such program is very important for the improvement and success of the student-athletes. This study aims to evaluate the existing sports training program of Marikina Polytechnic College (MPC) as perceived by the athletes and coaches. It also aims to come-up with a proposed comprehensive sports training program for the school based on the findings of the study. The respondents of the study were all 129 athletes and 13 coaches who participated from the State Colleges and Universities Athletic Association-National Capital Region 2018 Season 31. The researchers used purposive sampling technique. Descriptive method of research was utilized in the study. Percentage, frequency, and weighted mean were the statistical tools employed in computing data. The result of the study revealed that most of the athlete and coach respondents interpret satisfactory level on the Evaluation of MPC's Sports Training Program in terms of instructional content; training strategies; scheduling system; administrative support; and training facilities and equipment. Both coaches and athletes also agree that the inadequacy of facilities and equipment is the major contributory factor in sports-related problem in MPC. It was then recommended to the administration to build new or renovate existing sports facilities to prepare athletes for future competition. The college should set activities that refine and develop integrated skills from various sports and provide training activities that create habits and behavior conducive to each athlete's full development. Finally, the proposed enhanced sports training program is highly recommended to improve the quality of sports development programs being offered.

Keywords: Sports training program, Evaluation, Problems Encountered

INTRODUCTION

Sports training program in sports is a step-by-step way of improving oneself in the sports one is engaged in. This also serves as a preparatory program to increase the competency level of the athletes. It is the basic framework to strengthen the competitiveness of the athlete.

Kelly (2014) stated that the purpose of sports training is to develop and strengthen the strategies, technique, and skills. To help improve an athlete, one needs to identify the correct stimuli to perform a skill execution correctly. Aside from providing athletes proper training and preparation, a sports training program is also the best venue for testing and assessing the athletes. As far as the training program is concerned, assessment provides the coaches and athletes particular components that need to be improved and strengthened. Milroy (2010) stated that programs in training are utilized by competitors of all of levels of ability to improve execution by expanding strong quality and continuance, dexterity, adaptability, and cardiovascular capacities.

To prepare for elite sport performance, sportspersons must undertake thousands of hours of training. The training process is dependent on many variables which coaches strive to structure and control to allow the sportspersons to achieve their goals (Saavedra, Escalante, Garcia-Hermoso, and Dominguez, 2013). Gaal (2012) stated that when one approaches his multisport training, the best way to answer his questions is to better understand the principles behind the work he is putting in to improve.

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Philippine Sports Commission (2014) states that if there is one best way to develop the highest human potential in mind and body and to transcend social, political, and cultural differences, it is through sports. Sport's major reasons are to promote physical activity, improve motor skills, and enhance psychological development (Holt *et al*., 2017). Furthermore, sport is also one of the best popular activities among young people, which is also considered as one of the effective ways to keep student out of trouble (Bowen and Greene, 2012).

With this, it is imperative that educational institutions should provide attention to sports training. Sports training, based on scientific knowledge, is a pedagogical process of sports perfection through which systematic effect on psychophysical performance ability and performance readiness to lead the sportsman to his highest performance (Kumar, 2017). Thus, sports training is the basic form of preparation of sportsmen which aims to achieve maximum efficiency in selected sports disciplines which are limited by rules.

A better understanding of an effective sports training program is clearly stated on a study made by Howell and Sinri (1977) which describes that most of the universities in the Unites States had taken the lead in their sports development that is why majority of high achievers in sports in national and international levels are produced by American University System. The authors explained that these institutions take the responsibility of the following: Supplies and equipment. Universities have their own stadia, offer free uniform, and provide huge budget for sports annually. Coaching: Full-time coaches are hired to supervise the training and assure the skills development of athletes. Recruitment of athletes: Scholarship and flexible tutorial systems are offered to accommodate athletes who wish to undergo training while studying (Bennet *et al*., 1977).

Hence, from the American experience in university sports, it gives the idea that sports development program in school is a function of adaptation of academic, administrative, material and human resources, student, and training program factors to the demands of high athletic standards.

As pointed out by Yadav (2016), games and sports are specialized fields that require a specific, scientific, and systematic type of training to improve the performance of a player. Each activity requires a specific type of physical fitness components. Thus, to improve these components, a specific type of training is required. The program of training process is known as sports training. Sports' training is the branch of science which helps to increase sports performance. Sports training program improves physical fitness components along with health illness. It guides them the correct method to perform physical activity. The sports training program also guides them to have preventive, safe, and correct ways of performing physical activity. Nowadays, every sports competition is becoming tough. Thus, best training methods should be developed and utilized to keep the athletes at par.

Consequently, assessing, recording, and monitoring are important in the process of designing an effective training program. Designing such a program is a necessary and obligatory step for the purpose of having constant, systematic, and realistic activities. These activities should be well planned and all are subjects to a long-term development. Along with this, a deliberate sports training program is also proven to be the best venue for testing and assessing athletes, and coaches to know what particular components are needed to be improved and strengthened.

In connection with the foregoing, this study would like to probe the sports training program capacity of an educational college institution, particularly, the Marikina Polytechnic College. As of to date, the said college is one of the participant schools in the State Colleges and Universities Athletic Association-National Capital Region (SCUAA-NCR), along with the other SUC including Polytechnic University of the Philippines, Rizal Technological University, Philippine Normal University, Technological University of the Philippines, Eulogio Amang Rodriguez Institute of Science and Technology, and Philippine State College of Aeronautics. The SCUUA-NCR aims to showcase the different sports skills and to build a good camaraderie among the athletes of the said SUC.

The members of the organizations take turns in hosting the SCUAA Meet, and for the 1st time in 30 years, finally, the MPC took its turn to host and open the 31st SCUAA-NCR. This is the only sports competition that the MPC has been joining for years. However, it was found that the MPC has no formal or written guidelines when it comes to Sports Training Program of coaches and athletes, considering its SCUAA-NCR membership.

It is now the purpose of this study to evaluate the existing sports training program and determine the problems encountered by coaches and athletes. It also aims to come-up with a proposed comprehensive sports training program for the school, based on the findings of the study.

METHODOLOGY

The study focused on the Evaluation of Sports Training Program of Marikina Polytechnic College. The descriptive method of research was utilized in the study. According to De Guzman (2013), descriptive-evaluative research involves collection and analysis of information relating to the effectiveness and functioning of a program and procedure. The type of descriptive method used by the researcher is the survey method where respondents answer questions administered through questionnaires.

The respondents of the study were 13 coaches who handled particular team and all 129 athletes from different events for the SUC Athletics Association Competition (SCUAA) year 2018. Due to the limited availability of the athletes and coaches, the researcher used the purposive sampling technique.

Description of Respondents

Table 1 shows the frequency and percentage distribution of the coaches and athletes participated in the study.

As shown in Table 1, all coach-respondents are males and most of them range from 31 to 35 years old. Most of them are novice and coaching in individual/dual/combative and team sports. On the other hand, most of the 129 athlete-respondents are male. Majority of them belong to the age bracket of 20–22 years old and have been playing for 1–3 years in both sports event category.

Research Instrument

Researcher's made questionnaire was adapted and utilized in the study. Two sets of survey questionnaire were designed; the survey questionnaire for coaches and the survey questionnaire for athletes. The survey questionnaire for coaches and athletes consists of the following parts; Part I – Coaches/Athletes Profile; Part II – Assessment of the Sports Training Program of MPC in terms of instructional content, training strategies, scheduling system, training facilities and equipment, and administrative support; Part III – Dissemination of letter to gather data (coaches, number of athletes, events, and their name for last season of SCUAA-NCR); and Part IV – Dissemination of letter to conduct survey.

Using Delphi technique, it was validated and underwent three rounds of revisions by the experts in the field of physical education and sports. Initial pilot testing was also conducted to 30 respondents to be able to identify the flaws and limitations in the content of the instrument. These respondents are from local university and college. This is made to ensure the objectivity of the actual survey. The Cronbach's alpha was used to test the reliability of the questionnaire. As it is a statistical method used to ensure that the questions asked relate to the construct that is intended to be measured. It is commonly used to determine internal consistency of a given test. The coaches' survey results in a Cronbach's Alpha score of 0.937 which is also interpreted as having excellent internal consistency. The athlete's questionnaire gained a result of 0.933 which interpreted as having excellent internal consistency. All questions presented in the survey are essential and reliable.

Data gathering Procedure and Statistical Treatment of Data

The researchers requested specific line-up data from Office of the President and from the Sports Coordinator of the MPC to determine the sample size after the sample drawn. A letter requesting to conduct a survey among athletes was sent to the Office of the President which was further approved. Afterward, the researchers organized questionnaires which passed a thorough validation and

Table 1: Profile of coach-respondents

Profile	Coaches		Profile	Athletes	
	Frequency	Percent		Frequency	Percent
Sex					
Male	13	100.00	Male	92	71.32
Female	0	0.00	Female	37	28.68
Age					
46 and above	4	30.77	26 and above	3	2.33
41–45	1	7.69	23–25	10	7.75
36–40	2	15.38	20–22	89	68.99
31–35	5	38.46	17–19	27	20.93
21–24	1	7.69			
Sports event					
Individual/dual/combative Sports	7	53.85	Individual/dual/combative sports	57	44.19
Team sports	6	46.15	Team sports	72	55.81
No. of years in coaching			No. of years in playing		
Veteran (6–10)	2	15.38	4–6 years	5	3.88
Novice (1–5)	11	84.62	1–3 years	81	62.79
			<1 year	43	33.33
n =13			*n*=129		

conducted an initial pilot testing. After, the researcher coordinated with coaches to get the training schedules of the coach and athlete respondents.

The researchers distributed the questionnaire containing the needed information to the respondents as scheduled. After giving the instruction, the researchers allowed the respondents to answer the questionnaire. The researchers gathered data from coaches and athletes who were part of the SCUAA-NCR 2018. The retrieved data were then prepared for tallying, computation presentation, analysis, and interpretation.

Using SPSS software, data were treated and presented using frequency and percentage distribution for the profile of the respondents and the problems encountered in the said program. Whereas weighted mean and ranking were used to present evaluation of the sports training program of the school.

RESULTS AND DISCUSSION

Coaches and Athletes Evaluation of the Sports Training Program

Table 2 depicts the overall mean of the coaches' and athletes' evaluation of the sports training program of the school.

Based on the findings, majority of both coaches and athletes evaluated the sports training program of the school satisfactorily with an overall mean of 3.36 and 2.98, respectively.

Mountjoy ***et al***. (2008) emphasized the importance of sports training for the elite athlete. The essential objective is ensuring the advancement of safe practices in the preparation for the world class type competition. As Yadav (2016) points out, games and sports are specialized fields that require a particular, scientific and structured type of training to improve the performance of a player. Each behavior requires a specific type of components of physical health, so a specific type of training is necessary to enhance these components.

Overall, it only implies that though coaches and athletes sports training program satisfactorily, there are still a lot of areas for improvements.

Problems Encountered by Coaches and Athletes under Sports Training Program

It can be gleaned on the data that the "Inadequate facilities and equipment" was the most frequent problem that they encountered under sports training program as identified by both coaches and athletes, followed by "Unpleasant training environment and "poor identification of the needs of athletes." It only confirmed that these problems are very evident in their school.

Success of sports programs depends on a number of factors, one of which is availability of sports facilities. Lack of sports facilities is a major detrimental factor in the development of sports cultures in colleges (Londhe, 2013). Furthermore, the availability of programs and recreational sports facilities has an impact on students to attend and remain at an institution (Lindsey *et al*., 2009).

Lack of adequate facilities compromises the quality of preparation in sports and also denies students the opportunities to enjoy sports. Moreover, arranging the right place in exact sporting facilities is critical to increasing participation (Sports New Zealand, 2016). In addition, Krug (2014) emphasized that training facilities are constantly in use and must be designed to be as functional as possible. Before the facility is even open, players' traffic patterns and how they will use a space must be understood and reflected in the layout. Connectivity to the campus and accessibility for both students and fans whenever possible is an emerging trend. Renovations to its facility have focused on integrating the student-body and campus, allowing non-athletes to experience and interact with the training facility nearby.

Sports equipment and practice facilities are used to prepare teams for a season or throughout a game week to prepare for particular opponents. The equipment and facilities used in this manner are extremely important to a teams' performance. Thus, the school administrators should allocate sufficient budget for the improvement and maintenance of the facilities and equipment (Nero, 2010).

This implies that adequate facilities and equipment are important for every institution. Furnished with state-of-the-

Table 2: Overall mean of the coaches' and athletes' evaluation of the sports training program

	Coaches	Verbal interpretation	Athletes	Verbal interpretation
Instructional content	3.20	Agree/satisfactory	2.99	Agree/satisfactory
Training strategies	3.34	Agree/satisfactory	3.10	Agree/satisfactory
Scheduling system	3.33	Agree/satisfactory	2.93	Agree/satisfactory
Administrative support	3.45	Agree/satisfactory	3.01	Agree/satisfactory
Training facilities and equipment	3.48	Agree/satisfactory	2.90	Agree/satisfactory
Overall mean	3.36	Agree/satisfactory	2.98	Agree/satisfactory

Table 3: Problems encountered under the sports training program

Problems encountered	Coaches		Problem encountered	Athletes	
	Frequency	Rank		Frequency	Rank
Inadequate facilities and equipment	12	1	Inadequate facilities and equipment	70	1
			Unpleasant training environment	48	2
Unpleasant training environment	7	2.5	Too long- or short-time allotment for the conduct training	30	9
Poor identification of the needs of athletes	7	2.5	Poor instruction	37	8
			Unfair evaluation system or ranking	16	15
Poor training strategies	6	4.5	Unjustified implementation of policy regarding training	25	12
Too long- or short-time allotment for the conduct training	6	4.5	Unpleasant coach personality (grooming, attitude)	18	14
Unfair evaluation system or ranking	1	14	Inappropriate coaching styles	27	10
			Poor training strategies	46	4
Inappropriate coaching styles	1	14	Poor monitoring of athletes' safety	43	6.5
Unfair assessment of the athlete's performance	1	14	Unfair assessment of athletes' performance	26	11
			Poor identification of the needs of athletes	47	3
			Poor pressure (problems with teammates)	43	6.5
			Poor training management skills	44	5

art training equipment, technology, facilities, and modern amenities will definitely result to the athletes' and coaches' improvement of their athletic performance and reduce risk of injury during practice and sport competition. It may also attract students to participate in different sports.

CONCLUSIONS AND RECOMMENDATIONS

This study aims to evaluate the existing sports training program and determine the problems encountered by the coaches and athletes. It also intends to come-up with a proposed comprehensive sports training program for the school, based on the findings of the study.

Based on the findings, it can be concluded that both coaches and athletes rated the sports training program satisfactorily. I can be implied that the efforts of the school in implementing the sport training programs were appreciated by the both athletes and coaches, having a passing rate. But on the contrary, in terms of the problems encountered by both coaches and athletes, inadequacy of facilities and equipment; unpleasant training environment; and poor identification of the needs of athletes were the top most frequent problems. It seems that though they rated the sports training programs satisfactorily, there are still rooms for improvements that they are wishing for.

It is highly recommended that the coaches and trainers must continue to attend seminar-workshops in the local, national, and international levels to enhance their coaching competency, abreast the current trends, and issues in the field of sports and competitions. This would also help them to fully utilize their strategies and techniques. In the absence of the facility, the school may create public-private partnership with other organization for the utilization of its standard facilities needed by the coaches and players for their trainings. While for the long-term plan, the administration might want to consider building or renovating existing sports facilities to prepare athletes for future competition. A periodic monitoring and evaluation on the maintenance and improvement of the sports facilities and equipment is also advised.

Finally, the utilization of the proposed year-round sports training program which includes conditioning period, skill development period, mastery and perfection period, pre-competition period, and competition period is greatly recommended.

For future researchers, it is suggested to come up with a parallel study utilizing qualitative method as an eye opener to further understand the topic.

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Research Article

A Case Study of Poor participation Of Indian Women in Sports and Game With Special Reference to Odisha State

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The modern concept of being glamorous can never be ignored in games and sports, does not mean that it has to derail the children and the youths for the right social behavioral tracks. Here, the sponsors, the financing agencies play a major role for rising nudity in modern games and sports. Many major and brand companies think to market their products making a heavy contact to the sports personnel for it most display of body (sensual parts) with sensitive contortions of body. These we find Sania Mirza, Williams's sister and many in tennis wearing scantily and playing in a more junking mode. The role of media, particularly the cameramen seen more intentional at reflecting all these with slow view mode but why?

In traditional Indian society, women can be looked as member of the family, or a group as daughter, wife or mother or sister, and not as an individual with an identity or right of her own. The radicalism of the constitution and its implicit assumption that every adult women, whatever her social position or accomplishments, will flinction as a citizen and as an individual partner in the task of nation building, have not yet changed the status of women in our society.

In modern olympic women are creating new world and olympic records by participating in athletics and games of olympic, but the participation of women contingent in olympic is very poor. In our country also, it is observed that Indian women are not taking that much interest in participating. Reasons for non-participation can be many. These are psychological, physiological, social, economical, and of many other types. It is also observed that parents also do not allow girls to participate in games and sports, though the girls are interested in participating.

It is also thought that the reason may be of physiological type, as due to female body structure the women find difficulties in executing the skills required for games and sports. This can also be one of the reasons apart from social and economical reasons.

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Indian Society does not permit women to participate in sports and games. Therefore, Indian women feel shy of participating in sports and games, because of prevailing Indian customs and traditions economical reasons also cannot be overlooked. Costly equipment and cost of travels for competitions in other cities also are obstacles in the way of participation.

Women participated for the 1st time in 1928 olympics. Today, they are still lagging behind men even though the coaches, the facilities, the techniques, and the climatic conditions remain the same. The drawbacks inherent in them in giving them a second rank next to men only, perhaps are anatomical aspects and social taboos which play a major role in controlling their performances.

At present, the women are taking interest in all the athletic events, games, and sports. Women are also taking part in pole vault, triple jump, and other activities which are supposed to be the activities for men only by going through all these historical evidences regarding participation in sports, it has observed that the women are very much interested in participating in games and sports but due to male dominated world women were getting less chances for better exposure in participation.

Statement of the Problem

The problem is stated as; "A case study of poor participation of Indian women in sports and game with special reference to Odisha state."

The above problem was selected on Odisha's women and it was decided to conduct this study on state level, because, India is a vast country having different types of traditions, cultural, climatic conditions, social environment, economical status, and other differing factors. Hence, the researcher had taken his own state. In modem times, women are creating new records

in all the events in olympic games, but participation of women contingent in olympic games is decreasing.

In our Odisha state, it is observed that women are not taking that much interest in participating. Reasons for non-participating can be many. These are psychological, physiological, social, economical, and of many other types. It is also observed that parents also do not allow girls to participate in games and sports, though the girls are interested in participation. It is also thought that the reason may be of physiological type, as due to female body structure the women find difficulties in executing the skills required for the games and sports.

Significance of the Study

The researcher has selected the problem to locate the causes of poor participation of the Odisha's women in sports and games. The study was very important and significant because:

I. The study probably related to the women who were denied participating in male dominated sports and games which were thought to be the "male domain." Therefore, the causes of less participation of the Indian women were traced out
II. The study would be significant in tracing out the views of the parents and guardians of women players about their encouragement or discouragement for participation in sports and games
III. The views of the family members regarding women's participation would be found out
IV. The study would be helpful in finding out the facilities available in various parts of the state along with separate facilities for women
V. Tins study would also help the various organizations and institutions to take the measures in creating interest in girls and women for more participation in sports and games
VI. The study would be helpful to locate the various causes of poor participation of women in games and sports
VII. This study is significant because it would suggest the ways and means to the government, sports institutions, clubs, and other social organizations and agencies how to create interest and motivate the girls and women to participate in games and sports in large number
VIII. This study is also significant because it would wash out the misconceptions from the minds of people about the ill effects of the games and sports on the physiological factors of girls and women.

Purpose of the Study

The scholar decided to undertake the study to locate the causes of poor participation of Odisha's women. This study was mainly divided into five factors.

a. Sociological factors which include parents' views
b. Psychological points of view because psychology is a very strong factor that sometime compel the athlete to quit sports and games
c. Physiological factors which includes changes in body structure due to hard practices, change in nature, change in menstruation, change in beauty, change in period of pregnancy or paintui pregnancy, etc., which restrict the women from participating in games and sports
d. The fourth factor is economical. Sometime women players do not get financial support from their own family to go out of station for participation; sometimes they do not get any financial benefit after showing excellence in games and sports. This can also be a reason
e. The fifth factor was, others which included politics in sports, selection of teams, no response from government, no job opportunities, and security.

These could be the reasons due to which participation of women in games and sports decrease.

Therefore, research decided to undertake the study with the following purposes;

I. The purpose of this study was to find out the sociological causes which related to the views of the society, views of the parents and family members, and lack of separate facilities of sports in society for women to participate in games and sports
II. The second purpose of this study was totally based on psychological factors, which are mentioned below
    a. Whether women become more aggressive by participating in games and sports and they find any difficulty in future life adjustments
    b. Second purpose under psychological factor was to see whether women lose emotional control by participating in games and sports
    c. The third purpose was to see whether women become narrow minded by participating in games and sports
    d. The forth was, to see whether the confidence in women increased by participation in games and sports was the fourth purpose
    e. The fifth was to find out whether the sense of humor, alertness, and discipline increased m the women by participating in games and sports.

METHODOLOGY

The methodology for the study was survey method. The scholar's main aim in this study was to locate the causes of poor participation of Odisha's women in sports and games. The causes arrived at by the scholar were divided into Four major heads -

(i) Sociological causes, (ii) Psychological causes, (iii) Physiological causes, (iv) Economical causes

The scholar decided to prepare a questionnaire for survey and to know the attitude of the women athletes and players regarding women's participation. An opinionnaire was prepared.

Preparation of Opinionnaire

For getting correct answers to the opinionnaire, the scholar used Liker's five point scales and on the same guide line an opinionnaire of five point scales in consultation with the guide was prepared. This opinionnaire was sent to all the experts of physical education and also the sports psychologists for their comments and suggestions.

Pilot Study

To test the reliability of the opinionnaire the scholar decided to conduct a pilot study. For conducting the pilot study, the scholar decided to select Utkal University, Sambalpur University, F.M.University-Balaswar, North Odisha University, Baripada, KIIT and KISS University-Bhubaneswar, All Physical Education Colleges of Odisha, Some important women's Colleges of Odisha like Sailabala Women's College, Cuttack. Inter University players of Odisha. Ex-women athletes and players are residing in this cosmopolitan city.

Analysis of Data of Pilot Study

The data collected from one hundred subjects were tabulated for statistical analysis for finding out the reliability. The split-half method was used to calculate the reliability.

In the split half method; first, the test is divided in to two equal halves, the method used for dividing the scores was that all the scores were arranged in a serial order in a descending order. Then, the scores on even number were collected and the scores on odd numbers of serial order were collected to gether. In this way, the 100 scores were divided in two equal (halves). The self-correlation of the whole test is then estimated by Spearman-Brown phrophesy formula. The procedure in detail is to make up two sets of scores by combining alternate items in the test.

The first set of scores, for example, represents performance on the odd numbered items, 1,3,5,7, 9, etc., and the second set of scores performance on the even numbered items, 2,4,6,8,10... etc. This method is most commonly used for calculating reliability. Five point attitude scales was used for the study. The questions on which the opinions of the women players and athletes were sought were clubbed into four major heads.

The research scholar awaited for 1 month for getting the response from the women players and athletes only 20% of athletes and players responded to the opinionnaire. Therefore, again the reminders were sent to these women players and athletes. The scholar awaited for the response for 1 month and it was observed that responses were very poor.

The researcher decided to visit the various places of the state during the Inter College, Inter University Tournaments, National games, conferences, and seminars of physical education to collect the data. The scholar visited the following athletics meets, tournaments, conferences, and seminars and collected data.

Inter College athletic meet of Utkal University, Sambalpur University, F.M. University-Balaswar, North Odisha University, Baripada, KIIT and KISS University-Bhubaneswar, all Physical Education Colleges of Odisha, Some important women's Colleges of Odisha like Sailabala Women's College, Cuttack. Inter University players of Odisha. Ex-women athletes.

By visiting and personal contact with all the participating women players, athletes and participants the scholar collected the data and discussed the study which was undertaken by the experts who participated in the seminar and conferences.

After collecting the data and opinionnaire of 304 athletes and players from state of Odisha. The scholar thought that there are different cultural back grounds in the society different type of thoughts of society and different type of environments. Then Chi-square test was adopted to analysis of data.

SUMMARY, FINDING, CONCLUSION, AND RECOMMENDATIONS

It was observed by the research scholar that the participation of women players and athletes has decreasing. The grounds and play fields which were full of players in the past 20 years are new experiencing dearth of players and the sports associations are also not getting players in the number in which they were getting during past three decades. Therefore, the researcher conducted a project study of the participation of women's teams in Inter University Tournaments and in inter-collegiate tournaments. The conclusion of these studies is that though the number of universities has increased, the participation of women's teams has not increased in due proportion but decreased. In the second study of inter-collegiate tournaments, it was observed that the number of colleges affiliated to the university has increased but the number of women's teams participation has decreased in Odisha state. Therefore, the research scholar decided to locate the causes of this decrease in women's participation in sports and games.

Findings of the Project Studies

The project studies – in support of the main study to locate the causes of poor participation, were conducted by the scholar and the findings of these studies are given below.

1. The first study was regarding the participation of women teams in inter university tournaments since 2015 and it was found out in this study that the number of universities increased but the participation of women teams decreased in Odisha state
2. The second study was conducted on the participation of women teams in inter-collegiate tournaments and

the increase in colleges. Since 2015 it was seen that the colleges have increased in number, but the participation of women teams has decreasing

3. The third study was conducted for the infrastructure and facilities somehow available not plently or international standard size in universities in Odisha and it was found that the facilities and infrastructures available in Odisha universities are very poor and insufficient. There are no separate facilities for women teams. This may be one of the causes of poor participation of women in sports and games
4. The fourth study was conducted on attitude of physical education professionals toward women's participation in sports and games and it was found that the physical education teachers, coaches, and head of the institutions are not having favorable attitude toward the participation of women in sports and games
5. The fifth study was about the legal liabilities of physical education teachers toward injuries, and it was found, that the physical education teachers are not having the knowledge of legal liabilities of them, toward the injuries suffered by the players while participating in sports and games. Therefore, women players hesitate to participate whole heartedly in sports and games
6. The sixth study conducted was about the implementation of physical education program in the higher level of education and it was observed that there is no implementation of the program of physical education from primary level to P.G level in Odisha and because of this the girls are not motivated for participation in sports and games
7. The scholar conducted the study regarding the status of the women players in their job and it was found that these women players are having no status in the job and they advocated about the participation of women in sports and games
8. The study was also conducted on the opinions of the physical education teachers for poor participation of the women players in sports and games and it was found that due to lack of finance, lack of facilities, lack of interest, lack of interest of administrator, and political interference in sports are the main causes for poor participation
9. The ninth study was conducted on the effect of menstruation on the performance of the women players and it was found that before menstruation performance was good during menstruation the performance was not so good. However, after the menstruation period the women's performance was better than the performance before menstruation.

CONCLUSION OF THE STUDY

From the above studies and main study, it was concluded that the sociological factors, psychological factors, and physiological factors are not affecting significantly on the women's participation in sports and games of Odisha states. However, the economical factor and other factors such as political, cultural, and religious are affecting Odisha's women's participation in sports and games. Other causes for poor participation of women which located here are -

1. Lack of sufficient facilities and infrastructure
2. Lack of motivation
3. Lack of knowledge of the profession and legal liabilities
4. Lack of program of physical education in Odisha state
5. Lack of finance available for sports.
6. Lack of facilities in schools, colleges, and universities
7. Lack of interest of students and parents.
8. Lack of sound policy of sports
9. Political interference
10. Varied cultural background
11. Religious restrictions.
12. Lack of professional knowledge from teachers and lack of knowledge from students are far more common than believed
13. There is variety of ethnic groups and different social economic classes in the state besides the biocultural characteristics of age and gender
14. The entities related to sport should give more emphasis and recognition for women from both financial and psychological stand points
15. Media may contribute for emancipation of women in sports
16. Equal opportunities when developing, updating or delivering policies and projects
17. Management structure
18. Women to lead and participate in olympic movement. The immediate action plan is highly needed
19. Female ex-athletes as sport administrators
20. Greater coverage for women in olympic publications
21. Fair representation on committees and commissions from member sports
22. Initiative to add women to policy.

The above are all the causes located by the scholar from this study.

RECOMMENDATIONS

1. It is recommended that economical support must be made by the government and private agencies for women's participation
2. The political interference in games and sports must be withdrawn for improving the participation in games and sports
3. In cultural functions stress on womenos participation must be given to motivate the women to participate in sports and games
4. The religious barriers shall be relaxed for women to participate in sports and games
5. It is recommended that sufficient facilities and infrastructure shall be provided by the government to motivate the women's participation

6. It is also recommended that the professional personnel in the field must improve their knowledge about the field
7. Sufficient finance must be made available by the schools, colleges, universities and by government for participation in sports and games
8. Separate facilities for women's games and sports shall be provided by schools, colleges, and universities
9. The parents of the women students must be motivated to encourage their daughter to participate in sports and games
10. The Government of India must prepare a sound policy for women's sports and special incentives shall be provided for the women players and athletes, to encourage and motivate the other students participate
11. Academic burden of the women students shall be reduced so that women students can take part in sports and games
12. The same type of study also can be conducted on women's participation in sports and games
13. The same type of study can also be conducted from school level of student's participation in sports and games
14. An international participation of women players in sports and games also can be handled
15. The causes also can be traced out for less participation of students in physical education activities.

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Research Article

The Ayurvedic Approach to Fitness

Dr. Souman Kumar Panda

ABSTRACT

Ayurveda's fitness recommendations depend on one's constitution and current state of balance, age, the surrounding climate, and the season. By nature, exercise is qualitatively light, sharp, hot, mobile, clarifying, and drying. One of the foundational principles of Ayurveda is that like increases like and that opposites balance, which means that, ideally, we are mindful of how each of these qualities might interact with the energies already at play within our bodies, or with the broader context of our lives. Mainly five Ayurvedic herbal drinks must have to stay fit: Fenugreek Water, Tulsi Water, Cinnamon Water, Coriander seed Water, and Triphala Water. Second, five Ayurvedic medicines must have to stay fit, that is, Ashwagandha, Shatavari, Gokhru, Amla Berry, and Safed Musli. Last but not list, five karma to detoxification process of our body (panchakarma), that is, Vamanam Therapy, Virechanam Aasthaapana/Niruham, and Anuvaasan and Nasyam.

Keywords: Amla, Ashwagandha, Cinnamon, Coriander triphala, Fenugreek, Gokhru, Safed, Shatavari, Tulsi

INTRODUCTION

The human body was designed to move, as evidenced by the 360 joints in the human skeletal system, and we all know that exercise is critical to maintaining optimal health. When engaged appropriately, and according to one's individual needs, exercise can be a potent catalyst for improved health. Unfortunately, modern life requires more and more of us to lead extraordinarily sedentary lives, which makes movement and exercise more important than ever.

BENEFITS OF PROPER EXERCISE

Proper exercise gives the body a critically important outlet for movement, which, in turn, helps to maintain fluidity in the tissues, alertness in the mind, and lubrication in the joints. Exercise also supports the body's pathways of detoxification—kindling *agni* (the metabolic fire) throughout the tissues, while improving digestion, circulation, elimination, and lymphatic flow. Beyond that, exercise activates natural pathways of rejuvenation by helping to release accumulated tension, clearing stagnant mental and emotional energy, improving our ability to relax, and supporting sound sleep. All of these benefits are understandably critical to our experience of optimal health. Ideally, our fitness routines are both grounding and energizing, and truly help us to feel our best—body, mind, and spirit.

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THE AYURVEDIC PERSPECTIVE

One of the most elegant aspects of the Ayurvedic tradition is its incredible devotion to the individual. While there are aspects of the Ayurvedic lifestyle that is generally good for everyone, Ayurveda acknowledges that each of us is unique, and that what might be fantastically therapeutic for one person can be categorically harmful for another. The same is true of exercise. Ayurveda's fitness recommendations depend on one's constitution and current state of balance, age, the surrounding climate, and the season. By nature, exercise is qualitatively light, sharp, hot, mobile, clarifying, and drying. One of the foundational principles of Ayurveda is that like increases like and that opposites balance, which means that, ideally, we are mindful of how each of these qualities might interact with the energies already at play within our bodies, or with the broader context of our lives (as with the current climate or season).

At first glance, this perspective can feel a bit complicated, overwhelming, or overly limiting, but with a bit of education, the Ayurvedic approach is actually quite intuitive. More importantly, it celebrates your uniqueness and offers an approach to fitness that will best serve your specific situation. This tradition does not offer one path to peak performance, fitness, and overall well-being. Instead, there are many each tailored to the unique needs of the individual. Ultimately, the Ayurvedic approach to fitness is about you, your path, and the practices that are best going to serve you, in particular, in your journey toward optimal health.

FIVE AYURVEDIC HERBAL DRINKS YOU MUST HAVE TO STAY FIT

These Drinks are Very Healthy

Have we ever wondered why our forefathers had strong immunity and were naturally healthier? Well, one of the biggest reasons is that they had herbs and spices to heal their ailing bodies as compared to us, who are dependent on colorful pills. Herbs and spices have been used for centuries to treat different health issues. Soaking these herbs in water increases their healing power. To prepare herb-infused water, you just have to soak some herbs in a glass of water, leave it overnight and drink it in the morning.

Fenugreek Water

Fenugreek seeds are used to prepare Indian food and are commonly found in every household. Slightly bitter in taste, this spice is a storehouse of medicinal properties and can cure many health problems. Fenugreek seeds are loaded with antioxidants and anti-inflammatory properties. Drinking fenugreek infused water can help you lose weight, boost immunity, control blood sugar level, and promote better digestion.

Tulsi water

Tulsi is known for its medicinal properties. The antibiotic, anti-fungal, and antibacterial properties of Tulsi help to prevent fever and cold and are also good for your skin and hair. Many people even chew tulsi leaves to get rid of headache, toothache, and sore throat. Drinking tulsi infused water 3 times a day can even help to keep acidity at bay. Apart from this, the anti-inflammatory properties of tulsi help to lower inflammation, and risk of developing heart disease.

Cinnamon water

Loaded with antioxidants, cinnamon protects our body from oxidative damage caused by free radicals. Its anti-inflammatory properties help to protect the body from infections. Cinnamon water even helps to reduce the blood sugar level by lowering the breakdown of carbohydrates in the digestive tract. To gain maximum benefits of cinnamon, it is best to soak them in water for some time.

Coriander seed water

Coriander is used in Indian dishes to add a distinct flavor to the food. Coriander seeds are packed with antioxidants, which helps to promote heart health by lowering blood cholesterol levels and decreasing blood pressure. Coriander seed water even helps to manage diabetes and relieve symptoms of arthritis. Apart from this, Coriander seed water contains fatty acids and essential oils that help in easy digestion of food.

Triphala water

Triphala is a traditional Ayurvedic medicine. It is a mix of three dried fruits-Indian gooseberries (Emblica Officinalis), black myrobalan (Terminalia chebula), and Haritaki (Terminalia chebula). Due to its numerous health benefits, Triphala is considered a polyherbal medicine. Triphala infused water helps to promote longevity and cures acute constipation problems. Moreover, this concoction is beneficial for those trying to lose weight.

FIVE AYURVEDIC MEDICINES MUST HAVE TO STAY FIT

Ashwagandha for Muscle Strength

This incredibly healthy wonder herb is deeply rooted in Ayurveda practices and has been used for miles of years for a lot of benefits that it provides both to the body and the mind. The plant itself is a small bush of yellow flowers that can be Schwierarar in parts of North Africa and India and is harvested by its roots and leaves. This herb is also classified as an adaptogen, which means that it helps the body to control stress in a natural way and to control stressful situations. Research has revealed that Ashwagandha is effective in reducing symptoms in people with anxiety disorders and chronic stress. Other studies have determined that Ashwagandha is effective in reducing blood sugar levels, lowering cortisol levels, and even as a supplement to cancer drugs.

Shatavari for Muscle Strength

Shatavari is another herb that is known to have adaptogenic properties and has also been used for miles of years in Ayurvedic medicine. This herb actually belongs to the asparagus family, and the powdered extract is specifically taken in the form of a capsule or hot water mixture and is enjoyed as a tea. Studies have detected that Shatavari contains powerful antioxidant compounds that help prevent cell damage from free radicals. Like Ashwagandha, this herb is also known for providing important anti-inflammatory benefits, which help in overall body wellness. Other benefits range from treating the immune system and treating ulcers, to maintaining low blood sugar and helping to treat kidney stones.

Gokhru for Muscle Strength

Historically, Gokhru has been used in the Ayurvedic system to help treat cough, kidney problems, and asthma, but it is also known to have other benefits, ranging from increasing sexual libido to improving resistance levels. This allows to increase the supply of oxygen within the body' blood circulation, which allows the muscles to be used more effectively and efficiently. Research has linked the consumption of Gokhru with the reduction of sports fatigue and increased muscle strength. Gokhru intake is also linked to the preservation of the musculoskeletal system and metabolic rate, which means that

similar to Shatavari, this herb is an ideal remedy for athletes who need a supplement that can increase red fatigue tolerance when doing exercise.

Amla Berry (Indian Gooseberry) for Muscle Strength

The power of this plant is made from ground leaves and has been used in Ayurvedic practices for miles of years, similar to ashwagandha and Shatavari. In general, it considers an herb beneficial to general well-being, which provides benefits anti-inflammatory benefits and delivery of vital nutrients to body cells. Many people also use Amla for hair regrowth: Research has detected, the topical application of the herb has the ability to increase the rate of hair growth. With regard to muscle strength, studies have also improved that Amla is effective in inhibiting muscle hypersensitivity and inflammatory responses, producing the potential of this herb to help the body train harder and maintain more intense workouts.

Safed Musli for Muscle Strength

Ayurvedic first remedy is a rarer herb that grows in tropical environments in the Indian subcontinent. Like many of the other herbs identified on this list, Safed Musli is also an adaptogen, which means that it helps the body to stressful conditions in a natural and sustainable way. Safed Musli supplements are used to help treat a number of conditions, including increased sperm content and its use as an aphrodisiac. Many health professionals also associate Safed Musli supplementation with an increase in testosterone, making it a popular herb to increase muscle strength. Research has also linked Musli with a higher production of human growth hormone, making it an ideal herb for muscle growth and recovery.

FIVE KARMA TO DETOXIFICATION PROCESS OF OUR BODY (PANCHAKARMA)

Panchakarma is a Sanskrit word that means “five therapies.” This is a process used to clean the body of toxic materials left by disease, poor nutrition, and environmental toxins. Normally, the body has the innate ability to efficiently process and removes these waste materials, including the vitiated doshas.

Panchakarma is the most famous detoxification process of Ayurveda, restoring youth with the help of medicated oils. This special treatment of medicated oil massage and herbal remedies was prescribed in ancient Vedic scripture, and has been practiced in Kerala for many centuries, in accordance with the great works of the “Charaka Samhita.” Panchakarma and Shirodhara are the leading therapies in Indian Ayurveda; considering the level of transformative detoxification they provide, it is not difficult to understand why.

Panchakarma includes five natural methods of purgation or elimination, giving the body an intensively detoxifying the body, while balancing the three doshas: Vata, Pitta, and Kapha.

Panchakarma is a combination of five procedures of purification – Vamanam (Emesis), Virechanam (Purgation), Niroohavasti (Decoction enema), Anuvasanavasti (Oil enema), and Nasyam (instillation of medicine through nostrils). These procedures aim at plucking away the deep rooted imbalances in the body.

Vamanam (Emesis Therapy or Vomiting)

This process is well supervised at The Ayurvedic Healing Village, by highly trained therapists at our certified Panchakarma hospital. Vamanam is induced to eliminate Kapha, which causes the excess mucus. Congestion in the lungs causes repeated attacks of bronchitis, cold, and cough. Vamanam is the best treatment for Kapha-related diseases, as well as chronic skin disease such as psoriasis.

Virechanam (Purgation)

The elimination of toxic matter from the intestines by administering therapeutic purgation or a therapeutic laxative, Virechanam is an especially effective cure in cases of jaundice and hemorrhoids.

Aasthaapana/Niruham

An enema using quath or Kashaya Vasti and combating vata dominant disease, (Vata is dominant in the colon). Vasti involves the introduction of an herbal concoction into the rectum, relieving constipation, kidney stones, backaches, sciatica, and other types of joint pain.

Anuvaasan (Oil Enema)

This is given to patients suffering from diabetes, anemia, and obesity. All Vata aggravated diseases, such as joint disorders, paralysis, constipation, arthritis, urinary, and reproductive disorders benefit from the practice of Anuvaasan.

Nasyam

The inhalation of medicated oil through the nostrils, eliminating any excess of humors accumulated in the sinus, throat, nose, or head areas. The patient’s body is massaged from the shoulders upward, causing it to perspire. An exact dose of the herbal medicine is poured into the nostrils as the patient inhales. During the process, the area around the nose, neck, shoulders, palm, and feet are rubbed. This is highly beneficial in conditions such as sinusitis, migraine, chronic cold, and chest congestion. In case of hemiplegia and facial paralysis, nasyam is very effective.

Diet is important both during and after Panchakarma. After the purification process, the patient should take Kitchari (a mixed veg meal) whenever he feels hungry. He should maintain this diet for 3–4 days, slowly increasing the variety of other items

such as ginger, pepper, salt, green gram soup and other pulse soups, and increasing the quantity gradually.

Detoxification from the ama and purification of the bodily tissues can be touted as the only answer to the ever escalating angst and restlessness in the cacophony of this ruthless world. In the present scenario, it has become highly imperative to be relevant all times. Practically, seems impossible because of our habits and the stress, we undergo throughout the day. The only way out is to dig deep into our roots and rejuvenate our body, mind, and soul and maintains equilibrium that will not only keep you active all day, but will maintain your health as well; through Panchakarma treatment that anneals immunity by aiding removal of morbid dosha, damaged dhatu, and obstructed mala.

Ayurveda, our ancient science, underlines that stress and strain ferociously harms our gastro-intestinal tract, resulting in inflammation and slow digestion, which leads in creating ama and hence diseases and imbalances. Detoxifying and rejuvenating with Panchakarma enhance energy and mental clarity. By resetting digestion, Panchakarma therapy let the body detox naturally. Due to its enormous potency and instantaneous effects that last longer, this method has been deemed incredibly effective in fighting off against afflictions. Panchakarma is the true embodiment of Ayurvedic values and it lives up to its reputation.

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Research Article

Some biochemical variables response after anaerobic work between low and moderate temperature for football players

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ABSTRACT

Regular sporting exercises and activities lead to physiological changes in many internal systems of the human body. These changes can be identified through the presence of some certain enzymes in the blood and through the change that occurs to the concentration of such enzymes. Further, there are some factors, including the surrounding temperature, that impact these enzymes. Hence, this study aims at pinpointing the differences in some biochemical variables in low and moderate temperatures of football players before and after anaerobic stress. Two tests were conducted in the Faculty of Physical Education at two different temperature degrees (10–12°C) and (23–25°C) for the anaerobic stress for a period that did not exceed 3 min. The concentration of the enzymes (creatine kinase, LDH) was measured before and after the stress. The arithmetic means, standard deviations, the value of (T), probability, and error means were used to statistically process the data. The salient findings are as follows: The decrease in temperature negatively affects the biochemical variables that have been investigated in the current research. Therefore, the impact of the biochemical variables affects the performance of the players. This can be attributed to the slow movement of molecules in the enzymes where the number of collisions is less, resulting in a weak activity. The current study recommends the necessity of observing the temperature factor when conducting sporting competitions and during the training sessions. This is because there is a direct impact of the temperature on the physical condition of any player.

Keywords: Creatine kinase, Football players, Lactate dehydrogenase, Performance, Temperature

INTRODUCTION

The state of the body's physiological organs and their efficiency is reflected in the basic physical abilities of the football players. Such state depends on the energy produced by means of physical activities This energy goes through three sources of energy as follows anaerobic through ATP-pc system that is stored in muscle fiber, anaerobic glycolysis system (which produces lactic acid), and the aerobic system that uses oxygen. Further, the energy depends on the type of activity, training, and its purpose.[1] Furthermore, the changes and the functional response accompanying any physical activity can be identified through the existence of certain enzymes in the blood. It can also be identified in the light of any changes taking place in the concentration of certain other enzymes, reflecting the physiological changes in the body of an athlete person. In fact, the enzymes are biological catalysts, which accelerate the chemical reactions. They are also known to stimulate more than 5000 biochemical reactions.[2]

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Most of the metabolic processes require enzymes to occur quickly enough to maintain life.[3] The function of these enzymes is affected by the rise and fall of the temperature, leading to low performance of those enzymes, which, in turn, affect the quantity and viability of ATP. In view of what has already been mentioned, the significance of this paper lies in the fact that the researcher has investigated the impact of temperature on LDH and creatine kinase (CK) enzymes, which are part of the first energy and second anaerobic energy systems. One of the pivotal reasons behind the decrease of the enzyme activity is the increase of the acidity through the abnormal decrease of the blood pH and muscles in addition to the effect of temperature. The normal value of the blood pH and the muscles is 7.4 and 7.1, respectively.

It is worthy to note that LDH and CK enzymes are considered key symptoms of the muscles damage/injury because the

indicators of tissues damage show an increase in rates of LDH and CK enzymes.[4] Moreover, the level of the LDH and CK enzymes may increase because of the injury in the skeletal muscles because of intensive training.[5] The study carried out on marathon players after being involved in a race showed an increase in the rates of the LDH and CK enzymes.[6]

Objective of the Study

This study aims to identify the differences between the biochemical variables in the low and moderate temperatures of the football players before and after any anaerobic effort.

Method and Organization

The experiment was carried out on football players at the University of Mosul. The sample of the study consisted of fifteen players. The experiment was implemented in a laboratory that had a temperature between 10 and 12°C and a relative humidity of 9.5%. The entry of the members of the sample to the laboratory was arranged in such a way that each member would stay therein for 25 min before starting the warm-up activity and the respective test. The interval period between the entries of each member was 5 min.

Pre-test measurements

After staying in a 10–12°C laboratory for 25 min, the members of the study sample underwent the following procedures:

1. Measuring CK, and
2. Measuring lactate dehydrogenase.

Warming-up

Every member of the study sample pedalled an exercise bike for 2 min after which the members took a rest for 3 min.

The first test

Each member of the study sample underwent the test through pedalling an exercise bike with maximum efforts for time not exceeding 3 min. After the aforesaid test, the members took a rest. Then, the pre-test measurements were taken.

The second test

The methodology followed in the first test was applied in this test. However, the temperature was between 23 and 25°C and humidity of 64%.

FINDINGS AND DISCUSSION

Table 1 shows the arithmetic means, standard deviations, the value of t-statistics, probability, and standard error of biochemical variables before stress at the low and moderate temperatures.

As shown in Table 1, there is a big difference in the concentration of LDH at both low and moderate temperatures. The value of (t) was 5.37, having the probability of 0.00, and an error percentage of 0.05. There is a difference in both arithmetic means for the moderate temperature at 64.80.

As for the concentration of CK, there is a difference in the high morale at both low and moderate temperatures. The value of (t) was 4.14, having a probability of 0.01, and an error percentage of 0.05. There is a difference in both arithmetic means for the moderate temperature at 20.67.

Table 2 reports the arithmetic means, standard deviations, the value of t-statistics, probability, and standard error of biochemical variables after stress at the low and moderate temperatures. Table 2 reveals that there is a morale difference in the concentration of the LDH. The value of (t) was −3.30, having the probability of 0.0523, and an error percentage of 0.05. There is a difference in both arithmetic means for the moderate temperature at 78.940. As for the concentration of the CK, there is a morale difference in both low and moderate

Table 1: Concentration of biochemical variables before stress

Statistics / Biochemical variables	Arithmetic mean	Standard deviation	Value of (t)	Probability	Error percentage	Morality
Concentration of LDH at low temperature	171.60	18.41	5.37	0.00	0.05	High morale
Concentration of LDH at moderate temperature	236.40	33.97				
Concentration of CK at low temperature	30.46	16.88	4.14	0.01	0.05	High morale
Concentration of CK at moderate temperature	51.13	6.41				

Table 2: Concentration of biochemical variables after stress

Statistics / Biochemical variables	Arithmetic mean	Standard deviation	Value of (t)	Probability	Error percentage	Morality
Concentration of LDH at low temperature	437.46	75.35	−0.30	0.0523	0.05	High morale
Concentration of LDH at moderate temperature	516.4	86.51				
Concentration of CK at low temperature	148.8	101.21	−9.30	0.0225	0.05	High morale
Concentration of CK at moderate temperature	374.6	47.84				

temperatures. The value of (t) was −9.30, having the probability of 0.0225, and an error percentage of 0.05. There is a difference in both arithmetic means for the moderate temperature at 225.8.

CONCLUSION

The low temperature has a negative impact on the biochemical variables that were investigated in this study. This, therefore, negatively affects the performance of the players. For instance,

a. There is a high morale difference in the concentration of the LDH at both temperatures 10–12°C and 23–25°C. There is a difference in the arithmetic means for the 10–12°C temperature before the stress. The same thing holds true for the 23–25°C temperature after the stress, with the presence of a morale difference, and this agrees with what was mentioned by (Brancaccio) that LDH serum levels depend on many factors, including climatic conditions.[7]
b. There is a high morale difference in the concentration of the CK at both temperatures 10–12°C and 23–25°C. There is a difference in the arithmetic means for the 23–25°C temperature before and after the stress. There is a morale difference after stress, this agrees with what was mentioned by (Christina) that the CK serum influenced by climatic conditions.[8]
c. In view of the findings, the researchers attributes the decrease in the concentrations of the CK and the LDH at low temperature to the slow movement of the particles of the enzymes, leading to a slow, and weak activity of the enzymes. Further, the low temperature leads to a slow activity of the enzymes because the number of particle collisions will be less. Proponent argues that at low temperatures the activity of enzymes will be slower, and their reactions will be even slower.

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Research Article

A comparative study on selected motor fitness of intercollegiate women volleyball players

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ABSTRACT

Background of the Study: Volleyball is the world's most influential, popular, competitive, and recreational sport. It is easy, exciting, and it's explosive. However, volleyball contains many critical overlapping elements whose complementary interactions make it special among rally sports. Competition latent attributes. It has the best skill, spirit, imagination, and esthetics. With a few exceptions, volleyball requires all players to defend or serve both in the net in attack and block and back court.

Purpose of the Study: The purpose of this study was to compare the selected motor fitness components between Kuvempu University and Davanagere University intercollegiate women volleyball players.

Methodology: The present study was conducted on 120 intercollegiate volleyball women players subjects selected from Kuvempu University (60) and Davanagere University (60). The age of the subjects ranging from 18 to 25 years, who are representing their respective colleges, the required data collected at the time of intercollegiate tournament. Using the two-tailed "*t*" test for assed, the level of significance was set at 0.05 level.

Results: In view of the limitation and results of the study, the following conclusions were being drawn. The calculated "*t*" value shows that there is difference between the related motor performance variables and volleying ability. Kuvempu University players and Davanagere University players are the same in versatility as volleyball players require loose limbs. Players often focus on speed and stamina but lack versatility. Players may get hurt if their muscles stretch too fast or too far. Gently stretch muscles in stretching sessions before practice or matches to their full length, as this prepares muscles for vigorous movements.

Conclusion: The observed an empirical result stated that anthropometric measurements and motor fitness variables effectively influence on volleyball playing ability on players of both universities. These results further indicated that all coaches, players, and club players look after the anthropometric measurements and motor fitness skills in volleyball in particular and in general for all the elite athletes.

Keywords: Agility, Flexibility, Explosive strength and anthropometric measurements

INTRODUCTION

Volleyball is the world's most influential, popular, competitive, and recreational sport. It is easy, exciting, and it's explosive. However, volleyball contains many critical overlapping elements whose complementary interactions make it special among rally sports. Competition latent attributes. It has the best skill, spirit, imagination, and esthetics. With a few exceptions, volleyball requires all players to defend or serve both in the net in attack and block and back court.

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Sport successes are focused on optimal preparation to improve motor and coordinating skills. Motor and coordinating skills are the prerequisites for achieving outstanding results in professional sports. Motor capacity is mainly a skill-related fitness aspect and relates to many interrelated factors. Motor abilities include efficient coordination and control between the central nervous system and the peripheral nervous system. The peripheral system gathers information through the sensory system, the central nervous system receives and processes this information and sends an appropriate response through the motor system, triggering the appropriate response. Motor fitness may be more important to the sportsman.

Statement of the Problem

The purpose of this study was to compare the selected motor fitness components between Kuvempu University and Davanagere University intercollegiate women volleyball players.

Research Significance

The study's main aim is to compare the report on selected intercollegiate volleyball teams.

Research De-limitation

1. The study was delimited to women volleyball players
2. The study was further delimited to Kuvempu University and Davanagere University players only
3. The study was again delimited to intercollegiate volleyball players
4. The sample size was total of 120 only
5. The study was further delimited to the age group of 18–25 years that university players
6. The study was again delimited to selected motor fitness variables such as flexibility, agility, and explosive strength.

Research Limitation

1. The uncontrolled factors such as climatic conditions, dietary patterns, and emotional conditions at the time of testing could affect the study results, which can be considered another research limitation
2. No special technique was used to inspire subjects during test administration
3. For this analysis, socioeconomic factors were not considered one of the study's limitations
4. Unconsidered academic accomplishments. It is one restriction.

Research Hypotheses

The study was hypothesized that there will be a significance difference among selected motor fitness components of Kuvempu University and Davanagere University women volleyball players of Karnataka State.

METHODOLOGY

This chapter governs the procedure followed for the selection of subjects, selection of variables, collection of data, and statistical techniques.

Selection of the Subjects

The present study was conducted on 120 intercollegiate volleyball women players subjects selected from Kuvempu University (60) and Davanagere University (60). The age of the subjects ranging from 18 to 25 years, who are representing their respective colleges, the required data collected were at the time of intercollegiate tournament.

Selection of Variables

Motor ability has been defined as the present acquired and innate ability to perform motor skills of a general or fundamental nature exclusive of highly specified sports techniques. Taking into consideration of the view, the following motor abilities are selected for this study. 1. Flexibility – sit reach, 2. Agility – 6 x 10 mts shuttle run, and 3. Explosive strength – standing broad jump.

ANALYSIS OF DATA AND DISCUSSION

The statistical analysis of data collected from between Kuvempu University and Davanagere University intercollegiate women volleyball players on motor fitness variables such as flexibility, agility, and explosive strength and analyzed in this chapter.

Level of Significance

To use the two-tailed t-test for assed, the level of significance was set at 0.05 level.

RESULTS

To compare between the selected motor fitness variables strength (explosive strength, agility, and flexibility), the t-test data are presented in tables.

Table 1: Flexibility, agility, and standing broad jump scores of Kuvempu University

Kuvempu University	*n*	Mean	Standard Deviation	Minimum	Maximum
Flexibility (CM)	60	10.79	2.979	6	20
Agility (Seconds)	60	17.16	1.713	13	20
Standing broad jump (Mts)	60	1.60	.238	1	2

Table 2: Flexibility, agility, and standing broad jump scores of Davanagere University

Davanagere University	*n*	Mean	Standard Deviation	Minimum	Maximum
Flexibility (CM)	60	9.81	2.380	6	18
Agility (Seconds)	60	18.18	2.488	14	25
Standing broad jump (Mts)	60	1.40	.287	1	2

The 60 participants Kuvempu University players who performed flexibility in the game (M = 10.79, SD = 2.97) compared to the 60 participants in the Davanagere University players (M = 9.81, SD = 2.38).

However, the result was not statistically significant. Hence, the null hypothesis H_0 is accepted at 5% level of significance and result states that Kuvempu players and Davanagere University Players are same in flexibility-motor fitness of intercollegiate women volleyball players.

The 60 participants Kuvempu University players who performed agility in the game (M = 17.16, SD = 1.71) compared to the 60 participants in the Davanagere University players (M = 18.18, SD = 2.48) were found to be significant. Hence, the alternative hypothesis H_1 is accepted at 5% level of significance and result states that Davanagere University players' better than Kuvempu players in agility – motor fitness of intercollegiate women volleyball players.

The 60 participants Kuvempu University players who performed Standing broad jump in the game (M = 1.60, SD = 0.23) compared to the 60 participants in the Davanagere University players (M = 1.40, SD = 0.28) demonstrated statistically significant difference.

These is mean difference of (M = 1.020) standing board jump in the performance of game from Kuvempu University players compared to Davanagere University players.

Hence, the alternative hypothesis H_1 is accepted at 5% level of significance and result states that Kuvempu University players' better than Davanagere University players in standing broad jump – motor fitness of intercollegiate women volleyball players.

Table 3: Mean and standard deviation and "*t*" value of flexibility

Flexibility (CM)	*n*	Mean	Standard deviation	"*t*" value
Kuvempu University	60	10.79	2.979	1.83
Davanagere University	60	9.81	2.380	

Table 4: Mean and standard deviation and "*t*" value of agility

Agility (seconds)	*n*	Mean	Standard Deviation	*t* value
Kuvempu University	60	17.16	1.713	2.62*
Davanagere University	60	18.18	2.488	

Significant at 5% level

Table 5: Mean and standard deviation and *t*' value of Standing Broad jump

Standing broad jump (Mts)	*n*	Mean	Standard deviation	*t* value
Kuvempu University	60	1.60	0.238	4.16*
Davanagere University	60	1.40	0.287	

Significant at 5% level

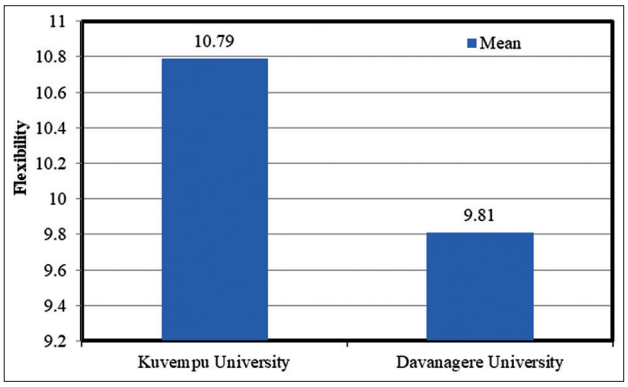

Figure 1: Difference between flexibility of Kuvempu University and Davanagere University

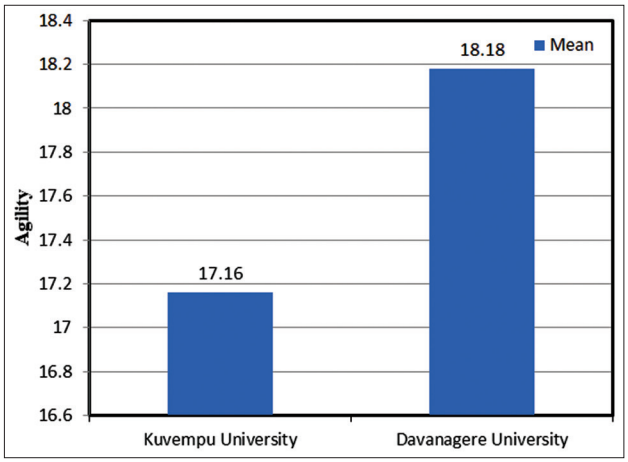

Figure 2: Difference between agility of Kuvempu University and Davanagere University

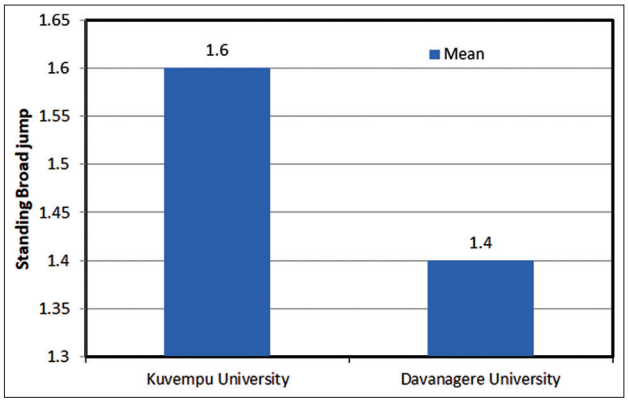

Figure 3: Difference between standing broad jump of Kuvempu University and Davanagere University

Discussion of Findings

- The *t* distribution confirms statistical results observed that Kuvempu University volleyball players had mean 0.900 flexibility differences compared to Davanagere University players
- The *t* distribution confirms statistical results observed that Davanagere University volleyball players had mean 1.020 agility differences compared to Kuvempu University players
- The *t* distribution confirms statistical results observed that Davanagere University volleyball players had mean 1.020 standing broad jump differences compared to Kuvempu University players.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

The study concludes selected motor fitness variables among ballplayers at Kuvempu University and Davanagere University. For all sports and games, we have summarized motor fitness variables, namely, speed, endurance, and explosive strength of women volleyball players.

1. The study found that Kuvempu University players and Davanagere University players are the same level of versatility in intercollegiate women volleyball players' motor fitness
2. Results also noted that players at Davanagere University are better than players at Kuvempu University in agility – motor fitness of intercollegiate women volleyball teams
3. Results provide statistically acceptable proof that players at Kuvempu University are better than players at Davanagere University which is standing big jump-motor fitness of intercollegiate women volleyball players.

CONCLUSION

Data Review Reveals

Results confined Kuvempu University players and Davanagere University players are the same in versatility as volleyball players require loose limbs. Players often focus on speed and stamina but lack versatility. Players may get hurt if their muscles stretch too fast or too far. Gently stretch muscles in stretching sessions before practice or matches to their full length, as this prepares muscles for vigorous movements.

Results confined Davanagere University players' need more explosive leaps and rapid change of direction than Kuvempu University players of agility volleyball matches. Due to the value of spiking the ball and defending opponent spikes, the ability to jump high is treasured among volleyball players. Vertical jumping is all about generating ground power, core stability, and tight hips, so agility is crucial for volleyball players to develop vertical jumps.

Results provide statistically clear proof that Kuvempu University players in standing wide jump volleyball need power in their legs to get high in the air and strength in their upper body to spike, knock, and dig balls. Lifting weights encourage muscle fibers to expand, allowing athletes to generate more power at faster rates. As players get more robust, their explosive strength also increases on the court. Strengthening volleyball-specific muscles ensure that athletes achieve their full output capacity, that is, motor as mentioned above performance. Agility, versatility, and standing broad jump (power) were too crucial for volleyball player success.

RECOMMENDATIONS

For future research on this subject, the present research findings suggest improving the field. Recommendations as follows;

I. Study on larger samples with additional physiological variables on both men and women at different levels of competition

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Research Article

Effect of hill running for development of speed among women volley ball players of K.V.R. Government College for Women, Kurnool, A.P.

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ABSTRACT

The purpose of this present study is to find out the effect of hill running on development of speed among women volley ball players of K.V.R. Government College for Women, Kurnool, A.P. The sample for the present study consists of 20 Women Volley ball Players of S.K. University out of which ten are experimental group and ten are controlled group. Hill running was given to experimental group on alternate days, that is, three sessions per week and controlled group were given the general training for 6 weeks. Pre-test and post-test were conducted in 30 M run to measure the speed among experimental group and controlled group. This study shows that due to the hill running, there is an improvement of experimental group in the speed and controlled group is decreased in performance of speed. It is concluded that due to hill running, there will be improvement in speed among women volley ball players. Hill running improves the jumping ability and leg strength of volley ball players.

Keywords: Hill running, Speed, Jumping ability, Leg strength, etc.

INTRODUCTION

Hill running has a strengthening effect as well as boost the power of volley ball players in legs. To reduce the possibility of injury, hill training should be conducted once the volley ball player has a good solid base of strength and endurance.

Hill training offers the following benefits to the volley ball players.

(a) Helps develop power and muscle elasticity.
(b) Develop maximum speed and strength (short hills)
(c) Improves lactate tolerance (mixed hills).

Ana Filipa Silva, Filipe Manuel Clemente, Ricardo Lima, Pantelis T Nikolaidis, Thomas Rosemann, Beat Knechtle (2019) studied the effects of plyometric training on volleyball players' performance. Results showed that the vertical jump (15 studies) was the major ability studied in plyometric training interventions, followed by strength (four studies), horizontal jump (four studies), flexibility (four studies), and agility/speed (three studies). In addition, it was observed that young (under 18 years old) female athletes were the most studied. The included studies indicated that plyometric training seems to increase vertical jump performance, strength, horizontal jump performance, flexibility, and agility/speed in volleyball players. However, more studies are needed to better understand the benefits of plyometric training in volleyball players' performance.

Vassil K, Bazanov B (2012) studied the efficiency of composed plyometric training program on youth volleyball players force capabilities in their usual training period. The plyometric training program was applied during 16 week period where was attended 21 12–19 years old youth volleyball players. Twelve of them were female and nine male volleyball players. There were three control testings. All subjects participated in following tests: Standing long jump, depth leap long jump, medicine ball throws up in 10 s, medicine ball overhead throws forward against the wall in 10 s, maximal vertical jumps to the maximal height in 10 s, and maximal vertical jump height.

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Testing results statistical analysis has shown athletes legs and arms speed force reliable improvement. Standing long jump, depth leap long jump, and maximal vertical jump height test results, what has shown legs explosive power, have not shown remarkable reliable difference ($P > 0.05$). Medicine ball throws and maximal vertical jumps to the maximal height in 10 seconds, what show speed force improvement, showed reliable difference ($P < 0.01$).

Objectives of the Study

The purpose of this present study is to find out the effect of hill running on development of speed among women volley ball players of KVR Government College for Women (Autonomous), Kurnool, A.P.

METHODS

The sample for the present study consists of 20 female women volley ball players of KVR Government College for Women (Autonomous), Kurnool, A.P. Out of which 10 are experimental group and 10 are controlled group. Hill running, that is, short sprints on hill was given to experimental group on alternate days, that is, three sessions per week and controlled group was given the general training for 6 weeks. Pre-test and post-test were conducted in 30 M run to measure the speed among experimental group and controlled group.

RESULTS

These results of the study show that due to the hill running, there is an improvement of experimental group in speed and controlled group is decreased the performance speed due to the general training.

The experimental group of 30 M run men is 4.61 in pre-test and controlled group mean is 4.66 in pre-test. The experimental group mean is 4.20 in post-test and controlled group mean is 4.73, the experimental group mean in post-test in 30 M run is decreased from 4.51 to 4.20, there is an improvement of 0.31 from pre-test to post and control group mean is post-test, which is 4.73, there is an increase of 4.66 to 4.73 from pre-test to post, the performance is come down to 0.07 in the controlled group. Due to the hill running, the experimental group has improved a lot.

Table 1: Mean values of 30 M run test between experimental and control groups of women volley ball players of KVR Government College for Women, Kurnool

Variables	Group	Pre-test mean	Post-test mean	t	*P*-value
30 M run test	Experimental	4.61	4.20	2.58	0.000
	Control	4.66	4.73		

CONCLUSION

It is concluded that due to the hill running, there is an increase of speed among the women volley ball players. Running uphill for 60 ft at a time will help your build speed, quickness, and leg strength for leaping, while running the same distance downhill will help you improve your balance. Hill running improves the jumping ability and leg strength of volley ball players.

Recommendations

Similar studies can be conducted on men volley ball players and other sports and games. The coaches can prepare the program for development of speed and other motor qualities in volley ball game.

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