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SUPERIOR ANTHROPOMETRIC AND BIOMECHANICAL INDEXES ON KABADDI SPORTS ATHLETE PERFORMANCE AND COMPARATIVE BETWEEN INDIA AND IRAN TEAMS – A CASE STUDY: YOUTH NATIONAL (KABADDI) TEAM OF ISLAMIC REPUBLIC OF IRAN

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ABSTRACT

In this study the researcher aimed to explore the effect of prior selected anthropometric, biomechanical, psychological indexes on kabaddi sport athlete performance of youth national team of Iran. 100 youth Kabaddi players were selected from national Kabaddi athletes of Iran in 2014-2015 as Subjects of the study. Their age ranged between 18 to 22 years. Speed, agility, power, flexibility, background play, femur length, tibia length, the percentage of the body fat and BMI has been selected for this study. The results of the study indicates that the average of these factors in national Kabaddi athletes of Iran are, speed (7.07 sec), agility (9.63 sec), power (0.51 kg), flexibility (36.57 cm), background play (7.56 year), percentage of the body fat (12.94) and BMI (23.92 kg/m²). Among the mentioned variables, power and background play have the most, and flexibility has the least impact on players' performance.

Keywords: *Kabaddi, Performance, Anthropometric, Biomechanical*

INTRODUCTION

Kabaddi in Iran

Kabaddi is a one of the traditional games in Iran, played until he takes another breath. If the raider cannot return to by thousands of people in cities and villages. This game his court in the same breath while chanting 'kabaddi', he has different names in various parts of Iran. For example, will be declared out. Each team alternates in sending is called Shirindudu in Gilan, Khorasan, Golestan and player into the opponents' court. If a player goes out of Mazandaran, Zou, Khuzestan Eshtiti and in Sistan and the boundary line during the course of the play, or if any Baluchestan is called Kabaddi (Majlesi *et al.*, 2012). Kabaddi same Zhu is a Persian game. This game is a local origin and dating back centuries in Iran. This game requires strength and skill and is quite simple and inexpensive and does not require large area and trampolines. This game is famous all over the country and kabaddi competitions are held on a regular basis. The rules of the game have changed and amended with the passage of time. The organization of the sport in Iran since 1996 Kabaddi Association started its activities.

And according to precious medal at the Asian championship and the world, in the year (2001) was a member of the World Federation Kabaddi Federation of the Islamic Republic of Iran (2005) for the development and expansion Kabaddi around the country and the potential in the sport and gain the championship is impressive.

Kabaddi in India

The Amateur Kabaddi Federation of India (AKFI) was founded in 1973. The game was included for the first time in Asian Games held in Beijing in 1990. India won the gold medal and has since won gold at the following three Asian Games in Hiroshima in 1994, Bangkok in 1998, Busan in 2002, and in Doha 2006. Kabaddi is popular throughout South Asia, and has also spread to Southeast Asia, Japan and Iran.

Kabaddi is a combative team game, played on a rectangular court, either out-doors or indoors with seven players on the ground for each side. Each side takes alternate chances of 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 the defensive side are called "Antis" while the player of the offense is called the "Raider". Kabaddi is perhaps the only combative sport in which attack is an individual attempt while defense is a group effort. The attack in

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Kabaddi is known as a 'Raid'. The antis touched by the raider during the attack are declared 'out' if they do not succeed in catching, the raider before he returns to home 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.

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 an ability to concentrate and anticipate the opponent's moves.

The aim of the Selection of kabaddi player is the main criteria of the selection plans. The aim of the Selection may vary. It could be to select talented youngsters for further training, competition at various levels, that is at the state, national or the Inter –national level.

Analysis of techniques and Performance of Kabaddi

Raid

The raid is of a complex nature and several factors are to be considered to make it successful. A good raider should have the skill, tactics, counter-action ability to extricate himself from difficult situations, and above all, good footwork to score points. A combination of all these factors, with an ability to make spot judgments of the situation will make the player a top class raider. We shall now go into the structure of a raid and the different steps associated with it, to understand the raid and its constituents.

CANT

one of the unique features of Kabaddi is the cant. The raider has to withhold his breath during the entire course of the raid and keep up a continuous and audible chant of the word Kabaddi until he returns to home court. This is known as cant in Kabaddi and if he happens to lose his cant during the raid or struggle before he reaches home court, he will be declared out and the offense side will lose a point.

Settling & Path of Attack Channel Line

Settling means getting set before an attack. Normally, after entry into the opponent's court, the raider takes a few seconds to study the situation and decide upon the path of attack. In these few seconds, he chooses a target and makes his moves accordingly. If he does not get set but charges blindly into the opponent's court, there is more likelihood of his being caught.

For example, in pursuit, when the raider charges without getting set, he exposes himself to the risk of being caught, since he does not take time to plan the path of attack or think of the consequence of his moves. The raider must take care not to go too deep into the opponent's court or be surrounded by the antis. He must also plan his path of retreat to home court. He must invariably select a path to the centerline for retreat after attack, for which he may choose to turn, go outside, or take a side ward movement.

Footwork

Footwork in Kabaddi means the movements made by the raider with his feet, during the course of the raid. The factors influencing footwork include the stance of the raider, body position, movement, speed, agility, etc. A raider has to move quickly from one spot to the other during raid, complete his task and reach home safe. For this he depends largely on footwork. Footwork can broadly be classified into four types, i.e. Leading Leg Raid, Shuffling Raid, Natural Method and Reverse Step Raid, which will be gone into in detail in the chapter on basic offense skills.

Skills

Skill is the automatic application of technique without conscious thought. Skill can also be defined as the ability to co-ordinate different muscles in order to perform a combination of specific movements smoothly and effectively. Technique should be applied with dexterity, economy of movement and easily, without tension.

Mastery over the techniques of the game is called skill. The skills used by the raider in Kabaddi are called- offensive skills, while the skills used by the antis are called defensive skills. During raid, the raider has to make maximum use of his limbs to come in contact or touch the opponents in order to score points. This is accomplished through leg touches such as toe touch, foot touch, squat leg, thrust, kicks etc, with lower limbs and through hand touches with upper limbs.

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Apart from these basic skills, the raider must also learn advanced skills, such as counter action for escape from different holds. A skillful raider is one who has gained mastery over all these techniques.

Tactics

Tactics means exploiting a given situation to one's advantage or creating a situation to suit one's purpose. In Kabaddi, the raider is the principal performer who can change the tempo of the game. Depending on the game situation, the raider may increase or decrease the tempo of the game. In order to do this he may adopt a passive raid or an aggressive raid by creating a situation for a struggle. Sometimes the raider may pass time in the last few minutes of the game, especially when his team is leading and the opponents are playing an aggressive game. All these are the tactics adopted by the raider keeping in view the game situation. Tactics and techniques go hand in hand for any successful raid.

Retreat

Unless the raider returns to home court, safely after. The raid, the raid cannot be treated as successful. This is called retreat. The raider has to pre-plan his path of retreat before starting his raid. While retreating to home court, the raider should keep the following points in view (Federation, 2012)

Psychological Preparation in Kabaddi Sport

Psychological preparation prior to the competition is very important for the team. Psychological preparation of the sportsman has gained a lot of importance in today's sport. Sienc mastery of the games techniques by itself may not result in top class performance in the actual competition. In addition to basic motor qualities such as speed, strength, endurance, agility, flexibility and efficiency in performing the games techniques and tactics, the player should be fit psychologically. Peak performance can be achieved only when the player attains maximum physical and psychological efficiency together with optimum technical and tactical ability. The coach has a big part to play in molding the player to achieve this model state during his sports career.

Athletic performance in kabaddi is a function of needs a small playing area and no special equipment is aerobic fitness, anaerobic fitness, dynamic balance, required. The kabaddi playing area is 13m x 10m, divided agility, individual proficiency, neuromuscular by a line into two halves. The side winning the toss sends coordination, lung capacity, quick reflexes, intelligence a 'raider', who enters the opponents' court chanting, and presence of mind on the part of both attackers and 'kabaddi-kabaddi'. The raider's aim is to touch any or all defenders (Dey *et al.*, 1993). During a match a player frequently performs players on the opposing side and return to his court in activities that require rapid development of force, such as one breath. The person, whom the raider touches, will reaction and quickly changing direction.

Kabaddi is a game which combines the actions of Data Collection: The following are the proposed variables wrestling, judo, rugby and gymnastics. The important for the proposed study: body movements in this game involve catching, holding, locking and jumping, thus the possession of desirable Anthropological Components: anthropometric and physiological characteristics will have a greater advantage in executing a better performance in Height competition (Dey *et al.*, 1993). There are a few biomechanical and Height leg physiological studies on kabaddi players on national or sitting height international players.

MATERIALS AND METHODS

Procedure and Methodology

Selection of Subjects For the present study 100 Kabaddi players were selected randomly as the subjects from national Kabbadi athletes of Iran. Their age ranged from 18 to 22 years.

Data Collection: The following are the proposed variables for the study:

1- Anthropological Components: height, weight, upper and lower body height, leg length, length of hip, thigh, calf circumference, and BMI and body fat percentage.

Body Fat Percentage: Subcutaneous body fat was measured at 3 sites (chest, abdominal and thigh) caliper. Body fat percent was computed through the formula developed by Jackson and Pollock (Jackson and Pollock, 1978; Aminian Razavi *et al.*, 2012)

2- Physical Fitness Components: speed, agility, power, flexibility

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Speed was measured by administering 50 yard dash and the performance was recorded in second (Verma *et al.*, 2011) and grip strength (GS) was measured by Hand Dynamometer (Afims *et al.*, 1982).

To determine the agility was used and the reading was recorded in seconds.

Statistics: Descriptive information was based on information gathered from the tests. Mean (M) and standard deviation (SD) were used to describe data.

RESULTS AND DISCUSSION

Results

Table 1: Main Characteristics of Subjects (Mean \pm SD)

BMI	23.929 \pm 1.039
FP%	12.945 \pm 6.941
Sitting height (cm)	89 \pm 2.582
Weight (kg)	72.909 \pm 8.320
Height (cm)	175.476 \pm 8.177
Age(years)	20.286 \pm 1.271
Upper body height	88.833 \pm 2.787
Lower body height	97.167 \pm 7.195
Length of hip	44.167 \pm 4.956
Thigh	51.333 \pm 4.033
Leg length	44.333 \pm 5.785
Calf circumference	34.333 \pm 3.445
Total arm length	169.714 \pm 7.111

Table 2: Agility Test, Speed, Power, Flexibility (Mean \pm SD)

Agility	9.63 \pm 0.702
Speed	7.704 \pm 0.473
Power	0.514 \pm 0.075
Flexibility	36.571 \pm 5.769

Discussion and Conclusion

Kabaddi, like any other sport, depends upon certain basic abilities and motor qualities such as speed, strength, endurance, flexibility and Co-ordination.

The factors for selection of Kabaddi players for attack are: attacking ability, foot-work, deciding ability, escaping skill, tactical ability, supporting ability.

The factors for selection of Kabaddi players for defense are: positional play, catching ability, control, Co-ordination with team mates, tactical play, supporting ability, safe raiding.

The results are shown in tables 1 and 2. The mean age of the subjects (M= 20.2 year) and the average Indian Kabaddi players age (M=20.7 year). The mean height of the subjects (M= 175.4 cm) was observed to be higher than those of the average Indian Kabaddi players (M= 174.3cm). This height difference

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might have given him the mechanical advantage that led to successes. Leg length in Iranian Kabbadi players is (M= 48.1 cm) and Leg length in Indian Kabaddi players (M= 44.3 cm).

Kabaddi similar to Wrestling and weight lifting require a heavy body weight (Morehouse and Rasch). The lower weight (M=72.9) and fat percentage (M=12.94) in these players may be due to their young age (M= 20.28) than Indian Kabaddi players (mean weight=75.49, mean fat percentage=17.56, mean age = 27.91). Calculation of body mass index (BMI) indicated that BMI in this research in subject was more than the India kabaddi player (23.93 versus 22.54). The result of 4×9 m (agility test) (9.63 ± 0.702) were lower than national soccer players norm, (9.59 ± 1.2).

Kabaddi being a body contact game, the player has to use a lot of explosive power combined with speed and strength. Fundamental defense comprises six skills, i.e., Ankle hold, tight hold, Knee hold, Waist hold, Wrist hold, and Blocking. The player, Use hand muscles in Kabaddi skills. The GS values of the hands were (51.4 kg) and a GS value of the Indian player hands is 44.6 kg. A test of hand grip strength is important for assessing athletes from many sports. Hand Grip strength testing is also often used as a general test of body strength. The values list the average of the best scores of each hand shown this score is average ().

The results of the research had shown that the arm Total arm length (169.7 cm) was less than his height (175.4 cm). The reaching ability and stretching capacity of the hand touch in Kabaddi players is point in attack situation. Three coach of Kabaddi who have observed the subjects' practices and aware of them properly, get subjects' performance quantitative scores from 0 to 100.

The mean score were considered as individual performance. To predict the performance, the independent variables, and to predict the design of equation for Kabaddi athlete's performance, multiple regressions were used for statistical analysis.

It can be concluded that experience, background play, agility, femur length, and flexibility skills are important in achieving success in Kabaddi. It is essential to consider these factors to achieve maximum success in the field and select the best players.

The findings of the present study demonstrated that there is a significant relationship between variables of the short distances between speed, power, agility, flexibility, background play, femur length, tibia length, the percentage of the body fat, agility, and BMI and successful performance. Among the mentioned variables, agility and background play have the most and the variable of flexibility has the less impact on players' performance.

As the next step the research team will study the effective factors in performing Kabaddi skills at high standards. The study team proposes the next step to be carried out via comparative study of various national teams. The next step will also propose practical methods in order to talent scout for Kabaddi.

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International Educational E-Journal, {Quarterly}, ISSN 2277-2456, **Volume-II** (Issue-IV), Oct-Nov-Dec 2013.