



Comparative study of physiological characteristics among kabbadi and Kho-Kho players

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ABSTRACT

Physiology play an important role in deciding the particular build of the body with various measurements of the segments of the body it has also its importance in the field of Kabaddi and Kho-Kho game. Some what or altogether the body height length of various level and measurements of the varies body segments, pulse rate blood pressure Haemoglobin, vital capacity and body composition have definite effects on the performance of these game players. The investigator in the present study made an effort to test this hunch to compare the difference between the various physiological measurement of Kabaddi and Kho-Kho players. The present comparative study is related Kho-Kho and Kabaddi players in relation to physiological variables. In the present investigation, Kho-Kho and Kabaddi players were the field of study. In the present study, 120 male Kabaddi and 120 male Kho-Kho players of Meerut who participated in Meerut State Kho-Kho and Kabaddi Championships.

Key words : Kabaddi and Kho-Kho, physiological, players,

INTRODUCTION

The world of games and sports has crossed many milestones, as a result of different achievements in general and their application in the field of sports in particular. Scientific investigation into performance of sportsman has been playing an increasingly importance role to attain excellence of performance in different sports. Now the sports-man have been able to give out standing performance because of involvement of new scientifically substantiated training methods and means of execution of sports exercise such as sports techniques and tactics, improvement of sports grass, and equipment, as well as other components and condition of the system of sports training (Powel 1983).

Physiological measurement and motor fitness variable play a vital role in almost all games and sports. Sportsmen concentrate on the development of speed, strength, agility flexibility, endurance etc. as a part of preparation in their respective sports General motor abilities assist a sportsman in learning specific skills from a solid base over which he can develop excellence in the particular game he is involved (Dobbins, 1985). Sports in 21st century have gained much popularity and prominence than in any other period of human history. Now it is become an absolute necessity that right talents are identified for the right same.

According to Thesis S Schanbal (1987) "Sports performance is the unity of execution and result of a sports action or a complex sequence of action measured or evaluated according to socially determined

and agreed norms.” The sports performance is affected by various factors like body types, structure, ground surface, psychological variables, biological aspect, lack of fitness, body motion, equipment standard etc.

Sports is now no more a hobby it has become a full time profession. Modern sports indeed compel athletes to take up sports competitions as a full time vocation besides making name and fame multi-disciplinary efforts are put together with the craze of taking human performance to its optimum possible level. Performance in certain events and activities has already reached a miracle increase in speed performance by 0.01 seconds seems to be a different and challenging task.

In the present era development of science and technologies has revolutionized the field of sports. Every day the new records are being established in different sports activities. International level competitions sports presence bringing honour of for their countries the field of physical education and sports as also affected from such developments of science and technologies over the last century, and sports has captured an important place in the world. This is so because the application to the field of sports and physical education has enabled modern youth to develop physical capabilities beyond anything earlier imagined. The sports scientists and coaches are demanding full time involvement and round the year dedicated practice of sports to reach the pinnacle of their performance.

The international community of sports lovers is also curiously looking for better and superb performance of sportsman and women in their respective fields. Aspirations and expectations of the people pertaining to the performance of sportsman all over the world are going higher and higher. The high level of performance by sportsmen and require a highly scientific approach and it should be done right from the level of identifying talents.

PHYSIOLOGY

Physiology is defined by dictionaries as ‘the science of the normal functions and phenomena of living things’. Historically, the subsequent meaning of ‘physiology’ is well illustrated by the way in which the word is used in the two following quotations. The first is from 1704 (J. Harris, *Lexicon Technica*): ‘Physiology, is by some also accounted a Part of Physic’ (i.e. Medicine), ‘that teaches the Constitution of the Body so far as it is sound, or in its Natural State; and endeavours to find Reasons for its Functions and Operations, by the Help of Anatomy and Natural Philosophy’. The second (a definition of Charles Darwin's colleague T. H. Huxley), 150 years later, is virtually identical to current usage: ‘whereas that part of biological science which deals with form and structure is called Morphology; that which concerns itself with function is Physiology’.

Physical variables may be defined as those variables which are performance oriented and dependent upon functioning of different systems of the body in an integrated manner (Toor 1996). Clarke (1978) has thus exhorted that physical fitness is a vital biological need. The neglect of which handicaps the total effectiveness of the individual. Physical fitness is not only essential for total effectiveness of all individuals but also of paramount importance to sportsmen. Harder to define, yet critical to the discipline of physiology, is the term ‘general physiology’. This subject emerged originally from the convergence of

nineteenth-century physical chemistry with experimental biology. It was founded on quantitative studies of plant and animal cells. Because of its reductionist goal, general physiology was an obvious forerunner of what is now described as cell and molecular physiology. However, more than this, it attempted to use the theoretical insights gained from the ‘hard sciences’ (physics and chemistry) to provide a rational basis for analyzing living matter, and was thus eager to embrace and test theory quantitatively. An outstanding example of the success of this approach is the experimental analysis of the resting potential and the action potential (nerve impulse) by Hodgkin and colleagues in the late 1940s. Indeed, successful analysis of ‘bioelectricity’ is one of the factors that led to the foundation by physiologists of yet another offshoot — biophysics. Although there are still (notably in North America) a number of distinguished university departments of Biophysics, growth of this subject as an independent discipline has been hampered somewhat by its failure to meld its ‘physiological’ roots with its links to biological physics (especially X-ray crystallography). However, the work of Nobel laureates Neher and Sakmann provides a spectacular example of how electrophysiological analysis can give biophysical insight not available through other means. These scientists, through clever technical developments, were able to design experiments that allowed structural, and hence functional, changes in single protein molecules (membrane ion channels) to be followed in real time by recording the flow of ionic current through them. By tightly sealing a fine, fluid-filled capillary tube to an extremely small part of a cell membrane, and linking it to a sophisticated amplifier (‘patch clamping’), they were able to measure the current through individual channels, flicking quickly from closed to open states. This physiological insight has very recently been matched by structural studies by MacKinnon and colleagues on membrane channels at atomic resolution.

Physiology has a complex, deep relationship with the approach of reductive science. This is in part because ‘function’, particularly ‘interesting’ or unexpected function, emerges from interactions that can be found only in relatively complex systems; hence physiologists are unlikely (unless they are working on essentially trivial problems) to find that molecular structures in isolation give more than partial insight into the problem under attack. ‘Explanations’ of physiological questions seem more likely to arise from combining such reductionist approaches with, on the one hand, thermodynamics and, on the other, control systems theory. Life depends on ‘non-equilibrium’ properties — i.e. on complex interactions that require the constant expenditure of energy to maintain them. And networks of information and control (the nervous system, hormones etc.) are central to the development, function, and probably the evolution of complex biological systems.

Seen in this way, the information encoded in the genes provides a very challenging experimental opportunity for physiologists. To have read the sequence of DNA is only a small step on the route to understanding how and to what extent our genes build and control our bodies, and cause disease. Genes do just one thing: they translate their information into proteins. To understand how the products of genes work individually and together to create the magnificent complexity of a whole organism is part of the exciting challenge that faces the revitalized science of physiology in the twenty-first century. Indeed, the prospects for physiology are wider still: it will ultimately need to link such understanding ‘upwards’ to such disciplines as experimental psychology, ecology and human biology.

KABADDI

Kabaddi is aptly known as the “Games of The mass” due to its popularity, simple, easy to comprehend rules, and public appeal. The game calls for no supplicated equipment what so ever, which it very popular sport in the developing countries. Though it is basically an out door sport played on clay court, of late the game is being played on synthetic surface indoors with great success. The duration of the game is 45 minutes for men & junior boys with a 5 minutes break in between for the teams to change sides in the case of women/girls & sub-junior boys, the duration of 35 minutes with a 5 minute break in between. Kabaddi is a combative team game, played with absolutely no equipment, in a rectangular court, either outdoors with seven players on the ground in each side. Each side takes ultimate chances at offence and defense.

The basic idea of the game is to score points by raiding into the opponents’ court and touching as many defense players as possible without getting caught on a single breath. During play, the players on defensive side are called “antis” while the players of the offense is called the “raider.” Kabaddi is perhaps the only combative sports in which attack is an individual attempt while defence is a group effort. The attack in Kabaddi is known as “raid.” The antis touched by the raider before the returns to his court. These players can resume play only when their side scores points against the opposite side during their raiding turn or if the remaining players succeed in catching the opponent’s raider.

Yoga, the Indian science to control body and mind through meditation and self-control players an integral part of Kabaddi. The raider has to enter the opponent’s court chanting the word “Kabaddi” while holding his breath and has to continue to do so until he returns to his home court. This is known as “cant” which is closely related to “pranayama” of yoga. While Pranayama is about with holding breath in order to exercise internal organs, cant is the means to with hold breath with vigorous physical activity. This is perhaps one of the few sports to combine yoga with hectic physical activity. The game calls for agility, good lung capacity, muscular co-ordination presence of mind and quick responses. For a single player to take on seven opponents is no mean task, requires dare as well as ability to concentrate and anticipate the opponents moves.

KHO-KHO

Kho-Kho, an ancient game of undivided India, Probably was derived from the different strategy and tactics of “Kuruksheetra” was in Mahabharata. The chariot fifth during the war and zigzag pathways followed by the retreating soldiers indicates the formation of chain play a defense skill in the game of Kho-Kho. On the 13 the day of war, the chief of Kaurav Army, Guru Dronacharya drew a typical strategic formation chakrabyuha keeping Jayadratha in main entrance with 7 soldiers to draw in and kill the enemy. Bir Abhimanyu, the son of Arruna, Entered into the trap but could not get his way out and in the process got killed. He fought gallantly alone against 7 soldiers adopted by Abhimanyu resembles the idea of Ring play a defense tactics in Kho-Kho game.

In the year 1936, during the event of Berlin Olympic one Kho-Kho team from Pune exhibited the salient feature of the game of Kho-Kho in Berlin. Kho-Kho, based on natural principals of physical development, fosters a healthy combative spirit of team understanding. Asian championship '96 was held in 'tera flex' court at Kshudiram Anushilan Kendra, Kolkata.

Asian Kho-Kho federation (AKKF) came into being after the demonstration game during 3rd SAF Games held in Kolkata in 1987. Kho-Kho made its entry into international sports area in a first Asian Kho-Kho Championship 96 held at Kolkata in 1996 under the Auspices of AKKF & KKFI and organized by the west Bengal Kho-Kho Association (WBKKA), India and Bangladesh were the winners and runner up respectively. The participants are Bangladesh, Pakistan, Sri-Lanka's Nepal and host India.

In 2nd Asian Kho-Kho Championship in Dhaka 2000 India, Sri Lanka, Pakistan, Thailand, Japan and host Bangladesh participated.

The game of Kho-Kho is based on natural principals of physical developments. It is vigorous and fosters a health combative spirit among youth. It is not merely running with speed but its CHASE a natural instinct to overtake, to pursue to catch a kill. No doubt speed is the heart and to stand to a relentless pursuit of a minutes at a stretch (turn) this heart demand stoutness stamina. In turn a physically fit youth enjoys it and the spectators who watch enjoy a trilling sport to their satisfaction. The game is played in two innings. A team consists of 15 players. However 12 players are nominated for a match and only a take to the actual game initially. Every team has to chase and defend for a minutes each twice in a match that thus consists of a 2 innings. Chasing or defending once in an inning is termed a "Turn" of the particular act.

There is a rest of a minute in between two innings and 5 minutes in between two turns for a change over. Controlled sprinting Dodging, dividing are few skills exhibited during the game which won by a team that scores more points (one point is awarded for away defender, who is out). The game can be played on any surface that suits open field sports. As on today it is played on grounds prepared from or earth or even on turf. Needless to say that synthetic ground and playing indoor is no card.

Through are nature of two game Kabaddi "Kho-Kho" seems to be similar yet there is some difference in skills and nature a activities of the two games. The size of court definitely denominates the difference in playing situation in the two games. As a matter fact, different qualities such as strength, speed, endurance, agility, co-ordinate balance, turning abilities. The best performance of sports person in kabaddi and Kho-Kho or any other games greatly depend upon various factors such as physical fitness, skill perfection, technical, understanding, psychological, anthropometry, sports medicine, social and physique (as physiology, morphology, Body composition factors) in which physique and physical fitness components are the physical educators and trainers are mere interested in physiology and anthropometry as it pertains to the selection of some problems in the field, for example has deviation in height seriously influence performance in tests in separate area? Should body build Besides being reviewed to clarify standard sports training's. the human body, size and from varies in a variety of ways and depend upon sex, age race and geography one of the main concerns of the physical anthropology and human physiology is to acquire and convey he knowledge on the true way and reasons of individual variability and differentiation.

Anthropometry and physiology play an important role in deciding the particular build of the body with various measurements of the segments of the body it has also its importance in the field of Kabaddi and Kho-Kho game. Some what or altogether the body height length of various level and measurements of the varies body segments, pulse rate blood pressure Haemoglobin, vital capacity and body composition have definite effects on the performance of these game players. The investigator in the present study made an effort to test this hunch to compare the difference between the various physiological and Anthropometrical measurements of Kabaddi and Kho-Kho players.

OBJECTIVES OF THE WORK

To compare the linear measurements such as height, weight, sitting height, Total leg length, thigh length, trunk length, total arm length, upper arm length, fore arm length, hand length, foot length and foot width of Kabaddi and Kho-Kho players.

ANALYSIS OF THE DATA

The minimum and maximum scores obtained and also the range of scores were calculated and presented in Table-1 to Table-2. The complete data of Kabaddi and Kho-Kho players were arranged in a way that mean and standard deviation may be calculated and also the mean difference MD ($m_1 - m_2$) and the calculation regarding 't'-test. Each independent variable of anthropometric variables was tabulated. The tabulation was prepared for each physiological and anthropometric variables separately. The calculations in connection with 't' – test were also arranged for individual variable wise. The SPSS were followed to calculate the 't'-test. The value of calculated 't'-test was compared with the tabulated significant value at 0.05 and 0.01 level of confidence. The details for comparative mean value and SD values of Kabaddi and Kho-Kho players were tabulated and the values of 't'-test with various step values were also presented from Table 1 to 2.

Table-1

Comparison of mean Values Between Kho-Kho and Kabaddi Players Regarding Weight

Players	Mean	Std. Dev.	D.F.	S.E.D.	't'-Ratio
Kho-Kho	59.38	3.64	2.38	1.475	8.727**
Kabaddi	72.62	1.07			

**Significant at 0.01 levels

The Table-1 represent the significance of mean difference of Kho-Kho and Kabaddi players regarding their weight. The mean values of Kho-Kho and Kabaddi players regarding weight were 59.38 and 72.62 respectively. The calculated 't' value is 8.727 which is significant at 0.01 level of significance as the tabulated value of 't' is 1.96 at 0.05 level and 2.58 at 0.01 level of significance. So there is a significant difference in weight of Kho-Kho and Kabaddi players. The weight of Kabaddi players is much higher in comparison to weight of Kho-Kho players.

Table-2

Comparison of mean values Between Kho-Kho And Kabaddi Players Regarding Height, Total Leg Length, Thigh Length, Lower Leg Length, Foot Length And Foot Width

Sr. No.	Variable	Group	N	Mean Scores	S.D's	t-value
1	Height	Kho-Kho	120	171.00	1.62	3.821**
		Kabaddi	120	174.21	2.10	
2	Total Leg Length	Kho-Kho	120	89.11	2.07	1.249(NS)
		Kabaddi	120	90.23	1.92	
3	Thigh Length	Kho-Kho	120	40.76	2.02	0.035**
		Kabaddi	120	40.79	1.51	
4	Lower Leg Length	Kho-Kho	120	48.40	0.99	3.126**
		Kabaddi	120	49.73	0.91	
5	Foot Length	Kho-Kho	120	25.64	0.66	5.119**
		Kabaddi	120	27.00	0.50	
6	Foot Width	Kho-Kho	120	10.91	0.27	3.483**
		Kabaddi	120	11.74	0.29	

**Significant at 0.01 level of significance

NS = Not significant

The Table-2 represent the significance of mean difference of Kho-Kho and Kabaddi players regarding their height, total leg length, thigh length, lower leg length, foot length and foot width. The mean values of Kho-Kho and Kabaddi players regarding height were 171.00 and 174.21 respectively. The calculated 't' value is 3.821 which is significant at 0.01 level of significance. So there is a significant difference in height of Kho-Kho and Kabaddi players. The height of Kabaddi players is much higher in comparison to height of Kho-Kho players.

The mean values of Kho-Kho and Kabaddi players regarding total length were 89.11 and 90.23 respectively. The calculated 't' value is 1.249 which is not significant at any level of significance. So there is no significant difference in total leg length of Kho-Kho and Kabaddi players. The mean values of Kho-Kho and Kabaddi players regarding thigh length were 40.76 and 40.79 respectively. The calculated 't' value is 0.035 which is not significant at any level of significance. So there is no significant difference in thigh length of Kho-Kho and Kabaddi players.

The mean values of Kho-Kho and Kabaddi players regarding lower leg length were 48.40 and 49.73 respectively. The calculated 't' value is 3.126 which is significant at 0.01 level of significance. So there is a significant difference in lower leg length of Kho-Kho and Kabaddi players. The lower leg length of Kabaddi players is much higher in comparison to Kho-Kho players. The mean values of Kho-Kho and Kabaddi players regarding foot length were 25.64 and 27.00 respectively. The calculated 't' value is 5.119 which is significant at 0.01 level of significance. So there is a significant difference in foot length of Kho-Kho and Kabaddi players. The foot length of Kabaddi players is much higher in comparison to Kho-Kho players

The mean values of Kho-Kho and Kabaddi players regarding foot width were 10.91 and 11.74 respectively. The calculated 't' value is 3.483 which is significant at 0.01 level of significance. So there

is a significant difference in foot width of Kho-Kho and Kabaddi players. The foot width of Kabaddi players is much higher in comparison to Kho-Kho players.

CONCLUSION

It was concluded that there is a significant difference in linear measurements such as weight, height, lower leg length, foot length, foot width, total arm length, forearm length, sitting height in comparison to Kho-Kho players. Kabaddi players are found more in weight, weight, height, lower leg length, foot length, foot width, total arm length, forearm length, sitting height in comparison to Kho-Kho players. But no significant difference was found in total leg length, thigh length, upper arm length, hand length, trunk length. Regarding body circumferences, there is a significant difference in shoulder, chest, hip, thigh, calf between Kabaddi and Kho-Kho players. Kabaddi players are found more in shoulder, chest circumferences, hip, thigh, calf, but there is no significant difference was found in abdomen. Regarding bone diameter, there is a significant difference in biacromial and ankle diameters. Kabaddi players are found more in biacromial and ankle diameters in comparison to Kho-Kho players. But no significant difference was found in bitrochanteric diameters and femur bicondylar between Kabaddi and Kho-Kho players.

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