Voulume 3 No 2
Half Yearly
JULY to DEC 2016

ISSN 2349 - 722x

International Journal of Fitness, Health, Physical Education & Iron Games

Published by

International Federation for Fitness,
Health, Physical Education &
Iron Games

icrtfhss@gmail.com

Thomson Reuters ID O - 6684 - 2015

ISRA Journal Impact Factor : 0.311

GLIMPSES

Of 2nd International conference on Fitness Health and Sports science July 2015 at Ma Hotel, Bangkok

Golden Fitness System

Manufacturing Home Gym & Gym Equipment

Welcome to Golden Fitness Systems!

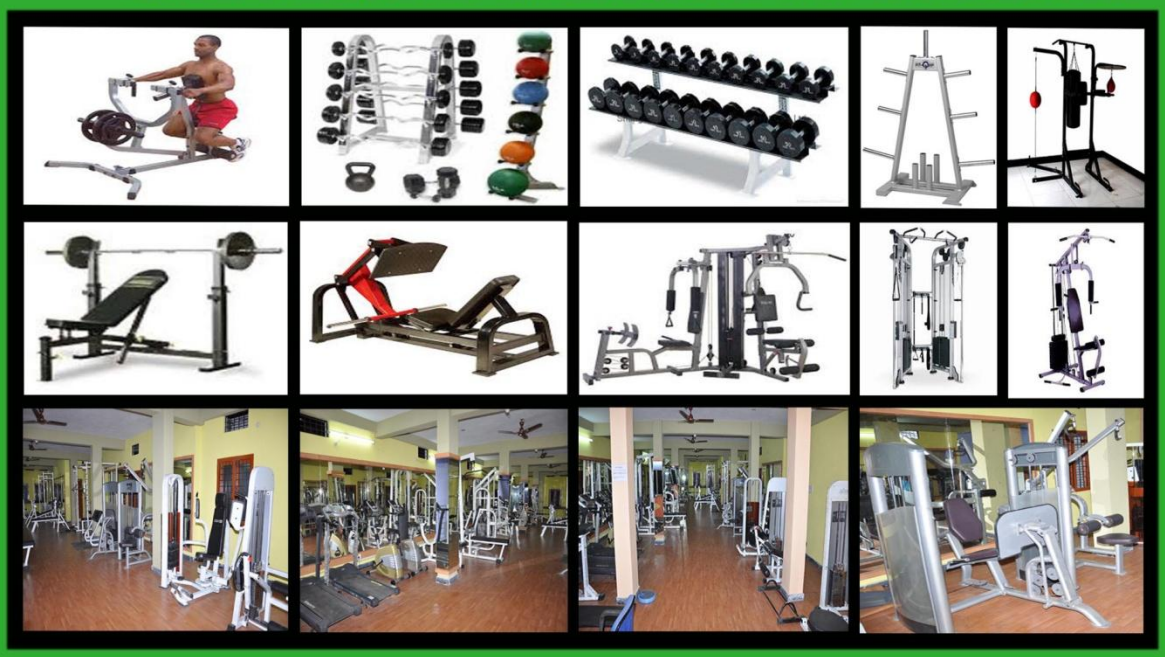
Golden Fitness System specializes in top-of-top-line fitness equipments and accessories with cutting-edge technologies.

Founded in 1992, Golden Fitness Systems has served innumerable customers and helped set up fitness center's across India.The Company has even supplied fitness equipment for prestigious COLLEGES and elite institutions and many gyms.

Browse through our products and have them installed at your home, gym, club or office for maimum fitness results. you will find our reange of Treadmills, Ellipically, Bikes and Gym Stations cost-efficient and within your budget.

Happy exercising....

COMMERCIAL EQUIPMENTS, Home EQUIPMENT, FITNESS ACCESSORIES.



Contact

SEEMAB AZEEM

9849407866,8801358352.

Email us at:- Getsimmu@gmail.com

ICPESS 2017

"INTERNATIONAL CONFERENCE ON PHYSICAL EDUCATION AND SPORTS SCIENCE"

5th - 7th JAN 2017

MANIPAL UNIVERSITY JAIPUR

"EMERGING TRENDS IN FITNESS and SPORTS SCIENCE"

It gives us immense pleasure to inform you that the Department of Physical Education (Arts), School of Humanities, Manipal University Jaipur, Rajasthan, India is organizing an International Conference on "**Emerging Trends in fitness and Sports Science** "on 5th -7th January 2017.

- Exercise Prescriptions and Physical Fitness.
- Mental Health, Yoga and Research Pedagogy.
- Sports Medicine, Aging and Exercise Physiology
- Psychological Interventions and Sports Performance
- Future Trends and Challenges in Physical Education & Sports.
- Sports Nutrition, Exercise Metabolism and Sports Performance.
- Recent Trends in Health and Sports Science.
- Sports Management and Economy of Nation.
- Recent Technical Innovation and Entrepreneurship in Sports.
- Sports Industrialization and Sports Journalism.
- Socialization Through Sports, Ethics and legal Sports law
- Sports Training and Sports Biomechanics.

IMPORTANT DATES

Abstract sub-mission last date	10th nov'16
Acceptance	15th nov'16
Full length Paper Sub-mission	05th dec'16
Conference Dates	05th - 7th jan'17

HIGHLIGHTS

Workshop on YOGA and wellness (Demonstration and Practice Session) at 7:00am to 9:00am on 5th & 7th Jan'17.

Registration for the ICPESS 2017 is now open.

EMAIL : info@icpess17.com

www.icpess17.com

Dr.Kaukab Azeem

Editor-in-Chief, IJFPHIG
Faculty, Physical Education Department
King Fahd University of Petroleum & Minerals
Saudi Arabia
drakbodybuilding@gmail.com

SUBSCRIPTION RATES (Print + Online)

Sl.no	Membership details for foreigners	Amount
I	Life time membership	
a	Researchers	750 us dollars
b	Organizations\ Gyms \ Health Clubs	1000 us dollars
II	Five Years membership	
a	Researchers	250 us dollars
b	Organizations\ Gyms \ Health Clubs	500 us dollars
III	Annual Membership	
a	Researchers	100 us dollars
b	Organizations\ Gyms \ Health Clubs	150 us dollars
a	Publish single research paper	50 us dollars

Sl.no	Membership details for INDIANS	Amount
I	Life time membership	
a	Researchers	35000 RS
b	Organizations\ Gyms \ Health Clubs	50000 RS
II	Five Years membership	
a	Researchers	15000 RS
b	Organizations\ Gyms \ Health Clubs	20000 RS
III	Annual Membership	
a	Researchers	2000 RS
b	Organizations\ Gyms \ Health Clubs	2500 RS
a	Publish single research paper	1200 RS

- RATES OF THE JOURNAL MAY BE VARY FROM TIME TO TIME AND UPDATED. (POSTAL CHARGES WILL BE CHARGED ACCORDINGLY)

IN THE FAVOR OF:
INTERNATIONAL FEDERATION FOR FITNESS, HEALTH, PHYSICAL EDUCATION & IRON GAMES
Current Account number: 33866093430
Bank name: State Bank of India
Address : Tolichowki Branch (05095), Hyderabad, India
IFSC CODE: SBIN0005095
SWIFT CODE: SBININBB321

Journal is Indexed with

1. **International Society for Research Activity (ISRA), Journal Impact Factor (JIF) (** http://www.israjif.org/single.php?did=2349-722x)
2. Google Scholar
3. Research gate
4. SJIF (Scientific Journal Impact Factor)

International Journal of Fitness, Health, Physical Education & Iron Games (IJFHPEIG) is an Academic, online peer-reviewed, refereed Journal and published by IFFHPEIG. The Journal had inspires lot of researchers from the globe to contribute in the field of sports, Physical Education and Iron Games to published their research work. It is great honor to receive lot of responses from the contributors for contributing and sharing their knowledge. We take privilege in inviting our colleagues/students/ researchers/ Faculty members to send their research work to publish in our esteemed Journal.

Table of Content

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Valorization of Competative Results in Short Distance Sprint Events for Boys Aged 7 to 17 Years

By
Babić, Vesna
University of Zagreb, Faculty of kinesiology
vesna.babic@kif.hr

Abstract

Sports' competition systems for younger athletes are developing and growing throughout the World, including Croatia. This research study observed competitive results of short distance sprint events for boys through ten years time period; from 2005 to 2014. The aim of this research study was to create norm values for 5 sprint events that could be used to valorize the individual results in these events, in order to identify the athletes who could be successful in competitive sprint events.

The subject sample included boys, from 7 to 17 yrs old, according to specific sprint event, who were involved, for last 10 years, in running certain sprint events at Croatian athletics north league (HALS). The entity sample is convenient and refers to achieved competitive results in different sprint events. The variables' sample consists of 5 short distance sprint events: 60m, 100m, 200m, 300m and 400m. For every sprint event and for every age group basic descriptive parameters were calculated and the results were grouped by frequency. The valorization of results' achievements was presented through 5 quality levels: extraordinary above-average values, moderate above-average values, above-average values, moderate below-average values, and extraordinary below-average values.

The results of this research showed greater occurrence of certain sprint events in competition programs. Although the competitive categories in the competition system are age-defined; from 10-11 yrs, 12-13 yrs, 13-14 yrs, 14-15 yrs and 16-17 yrs of age, the obtained results showed that even much younger boys than age defined categories 10-11yrs competed in the 200m sprint event, and especially in the 60m sprint event. In all analyzed events the average results' values were progressively better with the older age group.

INTRODUCTION

Sport competition systems for younger age categories are developing and growing in the World, Croatia included. Different age categories' competitions have been present since 1965. Competition systems for younger age categories have been upgraded and modernised according to the needs and trends of modern athletic practice. In Croatia, besides national athletic competitions, there are also regional athletic competitions. Five regional athletic leagues are leagues of: Slavonija and Baranja, Kvarner, Primorje, Dalmatia and north Croatia – Croatian Athletic League north (HALS). Each of mentioned leagues has its own competition system for younger categories whereas the most developed system is the one of HALS. HALS has the longest history compared to other leagues in Croatia and has in a way served as a model and an incentive for organisation of similar competitions for younger age categories' athletes in Croatia.

Since 2011, the competitions in certain athletic events have started being introduced for age groups of 10 and 11 years old. The system is set up in a way that two age categories mutually compete. Although in the competition system the set up categories are: 10-11, 12-13, 14-15 and 16-17 years old, younger athletes, for whom there is no separate category, compete as well, which makes the competition unjust for them. All mentioned points to the need of developing and creating new competition system for even younger athletes.

Furthermore, since 2013., "Erste Blue League" is being organised for children from third to sixth grade of elementary school, regardless whether the children are the members of athletic clubs or not. This league is carried on through regional qualifications' competition and final competition. The precedent of Erste Blue League, from 1991. to 1994. was the project named "Searching for the fastest and most endurable male and female students of fifth and sixth grades of elementary schools in Zagreb". This project was created as a simple, fast and easily applicable way of identifying talented children for athletics (Babić, 2001; Babić and al. 2012).

The practice showed, concerning the movements' structure that can be easily modified for the youngest athletes that children can get involved in athletics already at preschool age. How to identify the talented children? What is the way to monitor and select talented children for

athletics? In sports, the individuals talented for certain sport are being selected at the very young age. Is that good? Should talented children be selected earlier or later? Where is the play? A while ago, talented individuals were "discovered" at competitions whereas nowadays the different selection models are being developed (Babić, 2001; Babić and al. 2012).

Nowadays the number of active individuals is decreasing. The modern ways of life have influenced children as well in a way that their need for movement and spontaneous play has significantly decreased. In children's most intensive period of growth, from the ages of 7 to 11 years old, there is also a problem of "work" with children within educational system. This age period refers to the early elementary school (from first until third grade) during which PE classes are conducted by general class teachers, not PE teachers. Although general class teachers are educated for conducting PE classes in early elementary school, they often do not conduct PE in a way that it should be conducted or they do not conduct PE classes at all. This problem is not only present in Croatia but much wider as well.

Young athletes' training is much different than the training of adult top athletes in the same sport, and is also much different than the physical activities of children that are not in the competition system. In order to include young children in systematic training, the selection of children which shows their potential and readiness for systematic training is important. It is clear that children starting to get involved in athletics through athletic clubs' work systems do not get selected immediately for certain athletic events but they undergo basic athletic practice, which should be adjusted, by means of methodics and training system, to their biological and chronological age.

Athletics is a sport that offers huge research area regarding the number of its events. On another hand, small amount of research is being dedicated to younger age categories and their problematic. For the needs of this research study we observed, within ten years' period frame, from 2005 to 2014, the competition results in the sprint events for the boys. It is well known that the results in athletic are measureable and therefore are easy to track. The competition results

reflect the level of individual's temporary fitness which in practice makes for a simple way to select children in sports system.

The aim of this research study is to develop norm values for 5 short sprint events, which can be used, in a simple way, to valorise children's individual results in different athletic events with the intention to recognize those individuals who can be successful in sprint events at competitions. The results of this research could serve as an indicator to coaches as well as the selection model. The results of this study could also point to the realistically expected children's results' progression and therefore could be very helpful in creation of training plan and programme, not only on a single year basis but on several years' basis as well.

METHOD

The subject sample consisted of boys aged 7-17 years old who, within last ten years participated in certain sprint event at HALS competitions. The entities' sample is convenience and refers to the achieved results in different sprint events whereas it is dependable on the number of possible competitions in the ten years time period (Table 1 and 2).

The variables sample consisted of 5 short sprint events: 60m, 100m, 200m, 300m and 400m. All competitions were carried out according to the rules and regulations of athletic competitions by International Association of Athletics Federations (IAAF) and national athletic organisation - Croatian athletic association (HAS). The measuring of competition results was electronically. All values of competition results are shown in seconds, tenths of seconds and hundreds of seconds (Table 3 and 4).

The descriptive parameters and entities' frequencies were calculated on analysed results from each athletic event and from each age group. Valorisation of results' achievements was presented in 5 qualitative classes: extraordinary above-average values, moderate above-average values, average values, moderate below-average values and extraordinary below-average values. The statistics were calculated by programme package Statistics for Windows 12 at Faculty of Kinesiology, University of Zagreb.

RESULTS AND DISCUSSION

Sprint events results (60m, 100m, 200m, 300m, 400m) of boys aged 7 to 17 years who competed in four age categories (10–11; 12–13; 14–15 and 16-17 yrs old) within the time period from 2005 – 2014 at HALS competitions were analysed (Table 1). Although the age competition categories were clearly established, it can be seen from the analysed results that much younger boys also participated at the competitions. In the sprint event 60m the observed competitors were from 5 to 15 years old; in the event 100m the observed competitors were from 12 to 17 years old; in the 200m event the observed competitors were from 6 to 17 years old, in the 300m event the observed competitors were from 8 to 17 years old, and in the 400m event the observed competitors were from 8 to 17 years old. The statistical analyses included samples of 40 and more entities. The results from following age groups (Table 3) in sprint events were analysed: 60m (from 7 to 15 yrs old); 100m (from 14 to 17 yrs old); 200m (from 8 to 13 yrs old); 300m (from 12 to 17 yrs old); and 400m (from 10 to 13 yrs old).

***Table 1**. The number of possible competitions in different sprint events for every analysed competition category within ten year time period*

Distance	**years**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Σ**
60 m	10 - 11	3	2	2	6	5	6	6	6	6	6	48
N=3128	12 - 13	4	5	6	5	5	6	6	3	6	6	52
	14 - 15	4	5	6	6	4	5	6	3	4	3	46
100 m	14 - 15					1	1		3	2	3	10
N=499	16 - 17	2	2	3	3	2	4	2	4	3	2	27
200 m	10 - 11		2	3	6	4	3	2	3	6	3	32
N=858	12 - 13								3	4	1	8
300 m	12 - 13	3	2	3	2	3	3	3		2	2	23
N=908	14 - 15	1	3	3	3	2	3	3	3	2	1	24
	16 - 17	2	3	3	3	4	2	2	2	3	2	26
400 m	10 - 11					1	3	3	3	3	1	13
N=373	12 - 13				1				3	3	2	9

Table 1 shows, according to the HALS competition propositions, the number of possible competitions in every analysed sprint event for every competition year and for every analysed competition category. Also, Table 1 shows the summed number of possible starts for every age

category (Σ) within last 10 years, as well as the overall number of analysed results (N). From the data analysis it can be observed that sprint event 60m as competitive event has been offered to all age groups of competitors; its frequency was 146 times, and analysed entities counted 3128. The sprint event 300m follows, which was offered half as much as 60m event; 73 times. Compared to sprint event 60m the remaining sprint events were offered: 200m - 3.65 times less than 60m; 100m - 3.94 times less than 60m and 400m event - 6.63 times less than 60m event. According to that, the number of analysed competitors' results was lower in other sprint events compared to 60m sprint event: for 300m event – 3.45 times lower with 908 entities; for 200m event - 3.65 times lower with 858 entities; 100m event - 6.27 times lower with 499 entities and 400m event - 8.38 times lower with 373 entities.

Table 2. *The number of competitors, boys, aged 7 -17 years old who actively participated in Croatian competition system (CRO), in north Croatia region (HALS), and their relation in percentages (%)*

year	CRO	HALS	other	% HALS	% other
2005	533	298	235	55,91	44,09
2006	608	336	272	55,26	44,74
2007	527	289	238	55,84	45,16
2008	715	400	315	55,94	44,06
2009	723	413	310	57,12	42,88
2010	771	477	294	61,87	38,13
2011	956	487	469	50,94	49,06
2012	990	477	513	48,18	51,82
2013	904	489	415	54,09	45,91
2014	820	428	392	52,19	47,81

The greatest number of athletic clubs which systematically develop sport of athletics in all age groups is geographically situated in the north of Croatia. Table 2 shows the number of boys up to 17 years of age that were active in competitions within last ten years, both in Croatia and in HALS region, as well as their mutual relation. From the presented results it can be concluded that the number of competitors in almost all competition years in HALS region was

more than double compared to other regions, and therefore, the analysed data conclusions are primarily relevant to the northern Croatia region.

Table 3. Basic descriptive parameters of results in different sprint events

YRS	Valid N	Mean	Min	Max	SD
60 m					
7	60	11,53	10,14	17,72	1,14
8	204	11,11	9,20	12,76	0,73
9	310	10,56	8,96	13,58	0,72
10	327	10,08	8,57	12,37	0,66
11	520	9,80	8,26	14,15	0,67
12	477	9,42	8,05	13,23	0,62
13	512	8,96	7,56	11,31	0,62
14	354	8,40	7,39	10,99	0,50
15	351	8,05	7,26	10,66	0,44
100 m					
14	111	13,44	12,00	16,63	0,99
15	124	12,91	11,45	16,72	0,86
16	124	12,36	11,27	15,22	0,59
17	122	12,19	11,26	15,86	0,62
200 m					
8	41	39,26	32,40	49,02	3,63
9	98	35,92	30,87	45,53	2,73
10	139	34,46	28,51	46,91	2,81
11	268	33,38	27,27	40,36	2,24
12	90	31,51	26,97	36,83	2,09
13	89	29,80	25,30	37,07	2,35
300 m					
12	151	51,23	42,37	64,80	4,00
13	209	47,26	39,68	56,90	3,52
14	150	43,82	36,70	55,12	3,44
15	180	41,13	36,21	49,74	2,37
16	103	40,24	34,92	47,25	2,23
17	96	39,14	35,07	46,29	1,94
400 m					

10	42	79,10	66,70	94,80	6,25
11	75	74,31	64,70	94,90	6,70
12	53	72,49	62,30	93,40	6,35
13	82	66,69	57,11	92,50	6,41

Table 4. Values of results for successfulness' valorization in different sprint events

YRS	Valid N	extraordinary above-average values	moderate above-average values	above-average values	moderate below-average values	extraordinary below-average values
60m						
7	60	9,24	10,39	11,53	12,67	13,82
8	204	9,64	10,38	11,15	11,88	12,61
9	310	9,12	9,84	10,56	11,29	12,01
10	327	8,77	9,43	10,08	10,74	11,40
11	520	8,46	9,13	9,80	10,46	11,13
12	477	8,19	8,80	9,42	10,04	10,65
13	512	7,71	8,33	8,96	9,58	10,21
14	354	7,41	7,90	8,40	8,89	9,39
15	351	7,17	7,61	8,05	8,49	8,94
100 m						
14	111	11,45	12,44	13,44	14,43	15,42
15	124	11,19	12,05	12,91	13,76	14,62
16	124	11,18	11,77	12,36	12,96	13,55
17	122	10,96	11,57	12,19	12,81	13,42
200 m						
8	41	32,00	35,63	39,26	42,88	46,51
9	98	30,46	33,19	35,92	38,64	41,37
10	139	28,85	31,66	34,46	37,27	40,08
11	268	28,91	31,15	33,38	35,62	37,86
12	90	27,33	29,42	31,51	33,60	35,69
13	89	25,09	27,44	29,80	32,15	34,51
300 m						
12	151	43,23	47,23	51,23	55,23	59,23
13	209	40,21	43,74	47,26	50,78	54,31
14	150	36,94	40,38	43,82	47,26	50,71
15	180	36,38	38,76	41,13	43,51	45,88
16	103	35,78	38,01	40,24	42,47	44,70
17	96	35,25	37,20	39,14	41,09	43,03
400 m						
10	42	66,61	72,86	79,10	85,35	91,60

11	75	60,90	67,60	74,31	81,01	87,71
12	53	59,78	66,14	72,49	78,84	85,19
13	82	53,88	60,28	66,69	73,10	79,50

Descriptive parameters analysis (Table 3) shows great involvement of boys aged 7, 8 and 9 years old in the sprint event 60m, whereas in sprint event 200m boys aged 8 and 9 years old competed even though in the competition system there were no separate categories for that age group. The questions arise: is that pedagogically right? Can this kind of competition motivate children to continue being involved in athletics? Is this an example of "to compete at any price?" If so, why?

This trend was also present at the level of International Association of Athletics Federations and therefore, for those age categories the competition system "Kid's athletics" adjusted to children's cognitive, social and emotional characteristics was organised. Similarly, in athletics developed countries the competition system is organised and carried through every age group separately. The examples are different in every country (Juhas et al., 2013).

Although the average results' values from all analysed events for every age category show the linear progression of results along with children's age (Table 3) these changes should primarily be ascribed to biological growth and development and only after that, to training influences. The results' ranges were greater as the competitors were younger.

Table 4 shows different qualitative levels of results which can serve us to valorize individual results' achievements of children of different age. The valorization of results' achievement is shown in 5 qualitative classes: extraordinary above-average values, moderate above-average values, average values, moderate below-average values and extraordinary below-average values.

The presented norm values are the result of competitive activity of children who competed within last 10 years in the most developed competition system for young athletes in Croatia. It is important to notice that this refers to the part of Croatia which has the most influence on competition system in Croatia, number of clubs as well as number of active competitors in all age categories (Table 2). Similarly, this region is inhabited by more than half

of citizens, as well as competitors, of the overall number of inhabitants in Croatia. The competitive results in this research study are objectively collected indicators that enable valid insight into individually time changing conditions and can be of use in practice of athletic coaches. These qualitative presented values (Table 4) can serve in setting short and long-term training goals, and can also be a model for selection of individuals talented for short athletic sprint events and therefore can be very helpful in creating their training plan and programme, on a single as well as on the several years' basis.

CONCLUSION

It is well known that the results in athletics are measurable and are easy to track. The aim of this research study was to develop norm values (standards) for boys using the competitive results in different sprint events. The competitive results, which later served to establish norm values were obtained by following 10 years of competition in the most developed competition system for young athletes in Croatia. Even though some previous research studies (Babić, 2001; Babić et al., 2012) established selection models and differences between different age groups. The results of this research study and obtained norm values, can be helpful for future athletic practice in suggesting competition system for every single age category, which is already being conducted in more developed European countries. Furthermore, since presented results and their qualitative classes vividly indicate realistically expected progression of competitors' results, they can also serve as a model for selection of individuals talented for short athletic sprint events. The most simple selection models are based on competition results and this research study is a contribution to their better understanding. Finally, the results of this study can also serve PE teachers as sort of an indicator in understanding time parameters compared to individually changeable conditions in different age groups.

References

1. Babić, V. (1996). *Početni izbor djece za atletske sportske škole*. U V. Findak (ed.), Zbornik radova 5. ljetne škole pedagoga fizičke kulture Republike Hrvatske, Rovinj, 1996. (str. 127 – 128). Zagreb: Savez pedagoga fizičke kulture Republike Hrvatske.
2. Babić, V. (1997). *Putevi selekcije u atletskom sportu*. U V. Findak (ed.), Zbornik radova 6. ljetne škole pedagoga fizičke kulture Republike Hrvatske, Rovinj, 1997. (str. 91 – 93). Rovinj: Savez pedagoga fizičke kulture Republike Hrvatske.
3. Babić, V. (2001). *Mogućnosti otkrivanja za sprint nadarenih djevojčica*. Zagreb: Kineziološki fakultet Sveučilišta u Zagrebu, Magistarski rad; 136.

4. Babić, V, Viskić-Štalec N. (2002). *A Talent for Sprinting – Haw Can It Be Discovered and Developed*. Collegium Antropologicum; 26, 205-221.
5. Babić, V, Viskić-Štalec N. (2002). *Morfološko - motorička obilježja djevojčica od 11 do 13 godina i nadarenost za sprint*, Život i škola; 7: 55-69.
6. Babić, V. (2005). *Utjecaj motoričkih sposobnosti i morfoloških obilježja na sprintersko trčanje.* Zagreb: Kineziološki fakultet Sveučilišta u Zagrebu, Doktorska disertacija; 185.
7. Babić V., Rakovac M., Blažević I., Zagorac N., Švigir Potroško R. (2010a). *Terenski testovi bazičnih motoričkih sposobnosti i morfoloških obilježja za otkrivanje djece talentirane za sprint*. 8 godišnja međunarodna konferencija Kondicijska priprema sportaša, Zagreb: Zbornik radova; 488-494.
8. Babić V., Rakovac M., Blažević I., Zagorac N., Švigir Potroško R. (2010b). *Terenski testovi specifičnih motoričkih sposobnosti i morfoloških obilježja za otkrivanje djece talentirane za sprint*. 8 godišnja međunarodna konferencija Kondicijska priprema sportaša, Zagreb: Zbornik radova; 494-498.
9. Babić, V., Blažević, I., Radetić-Paić, M. (2011). *Sprintersko trčanje djece predškolske i mlađe školske dobi*. Napredak: časopis za pedagogijsku teoriju i praksu; 152 (1): 49-60.
10. Babić, V., Blažević, I. (2011). *The relation between the kinematic paramtres of running at maximum speed and the 50 metres running results*. Science, Movement and Health; XI (2): 195-199.
11. Babić, V., Blažević, I., Katović, D. (2012). *Model of tests for assesmentof sprint running proficiency*. Science, Movement and Health 12 (2), 115 – 120.
12. Blažević, I. (2010). *Utjecaj antropoloških i kinematičkih obilježja na dinamiku sprinterskog trčanja djece*. Zagreb: Kineziološki fakultet Sveučilišta u Zagrebu, Doktorska disertacija; 180.
13. Bračić M., Tomažin K., Čoh M. (2009). *Dejavniki razvoja maksimalne hitrosti pri mladih atletih in atletinjah starih od 7 do 14 let starih.* In: Čoh M, ed. Sodobni diagnostični postopki v treningu atletov, Ljubljana: Fakulteta za šport, Inštitut za kineziologijo, Slovenija; 155-63.
14. Juhas, I., Matić, M., Babić, V., Škof, B. (2013). *Comparative analysis of competition in athletics for children aged 7 to 14 years in Serbia, Croatia and Slovenia*. In M. Doupona Topić & T. Kajtna (Eds.), Proceedings of the 6th Conference for youth sport. Bled, 2012. (pp. 135 – 142). Ljubljana: University of Ljubljana, Facultyof Sport.
15. Kurija, S. (1982). *Utjecaj motoričkih sposobnosti na rezultate u trčanju 60 m kod pionira*. Zagreb: Fakultet za fizičku kulturu, Diplomski rad.
16. Šnajder, V. (1982). *Kanoničke relacije između sposobnosti sprinterskog trčanja i nekih antropometrijskih mjera*. Kineziologija; 12 (1-2): 43-48.
17. Vaeyens R**.**, Lenoir M, Williams AM, Philippaerts RM. (2008). *Talent identification and development programmes in sport: current models and future directions*. Sports Med.**;** 38 (9):703-14.
18. Zagorac, N. (1984). *Relacije između antropometrijskih i motoričkih karakteristika i rezultata u atletskim disciplinama: skok u dalj, skok u vis i trčanje na 600 m kod djece starosne dobi 11-13 godina*. Zagreb: Fakultet za fizičku kulturu, Magistarski rad.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Effect of using some plyometric exercises to improve explosive power and digital achievement in the long jump

Houcine Benzidane[1] , Djamel Mokrani[1] , Kotchouk Sidi Mohamed, Asli houcine, Zerguine Sadek

[1]Laboratory of Programs Optimization in APS, Institute of Physical Education and Sports, University of Mostaganem, Algeria
hocine76ben@yahoo.fr djameleps@yahoo.fr

ABSTRACT

This research aims to identify the effect of using some plyometric exercises to improve explosive power and digital achievement in the effectiveness of the long jump between pre and post tests for the sample research. The researchers used experimental method in confirmitee with research nature. The sample was formed of students belonging to the sport and physical education institute, university of Mostaganem (Algeria). 44 students were chosen and divided into two equal groups. The broad jump test of stability and digital achievement test were used. After statistical processing of the crude results, researchers found that plyometric exercises used led to the explosive power improvement for legs and so the digital achievement in long jump between pre and post tests in favor of the post test, in addition to the superiority of the experimental sample to the controlled one in tests results

Key words: plyometric exercises, explosive power, digital achievement, long jump

INTRODUCTION

Athletics games are considered among events that attracted attention in the area of research thing which led to the improvement in various training methods. As consequence there were improvement concerning records in run, jump and throwing competitions at different international levels.

This kind of games depend on muscle strength at jump and throw competitions. The muscle strength is an important element to achieve any sort of physical performance. Its contribution varies according to the kind of performance and contributes to the appreciation of other physical elements as speed, endurance and agility. For that, it has occupied part in sport training programs and it's considered as an important determinant in achieving sport superiority at most of athletics games events.

The different services of the muscle power in practice that athletes need, especially at long jump events have a crucial and effective role in results determining, without forgetting the other effectiveness requirements especially when beating the upgrading board after speed acquisition through the approximate sprint.

Also some experts indicates that the importance of plyometrics to a strength and conditioning program has previously been established, with positive training adaptations reported for force production (Malisoux,2006,771), muscular power (Thomas,2009,332), running velocity (Kotzamanidis, 2006, 441).

A review of the published literature produces a common definition of plyometric exercise. Fatouros & al (2000) , Moore & al (2005) report plyometric exercises as those that are characterized by a rapid deceleration of the body followed almost immediately by a rapid acceleration of the body in the opposite direction. It is this eccentric / concentric contraction

pattern which is reported to evoke the elastic properties of the muscle fibers and connective tissue in a way that allows the muscle to store more elastic energy during the deceleration phase and release it during the acceleration period. And Hamdi (2011) mentioned refering to Malisoux (2006) that plyometric training contributes in improving the achievement especially in activities that use explosive muscles contrations. (Hamed, 2011, p01-05). Labuber, Christon, Anne (1993) mentioned that plyometric training contributes to the development of maximum power and legs explosive power during the strength power application.

It's obvious that the main objective in sport and physical educations classes is to upgrade student's physical level so that they can practice practical lessons with good level of physical fitness. The research problem due to researchers field follow-upin the area of teaching students in athletics specialty at the sport and physical education institutes, where students physical fitness weakness was noticed add to lack of diversification and combination between modern methods by teachers and particularly while developing physical attributes belonging to the effectiveness.

It's, also, noticed students weak performance in the jump as well as slower speed concerning the approximate sprint add to bad standing after beating upgrade board which require a height speed and strong fast glance while approaching the standing board. This what athletes do suffer from in the long jump effectiveness.

This what let us to notice the reasons of digital achievement weakness in long jump for physical and sport education institute students due to the lack of using training methods with out looking for means and methods which may fulfill sport superiority. For that researchers suggested to know the effect of using some special plyometric exercises on legs explosive power to realize the digital achievement in the long jump effectiveness for students sample in the athletics specialty at the Institute of sport and physical education, university of Mostaganem, Algeria. Thus, some questions were asked:

- Does the use of plyometric exercises has an effect in improving legs explosive power in long jump for students practicing athletics?
- Does legs explosive power development contribute in digital achievement in long jump for students practicing athletics?

METHOD

Researchers used experimental method releving to the nature and the problematic of the research

Research society and sample: research society was chosen among students of first year LMD belonging to sport and physical education institute –Mostaganem- academic year 2013/2014 between 18 and 20 years old. Their number was about 240 students.44 students were chosen intentionally who were divided into two groups, experimental group included 22 students and the same number for control group, it means 22 students. Knowing that all of them belong to the same level and the same specialty (athletics).

- Tests specifications:

The broad jump test of stability.

-The aim of the test: explosive power measurement of legs muscles

- Tools used: flat land- band to measure distances.
- Description of performance: install the measurement band on the flat land. The candidate stands after the starting line, his knees bended, his arms put behind then he jumps to as far as possible. The candidate is given two chances. The best result is counted. (See figure 01).

The distance is calculated from the starting line to the nearest foot print from the starting line.

Figure 01: shows the wide jump test of stability

- Long jump test:

- Aim of the test: measurement of distance achievement for long jump
- Tools used: measurement band of distances, long jump track
- Performance description: each athlete was selected after controlling the approximate distance to the standing board. Three (03) attempts were given to every athlete recording the highest achievement. The distance was measured to the last trace left by the athlete. (See figure 02)

Figure (02) shows the long jump test.

- The main experience: training sessions for research sample were held in the morning of each Sunday and Wednesday. Set of plyometric exercises were prepared aiming to develop legs explosive power for first year students of physical and sport education by using the necessary tools and means. Ten (10) training sessions were proposed. Each session had its own procedural aim beginning from Feb. 02^{sd}, 2014 to Mar. 09th, 2014.

The first phase included 02 weeks. The duration used in the proposed training sessions was 16 minutes. The load intensity ranged between 40% to 60%. Each exercise was repeated from 06 to 10 times with 03 to 04 groups with a rest from 45 to 60 second.

The second phase included 03 weeks. The duration used in the proposed training sessions was about 18 minute. The load intensity ranged between 50% to 70%. Each exercise was repeated 08 to 12 times with 04 to 05 groups allowing a rest of 60 to 90 second.

Where the control sample practiced the long jump activities under the supervision of the teacher.

RESULTS

- Viewing, analyzing and discussing the broad jump test:

Table (01) shows the comparison between the pre-test and post-test of the results of research sample

Statistical means Research Sample	Pre test		Post test		T Calculated	T Tabulated	Différence signifiances
	x1	y1	x2	y2			
Control sample	2.17	0.18	2.19	0.19	1.12	2.08	Not Significant
Expérimental sample	2.16	0.16	2.34	0.12	6.57*		Significant

Level of significance 0.05 and the degree of freedom (n-1)=21

The results of table 01, after using the significance differences test, shows that the calculated T value for the control sample amounted to 1.12 which is inferior than tabulated T estimated to

2.08 at the degree of freedom 21 and the level of significance 0.05 which means the existence of statistical significance.

Concerning the experimental sample the calculated T value amounted to 6.57 which is superior than the value of tabulated T estimated to 2.08 at the degree of freedom 21 and significant level 0.05 that means the existence of statistical significance which means the existence of significant difference between averages in favor of the post test.

- Viewing, analyzing and discussing the long jump test:

Table (02) shows the comparison between the pre-test and post-test of the results of research sample

Statistical means Research Sample	Pre test		Post test		T Calculated	T Tabulated	Différence signifiances
	x1	y1	x2	y2			
Control sample	4.56	0.43	4.60	0.40	1.28	2.08	Not Significant
Expérimental sample	4.60	0.42	4.85	0.33	7.17*		Significant

Significant level 0.05 and the freedom degree (n-1)=21

Through the statistical results mentioned in table 02, after using the measurement of statistical significance T "student", we notice that the calculated T value for the control sample amounted to 1.28 which is smaller than the tabulated T value estimated to 2.08 at the degree of freedom 21 and significant level 0.05 which means the existence of statistical significance.

As for the experimental sample the value of calculated T amounted to 7.17 which superior than tabulated T amounted to 2.08 at the degree of freedom 21 and significant level 0.05 that means the existence of statistical significance which means also the existence of significant difference between the pre and post calculated average in favor of the post test.

Comparison of post-test results of research samples:

Table (03): explains the comparison of post-tests results of research samples.

Statistical measurements Tests	Control sample		Expérimental sample		T Calculated	T Tabulated	Différence signifiances
	X1	P1	X2	P2			
Board jump of stability	2.19	0.19	2.34	0.12	3.61*	2.04	Significant
Achievement in long jump	4.6	0.40	4.85	0.33	2.55*		Significant

Significant level 0.05 and degree of freedom (2n-2)=42

We do notice through table 03 that the calculated T value amounted between 2.55 as smallest value and 3.61 as biggest value which is bigger than tabulated T estimated to 2.04 at the degree of freedom 42 and significant level 0.05 which confirms the presence of significant differences between these averages that means the differences have statistical significance.

DISCUSSION

Through table (01) and (02) , we notice improvement in legs explosive power for the experimental sample in comparison with the control sample. This due to the use of plyometric

exercises aiming to improve and develop legs explosive power by activating voluntary muscles in work. This method leads to produce and output power maximum to fulfill the best result.

The development of explosive power leads to the production of high ability and fast dynamic performance. The use of plyometric exercises to develop legs muscles explosive power emphasizes to increase the push in advance due to the speed of the working muscles extension resulting from training and adapted to reduce the default time while executing the push in front of which increase the jump distance. Many studies, Labuber and al (1993), Essayed (2012), all these studies mentioned that the use of plyometric training contribute to the improvement the explosive power for low parties after applying the jump test. The results agreed with the results obtained which confirm the effectiveness of the plyometric training method use to improve low parties (legs) explosive power.

Researchers explain the result in table (02), that plyometric exercises used for experimental sample led to the faster explosive power improvement through central muscle contraction development and develop the relationship between the maximum forces and the explosive power. Researchers found also that the direct relationship between the rise of achievement level in the long jump is linked with the viability of the power characterized by speed and the upgrading capacity or the explosive standing and the possibility of developing them.

The results of table (03) show also that the experimental sample members had achieved the best results in post test compared with control sample members. This confirms the improvement of both experimental and controlled sample level with a superiority of experimental sample due to proposed exercises included for the experimental sample in order to develop the explosive power of low parties and thus the ability of upgrading to improve digital achievement in long jump. The series of the performed plyometric exercises ranged in a set of different plyometric leaps confirmed their effective impact on the muscle system through relationship development between the maximum power and the explosive power for low parties.

Thus the development of upgrading ability which improve the digital achievement in the effectiveness. This coincides with Essayed (2012) study which emphasizes on the application of physical exercises in adequate manner (redundancy, density appropriate as well as the intensity). Hamdi(2011) mentioned referring to Malisoux (2006) that plyometric training contributes in the achievement improvement especially in the activities where muscle explosive contractions are used, and Rahimi (2005) who mentioned that the plyometric training in short term has a great effect to power muscle and upgrading development. Add to what Matavulj & Al (2001) said that the plyometric training improved jump results for basketball players for example, and what Kotzamanidis (2006) approved while saying that plyometric training developed the achievement operation in the vertical jump for young people.

Researchers believe that upgrading is necessary in long jump effectiveness. This may be seen clear through the students obtained results in long jump which reflect interdependence between upgrading and the Athletic Performance.

CONCLUSION

That the exercises Plyometric a positive impact in the development explosive power of the legs in triple jump. That the exercises Plyometric a positive impact in the development digital achievement in long jump. There are no statistically significant differences between tribal and dimensional tests and for the post-test. Exercises Plyometric used led to the improvement of the explosive power of the legs and Athletic Performance of the long jump.

REFERENCES

1. Baechle, T, Earle, R.(2000). Essentials of Strength Training and Conditioning (3 rd ed.). Champaign, IL: Human Kinetics.
2. C.Etienne & L.Fabrice.(1999).Les fondamentaux de l'athlétisme. Paris. Ed amphora.
3. Chu, Donald .(1983). polymétries, the Link between strength and speed, Rome, p3.
4. Holcomb, W., Lander, J., Rutland, R., & Wilson, G. (1996). The effectiveness of a modified plyometric program on power and the vertical jump. Journal of Strength and Conditioning Research, 10, 89-92.
5. Edward Derse , Jacqueline Hansen, Tim O'Rourke, Skip Stolley (1995). Track and Field Coaching Manuel . LA84 Foundation. All rights reserved. Printed in the USA. ISBN 0-944831-32-XCIP 94-80269 .
6. Essam Fathy Ghareb (2014) Effect of Plyometric Training With Different Intensites on Kinimatics Variables in Fosbury-Flop High Jump. Ovidius University Annals, Series Physical Education and Sport Science, Movement and Health, Romania, Vol. XIV, ISSUE 2, p 251-256.
7. Fatouros, Ioannis G., Jamurtas, Athnasios Z., Leontsini, D., Taxildaris, Kyriakos, Aggelousis, N., and Buckenmeyer, Philip.(2000) Evaluation of Plyometric Exercise Training, Weight Training, and Their Combination on Vertical Jumping Performance and Leg Strength. Journal of Strength & Conditioning Research, 14(4), 470-476.
8. Hamdi Sofiane(2011) . Effect of two méthods entrainement, plyométric and musculation, on Explosive by players of Soccer Canada, Université du Québec à Montréal.p 02.
9. Kotzamanidis, C.(2006). Effect of Plyometric training on running performance and vertical jumping in prepubertal boys. Journal of Strength and Conditioning Research 20, 441- 445
10. Labuber, Christon, Anne(1993). The Effect of plyometrics training on selected measures of leg strength and power when compared to weight training. Unpublished MA Dissertation centered Michigan Univ.
11. Makaruk H., Sacewicz T (2011)The Effect of Drop Height and Body Mass on Drop Jump Intensity. Akademicka Biala Podlaska, Poland , Biology of Sport, Vol. 28 No1, p63.
12. Malisoux L, Francaux M, Nielens H, and Theisen D.(2006). Stretch-shortening cycle exercises: An effective training paradigm to enhance power output of human single muscle fibers. J Appl Physiol 100: 771– 779.
13. Matavulj, D., Kukolj, M., Ugarkovic, J., Tihanyi, J. and Jaric, S.(2001). "Effects of Plyometric training on jumping performance in junior basketball players". Journal of Sports Medicine and Physical Fitness 41,159.
14. Mohamed Abd El-Mawgoud Elsayed (2012).Effect of Plyometric Training on Specific Physical Abilities in Long Jump Athletes. IDOSI Publications .World Journal of Sport Sciences ,ISSN 2078-4724, 7 (2): 105-108.
15. Moore, Christopher A., Schilling, Brian K.(2005).Theory and Application of Augmented Eccentric Loading. National Strength and Conditioning Journal, 27(5), 20-27.
16. Rahimi, R., & Behpur, N. (2005). The effect of plyometric, weight and plyometric-weight training on anaerobic power and muscular strength. Facta Univ Phys Educ Sport, 3(1), 81-91.
17. Thomas K, French D, and Hayes PR (2009). The effect of plyometric training techniques on muscular power and agility in youth soccer players. J Strength Cond Res 23: 332–335.
18. Wathen, Dan.(1993) Literature Review: Explosive, Plyometric Exercises. National Strength and Conditioning Journal, 15(3), 17-19.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Retrospect on performances by the athletes in the world of Computer Technology.

MEER TAUSEEF ALI , Asst Prof (Sr) , MCA Dept, **D C E T , HYDERABAD ,INDIA**.

MEER ARSHAD ALI Asst Prof , CSE Dept, **M J C E T , HYDERABAD ,INDIA** ,

Abstract

This paper examines perspective of implementing technology in sport ranging from body techniques, traditional sport equipment used by athletes within competition, to performance-enhancing machines, substances, and methods used outside of the competitive setting. Any critical and systematic discussion of sport technology in competitive sport should relate to athletic performance. The theory of performance in Sport is considered an arena for the testing out of the performance potential of the human body. To end up with valid and reliable tests, performance measurements have to be accurate, and the method requires equal opportunity in competitions. An acceptable technology is simply a performance-enhancing technology. Technology that requires athletic efforts and skills, to which there is equal access, and that does not represent unnecessary risk for harm, is considered not merely as acceptable but as constitutive to the value in sport. In a final, critical comparison, it is argued that the technology in sport represents the only possibility towards a more sophisticated approach in the usage of technology in sport.

Keywords: Multimedia, Body techniques, Sports management, Interdisciplinary collaboration, Information and communication technology, Game analysis, Training and competition analysis, Performance analysis.

INTRODUCTION

Technology serves many functions in sport. Technology might enhance performances, such as the new Fastskin swimsuit that is said to reduce water friction, other kinds of technology, such as helmets and body protection in boxing and ice hockey, are supposed to prevent injuries.

Sport Technology

Technology is understood as human-made means to reach human interests and goals. Sport technologies, then, are human-made means to reach human interests and goals in or related to sport.

In the wide sense, the term refers to activities ranging from jogging and non-competitive aerobics via bodybuilding to traditional competitive sport. Sport refers to competitive activities in which the participants' bio-motor abilities (such as endurance, speed, and strength) and movement skills, determines the outcome. This can be described as the measuring, comparison, and ranking of competitors according to athletic performance as defined by the relevant rules.

The structural goal of competitive sport is to evaluate and rank persons according to their athletic performance. Several interpretations what athletic performance is all about, and these theories have implications for views on sport technology. More specifically, I will discuss athletic performance

Modern Sport Technology in Designing sports Equipment

Technology in sports is a technical means by which athletes attempt to improve their training and competitive surroundings in order to enhance their overall athletic performance. It is the knowledge and application of using specialized equipment and the latest modern technologies to perform tasks more efficiently. Examples of sporting technologies include golf clubs, tennis rackets, pole vault poles, athletic sports gear (clothing and footwear), advanced computer stimulations and motion capture.

Computerized Software Assessing sports performance

CAD offers an efficient means of considering and assessing new products and ideas, and is primarily used to improve safety, comfort and effectiveness of specialized sports equipment. However the development of these skills requires proper practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution

Computer science in sport is an interdisciplinary discipline that has its goal in combining the theoretical as well as practical aspects and methods of the areas of informatics and sport science. The main emphasis of the interdisciplinary is placed on the application and use of computer-based but also mathematical techniques in sport science, aiming in this way at the support and advancement of theory and practice in sports. The reason why computer science has become an important partner for sport science is mainly connected with "the fact that the use of data and media, the design of models, the analysis of systems etc. increasingly requires the support of suitable tools and concepts which are developed and available in computer science".

Purpose of this study

The purpose of this study is to make out how far the usage of computer technology, multimedia packages in teaching and learning process of physical education activities and sports skills to both athletes and trainer helped thereby finding out the Improvement in the game.

METHOD

The study of the game by observing the behavior of the athlete is not a recent phenomenon, characterized by a process that has evolved over time and that has accompanied the enormous growth of sports performance for the past 40 years. Traditionally, methods of analysis have used the frequency of occurrence of events as an indicator of performance. This analysis based on the analysis of the frequency of certain performance parameters provided and continues to provide important information for trainer and athletes, enabling advances in training processes. The performance of each player was assessed by the sum of the positive and negative aspects of movements executed during the course of the game.

Men's javelins throw world record progression

The following figure shows progression of the world record in the men's javelin throw, as recognized by the International Association of Athletics Federations (IAAF). The first world record in the men's javelin throw was recognized by the International Association of Athletics Federations in 1912[1].The first World records was set by Eric Lemming (SWE) on 29 September 1912 set with a mark of 62.32m. On 25 July 1976 Montreal, Canada Miklós Németh (HUN) threw 94.58m. Later on 20 July 1984 East Berlin, East Germany Uwe Hohn (GDR) set a

new record of 104.80m, and the current world record is held by Jan Železný (CZE) on 25 May 1996 at Jena, Germany set 98.48 m. [1]

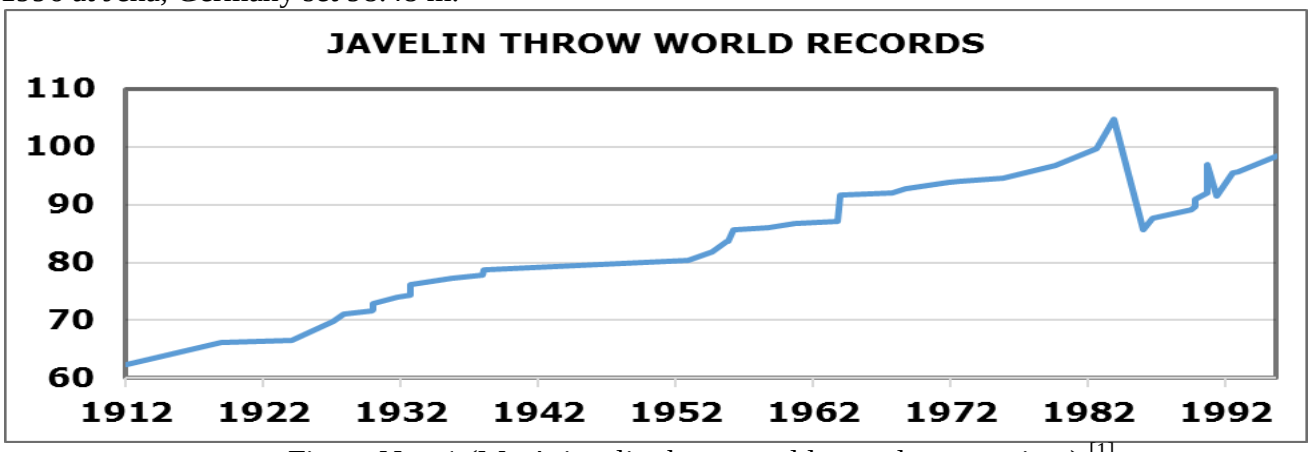


Figure No : 1 (Men's javelin throw world record progression) [1].

Men's hammers throw world record progression

The following figure shows progression of the world record in the men's hammer throw, as recognized by the International Association of Athletics Federations (IAAF).The first world record in the event was recognized by the IAAF in 1913[2].The first World records was set by Pat Ryan (USA) on August 17, 1913 set with a mark of 57.77 m . On August 6, 1978 Karl-Hans Riehm of West Germany threw 80.32 m. Later on May 16, 1980 at Neubrandenburg, East Germany Yuriy Sedykh of Soviet Union set a new record of 80.38 m, and the current world is also held by Yuriy Sedykh on August 30, 1986 at Stuttgart, West Germany throwing 86.74 m.

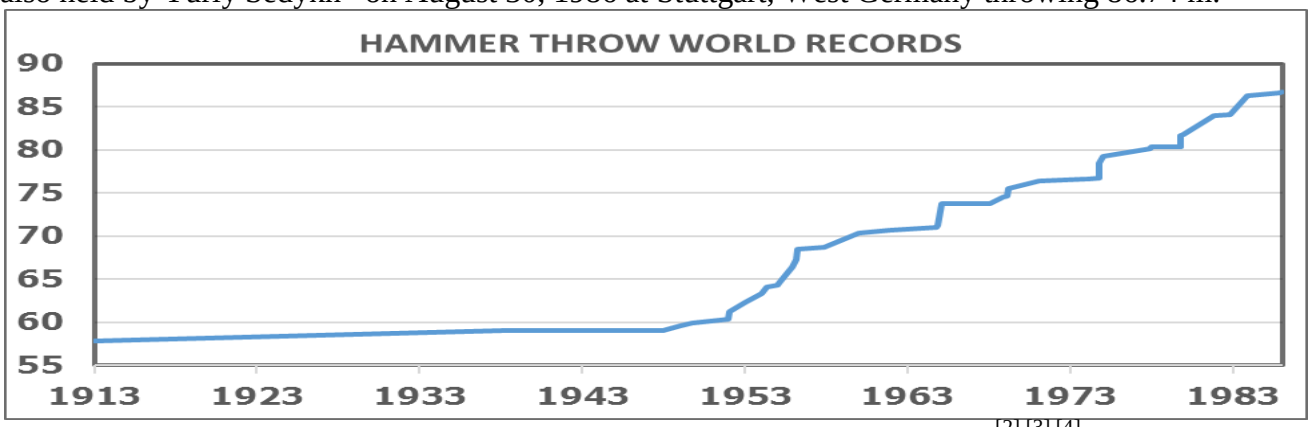


Figure No: 2 (Men's hammer throw world record progression) [2] [3] [4]

Men's Shotput world record progression

The following figure shows progression of the world record in the men's shotput as recognized by the International Association of Athletics Federations (IAAF).The first world record in the men's shot put was recognized by the International Association of Athletics Federations in 1912. That inaugural record was the 15.54 m performance by Ralph Rose in 1909. [5]

The first World record was set by Ralph Rose (USA) on 21 August 1909 with a mark of 15.54 m. On June 6 July 1978 Udo Beyer (GDR) threw 22.15 m. Later on 25 June 1983 Udo Beyer (GDR) again set a new record of 22.22 m, and the current world is held by Randy Barnes (USA) by throwing 23.12 m 20 May 1990 Los Angeles, U.S.A.

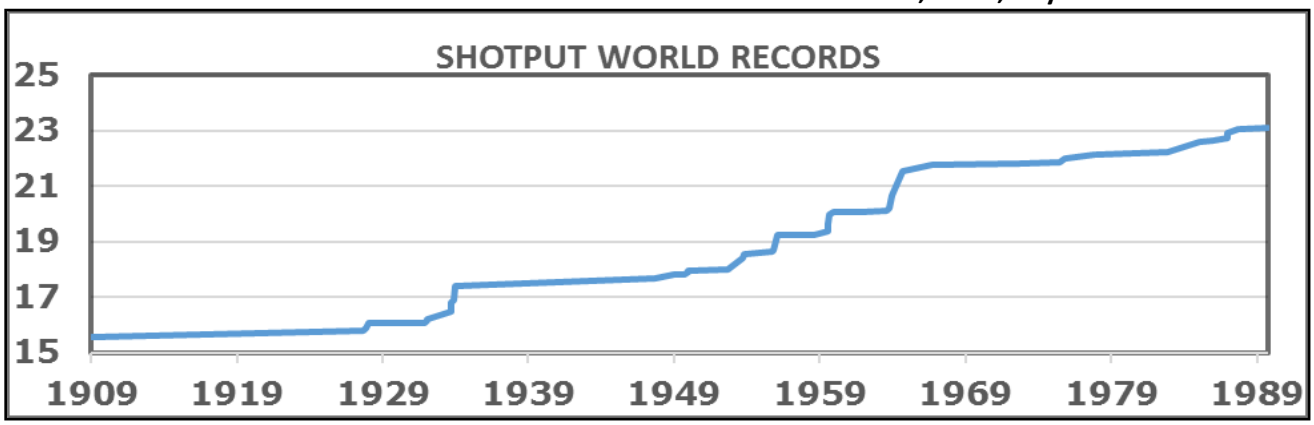


Figure No: 3 (Men's Shotput world record progression) [5]

Men's discus throws world record progression

The following figure shows progression of the world record in the men's discus throw, as recognized by the International Association of Athletics Federations (IAAF).The first world record in the men's discus was recognized by the International Association of Athletics Federations in 1912, The first World records was set by James Duncan (USA) on 27 May 1912 with a mark of 47.58 m. On 9 August 1978 Wolfgang Schmidt (GDR) threw 71.16 m. Later on 29 May 1983 at Neubrandenburg, Yuriy Dumchev (USSR)) set a new record of 71.86 m , and the current world is held by Jürgen Schult (GDR) by throwing 74.08 m. [6] [7]

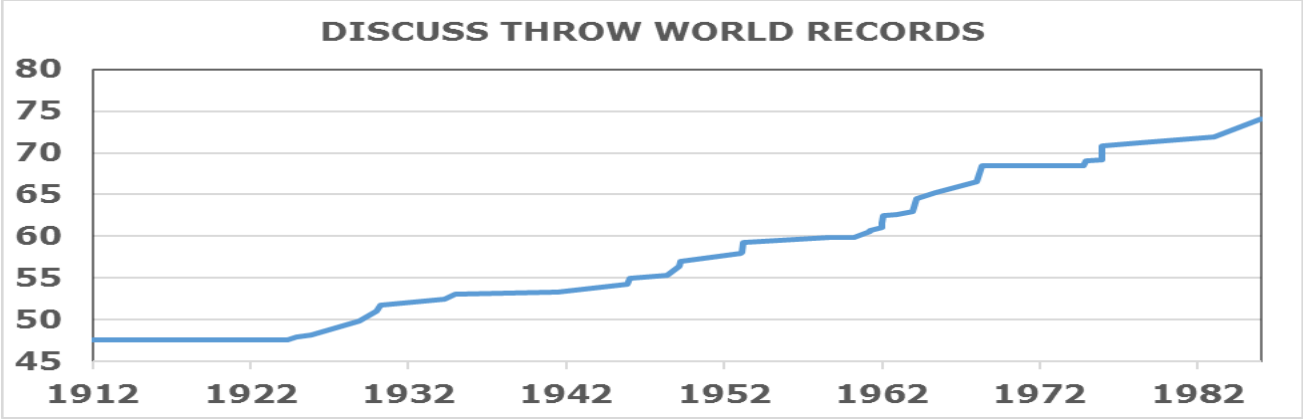


Figure No: 4 (Men's discus throw world record progression) [8] [9] [10]

Men's 100m world record progression

The following figure shows progression of the world record in the 100m, as recognized by the International Association of Athletics Federations (IAAF). The first World records was set Donald Lippincott (USA) on July 6, 1912 clocked 10.6 sec[11]. On May 22, 1976 Don Quarrie of Jamaica clocked 9.9 sec. Later on July 3, 1983 at Colorado Springs, Calvin Smith of USA clocked 9.93 sec and the current world record is held by Usain Bolt on August 16, 2009 at Berlin, Germany clocking 9.58 sec . [12] [13] [14]

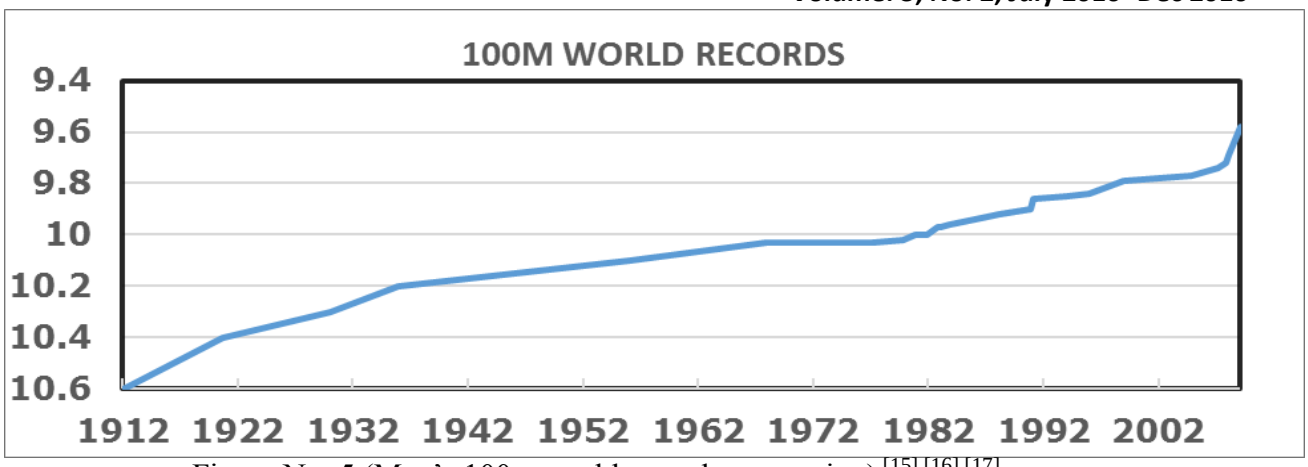


Figure No: 5 (Men's 100m world record progression) [15] [16] [17]

Men's pole vault world record progression

The following figure shows progression of the world record in the pole vault event, as recognized by the International Association of Athletics Federations (IAAF).The first world record in the men's pole vault was recognized by the International Association of Athletics Federations in 1912.The first World records was set by Marc Wright of USA on June 8, 1912 by crossing 4.02 m .On June 22, 1976 David Roberts of USA crossed 5.70 m. Later on Władysław Kozakiewicz of Poland crossed 5.72 m on May 11, 1980, and the current world record is held by Sergey Bubka of Ukraine crossing 6.14 m on July 31, 1994. [22]

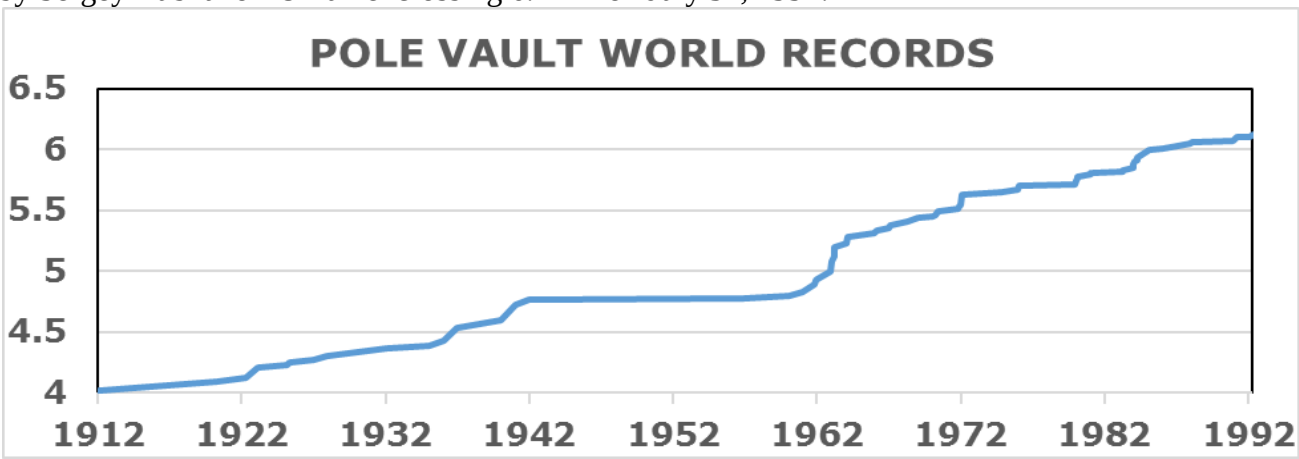


Figure No: 6 (Men's pole vault world record progression) [22]

RESULTS & DISCUSSION

Javelin throw

As of June 21, 2009, 46 world records have been ratified by the IAAF in the event.New specifications for the javelin were introduced in 1986, and javelins with serrated tails were banned in 1991 which had the effect of reverting to an earlier record set in 1996. Of the 69 Olympic medals that have been awarded in the men's javelin, 32 have gone to competitors from Norway, Sweden or Finland. Over time, distances thrown progressed significantly, and the 100 m mark was passed by Uwe Hohn in 1984.The current (as of 2015) men's world record is held by Jan Železný at 98.48 m (1996). [1]

Hammer throw

As of 2015 the men's hammer world record is held by Yuriy Sedykh, who threw 86.74 m (284 ft 63⁄4 in) at the 1986 European Athletics Championships in Stuttgart, West Germany on 30 August.1986. As of June 21, 2009, 45 world records have been ratified by the IAAF in the event. [2]

Shotput

The first world record in the men's shot put was recognized by the International Association of Athletics Federations in 1912. That inaugural record was the 15.54 m performance by Ralph Rose in 1909[1]. As of June 21, 2009, 51 world records have been ratified by the IAAF in the event[1] These distances by these men were accomplished with a 16 pound shot. The current world record has not changed since 1990, the longest duration of any one record. The record was improved upon five times in 1960, four times in 1934. [5]

Discuss throw

As of 2011, 42 world records have been ratified by the IAAF in the event.Another 14 are acknowledged but are unofficial since they were set before the founding of IAAF.The first modern athlete to throw the discus while rotating the whole body was František Janda-Suk from Bohemia (present Czech Republic). He invented this technique when studying the position of the famous statue of Discobolus. After only one year of developing the technique he gained the olympic silver in 1900. [24]

100 m

The Olympic 100 m is the most prestigious competition for the distance and it attracts elite level, international competitors. The winner of the race is occasionally referred to as "the world's fastest" man reflecting the high level of the competition and the quality of performances.[13] [14]As of February 2014, the current Olympic records of 9.63 for men rank as the second fastest times in history, for men [19] [20] [21]

The 2012 men's final was the fastest 100 m race in history, collectively: the top five men ran under 9.90 seconds for the first time ever and seven of the eight finalists ran under 10 seconds (the last runner suffered an injury).

Pole vault

The first world record in the men's pole vault was recognized by the International Association of Athletics Federations in 1912.As of June 21, 2009, 71 world records have been ratified by the IAAF in the event. The introduction in the early 1950s of flexible vaulting poles made from composites such as fiberglass or carbon fiber allowed vaulters to achieve greater height. [22]

The following table shows progression of the world record into two parts, one part depicts the rate of Displacements in records until 1980 and the other part depicts the Rate of Displacements in records since 1980 onwards to the current world records. It was observed that there was a drastic growth in the game like of Javelin throw, Hammer throw & Shotput. But whereas in the game of Discus throw, Pole vault and 100m sprint shown a steady growth.

Sport	Rate of Displacement in records until 1980	Rate of Displacement in records since 1980 onwards to the current world record
Javelin throw	0.047441	1.227750
Hammer throw	0.369200	0.802500
Shotput	0.095800	0.128570
Discus throw	0.357270	0.365000
100 m	0.010610	0.013460
Pole vault	0.024700	0.030000

CONCLUSIONS

I have suggested a particular understanding of sport technology and suggested a way of examining systematically and critically its role in sports, proper theory of athletic performance from which such evaluations can take place. Moreover, I have discussed theories of performance and its impact on sport technology. The theory accepts any kind of sport technology as long as it serves the purpose of reaching the desired external goals. The theory accepts all means of performance enhancement as long as there is equality of opportunity in terms of equal access to all competitors.

The underlying premise in this concept is that sport is an arena for the testing out of human limits in objective terms. The can be linked to various kinds of technological optimism that can probably be found in some high performance sport settings in which any technological innovation is considered a good innovation.

While much of this performance enhancement can be attributed to better training, diet, desire to win etc it is clear that advanced designs and the materials of construction have made a major impact in some sports. In the 100 m sprint, it is likely that the strength, power, and will to win of the athlete is dominant and that no technological development has arrived to require a rule change. The pole vault has seen heights increase dramatically with the introduction of flexible poles in the 1960's.

The rules of javelin have been altered by mandating the equipment that can be used to reduce throw lengths and make the sport safer for fellow athletes and spectators. Thus, there is a balance between technologies. Happily, a century on from Baron de Coubertin's original vision of the Olympics, the motto "faster, higher, stronger" is ultimately still dependent upon the skill of the athlete.

Multimedia is a powerful combination of earlier technologies that constitutes extraordinary advance in the capability of machines to assist the athletes & trainers. Multimedia elements such as text, graphic, video, audio and animation when integrated into teaching and learning processes as established by various authors internalize learning of physical education concepts and sports skills. These steps can be followed to teach any technique of a skill by showing it frame by frame from the start to completion of a technique or whole skill for student’s optimal learning and performance in sports. A bigger sample of players and teams would improve the validity of the obtained data and hence enable more detailed findings concerning an individual sport game which would, in turn, benefit sport science and sport practice.

From the above studies, the question of whether computer technology and multimedia have significant difference or not with traditional method have been well established in their contribution to learning processes one way or the other.

References

1. "12th IAAF World Championships In Athletics: IAAF Statistics Handbook. Berlin 2009." (PDF). Monte Carlo: IAAF Media & Public Relations Department. 2009. pp. Pages 546, 559. Archived from the original (pdf) on November 23, 2012. Retrieved August 5, 2009.

2. "12th IAAF World Championships In Athletics: IAAF Statistics Handbook. Berlin 2009." (PDF). Monte Carlo: IAAF Media & Public Relations Department. 2009. pp. Pages 546, 558–9. Archived from the original (pdf) on November 23, 2012. Retrieved August 5, 2009.
3. 17. Rouse, Paul (2015-10-01). Sport and Ireland: A History. Oxford University Press. p. 263. ISBN 9780198745907. Retrieved 16 November 2015.
4. 18. Athletics Weekly, (AW28.31.16).
5. ."12th IAAF World Championships In Athletics: IAAF Statistics Handbook. Berlin 2009." (PDF). Monte Carlo: IAAF Media & Public Relations Department. 2009. pp. Pages 546, 646–7. Archived from the original (pdf) on November 23, 2012. Retrieved August 5, 2009.
6. ."13th IAAF World Championships In Athletics: IAAF Statistics Handbook. Berlin 2011.". Monte Carlo: IAAF Media & Public Relations Department. 2011. pp. 606, 607. Archived from the original (pdf) on November 23, 2012. Retrieved 10 August 2011.
7. M Discus world record progress
8. "Top Lists: Discus Throw - Men - Senior - Outdoor". IAAF Athletics: Records and Lists. International Association of Athletics Federations. Retrieved March 8, 2013.
9. Litsky, Frank (November 22, 2002). "Obituaries: Ben Plucknett, 48, Track Star Who Lost Record After Drug Test". New York Times. The New York Times Company. Archived from the original on March 8, 2013. Retrieved March 8, 2013.
10. "Live from Växjö!". www.team75plus.com. 2009-03-22. Retrieved 2011-02-25.
11. "IAAF World Championships: IAAF Statistics Handbook. Daegu 2011.". Monte Carlo: IAAF Media & Public Relations Department. 2011. pp. Pages 595, 596. Archived from the original (PDF) on November 23, 2012. Retrieved August 3, 2011.
12. "12th IAAF World Championships In Athletics: IAAF Statistics Handbook. Berlin 2009." (PDF). Monte Carlo: IAAF Media & Public Relations Department. 2009. pp. Pages 546, 547. Archived from the original (PDF) on November 23, 2012. Retrieved July 29, 2009.
13. Revisionist history: men's 100 WR. Track and Field News. November 1, 2013
14. "Stat Corner: 100 WR Progression". Track & Field News 61 (7): 55. July 2008.
15. Track and Field News, November 1989, vol. 42, #11, p. 37
16. "10m Splits for Various 100m Final Events". Myweb.lmu.edu. Retrieved 2016-05-23.
17. "100m World Record falls to Montgomery - 9.78!". IAAF. 14 September 2002. Retrieved 2008-09-03.
18. Frank Litsky (May 18, 2006). "Gatlin Must Share 100-Meter Record". New York Times. Retrieved 2008-09-03.
19. "12th IAAF World Championships in Athletics - Berlin 2009 - Bolt again! 9.58 World record in Berlin!". Berlin.iaaf.org. 2009-08-16. Retrieved 2010-06-07.
20. "World records set at Berlin World Championships have been ratified". iaaf.org. 2009-09-30. Retrieved 2010-06-07.
21. "Effect of wind speed and altitude on sprint times". www.brianmac.co.uk. Retrieved 2011-04-28.
22. ."12th IAAF World Championships In Athletics: IAAF Statistics Handbook. Berlin 2009." (PDF). Monte Carlo: IAAF Media & Public Relations Department. 2009. pp. Pages 546, 555–6. Archived from the original (pdf) on November 23, 2012. Retrieved August

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

To Develop the Training Programme for the Improvement of Performance of Elite Libero Volleyball Players of Mumbai Region.

Mr. Bhaskar Salvi (Ph.D)
PTVA's, Mulund College of Commerce
Mulund, Mumbai. INDIA
Email: bhaskarlv57@gmail.com

INTRODUCTION

The game of Volleyball was invented in the year 1895 by William G. Morgan Hal yoke, Massachusetts as a recreational activity for the businessmen. The modern volleyball is highly specialized in almost all the major skills of Volleyball. It is a sport for young and old for men and women. The character of Volleyball game is entirely different than that of other sports discipline. Rotation system is a unique feature that differentiates Volleyball from other sports.

Is the introduction of a libero a "specialized defensive player" one of the series of innovations categorized in the current official rules of the federation international de volleyball. The libero must be recorded on the score sheet before the match in the special line reserved for it. His/ her number must also be added on the line up sheet of the first set. The libero player must wear a different colour uniform for the redesigned libero, in contrast to the order members of the team, the libero uniform may have a different design but it must be numbered like the rest of the team members.

Now the volleyball is game of power and tactics and is played at a faster pace and this call sharper thinking, high standard of skills and technical application. There are very fast action and accuracy in performance of technique and tactics which are the demand of present game. A team can only reach top level. If plan scientific training given to the players. Hence, the researcher of this study intends to develop training program for performance of elite libero players of Mumbai Region in Maharashtra.

History: Volleyballis an Olympic team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules.

Libero: In 1998 the libero player was introduced internationally. The libero is a player specialized in defensive skills: the libero must wear a contrasting jersey color from his or her teammates and cannot block or attack the ball when it is entirely above net height. When the ball

is not in play, the libero can replace any back-row player, without prior notice to the officials. This replacement does not count against the substitution limit each team is allowed per set, although the libero may be replaced only by the player whom they replaced.

Statement of the Problem: -

The discussion state above revealed that: Statement of the problem is **to** Develop **the training programme for performance of elite libero, volleyball players of Mumbai region, of Maharashtra State.**

No specific training program is assessed prior to performance of elite libero volleyball players. Hence, there is need to develop a specific training schedule for libero volleyball players to improve characteristics like physical fitness technical skills and tactics required for the game. Therefore, the investigator has conducted this study entitled, "To Develop training programme for improvement of performance of elite libero Volleyball players of Mumbai region.

Review of Literature:

This study has done extensive review to find out the related literature in various libraries as well as he has gone through various websites. The relevant studies by the research scholar are enumerated.

Malousaros et al.(2009)[1] described the morphological characteristics of competitive female volleyball players. For this purpose, body weight and height, breadths and girths as well as skinfold thickness at various body sites were assessed in 163 elite female volleyball players (age : 23.8+4.7 years, years of playing : 11.5+4.2, hours of training per week : 11.9+2.9, means+ S.D.) .

Zetou et al., (2007)[2] conducted a study with the aim to present the playing characteristics of the teams in complex I and to attempt to determine which of these characteristics led to victory and to the final ranking of the teams. The subjects were 38 Olympic Volleyball men's games. In every game, teams were characterized according to the result of the game (win or lose). The games were video-recorded and analyzed with the "Data Volleyball Project Sport Software" program.

Bayios et al., (2006)[3] conducted a study with the aims a) to determine the anthropometric profile, body composition and somatotype of elite Greek female basketball (B), volleyball (V) and handball (H) players, b) to compare the mean scores among sports and c) to detect possible differences in relation to competition level. Methods: A total of 518 female athletes, all members

of the Greek First National League (A1 and A2 division) in B, V and H sport teams participated in the calculation of body composition indexes and somatotype components were obtained according to the established literature. Results : V athletes were the tallest ($p<0.001$) among the three groups of athletes, had the lowest values of body fat ($p<0.001$)

Gabbett and Georgieff (2007)[5] investigated the physiological and anthropometric characteristics of junior volleyball players competing at the elite, semi-elite, and novice levels and to establish performance standards for these athletes.

Fleck et al., (1985)[8] conducted a study with the purpose to compare various physical and performance characteristics of two elite groups of athletes, the 1980 U.S. Women's National Volleyball Team and the collegiate players who composed the 1979 U. S. Women's University Games

Objectives of the Study: The objectives of the study were as follows:

- To measure and evaluate the selected physical fitness and technical skills of elite libero volleyball players in Maharashtra.
- To prepare training schedule for elite libero Volleyball players for enhancing selected physical fitness abilities and technical skills of elite libero volleyball players.
- To conduct a controlled experiment to assess the efficacy of the training schedule on some selected fitness and skills abilities of elite libero volleyball players.

Hypotheses: On the basis of literature available so far it was hypothesized that:

- H_1O: The training program would contribute to improve speed, agility and quickness of the elite libero volleyball players.
- H_2O: The training program would contribute to improve skill abilities of the elite libero volleyball players.

Significance of the Study: A long with physical fitness a libero volleyball player needs to enhance his skill ability for achieving success. Through this research project a training programme was developed for libero players which would be significant in following ways:

- This study may give ideas for the coaches, the teachers a separate concentration for training of libero Volleyball players.
-

- The physical education teacher and concerned professionals can get a readymade training schedule for libero volleyball players.
- This study may help the volleyball coaches and all others to practice the libero's specializations in the top level volleyball.

Operational definitions of terms Used: Training Programme: Training program refers to the acquisition of knowledge, skills and competencies as a result of the teaching of vocational or training skills and knowledge that related to specific useful skills. Physical training is more mechanistic planned suites of regimes develop specific skills or muscles with a view to peaking at a particular time.

Elite Players: The players who are perfectionist and beast in competitive sports are called elite players.

Libero: Alibero a "Specialized Defensive Player" is one of the series of innovations categorized in the current official rules of the federation International be volleyball.

METHOD

The Present study was undertaken with a view to develop training program for performance of elite libero volleyball players ofMumbai Region of Maharashtra State. The methodology employed to conduct this scientific experiment has been presented in this chapter.

Research Design: This study conducted in two phases:

Phase-I: Developmental study&Phase-II: Experimental study

Development of Training Programme for Libero Volleyball Players

It has become clear that the purpose of this phase was to develop a training programme especially for libero Volleyball players. The training programme was designed on the basis of followings:

For achieving high performance the training part of libero was divided into parts viz., physical training, technical training, and skills.

The first part of this training was physical training as the players required to achieve speed, agility and quickness to obtain success.

The second part of training was technical training, in technical training the skills like defensive, court defensive, attack and block cover and specific defense was covered.

The last part to develop all the skills required for libero was tactical training,

Table1.1, Development of Training Programme of Libero Volleyball Players

Time Schedule

The week –wise training programme which was developed is as follows

Time	Types	1st week	2nd week	3rd week	4th week	5th week	6th week
20 min.	**Warm ups**	Speed	Agility	Quickness	Speed	Agility	Quickness
20 min	**Skill Training**	Fore arm	Back Roll dig	Side roll with one hand dig	Forward dive	Forward sprawl	Finger dig
		Overhead pass	Backroll volley	Sideroll volley	One hand dig	Run through	Over head dig
							Retrieval skills
60 min	**Technical training (Defense)**	Defense in diagonal direction	Defending series	Accurate defense to front line player.	Return ball accurately	Defense in threes	Quick reaction when covering the block.
		Stationary defense sideways	Defending with change of direction	Court passes following variably fed balls	Return ball to the coach accurately	Defense in threes non stop	Three defensive actions in fast succession.
		Defending ball to the passer at the net	Takeover neighboring position& defend diagonal attacks	Command the defense area	Return the ball to the coach after rebound.	Divided attention and quick switching	Defend variable attack by coach.
			Penetrating& defending fast succession of strikes	Two successive actions of court defense	Defend line attacks and diagonal attacks non stop	Player remain at ball level	Recovering high block rebound.
			React quickly and defend	Successive defense and passes	Defend in cooperation with neighboring players	Approach ball and cover	Defend passed balls
						Cover three types in succession	
						Cover as 6 at front	
5 min	**Tactical training**	Tactical training	Tactical training	Tactical training	Tactical training	Tactical training	Tactical training
15 min	**Cooling down**	Cooling down	Cooling down	Cooling down	Cooling down	Cooling down	Cooling down

Table No. 2.2, Test Items to represent each Dimension of the Test Battery

Sr.No	No. of Dimensions	Test Item	To Measure	Equipment	Equipment
01	Morphological	Height		Stadiometer	Stadiometer
		Weight		Weighing Scale	Weighing Scale
02	Physical Fitness	50 metre dash	Speed	Stopwatch & Whistle	Seconds
		Shuttle run	Agility	Stopwatch & Whistle	Seconds
		Side shuffle	Quickness	Stopwatch & Whistle	Seconds
03	Skills Test	Upper hand pass	Passing ability by upper hand pass	Stopwatch & Whistle	Score
		Under hand pass	Passing ability by underhand pass	Stopwatch & Whistle	Score
		Service reception and pass	Accuracy in service reception	Stopwatch & Ball, Wall	Score

Variables selected, tools used and criterion measures.

Three main variables were covered in this study were morphological, fitness and volleyball skills. Although morphological contain many, only two (i.e. body height and body weight) have been considered. Similarly, fitness variable were, speed ability were the skill contain upper hand pass, under hand pass, serving, ball receiving. The tools used and criterion measures have been presented below:

Experimental Design:

All the selected subjects undergone specially designed volleyball training program. The design of the experiment has been planned in three phases.

- Phase :- I : Pretest
- Phase –II : Training or Treatment, and
- Phase –III : Post test

Pre –Test (phase –I) : All the selected libero volleyball players were exposed to standard tests to measure selected fitness factors viz; speed (50M Sprint), agility (Shuttle run,) quickness (side shuffle run), and skills viz; underhand pass, upper hand pass, and service reception and pass, for obtaining the pre test data.

Treatment Stimulus (phase –II): After the pre-test was over, all the subjects were exposed to six weeks training of selected volleyball technical and tactical practices for 2 hour daily in the morning except Sundays and holidays.

As the researcher of this study was expertise in volleyball he was well aware of practices selected for this study. The training part for the subjects was carried under the overall supervision of the present investigator.

Post Test (phase III) : Finally, when the treatment or training period of six week was over, the posttest on selected variables was conducted for the entire subjects.

Forty male elite libero volleyball players (n=10), age ranged from 18-20 yrs., from Mumbai Region of, Maharashtra state, were selected randomly for this study. All the forty subjects were divided into two groups (with equal number of subjects) viz., experimental and control groups. The design of the experiment has been planned in three phases viz., phase- I: pretest, Phase-II: Training or Treatment, and phase- III: post test. The experimental subjects received training as developed in this study, whereas the controlled subjects did not. The training was imparted for 2 hours daily in the morning except Sundays and holidays. The duration of the experiment was for six weeks. The variables tested before and after the experiment, were selected physical fitness (viz., speed, agility and quickness) and volleyball skils (under hand pass, upper hand pass and service reception-pass.)

Statistical Treatment:

Appropriated statistical procedure will be applied after completion of this study to see the effect of training program for performance of elite libero players on experimental group, 2 x 2 x 6 Factorial ANOVA **.** and Scheffe's post hoc test will be used for statistical data treatment.

Analysis and Interpretation:

Standard procedure was followed for data collection. Finally, the data were analyzed by using 2 x 2 x 6 Factorial ANOVA followed by Scheffe's Post Hoc Test and the results have been

presented in this chapter systematically in the form of Tables and Figures. Further, the results have been narrated, interpreted and discussed logically, with scientific reasoning, to conclude this investigation.

Table : 3

Central Tendency and Dispersion of the Groups in Fitness and skill responses due to Menstruation

Variables (A)	Groups			
	Exp. Group (B)		Control Group (C)	
	Pre-test	Post-test	Pre-test	Post-test
50 M sprint (A1) (sec.)	07.45 (0.39)	6.21 (0.58)	7.56(0.58)	7.49(0.43)
Shuttle run (A2) (sec.)	20.27(0.38)	17.42(0.29)	20.34(0.19)	20.17(0.20)
Side Shuffle run (A3) (sec.)	28.07(1.32)	25.71(1.26)	27.58(1.50)	27.34(1.35)
Forearm pass (A4) (Pts.)	7.32(0.64)	9.89(0.96)	7.55(0.85)	7.64(0.88)
Overhead pass (A5) (Pts.)	7.45(0.78)	9.98(1.33)	7.37(0.83)	7.82(0.98)
Service reception test (A6) (Pts.)	7.68(0.86)	10.00(1.09)	7.56(0.80)	7.82(0.79)

Statistical Model for Data Analysis

Planning of statistical model is necessary for data analysis. The model as finalized has been presented in Table 4.1, which indicates that this experiment included two groups (viz., Gr.A: Experimental and Gr.B: Control), who participated in all the six test items. Table 4.1 revealed the statistical design as 2 x 2 x 6 Factorial ANOVA (where there were two groups viz., Experimental and control; two times testing was done i.e., pre and post-tests; and six variables viz., 50 M sprint, shuttle run, side shuffle run, Forearm pass , Overhead pass and Service reception.) To determine the statistical design, the group-wise variables have been presented in

Major Findings: The results of 2 x 2 x 6 Factorial ANOVA followed by Scheffe's post hoc test revealed that Experimental group showed significant superiority over the Control group in reducing Shuttle run to the normal range (CD=0.36, $p<0.05$)

Experimental group showed significant superiority over the Control group in reducing performance time is Side shuffle run (CD=0.32, $p<0.05$)

Experimental group showed significantly better result in improving Under hand pass as compared to the Control group (CD=0.34, $p<0.05$)

Experimental group showed significantly better result in improving Upper hand pass as compared to the Control group (CD=0.34, $p<0.05$)(Fig.

Experimental group showed significantly better result in improving service reception-pass ability as compared to the Control group (CD=0.30, $p<0.05$)

SUMMARY, CONCLUSION AND RECOMMENDATION:

Summary: Volleyball is a game that integrates overall fitness and skills. Since the concept of Libero is a recent inclusion of International Volleyball Federation, no study in this direction is available so far. Therefore, the objectives of the study were as follows:

- To measure and evaluate the selected physical fitness abilities and technical skills of elite volleyball players of Mumbai region in Maharashtra.
- To prepare training schedule for elite libero volleyball players for enhancing selected physical fitness abilities and technical skills of elite libero volleyball players.
- To conduct a controlled experiment to assess the efficacy of the training schedule on some selected fitness and skill abilities of elite libero volleyball players.

On the basis of literature available so far it was hypothesized that:

H_1O: The training program would be contributed to improve speed, agility and quickness of the libero volleyball players.

H_2O: The training program would be contributed to improve skill abilities of the libero volleyball players.

This study was conducted in two phases: Phase-I: Development study Phase II: Experimental study

CONCLUSION

The training programme helped to improve selected physical fitness and skill abilities of the Libero Volleyball players.

The training programme as developed in this study has applicability especially for the Libero Volleyball players.

Recommendations: This study recommends that the training programme as developed in this study can be administered on the Libero Volleyball players for improving better level of fitness and skills.This training programme can also is applied for the general volleyball players too.

Contribution to the Knowledge: No standard "training programme" is available with us especially for the elite Libero Volleyball players. This study contributed a standard "training programme" for them. This, in fact, attributed a quantum of knowledge to the literature of Indian Physical Education and Sports with special reference to Volleyball game.

References

1. Abu El-Maaty Heba Rawhy Abdou (2010)''A training programme for developing motor response and balance and its effect on lunging accuracy of fencing juniors''. *Journal of sportssciences3*(s) pp584-587.
2. Amasay T., (2008), "static block jump techniques in volleyball: upright versus squat starting positions." *Journal of Strength and Conditioning Research*, 22, 4, pp. 1242-1248.
3. Bandyopandhyay,A. (2007). Anthropometry and body composition in soccer and volleyball players in West Bengal, India. *Journal of Physiology and Anthropology.*26, 4, pp. 501-505.
4. Barber Sue D.,Hermeto Alex A.And noyes Frank R.(2010)"A six week neuromuscular training program for competitive junior tennis players". *Journal of strength and conditioning research* 24(9), pp2372-2382.
5. Bayios, I. A.;Bergeles, N. K.; Apostolidis, N. G.;Noutsos,K. S. AndKoskolou,M. D. (2006). Anthropometric, body composition and somatotype differences of Greek elite female basketball, volleyball and handball players. *Journal of Sports Medicine and Physical Fitness.*46, 2, pp.271-280.
6. Bekiari A., Patsiaouras A., Kokaridas D., and Sakellariou K., (2006) "Verbal aggressiveness and state anxiety of volleyball players and coaches". *Psychol Rep.*, 99, 2, pp. 630-644.
7. Bera, T.K., and Rajapurkar, M.V. (1993).'' Body composition cardiovascular endurance and anaerobic power of yogic practitioner''. *Indian J. of physiol. Pharmacol.m 37,3,* pp.225-228.
8. Bhole, M.V. (1997). ''Some neuro-physiological considerations about asanas''. *Yoga Minamsa,15, 4* pp. 13-30.
9. Bouchard, C., and Lortie, G. (1984).'' Heredity and endurance performance''.*SportMed.,1*,pp.38-64.
10. Brandao.E., Janeira M.J. and Eta P.N.,(2000)''The relationship between team final standing and individual technical skills in youth basketball players''.*Brisben ,Australia:pre-Olympic congressAssociation*.pp.388.
11. Brar T.S.,(1988),"Prediction in Basketball Playing Ability at Two Level of A Achievement forFemale Players." *Abstract : New Horizontal of Human Movement.*, p. 78.
12. DeVicente and Pedro, Monjo. (1985). Yoga and sport Abstract, 1 st World Congress on ''Yoga and Ayurveda,''*San Marino, Italy, June 8-11 Yoga-Minamsa,24, 3,* pp.27-28.

13. Dyba, W. (1982).'' Physiological and activity characteristics of volleyball''.*Volleyball Teach,6,3,* pp. 210-215.
14. Duncan, M.J.;Woodfield, L. and al-Nakeeb,Y. (2006). Anthropometric and physiological characteristics of junior elite volleyball players. *British Journal of Sports Medicine.* 40, 7, pp. 649-651.
15. Faigenbaum Avery D.,Kraemer William J., Blimkie Cameron J.R.,Jeffreys Ian,Micheli Lyle J.,Nitka Mike and Rowland Thomas W.(2009)"Youth resistance training updated position statement paper from the national strength and conditioning association'' .*Journal of strength and conditioningresearch* 0(0) pp1-20.
16. Faigenbaum Avery D.,Mcforland James E,Keiper Fred B.,Tevlin William Ratamess Nicholas A.,KangJie and Hoffman Jay R.(2007)''Effect of a short-term plyometric and resistance training program on fitness performance in boys age 12to15 years.'' *Journal of sports science andmedicine.6,* pp.519-525.
17. Fagard, R., Bielen,E.,and Amery, A. (1991). ''Heritability of aerobic power and anaerobic energy generation during exercise''. *J Appl Physiol, 70,* pp.357-362.
18. R Conlle, K. Robinson, C. McGown, A Fisher, and G. Dalsky, "Physiological effects of power volleyball" Physician and Sports Medicine, 10, 2, pp. 110-116.
19. W. Dyba, "Physiological and activity characteristics of volleyball"Volleyball Tech, 6, 3, 1982, pp 210-215
20. J.T. Vittasalo, H. Rusko, O. Pajala, P. Rahkila, M. Ahila, and H.Montonen, "endurance requirements in volleyball'. Canadian Journal ofApplied Sports Science, 12, 2, 1987, pp. 112-118.
21. J.H. Wilmore, and D.L. Costill, "Physiology of Sports f Exercise" 2nd ed. Human Kinetics Champign, 1999, p 490-507. J. Keogh, "The use of physical fitness scores and anthropometric data ofpredict selection in an elite under – 18 Australian rules football team" J Sci Med Soprt, 2 pp. 125 -133.
22. J. Rico-Sanz, "Body composition and nutritional assessments in soccer" Int J Soprt Nutr. 8, 1998, pp 113-123
23. S. Chatterjee, P., Chartterjee, and A Bandyopadhopadhyay, "Skinfold thickness, body fat percentage and body mass index in obese and non- obese Indian boys" Asia Pac J Clin Nutr. 15, 2006, pp 232-235
24. C, Bouchard, and G. Lortie, "Heredity and endurance performance" Sport Med, 1 1984, pp 38-64.
25. R, Fagard E. Bielen, and A. Amery, "Heritability of aerobic power and anaerobic energy generation during exercise" J. Appl Physiol, 70, 1991, pp. 357-362

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Comparison of Single- and Multi-Frequency Bioelectrical Impedance Analysis and Skinfold Method for Estimation of Body Fat % in Young Male Indian Athletes

Dr. S.K.Dey, Abhishek Bandyopadhyay[1], Sujata Jana[1] & Subhra Chatterjee (Nee Karmakar)[2]
Human Performance Laboratory,
Sports Authority of India
Netaji Subhas Eastern Centre, Salt Lake City, Kolkata, India

Abstract

Background: Skinfold (SKF) and Bio-electrical Impedance Analysis (BIA) are the most common field based methods for estimating body composition in athletes. BIA has recently attracted a lot of attention due to minimal requirement of training experience and less time consumption in operation. ***Objectives:*** The present study was aimed to evaluate the fat mass by using bioelectrical impedance analysis (BIA) of Single frequency (SF) & Multi frequency (MF) and anthropometric methods in order to investigate whether the use of BIA or anthropometry would be useful under field conditions.

Method: Three hundred and forty nine (349) young male athletes of mean age 16.9 ± 2.82 years and having at least 3-5 years of formal sports training were participated in the present study from four different sports disciplines, viz., soccer, hockey, table tennis & badminton. BF% was measured by a single- frequency bio-impedance analyzer (TANITA Corporation BF-350, Tokyo Japan), multi-frequency analyzer (Maltron Bioscan 920- 2, Rayleigh, UK) and skin fold calliper (Skyndex Electronic Body Fat calculator System, Caldwell, Justiss & Co. Inc, USA). Skin fold thicknesses were measured from four different sites of the body i.e., biceps, triceps, subscapular & suprailliac and the estimation of Body Composition & BF% was calculated by using the equations of Durnin and Womersley and Brozek et. al., respectively.

Results: Analysis of variance showed the significant differences ($p<0.05$) in body composition parameters (Fat %) when compared among three different methods. On the other hand, Scheffe's post-hoc test clearly revealed the existing difference ($p<0.05$) between two different bio-impedance techniques i.e between MF-BIA & SF-BIA. A significant ($p<0.01$) Intra Class Coefficient (ICC) was also observed when compared among different methods. The similar observation was also made by applying partial correlation while adjusting the age and height for the prediction of BF% from different methods. Bland-Altman plot reveals that the smallest bias of MF-BIA & SKF (0.19, ± 4.73) with a moderate level of LoA (Limits of Agreement) as compare to the other methods. So the SKF had the highest level of agreement as compared to SF-BIA while MF-BIA serving as a reference standard.

Conclusion: Both MF-BIA & SKF can be interchangeably used in athletes. In the absence of well-trained personnel in anthropometric measurements, the MF-BIA could be useful in assessing body composition in these athletes, ensuring that measurements are taken in the same physiological state and day time conditions, such as in a fasted state in the early morning. However, in respect to simplicity, speed to operate & cost effectiveness, SKF would be an ideal tool to estimate BF% in field condition.

Keywords: *Body Fat percentage (BF %), Skinfold, Bio-electrical Impedance Analysis (BIA), Single- frequency BIA, Multi-frequency BIA, Indian athletes.*

INTRODUCTION

Body composition is an important determinant of sport performance. A high fat-free mass as well as high skeletal muscle mass is important for power and strength (Chromiak et al, 2004) whereas leanness as well as low fat mass, is needed for well performance in endurance events (Landers et al, 2000).

The non-invasive and fast methods, such as Skinfold (SKF) and Bio-electrical Impedance Analysis (BIA), are the most common forms of estimating body composition in this field (Jaffrin, 2009). Both are considered as level III methods (double indirect measure) as they are based on prediction equations (Brodie et al, 1998). Compared with the indirect methods of level II, such as hydrodensitometry, air displacement plethysmography (Bod Pod), isotope dilution, potassium-40 counting, magnetic resonance imaging (MRI) and dual-energy X-ray absorptiometry (DEXA), SKF and BIA have some advantages. In general these are relatively inexpensive, non-invasive techniques, safe, fast, portable and at the same time reliable, requiring little operator skill and subject cooperation in determining both skeletal muscle mass and fat mass (Lukaski et al, 1985).

The SKF method is based on the principle that there is a relationship between subcutaneous body fat (SKF thickness) and total body fat (Lohman, 1981). Measurement of SKF thickness at standardized anthropometrical sites is used to predict body density, from which body fat percentage (BF%) can be calculated using one of the many available prediction equations. On the other hand, BIA measures conductance through a subject's body tissues by applying a constant, low level, alternating, frequency-dependent electrical current (Lukaski et al, 1985). The measured fat-free mass by BIA is based upon the impedance being affected by geometric shape, cross-sectional area, and specific signal frequency (Lukaski, 1987).

BIA ranks similar to SKF measurement in its accuracy, precision and objectivity (Houtkooper et al, 1996) and has almost replaced it as the field method of choice. This may be due to the fact that accurate measurement of SKF is dependent on the technique, skill, and experience of the tester (Roche, 1996), whereas BIA is less time consuming, easily administered by investigators with little or no experience and the results are displayed within minutes on the screen of the small portable device (Cable et al, 2003).

Validity and reliability of SKF and BIA as tools for evaluating body composition have been frequently studied world-wide in non-athletic healthy individuals (Macfarlane, 2007);

physically active young people (Porta et al, 2009); body builders and other power athletes (Huygens et al, 2002); mixed sample of athletes from different sport disciplines (Ostojic, 2006). However, an overwhelming majority of the studies have shown equivocal conclusions. Sufficient variety of prediction equations has already been established and it also has been suggested that future studies should focus on cross validating of existing equations on the specific population of interest (Lohman, 1992).

Few investigations on Indian population, such as in healthy male subjects (Bhat et al, 2005; Debray et al, 2013) and school children (Kehoe et al, 2011) were conducted earlier. As per literature the present study may be the first attempt covering Indian athletes from different sports discipline. The purpose of the study was to evaluate the reliability and validity of single- & multi-frequency BIA and conventional skin-fold method in a group of Indian male athletes of different sports.

METHOD

Selection of Subjects:

349 male subjects (age range 15-20 years) were participated in the present study from four different sports discipline viz. Football (n=95), Hockey (n=110), Table Tennis (n=79) and Badminton (n=65). All the players were belonged to various schemes of Sports Authority of India (SAI), eastern region. The players were at least of state level performer with minimum of 3-5 yrs of formal training history. They were belonged to almost same socio-economic status, having similar dietary habits and were having training in same kind of environmental/ climatic condition. Hence, the subjects were considered as homogeneous.

Before the commencement of test all the players were clinically examined by the physicians of SAI, who are specialized in Sports Medicine following standard procedure (SAI Manual, National Sports Talent Contest Scheme, 1992). The players who were found to be medically fit, healthy and with no history of any hereditary and cardio respiratory diseases, were finally selected for the present study. All the players were evaluated for various anthropometric and physiological variables at Human Performance Laboratory of Sports Authority of India, Kolkata.

Ethical Consideration:

The present study was conducted according to the guidelines laid down in the declaration of Helsinki and all procedures involving human subjects were approved by the ethical committee

of Sports Authority of India, Kolkata. Prior to initial testing a complete explanation of the purposes, procedures and potential risks and benefits of the tests were explained to all the players and a signed consent was obtained from them.

Training Regimen:

The formulation and implementation of systematic training program was made by the qualified coaches with the guidance of the scientific experts from Sport Science Department, SAI, Kolkata. The training regimen was almost common to all the four games of the present study except the skill training and was used to apply on an average 4 to 5 hours every day except Sunday and which comes about 30 hours in a week. There were two sessions in a day i. e. morning session and evening session and both of which comprised of physical training for one hour and skill training for about two hours. The physical training schedule includes different strength and endurance training program along with flexibility exercises. Strength and Endurance training was also applied according to their sports specific requirement. Warm up & cool down session after & before starting of the main practice were also included in the programme. Besides the technical and tactical training the players were also provided psychological or mental training session.

Measurement procedure:

The decimal age of all the subjects were calculated from their date of birth recorded from original birth certificate, produced by them at the time of testing.

Anthropometric measurements were measured on a same day for each player in same session to avoid technical error by the standard procedure (Marfell-Jones, 2012). Technical error of measurement (TEM) was calculated for the first 20 participants and all the measures were within target intra-tester TEM values.

The physical characteristics of the subjects including height (to the nearest 0.1 cm) and weight (to the nearest 0.1 kg) were measured by digital stadiometer (Seca 242, Itin Scale Co., Inc., USA) and body composition analyzer (Tanita BF-350, Tanita Corporation of America Inc., USA) respectively. BMI is calculated from height and weight of each of the subject by the equation of weight (kg)/height (m)^2 (WHO, 1995).

Skin-Fold Measurement:

Measurement of skin fold thickness were performed using a skin fold calliper (Skyndex Electronic Body Fat calculator System, manufactured by Caldwell, Justiss & Co. Inc, USA) at

four different sites of the body viz., biceps, triceps, subscapular, suprailiac on the right side of the body with the subjects in a relaxed standing position. All skinfold measurement sites were marked before measurements were taken. The calliper was held on the right hand for measuring the skinfold thickness to the nearest 0.5mm. Two measurements were taken at each side and if a difference of greater than 2 mm was observed a third measurements were taken. The mean of the two measurements was used as the representative value of each side.

Body density of each subject was calculated by standard generalized equations of Durnin and Womersley (1974) from the skin fold thickness. The body fat % was calculated by using the formula described by Brozek et al (1963).

Body composition measurement by Bioelectrical Impedance Analysis (BIA):

Principle: BIA makes use of the fact that impedance to electrical flow of an injected current is related to the volume of a conductor (human body) and the square of the conductor length (height). The principle was demonstrated by Hoffer et al (1969) where it was reported that total body water and lean body mass were strongly related with height^2 / resistance formula, where body resistivity or impedance was measured by means of a tetra polar electrode method. The BIA technique is based on the fact that lean tissues have a high water and electrolyte content thus provides a good electrical pathway. Fat mass on the other hand, contains lower percentage of body water and is a poor conductor of the electrical signal.

Single Frequency Bioelectrical Impedance Analysis (SF-BIA):

In SF-BIA a localized 50 KHz current is injected through the body. By inducing a low energy, high frequency, electrical signal (50 KHz), 500µA, a measurement of baseline resistance to the flow of electrical current can be made. In the present study, BF% of each of the subject was measured by TANITA body fat composition analyzer (TANITA Corporation BF-350, Tokyo Japan) using tetra polar bioelectrical impedance analysis.

TANITA utilizes BIA technology with a patented “foot to foot press contact electrode” which is different from tetra-polar electrode used in conventional BIA technique. In the TANITA system, “two foot pad electrodes” (pressure contact) are incorporated to the platform of an instrument. A person’s measurements are taken while in a standing position with the electrodes in contact with bare foot. The body fat monitor analyses automatically weight and then impedance. Computer software imbedded in the product uses the measured impedance. The subject’s gender, height, fitness level, age and weight are used to determine BF% automatically

based on equation which is programmed inside the instrument. TANITA's equation is generalized for standard adults, athletes and children.

During the measurement taken by the TANITA instrument, the subjects were barefoot and were instructed to stand properly over the foot pad electrodes of the instrument with a proper contact of the foot with foot- pad electrodes. During the measurement the subject's inner thighs were not in contact with each other and the subjects wore minimum clothes.

Multi Frequency Bioelectrical Impedance Analysis (MF-BIA):

Total body electrical impedance to an alternate current (0.2 mA) with four different frequencies (5, 50, 100 and 200 KHz) was measured using a multi-frequency analyzer (Maltron Bioscan 920- 2, Made in UK). Measurements were taken followed by the standard testing manual of Maltron International (MaltronBioscan 920-2 operating and service manual. 1999).

The subject was in a supine position taking rest for 5 minutes on a non-conducting surface, with the arms slightly abducted from the trunk and the legs slightly separated. Before placing the surface electrodes, the sites were cleaned using isopropyl alcohol ensuring adherence and to limit the possible errors. Surface electrodes were placed on the right side of the body on the dorsal surface of the hands and feet proximal to the metacarpal-phalangeal and metatarsal-phalangeal joints, respectively, and also medially between the distal prominences of the radius and ulna and between the medial and lateral malleoli at the ankle. The whole-body impedance vector components, resistance (R) and reactance (Xc), were measured at the same time. BF% was calculated by using the manufacturer's software. The raw outputs were visible immediately on the analyser and subsequently transmitted to a host computer whereby dedicated software processes the data. Before testing, the analyzer was calibrated according to the manufacturer's instructions.

Before taking both the SF- & MF-BIA measurement, the players were instructed according to Heyward & Stolarczyk (1996) by the following guidelines: 1) no intake of alcohol 48 hours before the test; 2) no heavy exercise 12 h before the test; 3) no large meals & intake of caffeinated products 4 h before the test; 4) no intake of diuretics for 7 days before the test and 5) consumption of liquids limited to 1% of body weight, or, two 8-oz. glasses of water, 2 h before the test.

All the tests were conducted at a room temperature varying from 23 to 25 degree centigrade with relative humidity varying between 50- 60%.

Statistical Analysis:

Mean and standard deviation (± SD) for all the selected variables were calculated. One way ANOVA followed by Scheffe's post-hoc test for multiple comparisons was performed among the BF% predicted by different BIA devices & conventional skin fold method. Pearson's product moment correlation was performed to see the relation with general physical characteristics and BF% measured by three different methods. To further assess the independent relationship among three different techniques, standard partial correlation analysis was performed. In addition, the intra-class correlation coefficient (ICC) was used to determine the level of relative agreement between both frequency of BIA & conventional skin-fold method. The bias ([(observed value-criterion value)/criterion value] ×100) and 95% limits of agreement (mean difference ±1.96 SD) was assessed by Bland–Altman (1986) method. Data were analyzed using the Statistical Package for Social Science (version 21.0, SPSS, Inc., Chicago, IL).

RESULTS

Table 1 represented the mean and standard deviation of physical characteristics and body mass index of all subjects and all the sport disciplines combine together. The mean age of the subject was found to be 16.9 ± 2.82 years. The average body height and weight of the subjects were recorded 167.5 cm and 57.9 kgs. respectively. The body mass index was calculated as 20.6 ± 2.43.

Table 2 demonstrated the mean, standard deviation and level of significance of BF% measured by three different methods. The mean value of BF% measured by SKF and MF-BIA was found to be almost similar (14.1% & 14.3%) whereas slightly lower value was observed in case of SF-BIA (13.4%) as compare to other two techniques. Analysis of variance showed that a significant difference in body fat% at the level of $p<0.05$ when compared among three different techniques.

Scheffe's Post hoc test for multiple comparison of BF% measured by three different methods was presented in **Table 2a**. The difference was found to be significant ($p<0.05$) only when the comparison was made between 2 vs. 3 i.e. MF-BIA and SF-BIA. On the other hand 1 vs. 2 and 1vs. 3 were found to be totally insignificant.

The coefficient of correlation was made between physical characteristics and BF% were measured by three different techniques has shown in **Table 3.** It was evident from the table that age showed a significant ($p<0.01$) positive correlation with SKF & negative correlation with MF-

BIA respectively. Whereas no such significant correlation of age was observed with SF-BIA. Height had a significant ($p<0.01$ & 0.05 respectively) and negative correlation with both MF-BIA and SF-BIA respectively. However, no such significant correlation in height was observed with SKF. On the other hand, both weight and BMI had significant & positive correlation ($p<0.01$ & 0.05) with body fat percent measured by three different techniques.

Results of intra-class correlation coefficient (ICC), Pearson's product moment correlation coefficient (r) and standard partial correlation coefficient of multiple linear regression analysis for predicted BF% from three different techniques while controlling age and height were presented in **Table 4**. A significant correlation ($p<0.01$) was observed with BF% measured by Durnin and Womersley (1974) equation with both MF-BIA and SF-BIA. The range of correlation was r = 0.55 to 0.71 with standard error of estimate (SEE) ranging from 3.414 to 3.813. The coefficient values were found to be higher in intra-class correlation and as well as in standard partial correlation coefficient.

The bias and limits of agreement (mean difference ±1.96 SD) in relation to BF% measured by different frequencies of BIA and conventional Skinfold method were assessed with the Bland-Altman method (Bland & Altman, 1986) and was represented in **Table 5**. The recommended approach for comparing two methods is to analyze the differences between the measurements on each subject and uses the mean of the differences to estimate the average bias of one method relative to the other. For the comparison between the multi-frequency BIA and Skinfold results, mean bias was found to be -0.185 ±4.727 (95% CI -0.682, 0.313), and 0.733 ±3.894 (95% CI 0.323, 1.143) for single-frequency BIA respectively.

In case of MF-BIA vs SF-BIA, mean bias was found to be 0.918 ±3.882 (95% CI 0.509, 1.327). For reasonably symmetric distributions, the range (mean ±1.96 SD) was expected to include about 95% of the observations: this was used in indicating 95% limits of agreement. Internal consistencies for comparisons of different frequencies of BIA with Skinfold technique were calculated using Chronbach's alpha. The higher internal consistency was found for the comparisons between MF-BIA vs SF-BIA ($\alpha = 0.831$) and lower in SKF vs MF-BIA ($\alpha = 0.703$).

Scatter plots (fig. 1, 2 & 3) provided the relationships between SKF & MF-BIA, SKF & SF-BIA and MF-BIA & SF-BIA respectively. All the scatterplots showed strong correlation ($p<0.01$) between each other and the strength of relationship was indicated by the R^2. The

regression equation was also calculated along with regression line and represented in the above figure.

Figure 4, 5, & 6 represents Bland-Altman plots for the difference in BF% against the average BF% for SKF vs MF-BIA, SKF vs SF-BIA and MF-BIA vs SF-BIA respectively. The plots provide a visual confirmation of the agreement since the results of Bland-Altman analysis confirmed that the 95% of differences lie between Limits of agreement (LoA) (mean ±1.96SD).

Table 1. Mean and standard deviation of Physical Characteristics and Body Mass Index of present subjects.

Variable	**Mean** (N=349)	**SD (±)**
Age (yrs)	16.9	2.82
Height (cm)	167.5	5.63
Weight (kg)	57.9	8.11
BMI ($kg.m^{-2}$)	20.6	2.43

SD: Standard Deviation, BMI: Body Mass Index.

Table 2. Mean, standard deviation and one-way ANOVA for the Comparison of BF% measured by three different methods of the present subjects.

Technique	BF%	SEM
SKF	14.1 ±4.55	0.244
MF-BIA	14.3 ±5.30	0.284
SF-BIA	13.4 ±4.90	0.262
Level of significance♣	P < 0.05	

Values are mean ±SD; SEM: Standard Error of Mean, ♣ One way ANOVA was performed to see the significant difference; * p < 0.05

Table 2a. Scheffe's Post hoc test for multiple comparison of BF% predicted by three different methods

Method	Mean Difference	Std. Error	95% Confidence Interval		Sig.
			Lower Bound	Upper Bound	
1 vs 2	-0.18453	0.37309	-1.0991	0.7300	ns
1 vs 3	0.73324	0.37309	-0.1813	1.6478	ns
2 vs 3	0.91777	0.37309	0.0032	1.8323	*

[1]SKF; [2]MF-BIA; [3]SF-BIA * P< 0.05; ns, not significant

Table 3. Correlation coefficient of physical characteristics and BF% measured by three different techniques of the present subjects.

	BF% (SKF)	BF% (MF-BIA)	BF% (SF-BIA)
Age (yrs)	0.235^{**}	-0.215^{**}	0.038^{ns}
Height (cm)	0.034^{ns}	-0.231^{**}	-0.109^{*}
Weight (kg)	0.592^{**}	0.107^{*}	0.422^{**}
BMI (kg.m^{-2})	0.673^{**}	0.280^{**}	0.541^{**}

* ***P< 0.05;*** ** ***p < 0.01;*** ^{ns} ***not significant***

Table 4. Intra-class correlation (ICC), Pearson's product moment correlation (r) and the standard partial correlation while controlling age & height for the predicted BF% from different frequencies of BIA and Skinfold method.

Body fat% (different methods)	ICC (95% CI)	Pearson's r	Partial r	R^2	SEE
SKF & MF-BIA	0.704 (0.634-0.760)	0.549**	0.638**	0.301^{**}	3.813
SKF & SF-BIA	0.791 (0.739-0.832)	0.663**	0.676**	0.440^{**}	3.414
MF-BIA & SF-BIA	0.824 (0.776-0.861)	0.713**	0.735**	0.508^{**}	3.721

* ***P< 0.05;*** ** ***p < 0.01;*** ^{ns} ***not significant; SEE: standard error of estimate***

Table 5. Bland-Altman analyses for validity among BF% measured by different frequencies of BIA and Skinfold technique of the present subjects.

Test	Bias	Std Dev	Bias 95% CI	Chronbach's α
SKF vs MF-BIA	-0.1845	4.7271	-9.46 to 9.18	0.703
SKF vs SF-BIA	0.7332	3.8938	-6.82 to 8.29	0.796
MF-BIA vs SF-BIA	0.9178	3.8820	-6.69 to 8.53	0.831

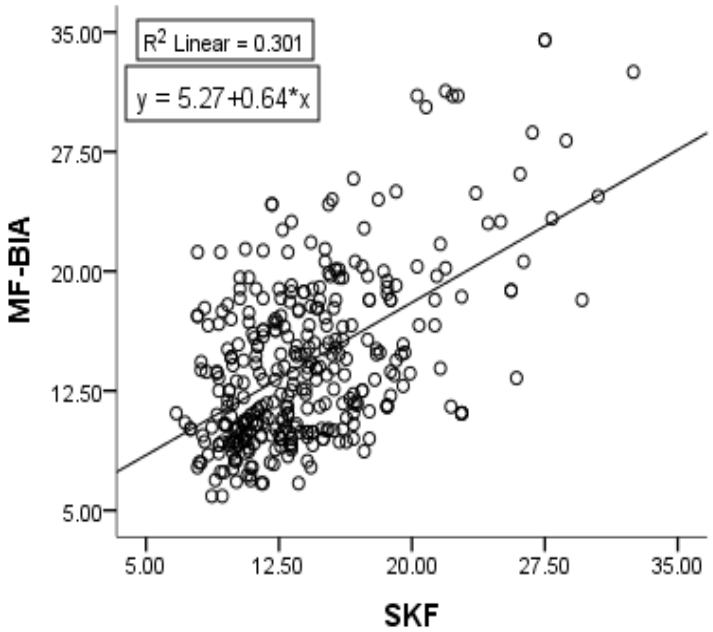


Fig 1. *Scatterplot for SKF and MF-BIA of Indian male athletes.*

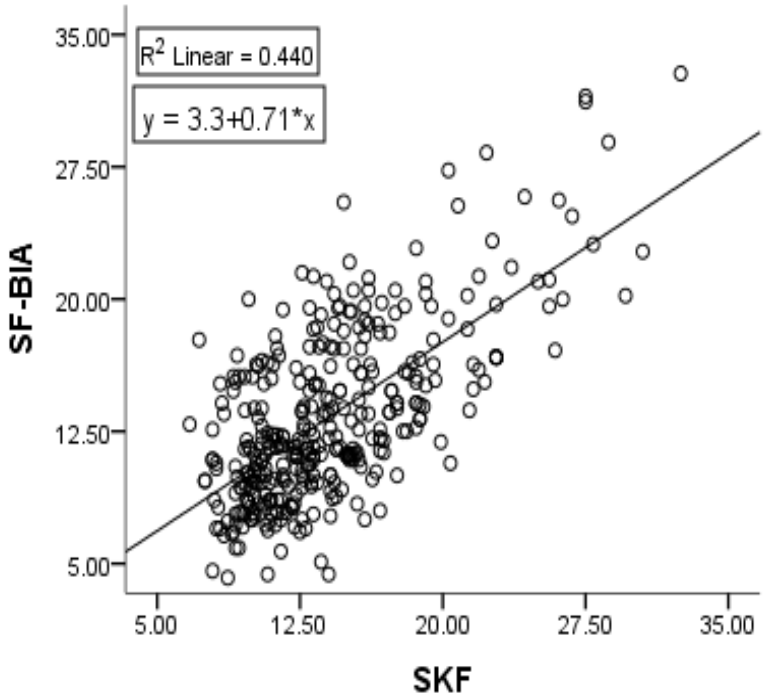


Fig 2. *Scatterplot for SKF and SF-BIA of Indian male athletes.*

.

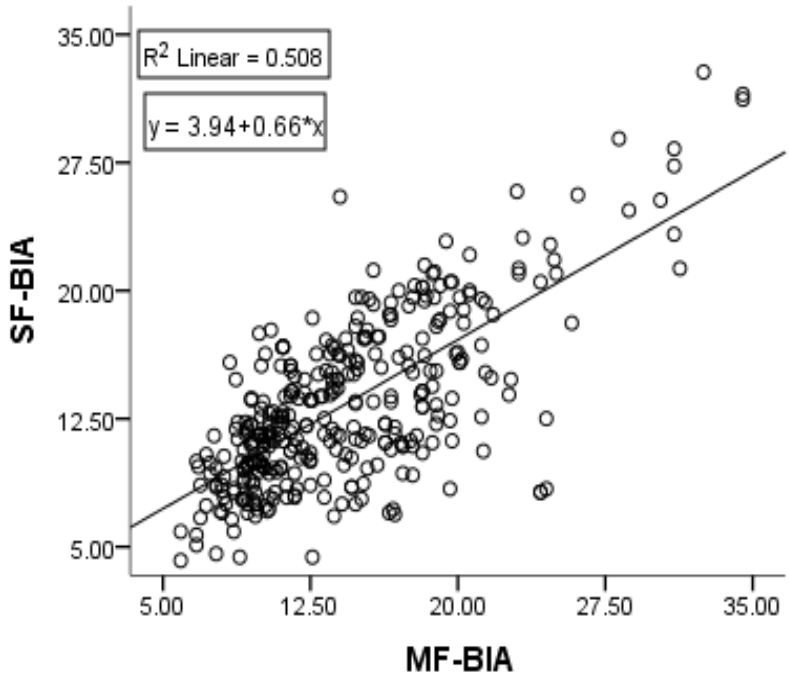


Fig 3. *Scatterplot for MF-BIA and SF-BIA of Indian male athletes.*

.

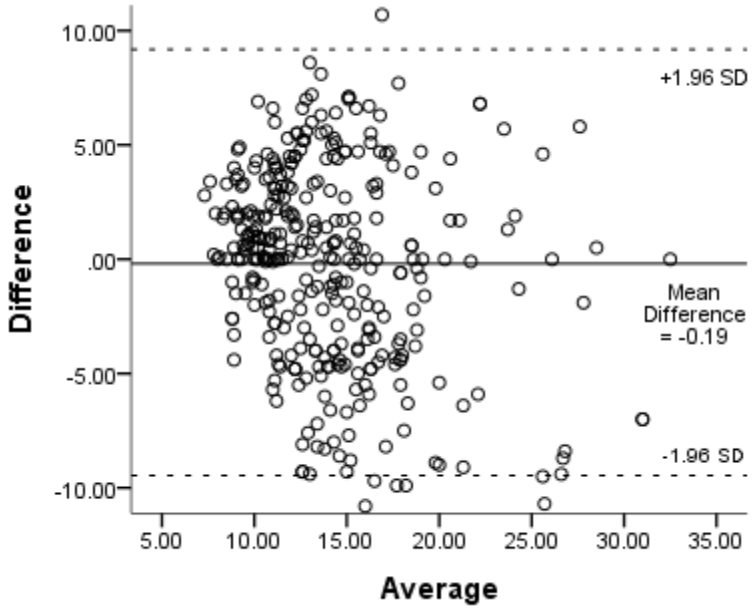


Fig 4. *Bland-Altman analysis of the difference between body fat % measurements using SKF and MF-BIA of Indian male athletes.*

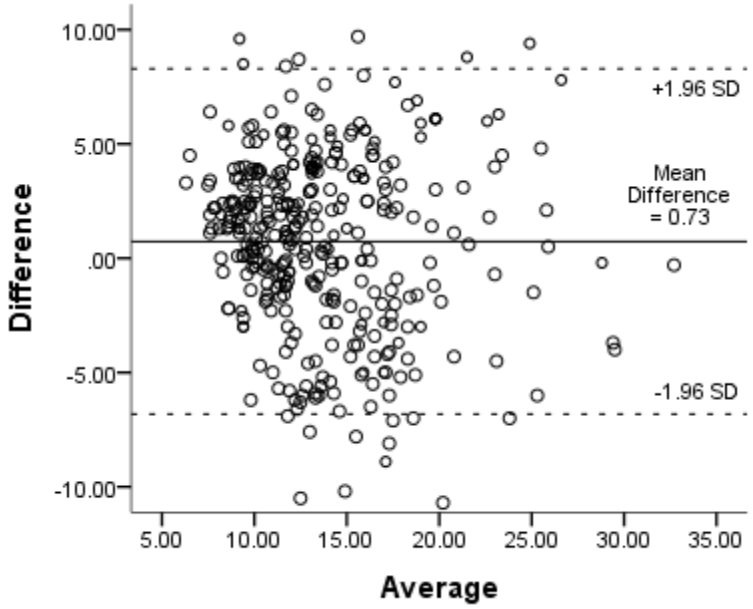


Fig 5. *Bland-Altman analysis of the difference between body fat measurements using SKF and SF-BIA of Indian male athletes.*

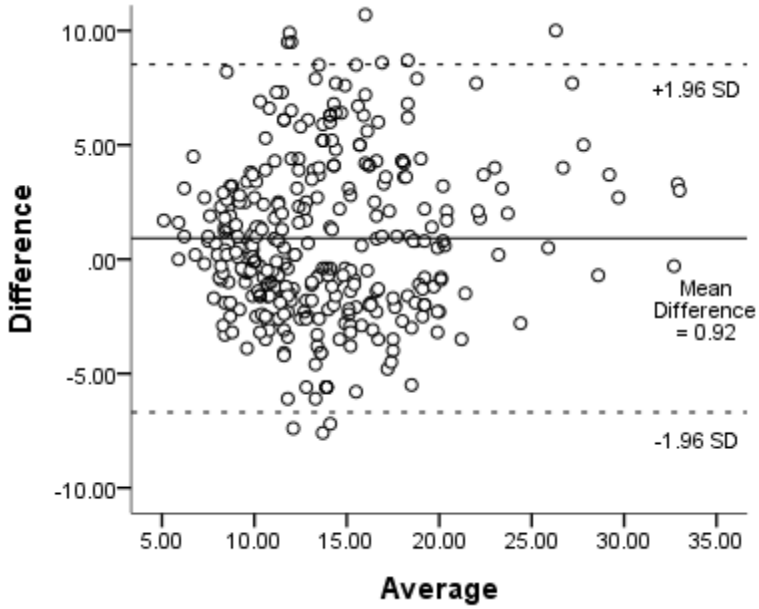


Fig 6. *Bland-Altman analysis of the difference between body fat measurements using MF-BIA and SF-BIA of Indian male athletes.*

DISCUSSION

The present study showed that BF% measured by SF-BIA and MF-BIA devices have high inter-method agreement with SKF technique while using Durnin and Womersley (1974) as a reference equation. In a previous study of Bhatt et al (2005), the equation (Durnin and Womersley, 1974) has shown a good agreement with criterion method, D_2O measurements. This equation can be used in Indian population without any further change as suggested by Bhatt et al (2005). Furthermore, this equation is also appeared to be satisfactory when cross-validated on male athletes as reported by Sinning et al (1985).

The young athletes of different games of present study (viz., football, hockey, table tennis and badminton), the estimated values of BF% deriving both from SF-BIA and MF-BIA has showed no significant differences when compared to the reference method, SKF. In the present study almost similar values in body fat% were recorded by MF-BIA method (14.3%) and SKF method (14.1%). Such similarities in estimated BF% also have been reported in previous studies (Ostojic, 2006; Stolarczyk et al, 1997; Heyward & Stolarczyk, 1996) with special reference to arm-to-leg BIA and SKF.

The present study reveals that the significant and positive correlation was obtained between SKF and two different BIA methods. However, Bowden et al (2005) have reported that both SKF & BIA methods showed greater correlation (r = 0.824 & 0.798 respectively) with DEXA as a criterion method. Again, Bhatt et al (2005) have shown SKF exhibits higher and stronger correlation (r = ~0.9) with the criterion method (D_2O measurements). On the other hand, comparing arm to leg BIA method and SKF method in professional soccer players, Michailidis et al. (2013) have reported a significant & positive correlation (r = 0.56) which is in accordance with the association of MF-BIA & SKF method in the present study. Previously, Debray et al. (2013) has reported a negative association of height with BIA which is similar to our findings. However, a negative and significant correlation of MF-BIA with age is still unclear in the present study. Therefore, in order to further improvement of correlation values among the three methods standard partial correlation while controlling age and height was applied.

In a study on large population of 591 healthy adults demonstrated that multifrequency BIA is a good alternative for quantifying BF% in healthy adults but leads to an underestimation

in obese adults and overestimation in lean adults (Sung et al, 2001). Several other studies (Deurenberg, 1996; Segal et al, 1988) also have reported that BIA overestimates BF% in athletes and underestimates in obese subjects. The fact was quite similar in our athlete group as SF-BIA showed a 0.73% mean range of tendency to overestimate the BF% values. In contrast, a study by Shafer et al (2009) determined that the multi-frequency BIA was a valid method for BF%, however, with an underestimation of 1.6% in normal adults and an overestimation of 3.4% body fat in obese adults in comparison with the DXA. The athletes of the present study can be considered to be almost nearer to the normal population in contrast to the obese population. Therefore, a slight tendency (0.19%) to underestimate BF% values by MF- BIA, is also considered to be corroborated with the findings of Shafer et al. (2009).

Using BIA to estimate individual's body fat, one can assumes that the body is within normal hydration ranges or not. If a player is dehydrated, the amount of adipose tissue may also be altered (Segal, 1988). Hydration can be affected by intense exercise or hot environment without replacing the fluids and drinking too much caffeine or alcohol (Heyward & Stolarczyk, 1996). Lukaski et al., (1990) have reported that a significant alteration in BIA determined BF% values consequent to exercise. However, on the contrary, Liang and Norris (1993) have reported that 1 kg acute loss in body weight following exercise had no effect on the BIA determination of BF%. In our present study, we have made a reasonable attempt to our subjects being euhydrated before BIA measurement to achieve accuracy in the estimation.

Although the scatter plots have shown linear relationship for different BIA with SKF method, Bland-Altman plots, displayed increment of differences between two methods with a rise in average estimated BF% value. However, a better agreement between two different BIA and SKF methods has been found in the present study. To evaluate how well the methods are likely to be agreed for an individual, the standard deviation of the differences for each subject was used. Data revealed that mean bias did not vary substantially in two different BIA methods against SKF. As a result we did not find any significant differences in reliability and validity in BIA vs SKF. However, MF-BIA method has indicated a lower validity for BF% estimation, producing a wider limit of agreement (± 4.73%) compared to SF-BIA (± 3.89 %) against the reference method, SKF.

The present study has got some major limitations. DEXA or other 3- or 4-compartment chemical models often have been used as criterion methods (Heymsfield et al, 1997). Therefore,

we cannot consider SKF as an accurate reference method for BF% measurement since application of any gold standard method was beyond our scope of the study. A further limitation is that BIA is sensitive to the hydration status of the individual. Although the participant were at their normal state of euhydration prior to the measurements however, no direct measure of hydration status was possible in our study independent of BIA.

Body composition practitioners who measure their clients' body fat often pick up the most readily available BIA instrument believing it to be accurate. However, it is important to consider the inherent possibilities of measurement inaccuracy and relative validities while using different BIAs. Comparison of different types of BIA (foot to foot BIA, hand held BIA) and traditional tetrapolar BIA (arm to leg or whole body) have been reported with a variation in estimated values in previous studies (Ritchie et al, 2005; Williams et al, 2010). In the present study, we have found a significant difference between SF-BIA (foot to foot BIA) & MF-BIA (whole body BIA) with the mean bias of 0.92% (LoA, ±3.88%) although there was a good and significant correlation ($r=0.71$, $p<0.01$) with the accuracy of (standard error of estimate) 3.7% between the two methods. The imprecision in the estimated BF% was might be due to the highly derived nature of the values determined by BIA prediction equations. The accuracy of estimating BF% using different BIA is highly dependent on matching the correct formula to a specific race, gender, age, weight and athletic status of the individual (Fogelhom & van Marken Lichtenbelt, 1997).

CONCLUSION

It can be concluded from the above discussion that both MF-BIA & SKF can be interchangeably used in athletes. In the absence of well-trained personnel in anthropometric measurements, the MF-BIA could be useful in assessing body composition in these athletes, ensuring that measurements are taken in the same physiological state and day time conditions, such as in a fasted state in the early morning. However, in respect to simplicity, speed to operate & cost effectiveness, SKF would be an ideal tool to estimate BF% in field condition.

Acknowledgements

Sports Authority of India, Eastern centre is greatly acknowledged to provide all the facilities to complete the present study.

References:

1. Bhat DS, Yajnik CS, Sayyad MG, Raut KN, Lbree HG,Rege SS, Chougule SD, Shetty PS & Yudkin JS . Body fat measurement in Indian men: comparison of three methods based on a two-compartment model. Int J Obes 2005; 29(7): 842-848.
2. Bland JM & Altman DG. Statistical methods for assessing agreement between two methods of clinical measurement. Lancet 1986; 1(8467):307-310.
3. Bowden RG, Lanning BA, Doyle EI, Johnston HM, Nassar EI, Slonaker B & Scanes G. Comparison of Body Composition Measures To Dual-Energy X-Ray Absorptiometry. JEPonline 2005; 8(1):1-9.
4. Brodie D, Moscrip V & Hutcheon R. Body composition measurement: A review of hydrodensitometry, anthropometry, and impedance methods. Nutrition 1998; 14(3): 296-310.
5. Brozek J, Grande F, Anderson JT & Keys A. Densiometric analysis of body composition: revision of some quantitative assumptions. Ann NY Acad Sci 1963; 140: 110-113.
6. Cable A, Nieman DC, Austin M, Hozen E & Utter AC. Validity of the leg-to-leg bioelectrical impedance measurements in males. J Sports Med Phys Fitness 2003; 37(3): 278–279.
7. Chromiak JA, Smedley B, Carpenter W, Brown R, Koh YS, Lamberth JG, Joe LA, Abadie BR & Altofer G. Effect of a 10-week strength training program and recovery drink on body composition, muscular strength and endurance, and anaerobic power and capacity. Nutrition 2004; 20(5): 420-427.
8. Debray PS, Yadav S, Kar N and Dey SK. Validity of 'generalized skin-fold thickness equations' for predicting body fat percentage in healthy Indian adult males. Indian Journal of Physiology and Allied Sciences, 2013; 67(1):42-52.
9. Deurenberg P. Limitations of the bioelectrical impedance method for the assessment of body fat in severe obesity. Am J Clin Nutr 1996; 64(3 suppl): 449S- 452S.
10. Durnin JVGA & Womersley J. Body fat assessed from total body density and its estimation from skinfold thickness: measurements on 481 men and women aged from 16 to 72 years. Br J Nutr 1974; 32(1): 77-97.
11. Fogelholm M & van Marken Lichtenbelt W. Comparison of body composition methods: a literature analysis. Eur J Clin Nutr 1997; 51 (8): 495-503.
12. Heymsfield S. B., Wang Z., Baumgartner R. N. & Ross R.: Human body composition: advances in models and methods. Annu. Rev. Nutr., 1997; 17: 527-58.
13. Heyward VH, Stolarczyk LM. Applied Body Composition Assessment. Champaign, IL: Human Kinetics 1996. 1-215.
14. Hoffer, EC, Meador CK & Simpson DC. Correlation of whole body impedance with total body water volume. J Appl Physiol 1969; 27(4): 531-534.
15. Houtkooper LB, Lohman TG, Going SB & Howell WH. Why bioelectrical impedance analysis should be used for estimating adiposity. Am J Clin Nutr 1996; 64(Suppl.): 436S-448S.
16. Huygens W, Claessens AL, Thomis M, Loos R, Van Langendonck L, Peeters M, Philippaerts R, Meynaerts E, Vlietinck R & Beunen G . Body composition estimations by

BIA versus anthropometric equations in body builders and other power athletes. J Sports Med Phys Fitness 2002; 42(1): 45-55.
17. Jaffrin MY. Body composition determination by bioimpedance: an update. Curr Opin Clin Nutr Metab Care 2009; 12(5): 482-486.
18. Shafer KJ, Siders WA, Johnson LK & Lukaski HC. Validity of segmental multiple-frequency bioelectrical impedance analysis to estimate body composition of adults across a range of body mass indexes. Nutrition 2009; 25 (1): 25–32.
19. Kehoe SH, Krishnaveni GV, Lubree HG,Wills AK, Guntupalli AM, Veena SR, Bhat DS, Kishore R, Fall CH, Yajnik CS & Kurpad A . Prediction of body-fat percentage from skinfold and bio-impedance measurements in Indian school children. Eur J Clin Nutr. 2011; 65(12):1263-1270.
20. Landers GJ, Blanksby BA, Ackland TR & Smith D. Morphology and performance of world championship triathletes. Ann Hum Biol 2000; 27(4): 387-400.
21. Liang MT & Norris S. Effects of skin blood flow and temperature on bioelectrical impedance after exercise. Med Sci Sports Exerc 1993; 25(11):1231-1239.
22. Lohman TG. Advances in Body Composition Assessment. Champaign, IL, Human Kinetics Publishers, 1992.
23. Lohman TG. Skinfolds and body density and their relation to body fatness: a review. Hum Biol 1981; 53(2): 181–225.
24. Lukaski HC, Bolonchuk WW, Siders WA & Hall CB. Body composition assessment of athletes using bioelectrical impedance measurements. J Sports Med Phys Fitness 1990; 30(4): 434-440.
25. Lukaski HC, Johnson PE, Bolonchuk WW & Lykken GI. Assessment of fat-free mass using bioelectrical impedance measurements of the human body. Am J Clin Nutr 1985; 41(4): 810-817.
26. Lukaski HC. Methods for the assessment of human body composition: traditional and new. Am J Clin Nutr 1987; 46(4): 537-556.
27. Macfarlane DJ. Can bioelectric impedance monitors be used to accurately estimate body fat in Chinese adults? Asia Pac J Clin Nutr 2007; 16(1) : 66-73.
28. Maltron International. Maltron Bioscan 920-2 operating and service manual. 1999: 8-30.
29. Marfell-Jones MJ, Stewart AD, de Ridder JH. International standards for anthropometric assessment. 2012.
30. Michailidis Y, Methenitis S, Michailidis C. A comparison of arm to leg bioelectrical impedance and skinfolds in assessing body fat in professional soccer players. J Sport Human Perf 2013; 1(4): 8-13.
31. Ostojic SM. Estimation of body fat in athletes: skinfolds vs bioelectrical impedance. J Sports Med Phys Fitness 2006; 46(3): 442- 446.
32. Portao J, Bescós R, Irurtia A, Cacciatori E & Vallejo L. Assessment of body fat in physically active young people: anthropometry vs bioimpedance. Nutr Hosp 2009; 24(5): 529-534.
33. Sung R, Lau P, Yu C, Lam P & Nelson E. Measurement of body fat using leg to leg bioimpedance. Arch Dis Child 2001; 85(3): 263–267.
34. Ritchie JD, Miller CK & Smiciklas-Wright H. Tanita foot-to-foot bioelectrical impedance analysis system validated in older adults. J Am Diet Assoc 2005; 105(10): 1617-1619.
35. Roche AF. Anthropometry and ultrasound. In A.F. Roche, S.B. Heymsfield, T.G. Lohman (Eds). Human Body Composition. Champaign, IL: Human Kinetics. 1996.

36. SAI. Sports Authority of India National Sports Talent Contest Scheme, Spotting and Nurturing of Sport Talent. Appendix D, 1992: 110-116.
37. Segal KR, Van Loan M, Fitzgerald P, Hodgdon JA & Van Itallie TB. Lean body mass estimation by bioelectrical impedance analysis: a four site cross-validation study. Am J Clin Nutr 1988; 47(1): 7–14.
38. Sinning WE, Dolny DG, Little KD, Cunningham LN Racaniello A, Siconolfi SF, & Sholes JL. Validity of generalized equations for body composition analysis in male athletes. Med Sci Sports Exerc 1985; 17(1): 124-130.
39. Stolarczyk LM, Heyward VH, Van Loan MD, Hicks VL, Wilson WL & Reano LM. The fatness specific bioelectrical impedance analysis equations of Segal et al: are they generalizable and practical? Am J Clin Nutr 1997; 66(1): 8-17.
40. WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. World Health Organ Tech Rep Ser. 1995; 854:1-452.
41. Williams RD Jr, Barnes JT, Pujol TJ. Comparison of body composition assessment techniques in a non-athletic, non-obese young adult population. J Strength Cond Res 2010; 24(1): 1.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Walking It's Health, an Activity for all and Its Benefits

DPhil(S): Abdelkrim Ferguen [(1)]
Karim Labane [(2)]
Mohamed Riadh Fahssi [(3)]
University Of Algiers 3
Institute of Physical Education and Sport, Algiers
Lecturers at the IPES, Sidi-AbdAllah, University of Algiers "3"

labakarim@yahoo.fr

Abstract

Man has been walking for millennia; this physical activity is naturally an inalienable right of every living being. It is practiced "Without knowing, more or less well, more or less quickly and more or less elegantly. But whoever does not practise it becomes disabled." F. Jenevein (1982). It is a vital activity of man, which deserves a deep study to promote it and finally meet the vital needs of man. Therapeutically, walking, since ancient Greece, Hippocrates considered it as the best remedy for humans. It prevents some of the most known diseases nowadays, such as blood pressure, blood sugar, osteoporosis, stroke, etc. This physical activity is an excellent antidote, it also helps keep fit, maintains joint flexibility by strengthening the bones. It also promotes the fight against stress. However, with the evolution of societies, the technological development of means of transport, the advent of the Internet where the purchases are made at home, this activity is practised less and less. This therefore has influenced our life habits while reducing physical effort, especially walking. Indeed, we cannot turn back the clock, or reject all of these new technologies, how to insert this vital physical activity in our daily lives to maintain our well-being? How to properly practice walking to take advantage of its benefits?

Key's words: Walking's activity, The healt, The society and all ages.

INTRODUCTION

Man has been walking for millennia; this physical activity is naturally an inalienable right of every living being. It is practiced "Without knowing, more or less well, more or less quickly and more or less elegantly. But whoever does not practice it becomes disabled." F. Jenevein (1982)
It is a vital activity of man, which deserves a deep study to promote it and finally meet the vital needs of man.

Therapeutically, walking, since ancient Greece, Hippocrates considered it as the best remedy for humans. It prevents some of the most known diseases nowadays, such as blood pressure, blood sugar, osteoporosis, stroke, etc.

This physical activity is an excellent antidote, it also helps keep fit, maintains joint flexibility by strengthening the bones. It also promotes the fight against stress.

However, with the evolution of societies, the technological development of means of transport, the advent of the Internet where the purchases are made at home, this activity is practised less and less. This therefore has influenced our life habits while reducing physical effort, especially walking.

Indeed, we cannot turn back the clock, or reject all of these new technologies, how to insert this vital physical activity in our daily lives to maintain our well-being? How to properly practise walking to take advantage of its benefits?

1. The benefits of walking

Some experts recommend walking at least 30 minutes a day to halve the risk of colon cancer, cardiovascular diseases, problems related to obesity ... etc.

This physical activity also fights against stress and liberate our mind from disturbances related to the professional environment, family, sound problems, etc.

Thus, it would be better, to walk without personal stereo (*Walkman*) to benefit by giving free rein to thought, relaxation and to think about your projects, solving your problems.

In other words, it must be ensured to drive all one's friends away and come face to oneself after working hours, loud noises of the city, etc. This, leads us to deduce that walking is not only a physiological physical activity but also anti-stress.

Therefore, this physical activity requires few resources, for a great benefit, hence its advantages. So, we do not need any special equipment or specific location, and we can even keep our everyday outfit and walk a few metres from us. The duration of the walk can vary between 10 and 30 minutes to an hour a day.

2. Why walk?

This natural exercise, as Hippocrates said two thousand years ago, is indeed the best medicine for humans. One of the first problems found nowadays within societies is the overweight, where people would rather drive than walk. This decline in physical exertion generates multiple pathologies that we have briefly mentioned above.
To overcome these health problems, we should regularly practice this activity so that there is a direct and positive impact on cardiovascular and musculoskeletal (*locomotor*) systems.
Walking prevents the following pathological cases:

- The risk of cardiovascular diseases and cerebrovascular accident (*stroke*);
- Drop in blood pressure (*low blood pressure*);
- Reduction of cholesterol levels in blood;
- Increase of bone density, to prevent osteoporosis;
- Mitigation of the negative effects of osteoarthritis;
- Relief of back pain.

Other benefits can also be reaped from regular walking:

- longevity and best quality of life;
- improvement of fitness (aerobic capacity and cardiorespiratory function);

- regular walking avoids risks of leg or hand fractures in case of fall;
- regular walking avoids risks of sustaining injuries; because the joints have a better range of motion and the muscles are more flexible;
- improvement of capability to control weight by maintaining the balance between calories taken in and those expended;
- improvement of mental health, for instance, walking in a group and in pleasant places, reduces depression and anxiety, makes one's also sleep better;
- improvement of healing process for people recovering (*in period of convalescence*) by gradually increasing the distance of walking.

3. How to incorporate walking into our daily life?

Today, the phrase "I have no time" has become familiar in our language, while knowing that walking brings many benefits to our body. In order to get round this time problem, simply allocate a time slot to walking and make it a habit to do so. For example, from time to time, after waking up, taking a fifteen minute walk in the morning is always beneficial. So a long walk in fresh weather is recommended, in serene and peaceful atmosphere. Regarding people using vehicles for moving are recommended to park further away, 10-15 minutes from the workplace, the distance on foot allows us to mentally prepare ourselves for our work, and, on the way back, this also allows us to plan the rest of our activities.
If you take public transport, for example, always try to walk along for a while to get to a particular place.
You can practise this activity in parks, forests, town, etc., to relax and relieve stress, maintain social relationships with walkers of all ages.

4. How to walk?

The best way to walk ... is to put one foot in front of the other by trying to naturally bring the two legs on a straight line. It is important not to walk on tiptoes, legs parallel. We walk neither into circles or in zigzag nor backwards nor by stomping nor even with feet in a V shape, that is to say,

From a mechanical point of view, the way of walking varies according to the morphology and the character of the individual. We have got the hurried (*hasty*) walking, the relaxed walking, the walking looking like a skip (*hop*) and the disjointed walking, the walking looking like a dance or a scrolling, the walking with firm and steady steps (*with determination*), the discrete walking, the straight walking, the indifferent, the irregular, the strict or the monotonous walking, walking with little steps and walking with long steps (*stride*).

However, walking into a house, a waiting room, or in an enclosed space, does not mean that one is walking, but that one is pacing.

Therefore, we find that nowadays, although multiple ways of walking exist, there are few people practising, due to the development of societies, which is synonymous with a modern lifestyle where one moves on foot less and less. To maintain our health capital, we need to find a time slot for physical activities, particularly for walking.

We have hiking (*rambling*) with an average speed of 4 to 5 kms / h, which requires neither a special technique nor a specific physical ability unless the distance to be covered is long. If we exceed the speed

of 5 kms/ h, we will find ourselves in a brisk walk which is very beneficial for health. In other words, the faster we are, the more beneficial it is for our health. Beyond that, we go to the area of race walking, that is to say, the one we practice in athletics' competitions. At that time, this activity becomes more natural walking.

5. Race walking

5.1. Definition of Race walking

It is a progression of steps so taken that "the contact with the ground is maintained without interruption."

5.2. Regulatory principles

The correct race walking meets two main requirements:

- The walker (*the athlete*), for this purpose, has to make sure that the heel of the front foot touches down, before the back tiptoe has left the ground.
- He has to make sure that the advancing (*the front*) leg must be straightened (should not be bent at the knee) from the moment of first contact with the ground until it (*the leg*) passes under the body (*in the vertical position*) and it is obvious here, that the knee should be straight when the heel strikes the ground.

In conclusion, it should be noted that the walker (*the athlete*) must maintain, in a permanent and visible way, the front leg in contact with the ground, it means that it (*the front leg*) should not be bent between the contact and the vertical position of the body. Finally, we must note that a brisk walk performed (*achieved*) on tiptoes is considered as a race.

CONCLUSION

To prevent diseases, the daily practice of walking seems very beneficial. This natural activity is within the reach of everyone; simply schedule it into your daily activities and practice it in a brisk manner and with a body's attitude which fits you. However, it is advisable to respect the basic technical principles that we have just mentioned in order to reap its benefits.

References

1. Denis Langlois, Décathlon Olympique Moderne, fiche technique – la marche athlétique –, http://www.denislanglois.com/lamarche (2012).

2. Dominique, Guebey, Décathlon, Olympique Moderne, - fiche technique – la marche –, http://www.dg77.net/marche/tech/schemas.htm. (2012).

3. Hervet, R., Bohain, L.Y, la marche, - de la randonnée à la compétition – édition Vigot, Paris, 1982

4. Physical Activity and Health: A Report of the Surgeon General. US Department of Health and Human Services, 1996

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Effect of therapeutic kinetic program to improve kinetic cognitive efficiency for intellectual disabilities (10-12) years old

Benzidane Houcine, Djamel Mokrani , Dahoune Oumri.

Laboratory of Programs Optimization in Physical Activity and Sports
Institute of Physical Education and sports, University of Mostaganem, Algeria.

Email address: *houcine.benzidane@univ-mosta.dz

Abstract

This research was an attempt to know the impact of kinesthetic treatment program proposed on the kinetic cognitive efficiency for pupils with intellectual disability to consenting to learn (10-12) yearsof the school year 2014/2015. Experimental method was adopted for its compatibility with the problematic of the research. A sample was selected in an intended manner which included 20 children and divided into an experimental sample of 10 pupils and control sample of 10 pupils. A program was applied on the experimental sample under the supervision of researchers where 10 therapeutic servings containing physical exercises and rehabilitation mobility activities were applied and the unit was repeated twice per week and the total of a serving was 20. Bordeaux scale was applied on the control sample practicing sports activity under the supervision of a competent educator to measure cognitive abilities and which includes the areas (balance and strength, indistinguishable and body perception, visual perception and kinetic cognitive pairing). After statistical treatment of raw results, it was obtained:

-The superiority of the experimental sample on control sample which is shown clearly through the results, shows significant statistically differences between all research samples (control and experimental) and are for the benefit of the experimental sample in most efficient kinetic cognitive tests where the value of the calculated T between 3.82 and 7.59. They are greater than the value of the indexed T estimated 2.10 at significance level 0.05 and the degree of freedom 18 except for kinetic imitation test value calculated 1.92 T which is less than the value of the indexed T.

Which reflects the extent of coherence between the program and the improvement of kinetic cognition. Thus, the progress was the result of employing the scientific foundations of the proposed program in dealing with respondents through respect for the rules of "the duration and continuity of the exercise, repeat exercise and the number of weeks. It suits the features and characteristics of students with intellectual disability.

- The proposed kinetic program has a positive impact on the efficiency of kinetic and cognitive disabilities (10-12) years old.

Keywords: cognitive efficiency, kinetic cognitive program, intellectual disability.

INTRODUCTION

The term intellectual disability (ID) is used as synonym to mental retardation (MR) and it refers to substantial limitations in present functioning. In the literature, the following terms are used to mean intellectual disability, mental retardation (MR). Some prefer the term mentally handicapped. (Patja ,2001, p13), (Steadward 2003, p560)

Intellectual disability (ID) is diagnosed when a person has significant impairment in mental functioning and limitations in adaptive behavior, (Salva & al, 2011, p175)

Kurt Manel (1987) refers that the movement of one life for misfits and disabled and is therapeutic tool, because the motion is not only functionally without consequence, pursuant to physiology, but at the same time experience the environment in order to identify it. The child learns things near and far in his life

through intelligence, observation, experiment and holding with the help the movements of hands and senses which allow him to recognize the attributes of shapes, the quality, the scope and timing of everything that surround him and everything that has a relationship with his life (Kurt, 1987, p25)
Decades of research have shown that play is an important mediator in the physical, social, cognitive, and language development of young children (Bergen, 2002) (Garvey, 1993)
Ruby (1990) adds that kinetic cognitive abilities caught the attention of scientists and researchers like Kifart and Biagih in multiple areas and psychology studies. Particular research and studies on awareness, education, and kinetic development demonstrated the need to use kinetic cognitive programs that give individuals in the stages of learning of education pure kinetics (Ruby, 1990,p 17)
Some studies also dealt with this category such as the studies of Sigman and Angerar (1984), Selja Babril (1996), Nejda Lotfy (2002),Fathi Mohamed Suleiman (2004), the study of benzidane Houcine (2009) who addressed some variables such as kinetic cognition, physical attributes and abilities.
Despite the attention of the Algerian State given to this category recently, there is a lack of studies and research on sports activity in this category to the local level. Through field visits to some medical centers for the retarded mentally, pedagogical and personal interviews with some of those centers, it was noted to contain a process applicable to pedagogical activities such as intellectual activity and psychomotor education and lack of physical activity classes, this class helps develop motor and mental capacities. This came to the attention of researchers employing therapeutic kinetic program proposal and to know its effect on perceptual kinetic efficiency for intellectual disabilities (10-12) years old.

Objectives of research:

- Preparation and recruitment of the kinetic program and attempt to determine its effect on perceptual kinetic efficiency for intellectual disabilities (10-12) years old.
- Detect differences between control and experimental sample in telemetric perceptual kinetic efficiency for intellectual disabilities (10-12) years old.
- Improve kinetic cognitive efficiency for intellectual disabilitiesandconsenting to learn.

RESEARCH METHODOLOGY AND FIELD PROCEDURES:

Research methodology:

The researcher used experimental method of the relevance and nature of the problem.

Community and research sample:

Research community reaches 67 pupils of the school year 2014/2015 in Mostaganem city (Algeria), and is chosen in a deliberate manner. They were selected after applying intelligence test (test of Godunov draw man), defining age and height, and in the end 20 pupils aged (10-12) were kept.29,2 % represents the original community, and the two samples have been harmony with variables (age, height-intelligence, dimensions of Bordeaux for kinetic cognitive abilities). The group was split into two samples randomly which included:

Experimental sample of 10 students and applied on them kinetic program motor under the supervision of researchers. Control Sample with 10 students and applied on them a school sports program under the supervision of the teacher.

Research tools:

- Sources and references, as well as previous studies and expert polls, these tools are in:
- Cleverness test of Godunov (man drawing test).
- Bordeaux measurement to cognitive abilities. This measurement includes 05 dimensions with the adoption of the 3 areas because it fits with kinetic domain.

First field: Balance and strength.
Second field: Body image and its features.
Third field: Optical control.

The foundations of the program:

The researchers followed the scientific foundations for building the program by selecting the program content (kinetic activities and physical exercise to develop perceptual-kinetic efficiency), in line with the

characteristics of this category (age and degree of mental retardation), and using the method of college education because the biomechanics of intellectual disability is not caused by cognitive thinking analysis of kinetic skills but saves movement and imitated directly.

When designing the program, the appropriate kinetic activities were selected for this category such as running games, jumping and jump that do not require durability. Researchers viewed the program content for the experts in the field of physical education and sports and adapted athletic activities to recognize program objectivity.

RESULTS

Table (01) illustrates the significance of the differences between the remoteness measurements of experimental sample in the efficiency of kinetic cognitive test

Statistical measurements / Tests		Post-test		Pre-test		T Tabular	Statistical significance
		X1	Y1	X2	Y2		
walk forward on the Board		1.88	0.64	03	0.53	4.8	Significant
walk back on the Board		1.5	0.46	2.5	0.86	2.67	Significant
walk by the board		02	0.75	03	0.75	2.70	Significant
Test of setting of body parts		02	0.75	3.25	0.76	3.47	Significant
crossing obstacle		1.88	0.73	3.25	0.70	4.28	Significant
Defining angles on Earth		2.13	0.98	3.25	0.67	5.09	Significant
Kinetic imitation		1.63	0.71	03	0.84	3.70	Significant
Visual achievement	Shape	02	0.75	3.25	0.76	3.47	Significant
	Organisation	02	0.75	03	0.75	2.70	Significant

Significance level 0.05 and the degree of freedom (n-1) = 9 T Calculated= 2.26

Table(01) shows significant statistically differences for dimensionally measurements in experimental sample where calculated T value ranging between 2,67 to 5,09. They are greater than the value of the indexed T estimated 2.26, at significance level 0,05 and the degree of freedom (n-1) = 9.

Table (02) illustrates the significance of the differences between the remoteness measurements of control and experimental samples

Statistical measurements / Tests		Control		experimental		T Tabular	Statistical significance
		X1	Y1	X1	Y1		
walk forward on the Board		2.12	0.35	03	0.75	4.63	Significant
walk back on the Board		1.62	0.52	2.5	0.86	3.82	Significant
walk by the board		1.87	0.64	03	0.75	4.91	Significant
set of body		2.12	0.75	3.25	0.76	4.52	Significant
Obstacle crossing		1.62	0.5	3.25	0.70	6.25	Significant
angles on Earth-body		2.12	1.06	3.25	0.67	4.03	Significant
Kinetic imitation		2.5	0.75	03	0.84	1.92	No Significant
Visual achievement	Shape	1.5	0.53	3.25	0.76	7.59	Significant
	organisation	02	0.5	03	0.75	4.76	Significant

Significance level 0.05 and the degree of freedom (2n-2) = 18 , T Calculated= 2.10

Table (02) shows significant statistically differences between all research samples (control and experimental) and are for the benefit of the experimental sample in most efficient kinetic cognitive tests where the value of the calculated T between 3,82 and 7,59. They are greater than the value of the indexed

T estimated 2,10 at significance level 0,05 and the degree of freedom 18 except for kinetic imitation test value calculated 1,92 T which is less than the value of the indexed T.

Discussion of the results:

It is evident from table (01) that statistical differences in favour of telemetric in perceptual kinetic efficiency tests of the experimental sample, as indicated in the table (02) differences between experimental and control research samples in telemetric and are for the benefit of the experimental sample in all tests except the kinetic imitation test.

Researchers suggest that is due to the positive impact of the therapeutic program of activities enriching which contain the kinetic physical exercises and dynamic activities that were applied to experimental sample research. It has been taken into account when developing the program by adopting the scientific foundations for building units in addition to choosing exercises and running games, jump, high jump, change directions and balance and compatible exercises. The exercises were also competitive development in the form of games with some small tools of different sizes, shapes and colors.

This result is consistent with the findings of Sigman & Angerar (1984), Selja Babril (1996), Makarim Helmy (1990), Horvat, M., & Franklin, C. (2001), Benzidane houcine (2009) who proposed programs in various physical activities and Sport (playing, athletics, gymnastics, educational gymnastics barriers, kinetic activity) which have positive impact on different physical abilities under research on the sample in question.

This was confirmed by Pitetti, K. H. & Yarmer, D. A. (2002) that the practicing of kinetic sports activities by the disabled improves the physical and kinetic abilities and increases his kinetic perceptual efficiency. As it was evidenced by Hilmi Ibrahim and Lila Farhat (1998), Faison-Hodge & Porretta D.L. (2004),Bergen (2002) that one of the objectives of the exercise of the physical education for persons with intellectual disability gain kinetic compatibility and muscle strength. It also helps to perform basic kinetic skills transition as standing, walking, jumping and movement of various types in accordance with the requirements of normal life for the individual. It also stressed the need to use the adapted physical activities in therapeutic kinetic programst.

The results of control sample is no statistically differences in sample control in most tests where the calculated T value ranged between 0,44 to 1,87. They are smaller than the value of the indexed and estimated T 2,26 at indication 0,5 degree freedom 09 except the set of body parts test. Where T was calculated from 2,27 to 2,38 and is larger than the value of the table T, the researchers suggest that is due to the adoption of simple kinetic activities by the teacher from which unguided and lacking aimed and arousal effectiveness for physical, cognitive, and capacity development.

The researchers also notice the superiority of the experimental sample on the control sample that is shown clearly through the results in table (02), which reflects the extent of coherence between the kinetic program of activities and the kinetic cognition improvement. Thus, the progress was the result of employing the scientific foundations of the program proposed in dealing with individuals through respect for learning and training, the duration and continuity of the exercise, repeating the exercise, the number of weeks and suits the features and characteristics of pupils with intellectual disability.

CONCLUSION

Giving attention to therapeutic kinetic activities and sports classes for pupils with intellectual disability in teaching medical centers.

Using therapeutic kinetic and physical activities for its effects on perceptual kinetic efficiency for intellectual disabilities

Developing of perceptual kinetic efficiency for intellectual disabilities.

Creating dynamic and sports programs for pupils with intellectual disability to different degrees of disability and for all age phase.

References

1. Benzidane Houcine. (2009). The role of kinetic games in improving kinetic cognitive for the mentally retarded. Algeria: Mostaganem University. Journal of Physical Activity and Sports Sciences, Issue 07.
2. Bergen, D. (2002). The role of pretend play in children's cognitive development. Early Childhood Research and Practice, 4, 1-12
3. Faison-Hodge, J., & Porretta, D.L. (2004). Physical activity levels of students with mental retardation and students without disabilities. Adapted Physical Activity Quarterly, 21,139–152.
4. Garvey, C. (1993). Play. Cambridge, MA: Harvard University Press.
5. Horvat, M., & Franklin, C. (2001). The effects of the environment on physical activity patterns of children with mental retardation. Research Quarterly for Exercise and Sport,72, 189–195.
6. Kariman Bedier. (2003). Children with special needs. Cairo: the world books.
7. Kort Manel translation Abdul Ali Nassif. (1987). kinetic learning. Iraq: Baghdad University.
8. Mohamed Fathi Suleiman. (2004). The effect of kinesthetic recreational program on basic kinetic skills for children with mental development needs.Egypt. Helwan University.
9. Maysa Azmi El-dessoki. (1996). The impact of the proposed training program for rhythmic exercises on some kinetic variables with the mentally disabled. Egypt. Journal of Sports Sciences 14.
10. Nejda Lotfi Ahmed. (2002). Effective exercise program on some kinetic capacity and compatible behavior of mentally handicapped children. Alexandria: Unpublished Ph.D., Faculty of Physical Education for Girls.
11. Omar Suleiman Ruby. (1990). Kinetic cognitive abilities of the children. Cairo: Arab House Thought.
12. P.Jansma, R.French .(1994) .Special physical education-physical activity sports and recreation .new jersey. prentice hall.
13. Patja, K.(2001). Life expectancy and mortality in Intellectual Disabilities. Helsinki: Kehitysvam maliitto.
14. Pitetti, K. H. & Yarmer, D. A. (2002). Lower body strength of children andadolescents with and without mental retardation. A comparison. Adapted Physical Activity Quarterly, 1, 68-81
15. Steadward, R.D., Wheeler, G.D. & Watkinson, E.J. (2003). Adapted physical activity. Edmonton: The University of Alberta Press.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Nutrition Education Intervention in the Enhancement of Knowledge Attitude and Dietary Practices of Athletic Men and Women

Supriya Velraja*, Lalitha Ramaswamy**
*- PhD Scholar, Bharathiyar University, Coimbatore (Part-time)
Lecturer, Department of Clinical Nutrition, Sri Ramachandra University, Porur, Chennai
Email: priiyas@gmail.com,
**-Associate Professor and Head, Department of Nutrition and Dietetics,
PSG College of Arts and Science, Coimbatore

ABSTRACT

Background: Generous knowledge on nutrition for athletes and coaches becomes imperative. In spite of enhancement, athlete crosswise stay ignorant of the consequence their nutritional habits. Knowledge, attitude and practices (KAP) regarding food intake of athletes become essential more so for their winning edge. **Aim:** The main aim is to determine whether the nutrition education intervention positively impacts athletes' sports nutrition knowledge, attitude and dietary practices, thus enhancing their performance. **Methodology:** One and hundred seventy eight athletes were screened using a structured KAP questionnaire highlighting the various sports nutrition concepts. 20 athletic men and women were selected for nutritional intervention and educational aids were developed and the impact was assessed using the same KAP before and after intervention. The results were analyzed using SPSS package (version 15). **Results**: The mean age of athletic men and women was 18 ±3.2 yrs. 60 % of the subjects were females and 40% males. Mean height was 165.5 ±3.2 cms and weight 61. 2 ± 2.1 kgs. The participants played the sport for an average of 6 hrs every day. The mean KAP scores before nutrition education was 48.7 ± 6.05 while the scores after nutrition education were 62.5 ± 5.4, thus indicating an improvement. Knowledge correlated well with attitude ($p<0.05$), knowledge and nutrition practices ($p<0.001$). There seems to be no significant correlation between knowledge and practice. **Conclusions:** The results of the study demonstrate that nutrition education interventions may serve as effective tools for increasing nutrition knowledge among athlete fraternity.

Key words: athletic performance, knowledge, attitude, diet

INTRODUCTION

Optimal Nutrition intake forms a basis of an athlete's daily routine and enhanced performance. Apart from daily practice, meticulous training schedule, nutritional intake plays a vital part as well. There is no suspicion about the consumption pattern of athletes influencing fitness, weight and body composition, revitalization period following work out, and eventually, training performance [1]. It is important for athletes' to understand basic nutrition information and have basic knowledge of their energy and nutrient needs in order to optimize athletic performance. Not many studies have been conducted on nutrition knowledge among athletes, majority of them have found lack of basic nutrition in this population Numerous earlier

researches which have looked into the level of nutrition knowledge among athletes have come to one similar conclusion; athletes lack basic nutrition knowledge[2]

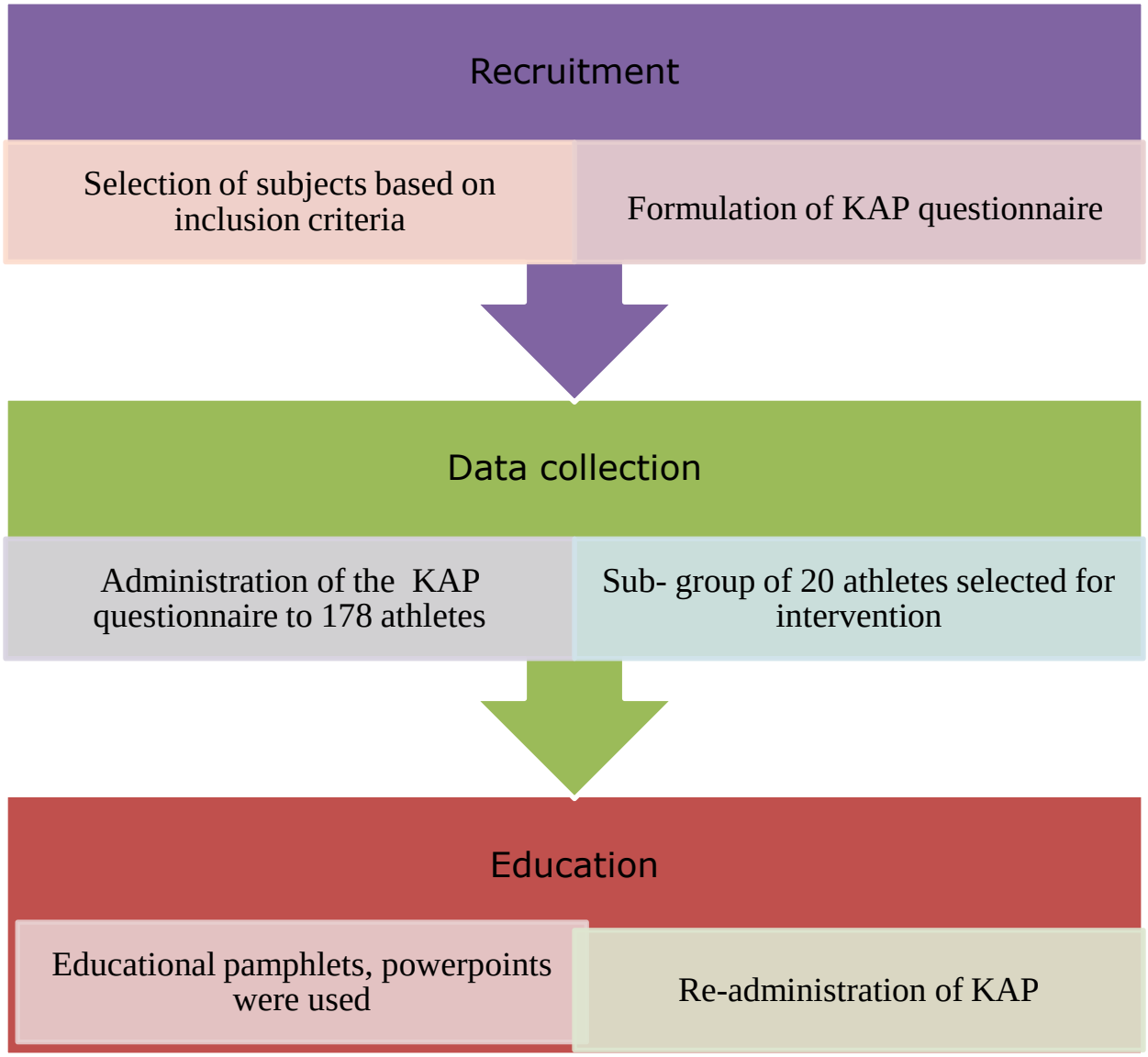
Several previous studies have indicated that the more nutrition knowledge athletes acquire, the more likely they will apply such knowledge to their actual dietary intake and make better food choices [3]. In contrast athletes who lack basic nutrition knowledge are less likely to maximize their athletic performance potential as well as their health status later in life. To date, only a few published studies have investigated the outcome of nutritional involvement in athletes' dietary familiarity, manners and other nutrition-related factors. Hence, the study was undertaken to establish the efficiency of diet education and intervention of athletic men and women in improving their knowledge, attitude and dietary practices.

METHOD

Study design and participants

The study design adopted was descriptive design - pre test-post test without control group design. 178 athletes were recruited from various Sports Academies in Chennai and were administered with a KAP questionnaire. Sample size estimation was done based on the **Openepi Version 2**, used for sample size calculation with 99% confidence interval (Overall sample size=178) and a power estimate of 0.80 with a sub sample size of 20 for nutrition education intervention. The study was carried out between January 2014 and March 2014. Inclusion Criteria involved athletes who had previously not been educated by a nutritionist, who had a minimum of 3 years of experience in sports activities, belonging to the age group between 18 and 22 years and who submitted the written permission and willing to participate. Athletes who were <18 and > 22 years of age and who did not fill in the written consent forms were excluded from the study (Figure 1)

Figure-1 Study design and procedure



Informed consent and Ethical approval

A well explained approval was collected from the athletes, voluntary involvement was emphasized and a written consent was obtained from them to be incorporated into the study. The Human Research Ethics Committee for Nutrition departments of PSG College of Arts and Science, Coimbatore, India approved the study. ((REF: REC/NCND/K14 003).

Reliability

For the pilot study, the KAP survey was performed among twenty athletes. A strong reliability (0.82 for knowledge, 0.96 for attitude, and 0.638 for practice) was observed using test-re test reliability tests. The survey contained three sections: the primary component was

deliberated to acquire information about knowledge on sports nutrition (10 questions), whereas the next section enclosed ten declarations associated with diet familiarity and final component consists of ten practice related questions[4]

Data Collection

An interview schedule was prepared to gather general as well as information pertaining to sports namely, name, age, sex, qualification, sports involved, duration of sports involved per day, number of years involved in the respective sports and the level of games (District/State/National). The information was gathered by personally interviewing the athletes.

The survey has preset questions and configured in uniform format to aid in data collection. The validated KAP questionnaire was administered to all the 178 athletes at the commencement of the study with the rationale of the study explained clearly. It was completed two times, both prior to and subsequent to nutrition intervention, so as to appraise the effectiveness of the KAP questionnaire within a time frame of one week.

Dietary Record - keeping for 3 days is tremendously imperative as a precise evaluation can be prepared out of the routine day by day nutrient ingestion prior to and subsequent to diet instruction, to make out the nutritional outline of athletic population. Nutritional ingestion all the way through 3 day documentation was analyzed by means of DIETCAL software.

Development of Nutrition Education Modules and Imparting Nutrition Education

A colorful, informative, attractive and easy to carry pamphlet was prepared focusing on balanced diet, sports nutrition -Pre event meal- Morning event, Afternoon event, post event meal. The pamphlets provided easy to follow food and nutrition tips in a convenient way.

Team talks with efficacious and informatory power point emphasizing on the nutrition for athletes, sports nutrition pyramid- an easy way to understand how to eat, calories, protein, and carbohydrates, anti-oxidants to athletic performance. Wherever required, the questions were translated to dialect (local) language. Subsequently, ample time was provided to fill up the questionnaires. The researcher took concern to ensure whether all the questions were filled up by the athletes. The time taken for filling up the questions at the pre-assessment meeting was higher (nearly half an hour) whilst, it took only 15 minutes to fill up the questionnaire in the post-assessment sessions. Thereby, proving an impact of the instruction modules prepared such as slide presentations, pamphlets accentuate the significance of anti- oxidants in an athlete's diet.

Statistical Analysis

The KAP Survey questions were coded, tabulated and analyzed statistically. Mean, standard deviation and percentage were estimated from the survey scores. Independent't' test was employed to work out the prior and after intervention test scores of KAP ($p<0.001$). Pearson's correlation coefficient ($p<0.05$) was applied to assess the correlation between nutrition knowledge, the attitude and practices of athletes. Open epi version 2 was made use of in estimating the sample size. Statistical analysis performed using SPSS (version 15).

RESULTS

Demographic characteristics

The baseline characteristics of the sample population are given in table 1.

Table 1-Baseline characteristics of the atheletes

Characteristics	**Mean ± SD**
Height	165.5 ±3.2 cms
Weight	61. 2 ± 2.1 kgs
Age	18 ±3.2 yrs
Males (%) Females (%)	71(40) 102 (60)
No.of hours Spent/day (n/%) 1-2 hrs 3-4 hrs 5-6 hrs	 103 (58) 49(27) 25(15)
No.of yrs involved in sports (n/%) 1-2 3-5 6-8 9-11	 64(36) 73(41) 26(15) 14(8)
Level of participation in sports (n/%) District State National International	 35(20) 69(39) 72(40) 01 (1)
Source of information (n/%) Coaches Magazines and internet	 100(56) 78(44)

Mean age of athletic men and women was 18 ±3.2 yrs. 60 % of the subjects were females and 40% males. Mean height was 165.5 ±3.2 cms and weight 61. 2 ± 2.1 kgs [4]. The participants played the sport for an average of 6 hrs every day. It was found that majority (58%) of the

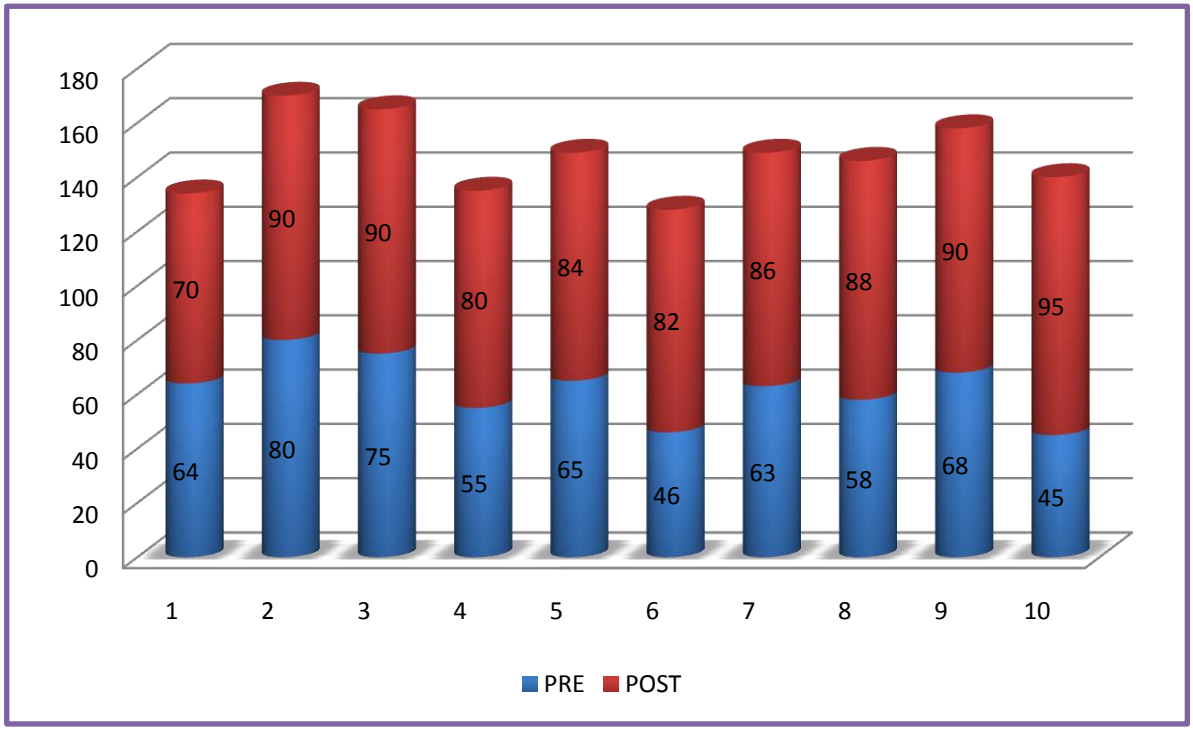
athletes spent on an average 1-2 hrs/day on their sports activity, which was followed by 27% of them practicing for three to four hours.

Thirty six percent of the selected sports persons were involved in sports activities for one to two years, and maximum percentage of athletes (i.e 41%) for a period of three to five years, followed by 15% for 6-8 years. About 8% of the selected athletic populations were indulged for 9-11 years. Twenty percent of the selected athletes were playing at the district level and 39% at the state level, majority (40%) were competing at the national level. The main source of nutrition information was from coaches (56%) and magazines (30%). Coaches themselves act as nutritionists. In the present days where areas of specialization are well defined, it is imperative that coaches confine themselves to coaching the athletes only on the nuances of the games and leave the dietary advices to the nutritionist. It is essential that the importance of sports nutritionist is felt by all the people (officials, selectors, coaches and athletes) for winning.

Nutrition knowledge

Nutrition information of the athletes has been misguided. KAP questionnaire threw light upon the misconceptions they carry with regard to general sports nutrition.

Figure- 2 Pre and Post Test Scores (% correct responses) of Knowledge



It is seen from figure 2, that the knowledge of sports person was quite low before nutrition education and had improved considerably after nutrition education as is evident from the increase in the number of right answers given after nutrition education. For all the questions, there has been a remarkable improvement in the knowledge on carbohydrate loading, anti-oxidants, fluids which was found to be evident by the right responses given by the athletes after nutrition education. The attitude of sports person was fair before nutrition education and it had improved considerably after nutrition education.

Attitude

Only 27% have a right outlook that elevated use of ghee, milk, almonds augments athletic endurance capacity. 2% only disagreed that consumption of water is necessary before, during and after performance. There was an increase in the number of right answers observed post dietary intervention (Table 2).

TABLE 2- Pre and Post test scores on Attitude changes after intervention

Statements	Strongly Agree		Agree		Undecided		Disagree		Strongly disagree	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Nutritional requirements of athletes vary from regular people	57	80	20	10	0	0	13	05	10	05
Good nutrition is as important as skill, training and motivation	68	78	22	15	3	2	5	4	2	01
Expensive foods are better and are important for good performance	25	21	35	14	25	10	5	0	10	45
Coaches influence the food choices of athletes	25	20	36	56	13	6	12	8	14	10
Peers and role models influence the food choice and consumption	35	28	19	12	20	12	15	9	11	9
Large consumption of water is necessary before, during and	36	26	39	15	3	3	0	2	23	44

after performance										
It is necessary to add electrolytes in sports drinks.	35	48	22	12	0	0	21	15	22	25
Usage of Milk, almonds, ghee augment performance	62	85	27	18	3	2	5	3	3	01
Fasting is the best method to lose weight.	27	21	35	14	25	10	5	0	08	45
Consumption of nutrition supplements is vital to win in sports	57	80	20	10	0	0	13	05	10	05

Dietary practices and Intake

45% of them were found to change their nutritional outline at the occasion of sport events, 55% skipped serving of food preceding the event. In concern with carbohydrate loading, only 37% practiced this. An average of 60% was not consuming any form of sports supplements, drinks every day (Table 3).

TABLE 3Pre and Post intervention scores on dietary practices

Practice Questions	**Pre Test**		**Post Test**	
	Yes	**No**	**Yes**	**No**
Altering the diet pattern at competition time	45	55	65	35
Skipping of meals preceding competition	55	45	25	75
Involved in carbohydrate loading previous to competition	37	63	67	33
Consuming commercial sports food supplements everyday	45	55	75	25
Consuming commercial sports drinks everyday	35	65	55	45
Consuming commercial sports supplements everyday	42	58	59	41
Skipping meals to lose weight	47	53	61	39
Consuming ergogenic foods before performance	47	53	38	62
Following a strict dietary regimen everyday	39	61	42	58
Eating all the recommended foods in the right quantities every day for peak performance	34	66	59	41

Ignorance, lack of sufficient information has lead to such faulty practices which was found to be corrected after intervention. The nutrient intake of the athletes in terms of calories,

protein, carbohydrates, fats and showed an optimistic effect of intervention against the recommendations (p<0.001). Table 4 highlights the increment of macronutrient intake with regard to dietary intervention.

TABLE 4 Dietary intakes before and after intervention

Nutritional parameters	**Mean ± SD (Pre- intervention)**	**Mean ± SD (Post- intervention)**	P value
Energy (kcals)	1915.00 ±240.83	2171.20±267.42	P<0.001
Protein (gm)	61.40 ± 8.04	79.05±17.74	P<0.001
Carbohydrates(gm)	291.65±25.51	323.45±32.40	P<0.001
Fats (gm)	41.40±3.48	41.50±2.50	P<0.001

Efficacy of Nutrition Education

The efficacy of nutrition education has been depicted in table 5.

TABLE 5-Mean, Standard deviation, level of significance and Correlation of KAP before and after nutrition intervention

Attributes	**Mean ± Std Deviation**		
	Knowledge	**Attitude**	**Practice**
Pre-test	7.00±1.170	35.60±5.548	6.70±1.174
Post-test	7.95±1.356	37.35±4.603	8.20±1.056
Change	0.95	1.75	1.5
P trend	0.000*	0.000*	0.000*
Correlation (r)	0.163**		0.257***
	0.17 NS		

*- p<0.001, NS- Not significant
**. Correlation is significant at the 0.05 level (2-tailed).
***. Correlation is significant at the 0.01 level (2-tailed).

Figure 3 emphazises the mean pre- test score for knowledge was found to be 7.00±1.170, which has been enhanced to 7.95±1.356 (p<0.001).

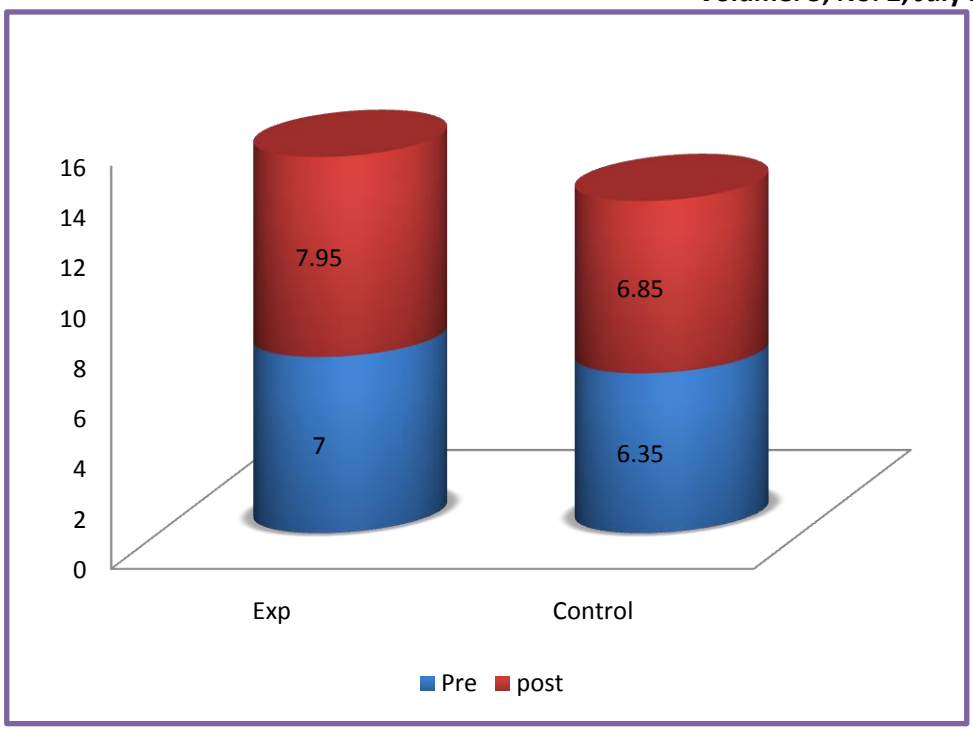


Figure 3-Pre and post test scores on knowledge

The initial mean pre- test score for attitude was 35.60±5.548, which has been enhanced to 37.35±4.603 finally, as shown in figure 4 with a positive response (change trend- 1.75 $p<0.001$).

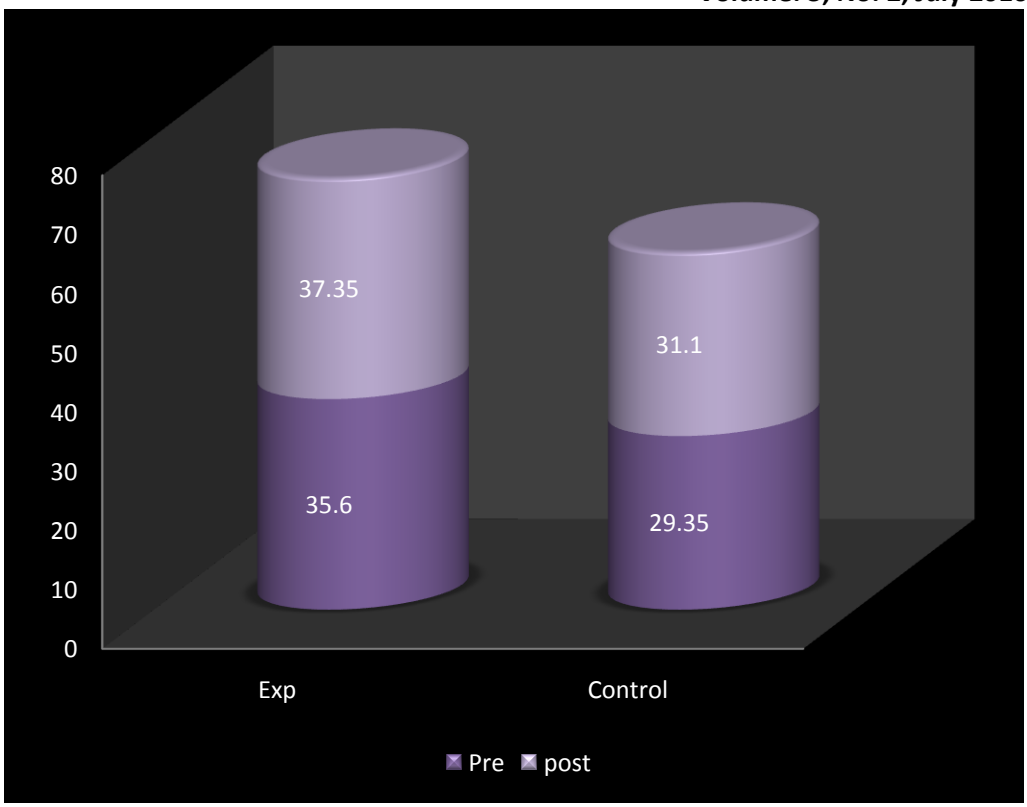


Figure 4- Pre and Post intervention test scores on attitude

Similar observation (figure 5) has been made in dietary practices which was initially 6.70±1.174 and was augmented to 8.20±1.056 (positive change- 1.5 $p<0.001$).

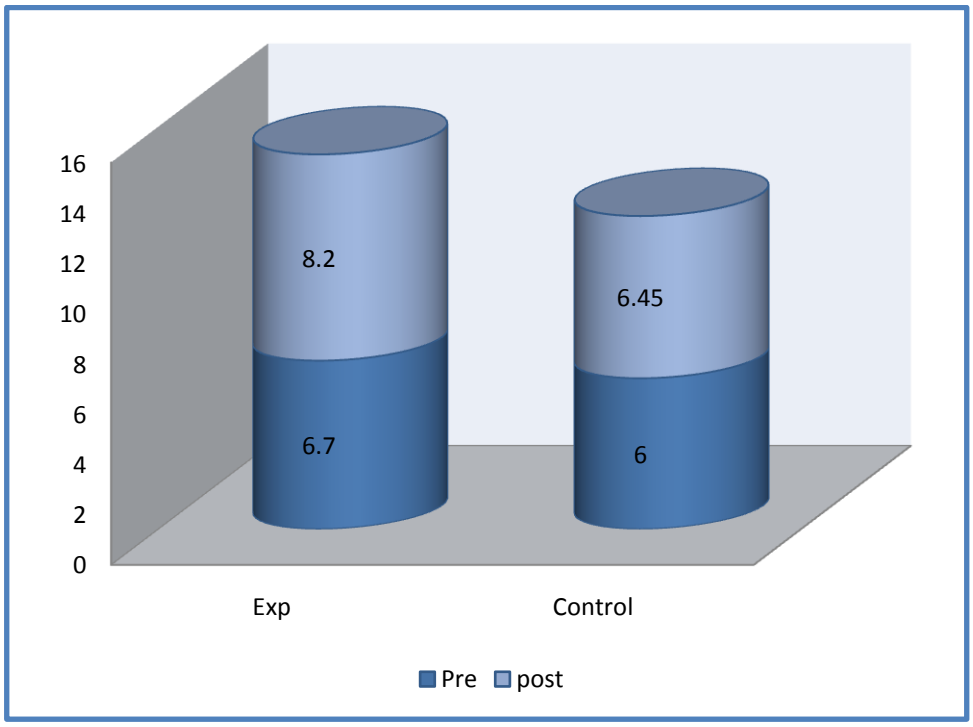


Figure- 5 Pre and Post intervention scores on dietary practices

The mean KAP scores before nutrition education was 48.7 ± 6.05 while the scores after nutrition education were 62.5 ± 5.4, thus indicating an improvement.

It was found that the knowledge is correlating well with attitude at $p<0.05$ and it can be assumed that the food is interrelated with the diet outlook and familiarity and later on food practice, encouragement of understanding directs to the enhancement of their outlook, following to the progress in their diet. This investigation suggests the significance of diet information and its influence on diet approach and practice. A suitable diet has a substantial result on the progress of an athletes' health. A similar observation was made with an attitude and practice, which correlated well at $p<0.01$. There seems to be no significant correlation between knowledge and practice.

DISCUSSION

A personalized diet session was accomplished for every athlete in accordance with their pre test KAP scores. The principle researcher being a Registered Dietitian as well, meet up with all the athletes for a period of seven days following the collection of diet histories during the session. All the participants responded precisely subsequent to the intervention than prior to the intervention on the sports nutrition knowledge survey. At the beginning and end of the intervention season, participants were required to complete the KAP survey to assess each participant's individual knowledge. The survey was separated into 10 essential parts as follows: Balanced diet, consumption outline and nutritional manners, hydration, carbohydrate loading, weight control, dietary supplements, general nutrition, sports nutrition, protein, strategies for training and food choices, and anti-oxidants section. It is very important for athletes to comprehend suitable weight loss and grow on their performance before the event to avoid depressing athletic performance and overall health. It is extensively acknowledged among fitness experts that secure and efficient way to lose weight is not by fasting [6]

A Similar observation was made by studying the effect of nutrition education by a Registered Dietitian which improves Dietary Intake and Nutrition Knowledge of a NCAA Female Volleyball Team. Dietary intervention was employed regarding the individual dietary needs of each athlete as well as a pre- and post-sports nutrition knowledge survey. After dietary interference, total energy, and macronutrient intake enhanced, as well as a significant

improvement in sports nutrition knowledge ($p < 0.001$). Nutrition instruction is helpful in improving dietary intake and nutrition knowledge of female athletes.[7]

Several studies have indicated that the more nutrition knowledge athletes possess, the more likely they will apply such knowledge to their actual dietary intake and make better food choices. In contrast, athletes' who lack basic nutrition knowledge are less likely to maximize their athletic performance potential as well as their health status later in life.

Moreover, studies show that even if athletes possess some nutrition knowledge they have a difficult time translating their knowledge into food choices. Contrastingly, observations made from the current study showed more improvement in knowledge, and high translations of knowledge into practices were also observed. Some studies have shown a positive correlation between the nutrition knowledge of athletes and the quality of their dietary intakes [8].

The study has strengths such as ethical committee approval, involving both the genders. A well-versed written authorization was acquired. Nutrition education provided could make them successful in competition. Suggestions for future studies could be to involve more athletes for dietary intervention so as to appraise their basic competency. In addition, owing to the limited number of published studies and the importance of the promotion of nutrition knowledge and attitude for keeping the athletic society healthy, further studies in this area emerge to be essential.

Conclusion

The current study reveals that there is a scantiness of nutrition education intervention program among athletic population, thereby demanding to have such nutrition interventions for athletic professionals augmenting the performance. False attitude, faulty food trends may pose a great depression on overall athletic performance, hence appropriate nutrition knowledge is necessary for winning.

Acknowledgements

The authors would like acknowledge the sports academies, coaches and the athletes for their instinct support and co-operation.

Conflict of interests: The author(s) declare that there is no conflict of interest generated.

References

1. Institute of Medicine. Dietary reference Intakes for Vitamin C, Vitamin E, selenium and Carotenoids,(2000). Washington DC, National Academy Press.
2. Dunn D,Turner L and Denny G.Nutrition knowledge and attitudes of college athletes. The Sports Journal (2007) 10(4): 1-5.
3. Bell , Kunkel and Luccia. The association between nutrition!knowledge and eating Behavior in male and female adolescents in the US. International Journal of Food Sciences and Nutrition, (2001); 52(2):127-32.
4. Supriya V, Ramaswamy L. Knowledge attitude and dietary practices of track and field athletic men and women aged 18-22 years (2013); 2 (11): 399-404.
5. Rash, C.L., Malinauskas, B.M., Duffrin, M.W., Barber-Heidal, K., & Overton, R.F. Nutrition-related knowledge, attitude, and dietary intake of college track athletes. Sport Journal, (2008); 11(1), 48-54.
6. Skinner R, Jonnalagadda SS, Rosenbloom CA.Dietary practices, attitudes, and physiological status of collegiate freshman football players. *J Strength Cond Res*(2001). ;15(4):507-513.
7. Valliant MW, Emplaincourt P H, Wenzel R K and Garner B H**.** Nutrition Education by a Registered Dietitian Improves Dietary Intake and Nutrition Knowledge of a NCAA Female Volleyball Team. *Nutrients* **2012**, *4*, 506-516; doi:10.3390/nu4060506.
8. Nazni P. Vimla S. Nutritional knowledge attitude and practice of College sportsmen. Asian J Spor Med (2010). 1(2) :93-99.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Developing Sports Philosophy

Md. Muzafar
B.Li.Sc., M.A. (Philosophy)
Osmania University, Hyderabad, India

Abstract

Philosophy of sport is an area of philosophy that aims to theoretically analyze issues of sport as human activity. These issues cover many areas which fall primarily into five philosophical categories namely metaphysics, ethics, moral philosophy, philosophy of law, political philosophy, and aesthetics.In the ancient Greece, Sports was perceived to be a person's athletic potential by realizing it in an athletic competition. Athletics as a measure of individual worth was seen as a cure to social inequality. Sport was also seen as moral education, with Plato advocating the participation of women in sport for their moral enrichment. Aristotle emphasized physical activity as an ethical responsibility. Mentions of sport were found in the work of Socrates. Robert G. Oasterhoudt defines the basic character of philosophic inquiry while recounting its main concepts with an emphasis on its possible significance to an absolutely unphilosphical world. His informative three pronged classification of philosophy into the study of metaphysics(cosmology, ontology, theology),epistemology and axiology (ethics, aesthetics and politics) and his two pronged division of its basic methodology into an exploratory and critical discourse offers a very useful and attractive introduction to the chief subject matter.

Playing sports not only builds one's character and confidence but also gives a sense of accomplishment. It also prepares an individual for life to have a positive learning environment that encourages him/her to learn and develop on and off the playing field in every situation.

The athlete needs to be given the opportunity to develop his/her skill level in a structured learning environment that constantly challenges the athlete while providing both encouragement and support at the same time. Your sports philosophy can be shaped inevitably by the experiences working with different athletes in various kinds of situations.

A coaching philosophy is a statement of what you value and how you will approach your coaching role. It should reflect who you are and who you want to be. It is based on your experiences, knowledge, values, opinions and beliefs.

OBJECTIVES

- to analyze on the perceptions of effective sports coaching based on interviews with male professional coaches and players like cricket, rugby
- to focus on learning and develop a winning attitude
- to reflect on the effectiveness of coaching
- to study coaching philosophies of professional coaches specifically in professional sport
- to provide rich descriptions of data so that readers could make their own generalisations from the findings

KEY WORDS

Sports ethics athletics aesthetics philosophy learning environment coaching effectiveness

INTRODUCTION

The word philosophy takes on many meanings and within the context of sports philosophy, the development of a clear philosophy for the individual has often been stated as a key component of coaching. Lyle argues that sport has huge potential for personal growth and development if it is centred round on Humanistic aims. However, Lyle maintains that performance coaching, which involves extensive participation, intensive commitment and a focus on competition goals, does not have this essential purpose because winning frequently provides the measure for player and coach development at the professional level. As such, Lyle believes that the Humanistic approach to coaching provides a feasible theoretic suggestion for coaching. It is, however, yet to be determined if the parameters of this model are virtually viable in professional sport.

Lyle proposed a Humanistic model of athletic coaching as an educational model devoted to the total development of the individual. Lyle states that the Humanistic approach to coaching is a person centred ideology that emphasises the empowerment of the individual towards achieving personal goals within a facilitative interpersonal relationship (p. 174). It is athlete-centred, and focuses on enhancing the athlete's self-awareness, growth and development. As such, the coach encourages and supports athletes as they develop into authentic and valued adults.

As such, personal growth and development may be an appropriate goal for the coach in order to satisfy the on- and off-field needs of the athlete and develop appropriate role models for society. Research that specifically investigates the extent to which coaches employ a certain coaching

philosophy is necessary. As such, the main aim of this paper is to explore the coaching philosophy of professional coaches from cricket, rugby.

REVIEW OF LITERATURE

In a recent review of coach effectiveness literature, Côté and Gilbert suggest that coaching effectiveness involves: "The consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts" (p. 316). This definition supports the notion of Humanistic coaching where the coach's application of knowledge improves both the physical and personal charter of the athlete. Interestingly, Côté and Gilbert claim that while some coaches of professional athletes may exhibit behaviours consistent with developing athletes' competence, confidence, this is not inherently required in the professional context. They argue that in the professional sport context, the main task of a coach is to manage the talent necessary to win championships and to make sure that fans are entertained.

In some cases, coaches at the professional level have expressed the need to be concerned about athlete welfare and not solely focused on performance-based criteria. For example, Wayne Bennett, a professional rugby league coach for more than 20 years in Australia, insisted that his players were there to learn and develop skills, knowledge and expertise not just in football, but also life.

For Karpel [2], the coach's philosophy reflects the foundation that ultimately guides and directs coaching practice. Similarly, Reynolds [3] stated that a coaching philosophy clarifies many aspects of the coach's delivery and presents their core values and coaching methods. According to Parkin [5], coaches should develop a system for conducting their coaching based on personal truths, principles, attitudes and values. Further to this, Parkin [5] states that a coach's system or philosophy can and should change over time yet provides clear guidelines for consistency, trust, cooperation, understanding and expectation, as it relates to discipline, teamwork and communication between all parties. As such, a coach's philosophy may underpin their leadership style and preferences for teaching, organising and managing the coaching environment while also having a significant impact on athlete motivation.

FINDINGS

The findings from the current study show that coaches in these professional settings develop programs to assist players in acquiring on- and off-field skills.

METHOD

The study aims to provide a rich description and interpretation of the participants' feelings, thoughts, emotions, beliefs, and experiences. While quantitative research emphasises the measurement and analysis of causal relationships between variables, qualitative research attempts to capture the individual's point of view and examines the constraints of everyday life to secure rich descriptions of the social world.

The paper aims to explore the research conducted by Yin and Glaser et al.

The current study employed a multidimensional case study method and Grounded Theory (GT) research strategies based on the methodological frameworks outlined by Yin [13] and Glaser et al. [14-15].

Multidimensional case study research is useful for assessing a coach's knowledge and their practical application of coaching skills. Studying the components of coaching based on a case-by-case scenario provided great clarity regarding the similarities and differences exhibited across different professional sport teams and codes. In fact, Yin [13] claims that case study research allow perceptions of important events and situations to speak for themselves.

An important feature of this research is that Pidgeon and Henwood [16] make a distinction between GT research and research using GT. The former is characterised by following the precise procedures outlined by Glaser et al. [14-15] while the latter pertains to elements of GT that have been used with other ideas from social science research methodologies. In this project, GT research strategies were used, rather than conducting GT research.

PARTICIPANTS

Professional coaches and players from the following team sports were recruited to participate in the current research: National Rugby League (NRL); Super 14 Rugby (rugby union); and the Sheffield Shield, One-day and Twenty-20 competitions (men's national cricket league). These competitions are the highest level of professional sport in Australia and are conducted at the level below international representation (i.e., representing a national team at international sport.

Three male, professional sport teams participated in the present study. In order to investigate a broad range of perceptions regarding effective coaching, head and assistant coaches as well as a balance of early career (i.e., in their first two years of participation in professional sport) and

experienced (i.e., eight to ten years of participation) players from a variety of positions within the team (e.g., in rugby union, a mixture of forwards and backs) were included in the sample. Details of the interview participants are included in Table1.

Table 1: Participants

Team	Participants	Average Age (years)	Average professional experience	Average Player experience
Cricket	1 Head Coach	51	14	
	1 Assistant Coach			
	8 Players	28		6.1
Rugby	1 Head Coach	49.5	18	
	1 Assistant Coach			
	8 Players	25.8		7.3
Rugby Union	Head Coach	45	11	
	1 Assistant Coach			
	8 Players	26.3		5.4

DATA COLLECTION METHODS

The data collection process involved semi-structured interviewing with coaches and players. When constructing interviews, Berg [18] and Patton [19] recommended that the sequence of questions should flow from general and descriptive questions to questions that more specifically target the proposed research area. Hence, the thematic categories of the interview schedule followed this procedure in order to explore the professional coach and player perceptions concerning effective coaching. The semi-structured nature of the interviews enabled the researchers to explore relevant information in line with the research aims yet allowed for additional information to be collected from topics that were not included on the interview schedule.

The first interview question: “Could you give me some examples of the things that you think make a coach effective?”

This question was aimed to elicit detailed responses in relation to the topic of effective coaching. A topic that surfaced in response to the first interview question related to what coaches and players described as the coach’s philosophy or direction for the team. The categories within this

concept also emerged when coaches were asked to elaborate on the aims of their coaching programs or the types of responsibilities delegated to assistant coaches and players. Further to this, coaches and players were asked about key roles within the team.

For instance:

1. What do you consider your main role as a coach?
2. How do you go about achieving this role?
3. What do you consider the main role of a coach? (and to the players)

DATA ANALYSIS

The principal researcher conducted and audio taped all interviews. The data collected was then transcribed verbatim into Microsoft Word. He then utilised the constant comparative analytic procedures [14, 20-25] to examine perceptions of professional coaches and players both within and across each context investigated.

This involved several stages including:

a) creating tags,

b) creating properties,

c) creating categories, and

d) developing a conceptual

Such a procedure enables information to emerge inductively (i.e., from the data) rather than being established prior to data collection and analysis.

CREATING TAGS, PROPERTIES, CATEGORIES AND CONCEPTS

This procedure begins by identifying 'meaning units'. These were established based on text segments that contained one idea that was appropriately coded with a provisional descriptive name [21, 26]. The meaning units were refined and given 'tags' when illuminating interview content emerged. For example, the meaning unit "So I think effective coaching comes down to ... how you develop them on and off the field" (Ronnie, union assistant coach) was assembled into the tag called Develop the player and the person. Creating 'properties' involved the development of higher-order groups based on similar features from the initial level of analysis [21]. In this case, the principal author re-read and re-analysed previously coded text and tags to see where similarities and differences existed. Where there were similarities across each context tags were

assembled into the 'property group', Player Development On and Off the Field as new 'tree node files'.

Further analysis of the data identified similarities between the property groups, which the principal author then collated to make up the 'category' of Coach Philosophy whereby relationships were identified and organised into higher-order groups [20].

QUALITATIVE RESEARCH

Qualitative research is regularly criticised in relation to the authenticity of findings based on subjective communication. Various techniques outlined by previous research [15, 19, 27-30] were used to ensure trustworthiness in the present qualitative study. To minimise the possibility of misrepresentation, data was triangulated by using multiple perceptions to clarify various explanations of the questions asked [13, 15, 31]. Triangulation was achieved through a combination of participants (both players and coaches) and was used to verify the meanings and interpretations of the coaches against the players and vice versa.

Rigour in data collection and analysis occurred in the form of detailed descriptions of reported findings, peer examination (or auditing) of findings, and through member checking techniques [19, 29-30].

Merriam [29] points out that the aim of qualitative research is not to produce replicability in the same manner as quantitative research, but to make sure results that are consistent with the data collected. This was ensured by triangulating data collection and analysis, and developing an audit trail of accounts that outline and authenticate how data was collected.

Case studies based in qualitative paradigms attempt analytic as opposed to statistical generalisations where essentially, the generalisation is left up to the reader. The researchers' goal may be to expand and generalise theories or to generalise findings from a single case into a multiplicity of cases rather than enumerating statistical generalisations.

This paper does not attempt to provide generalisations beyond the contexts investigated. It rather aims to provide rich descriptions of data so that readers could make their own generalisations from the findings. Finally, pseudonyms were used throughout the research to protect the identity of the participants

RESULTS

A total of 953 raw data units emerged from the analysis process, of which, 85 were relevant to the Coach Philosophy category. These units included comments, statements and quotations from

a few words to entire paragraphs. Further inductive analysis reduced the data to 4 tags and one major property within the category referred to as Coach Philosophy. The principal researcher used the terms from participants that best described each of the concepts as shown in Table 2.

Table 2: Tags and Properties in the Coach Philosophy Category

Coach Philosophy Category

Tags	**Property**
Role of the coach	Player Development On and Off the Field
Develop the player and the person	
Educate the players	
Not purely focused on the results	

It may be assumed that the results reflect the responses of all participants from each context explored in this research. The results from the data analysis indicate that the philosophy of the coach reflects the coach's goals, actions, values and approach to coaching, which in turn is underpinned by personal qualities and skills. The coach's philosophy forms the basis of what the coach believes is necessary to: coach effectively, develop a successful programme, and guide player development.

Eventually, the head coach's philosophy influences the manner in which he communicates with players and staff, organises the training environment, leads and manages the team. This relates to what Cassidy [32] identified as "why coaches coach as they do" (p.55). The results from the current study show that the articulation of a philosophy is critical to providing the team with direction, endowing players and coaches with on-and-off-field responsibilities, and developing an appropriate framework for the team. This needs to be communicated not just to the players, but also to all those involved in the organisation from assistant coaches, to support staff and ultimately those in key administrative positions (e.g., Chief Executive and the Board of Directors).

PLAYER DEVELOPMENT ON AND OFF THE FIELD

One of the common aims described by the coaches and players in the present research is the need to focus on player development, player education and trying to get the best out of each individual. This means that the coach's role involves developing the player and the person both on and off the field as shown in the following examples: ... I think coaching ... look[s] at the

person as a whole, not just the sporting side of it so ... you know what their background is, what their 314 Coaching Philosophies in Australian Professional Sport work thing is what their family is ... if they're happy in that, it'll help the other side of it as well. So there's more of a responsibility than just trying to produce a bloke who can bat or bowl ... (Cyrus, cricket head coach)

So I think effective coaching comes down to ... how you develop them on and off the field. (Ronnie, union assistant coach)

I think coaching is … not just about footy, [it] is about knowing how to manage a player's life. (Lenny, league player)

The terms 'responsibility', 'develop' and 'manage' used by the above coaches and players are interesting because they describe the broad range of tasks bestowed upon coaches working with an individual or team. In each context examined during the current research, coaches and players claimed that players are there to learn and develop skills, knowledge and expertise not just in football, but also life. In this respect, part of the coach's role is to encourage players to seek outside interests beyond the scope of day-to-day training.

I think you need to have something off [the] field just purely because of the amount of time you spend with each other. You can't be talking about just cricket the whole time you're around each other so I think you need to have something a bit different from the game itself ... I think that the coaching and communication can be about not just the game itself but life in general ...

The ability to talk about life and general matters was particularly important if players were experiencing personal issues that required consultation and direction from the coaching staff, as shown by the following quote:

I s'pose someone that you have the confidence in that you can go to, if you've got a problem with your game or something or some part of your life, that you're pretty certain that they've got the answer for it ... (Lloyd, league player)

Lloyd provides an example of how coaches can utilise their knowledge of individual players to help develop players' physical and personal capacities even during challenging times. Rex (union head coach) provides a further example of the significant role coaches play in being understanding of players' off-field issues, as these factors may influence their players personally and professionally:

You need to be… more tolerant of individuals that have external factors at play, cultural and family circumstances … we worked for nine months to try and get a solution to his [Ronald, current player] family and cultural issues … we allowed him more latitude [with attendance at training] … because there were problems for long time…

The philosophy outlined here reflects an interest in assisting players when they have off-field issues that may affect their performance and ultimately, the team's ability to be successful. This is important because:

… an athlete or a player is a reflection of what he is when he isn't here more than what he is when he is here. So if they go away and they can't relax and they can't be themselves when they're away, ... they can't recover properly ... if things aren't good away from the football training paddock and the game, you won't get an effective result in those areas. (Ronnie, union assistant coach)

I think the first part's gotta be making sure that rugby league players have got their own lives in order ... that he's ... happy at home ... he's using his finances to set himself up for the future ... if he's got everything around him happening in good order ... then he can concentrate solely on his rugby league. Then I think the next thing as a coach is to take the individual and concentrate really heavy on the individual becoming a better player, a more skilful player, a player that continues to learn and improve ... (Leonardo, league assistant coach).

In this respect, the professional coaches in the present study develop an awareness of each player's personal context to create an environment in which the players are comfortable and able to reach their potential, whatever the circumstances. These findings lend support to the Humanistic ideals of coaching and suggest that a professional coach is interested in a holistic approach to developing the players in their team.

The philosophy of player development outlined by the coaches in the current study is resonant with previous research in individual [23] and team sport contexts [10-11]. Similar to the philosophy of the coaches of gymnastic, volleyball and basketball coaches [10, 23], assisting players reach their individual goals and performance outcomes or finding areas to improve in the player's game are far more important than winning in the eyes of the coaches and players interviewed in this research. Collectively, the participants in the current study felt that winning or success on the field is a consequence of first developing the individual player and the team. As

such, the coaches involved in the present research centre their philosophies on player improvement, educating players and setting the club up to function effectively in the long term.

STUDY LIMITATIONS AND FUTURE RESEARCH

This research paper illuminates player and coach perceptions from cricket, rugby league and rugby union in relation to the topic of coaching philosophy. Given that the focus was on the coach's philosophy, the coach's voice was more prominent than the player's perceptions of what constitutes an effective coach philosophy.

Future investigations could complement and improve on these results by eliciting deeper perceptions from the players while also gathering more evidence from the coach's perspective in a range of other professional sports. Other parameters that influenced the outcome of this research include the small sample size and the varied time of year in which data was collected. Although a large and detailed amount of data was gathered, the limited number of teams included in the current research restricted the breadth of views to just three of the professional sports codes in Australia. Ultimately, the number of participating teams was limited due to the difficulty in gaining access to a sample of professional teams and the amount of time permitted by each organisation.

CONCLUSION

The present study highlights that the development of the total person is a high priority for each coach. They believe that if you develop the player and the person, this will likely result in on-and-off field success. This reflects a shift from merely developing the players' competitive skills, to the total development of the person, and supports previously stated Humanistic aims. The participants in the current research outlined that professional coaches possess their own unique philosophy of coaching with each coach describing their main values, attitudes and objectives for why they coach as they do. The coaches and players in the present study place a strong emphasis on Humanistic goals for their coaching programs with their desire to develop the player and the person. In fact, one of the key findings in this research is that the Humanistic ideals of developing the player and the person which was once thought to be incompatible with principles of performance sport now form a prominent part of the professional in the present study. According to recent research, this emerging trend highlights the importance of the social aspects of coaching.

REFERENCES

1. Lyle, J., Sports Coaching Concepts: A Framework for Coaches' Behaviour, London, Routledge, 2002.
2. Karpel, M. P., An Inquiry Into the Philosophies and Coaching Processes of Successful Division I Head Baseball Coaches, PhD Thesis, Brigham Young University, 2006.
3. Reynolds, F., Coaching Philosophy, retrieved January 29, 2010 from http://www.brianmac.co.uk/coachphil.htm, (n.d.).
4. Special Olympics, Principles of Coaching, retrieved January 29, 2010 from http://info.specialolympics.org/Special+Olympics+Public+Website/English/Coach/Coaching_Guides/Princ iples+of+Coaching/Developing+Your+Coaching+Philosophy.htm, 2003.
5. Parkin, D., Coaching Philosophy, retrieved March 20, 2009 from http://www.afl.com.au/news/newsarticle/tabid/208/newsid/4753/default.aspx, 2003.
6. Côté, J. and Gilbert, W., An Integrative Definition of Coaching Effectiveness and Expertise, International Journal of Sports Science and Coaching, 2009, 4(3), 307-323.
7. Bennett, W. and Crawley, S., Don't Die With the Music in You, Sydney, Australian Broadcasting Corporation, 2002.
8. Sheedy, K., Contemporary Issues in Coaching (Notes of Lecture, 2005, February
9). International Journal of Sports Science & Coaching Volume 5 · Number 2 · 2010 319 9. Kellett, P., Organisational Leadership Lessons From Professional Coaches, Sport Management Review, 1999, 2(2), 150-171.
10. Vallée, C. N. and Bloom, G. A., Building a Successful University Program: Key and Common Elements of Expert Coaches, Journal of Applied Sport Psychology, 2005, 17(3), 179-196.
11. Gilbert, W.D. and Trude, P., Validation of the Coaching Model (CM) in a Team Sport Context, International Sports Journal, 2000, 4 (2), 120-128.
12. Denzin, N. K. and Lincoln, Y. S., Introduction: The Discipline and Practice of Qualitative Research, in: Denzin, N. K. and Lincoln, Y. S., eds., Handbook of Qualitative Research, 2nd edn., Sage Publications, Thousand Oaks, 2000, 1-28.
13. Yin, R. K., Case Study Research: Design and Methods, 2nd edn., Sage Publications, Thousand Oaks, 2003.
14. Glaser, B. and Strauss, A., The Discovery of Grounded Theory, Aldine, Chicago, 1967. 15. Strauss, A. and Corbin, J., Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory, 2nd edn., Sage Publications, Thousand Oaks, 1998.
16. Pidgeon, N. and Henwood, K., Grounded Theory, in: Hardy, L. and Bryman, A. eds., Handbook of Data Analysis, Sage Publications, London, 2004.
17. Bennie, A., Effective Coaching in Cricket, Rugby League and Rugby Union: A Qualitative Investigation Involving Professional Coaches and Players from Australia, PhD Thesis, University of Sydney, Australia, 2009.
18. Berg, B. L., Qualitative Research Methods for the Social Sciences, 3rd edn., Allyn and Bacon, Boston, 1998.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Effect of Varied Intensity Training on Muscular Endurance among the School Children's Aged 11 to 13 Years

Dr. Madhuri P.Sadgir,
Assistant Professor,
Department of Physical Education,
University of Mumbai, Mumbai.

Nilesh M. Gharat
Master of Phy. Edu.
Department of Physical Education,
University of Mumbai, Mumbai.

Abstract

Background : The aim of this present study was to determine the varied intensity treatment effect on the muscular endurance capacity of school children aged 11 to 13 years.
Method :Forty –Five participants(aged 11 to 13 years school boys) were randomly selected and divided into three groups called control (Group -A), Low Intensity (Group -B) and Moderate Intensity (Group - C). The three groups exercised thrice a week, 60 min per session for 6 weeks. The Muscular Endurance of the participants was assessed by bent knee sit- ups at pre and post of the treatments.
Results : Moderate intensity mean is more than the low intensity and control group score.The F test score of post experiment data (50.542) is significant at 0.05 level. The low intensity and control group post experimental data mean (12.667/12.550) nearly equal.
Conclusions : Our findings indicate that the moderate intensity treatment is more effective in improving the muscular endurance of school boys aged from 10 to 13 years.

Key words: Intensity, Treatment, Muscular Endurance,

INTRODUCTION

A good health is aasset of quality of life, which cannot be easily achievable.The good health can be achieved by developing different dimensions of wellness and health, like physical, mental, social, spiritual, emotional, vocational and others. The physical dimensions means the fitness of physical factors which “allows perfect functioning” of the body (Park,2015). As we know “NO PAIN NO GAIN”, this slogan work in our day to day life. To achieve optimum health one must go through physical stress of exercises, vigorous training program or well planned conditioning. This will help you to improve physical and motor performances, relief stress, provide disease free health, promoting well-being and strengthening the immune system.The present study deals with Muscular Endurance, a factor of Physical Fitness. Muscular Endurance is the ability of a muscle or group of muscles to repeatedly exert force against resistance (Brown,2014). The objective of the study was to find out the effect of different intensity(Low & Moderate) training on muscular endurance of school children's aged 11-13 years.

METHOD

The mix design research was conducted on Forty –Five participants(aged 11 to 13 years school boys). Thesamplewere drawnrandomly from D.S.High School, Sion, Mumbai and divided into three groups (15 each) called control (Group -A), Low Intensity (Group -B) and Moderate Intensity (Group -C). These three groups exercised trice a week, 60 min. per session to 6 weeks. To develop muscular endurance researcher adopted relevant exercises from the reviews. To find out the effect of different intensity treatmentsubjects were assessedby bent knee sit ups at pre and post of the treatments.The Ancova was applied to find out the result of the treatment on pre and post test data.

RESULTS

The mean value of Moderate intensity is more than the low intensity treatment and control group.

Table 1. Mean and standard deviation of different post-treatment groups.

Treatment	Mean	Std. Deviation	N
Low	12.2000	2.78260	15
Moderate	16.1333	3.11372	15
Control	11.7333	1.57963	15
Total	13.3556	3.21329	45

And the mean value of low intensity and control group treatment has no significant difference.

Table 2 ANCOVA table for the post test data on resting muscular endurance

Source	Type I Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Square
Pre_testing	392.402	1	392.402	900.579	.000	.956
Treatment	44.045	2	22.022	50.542	.000	.711
Error	17.865	41	.436			
Corrected Total	454.311	44				

The F test score of post experiment data (50.542) is significant at 0.05 level of significant. It is therefore interpreted that there is significant difference exist between three post experiment data sets of low intensity, moderate intensity and control treatment groups. Hence, the null hypothesis is rejected. It means the score obtain from treatment test indicates that the moderate intensity treatment has significant improvement in muscular endurance of selected sample, but there is no significant improvement observe in muscular endurance due to low intensity treatment.

Table 3 Adjusted mean and standard error of different post-treatment groups

Treatment	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low	12.667[a]	.171	12.320	13.013
Moderate	14.850[a]	.178	14.490	15.210
Control	12.550[a]	.174	12.199	12.901

The low intensity and control group post experimental data mean (12.667/12.550) nearly equal.

Table 4. Pairwise Comparisons

Dependent Variable:Post testing muscular endurance

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Low	Moderate	**-2.183***	.251	.000	-2.811	-1.556
	Control	.117	.241	1.000	-.486	.719
Moderate	Low	2.183*	.251	.000	1.556	2.811
	Control	**2.300***	.256	.000	1.662	2.939
Control	Low	-.117	.241	1.000	-.719	.486
	Moderate	-2.300*	.256	.000	-2.939	-1.662

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.

Table 4. Indicates that The mean of moderate treatment is more than the mean of low intensity treatment as well as control group score. It means moderate intensity is more effective treatment to improve muscular treatment.

CONCLUSION

Our findings indicates that the moderate intensity treatment is more effective in improving the muscular endurance of school boys aged from 10 to 13 years.

References

1. Enakshi Ganguly-Thukral, Bharti Ali and Saloni Mathur. June 2007. *InfoChange News & Features.* New Delhi: HAQ: Centre for Child Rights.
2. Nehal Patel, Geet Gunjana, Shital Patel,1 Rashmi Thanvi, Paresh Sathvara, and Rajesh Joshi. 2015 Jul-Dec;. "Nutrition and health status of school children in urban area of Ahmedabad, India: Comparison with Indian Council of Medical Research and body mass index standards." *J Nat Sci Biol Med* 372–377.
3. Thomas Kirk Cureton, Warren J. Huffman, Lyle Welser, Ramon W. Kireilis and. 1945. "Endurance of Young Men: Analysis of Endurance Exercises and Methods of Evaluating." *Monographs of the Society for Research in Child Development*, pp. i+iii-v+vii-xxiii+1-267+269-284.
4. Brown, Eric. Jan 27, 2014. " Exercises and Workouts." *LIVESTRONG.COM Sports and Fitness.*
5. D.K.Kansal. 2008. *Text book of applied measurement evaluation and sport selection.* New Delhi: SSS.
6. Hood MS, Little JP , Tarnopolsky MA , Myslik F , Gibala MJ. [2011. "Low-volume interval training improves muscle oxidative capacity in sedentary adults." *Medicine and Science in Sports and Exercise* 1849-1856.
7. Kearneya, Tim Andersona & Jay T. 1982. "Effects of Three Resistance Training Programs on Muscular Strength And Absolute and Relative Endurance." *Research Quarterly for Exercise and Sport* 1-7.
8. Avery D. Faigenbaum, Wayne L. Westcott, Rita LaRosa Loud, Cindy Long. july 1999. "The Effects of Different Resistance Training Protocols on Muscular Strength and Endurance Development in Children." *American Academy of Pediatrics* 104.
9. Kearney, Tim Andersona & Jay T. 08 Feb 2013. "Effects of Three Resistance Training Programs on Muscular Strength And Absolute and Relative Endurance." *Research Quarterly for Exercise and Sport* 1-7.
10. Daniel Mayorga-Vega, 1 Jesús Viciana, 2 and Armando Cocca 3. 2013 Jul; . "Effects of a Circuit Training Program on Muscular and Cardiovascular Endurance and their Maintenance in Schoolchildren." *J Hum Kinet* 37: 153 – 160 .
11. Andrew M. Jones, Helen Carter. 24 September 2012. "The Effect of Endurance Training on Parameters of Aerobic Fitness." *Leading Article* 373-386.
12. Kearneya, Tim Andersona & Jay T. 08 Feb 2013. "Effects of Three Resistance Training Programs on Muscular Strength And Absolute and Relative Endurance." *Research Quarterly for Exercise and Sport* 1-7.
13. S. SIPILÄ1, J. MULTANEN1, M. KALLINEN3, P. ERA2 andH. SUOMINEN1. 6 NOV 2003. "Effects of strength and endurance training on isometric muscle strength and walking speed in elderly women." *Acta Physiologica Scandinavica* 457–464.
14. Jan Hoff, Jan Helgerud. 23 September 2012. "Endurance and Strength Training for Soccer Players." *Sports Medicine* 165-180.
15. Bishop D, Jenkins DG , Mackinnon LT , McEniery M , Carey MF. 1999, 31(6). "The effects of strength training on endurance performance and muscle characteristics." *Medicine and Science in Sports and Exercise* :886-891.
16. Mayhew JL, Prinster JL , Ware JS , Zimmer DL , Arabas JR , Bemben MG. [1995, 35(2):. "Muscular endurance repetitions to predict bench press strength in men of different training levels." *The Journal of Sports Medicine and Physical Fitness* 108-113.
17. Bemben MG, Massey BH , Bemben DA , Misner JE , Boileau RA. 1996, 28(1). "Isometric intermittent endurance of four muscle groups in men aged 20-74 yr." *Medicine and Science in Sports and Exercise* 145-154.

18. Mayhew, Jerry L., Thomas E. Ball, Micheal D. Arnold, and Jack C. Bowen. November 1992. "Relative Muscular Endurance Performance as a Predictor of Bench Press Strength in College Men and Women." *National Strength and Conditioning Association.*
19. Franco, Bruno L1, Gabriel R2 Signorelli, Gabriel S3 Trajano, and Carlos G1 de Oliveira. November 2008 - . "Acute Effects of Different Stretching Exercises on Muscular Endurance." *National Strength and Conditioning Association* 1832-1837.
20. RHEA, MATTHEW R., WAYNE T. PHILLIPS, LEE N. BURKETT, WILLIAM J. STONE, STEPHEN D. BALL, BRENT A. ALVAR, and AARON B THOMAS. February 2003. "A Comparison of Linear and Daily Undulating Periodized Programs With Equated Volume and Intensity for Local Muscular Endurance." *Journal of Strength & Conditioning Research:* Volume 17 - Issue 1 .
21. Neufer PD, Costill DL , Fielding RA , Flynn MG , Kirwan JP. 1987, 19(5). "Effect of reduced training on muscular strength and endurance in competitive swimmers." *Medicine and Science in Sports and Exercise* 486-490.
22. Invergo, Joseph J., Thomas E. Ball, and Marilyn Looney. August 1991. "Relationship of Push-ups and Absolute Muscular Endurance to Bench Press Strength." *Journal of Strength & Conditioning Research.*
23. Kelseya, Ian Bruce. 26 Dec 2013. "Effects of Mental Practice and Physical Practice upon Muscular Endurance." *Research Quarterly. American Association for Health, Physical Education and Recreation* 47-54.
24. Betül Sekendiza, , , Özkan Altuna, Feza Korkusuza, b, Sabire Akınb. October 2007, . "Effects of Pilates exercise on trunk strength, endurance and flexibility in sedentary adult females." *Journal of Bodywork and Movement Therapies* 318–326.
25. J. D. Dennisonab, M. L. Howellac & W. R. Morfordad. 17 Mar 2013. "Effect of Isometric and Isotonic Exercise Programs upon Muscular Endurance." *American Association for Health, Physical Education and Recreation* 348-352.
26. Michael Bar-Eli, Gershon Tenenbaum, Joan S. Pie, Yaacov Btesh & Asher Almog. 18 Nov 2010. "Effect of goal difficulty, goal specificity and duration of practice time intervals on muscular endurance performance." *Journal of Sports Sciences* 125-135.
27. Maxwell L. Howella, Ray Kimotob & W. R. Morfordc. 26 Dec 2013. "Effect of Isometric and Isotonic Exercise Programs upon Muscular Endurance." *American Association for Health, Physical Education and Recreation* 536-540.
28. n.d. *http://www.brianmac.co.uk/circuit.htm.* http://www.brianmac.co.uk/circuit.htm.
29. Gettman LR, Ayres JJ , Pollock ML , Jackson A. 1978, 10(3). "The effect of circuit weight training on strength, cardiorespiratory function, and body composition of adult men." *Medicine and Science in Sports* 171-176.
30. Taşkin, Halil. September 2009. "Effect of Circuit Training on the Sprint-Agility and Anaerobic Endurance." *National Strength and Conditioning Association* 1803-1810.
31. . Gregory Paynea, James R. Morrow Jr.b, Lynne Johnsona & Steven N. Daltonb. 26 Feb 2013. "Resistance Training in Children and Youth: A Meta-Analysis." *Research Quarterly for Exercise and Sport* 80-88.
32. Yamamoto, Linda M, Rebecca M Lopez, Jennifer F Klau, Douglas J Casa, William J Kraemer, and Carl M Maresh. November 2008. "The Effects of Resistance Training on Endurance Distance Running Performance Among Highly Trained Runners: A Systematic Review." *Journal of Strength & Conditioning Research* 2036-2044.
33. Berrios, Luis. Sep 09, 2004. "Circuit training is best for beginners and those of average fitness looking to tone up and get in shape." *Circuit Training.*
34. Daniel Mayorga-Vega, 1 Jesús Viciana, 2 and Armando Cocca 3. 2013 Jul 5. "Effects of a Circuit Training Program on Muscular and Cardiovascular Endurance and their Maintenance in Schoolchildren." *Journal of Human Kinetics* 153 – 160 .

35. Al-Haliq, Mahmoud. 2015, 5. "Using the Circuit Training Method to Promote the Physical Fitness Components." *Advances in Physical Education* 170-175.
36. Toshikazu Ito, RPTa, Osamu Shirado, MD, PhD, a, Hideki Suzuki, RPTa, Masaaki Takahashi, MA, RPTb, Kiyoshi Kaneda, MD, PhDa, Thomas E. Strax, MDc. January 1996,. "Lumbar trunk muscle endurance testing: An inexpensive alternative to a machine for evaluation." *Archives of Physical Medicine and Rehabilitation* 75–79.
37. I Holm1, 2, PM Fredriksen1, M Fosdahl1 andN Vøllestad2. May 2008. "A normative sample of isotonic and isokinetic muscle strength measurements in children 7 to 12 years of age." *Acta Paediatrica* 602–607.
38. Ray G. Burdett, PhD, PT, Jessie van Swearingen, MS, PT. 1987. "Reliability of Isokinetic Muscle Endurance Tests ." *Journal of Orthopaedic & Sports Physical Therapy* :484–488.
39. Franco BL1, Signorelli GR, Trajano GS, de Oliveira CG. 2008. "Acute effects of different stretching exercises on muscular enduranc." *J Strength Cond Res.* 1832-7.
40. John,Best, James,Kahn,2008. 2008. *Research in Education.* tenth. New Delhi: Prentice Hall of India.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Meaningful Experience in Sport Events: A Scale Development Study

Tuba Yazici[1],ZulalKilci[2], SettarKocak[1]
[1]Department of Physical Education and Sports, Middle East Technical University, Ankara, Turkey
Department of Physical Education and Sports, Faculty of Sport Sciences, Anadolu University, Eskisehir, Turkey

Abstract

Providing high quality experiences is an important goal for the sport event organizers. The aim of this study was to develop a scale to measure experience concepts for any sport event participant. In order to reach the intended purpose, items were generated depending on experiential marketing literature and examined to see its factor structure and reliability. A total of 203 university and high school students were asked to complete the developed scale. Preliminarily, 30 items were generated depending on extensive experiential marketing research. However after cognitive interview and expert opinion, because of ambiguity of some items and the meaning problems, 3 items eliminated and 27 item version was administered to sample to see factor structure and reliability of the developed scale. The items were related to the perceived meaningful experiences and generated depending on 6 sub-categories; Individuality, Authenticity, Story, Multi-sensory Perception, Contrast and Interaction. All 27 items on the scale were rated on a 5-point Likert scale. Results of factor loadings with Principal Axis Factoring (PAF) method followed by a direct oblimin rotation revealed that, items loaded to the first factor were related to both 6 "meaningful experience" dimensions in a certain way. However, only two items which were loaded to the second factor were related with "story" sub-dimension. Moreover item 3 was found to be as cross loaded and omitted from the scale. All retained factor loadings were >.40 which are stated as practically significant by Hair et al. (2014). In order to decide the exact number of factors, eigenvalues was checked and also the scree plot was inspected. First of all, four factors were greater than 1 and they were explained the 63.86 % of the variance. However, factor one alone explained 45.81 % of the variance and eigenvalue for factor 1 solution was 12.37. These high values offered us one factor solution. Depending on all statistically significant results and appropriate criterias, one factor structure of the scale was decided as a final solution and factor was named as "Meaningful Experiences in Sport Events." Internal consistency score of the scale for one factor solution was found as α= .95. By this way, sport event provider can critically analyze the service and discover ways to improve it and design an event that offers a true meaningful experience to the participants (Tarssanen&Kylänen 2005).

Keywords: Meaningful experience, sport event, scale development, reliability

INTRODUCTION

Increasing number of people are in search of meaning, happiness, sensations, new forms of fulfillment and core valueswhich they often find in market offerings (Fortezza, Pencarelli 2011).Experience marketing is a newformof marketing field. It is an innovative and creative approach with compared to traditional marketing (Same &Larimo, 2012). Therefore Experiential

marketing is an inevitably growing trend worldwide. It is being utilized by more and more companies from airlines to leisure industries in order to arouse consumer's interest also to create experiential connections with customers by diverse offerings(Mehmetoglu & Engen, 2011). As the wording of the phrase itself implies, the emphasis in experience marketing is onexperiences and offering them.

Tarssanen and Kylänen (2005) proposed a model named as "the Experience Pyramid" in order to demonstrate the key product elements that are essential to the creation of experiences. By utilizingthe experience pyramid model it is likely to design, analyze and comprehend the experientialaspects of services. The model has two perspectives: firstly, service elements for promoting the participants' experience namely; individuality, authenticity, story, multisensory perception, contrast, interaction and secondly, levels of participants' experiences including; motivation, psychical, intellectual, emotional and mental. The Pyramid proposes that service should include six elements in order to be experiential including; individuality, authenticity, story, multi-sensory perception, contrast and interaction. What makes "Experience Pyramid" superior is that it takes into account both the provider and the costumer in creating the experience. This framework is structured on the notion that emotions stem from not only from objective features of the events themselves but also individuals' perceptions of events (Lazarus, 1991). Although Tarssanen and Kylänen (2005) presented a practical, conceptual framework for understanding the nature of customer experience in general, a corresponding measurement tool has not yet been developed.Thus, this study aims to develop a scale for measuring experience concepts for any sport event participants. In order to reach the intended purpose, items were generated depending on experiential marketing literature and examined to see its factor structure and reliability. By this way, service provider can critically analyze the service and discover ways to improve it and design an event that offers a true meaningful experience to the participants (Tarssanen&Kylänen 2005).

METHOD

Participants

A total of 203 university and high school students wereasked to complete the developed questionnaire. The response rate was 96.7%. Especially a sample with young participants was preferred since this age group (15 to 35 years of age) are more prone to attend sport events and

therefore, more knowledgeable about sport events. The sample comprised of 51% of female and 46% male participants. 63 % of them were high school students in Ankara, Turkey. 33 %of the respondents were undergraduate students in Middle East Technical University, Ankara. 1 % were at the graduate level. Most of the participants, 63% were at the age of between 15 -19; 32 % of the respondents were between the age of 20-24; 1 % were between the age of 25-29 and 1 % of the participants were at the age of 35 and above. Descriptive statistics of the sample is presented in the Table 1 below.

Table 1

Descriptive Statistics of the Sample

Variable		*Frequency*	*Percent*
Age	15-19	132	62,9
	20-24	68	32,4
	25-29	2	1,0
	35 and above	2	1,0
Gender	Female	108	51,4
	Male	96	45,7
Education	High School	132	62,9
	Graduate	70	33,3
	Master	1	,5
	Doctorate	1	,5

Instrument Development Procedure

Item Generation

Content validity requires the accuracy of measurement of the specific areaof interest, and in many ways involves the minimum requirement for constructing new measures (Hinkin, 1998). In the scale development process, the researcher shouldguarantee that the items in a scale accurately reflect phenomena to be evaluated in the study. The articlescovered in this presentresearchgenerally adhered to acceptable practices with regard to content development.

A literature review was undertaken to document a sample of studies published from 1980 through 2014 whose primary aim was about the experimental marketing and specifically, meaningful experiences. Different measurement instruments of perceived experiences were also reviewed for the construction of this questionnaire (e.gBoswijk, Thijssen, &Peelen, 2007; Brakus, 2009). Preliminarily, 24 items were generated depending on extensive experiential marketing research. But in order to increase item number in some sub-scales, item number increased to 30 so that each sub-scale should have at least 3 items since this scale has been intended to have 6 subscales. However after cognitive interview and expert opinion, because of ambiguity of some items and the meaning problems with regard to sub-scales, 3 items eliminated and 27 item version was administered to sample to see factor structure and reliability of the developed scale. The items were related to the perceived meaningful experiences and generated depending on 6 sub-categories; Individuality, Authenticity, Story, Multi-sensory perception, Contrast and Interaction such as "Sporting event activities are appropriate to my personal tastes" (Individuality, item7). "Sporting event organized in creative way" (Authenticity, item25). "Sporting event has a legend" (Story, item13). "Sporting event is visually interesting" (Multi-Sensory Perception, item1). "Sporting event helps to escape from the daily routine mentally" (Contrast, item16) and "The officials in sporting event kindly contact with me" (Interaction, item12).

Reading Level and Item Clarity

For content validation purposes, a cognitive interview was conducted with a person who is knowledgeable about sport marketing issues, to check the meanings of the items and design of the scale. Cognitive interview process revealed that the reading level and clarity of theitems was appropriate for people who has a general knowledge about sport events. At the item level, no item wasstated as being difficult to read. But interviewee expressed his concerns about a homophonic word which can be understood in different ways. At the subscale level, interviewee expressed concerns about the placement of items within subscales.Henoted that some subscale definitions were too broad, he found some items appeared to be relevant to more than one subscale, and that other items were not specific enough. Interviewee provided a reason for his concerns, offereditem revisions, and suggested item additions.In a similar vein, to address any wording issues within thequestionnaire, including hypothetical, leading or double-barrelledstatements, ambiguous statementsor wrong wordings about technical terminology an

expert opinion was provided before administering to the target population. As a result of the assessment of an expert in physical education department and depending on the cognitive interview process only minor amendments were made.

Data Collection Process

Participants were asked to rate how each statement characterized their own decision-makingprocesses in sport events. To aid in directing participants towards decision demanding situations, the researcher provided some sport event specific examples, such as the giving an example of mega sport event as "Olympics". By this way scale takers were leaded to think a concreate event and they leaded to visualize the event and answer the questions accordingly. Participants were informed that there were no right or wrong answers and they were asked to answer as honestly as possible. These instructions were writtenat the top of the scale. Finally, the researcher clarified that all answers would remainconfidential.

All 27 items on the scale were rated on a 5-point Likert scale, anchored by 0 (''extremely disagree'') and 5 (''extremely agree'').Researcher preferred using the 5-point Likert scale since 5-point Likert scale is seemed to be better enough in terms of capturing the accurate feeling of our target participants.

RESULTS

In order to analyze the data, exploratory factor analysis was preferred way to reveal the relationships between items and to reveal out the factor–structure of the scale because the researchers did not have any pre-information with regard to the possible sub-dimensions of the scale. The software named IBM Statistical Package for the Social Sciences (SPSS) 22 was run out to analyze the data. The Kaiser-Meyer-Olkin (KMO) and Barlett's test of sphericity were taken into consideration. The number of factors was determined by visually inspecting eigenvalues, scree plot and factor loadings (pattern matrix) table. Finally, the reliability analysis was performed for each factor. Alpha level was set as $p=.05$. Inspectionof the box plotsrevealed that, 60th, 100th, 110th, 163,th 166,th 173th and 176thcases were outliers. So, these cases were omitted from the data set.

As for the descriptive statistics of items, the mean scores of items were ranged between 4.07 and 3.41 as it can be seen on the Table 2. Before conducting the exploratory factor analysis, required assumptions including Skewness-Kurtosis values, histograms and Q-Q Plots were checked. The Skewness and Kurtosis scores were found between -3.00 and +3.00

(Tabachnick&Fidell, 2007). In histograms, items seemed to be negatively skewed. Items were not seen as normal distributions. Thus, all assumptions for univariate normality were not met for the present study. On the other hand, the dots were found close to the line in the Q-Q Plots.

Table 2.

Descriptive Statistics and Skewness-Kurtosis Values

	M	*SD*	*Skewness*	*Kurtosis*
1.Sporting event is visually interesting	4,07	1,16	-1,35	,87
2.Sporting event presents innovations	3,87	1,23	-,95	-,10
3.Sporting event does not contain irritating sounds	3,58	1,43	-,57	-1,01
4.Sporting event includes ear-pleasing musics	3,56	1,46	-,59	-1,04
5.Sporting event helps to explore my different aspects	3,99	1,24	-1,06	,011
6.Sporting event helps to feel intense emotions	3,41	1,36	-,353	-1,03
7.Sporting event activities are appropriate to my personal tastes	3,97	1,22	-1,02	-,02
8.Sporting event makes me feel privileged	3,64	1,24	-,60	-,56
9.Surprises that makes me happy in sporting event	3,56	1,39	-,48	-1,05
10.The degree of competitions in sporting event makes me satisfied	3,94	1,25	-,98	-,12
11.Sporting event provides opportunities to establish a good interaction with other people	3,80	1,29	-,88	-,33
12.The officials in sporting event kindly contact with me	3,70	1,30	-,70	-,33
13.Sporting event has a legend	3,56	1,27	-,44	-,78
14.Sporting event makes me feel belong to a certain group, or a country	3,93	1,29	-1,03	-,10
15.Sporting event helps to escape from the daily routine physically	3,58	1,37	-,59	-,82
16.Sporting event helps to escape from the daily routine mentally	3,63	1,39	-,62	-,89
17.Sporting event provides different experiences that I've never experienced	3,79	1,34	-,85	-,49
18.Sporting event offers different experiences from my daily life	3,91	1,23	-1,00	,03
19.Sporting event appeals to my senses	3,72	1,25	-,75	-,29
20.Sporting event has a story	3,44	1,36	-,41	-1,00
21.Sporting event has other people compatible with me	3,76	1,34	-,76	-,58
22.The competitions in sporting event are appropriate for the content of the event	3,89	1,19	-,98	,15
23.Sporting event has historical background from past to present	3,51	1,37	-,48	-,97
24.Sporting event includes original demonstrations	3,91	1,23	-,96	-,03
25.Sporting event organized in creative way	3,89	1,31	-1,00	-,17
26.Sporting event makes me feel private	3,88	1,25	-,90	-,27
27.Overall atmosphere of sporting event is impressive	3,97	1,29	-1,03	-,05

Since univariate normality assumption was not so clear to make definite judgements, researchers proceeded with multivariate normality assumption. Mardia's test was performed as an indicator of multivariate normality, Mardia's test results were found significant. Therefore, themultivariate normality was violated for this study ($p<.05$). Thus, researchers proceeded with Principal Axis Factoring (PAF). When multivariate assumption was violatedPAF is less likely than Maximum Likelihood to produce improper solutions (Finch& West,1997). In order to figure out the factorability of the scale, correlation matrix was checkedconsidering correlation coefficients of .30 and above (Hair et al, 2014). Since the scores were scattered, any preliminary judgments were hard to done between factorial structures.

Furthermore, Barlett test of sphericity and Kaiser-Meyer-Olkin values were inspected before running factor analysis. Significant results of Bartlett Test of Sphericityis a sign of correlation matrix is not equal to the identity matrix and a correlation exists among items (Field, 2009). Bartlett test of sphericitywas found as statistically significant for this scale, χ^2(df=35)=3278,57, ($p<.05$), supporting the factorability of the correlation matrix in Table 3.

After evaluating existing correlation, the absence of multicollinearity was checked. Determinant score of correlation matrix was 0.005whichimplied that multicollinearity didn't become a problem for the present study (Field, 2009).

Another requirement need to be evaluated is the sample size. Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) is an alternative way of checking this assumption (Field, 2009). Kaiser-Meyer- Olkin (KMO) test score for this study (.93) found to be surpassing the recommended value of .60 (Tabachnick&Fidell, 2007; Kaiser, 1974).

Table 3

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,93
Bartlett's Test of Sphericity	Approx. Chi-Square	3278,57
	df	35
	Sig.	,000

When considering sampling adequacy issue, the ratio of subjects to variables (*N/p*) required in internal validity studies on measurement scales.As for the sample size, at least N/p≥5 is needed; but, N/p≥10 is generally acceptable (Hair, 2006). From this standpoint, it can be interpreted that the 203 sample for a 27 item questionnaire is adequate when considering N/p≥5 formula. Moreover, an alternative issue that can be considered when deciding sample size is the communalities. According to Stevens (2009) when communalities are low (< .40) and factors are not well determined, extremely large samples would be required.When communalities are high (>.70) and factors are well determined, small samples would be adequate. In this study communalities computed as bigger than .40 and depending on at least N/p≥5 formula the 203 sample size was decided to be appropriate for this study.

In order to make a decision regarding the dimensional structure of the items of the scale, an exploratory factor analysis was run out. Williams, Brown, and Onsman, (2010) claim that determining about the number of factors is being sure about whether an item relates to more than one factor. Authors suggest utilizing rotation to maximize high item loadings and minimize low item loadings which offers a more interpretable and purified solution. There are two types of rotation techniques: orthogonal and oblique. Oblique rotation considers the correlation of factors within rotation (Field, 2009). In this study researchers were expecting a possible correlation and thereforepreferred to use direct oblimin as an oblique rotation technique instead of orthogonal rotation which do not assumes correlation between the factors (Field, 2009).Principal Axis Factoring (PAF) method was preferred to extract possible factors, followed by an oblimin rotation to find out stable factor loadings for each item. Principal Axis Factoring (PAF) method was preferredsincePAF is less likely than Maximum Likelihood to make improper solutions when multivariate assumption was violated (Finch& West,1997). An oblique rotation was performed because it was assumed that there was relationship between extracted factors which would be moderately correlated.

Results of factor loadings with Principal Axis Factoring (PAF) method followed by a direct oblimin rotation revealed that, items loaded to the first factor are related to both 6 “meaningful experience” dimensions in a certain way. However, only two items which are loaded to the second factor were related with “story”sub-dimension which are Item 20, “Sporting event has a story”, and item 23. “Sporting event has historical background from past to present”.

According toOsborne and Costello(2009), a factor with fewer than three items is generally weak and unstable Therefore, it is decided to name the factor 1 as “meaningful experience in sport events” and deleting the items that are loaded to the second factor since it has only two items which is weak and unstable (Osborne& Costello, 2009). Moreover, item 3. “Sporting event does not contain irritating sounds” was found to be as cross loaded therefore omitted from the scale. As it can be seen on the table all retained factor loadings were >.40. Therefore,only loadings above .40 were considered for interpretation.

Table 4 , *Factor Loadings and Communality*

	Factor Loading		
	1	*2*	*Communality*
5.Sporting event helps to explore my different aspects	,90	-,23	,69
7.Sporting event activities are appropriate to my personal tastes	,85	-,19	,64
1.Sporting event is visually interesting	,82	-,11	,64
10.The degree of competitions in sporting event makes me satisfied	,81	-,16	,66
2.Sporting event presents innovations	,81	-,14	,64
9.Surprises that makes me happy in sporting event	,72	-,04	,66
17.Sporting event provides different experiences that I've never experienced	,70	,10	,75
18.Sporting event offers different experiences from my daily life	,69	,09	,73
6.Sporting event helps to feel intense emotions	,66	-,01	,54
19.Sporting event appeals to my senses	,66	,11	,59
8.Sporting event makes me feel privileged	,64	,09	,59
12.The officials in sporting event kindly contact with me	,63	,08	,58
14.Sporting event makes me feel belong to a certain group, or a country	,63	,04	,57
11.Sporting event provides opportunities to establish a good interaction with other people	,63	,02	,53
15.Sporting event helps to escape from the daily routine physically	,61	-,03	,57
26.Sporting event makes me feel private	,58	,21	,58
16.Sporting event helps to escape from the daily routine mentally	,56	,04	,61
22. The competitions in sporting event are appropriate for the content of the event	,55	,24	,55
24. Sporting event includes original demonstrations	,52	,23	,59
4. Sporting event includes ear-pleasing music	,51	,09	,47
27. Overall atmosphere of sporting event is impressive	,50	,23	,57
25. Sporting event organized in creative way	,48	,33	,63
21. Sporting event has other people compatible with me	,48	,36	,61
13. Sporting event has a legend	,47	,32	,63
3.Sporting event does not contain irritating sounds	,35	,11	,63
23. Sporting event has historical background from past to present	,09	,70	,52
20. Sporting event has a story	,13	,69	,65

Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 8 iterations.

The best way to decide the number of factors of the scale is evaluating more than one method. These methods are scree plot and eigenvalues(Field, 2009). Therefore,in order to decide the exact number of factors, eigenvalues (Table5) was checked and also the scree plot (Figure 1) was inspected to determine the factor structure of the scale. First of all, identifiable factors were required to have eigenvalues greater than 1. When looking to Table 4, it was seen that four factors were greater than 1 and they are explained the 63.86 % of the variance. However, factor one alone explained 45.81 % of the variance and eigenvalue for factor 1 solution was 12.37. These high values offered us one factor solution.

Table 5

Eigenvalue, Percentages of variance and cumulative percentages

Factors	*Eigenvalue*	*% of variance*	*Cumulative %*
1	12,37	45,81	45,81
2	1,54	5,71	51,52
3	1,28	4,73	56,25
4	1,08	3,99	60,24
5	,98	3,62	63,86

Secondly, the scree plot revealed one possible factor on the slope of the plot.Also when looking the Figure 1, it was seen that the inflection point is 2. Therefore, parallel with the eigenvalues and scree plot, this scale was considered to have one factor.

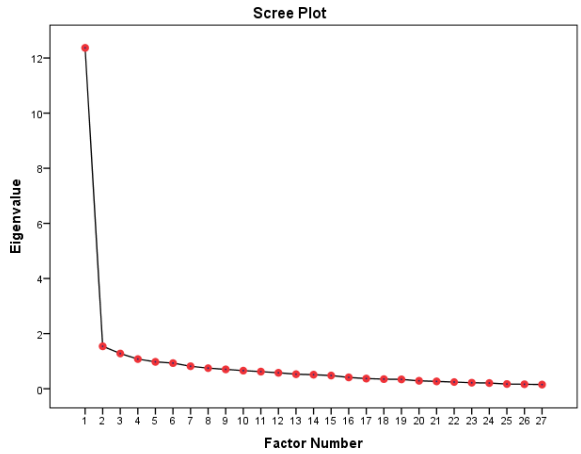


Figure 1. Scree Plot

What is more, another step to be followed is evaluating the communalities after factor extraction. Low communality implies that factors which account for a little variance. For large samples, communalities even <.30 are acceptable (Field, 2009); for this study, communalities >.30 are accepted. As it is seen in the Table 4, All the items were>.40 which are stated as practically significant by Hair et al. (2014).Alternatively, to check the factor structure better, the factor plot in rotator factor space was also evaluated; the plot offered that the factors fit the one factor model when omitting item 3, item 20 and item 23 (figure 2).

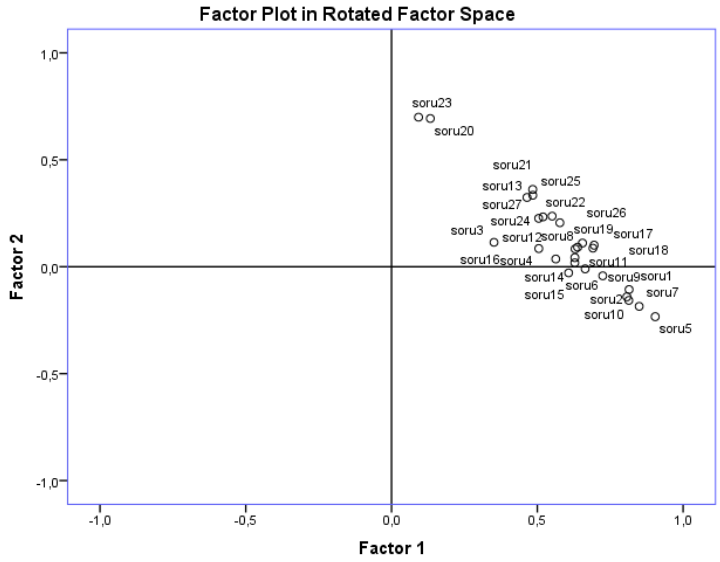


Figure 2 Factor Plot in Rotated Factor Space

Overall, depending on all statistically significant results and appropriate criterias,one

factor structure of the scale was decided as a final solution and factor was named as "Meaningful experiences in sport events."After conducting the exploratory factor analysis, and deciding the factor structure of the scale, cronbach alpha scores were computed for the internal consistencyconcerns of the retained factors. As it can be seen on Table 6below, all of the factors have significantly high cronbach alpha values (α >.70) (Nunnally, 1978). Additionally, there was no need to delete any items since the "cronbach alpha if item deleted" values were lower than the existing cronbach alpha values.Internal consistency score of the scale for one factor solution was found as α= .95 whichindicates excellent internal consistency (Cortina, 1993). Results of the internal consistency analysis indicated that both of the items surpassed the .70 cut-off point revealing that the factors are reliable to measure the intended factor (Fraenkel&Wallen, 2000).

Table 6, *Cronbach's Alpha and Cronbach's Alpha if Item Deleted Values for the One Factor Solution*

Factors	*Cronbach's Alpha*	*N of Item*	*Items*	*Cronbach's Alpha if Item Deleted*
Factor 1:	.953	24	1	,950
			2	,950
			4	,952
			5	,950
			6	,951
			7	,950
			8	,951
			9	,950
			10	,950
			11	,951
			12	,951
			13	,951
			14	,951
			15	,952
			16	,952
			17	,950
			18	,950
			19	,950
			21	,951
			22	,951
			24	,951
			25	,951
			26	,950
			27	,951

DISCUSSION

The aim of this study was to to develop a scale to measure experience concepts for any sport event participant. By this way, service provider can critically analyze the sport event and discover ways to improve it and design an event that offers a true meaningful and unforgettable experience to the participants (Tarssanen&Kylänen, 2005).In order to reach the intended purpose, items were generated depending on experiental marketing literature and examined to see its factor structure and reliability. Afterevaluating the eigenvalues, scree plot and finally factor loadings (pattern matrix) table, researcher come up with a conclusion that the instrument has only one factor which explain approximately 46 % of the common variance. The factor was named as "Meaningful experiences in sport events."Results of factor analysis and the internal consistency scores showed that the developed scale reliably assess the meaningful experiences in sport events.

The underlying theory of this scale isthe "Experience Pyramid" which can be utilized as a professional tool for experience co-production. It offers an optimal experience design by detecting the components that should be incorporated into experiences in order to provide engagement and customer value (Tarssanen&Kylänen, 2005). First of all, the Experience Pyramid developed by Tarssanen&Kylänen, (2005) is consisting on 6 sub-categories which are individuality, authenticity, story, multisensory perception, contrast and interaction. Before conducting the statistical analysis or even deciding to generate a scale covering Experience Pyramid, researcher hope to find 6 sub-scales since items were generated with regard to these 6 sub-categories. When writing items, researcher tried to cover all individuality, authenticity, story, multisensory perception, contrast and interaction dimensions. However, results of the EFA statistical analysis revealed that the scale has only one factor solution. The Turkish culture might be a reason of this result because in Turkey experiential marketing strategies are not well applied. Mega events such as; Super Bowl, Olympics, American football matches are very good examples of events where experiential marketing strategies are well applied and therefore participants experience unforgettable, meaningful experiences. In Turkey, however, experiential marketing strategies are very new and Turkish people are not familiar with these kinds of events. For this reason, respondents may not differentiate some of the items.As a recommendation, in order to get better results, this scale should be replied by mega event participants such as; Super Bowlor Olympics. After people experience this kind of events, they may have more concrete

understanding about items of this scale and therefore developed inventory can be filled by more knowledgeable participants on this issue.Besides, participants' age range of this study may not be convenient. Most of the participants, 63% were at the age of between 15 to 19. For further studies, it is recommended to have older sample with compared to this study especially for Turkish culture. Because graduate level students seemed to comprehend scale items more accurately with compared to high school students.

REFERENCES

1. Boswijk, A., Thijssen, T., &Peelen, E. (2007).*The Experience Economy a new perspective.* Amsterdam: Pearson Prentice Hall.
2. Brakus, J. J.,Schmitt, B. H., &Zarantonello, L. (2009). Brandexperience: what is it? How is it measured? Does it affectloyalty?.*Journal of Marketing*, *73*, 52-68.
3. Cortina, J.M. (1993). What is coefficient alpha? An examination of theory and applications. Journal of Applied Psychology, 78, 98–104.
4. Field, A. (2009). Discovering Statistics using SPSS for Windows. London – Thousand Oaks – New Delhi: Sage Publications.
5. Finch, J. F., & West, S. G. (1997). "The investigation of personality structure: Statistical models". *Journal of Research in Personality*, 31 (4), 439-485.
6. Fraenkel, J.R., & Wallen, N.E., (2000). How to Design & Evaluate Research in Education (4th Ed.). United States, McGraw-Hill Higher Education.
7. Fortezza, F., & Pencarelli, T. (2011). Experience marketing: specific features and trends. The Wish Days case study, *Journal of Marketing Trends*, *1*(6): 57–69. ISBN 978-2-9532811-0-2
8. Hair, J., Anderson, R.E., Tatham, R.L., & Black, W.C (2014).Multivariate data analysis. 7th ed. New Jersey: Prentice-Hall Inc.
9. Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational research methods*, *1*(1), 104-121.
10. Kaiser, H. (1974). An index of factorial simplicity. Psychometrika, 39, 31-36.
11. Mehmetoglu, M., & Engen, M. (2011). Pine and Gilmore's Concept of Experience Economy and Its Dimensions: An Empirical Examination in Tourism. *Journal of Quality Assurance in Hospitality & Tourism*, *12*(4), 237-255. doi: 10.1080/1528008x.2011.541847
12. Osborne, J. W., & Costello, A. B. (2009). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Pan-Pacific Management Review*, *12*(2), 131-146.
13. Same, S., & Larimo, J. (2012, May). Marketing theory: Experience marketing and experiential marketing. In *7th International Scienti fi c Conference Business and Management— 2012, in Vilnius, Lithuania*.
14. Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences*. Taylor & Francis.
15. Tabachnick, B. G., & Fidell, L. S. (2001).Using multivariate statistics.
16. Tarssanen, S., & Kylänen, M. (2005). *Handbook for experience stagers*. Rovaniemi:Oy Sevenprint Ltd.
17. Williams, B., Brown, T., & Onsman, A. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, *8*(3), 1-5.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Study on Measuring The Strength and Speed Among College Profile Girls Through Single Leg Bounding

Dr. Deepak S. Patil (Dange)
Asso. Prof. & DPE
Balasaheb Desai College , Patan
Dist – Satara. Maharashtra (India)

Prof. B.K. Ghadge
Former Vice President NAPESS
Vidyanagar, Karad
Dist – Satara. Maharashtra (India)

dsp25469@gmail.com

ABSTRACT

WHO commissioned global strategy for health. Many of the people now a day's join clubs for walking, jogging, and playing to keep them fit. Obesity and poor diet are the main facts for the physical inactivity of the women from our country. The strength and prosperity of the nation depend open the well being of the women. The concept of physical fitness was very popular, prompt and major. It has risen to new heights since 2000 century. In past days we read in books that without the physically and mentally fit no one could actively participates in the any kind of tournaments. In recent valuable days Physical Education has got much wider scope in concerning Endurance, Strength, Agility, Weight Training, Circuit Training, included in all round development of the human beings. Strength and Speed is indirectly connected with the muscle and skeletal body. To start with the muscle, Muscle is a specialized tissue of mesodermal origin. About 40-50 percent of the body weight of a human adult is contributed by muscles. They have special properties like exist ability, contractibility, extensibility and elasticity. Three types of muscles are identified so far 1] Skeletal 2] Visceral and 3] Cardiac. They are based on their location and known as voluntary control of the nervous system**.** The present paper has been under taken to record and to estimate the speed and strength of College girl students. The age groups of 17 to22 who are good at sports were taken for the study. This study indicates the gradual increase in timing and decrease in speed and strength and vice-versa. The result of 25Mtrs run and Formula of athlete is discussed.

Keywords: Sports, Students, health, strength

INTRODUCTION

Single Leg bounding over a distance of 25 meters can be used as a measure of an athlete's strength and speed. To be performed efficiently and quickly, bounding requires both strength and speed. Bounding is based on the myotactic or stretch-reflex principle. Muscle spindle receptors which lie within the body of all skeletal muscles are sensitive not only to the amount of stretching.

Since they are sensory in nature, they transmit the information of a muscle being rapidly lengthened to the spinal cord, and through one synaptic junction to the motor horn cells that supply motor information to the extrafusal fibers to reverse the lengthening process and to rapidly shorten the muscle concentric contraction.

It has been well established that the faster a more forceful movement devoted to overcoming the inertia of an object. This is an over simplification of the my tactic stretch-reflex but with this explanation. It becomes clearer as to how plyometerics require both strength and speed to produce a more forceful contraction.

To perform this test, measure a distance of 25 meters. Time the athlete from first movement to the end of 25 meters. The horizontal component of the bound should be emphasized for greater speed of movement. Time recorded can be compared with the table below.

METHOD

This is very simple test or indirect method. It is recognized Internationally and introduced in India by 'Armed Forces Sports Medicine Center, Pune,' Speed and Strength of an athlete can determine and identify the real talent regarding strength and speed.100 good sports women students of college were selected for test. They were allowed to run 25mts, distance as per their own pace and capacities. They have to complete this distance once only. Time was noted for each athlete at the end of the race. Against the different timings starting from3.00sec to 9.00 sec which can be interpreted directly and is self explanatory. As the runners keep coming they are put into respective Groups as per the time they have taken.

At first researcher have to give them warm up to put them all into initial velocity so that they could get the perfect timing regarding completing the 25 meters distance run with single bounding leg i.e. hoping with one leg.

Here researcher like to elaborate the grades

Excellent -	Above	90% to 100%
Good -	Above	80% to 89.09%
Average -	Above	65% to 79.09%
Fair-	Above	50% to 64.09%
Poor -	Below	35% to 49.09%
Very poor -	Below	35%

RESULTS

As per their capabilities. Researcher found that less the time required greater the performance of athletes for 25mts run test. Girl students of the age group of 17 to 22 were selected each group is made of five players. At the finish point various Groups are made to receive the runners.

1) In Group A - 7 girl students completed this race in 4.00 sec. Which are called as Excellent.
2) In Group B- 12 girl students completed this race in 4.00sec.to5.00sec.Which are called as Good.
3) In Group C- 31girl students completed this race in 5.00sec. to 6.00sec.Which are called as Average.
4) In Group D- 20 students completed this race in 6.00sec. to 7.00sec.Which are called as Fair
5) In Group E- 14 students completed this in 7.04sec. to 7.00 sec to 8.00sec. Which are called as poor.
6) In Group F- 16 students completed this in 8.01sec. to 8.00sec to 9.00sec Which are called as very poor.

Example--

speed = Distance 25Mtrs
Time = 3.03 sec = 8.250 mts. /sec

DISCUSSION

As we find more capability in the age group of 17 to 22;100 girl students of college who are good in sports were selected to get the conclusion speedily and properly. This test suggests percent wise mass study of active age groups from 1to 6.

1) 7% of girl students who completed the race in Group A were good at Short runners, which show that they have good stamina and much oxygen consumption capacity. As some of them were sprinters at zonal level and Inter zonal level.
2) 12% of girl students who completed the race in Group B were good at Middle distant running they have better concentric contraction of the muscle. These students can allotted to 800mtrs and 1500mtrs run at different level.
3) 31% of girl students who completed the race in Group C were good at middle distance running they were Basket ball players.
4) 20% of students who completed the race in Group D were playing Football, Hockey. 13 of them are hockey players and 7 are Foot ball players
5) 14% of students who completed the race in Group E were playing boxing and wrestling. The boxing player's were 7 in numbers and 7 wrestlers.
6) 16% of students who completed the race in Group F were good at Jumps and Throws. The capacity of these players was much less. From the point of view of the strength and speed researcher found 6 jumps and 10 of throws.

Here again researcher found that when more percentage is occurred that means girl students completed 25 mtr run in less timing .And when less percentage is occurred the more timing is given by girl students to complete above mentioned race.

REFERENCES

1] Conditions Training - Jonath /Krempel
2] Konditions Training -Grosser /Starischka/ Zimmermann zint
3] Journal of Strength & Conditioning Research, NSCA, USA
4] AUSDAUER TRAINIG -Peter G.J.M.Janssen KINDER TRAINING - Erwin hahu.
5] RAHMEN TRAININGS PLAN FUR DAS AUFBAU TRAINING – SPRINT Prof.Dr.Winfried Joch (Hrsg), Meyer & Meyer Verlag, Aachen,1992, I S B N 3-89124-140-2.
6] RAHMEN TRAININGS PLAN FUR DAS AUFBAU TRAINING – SPRINT Prof.Dr.Winfried Joch (Hrsg), Meyer & Meyer Verlag, Aachen,1992, I S B N 3-89124-141-0.143-7,145-3
7] Sports is a social medicine. Report of the seminar on service to the Society through sport. PP, 3. Rayalaseema College of Education (A.P.) India – Rao P.V. (1988)
8] Wasserman. K (1984). The anaerobic threshold measurement to evaluate exercise performance American Review of Respiratory Diseases. 129, S35-S40
9] Poote DC & Gaesser GA (1984).effect of continuous and interval training on lactate threshold and maximal aerobic capacity.

Indirect scale of speed and strength, Bounding test of 25 mtrs distance.

- Time (in sec)Speed (in m/s)Time (in sec)Speed (in m/s)

- 3.00---8.3336. 05--4.132 3.058.1966.104.098 3.108.0646.154.0653.157.9366.204.0323.207.8126.254.0003.25
- A7.6926.30
- D3.9683.307.5756.353.9373.357.4626.403.9063.407.3526.453.8753.457.2466.503.8463. 507.1426.553.8163.557.0427.00---3.5714.00--- 6.2507.053.5464.056.1727.103.5214.106.0977.153.4964.156.0247.203.4724.205.9527.25 3.4484.255.8827.30
- E3.4244.305.8137.353.4014.35
- B5.7477.403.3784.405.6817.453.3554.455.6177.503.3334.505.5557.553.3114.555.4948. 00--3.1255.005.0008.053.1055.054.9508.103.0865.104.9018. 153.0675.154.8548. 203.0485. 204.8078.253.0305.25
- C4.7618.30 F3.0125.304.7168.352.9945.354.6728.402.9765.404.6298.452.9585.454.5878.502.9415. 504.5458.552.9235.554.5049.002.7776.00---4.166A for Excellent, B for Good, C for Average, D for Fair, E for Poor, F for Very poor. strength, Bounding test of 25 m. distance.
- Time (in sec)Speed (in m/s)Time (in sec)Speed (in m/s)
- 3.00---8.3336.05--4.132 3.058.1966.104.098 3.108.0646.154.0653.157.9366.204.0323.207.8126.254.0003.25 A7.6926.30D3.9683.307.5756.353.9373.357.4626.403.9063.407.3526.453.8753.457.246 6.503.8463.507.1426.553.8163.557.0427.00---3.5714.00--- 6.2507.053.5464.056.1727.103.5214.106.0977.153.4964.156.0247.203.4724.205.9527.25 3.4484.255.8827.30
- E3.4244.305.8137.353.4014.35 B5.7477.403.3784.405.6817.453.3554.455.6177.503.3334.505.5557.553.3114.555.4948. 00 --3.1255.00--- 5.0008.053.1055.054.9508.103.0865.104.9018.153.0675.154.8548.203.0485.204.8078.25 3.0305.25 C4.7618.30 F3.0125.304.7168.352.9945.354.6728.402.9765.404.6298.452.9585.454.5878.502.9415. 504.5458.552.9235.554.5049.002.7776.00---4.166A for Excellent, B for Good, C for Average, D for Fair, E for Poor, F for Very poor.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Individualized Fitness and Diet Prescription for a Sedentary IT Professional – A Personalised Approach

Dr. R. SaravanaPrabha
Assistant Professor in Physical Education,
Avinashilingam Institute for Home Science and Higher Education for Women,
Coimbatore, Tamilnadu, India
sportprabha@gmail.com

Abstract

An IT Professional cum Professor was taken as a subject and to study her life style pattern, her interest, her motivational level, attitude towards physical fitness, exposing her to regular and continuous fitness regimen, her progress and elicit all through questionnaire and Intervention programme. Her Lifestyle becomes more sedentary and at this young age started with onset of many hypokinetic diseases. Moreover she is interested in initiating small physical fitness regimen but does know what, when and how to do it?

Had face to face interactions with the client. Initiated with an initial fitness assessment and setting goals, we worked jointly for a twelve week period to help the client reach her goals. During the twelve weeks, diversified work out programs was employed depending on the client's needs.

Questionnaire method was used to assess the Physical Activity Readiness, Medical history and present medical condition, Comprehensive client information, Three day dietary record, Readiness for change, Social Support, Initial body composition, Initial recovery Measurements, Initial performance etc.

- Pre-test (to identify the current fitness level and life style related disorders),
- Post-test method was followed with regular test trials in between to check the progress line.

Collected preliminary client information/Evaluated the information and explained the results to the client/ developed a coaching strategy. Started regular/strenuous practice / nutrition and supplement plan, Follow up training and nutritional assessment made, trouble shooting done. Bi-weekly client report issued checked for compliance and adherence, monitored Progressions. Intermittent test/ regular training and strict nutritional plan followed. Well-structured and periodized program that emphasized diversity of training modalities and planned five habits nutritional and super food diet showed exemplary result in achieving the outcome goal and no plateau was observed during the plan period.

Key words: modalities, Fitness, professional, Periodized

INTRODUCTION

My associateMrs. *******, working for a Engineering College in Coimbatore, Tamilnadu, India as an Associate Professor in General Engineering. She was very much interested in viewing sports rather than playing sports. She is a very motivated teacher but leads a sedentary life style. Her weight is 84 kilograms, height 1.57 Cms, 37 years and she is a strict vegetarian. Her day programme starts with mild household works, getting ready for the college, teaching for

continuous four to five hours of theory and practical, coming back from college and simple house chores and back to bed.

Her Lifestyle becomes more sedentary and at this young age started with onset of many hypokinetic diseases. Moreover she is interested in initiating small physical fitness regimen but does know what, when and how to do it?

Hence this IT Professional cum Professor was taken as a subject and to study her life style pattern, her interest, her motivational level, attitude towards physical fitness, exposing her to regular and continuous fitness regimen, her progress and elicit all through questionnaire and Intervention programme.

I had face to face interactions with my client. Initiated with an initial fitness assessment and setting goals, we worked jointly for a twelve week period to help my client reach her goals. During the twelve weeks, diversified work out programs was employed depending on my client's needs.

Client Standard

She is a beginner, so she falls in the Level I category (Client). Her main aims are to enhance the fitness level, to reduce weight as per doctor's advice to get pregnant, increase cardio respiratory fitness. She is not a regular exerciser but interested in doing simple yogic exercises when she finds time. Reason for choosing her as my client are she is a beginner moreover she showed much interest when I come out with this idea of taking a case study, training execution feasibility and conducive infrastructure facilities in my work place and above all she is a good friend of mine. My underlying idea was to increase her confidence about exercise and diet in turn to raise her overall health and well being.

Limiting factors

- She hailed from the traditional Brahmin family were regular exercising is not possible and this was considered as taboo and meant only for men.
- She is good in academics during her school days and ignored sports during her adolescence hence she needs the training to be start from the basic.
- Now as a teacher, busy with her academics, she did not find time to engage in the regular program.
- As she is new to regular exercise program, I doubt whether she would commit herself for change.

Outcome goals

My client's goals are;

♣Reduce ten kilograms (12 weeks) by the end of the exercise program/post-fitness testing to get pregnant.

♣ Increase VO2 Max by 5% so taking the stairs is an easier task.

♣ Enhance over all fitness and wellbeing.

Behaviour goals

As she is a self motivated client, with a complete commitment she herself framed few behavior goals like: To reduce 8kgs in twelve weeks, decrease 500 calories in the daily diet. o Commit to start exercise in alternative days, more of aerobic exercise, stretching and strengthening exercises. o Eating junk in relax days only. o Distribute the total intake of calories in five major meal than tree major meal.

Assessment Tools used to elicit the Progress

Questionnaire method was used to assess the Physical Activity Readiness, Medical history and present medical condition, Comprehensive client information, Three day dietary record,

Readiness for change, Social Support, Initial body composition, Initial recovery Measurements, Initial performanceetc

- Pre test (to identify the current fitness level and life style related disorders),
- Post test method was followed with regular test trials in between to check the progress line.

Recommended nutrition and supplement plan

Pre-workout – Carb intake. Breakfast – Black coffee/green tea without sugar (to boost the metabolism during workout days), bowl of sprouted grams / corn flakes/wheat flakes/brownbread (these are high carbs) and one apple.

Post workout – bowl of fruits and veggeis with carb shake.

Morning breaks – Idli / uthappam / Appapam/ (south Indian meal (for the carbs quotient, Whey proteins, Salad)

Lunch – rotis, 3-4 slices of steamed natural coulored vegetables, Sprouts, sabji, dal, curd anda carrot

Evening breaks –apple, orange, sweet lime or papaya

Dinner – Bajra/ jowar/ whole multigrain rotis with fruit.

Suppliedwith necessary vitamin and minerals supplement as she is a vegetarian.

Physician Check

No specific activities she underwent troubles her. She was very quite comfortable with theregular routine of exercises but only went to her gynecologist doctor for review often. She didn't face any discomfort during the training programme.

Twelve Weeks Training Programme

Fixed regular appointments, training, discussions and assessment made.

End of II week

Collectedpreliminaryclientinformation/Evaulatedtheinformation and explained theresults to the client/ developeda coaching strategy. Initial assessment viacollectedquestionnaire,informationexplainedgoals set. Bi-weeklyclient report issued.

End of IV week

Startedregular/strenuous practice /Started with nutrition andsupplement plan, Follow up training andnutritionalassessmentmade, trouble shootingdone. Bi-weekly clientreport issued

End of VI week

Checked forcompliance and adherencemonitoringProgressionsassessed.Bi-weekly client reportissued

End of VIII week

Intermittenttest/ regular training and strict nutritional plan, Follow up assessmentsand Bi-weekly clientreport issued

End of X week

Conductedfollow up testsBi-weekly client reportissued

End of XII week

Judged theclients progress/ check foroutcome goals, Improvedclientadherence and expectedoutcome achieved**.**

Discussions

- As planned earlier reduced nine and a half kilogram weight improved her physical grace, confidence level and combats health conditions and diseases.

- Organised and strict nutritional plan helped her to reduce weight and improved her nutritional knowledge.
- Releases tension, promotes enthusiasm, optimism, counters anxiety and depression by improving self image.
- Structured training regimen improved her vitality, energy, performance to the next level.
- Ensured continuity in training to still achieve improved level of fitness.

Recommendations:

- The frame of information is large, but data on exercise and its effects on the cardiovascular system and long-term existence are still fairly limited. The duty for conducting research lies with government agencies, private health organizations, universities etc.

- Basic facts of the anatomic, biochemical, and physiologic changes that result from several patterns of physical activity (short- and long-term, sustained and intermittent, isotonic and isometric, low and high intensity) in persons of different ages is needed, as is a determination of whether a certain minimum-intensity in verge of physical activity is required for value.

CONCLUSION

Well structured and periodized program that emphasized diversity of training modalities and planned five habits nutritional and super food diet showed exemplary result in achieving the outcome goal and no plateau was observed during the plan period.As the client showed excellent compalince and adherence towards the programme and the goal still remains to continued weight loss (as she is overweight) and enhanced fitness and wellbeing the same plan of action may be followed for the next plan period might be with much intensity.

References

1. Abraham Workout Schedule and Diet Chart Case Study
2. Self Efficacy Theory and Stages of Change Theory.
3. 3. School Based and Health Alliance. Clinical Interventions to Promote Nutrition and Fitness

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Ending the Sports Career
What Message Can We Send to Our Retired Athlete!!

ZERF MOHAMMED

Department of Sport Training Institute Physical Education Laboratory OPAPS,University of Mostaganem, Mostaganem 27000, Algeria

E-mail : biomeca.zerf@outlook.com

Abstract

Exercising an athlete activity can lead a negative attitudes toward physical activity after the athletes retire from the sport. (Anshel, Mark 2014)Whereas very few studies have focused on the development of fitness health after stopping sports career for the reason of access to subjects 30 years(David L. Costill, Jack H. Wilmore, W. Larry Kenney, 2009). Through the above come the importance of this study acrossthe maintain healthy lifestyle at all levels of physical fitness of life,(Natalie Digate Muth, 2014)and the interplay between productivity life and retirement which is central to many core issues in life retired(Q.Asthon Acton, PhD, 2011), (Lisa F. Berkman, Ichiro Kawachi, M. Maria Glymour, 2014) as extensive physical and mental health consequences according to the similar studies,which confirmed that the free time unstructured contributes to substantially and the global burden of disease. Whether the most of the research exposedin on hand the retirement as risk life stage due to the change in lifestyle, the case of the athletes who may be ill prepared to manage their life after the Ending of them Sports Career.while in anotherour review theory confirmed the conflict between the similar studies in the benefits of physical activity as a lifestyle. For this propose,28 older players team Sefisaf state Sidi Bel Abbes Algeriaparticipated in the present study,selected based on their choice(stop the practice of sports and continuous),tested on three parametersAnthropometric measurements (chronological age and professional training age, weight, height,), Morphological (Grasse Mass Index,Body mass index),Physiological (maximum oxygen consumption, Ruffier functional Dickson index andPower leg (vertical jump)).Their homogeneity was calculated at the base of their deferments ages, sex, medical examinationand good habits. Based on the analyses, statistics we confirm that stress exercise is the best medicine.However, our message is quite simple to our Retired Athlete “you must involvement in physical activity”. Because the exercise isn't only a “feel good” activity, but a powerful and effective medicine that has far-reaching effects.

Keywords: sports career,Health,retired athlete,Physical Fitness.

INTRODUCTION

Physical Activity and Health explains clearly, systematically and in detail the relationships between physical activity, health and disease, and explores the benefits of exercise in the prevention and treatment of health conditions(Adrianne E. Hardman, David J. Stensel, 2009) where the American College of Sports Medicine (ACSM), that it is necessary at any age to develop the skills to assess health-related physical fitness of an individual.(Medicine, American College of Sports, 2013).

Whereas very few studies have focused on the development of fitness health after stopping sports career for the reason of access to subjects 30 years (David L. Costill, Jack H. Wilmore, W. Larry

Kenney 2009) wherever the similar studiesaggregate theretirement astransitions stage of life to another including (John Blando, 2014) disorganized Stability Zone Relatively stable factors in our life.(Ruth Wright, Léonie Sugarman, 2009)

Where the Work approach has a significant impact on lifestyle and health, due to the total working time and the ability obtained as physical and mental fitness,according to the statementof(Jan A. M. Graafmans, Vappu Taipale, Neil Charness, 1998),whoconfirm that work is state of quality of life to develop health(Corbin, Charles B, McConnell, Karen, Le Masurier, Guy, 2014) as that Everyone needs to work (Christine E. Gudorf, 2013)by dint of the work which can give our lives meaning structure, productivity, and organization for nowadays (Heidi Catherine Culbertson, 2011) WhereasYves C. Vanlandewijck et al(2011)(Yves C. Vanlandewijck, Walter R. Thompson, 2011)confirm, thatthe athletes may be ill prepared to manage life after the Ending of Sports Career,owing to Theminterplayed between prestige in the productivity life and retirement which is central to many core issues in life retired according to(Q. Ashon, acton, 2012). Where (Lisa F. Berkman, Ichiro Kawachi, M. Maria Glymour, 2014)confirm that retirement, may have extensive physical and mental health consequences. Wherever the evidence show that retirement has not immediate negative effects on health if life change means that retirees must look for ways to adapt themselves to new routines(Robert V. Kail, John C. Cavanaugh, 2015)

From the proofs Our aims in this study are to examine the Impact of the ending the sports career on various health outcomes,when the athlete has decided to stop the practice of sport. Base on the hypotheses which confirm that Retirement offers more free time which recommended from an individual to engaged in leisure activities(Mo Wang, 2012). Our comeis based on one hand, on the numerous studies which show that physician recommendation is a powerful motivator to change lifestyle habits, including level of physical activity(James M. Rippe , 2013)thing confirmed by The Results of Healthy Habits basic which advice eating three meals per day and avoid snacks, maintain normal body weight, exercise moderately, sleep seven or eight hours(Ron Meyers, 2003). WhereasPreparing for the retirement as transitiondisorganized Stability Zone Relatively stable factors in our life according to (Lee Knifton, Neil Quinn , 2013), and (Michael L. Malone, MD, Paul R. Katz, MD, Mathy Mezey, 2013)and loss of social prestige thing confirmed by(K. Warner Schaie, Dan Blazer, James S. House, 2013)as the case of our sportive, where(Martin P. Simmons, Liman A. Foster, 2008)determined that life after ending the sports

career, can be interpreted as "To be afraid of not being".

From the perspective that Very little systematic research has tracked the effects of professional sports on the lives of athletes after their careers are over according to (Howard L. Nixon, 2015)and the rapport mentioned bythe Aging Athlete Project suggests that only 10 percent of retired athletes take up a physical education life (Sifu Slim, 2015)the importance of this study was to reveal the conflicts of the similar studies onthe beneficial effects Physical activity approach to manage time life confirmed by (Dominic Haydn-Davies, Emerick Kaitell, 2010),(Lee, I-M, Shiroma FJ, Lobelo F, et al, 2012),(Peter A. Bamberger, Samuel B. Bacharach, 2014),(James F. Sallis and Jordan A. Carlson, 2015) and(Bette Loef, Ellen L. de Hollander, Cécile R.L. Bootb, Karin I. Proper, 2016).(Lisa F. Berkman, Ichiro Kawachi, M. Maria Glymour, 2014)confirm the opposite (no negative effects of retirement on physical or mental health)

METHOD

The research is a descriptive Where we focus on retirement sporting that (John Blando, 2014) (John Blando, 2014)generally describe as a disorganized stability in our lives. Whether (Ruth Wright, LéonieSugarman, 2009)(Ruth Wright, Léonie Sugarman, 2009)show that retirement has not immediate negative consequences if individual look for ways to adapt the new routines according to (Robert V. Kail, John C. Cavanaugh, 2015) (Robert V. Kail, John C. Cavanaugh, 2015)based on the above our aim in this study are to examine hypothesis what message can we send to our Retired Athlete.

Population and Sample

The data of This studywere conducted in the Laboratory OPAPS" Physical Education Institute" University of Mostaganem for academic years 2014-2015. Where we have tested the sample consisting from 28 olderplayers from the team SefisefSidi Bel Abbestheir age is between 33 and 35yearsdistributed in two groups (13 player stopped practice of sports 15 continued the practice of sport)based on the field test.(Nick Draper, Helen Marshall, 2014) To archive this objective,the participated in the present study were selected based on their choice (stop the practice of sports and continuous), tested on three parameters (a)Anthropometric measurements (chronological age and professional training age, weight, height,), (b) morphological (Grasse Mass Index, Body mass index), (c) physiological (maximum oxygen consumption, Ruffier functional Dickson index and Power leg (vertical jump)). Their homogeneity is calculated at the base of their deferments ages (chronological age-training age), sex male and medical examination also good

habits (non-smokers and not taking any medication on a regular basis).For the experimental condition the participants were informed about procedures and provided their written consent.

Table 1 shows homogeneity population in selected parameters to study

N=28	Mean	SD	Levene Statistic	df1	df2	Sig.
weight	71,71	4,71	2,64	1	26	0,11
height	1,71	0,040	0,78			0,38
Grasse Mass Index	14,11	2,32	0,21			0,65
Vo2MAX	48,36	6,50	0,83			0,37
Power leg	45,48	7,38	0,00			0,97
chronological age	33,28	0,71	0,00			0,98
Body mass index	24,49	1,75	0,08			0,78
Ruffier functional Dickson index	8,67	1,63	2,29			0,14
professional training age	12,64	1,36	1,98			0,17

Through the table 1 the homogeneity was calculated based on Levene Statisticshows a “Sig.” value of greater than (>) .05 whom assumes that the variances are equal across groups or samples. then we conclude the differences are not significantly different, so that we can have confidence in the validity of the statistical t-test as a means of comparison

Statistical analysis

Based on the data retests and the data analysis procedures used in this study consisted of the computation of the means, standard deviations, the Levene Statistic, independent T test and Correlation Paired Samples. We have chosen the Descriptive statistics where we have calculated the conditions chosen for this experience. With a Significance level was set at 0.05. Statistical procedures were done using SPSS 21.0.

Measures

Our focus in this studyit is based on selective plane all samples do not smoke and drinkalcoholin good medical health.In terms of tests we have tested the sample based on the basic protocol jump test(Tom Kortemeier, Todd Kortemeier, 2016) and bending the legs(Antonio Baena Extremera , Antonio Granero Gallegos, 2015),(Hermann O. Mayr, Stefano Zaffagnini, 2015) to calculate anaerobic muscular power - leg power for Ruffier-Dickson test(Jean Ferré, Philippe Leroux, 2009) we calculate the heartbeat and index adaptation to effort as basic medical assessment. Whereasto computePower (Watts)(John McLester, Peter St. Pierre, 2007)(Jim Breithaupt, 2015) we chosepower leg (W) = 21.72 x VJ (m) x mass (kg)(Nesta Wiggins-James,Rob James, 2005)(Greg Haff,Charles Dumke, 2012)(SAYERS, S. et al, 1999)(William D. McArdle,Frank I. Katch,Victor L. Katch, 2010),forMaximum Heart Rate to estimation of VO2max(Larry Hoover, 2013)VO2 max = 15 x (HRmax ÷ HRrest) we chose the formula of(UTH, N. et al, 2004).Body

mass index (BMI) was calculated as body mass (kg) divided by height (m) squared. The subjects' adiposity was classified according to WHO standards: underweight was defined as BMI < 18.5, normal weight as BMI ≥ 18.5 and <25, overweight as BMI ≥ 25 to BMI <30, and obesity as a BMI ≥30(Marzena Malara, Anna Kęska, Joanna Tkaczyk and Grażyna Lutosławska, 2015)

RESULTS

Table 2 shows the Anthropometric characteristics chosen to study

		N	mean	SD	T	df	Sig. (2-tailed)
weight	Practice Sports	15	68,48	2,53	-5,79	26	0,00
	Stop Practice	13	75,45	3,78			
weight	Practice Sports	15	1,72	0,04	1,02		0,319
	Stop Practice	13	1,70	0,04			
chronological age	Practice Sports	15	33,13	0,74	-1,22		0,231
	Stop Practice	13	33,46	0,66			
training age	Practice Sports	15	13,00	1,13	1,52		0,140
	Stop Practice	13	12,23	1,53			

Through the table 2 where the independent T test is not significantin weight, chronological age and training age in the opposite of weight, our results line with the confirmation of the intervention and experimental studies which confirm that physical activity over time can prevent unhealthy weight gain and in turn reduce the risk of overweight/obesity.(Ken Green, Andy Smith, 2016) where (Fleck, Steven J., (2014 ,mailliW ,remearK Advised to reduce this risk, retired athletes require the proper prescription of exercise, along with dietary changes and weight control.

Table 3 shows the Morphological characteristics chosen to study

		N	Mean	SD	T	df	Sig. (2-tailed)
Grasse Mass Index	Practice Sports	15	12,26	1,06	-9,14	26	0,00
	Stop Practice	13	16,25	1,25			
Body mass index	Practice Sports	15	23,17	0,95	-7,21		0,00
	Stop Practice	13	26,00	1,12			

Through the table 3 where the independent T test is significant in the Morphological characteristics chosen to study in the benefit of the group which stop practiced sport our results confirm the overweight problem mentioned in the table 1 based on that we agree the Principle of reversibility States that changes occurring from physical activity are reversible if a person stops to being active according to Jerome E. Kotecki (2011)(Jerome E. Kotecki, 2011).However,(Fleck, Steven J., Kraemer, William, 2014), confirm that health life requiring endurance and the continuation of vigorous physical activity after retirement.

Table 4 shows the Physiological characteristics chosen to study

		N	mean	SD	T	df	Sig. (2-tailed)
Vo2MAX	Practice Sports	15	53,60	3,27	5,80	26	0,00
	Stop Practice	13	42,32	2,97			
Power leg	Practice Sports	15	51,47	3,37	1,02		0,00
	Stop Practice	13	38,58	3,61			
Dickson index	Practice Sports	15	7,40	0,98	-1,23		0,00
	Stop Practice	13	10,15	0,68			

Through the table 4 where the independent T test is significant in the Physiological characteristics chosen to study in the benefit of the group which continued Practicing Sports our results confirm the overweight problem mentioned in the table 1and 2 based on that we agree the Principle which confirm “the Level of body weight or fatness maintained is an achieving balance between energy intake (consumption of food) and energy expenditure (metabolism and physical activity) according to (Liane M. Summerfield, 2015). Whereas (Skrypnik D.· Bogdański P. · Mądry E. · Karolkiewicz J. · Ratajczak M.· Kryściak J. · Pupek-Musialik D. · Walkowiak J., 2015) confirm that Physical activity should be implemented as a baseline protocol of the body weight or weight loss goals. Where (Swift DL, Lavie CJ, Johannsen NM, Arena R, Earnest CP, O'Keefe JH, Milani RV, Blair SN, Church TS, 2013) confirm the impact of the Physical training which is associated with body weight loss and with reductions in cardiovascular, based on aerobic endurance training whereabouts the numerous research indicate the advantages of strength training which increased muscle strength and decrease body fat.(Haskell WL, Lee IM, Pate RR, Powell KE, Blair SN, Franklin BA, Macera CA, Heath GW, Thompson PD, Bauman A::Haskell WL, Lee IM, Pate RR, Powell KE, Blair SN, Franklin BA, Macera CA, Heath GW, Thompson PD, Bauman A, 2007)

Table 5 shows theCorrelationsbetween the parametersthe Morphological andthe Physiologicalchosen to study

Correlations				
		Vo2MAX	Power leg	Dickson index
weight	Pearson Correlation	-0,701**	-0,614**	0,703**
Grasse Mass Index	Pearson Correlation	-0,881**	-0,804**	0,867**
Body mass index	Pearson Correlation	-0,716**	-0,732**	0,752**
N		28	p≤0,05	
**. Correlation is significant at the 0.01 level (2-tailed).				

Through the table 5 where we have calculated the correlation between the parameters the Morphological and the Physiological chosen to study which they are significant in all compare at

level ≤ 0,01wereour results shows strong negative correlationThe more weight fat mass and body mass index deficiency vital capacity and muscle strength in the opposite of the relationship betweenDickson index which is strongly positivewhereas this increase reflects the heart trouble during physical effort based on those results whom we confirm the health statesof our samples which is in the benefit ofthe group who practices sports Leisure time our findings line with the commendationwhich confirm "to promote and maintain good healtha moderate-intensity aerobic activity involves the aerobic fitness thing confirmed by (Jana Pelclová, 2015) whereas (Peter D. Le Roux, Joshua Levine, W. Andrew Kofke, 2013)confirm that Outcomes are described byorganism functional where Individuals who do not engage in any moderate or vigorous physical activity during leisure time risk Functional capacity declines(William D. McArdle, Frank I. Katch, Victor L. Katch, 2010) case of our Retirees who do not practice sports. from the approve we confirm thatfree time in retirements cancontribute to degradation of the level Health Physical Abilities where this result is approved by (James F. Sallis and Jordan A. Carlson, 2015), (Pate, Russell R., Buchner, David, 2014)and (Lee, I-M, Shiroma FJ, Lobelo F, et al, 2012). From the proof we agreed the judgment of (Stuart Biddle and Nanette Mutrie, 2001) that We must get serious importance about improving the health of the nation by affirming our commitment to healthy physical activity in our caseintegrationour retirees' in leisure activities to improves the one's well-being(Robert Kail, John Cavanaugh, 2015).Where our message line with the recommendation of (Fan Hong, J.A. Mangan, 2005)to assist athletes to obtain jobs in sports-related enterprises to help them to enjoy a decent and dignified life after they retire.

DISCUSSION

From the data analysis, we observe that free time within the retirement is a serious public health problem(N. A. Garrett et al, 2004)due to the choice made by our sports(L. B. Robbins et al, 2001). whereas our finding line with the similar studies,which approve the benefits of physical activity as a lifestyle. However,ending the practice of sport is recognized as an important risk factor for multiple causes of disability (Majid Ezzati, 2004)as the risk of stroke cardiovascular obesity, high blood pressure, and low HDL ("good") cholesterol (Noemie P. Beaulieu, 2008)where theanthropometric measurements of individual influence and multiple the cardiovascular risk factors, including blood pressure, lipoprotein profiles, obesity, and inflammation(Marlene B. Goldman, Rebecca Troisi, Kathryn M. Rexrode , 2012).

In addition,the Physical state healthy are improvesin the level of endurance and strength as physical quality, because they allow the user to perform activities more effectively and for longer periods.(Jerrold S. Greenberg, George B. Dintiman, Barbee Myers Oakes, 2004) from that our result line in The investigation of the relationships betweentypically use time andthe health fitness. Where(Krell-Rösch, Janina, 2014)improve it inthe integrating of these retirees in sports Social activities.

CONCLUSIONS

The most important finding of our study concerns the effect of ideal weight (Thierry Paillard, 2010)on parameters chosen to study, Morphological,Anthropometric and the physiological functions.Where our result line with the confirmation of (David R. Mottram, 2010)thatthe free time in retirement may well be a gradual deterioration in physical condition, with body weight increasing and fitness declining. whereas(BENGOUA ALI, ZERF MOHAMMED, MOKKEDES MOULAY IDRISS, ATTOUTI NOUREDINE& ANDRE SEABRA, 2015)confirm thatthe health requires a good reflection of the actors and decision makers our advice to our Retired Athlete that theEnding of a sporting career is not the end of life.On this basis we indicate our sample that Sport activities are social forms of human activity(Karin Volkwein-Caplan, 2013)whetherthe age in progress requires the practice of physical activity to maintain an optimal health consist by a regular, plan physical fitness (Encyclopedia of Human Nutrition, 2012). Whereas the England Journal of Medicine reports that stress exercise is the best medicine according to(Byong-Hyon Han, 2015). From the proof, our message is quite simple to our retired sportive that they must involvement in physical activity. Where the exercise isn't only a “feel good” activity, but a powerful and effective medicine that has far-reaching effects(Jordan Metzl, 2014).

On the basis of our resultswe recommend ourRetired Athlete:

- The end of a sporting career is not the end of life.
- Stop sports leads to the health risks associated with growingof the Body weight.
- The ideal weight is the relationship between physical activity, weight, and health. body composition and body mass.

- The promote health throughout life is the relationship between a Regular exercise and ideal weight wherethe stress exercise is the best medicine.

References

1. Adrianne E. Hardman, .(2009) .lesnetS .J divaD*Physical Activity and Health: The Evidence Explained.* US: Taylor & Francis.
2. Anshel, Mark. (2014). *Applied Health Fitness Psychology.* US: Human Kinetics.
3. Antonio Baena Extremera , .(2015) .sogellaG orenarG oinotnA*Componentes básicos del currículum de Educación Física.* Deportiva: Ebooks Wanceulen.
4. BENGOUA ALI, ZERF MOHAMMED, MOKKEDES MOULAY IDRISS, ATTOUTI NOUREDINE& ANDRE SEABRA. (2015). INJECTIONS VS ORAL ANABOLIC STEROID WHICH CORRELATIONSHIP EXPLAIN THE DOPING RISKS HEALTH IN THE LEISURE ALGERIAN SPORT BODYBUILDING. *BEST: International Journal of Humanities, Arts, Medicine and Sciences (BEST: IJHAMS), 3*(10), 159-168. Retrieved from https://www.researchgate.net/publication/283210301_INJECTIONS_VS_ORAL_ANABOLIC_STEROID_WHICH_CORRELATIONSHIP_EXPLAIN_THE_DOPING_RISKS_HEALTH_IN_THE_LEISURE_ALGERIAN_SPORT_BODYBUILDING
5. Bette Loef, Ellen L. de Hollander, Cécile R.L. Bootb, Karin I. Proper. (2016). Physical activity of workers with and without chronic diseases. *Preventive Medicine Reports, 3,*, 30–35. doi:10.1016/j.pmedr.2015.11.008
6. Byong-Hyon Han. (2015). *Therapy of Social Medicine - Page 54.* UK: Springer Shop.
7. Corbin, Charles B, ,neraK ,llennoCcM .(2014) .yuG ,reirusaM eL*Health Opportunities Through Physical Education.* US: Human Kinetics.
8. David L. Costill, ,eromliW .H kcaJ .(2009) .yenneK yrraL .W*Physiology of Sport and Exercise: Physiological adaptations during exercise.*FR: De Boeck Supérieur.
9. David R. Mottram. (2010). *Drugs in Sport.*US: Routledge.
10. Dominic Haydn-Davies, .(2010) .lletiaK kciremE*Physical Education: Beyond the Curriculum.* USA: Coachwise 1st4sport.
11. *Encyclopedia of Human Nutrition.* (2012). UK: Access Online via Elsevier.
12. Fan Hong, .(2005) .nagnaM .A.J*Sport in Asian Society: Past and Present.* Asian: Routledge.
13. Fleck, Steven J., .(2014) .mailliW ,remearK*Designing Resistance Training Programs, 4E.* US: Human Kinetics.
14. Greg Haff,Charles Dumke. (2012). *Laboratory Manual for Exercise Physiology.* US: Human Kinetics.
15. Haskell WL, Lee IM, Pate RR, Powell KE, Blair SN, Franklin BA, Macera CA, Heath GW, Thompson PD, Bauman A::Haskell WL, Lee IM, Pate RR, Powell KE, Blair SN, Franklin BA, Macera CA, Heath GW, Thompson PD, Bauman A. (2007). Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Med Sci Sports Exerc, 39,* 1423-1434.
16. Hermann O. Mayr, 2015) .iningaffaZ onafetS). *Prevention of Injuries and Overuse in Sports.* UK: Springer Shop.
17. Howard L. Nixon. (2015). *Sport in a Changing World.* US: Routledge.
18. James F. Sallis and Jordan A. Carlson. (2015). Population Health: Behavioral and Social Science Insights Physical Activity: Numerous Benefits and Effective Interventions. *Agency for Healthcare Research and Quality, Rockville, MD.* Retrieved from www.ahrq.gov/professionals/education/curriculum-tools/population-health/sallis.html
19. James M. Rippe . (2013). *Lifestyle Medicine, Second Edition.* US: CRC Press.

20. Jan A. M. Graafmans, ,elapiaT uppaV .(1998) .ssenrahC lieN*Gerontechnology: A Sustainable Investment in the Future.* UK: IOS Press.
21. Jana Pelclová. (2015). *Physical activity in the lifestyle of the adult and senior.* czrech: e-book english.
22. Jean Ferré, .(2009) .xuoreL eppilihP*Préparation aux diplômes d'éducateur sportif.*FR: Editions Amphora.
23. Jerome E. Kotecki. (2011). *Physical Activity and Health: an Interactive Approach* . US: Jones & bartlett Learning.
24. Jerrold S. Greenberg, eGorge B. Dintiman, .(2004) .sekaO sreyM eebraB*Physical Fitness and Wellness: Changing the Way You Look, Feel, and Perform.* UK: Human Kinetics.
25. Jim Breithaupt. (2015). *Physics.* UK: Palgrave Macmillan.
26. John Blando. (2014). *Counseling Older Adults.* US: Routledge.
27. John McLester, .(2007) .erreiP .tS retep*Applied Biomechanics: Concepts and Connections.* US: CengageBrain.com.
28. Jordan Metzl. (2014). *The Exercise Cure: A Doctor's All-Natural, No-Pill Prescription for Better.* US: Rodale.
29. K. Warner Schaie, ,rezalB naD .(2013) .esuoH .S semaJ*Aging, Health Behaviors, and Health Outcomes.* US: Psychology Press.
30. Karin Volkwein-Caplan. (2013). *Sport Fitness Culture.* UK: Meyer & Meyer Verlag.
31. Ken Green, .(2016) .htimS ydnA*Routledge Handbook of Youth Sport.* UK and US: Routledge.
32. Krell-Rösch, Janina. (2014). *Interdependence of Physical (In-) Activity, Fitness and Cognition.* KIT Scientific Publishing.
33. L. B. Robbins et al. (2001). Physical activity research in nursing. *Journal of Nursing Scholarship, 33*(4), 315–321.
34. Larry Hoover. (2013). *Metabolic States: Notes on Stress, Nutrition and Exercise.* US: XLibris LLc.
35. Lee Knifton, .(2013) . nniuQ lieN*Public Mental Health: Global Perspectives.* UK: McGraw-Hill Education .
36. Lee, I-M, Shiroma FJ, Lobelo F, et al. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet, 380*, 219-29.
37. Liane M. Summerfield. (2015). *Nutrition, Exercise, and Behavior: An Integrated Approach to Weight Management.* US: CengageBrain.com.
38. Lisa F. Berkman, ,ihcawaK orihcI .(2014) .ruomylG airaM .M*Social Epidemiology.* UK: Oxford University Press.
39. Lisa F. Berkman, ,ihcawaK orihcI .(2014) .ruomylG airaM .M*Social Epidemiology.* UK: Oxford University Press.
40. Majid Ezzati. (2004). *Comparative Quantification of Health Risk.* Geneva: World Health Organization.
41. Marlene B. Goldman, ,isiorT accebeR .(2012) . edorxeR .M nyrhtaK*Women and Health.* US: Access Online via Elsevier.
42. Martin P. Simmons, (2008) .retsoF .A namiL. *Sport and Exercise Psychology Research Advances.* US: NOVA Biomedical Books.
43. Marzena Malara, Anna Kęska, Joanna Tkaczyk and Grażyna Lutosławska. (2015). Body shape index versus body mass index as correlates of health risk in young healthy sedentary men. *Journal of Translational Medicine, 13*, 75. doi:10.1186/s12967-015-0426-z
44. Medicine, American College of Sports. (2013). *ACSM's Health-Related Physical Fitness Assessment Manual.* US: Wolters Kluwer Health.
45. Michael L. Malone, MD, ,DM ,ztaK .R luaPezeM yhtaMy. (2013). *The Encyclopedia of Elder Care: The Comprehensive Resource on Geriatric* . UK: Springer Publishing Company.

46. Mo Wang. (2012). *The Oxford Handbook of Retirement.* UK: Oxford University Press.
47. N. A. Garrett et al. (2004). Physical inactivity: direct cost to a health plan. *The American Journal of Preventive Medicine, 27*(4), 304–309.
48. Natalie Digate Muth. (2014). *Sport Nutrition for Health Professionals.* US: F.A. Davis.
49. Nesta Wiggins-James,Rob James. (2005). *AS PE for AQA.* UK: Heinemann.
50. Nick Draper, .(2014) .llahsraM neleH*Exercise Physiology: For Health and Sports Performance.* US: Routledge.
51. Noemie P. Beaulieu. (2008). *Physical Activity and Children: New Research.* USA: Nova.
52. Pate, Russell R., .(2014) .divaD ,renhcuB*Implementing Physical Activity Strategies.* USA: Amazon France.
53. Peter A. Bamberger, .(2014) .hcarahcaB .B leumaS*Retirement and the Hidden Epidemic.* UK: Oxford University Press.
54. Peter D. Le Roux, ,eniveL auhsoJ .(2013) .ekfoK werdnA .W*Monitoring in Neurocritical Care.* US: Elsevier Health Sciences.
55. Q. Ashon, acton. (2012). *Cardiovascular Diseases: Advances in Research and Treatment: 2011 Edition.* US: ebook.
56. Q.Asthon Acton, PhD. (2011). *Issues in Global, Public, Community, and Institutional Health.* USA: General edition.
57. Robert Kail, .(2015) .hguanavaC nhoJ*Human Development: A Life-Span View.* UK: CengageBrain.com.
58. Robert V. Kail, .(2015) .hguanavaC .C nhoJ*Human Development: A Life-Span View.* UK: CengageBrain.com.
59. Ron Meyers. (2003). *Habits of a Highly Effective Christian.* US: XulonPress.com.
60. Ruth Wright, .(2009) .namraguS einoéL*Occupational Therapy and Life Course Development.* US: Wiley.com.
61. SAYERS, S. et al. (1999). Cross-validation of three jump power equations. *Med Sci Sports Exerc, 31*, 572.
62. Sifu Slim. (2015). *The Aging Athlete: Elite Athletes Reveal Their Secrets For Life.* US: The Aging Athlete.com.
63. Skrypnik D.· Bogdański P. · Mądry E. · Karolkiewicz J. · Ratajczak M.· Kryściak J. · Pupek-Musialik D. · Walkowiak J. (2015). Effects of Endurance and Endurance Strength Training on Body Composition and Physical Capacity in Women with Abdominal Obesity. *Obes Facts, 8*(3), 175-187. doi:DOI:10.1159/000431002
64. Stuart Biddle and .(2001) .eirtuM ettenaN*Psychology of Physical Activity.* USA: Psychology Press.
65. Swift DL, Lavie CJ, Johannsen NM, Arena R, Earnest CP, O'Keefe JH, Milani RV, Blair SN, Church TS. (2013). Physical activity, cardiorespiratory fitness, and exercise training in primary and secondary coronary prevention. *Circ J, 77*, 281-292. doi:CrossRef (DOI)
66. Thierry Paillard. (2010). *Optimization of sports performance in judo.* FR: De Boeck Supérieur.
67. Tom Kortemeier, .(2016) .reiemetroK ddoT*Pro Football by the Numbers.* US: Capstone.
68. UTH, N. et al. (2004). Estimation of VO2 max from the ratio between HRmax and HRrest -the Heart Rate Ratio Method. *Eur J Appl Physiol, 91*(1), 111-115.
69. William D. McArdle, ,hctaK .I knarF .(2010) .hctaK .L rotciV*Exercise Physiology: Nutrition, Energy, and Human Performance.* US: Wolters Kluwer Health.
70. William D. McArdle,Frank I. Katch,Victor L. Katch. (2010). *Exercise Physiology: Nutrition, Energy, and Human Performance.* US: Wolters Kluwer Health.
71. Yves C. Vanlandewijck, .(2011) .nospmohT .R retlaW*Handbook of Sports Medicine and Science, The Paralympic Athlete.* US: Wiley.com.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Effect of Strength and Endurance Training on Cardio-Respiratory Endurance

Anurag sachan Dr.Rina Poonia***
Research Scholar, Dept. in Physical Education, JECRC University, Jaipur, Rajasthan.
Associate Prof., Dept. in Physical Education, Manipal University, Jaipur, Rajasthan.

Abstract

The purpose of this present study was to find the effect of strength and endurance trainings on cardio-respiratory endurance. For this purpose, thirty female players from NIMS University, Jaipur representing in various games and sports in the age group of 18 to 26 years were selected. They were divided into three equal groups, each group consisted of ten players, in which group – I underwent strength training, group – II underwent endurance training and group – III acted as control group who did not participate in any special training and underwent their normal respective training sessions. The training period for this study was three days in a week for twelve weeks. Prior to and after the training period the subjects were tested for leg strength and cardio-respiratory endurance. Leg strength was assessed by using dynamometer and Cardio-respiratory endurance was assessed by administering Cooper's 12 minutes walk/run test. The result of the study has shown that the strength training group has significantly improved in cardio-respiratory endurance and endurance training group has significantly improved their cardio-respiratory endurance after twelve weeks of training when compared with the control group.

Keyword: strength, endurance, cardio-respiratory, performance

INTRODUCTION

Human beings have constantly tried to jump higher, run faster and exhibit greater endurance, strength and skill. We are naturally ambitious and competitive of excellence in athletic performance. As a result of practical observation, experience and scientific experimentation, old method of conditioning, though attractive and rich in tradition, have been replaced and discarded by new methods based on approaching and understanding. For centuries, this evaluation towards better methods of conditioning was slow, but in the recent years the affective changes that have taken place have brought about some amazing results in performance. New advances in science make it possible to jump higher and run faster than ever before. Plyometrics is a form of exercise, which links muscles strength with speed of movement. There are two phases of muscular contraction during the running or jumping motion. Muscles go through a stretch phase, and then after a contraction phase. Plyometric exercises are designed to shorten the cycle time between the two phases. A rapid cycle time allows max. energy transfer between contraction phases and stretch plase. The new platform shoes have been shown to dramatically improve the

efficiency of plyometric exercises. Training in platform shoes is increasingly becoming the method of choice for serious jumpers and sprinter. No other method develops as quickly, the specific muscle groups and neural links essential for running, jumping height and speed. Strengthening one's muscles through strength training offers several benefits and makes it easier to do one's daily practice. One can find that carrying your briefcase, doing laundry and hauling groceries becomes easier when chest muscles and one's arm are toned leg strength is very essential for sports persons, especially athletes. The strength of a muscle is related to its cross sectional area or girth. Strength training increased the contractile proteins that give the muscle its pulling power. By comparing strength to act, it is possible to determine if more strength is needed. If an athlete's performance improves with increased strength then strength training is to be suggested. Cardio-respiratory endurance is the ability work done to one's maximum aerobic capacity for a prolonged period of time. To increase one's endurance is depend upon increasing the skill to work at high, relative work load for extended periods of time. (Kaukab Azeem, 2006) revealed that the resistance training is beneficial for athletes and important and part of the athlete's training schedule. Upper body strength is very important and part of the training program for the following sports men and women globally i.e., cricketers, basketball players, boxers, baseball players, wrestlers, judo players, etc. (Arif Ali.K, 2016) Resistance training is the method to use of resistance for muscular contraction to build the strength, anaerobic endurance and size of skeletal muscles.

The purpose of this study was to find out the effect of Effect of Strength and Endurance Training on Cardio-Respiratory Endurance.

METHOD

This study under investigation involves the conducting tests of strength and endurance training on cardio-respiratory endurance. Only thirty female players from various games and sports those who were studying in the NIMS University, Jaipur from various classes and aged between 18 and 26 years were selected as subjects. The selected thirty players were randomly divided into three groups of ten each, out of which group – I (n = 10) underwent strength training, group – II (n = 10) underwent endurance training and group – III (n = 10) remained as control, which did not participate any special activities. The training program was carried out for three days per week during morning session only (6 am to 8 am) for twelve weeks. Leg strength was assessed

by using dynamometer and cardio-respiratory endurance was assessed by administering Cooper's 12 minutes run/walk test. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental groups on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. Since, there were three groups involved, the Scheffé *S* test was applied as post hoc test.

ANALYSIS OF DATA

The data collected prior to and after the experimental periods on leg strength and cardio-respiratory endurance on strength training group, endurance training group and control group were analyses and presented in the following table - I.

Table– I: Analysis of Covariance and 'F' ratio for Cardio-respiratory endurance for Strength Training Group, Endurance Training Group and Control Groups

Variable Name	Group Name	Strength Training Group	Endurance Training Group	Control Group	'F' Ratio
Cardiorespiratory Endurance (Meters)	**Pre-test Mean ± S.D**	1286.3±25.11	1281.9±30.71	1287.6±29.55	1.596
	Post-test Mean ± S.D.	1289.5±26.86	1301.5±28.26	1288.9±27.46	9.213*
	Adj. Post-test Mean	1288.74	1312.66	1286.198	21.923*

* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 27 were 1.596).

Table – II: Scheffé S Test for the Difference Between the Adjusted Post-Test Mean of Selected Criterion Variables Adjusted Post-test Mean on cardio respiratory endurance

Strength Training Group	**Endurance Training Group**	Control group	**Mean Difference**	**Confidence interval at .05 level**
1288.74		1286.198	2.515	18.37256
1288.74	1312.66		23.96*	18.37256
	1312.66	1286.198	26.452*	18.37256

* Significant at .05 level of confidence.

RESULTS

Table – I showed that there was a significant difference among strength training group, endurance training group and control group on cardio-respiratory endurance. Table – II also shows that the Scheffĕ *S* Test for the difference in cardio-respiratory endurance between adjusted post-test mean of strength training group and endurance training group (23.96) and endurance training group and control group (26.452), which were significant at .05 level of confidence. And there was no significant difference between strength training group and control group (2.515) on cardio-respiratory endurance after the training program.

DISCUSSION ON FINDINGS

Based on the results of the study, the following findings were drawn

There was a significant improvement in cardio-respiratory endurance after the endurance training when compared with strength training and control groups. But there was no significant improvement in cardio-respiratory endurance after the strength training. This result is in line with the findings of ***Raja*** (1992) and ***Uppal*** (1980) found that there was a significant improvement in cardio-respiratory endurance after the endurance training.

References

1. Arif Ali.K, (2016), Resistance training: benefits on health & fitness. International Journal of Fitness, Health, Physical Education & Iron Games. Volume: 3, No: 1, Pg. 60.
2. C. Boucher and R.M. Malina, "Genetics of Physical Fitness and Motor Performance", *Exercise and Sports Sciences Reviews*, 11, (1993), 3206. Internet Resources, www.Sales@jumpusa.com
3. Edward G. Mcfarland, *Getting Strong Through Strength Training*, Internet Resource, www. Google.Com.
4. Jack Daniels, Robert Fitts and George Sheehan, *Conditioning for Distance Running*, New York: John Willey and Sons Inc., 1978. www.generalfitness.com
5. Philip J. Rasch and Rogher K. Burkey, *Kinesiology and Applied Anatomy*, 6th Ed., Philadelphia: Lea and Febiger Co., 1978.
6. K. Spanos, L. Karaiskos, E. Zetou and C. Portokalis, "The Effects of Two Strength Training Programs in Maximum Strength and Muscular Endurance of Male Adults", *Physical Training*, August 2007.
7. Hennessay and Watson, "The Interference Effect of Training for Strength and Endurance Simultaneously", *Journal of Strength and Conditioning Research*, 8:1, February 1994.
8. Kaukab Azeem (2016), Resistance training: benefits on health & fitness. International Journal of Fitness, Health, Physical Education & Iron Games. Volume: 3, No: 1, Pg. 60.
9. Kraemer, W.J., S. A. Mazzetti, B. C. Nindl, L. A. Gotshalk, J. S. Volek, J. A. Bush, J. O. Marx, K. Dohi, A.L. Gómez, M. Miles, S. J. Fleck, R. U. Newton, and K. Häkkinen, "Effect of Strength Training on Women's Strength/Power and Occupational Performances", *Med. Sci. Sports Exerc*, 33:6, 2001.
10. Raja, S. Chidambara, "Comparative Analysis of the Effects of Continuous and Interval Running on Cardio-respiratory Endurance", *Unpublished M.Phil., Dissertation*, Rajasthan University, jaipur, 1992.
11. Uppal, Arun Kumar, "Effects of Interval Training and Two Continuous Load Methods on Cardio Respiratory and Selected Physiological Parameters", *Unpublished Doctoral Dissertations*, Jiwaji University, Gwalior, 1980.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Effect Of Ocular Health Status On Perceptual Ability Among Sportspersons

Prof. C.D. Agashe
SoS in Physical Education, Pt. Ravishankar Shukla University, Raipur C.G.

Abstract

Sense of good depth perception is the key to success in many sports. The most important aspect in this relation is good functioning of eyes. In India optometric testing is relatively a new concept hence the present study was conducted to find out the effect of ocular health status on depth perception of male sportspersons. 200 interuniversity male sportspersons (Av. age 23.44 years) who took part in team and individual sports such as basketball, table tennis, badminton, judo, kabaddi and volleyball were selected as sample. To evaluate depth perception, Johnson and Nelson's (1974) depth perception test was used. Ocular health status consists of routine ocular examination for visual acuity, cover-uncover test and asthenopia. All the ophthalmic examinations were performed at All India Institute of Medical Sciences (AIIMS) Raipur Chhattisgarh. Results indicate that binocular depth perception in male sportspersons with normal ocular health status was significantly better as compared to subjects who need ophthalmic corrections due to ocular health problems. It was concluded that regular monitoring of ocular health status of Indian sportspersons is the need of the hour because deficient ocular health status means compromised perception of depth which adversely affect sports performance.

Keywords : Ocular health status, Depth Perception, male sportspersons.

INTRODUCTION

The ability to judge and understand the relative distance between eyes and objects is depth perception. Its main contribution is to make hand eye coordination more meaningful in terms of relative depth. In the second century Roman physicians have recognised the importance of vision in sports performance because in sports, certain perceptual tasks needed to be performed for efficient skill level. Galen, a Roman Physician believed that there is a positive relationship between visual status and performance in certain sports (Hitzemen and Beckerman, 1993).

There are evidences which support the claims of vision playing an important role in the perceptual ability of an athlete relating proportionately to his/her motor response [Strydom and Ferreira, 2010; Elsawy, 2011; Clark et al., 2012; Pires et al., 2014]. Revien & Gabor (1981) stated that visual abilities affect sports performance and the acquisition of motor skills. West &

Bresson (1996) also indicated a positive effect on the performance of cricketers to judge the length of ball after specific visual training program. Hence, it is important for a sportsperson to have optimal ocular health status. The term "ocular" refers to the eye and its organ system. The eyes play an important role in mobility, functional aspect in life. The eye performs the sole task of capturing light. All different parts of the eye system then work together, connecting with neurons that transmit and translate messages directly into the brain that result in visual images. Having good ocular health means "vision is at least 20/20 or better with or without correction and the eyes are disease-free". But apart from normal vision other factors such as ocular media, convergence insufficiency, visual fatigue and many ophthalmic conditions that are important in maintaining a good ocular health.

In this regard, the researcher decided to assess the impact of ocular health status on depth perception of sportspersons.

HYPOTHESIS

Perception of depth among male sportspersons will vary significantly on the basis of their ocular health status.

METHOD

The following methodological steps were taken to conduct the study :

Sample : 200 interuniversity male sportspersons (Av. age 23.44 years) who took part in team and individual sports such as basketball, table tennis, badminton, judo, kabaddi and volleyball were selected as sample. Convenience sampling method was used in the present study to collect the data.

Tools:

Depth Perception:

To evaluate depth perception, **Johnson and Nelson's (1974) depth perception test** was be used. The subject will be asked to sit on a stool of adjustable height in such a position that the observation slight of the box will be in level with his eyes and at such a distance from where he can see the steel rods only against the illuminated while background and no other part inside the box. The research scholar will stand at the side of the box and will move the middle rod towards inner side of the box and slowly the fixed rod (inner to middle) and will ask the subject to indicate when he (subject) feels that the middle rod has come to line with the fixed rods. The

research scholar will note the actual distance from the zero mark. Similarly outer to middle (from illuminated white background side to middle) to rod will be moved and reading will noted. Three trails each from inner to middle and from outer to middle will be given to each subject and the least distance for both sides out of the three trials will be taken as the depth perception score.

Ocular Health Status:

Ocular health of the selected subjects was assessed by Snellen's chart, cover-uncover test, errors of refraction test and asthenopia test respectively. Ocular examination of selected subjects was carried out at AIIMS, Raipur, C.G. Subjects diagnosed with problems such as visual acuity, convergence insufficiency, errors of refraction and visual fatigue were classified as having some or other visual problems.

Procedure:

Ocular examination of the subjects was conducted by ophthalmologist at All India Institute of Medical Sciences, Raipur. Subjects needed ophthalmic corrections due to ocular disorders were separately grouped and rest with normal ocular health status were grouped separately. Johnson and Nelson Depth Perception Test was conducted under the supervision of the researcher. The deviation was recorded. To compare depth perception of subjects with normal ocular health status and subjects who need ophthalmic corrections i.e. deficient ocular health status, independent sample 't' test was used. The result presented in table 1.

RESULT

Table 1, Effect of Ocular Health Status on Depth Perception of Male Sportspersons

Depth Perception	Ocular Health Status				MD	't'
	Sub-normal (N=12)		Normal (N=188)			
	Mean	S.D.	Mean	S.D.		
Perception of Depth (Left Eye)	0.57	0.24	0.49	0.24	0.08	1.14(NS)
Perception of Depth (Right Eye)	0.46	0.30	0.36	0.30	0.09	1.03(NS)
Perception of Depth (Both Eyes)	0.35	0.15	0.15	0.30	0.20	2.38*

* Significant at .05 level

NS Not Significant; t(df=198) at .05 level = 2.01; t(df=198) at .01 level = 2.59

A perusal of entries reported in table no. 1 shows that perception of depth (left eye) between male sportspersons with sub-normal ocular health status (M=0.57) and normal ocular

health status (M=0.49) was not found to differ with each other significantly. The calculated t=1.14 was statistically not significant.

Similarly perception of depth (right eye) between male sportspersons with sub-normal ocular health status (M=0.46) and normal ocular health status (M=0.36) was not found to differ with each other significantly. The calculated t=1.03 was statistically not significant.

A perusal of entries reported in table no. 1 shows that binocular depth perception of male sportspersons with normal ocular health status (M=0.15) was found to be significantly superior as compared to male sportspersons with sub normal or deficient ocular health status (M=0.35).[t=2.38, p<.05]

DISCUSSION

The results of the present study indicate that binocular depth perception in male sportspersons suffering from ocular disorders such as visual acuity, convergence insufficiency, errors of refraction and visual fatigue is compromised. Since all these factors are directly related to visual processing of information, it is quite natural that due to disorders of eye the perceptual ability is compromised.

CONCLUSION

On the basis of results and associated discussion, the researcher came to a conclusion that ocular health status affects perceptual ability of sportspersons. It was also concluded that not only visual acuity but other ocular disorders such as errors of refraction, convergence insufficiency and visual fatigue hinders perceptual ability.

References

1. Clark, J.F.; Ellis, J.K.; Bench, J.; Khoury, J. and Graman, P. (2012) High-Performance Vision Training Improves Batting Statistics for University of Cincinnati Baseball Players. PLoS ONE 7(1): e29109. doi:10.1371/journal.pone.0029109.
2. Elsawy, G.Y. (2011). Eye Movements among Female Taekwondo Players with High and Low Levels. World Journal of Sport Sciences 4 (4): 347-350.
3. Griffiths, G. (2002). Eye speed, motility and athletic potential. Optometry Today, v. 42, p. 34-37.
4. Hitzemen, S. and Beckerman, S. (1993). What the literature says about sports vision. Optometric Clinics, Vol. 3, p. 145-169.
5. Pires, A.; Lobietti, R. and Squatrito, S. (2014). Response time, visual search strategy, and anticipatory skills in volleyball players. Journal of Ophthalmology, 1:1.
6. Revien, L. and Gabor, M. (1981). Sports Vision: Dr. Revien's Eye Exercises for Athletes. New York: Workman Publishing; 1981.
7. Strydom, B. and Ferreira, J.T. (2010). The role of vision and visual skills in archery. S Afr Optom 2010 69(1) 21-28.
8. West, K. L., & Bressan, E. S. (1996) The effect of a general versus specific visual skills training programme on accuracy in judging length-of-ball in cricket. International Journal of Sports Vision, 3, 41–45.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

A Comparative Study of Speed and Agility among High Jumpers and Long Jumpers of Osmania University in India

Prof.J.Prabhakar Rao
President, Indian Federation of Computer Science in Sports
Principal, University College of Physical Education, Osmania University, Hyderabad
Yerraguntla Emmanuel Shashi Kumar
Chairman, Indian Federation of Computer Science in Sports

Abstract

The high jump is a track and field event in which competitors must jump over a horizontal bar placed at measured heights without the aid of certain devices. The fosbury style is main Style in the High jump. The long jump is a track and field event in which athletes combine speed, strength and agility in an attempt to leap as far as possible from a take of point. The Hitch Kick in the main style in long Jump. This Event has been an Olympic medal event since the first modern Olympics in 1896 and has a history in the Ancient Olympic Games. The purpose of the study is to find the speed and agility among High Jumpers and Long Jumpers. The sample for the present study consists of 20 Male High Jumpers and 20 Male Long Jumpers of Osmania University. The 30 M Run is used to assess the Speed and Shuttle Run is used to assess the Agility.The results of the Study shows that Long Jumpers are having good Speed and High Jumpers are having the good Agility. The Long Jumpers generally requires training in a variety of areas. These areas include Speed work, jumping, overdistance running, weight training, plyometric training, bounding and flexibility. The High Jumpers generally requires training to improve the technique, speed work, plyometric training, bounding etc to improve all the motor qualities. Both High Jumpers and Long Jumpers requires good technical and conditioning training to excel in the performance.It is concluded that Long Jumpers are having good speed and High Jumpers are good agility. Coaches must give Coaching to the High Jumpers and Long jumpers to improve their motor qualities to excel in the performance.

Key words: Speed,agility, motor qualities

INTRODUCTION

The High jump is a track and field athletics event in which competitors must jump over a horizontal bar placed at measured heights without the aid of certain devices. In its modern most practiced format, auxiliary weights and mounds have been used for assistance; rules have changed over the years. Over the centuries since, competitors have introduced increasingly more effective techniques to arrive at the current form. Javier Soto mayor(Cuba) is the current men's record holder with a jump of 2.45 m (8 ft 0¼ in) set in 1993, the longest standing record in the history of the men's high jump. Stefka Kostadinova (Bulgaria) has held the women's world record at 2.09 m (6 ft 10¼ in) since 1987, also the longest-held record in the event. The Fosbury Flop is a style used in the athletics event of high jump. It was popularized and perfected by

American athlete Dick Fosbury, whose gold medal in the 1968 Summer Olympics brought it to the world's attention.

The straddle technique was the dominant style in the high jump before the development of the Fosbury Flop. It is a successor of the western roll. Unlike the scissors or flop style of jump, where the jumper approaches the bar so as to take off from the outer foot, the straddle jumper approaches from the opposite side, so as to take off from the inner foot. In this respect the straddle resembles the western roll. However, in the western roll the jumper's side or back faces the bar; in the straddle the jumper crosses the bar face down, with legs straddling it. With this clearance position, the straddle has a mechanical advantage over the western roll, since it is possible to clear a bar that is higher relative to the jumper's center of gravity.

The **long jump** is a track and field event in which athletes combine speed, strength, and agility in an attempt to leap as far as possible from a take off point. This event has a history in the Ancient Olympic Games and has been a modern Olympic event for men since the first Olympics in 1896 and for women since 1948.

Long Jump Styles

The Stride Jump

In the stride jump style the athlete maintains the take off position for as long as possible and only as the athlete comes into land does the take off leg join the free leg for a good landing position.

The Hang Style

On take off the athlete drops the free leg to the vertical, which is then joined by the take off leg. The arms go overhead to slow down the rotation about the athlete's centre of gravity. The legs are then lifted

upwards and forwards whilst lower the trunk. The arms swing past the legs during the landing phase to ensure a good leg shoot.

The Hitch-Kick

Following take off the free leg is straightened and swung back and down as the take off leg folds up beneath the hips and comes forward bent. The take off leg then continues forward, straightening for landing. The free leg completes its backward swing behind the hip and then folds up and moves forwards bent, to join the take off leg ready for landing.

METHOD

AIM: To find out the Speed and agility between Male Long Jumpers and Male High Jumpers of Osmania University, Hyderabad, Telangana, India.

SAMPLE: The sample for present study consists of 20 Male Long Jumpers and 20 Male High jumpers between the age group of 19 to 22 years of Osmania University those who have participated in the O.U.Inter College Athletics Championships.

TOOLS: 30 Meter Run and Shuttle Run is used to collect the data for speed and agility.

30 Meters sprint Test:

Objective:To monitor the development of the athlete's maximum sprint speed.

To undertake this test you will require:

• Flat non-slip surface, Cones and Stopwatch

• Assistant

This test requires the athlete to sprint as fast as possible over 30 metres

• The athlete warms up for 10 minutes

• The assistant marks out a 30 metre straight section with cones

• The athlete starts in their own time and sprints as fast as possible over the 30 metres

• The assistant starts the stopwatch on the athlete's 1st foot strike after starting and stopping the stopwatch as the athlete’s torso crosses the finishing line

• The test is conducted 3 times

• The assistant uses the fastest recorded time to assess the athlete’s performance.

Shuttle Run:

purpose: this is a test of speed and agility, which is important in many sports.

equipment required: wooden blocks, marker cones, measurement tape, stopwatch, non-slip surface.

procedure: This test requires the person to run back and forth between two parallel lines as fast as possible. Set up two lines of cones 30 feet apart or use line markings, and place two blocks of wood or a similar object behind one of the lines. Starting at the line opposite the blocks, on the signal "Ready? Go!" the participant runs to the other line, picks up a block and returns to place it behind the starting line, then returns to pick up the second block, then runs with it back across the line.

Scoring: Two or more trails may be performed, and the quickest time is recorded. Results are recorded to the nearest tenth of a second.

RESULTS AND DISCUSSION

The results of the Study shows that Long Jumpers are having good Speed and High Jumpers are having the good Agility. The Long Jumpers generally requires training in a variety of areas. These areas include Speed work, jumping, overdistance running, weight training, plyometric training, bounding and flexibility. The High Jumpers generally requires training to improve the technique, speed work, plyometric training, bounding etc to improve all the motor qualities. Both High Jumpers and Long Jumpers requires good technical and conditioning training to excel in the performance.

Table 1 :showing the Mean values and Independent Samples Test of 30 M run test for speed between Long Jumpers and High jumpers

Variables	Group	Mean	SD	t	P - Value
30 M Run	Long Jumpers	3.48	0.115	10.62	0.000
	High Jumpers	3.57	0.102		

*Significant at 0.05 level

In Table –I the Mean Values of Long Jumpers is 3.48 and High Jumpers is 3.57. The Standard Deviation of Long Jumpers is 0.115 and High Jumpers is 3.57 and t is 10.62 and P-Value is 0.000.

The Mean values of Long Jumpers are in 30 M Run for Speed 3.48 and High Jumpers is 3.57. The Long Jumpers are good in horizontal running because they have to run 30 M to 40 M Run to do long jump where is the High Jumpers runs upto 15 M in High Jump. Hence Long Jumpers will have better speed compare to High Jumpers.

Table 2 :showing the Mean values and Independent Samples Test of shuttle run test for agility between Long Jumpers and High Jumpers

Variables	Group	Mean	SD	t	P - Value
Shuttle Run	Long Jumpers	15.58	0.21	2.54	0.000
	High Jumpers	14.30	0.57		

*Significant at 0.05 level

In Table –II the Mean Values of Long Jumpers is 15.58 and High Jumpers is 14.30. The Standard Deviation of Long Jumpers is 0.21 and High Jumpers is 0.57 and t is 2.54 and P-Value is 0.000.The Mean values of Long Jumpers are in Shuttle Run is 15.58 and High Jumpers is 14.30. The High Jumpers are having good agility compare to long jumpers because they have to more agile in air and ground to excel in the better performance compare to high jumpers.

CONCLUSIONS

It is concluded that Long Jumpers are having good speed because they have to Run horizontal distance to achieve the speed for Long Jump Performance and High Jumpers are good agility because they have to more agile in air and ground to jump high in high jump. Coaches must give Coaching to the High Jumpers and Long jumpers to improve their motor qualities to excel in the performance.

RECOMMENDATIONS

Similar Studies can be conducted among females and in other events in athletics. This type of studies is useful for preparing the coaching and condition program for improvement of motor qualities among the long jumpers and high jumpers.

Acknowlegements:
I am very thankful to Mr.A.Xavier, Athletics Coach of Osmania Univeristy for his help in accomplishment of the study.

References:
www.brianmac.co.uk
www.topendsports

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Comparison of Selected Biomechanical Variables and Performance of National Level Judokas in Kata Guruma

Dr. R. Chakravarty,
Assistant Professor, Deptt. Of Physical Education, University College of Medical Sciences (University of Delhi), Delhi.
chakravarty.ranjan@gmail.com

Abstract

The purpose of this study was to measure the relationship of selected biomechanical variables to the performance of National level Judokas in kata guruma. The subjects for this study were 60 male judokas who had represented their respective states in national tournaments(12 subjects from each team). Their age ranged from nineteen to twenty five years. All the subjects were right handed throwers. The data was analyzed by use of Ananlysis of Variance and LSD Test. The level of significance chosen to test the hypothesis was .05. None of the selected angular biomechanical (kinematic) variables that is Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) has significant difference also the performance of Judokas in kata guruma. In case of Linear A biomechanical (kinematic) variable that is height of center of gravity at moment contact does not have significant difference in Judokas in kata guruma.
Key Words: Biomechanical, Kinematics, Kata guruma.

INTRODUCTION

Judo (柔道 jūdō?, meaning "gentle way") is a modern martial art, combat and Olympic sport created in Japan in 1882 by Jigoro Kano (嘉納治五郎). Its most prominent feature is its competitive element, where the objective is to either throw or takedown an opponent to the ground, immobilize or otherwise subdue an opponent with a pin, or force an opponent to submit with a joint lock or a choke. Strikes and thrusts by hands and feet as well as weapons defenses are a part of judo, but only in pre-arranged forms (kata, 形) and are not allowed in judo competition or free practice (randori, 乱取り). A judo practitioner is called a judoka.

The philosophy and subsequent pedagogy developed for judo became the model for other modern Japanese martial arts that developed from koryū (古流?, traditional schools). The worldwide spread of judo has led to the development of a number of offshoots such as Sambo and Brazilian jiu-jitsu.

The early history of judo is inseparable from its founder, Japanese polymath and educator Jigoro Kano (嘉納 治五郎 Kanō Jigorō, 1860–1938), born Shinnosuke Kano (嘉納 新之助 Kanō Shinnosuke). Kano was born into a relatively affluent family. His father, Jirosaku, was the second son of the head priest of the Shinto Hiyoshi shrine in Shiga Prefecture. He married Sadako Kano, daughter of the owner of Kiku-Masamune sake brewing company and was adopted by the family, changing his name to Kano, and ultimately became an official in the Shogunal government.[1]

The role that sports biomechanics can play is becoming more widely understood in sports community and the demand for service increasing, researchers in sports biomechanics will have to consider carefully how much time they can devote to the provision of scientific services without impairing their performance as scholar researchers. To develop programmers of study for the training of techniques in sports biomechanics, technicians who can provide the kind of services sought by sporting bodies.

In order to analyze the techniques o sports and games, photographic methods is probably the most popular methods. Although this is not a recent development, photography was formally limited to the filming of few sports only. It is now being applied to many sports at an increasing rate.

Recently videotapes have begun to replace conventional motion pictures for teaching and coaching purpose. Since videotape is erasable reusable and does not require any developing. It is more economical than film. The relatively inexpensive recorders are simple to operate and permit immediate play back.

Biomechanics and Judokas in kata guruma practices described by some of the authors are as follows: -

Biomechanics

1. A branch of physics concerns with the description of the motion of objects without considering the forces that causes or result from the motions. It is a study of motion that aims to provide a description of the spatial position of points in moving bodies. For the purpose of this study Biomechanical variables were represented by the selected angles of the various joints of human body and height of center of gravity at moment contact.

Kinematics

1. Kinematics will be represented by the selected angles of the various joints of human body and height of center of gravity at selected moment.

Kata Guruma

Kata guruma (肩車) is one of the traditional forty throws of Judo as developed by Kano Jigoro.Kata guruma belongs to the third group of the traditional throwing list in the Gokyo no

[1] Daigo, Toshiro (2005), Kodokan Judo Throwing Techniques, Tokyo, Japan: Kodansha International

waza of the Kodokan Judo. It is also part of the current 67 Throws of Kodokan Judo. Because the technique is not a sweep nor a trip and requires tori to pull uke into a carry, it is categorized as a hand throwing technique (tewaza).

METHOD

The subjects for this study were 48 male Judokas who had represented there respective states in National Judo tournaments. Four teams were selected for this study namely: Uttar Pradesh, Uttarakhand, Delhi and Haryana (12 subjects from each team).There age ranged from Nineteen to Twenty Five years.

All the subjects were right handed Throwers.ollowing were the Kinematic variables which were constituted in the study: The selected kinematical variables were divided in two parts i.e.

a) Linear Kinematic Variable were:

i. Height of Center of Gravity at moment release.

b) Angular Kinematic Variables were represented by the angles at selected joints i.e.

i. Ankle joints
ii. Knee joints
iii. Hip joints

The scholar developed stick figures on the photographs, from which selected kinematical variables were calculated. The stick figures were developed by using Joint-point method. The center of gravity of each subject, at one selected moment.

Procedure for Location of Center of Gravity

The center of gravity of the body at moment release was determined by use of segmentation method.

ANALYSIS OF DATA AND RESULTS OF THE STUDY

The data was analyzed by use of Analysis of Variance and LSD Test. The level of significance chosen to test the hypothesis was .05 and are presented in Table-I, Table-II, Table-III, Table-IV.

Table-I
Analysis of Variance of the Mean Difference of the Four Groups for Height of Centre of Gravity at Moment Contact

Source of Variance	df	Sum of Square	Mean Sum of Square	'F' Ratio
Between Groups	3	3731	1243.06	9.48*
Within Groups	44	6295.92	131.66	

*Significant at .05 level.
F.05 (3, 44) = 2.82

It is evident from Table – I that variability exists among the four groups with respect to criterion variable namely Height of Centre of Gravity at moment contact. As each player has his own reach as per the flexibility of the groin muscle and leg length so the difference in the Centre of Gravity at moment contact must have been there.

Since there is significant difference in the result of 'One Way Analysis of Variance' therefore Post Hoc (LSD) test was applied to find out which of the mean difference amongst the group were statistically significant. The data relating to this is presented in Table -II.

Table-II
Least Significant Difference Post Hoc Test for Mean of the Four Groups for Height of Centre of Gravity at Moment Contact

Uttar Pradesh	Delhi	Uttaranchal	Haryana	M. D.	C. D.
	188.72		185.20	-3.52*	
		183.15	185.20	-2.05*	
166			185.20	-19.2*	0.2282
	188.72	183.15		-5.57*	
166		183.15		-17.15*	

*Significant at .05 level.

The above table **II** shows that there was significant difference between the means of Delhi and Haryana Under-1 9 teams in which as per the terms of means Delhi Judokaswas found to be superior.

Significant difference was also found between the means of Uttaranchal and Haryana Judokas in which as per the terms of means Haryana Judokaswas found to be superior. Significant difference was also found between the means of Uttar Pradesh and Haryana Judokas in which as per the terms of means Haryana Judokaswas found to be superior. Table – 4.26 also reveals that difference was found between the means of Delhi and Uttaranchal Judokasas per the means the Delhi Judokaswas found to be superior. Significant difference was also found between the means of Uttar Pradesh and Uttaranchal Judokas in which as per the terms of means Uttaranchal Judokaswas found to be superior. Difference between the means of four groups is shown in Fig. -1.

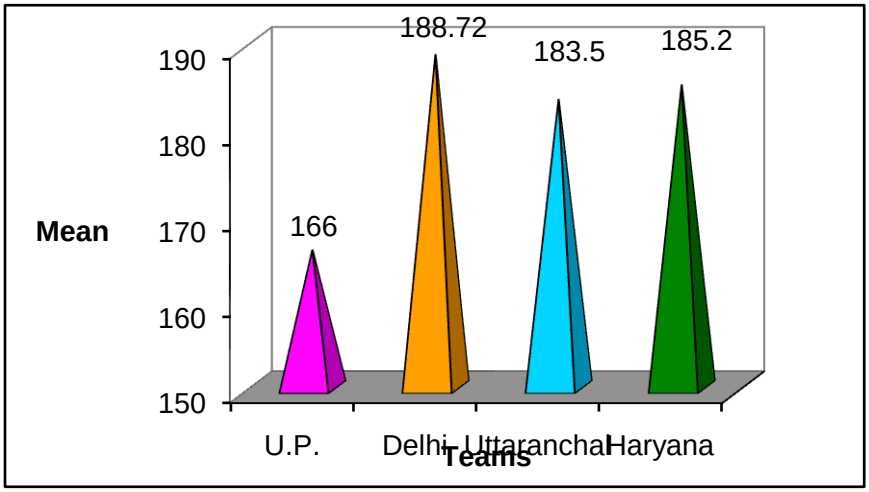


Fig.1 Bar Diagram Representing Means for Four Judokas for Height of Centre of Gravity at Moment contact

All the teams were compared to find out the effect of the variables on them on the basis the selected kinematic variables, and performance in kata guruma. One way Analysis of Variance and Least Significant Difference Test (LSD) was used to compare the groups on the basis of kinematic variables as the ankle of the joints play a vital role in performing a skill and the more is the range of the joint the better would be performance so the researcher has made an attempt to compare the four groups on the basis of the angular kinematic variables namely ankle joint which is presented in Table-III.

TABLE-III

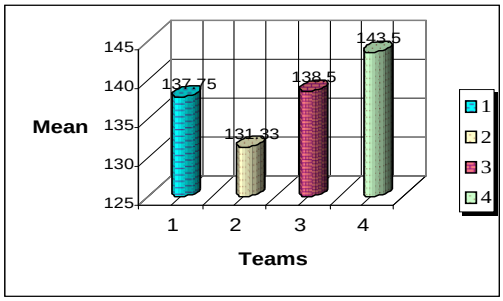
ANALYSIS OF VARIANCE OF THE MEAN DIFFERENCE OF THE FOUR GROUPS FOR ANKLE JOINT (LEFT)

Source of Variance	df	Sum of Square	Mean Sum of Square	'F' Ratio
Between Groups	3	897.56	244.18	0.2847
Within Groups	44	1668.41	378.84	

It is evident from Table -4.9 that variability does not exists among the four teams with respect to criterion variable namely ankle joint(left).This must be because most of the players tend to keep there ankle in the same position at the execution of the kata guruma.

Since there is no significant difference in the result of 'one way analysis of variance' therefore post hoc (LSD) test was not applied to but some difference was found in there means respective means which is depicted in Fig.2.

Fig.2 Bar Diagram Representing Means for Four Teams for Left Ankle Joint



One way Analysis of Variance and Least Significant Difference Test (LSD) was used to compare the groups on the basis of kinematic variables as the ankle of the joints play a vital role in performing a skill and the more is the range of the joint the better would be performance so the researcher has made an attempt to compare the four groups on the basis of the angular kinematic variables namely ankle joint which is presented in Table-III.

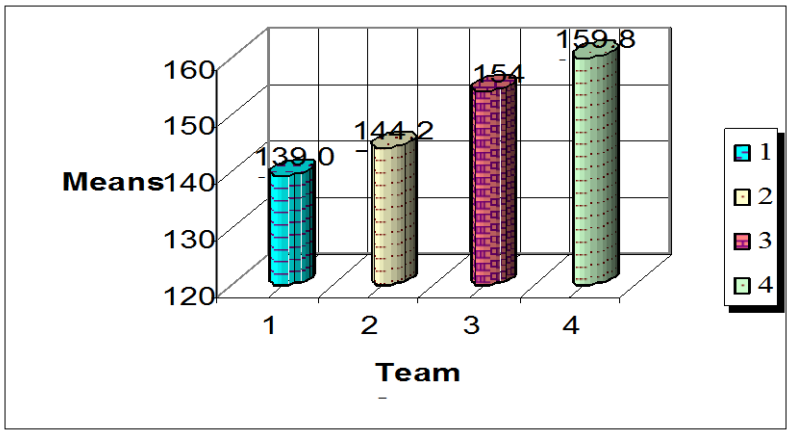
TABLE-III, ANALYSIS OF VARIANCE OF THE MEAN DIFFERENCE **OF THE FOUR GROUPS FOR ANKLE JOINT (RIGHT)**

Source of Variance	**df**	**Sum of Square**	**Mean Sum of Square**	**'F' Ratio**
Between Groups	3	897.56	244.18	1.65
Within Groups	44	1668.41	378.84	

It is evident from Table -III that variability does not exists among the four teams with respect to criterion variable namely ankle joint(right).This must be because most of the players tend to keep there ankle in the same position at the execution of the kata guruma.

Since there is no significant difference in the result of 'one way analysis of variance' therefore post hoc (LSD) test was not applied to but some difference was found in there means respective means which is depicted in Fig.3.

Fig.3 Bar Diagram Representing Means for Four Teams for Right Ankle Joint



One way Analysis of Variance and Least Significant Difference Test (LSD) was used to compare the groups on the basis of kinematic variables as the ankle of the joints play a vital role in performing a skill and the more is the range of the joint the better would be performance so

the researcher has made an attempt to compare the four groups on the basis of the angular kinematic variables namely knee joint which is presented in Table-IV.

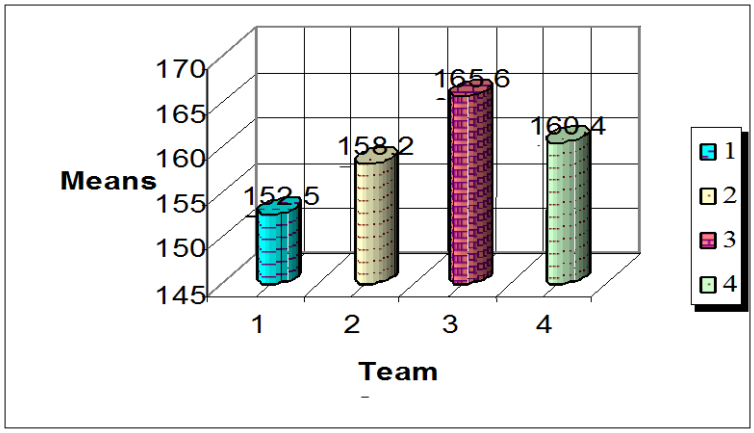
TABLE-IV, ANALYSIS OF VARIANCE OF THE MEAN DIFFERENCE
OF THE FOUR GROUPS FOR KNEE JOINT (RIGHT)

Source of Variance	df	Sum of Square	Mean Sum of Square	'F' Ratio
Between Groups	3	1059.89	353.9	1.66
Within Groups	44	9337.41	212.1	

It is evident from Table -IV that variability does not exists among the four teams with respect to criterion variable namely knee joint(right).This must be because most of the players tend to keep there knee in the same position at the execution of the kata guruma.

Since there is no significant difference in the result of 'one way analysis of variance' therefore post hoc (LSD) test was not applied to but some difference was found in there means respective means which is depicted in Fig.4.

Fig.4 Bar Diagram Representing Means for Four Teams for Right Knee Joint



One way Analysis of Variance and Least Significant Difference Test (LSD) was used to compare the groups on the basis of kinematic variables as the angle of the joints play a vital role in performing a skill and the more is the range of the joint the better would be performance so the researcher has made an attempt to compare the four groups on the basis of the angular kinematic variables namely knee joint which is presented in Table-V.

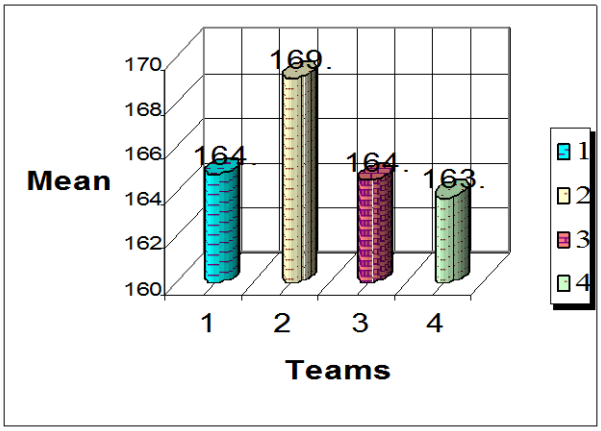
TABLE-V, ANALYSIS OF VARIANCE OF THE MEAN DIFFERENCE
OF THE FOUR GROUPS FOR KNEE JOINT (LEFT)

Source of Variance	df	Sum of Square	Mean Sum of Square	'F' Ratio
Between Groups	3	206.06	68.68	0.44
Within Groups	44	6943.87	153.73	

It is evident from Table -V that variability does not exists among the four teams with respect to criterion variable namely knee joint(left).This must be because most of the players tend to keep there knee in the same position at the execution of the kata guruma.

Since there is no significant difference in the result of 'one way analysis of variance' therefore post hoc (LSD) test was not applied to but some difference was found in there means respective means which is depicted in Fig.5.

Fig.5 Bar Diagram Representing Means for Four Teams for Left Knee Joint



One way Analysis of Variance and Least Significant Difference Test (LSD) was used to compare the groups on the basis of kinematic variables as the angle of the joints play a vital role in performing a skill and the more is the range of the joint the better would be performance so the researcher has made an attempt to compare the four groups on the basis of the angular kinematic variables namely hip joint which is presented in Table-VI.

TABLE-VI, ANALYSIS OF VARIANCE OF THE MEAN DIFFERENCE

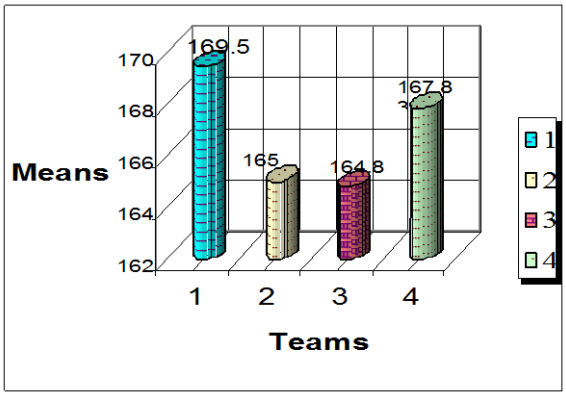
OF THE FOUR GROUPS FOR HIP JOINT (RIGHT)

Source of Variance	df	Sum of Square	Mean Sum of Square	'F' Ratio
Between Groups	3	181.83	60.61	0.33
Within Groups	44	8082.03	183.70	

It is evident from Table -VI that variability does not exists among the four teams with respect to criterion variable namely hip joint(right).This must be because most of the players have there hip in the same position at the execution of the kata guruma.

Since there is no significant difference in the result of 'one way analysis of variance' therefore post hoc (LSD) test was not applied to but some difference was found in there means respective means which is depicted in Fig.6.

Fig.6 Bar Diagram Representing Means for Four Teams for Right Hip Joint



DISCUSSION OF FINDINGS

a. No variation was found between the groups in case of all the Judokas in terms of their performance in Kata guruma but the mean of the performance of Haryana was a little high than the other teams. As the performance of the Judokas is more or less the same but in this age of cut throat competition even a little difference can win or lose matches but the skill tested was under controlled conditions and was also one in number so if a detailed study on each and every skill (Hook Shot, Pool Shot, Drive Shot etc.) may be done difference can found.

b. No variation was found between the Judokas in terms of their Angular Kinematic Variables Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Left), and Hip Joint (Left and Right) apart from right wrist joint and Height of Centre of Gravity at moment contact which was the highest in case of Uttar Pradesh Under-19 state team. No significant difference was found between the means of Uttar Pradesh and Haryana, Delhi and Haryana, Uttaranchal and Haryana but the means of the Uttar Pradesh and Delhi, Delhi and Uttaranchal were found to be statistically significant as per the LSD test implemented which showed the mean difference 13.91 in case of Uttar Pradesh and Haryana,8.08 in case of Delhi and Haryana and 8.41 in case of the means of Uttar Pradesh and Haryana , Delhi and Haryana, Uttaranchal which was higher than the tabulated value of 3.59.The analysis of data clearly reveals that the Uttar Pradesh and the Uttaranchal Under-19 State team are better in terms of right Wrist Angle. In case of Height of The Center of Gravity the following state teams differed Uttar Pradesh and the Delhi State team as the mean difference was 22.49, Uttar Pradesh and Uttaranchal Under-19 State team which was 15.34, Uttar Pradesh and Haryana was 16.62 which was higher than the tabulated value of 3.59 hence it could be said that Delhi and Uttaranchal Under-19 State team was better in terms of Height of Center of Gravity at moment contact.

CONCLUSIONS

1. No variation was found between the groups in case of all the National Teams in terms of their performance in Kata guruma but the mean of the performance of Haryana was a little high than the other Judokas.

2. No variation was found between the Judokas in terms of their Angular Kinematic variables Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Left), and Hip Joint (Left and Right) apart from right wrist joint and Height of Centre of Gravity at moment contact which was the highest in case of Uttar Pradesh Under-19 state team. No significant difference was found between the means of Uttar Pradesh and Haryana , Delhi and Haryana, Uttaranchal and Haryana but the means of the Uttar Pradesh and Delhi, Delhi and Uttaranchal were found to be statistically significant as per the LSD test implemented which showed the mean difference 13.91 in case of Uttar Pradesh and Haryana,8.08 in case of Delhi and Haryana and 8.41 in case of the means of Uttar Pradesh and Haryana, Delhi and Haryana, Uttaranchal which was higher than the tabulated value of 3.59.The analysis of data clearly reveals that the Uttar Pradesh and the Uttaranchal Under-19 State team are better in terms of Right Wrist angle. In case of Height of the Center of Gravity the following state teams differed Uttar Pradesh and the Delhi Under-19 State team as the mean difference was 22.49, Uttar Pradesh and Uttaranchal State team which was 15.34, Uttar Pradesh and Haryana was 16.62 which was higher than the tabulated value of 3.59 hence it could be said that Delhi and Uttaranchal Under-19 State team was better in terms of Height of Center of Gravity at moment contact.

References

Book

1. Birley Derek, **A Social History of English Cricket**, (London: Aurum Press Ltd., New edition, 1999).
2. Bunn, John W. **Scientific Principles of Coaching**, New York: Prentice Hall, Englewood Cliffs, 1972.
3. Clarke, David H. and Clarke, H. Harrison, **Research Process in Physical Education** IInd Ed. New York: Prentice Hall, Englewood Cliffs, 1984.
4. Gerrett, Henry E. **Statistics in Psychology and Education**, Bombay: Vakils Feffer and Simons Ltd. 1981.
5. Kamlesh M.L, **Sports & Games,** (New Delhi: Nageen Prakashan, 2006-07).
6. Miller,Doris I. And Nelson, Richard C. **Biomechanics of Sports**, Philadelphia: ea and Febiger, 1973.
7. Syal Meenu, **Teach Yourself Cricket,** (New Delhi: Prerna Prakashan, 2004).

Journals and Periodicals

1. Ginnis, Mc. And Richard, A. "A Kinematical Analysis of a One Hand Jump-shot in Basketball, **Completed Research in Health, Physical Education and Recreation** 19 (1977): 254.
2. Hudron, Jackie, "Cinematographic Analysis of the Basketball One Handed Free Throw." **Abstracts of Research** Papers (1980): 30.
3. Hay, James G., The Biomechanics of Sports Technique, Englewood Cliffs, N.J.: Prentice Hall Inc., 1985. Ranson Craig A. & Burnett Angus F., "The relationship between bowling action classification and three-dimensional lower trunk motion in fast bowlers in cricket". **Journal of Sports Sciences,** Vol. 26, Is. 3, (Jan. 2008).
4. Karayanne, "The Bio-mechanics of Triple Jump", **Track and Field Quarterly Review**, Vol. 87, (Spring1987).
5. Kellis E. & Liassou C., "The effect of selective muscle fatigue on sagittal lower limb kinematics and muscle activity during level running", **Journal Orthop Sports Phys Therapy**, Vol. 39, No. 3, (Mar. 2009).
6. Kellis, Eleftherios, Katis, Athanasios, "Biomechanical characteristics and determinants of instep soccer kick", **Journal of Sports Science and Medicine**, Vol. 1, (Jun 2007).
7. Kirten Ronald F., "An introduction to Sports Photography", Athletic Journal, Vol. 52, No. 6, (Feb. 1972).
8. Laurence Chéze, "Comparison of different calculations of three-dimensional joint kinematics from video-based system data**", Journal of Biomechanics**, Vol. 33, Iss.12, (Dec. 2000).
9. Laurence Hort E., "A Comparative Study of Selection handball Techniques", **Research Quarterly**, Vol. 40, No. 4, (Dec.1969).
10. Lawrenee Casico T., "A Cinematographical Analysis Comparing Approach Velocity of Pole Vaulters Using Horizontal and Vertical Pole Carries", **Completed Research in Health, Physical Education and Recreation**, Vol. 79, (1978).

11. Lloyd D.G., Alderson J.A. & Elliotta B.C., "An upper limb kinematic model for the examination of cricket bowling: A case study of Mutiah Muralitharan", **Journal of Sports Sciences**, Vol.18, Is. 12, (Dec.2000).
12. Loram L.C., McKinon W. & Wormgoor S., "Determinants of ball release speed in schoolboy fast-medium bowlers in cricket", **Journal Sports Medicine Physical Fitness.** Vol. 45, No. 4, (Dec. 2005).
13. Marshall K.W. & Marshall D.L., "Osteochondral lesions of the humeral trochlea in the young athlete", **Springer,** Vol. 38, No. 5, (May 2009).
14. Mccaw, Cerullo Steven T. & James F, "Prophylactic ankle stabilizers affect ankle joint kinematics during drop landings", **Medicine & Science in Sports & Exercise,** Vol. 31, Is. 5, (May 1999).
15. Stidwilla T**.** J., Pearsalla David & Turcotte Rene, **"Comparison of skating kinetics and kinematics on ice and on a synthetic surface", Sports Biomechanics,** Vol. 9, Iss. 1, (Mar. 2010).
16. Wagner Herbert, Buchecker Michael, Serge P., Duvillard Don, Müller Erich, "Kinematic description of elite vs. low level players in team-handball jump throw", **Journal of Sports Science and Medicine,** Vol. 9, (2010).

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Effect of Strength Training for development of Performance in Shot Put Throwers of Hyderabad District in India

Prof.Rajesh Kumar
Secretary, Board of Control, Inter University Tournaments
Department of Physical Education
Osmania University, Hyderabad, Telangana

Abstract

The Purpose of this study is to find out the effect of Strength Training exercises for development of Shot Put throwing ability among Shot put throwers of Hyderabad in India. The Sample for the Study consisted of 20 Male shot-put throwers of Hyderabad District between the age group of 18-21 Years, 10 participants were in the Experimental Group and 10 are Control group. Strength training exercises are given three times a week for eight weeks for experimental group and controlled group were given general training of Shot Put. Pre Test and Post Test were conducted on Shot Put throw with technique of the Shot Putters. It is concluded that due to the Strength training that Shot Put Performance has been improved among shot put throwers. It is recommended that similar studies can be conducted on other events in Athletics.

Key words: Strength Training, shot put, speed, agility etc.

INTRODUCTION

Strength training is a type of physical exercise specializing in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of muscles. When properly performed, strength training can provide significant functional benefits and improvement in overall health and well-being, including increased bone, muscle, tendon and ligament strength and toughness, improved joint function, reduced potential for injury, increased bone density, increased metabolism, increased fitness, improved cardiac function, and improved lipoprotein lipid profiles, including elevated HDL cholesterol. Training commonly uses the technique of progressively increasing the force output of the muscle through incremental weight increases and uses a variety of exercises and types of equipment to target specific muscle groups. Strength training is primarily an anaerobic activity, although some proponents have adapted it to provide the benefits of aerobic exercise through training. Sports where strength training is central are bodybuilding, weightlifting, powerlifting, strongman, Highland games, shotput, discus throw, and javelin throw. Many other sports use strength training as part of their training regimen, notably American football, wrestling, track and field, rowing, lacrosse, basketball, pole dancing, hockey, professional wrestling,rugby union, rugby league and soccer. Strength training for other sports and physical activities is becoming increasingly popular. (Kaukab Azeem, 2013), revealed that the muscular strength includes a variety of training modalities, including body weight exercises, elastic bands, plyometric exercises for (upper and lower body), multi machines, free weight machines and hydraulic machines. (K.Azeem, et.al 2006) stated that the resistance training is beneficial for athletes and important and part of the athlete's training program. Upper body strength is very important and part of the training program for the

following sports men and women globally i.e., cricketers, basketball players, boxers, baseball players, wrestlers, judo players, etc.

METHOD

The sample for the present study consists of 20 Male Shot Put Throwers out of which 10 are experimental group and 10 are controlled group between the age group of 18-21 Years.Strength training exercises are given Three times a week for eight weeks for experimental group and controlled group were given general training of shot put.

The following are the strength training exercises were given three times a week for eight weeks to the experimental group of shot put throwers, Weight Training Exercises, Circuit Training, Plyometric Training. The Training is given as per the requirement in the three sessions in a week. The controlled group were given general training of Shot put

To assess the Performance the Performance of the shotput throwers. The Throwers has given best of six chances to throw with full Technique in Pre Test and Post Test.

RESULTS AND DISCUSSION

The results of the study shows that Shot Put Throwers of Experimental group has increased in Performance due to strength Training compare to shot put Throwers Control group which does the general training of shot put throw.

Mean values & Independent Samples Test of shot put between experimental & control groups

Variables	Group	Pre Test Mean ± SD	Post Test Mean ± SD	T	P - Value
Shot Put Test With full technique	Experimental	13.12±1.26	13.40±1.23	1.22	0.231
	Control	13.06±1.22	12.95±1.20		

*Significant at 0.05

The Mean Performance of Experimental Shot Put Group is 13.12 in Pre Test and it is improved to 13.40 in the Post Test due to the effect of Strength Training. The Mean Performance of the Control Group in Pre Test is 13.06 it has slightly reduced to 12.95 in the Post Test.

CONCLUSIONS

It is concluded that due to the Strength Training the Performance among the Shot Put Throwers has increased.

RECOMMENDATIONS

It is recommended that similar studies can be conducted on other events in athletics and also female Shot Put throwers. This type of study is useful to coaches to give proper coaching for development of motor qualities for improvement of performance among Throwers.

References

1. Asian Journal of Physical Education and computer science in sports.
2. International Journal of Health, Physical Education and Computer Science in sports
3. Kaukab Azeem (2013), Resistance Training: Benefits on Health & Fitness. International Journal of Fitness, Health, Physical Education & Iron Games. Volume: 3, No: 1, pg. 60
4. K. Azeem (2016), Resistance Training: Benefits on Health & Fitness. International Journal of Fitness, Health, Physical Education & Iron Games. Volume: 3, No: 1, pg. 60
5. Wikipaedia, Weight Training, Strength Training
6. Wikipaedia, Shot Put Throwers.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Effect of Circuit Training for development of Endurance among Net Ball Players of Osmania University

Prof. Loka Bavoji Laxmikanth Rathod
Prnicipal PG college of Physical Education, Osmania University, Hyderabad, India
Dr.K.Deepla
Chairmen Board of studies, Osmania University Hyderabad, India

Abstract

The purpose of this present study was to find out the effect of circuit training for the development of Endurance among net ball players. The sample for the present study consists of 20 Male Boxers of Osmania University out of which 10 are experimental group and 10 are controlled group.. The circuit training comprises of 6 to 10 strength exercises that are completed one exercise after another such as squat jumps, medicine ball throws, sit-ups, steps ups, hopping shuttles, skipping, sit-ups etc were given to experimental group on alternate days i.e. three sessions per week and controlled group were given the general training for six weeks. Pre Test and Post Test were conducted in 12 Min Run cooper test to measure the endurance among experimental group and controlled group .This study shows that due to the Circuit training there is a improvement of experimental group in endurance and controlled group is decreased in performance in endurance.. It is concluded that due to circuit training there will be improvement in endurance among Net ball Players.

Key Words: Circuit training, net ball, endurance, performance

INTRODUCTION

Circuit training is a form of body conditioning or resistance training using high-intensity aerobics. It targets strength building and muscular endurance. An exercise "circuit" is one completion of all prescribed exercises in the program. When one circuit is complete, one begins the first exercise again for the next circuit. Traditionally, the time between exercises in circuit training is short, often with rapid movement to the next exercise.The program was developed by R.E. Morgan and G.T. Anderson in 1953 at the University of Leeds in England

Circuit training provides a format that allows boxers to condition themselves physically, as well as focus on the development of specific skills. Circuits can focus on development of endurance, speed or power. Focus on one skill or combine various exercises to cover them all in a single circuit to become a better conditioned boxer.

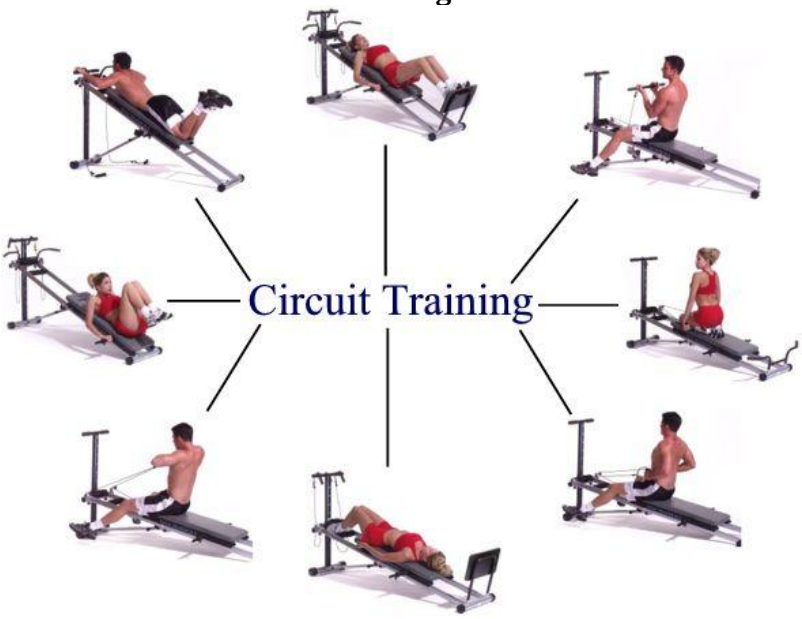
Boxing requires anaerobic bursts of energy but also requires the staying power needed to remain strong and effective through a full 12 rounds if necessary. Circuit training for endurance can be a simple combination of bag work and running. Start with a three-minute round on the heavy bag. Instead of taking a rest period, take yourself outside or get on the treadmill and run a quarter mile at a steady pace. Continue alternating between bag work and running, with no rest in between, for a full nine rounds.

METHOD

The purpose of the present study to find out the effect of circuit training for the development of endurance among Net ball Players of Osmania University. The sample for the present study consists of 20 Male Net Ball Players of Osmania University out of which 10 are experimental group and 10 are controlled group.

The circuit training comprises of 6 to 10 strength exercises that are completed one exercise after another such as squat jumps, medicine ball throws, sit-ups, steps ups, hopping shuttles, skipping, situps etcwere given to experimental group on alternate days i.e. three sessions per week and controlled group were given the general training for six weeks. Pre Test and Post Test were conducted in 12 Min Run cooper test to measure the endurance among experimental group and controlled group .

Circuit Traing Format



RESULT

This study shows that due to the Circuit training there is a improvement of experimental group in endurance and controlled group is decreased in performance in endurance to less levels due to the general training.

Table I: Showing the Mean values of Experimental Group Net Ball Players and Control Group Net ball Players in 12 Min Run Cooper Test in Pre Test and Post Test

12 Min Run Cooper Test	N	Pre test	Post test	t	Sig.
Experimental group Net Ball Players	10	2654.50	2805	3.35	0.004
Control group Net Ball Players	10	2647.50	2640		

The Mean Values of Experimental Group Net Ball Players is 2654.50 in Pre Test and Post Test is 2805 in 12 Min Run Cooper Test. There is a improvement of Experimental group from 2654.50 to 2805 due to the Circuit Training.
The Mean Values of Control Group Net ball Players is 2647.50 in Pre Test and Post Test is 2640 in 12 Min Run Cooper Test. There is a slight decrease in mean values of control group from 2647.50 to 2640 due to the general Training

CONCLUSION

It is concluded that due to Circuit Training there is a improvement of endurance among Net Ball Players.Fitness Components of Speed is not always expressed in straight lines- not just driving forward.Netball involves many changes in pace and direction and it involves more endurance to play longer time efficiently.

RECOMMENDATIONS

Similar Studies can be conducted on Women Net Ball Players and other sports and games. The Coaches can include the circuit training in their physical conditioning programs to improve the endurance among the Boxers.

References

Wikipaedia, Net ball
https://prezi.com/yuwdql9trvuv/fitness-components-of-netball

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Influence of Plyometric Training in enhancement of Shoulder Strength and Speed Performance among Judokas

Seemab Azeem
Lecturer,Physical Education Department,
Hyderabad Presidency PG college, Hyderabad, India
Dr.Syed Asifuddin
Assitant Prof Department of Physical Education
Acharya Nagarjuna University, Ongole Campus, Ongole, India

Abstract

The purpose of this present study was to find out the influence of plyometric training in enhancement of shoulder strength and speed performance among judokas. Plyometric exercise are important component for Judokas to obtaining the maximal strength, speed and force during the Judo event and should be included in all form of conditioning programs of Judokas. The sample size for this present study consists of 20 Male Judokas of Osmania University out of which 10 are experimental group and 10 are controlled group. Plyometric exercises such as hopping, bounding, depth jumps, tuck jumps, Push-ups and etc were given to experimental group on alternate days i.e. three training sessions per week and controlled group were given the general training for six weeks. Pre Test and Post Test were employed in Pull ups to measure the shoulder strength and 30 M Run to measure the speed among experimental group and controlled group. This study shows that due to the plyometric training there is a improvement of experimental group in the Shoulder strength and Speed and controlled group is decreased in performance of shoulder strength and speed. Judokas is all about explosive power. Explosive power is a combination of speed, muscular endurance and muscular strength, all of which can be developed through plyometric exercises. It is concluded that the influence of plyometric exercises had shows a significant improvement in shoulder strength and speed among Judokas.

Key Words: Performnce, plyometric exercises, judokas, fitness,

INTRODUCTION

Plyometric exercises are a vital component for Judokas for obtaining the maximal strength, speed and force during the Judo event and should be included in any conditioning program of Judokas. Successful Judokas are athletic, technically sound and tactical savvy in the ring. Spending long hours in the gym makes you more technical and tactical. With an effective workout routing and the right training, your coordination, quickness and explosiveness should improve through Plyometric training

Plyometric train your nervous system to trigger quick, Powerful muscle contractions, workouts include high intensity exercises that emphasize short bursts of energy. Judokas a sport that requires explosive and powerful movements for an athlete to succeed. Plyometrics mimics the physical demands of a fight and will train your body to move more quickly and explosively. When completing plyometric exercises, they must be done in short bursts at the highest intensity possible, then take a brief rest before moving to the next set or exercise

Judo is a modern martial art, combat and Olympic sport created in Japan in 1882 by Jigoro Kano. Its most prominent feature is its competitive element, where the objective is to either throw or takedown an opponent to the ground, immobilize or otherwise subdue an opponent with a pin, or force an opponent to submit with a joint lock or a choke.Strikes and thrusts by hands and feet as well as weapons defenses are a part of judo, but only in pre-arranged forms and are not allowed in judo competition or free practice judo practitioner is called a **judoka**.

The philosophy and subsequent pedagogy developed for judo became the model for other modern Japanese martial arts that developed from traditional schools. The worldwide spread of judo has led to the development of a number of offshoots such as Sambo and Brazilian jiu-jitsu.

Judokas in action

Fitness is a very important in the success of a Judokas. Judokas need excellent levels stamina, speed, agility and power. In order to improve as a judo player you should be testing and monitoring your fitness levels and adjusting your training so you can fully reach your potential.

The purpose of the present study to find out the effect of plyometric exercises for the development of Shoulder strength and speed among Judokas.

METHOD

The sample for this present study consists of 20 Male Judokas of Osmania University out of which 10 participants were in the experimental group and 10 are controlled group. Plyometric exercises such as Push -ups, medicine Ball Throws, Hopping, Bounding, Tuck Jumps, Box Jumps, dumbell throws etc were given to experimental group on alternate days i.e. three sessions per week and controlled group were given the general training for six weeks. Pre Test and Post test were conducted in Pull ups to measure the shoulder strength and 30M sprint to measure the speed among experimental group and controlled group. The Judo Player weight categories are from 50 kg to 80 Kgs.

RESULT

This results of the study shows that due to the plyometric training there is a improvement of experimental group in the Shoulder strength and speed and controlled group is decreased in performance of shoulder strength and speed due to the general training.

Table I, Mean values of 30 M run test between experimental and control groups of Judokas

Variables	Group	Pre Test Mean	Post Test Mean	t	P - Value
30 M Run Test	Experimental	4.53	4.23	2.58	0.000
	Control	4.66	4.73		

The Experimental Group of 30 M Run Men is 4.53 in Pre Test and Controlled Group mean is 4.66 in Pre Test there is a difference of 0.13 in Pre Test. The Experimental Group Mean is 4.23 in Post Test and Controlled Group mean is 4.73, the Experimental Group mean in Post Test in 30 M Run is decreased from 4.53 to 4.23 there is a improvement of 0.30 from Pre Test to Post and Control Group Mean is post test is 4.73 there is a 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 Plyometric Training the Experimental group has improved a lot.

Table II: Mean values **of Pull Ups test between experimental and control groups of Judokas.**

Variables	Group	Pre Test Mean	Post Test Mean	t	P – Value
Pull ups	Experimental	10.00	13.50	6.19	0.000
	Control	10.10	10.00		

The Experimental Group of Pull ups in Pre Test is 10.00 and Controlled Group mean is 10.10 in Pre Test there is a difference of 0.10 in Pre Test. The Experimental Group Mean in Pull Ups Test is 13.50 in Post Test and Controlled Group mean is 10.00, the Experimental Group mean in Post Test in Pull ups Test is improved from Pre Test 10.00 to Post Test 13.50 and Control Group Mean is post test is 10.00 there is a decrease in the performance from 10.10 to 10.00. The Experimental Group has improved due to Plyometric exercises in Pull ups Test and Controlled Group is decreased due to general training.

CONCLUSION

Judo is all about explosive power. Explosive power is a combination of speed, muscular endurance and muscular strength, all of which can be developed through plyometric exercises. In a competitive sport such as Judo overall body strength and ability to attack quickly are distinct advantage. Competition are according to the weight categories.It is concluded that due to plyometric exercises there will be improvement in shoulder strength and speed among Judokas.

RECOMMENDATIONS

Similar Studies can be conducted on Women Judokas and other sports and games.

References

Wikipaedia, Judo

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Academic achievements of volleyball players of Urban Government Schools in relation to their socio-economic status

By
Dr.M.Barnabas
Associate Prof, MGIT, Hyderabad, India
Dr.Kaukab Azeem
Faculty, Physical Education Department,
King Fahd University of petroleum & Minerals, Saudi Arabia

Abstract

Current education is intended for the students to promote as much from it. It aims at a healthy growth of a student omit as feature. As a result, it should be based on the need, interest and aspiration of the student. (Knapp & et.al) affirmed that the teachers can augment the changes for students in achieving the accomplishment by cautiously graded teaching methods. The idea of socio-economic status varies from society to society according to the social values held by that society. The purpose of this study was to find out the academic achievement of volleyball players of Urban Private Schools in relation to their socio economic status. A group of (n=250) subjects from urban private schools were randomly selected for this study. There ages were up to 16 years. To investigate the academic achievement of the volleyball players, following heads were considered: academic achievement in Telugu test, academic achievement in English test, academic achievement in problem areas, and total academic achievement. To ascertain the socio-economic status of the subjects, the investigator followed questionnaire as suggested by Aggarwal et al. The analyzing of data reveals that the mean and S.D for academic achievements with regard to Telugu subject was (57.42 $\pm$ 14.74). Mean and S.D with regard to English subject was (59.69 $\pm$ 15.02). Mathematics subject had shows mean and S.D (61.94$\pm$14.10). With regard to problem areas mean and S.D was (65.69$\pm$15.15). Total marks had shows with mean and S.D (244.2$\pm$ 50.10). Socio economic status of the subjects with mean and S.D was (44.3$\pm$10.5). It was concluded that the volleyball players of urban government schools achieve higher academic performances in compare with lower socio-economic status.

Key words: socio-economic, achievements, status, players

INTRODUCTION

Current education is intended for the students to promote as much from it. It aims at a healthy growth of a student omit as feature. As a result, it should be based on the need, interest and aspiration of the student. (Knapp & et.al) affirmed that the teachers can augment the changes for students in achieving the accomplishment by cautiously graded teaching methods. The idea of socio-economic status varies from society to society according to the social values held by that society. The purpose of this study was to find out the academic achievement of volleyball players of Urban Private Schools in relation to their socio economic status.

Swami Vivekananda said that education is the manifestation of perfection, which is already in man. But without sound body there cannot be sound mind. Both are inter-related and inter-connected. This is the most valuable point, which is stressed in the field of physical education.

(Knapp and Hagnaman) says that the teachers can enhance the changes for pupils achieving the success by carefully graded teaching methods.

There can be no teaching unless learning takes place. To make the pupils learn, a teacher must do certain things in certain ways. It is not enough for a teacher merely to know his subject matter and to have clearly in mind what he wishes his pupil to learn. In order to make pupils learn, he must carefully plan the procedure he will adopt and the activities that the pupils undergo. No amount of activity on the part of teacher will result in learning unless pupils actively participate in the learning experience.

Moreover, the need for efficiency in selecting the proper teaching method is apparent for a number of reasons. First, efficiency will save time and allow the teaching of more activities in school program.

(Kaukab Azeem 2016) mentioned that the Physical Education is not only fulfills a unique role in education, but is also an integral part of Education. It is sum of total experience and their related responses. Experience grown and responses developed out of participation in big muscular activities. All-round development of individual – physical, mental, social, moral is the real aim of Physical Education.

METHOD

A group of (n=250) subjects from urban government schools were randomly selected for this study. There ages were up to 16 years. To investigate the academic achievement of the volleyball players, following heads were considered: academic achievement in Telugu test, academic achievement in English test, academic achievement in problem areas, and total academic achievement. To ascertain the socio-economic status of the subjects, the investigator followed questionnaire as suggested by Aggarwal et al.

Table I

Number of Volleyball Players Selected from Urban Government Schools

S.No	Name of School	PLACE	No. of Players Selected
1	Z.P. High School	RUDRARAM	12
2	Z.P. High School	KODANGAL	12
3	Z.P. High School	KOTEPALLY	12

4	Z.P. High School	DHARUR	12
5	Z.P. High School	AMEERPET	14
6	Z.P. High School	AMEERPET	12
7	Z.P. High School	KARAMUNGI	12
8	Z.P. High School	SHELGIRA	12
9	Z.P. High School	MACHERLA	14
10	Z.P. High School	ALOOR	12
11	Z.P. High School	KUCHALAPOOR	14
12	Z.P. High School	SUNKIDI (VILL)	12
13	Z.P. High School	VEMULAKURTHI	12
14	Z.P. High School	GODUR	14
15	Z.P. High School	THADOOR	12
16	Z.P. High School	DHANAMPALLY	12
17	Z.P. High School	VENKATAPURAM	12
18	Z.P. High School	VENKATAPURAM	12
19	Z.P. High School	RAMLINGAM PALLE	14
20	Z.P. High School	BOMMALARAMARAM	12

RESULTS AND DISCUSSION

Table II, Mean and Standard Deviation Values of Volleyball playing Ability, Academic Achievement and Socio Economic Status of Andhra Pradesh Volleyball Players

S.NO	VARIABLES	Urban Govt
1	Volleyball Playing Ability SD	120.37 (± 19.53)
2	Telugu SD	57.42 (± 14.74)
3	English SD	59.69 (± 15.02)
4	Mathematics SD	61.94 (± 14.10)
5	Problem Areas SD	65.69 (± 15.15)
6	Total Marks SD	244.2 (± 50.10)
7	Socio Economic Status SD	44.3 (± 10.5)

The analyzing of data reveals that the mean and S.D for academic achievements with regard to Telugu subject was (57.42 ± 14.74). Mean and S.D with regard to English subject was (59.69 ± 15.02). Mathematics subject had shows mean and S.D (61.94±14.10). With regard to problem areas mean and S.D was (65.69±15.15). Total marks had shows with mean and S.D (244.2± 50.10). Socio economic status of the subjects with mean and S.D was (44.3±10.5).

CONCLUSION

It was concluded that the volleyball players of urban government schools achieve higher academic performances in compare with lower socio-economic status.

References

1. Agarwal,J.C. (1975) Educational Research , Agra Book Depot, New Delhi, p.109.
2. Aggarwal,O.P, S.K. Bhasin, A.K. Sharma, P. Chhabra, K. Aggarwal, O.P. Rajoura, *(2005), "*A New Instrument (Scale) for Measuring the Socioeconomic Status of a Family :Preliminary Study", Indian Journal of Community Medicine Vol. 30, No. 4, October-December, 2005.
3. Cathy Cockrell (2004), "Achievement: It's not all on the field **Grad students apply sports experiences to their research on athletes and academics",** Public Affairs | 14 October 2004
4. Charles, A. Bucher, Constance R. Koenic and Milton B. Arnland, Methods and Materials for Secondary School Physical Education (St. Louis: The C.V.Mosby Company, 19700, p. 226.
5. Kaukab Azeem (2016) . Physical Education in India – A Study. International Journal of Fitness, Health, Physical Education & Iron Games. Vol: 3, No: 1, Pg no-01.

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
Volume: 3, No: 2, July 2016- Dec 2016

Influence of Restricted Physical Activity on the selected Fitness Variables among Obese University Males

Dr.Kaukab Azeem
Faculty, Physical Education Department
King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

ABSTRACT

INTRODUCTION: The purpose of this study was to find out the influence of restricted physical activity program on the selected fitness variables among obese university males.
METHOD: For this study a group of (N=100) participants were selected randomly from the group of 200 students undergoing orientation course to participate in the physical education program. The duration of the restricted physical activity was 40 minutes twice per week in the game of volleyball and football for a period of 8 weeks. The variables which were considered for this study were body mass index, 50 M run, sit ups, standing long jump and sit & reach test. Pre and post test were conducted to find out the effect of physical activity on the fitness level of the obese university males. The statistical tools which were utilized for this study are mean, standard deviation and t- test with help of statistica software.
RESULTS & DISCUSSION: The analysis of the data had shows a motivating results. The mean and S.D with regard to body mass index of the subjects from pre to post test were (35.73, 4.89) and (34.57, 4.67). The mean and S.D with regard to 50 M. Sprint performance of the subjects were (10.29, 3.05) and (9.12, 1.86). Standing broad jump of the subjects from pre to post test were (158.87, 24.50) and (168.25, 27.45). The mean and S.D with regard to sit-ups from pre to post test were (18.05, 4.31) and (21.23, 4.55). The mean and S.D with regard to sit & reach test of the subjects from pre to post test were (21.85, 7.85) and (25.20, 7.94) respectively.
CONCLUSIONS: It is concluded that the influence of physical activity training program had shown significant performance from pre to post test among the obese university males with regard to body mass index (BMI), sit-ups exercise, standing broad jump, and sit & reach test respectively.

Keywords: Physical activity, Health, Obese, Fitness

INTRODUCTION

Globally Physical activity plays an important part in the human life. According to fitness expert (Michael Kent, 1997); the health benefits and the performance benefits, or "training effect", requires a minimum duration and frequency of exercise. Generally professionals suggest at least twenty minutes of training session at least three times per week.

According to the American College of Sports Medicine (ACSM, 2004) reveals that the children and adolescents should perform physical activity of high intensity at least three times a week from 10 to 20 minutes, twice or more per day, and it should includes of gymnastics,

plyometrics, jumping and endurance training of moderate intensity, on top of participation in sports that involve running and jumping (football, basketball, handball, volleyball, among others). (Haslam and et al, 2005) reveals that the overweight leads to many types of diseases i.e. diabetes, chronic heart diseases, deterioration of brain functions, speeding up of aging process and deteriorated muscle –skeletal system.

Moreover commonly it appears that higher volumes or intensities of physical activity are likely to have greater benefit, but research in this area is still limited and the results are not convergent (Janssen, 2007; Tassitano et al., 2007).

World Health Organization (WHO, 2010), recommends that the children and adolescents should actively participate in moderate or vigorous intensity aerobic physical activities such as running, hopping, skipping, jumping rope, swimming, dancing, and bicycling that should comprise 60 or more minutes a day and high intensity physical activity should be included at least 3 days a week.

Physical activity is described as body movement that expends energy and raises the heart rate. Inactivity is classed as less than 30 minutes of physical activity a week, and sedentary time means time spent in low-energy postures, e.g. sitting or lying (Public Health England, 2014). According to (WHO, Jan 2015), in the year 2014, more than 1.9 billion adults, 18 years and older, were overweight of these over 600 million were obese. Moreover 39% of adults aged 18 years and over were overweight in 2014, and 13% were obese.

The purpose of this study was to find out the influence of restricted physical activity program on the selected fitness variables among obese university males.

METHOD

A group of (N=100) participants were selected randomly from the group of 200 students undergoing orientation course to participate in the physical education program at King Fahd University of Petroleum & Minerals, Saudi Arabia during the year 2013-14. The age of the subjects was between 18-21 years. Furthermore the intention of this study was explained in detail and doubts were addressed to the subjects. The duration of the restricted physical activity was 40 minutes twice per week in the game of volleyball and football for a period of 8 weeks. The

variables which were considered for this study were body mass index, 50 M run (seconds), sit ups for 30 seconds (score), standing long jump (mts) and sit & reach test (mts). The training was given at the orientation building 39, King Fahd University of Petroleum & Minerals, Saudi Arabia. The students were suggested not to play any other sports apart from the restricted activities i.e. Volleyball and football to know the actual influence of these activities on the obese students. Pre and post test were conducted to find out the effect of physical activity on the fitness level of the obese university males. The statistical tools which were utilized for this study are mean, standard deviation and t- test with help of statistica software.

RESULTS & DISCUSSION

Table-1 showing the analyzing data pertaining to body mass index, 50M, Sprint, standing broad jump, sit-ups test and sit and reach test.

Test Items for obese weight group	**Pre-test N=100**		**Post- test N=100**		**'t'-value**	**p-value**
	Mean	**S.D**	**Mean**	**S.D**		
Body mass index	35.73	4,89	34.57	4.67	4.051	0.000
50 M. Sprint	10.29	3.05	9.12	1.86	4.71	0.000
Standing broad jump	158.87	24.50	168.25	27.45	4.74	0.000
Sit –ups test (30 sec)	18.05	4.31	21.23	4.55	7.94	0.000
Sit & reach test	21.85	7.85	25.20	7.94	8.07	0.000

The analysis of the data had shows a motivating results. The mean and standard deviation with regard to body mass index of the subjects from pre to post test were (35.73, 4.89) and (34.57, 4.67) respectively. The obese students had reduces their body weight from pre to post test. Moreover this is evident that the physical activity is very important for the obese students to lose weight and to maintain quality of life. The mean and standard deviation with regard to 50 M. Sprint performance of the subjects were (10.29, 3.05) and (9.12, 1.86) respectively. It was evident that the impact of restricted physical activity had influenced on the improved performance with regard to sprinting performance among the obese students, which is very encouraging and significant. Standing broad jump of the subjects from pre to post test were (158.87, 24.50) and (168.25, 27.45) respectively. The participants had improved their muscular

power from pre to post test. The data had shows a greater performance among the subjects. The mean and standard deviation with regard to sit-ups from pre to post test were (18.05, 4.31) and (21.23, 4.55) respectively. The participants had improved their muscular endurance from pre to post test. The obese personals tend to have difficulty in doing more number of sit-ups in 30 seconds due to their poor fitness levels. The score from pre to post test pertaining to sit-ups test had shows improved performance. The mean and standard deviation with regard to sit & reach test of the subjects from pre to post test were (21.85, 7.85) and (25.20, 7.94) respectively. Lastly the influence of restricted physical activity on the obese subjects had also shows the improvement in the flexibility from pre to post test, which is significant.

The following studies are agreement with the present study;

(K.Azeem, 2012) had investigated a study on the Impact of Physical Activity on Body composition, Flexibility, and Muscular Endurance on males and find significant performance.
(Raj Kumar P. Malipatil, 2014, in this study investigate and found the significant difference from pre to post test for six weeks of aerobic training on the selected fitness variables i.e. Cardio-vascular endurance, sit and reach test, vital capacity and found insignificant improvement in the body mass index among the participants. The body mass index of the participants was found insignificant and this is may be due to the short training protocol for six weeks on the participants. (S.Archana Mani Malathi, 2014), investigated in this study about the combined training group on the effect on physical fitness variables and found significant improvement among the subjects. (seemab. A, and etal, 2015), investigated a 12 weeks study on the effect of weight training on the selected fitness variables among gym students i.e. muscular strength, muscular endurance, and flexibility had find improved performance.

CONCLUSIONS

It is concluded that the influence of restricted physical activity training program had shown significant performance from pre to post test among the obese university males with regard to body mass index (BMI).

It was also concluded that the obese participants had shows greater performance from pre to post test pertaining to the sit-ups exercise, standing broad jump, and sit & reach test respectively.

Acknowledgement

The Author thanks the authorities of DSR, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia, and the subjects for the help in completion of this study.

References

1. ACSM Physical Activity and Bone Health. Med Science Sports exercise. 2004;11:1985–96. [PubMed].
2. Janssen I. Physical activity guidelines for children and youth. Applied Physiology Nutrition and Metabolism. 2007;32:109–121.
3. Kaukab Azeem, (2012), Impact of Physical Activity on Body composition, Flexibility, and Muscular Endurance on males. Published in the proceedings of 2012 pre-Olympic congress on sports science & computer science in sport (IACSS 2012), Pg :123.
4. Michael Kent, (1997) aerobic exercise', *Food and Fitness: A Dictionary of Diet and Exercise*, , Oxford University Press. Public Health England, Everybody Active Every Day – an evidence based approach to physical activity (October 2014), p4
5. Raj Kumar P. Malipatil, Savitri .S.Patil (2014). Effect of aerobic exercises on viatl capacity and body mass index of adults. International Journal of Fitness, Health, Physical Education and Iron Games**,** ISSN 2349-722X (vol-2, no-1, Jan –June 2015) pg:75**.**
6. S.Archana Mani Malathi, (2014). Effect of core strength , mobility training and combined training on physical fitness variables among college womens. International Journal of Fitness, Health, Physical Education and Iron Games**,** ISSN 2349-722X (vol-1, no-1, July –Dec 2014) pg:200.
7. seemab. A, M.Nazeer, (2015), effect of weight training exercise on the selected fitness variables among gym students. International Journal of Fitness, Health, Physical Education and Iron Games, ISSN 2349-722X (vol-2, no-2, July –Dec 2015) pg:123.
8. Tassitano RM, Bezerra J, Tenório MCM, Colares V, Barros MVG, Hallal PC. (2007) Physical activity among adolescents: a systematic review. Rev Bras Cineantropom Desempenho Hum. ;9(1):55–60.
9. World Health Organization, 2010, Global Recommendations on Physical Activity for Health. Geneva: World Health Organization.
10. World Health Organization; google.com, Jan 2015