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An evaluation of Selected Physical Fitness variables of Kabaddi, Kho-kho and Wrestling players from Haryana and Punjab, India

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Abstract

A comparative examination of physical fitness variables viz., power, agility, strength, speed, flexibility, and endurance was conducted on players of Kabaddi, Kho-kho and Wrestling-the three popular indigenous games of India. Data was collected during training camps of the three games. The subjects for the study were participants between age group 18-25 representing the respective games from Kurukshetra University, Kurukshetra, Guru Nanak Dev University, Amritsar, Punjab University, Chandigarh, and Punjabi University, Patiala camps. A total of 158 subjects were examined (54 from Kabaddi and Kho-Kho each, and 50 from Wrestling). The study reveals that, Kabaddi and Kho-kho players have equal leg power agility, flexibility and speed ability. Agility of Kho-kho players was the best followed by Kabaddi players with minimum scores for Wrestlers. Endurance of Kho-kho players was the best followed by Kabaddi and Wrestling players which showed similar endurance. The arm strength of Kabaddi players was the best whereas; Kho-kho and Wrestling players performed equally. Hence, as per the requirement of the respective game all the players are physically fit but, in comparision to Kabaddi and Wrestling players, Kho-kho players address a better fitness. This study provides base information for devising training module for enhancement of performance of the players of the three indigenous games.

Keywords: Kabaddi, Kho-kho, Wrestling, physical fitness variables.

Introduction

Good health is the barometer of a person's well being. It comes from the inner balance of the body, mind, and spirit. Our body is our valued possession and good health is our prime asset. Physical education and sports sciences have always been for promotion and improvement of health and physical fitness through muscular activities. Enthusiasm for sports and physical fitness is growing in our country. The governments, and some voluntary sports organizations, are adopting various measures to make people aware of the importance of physical fitness.

Fitness of an individual is a measure of its ability to. Fitness is an individual's trait which enables person of live most effectively and potentially. The functional ability of an individual is governed by the physical, mental, emotional, social and spiritual components of fitness, all of which is related to each other and are mutually interdependent (*American Alliance for Health, Physical Education, and recreation, AAHPER)*

Physical fitness, as one aspect of total fitness, is a means for development of individual personality as a whole. Physical fitness includes adequate degrees of health, posture, physique, proper functioning of vital organs, nutrition, and good health habits, along with an adequate amount of endurance, strength, stamina, and flexibility.

Very little work has been done in the field of physical fitness pertaining to the indigenous games–Kabaddi, Kho-kho and Wrestling[1,2]. In India it is a relatively a neglected field. For coaches of Kabaddi, Kho-kho and Wrestling there is a need to explore this field. Moreover; a comparison helps in understanding the variables under study properly and in a detailed manner. This study was undertaken to understand the nature of these games and can help to propose some modules for an improvement in the coaching and training methods that are being used today. The findings of the study will have significance in assessment of the role of various physical. Fitness variables for indigenous game players.

Methodology

To examine the players of different indigenous games i.e. Kabaddi, Kho-kho and Wrestling on 6 components of physical fitness variables *viz;* power, agility, strength, speed, flexibility, and endurance, data was generated with the help of trained physical education teachers and coaches during the training camps of their respective universities in respective games of the inter-varsity tournaments. Players between age groups 18-25 years were selected from camps at Kurukshetra University, Kurukshetra, Guru Nanak Dev University, Amritsar, Punjab University, Chandigarh, and Punjabi University, Patiala. A total 158 subjects were tested (54 from Kabaddi and Kho-kho each, and 50 from Wrestling).

The component of leg power only was used as a marker of power measured by using *Standing Broad Jump Test* (Ground surfaces of about 20 feet with marked 'take-off line' at any side and a measuring tape was used to determine the distance of the jump, as described in Barrow's test battery. The respective scores of the players were recorded with the help of two trained assistants. Each jump was measured in metres from the take off point to the nearest point where any part of the body touches the ground surface. The reading of the best jump out of three trails was recorded as the final score. Agility was measured by Zig-*zag Run Test* (based on Barrow's test battery, using a stopwatch, 5 wooden sticks, a measuring tape, a scorecard, and outdoor area (20 feet x 25 feet). Scoring was done up to the nearest tenth of a second on completion of three laps. *6-Ibs. Medicine Ball Put Test* was adapted to measure arm strength as prescribed in Barrow's test battery, 1954. The distance of the best put out of three trials was recorded as the final score. Speed of the subjects was obtained by *50-Yard Dash Test developed by AAPHERD*. The score was defined as the elapsed time to the nearest tenth of a second between the starting signal and the moment the subject crosses the finish line. Flexibility was measured by *Kraus-Weber Floor Touch Test* devised by Kraus, and Hirschland for testing the range of movement at specific joints (touching the fingertips to the floor by bending downward have been used to examine the ability of the parts of the body to extend or flex). Endurance was examined by *12-Minute Run Walk Test* developed by Cooper. The distance covered by the subjects was recorded in kilometers. The distance recorded was the completed laps plus distance covered after the finish line.

Results and Discussion

The data collected with various tools of physical fitness variables were arranged, tabulated and statistically analysed. The following techniques as mean, SD, and Z-test were used to see the significance of differences between the players of Kabaddi, Kho-kho and Wrestling on various measures used in the study.

A perusal of table-1 above reveals that the mean difference, 0.584, is not significant at 0.05 level of confidence, therefore *no significant difference exists between the leg power ability possessed by Kabaddi and Kho-kho players.* The mean difference of Zig-zag run Test for Kabaddi and Kho-kho is 4.229 in favour of Kho-kho players, which is significant at 0.1 level of confidence. Thus, it implied that *the Kho-kho players have better agility components as compared to Kabaddi players.* Similarly, the mean difference of 6-Ibs Medicine Ball Put Test for Kabaddi and Kho-kho players = 6.009, in favour of Kabaddi players, which is significant at 0.01 probability level meanimg that, *the Kabaddi players have better arm strength component of physical fitness than Kho-Kho players.* Also, the mean difference of 12-Minute Run Walk Test of Kabaddi and Kho-kho players is 4.355 in favour of Kho-kho players, which is significant at 0.01 level of confidence. It implied *the Kho-kho players have better endurance ability than Kabaddi players.* However; the Z-ratio of mean difference for 50-Yard Dash Test is 0.576 and that of Kraus-Weber Floor Touch Test is 0.381 which is not significant ar 0.05 level of confidence. It means that the difference between the speed ability and flexibility possessed by Kabaddi and Kho-kho players are almost the same.

A perusal of table 2 above reveals that the mean difference in the scores on standing Broad Jump Test for Kabaddi and Wrestling players is 3.306 in favour of Kabaddi players, which is significant at 0.01 level of confidencemeaning that, *the leg power ability of Kabaddi players is better than Wrestling players*. Similarly, the Zig-zag Run Test (mean difference of 6.909 in favour of Kabaddi players), 6- Ibs Medicine Ball Put Test (mean difference 4.144) and 50- Yard Dash Test (mean difference 4.131) were also found to be significant at 0.01 level meaning that, *Kabaddi players have better agility, arm strength and speed ability components as compared to the wrestlers.* However; Kraus- Weber Floor Touch Test (mean difference 0.455) and 12- Minute Run Walk Test (mean difference 1.627) were insignificant meaning that, flexibility and endurance of the players of two games were almost the same.

Table-1
Statistics and Z-ratio of Physical fitness variables for Kabaddi and Kho-kho Players

Sr. NO.	Variables	Kabaddi		Kho-Kho		Z-ratio
		Mean	S.D.	Mean	S.D	
1	SBJ	2.31	0.15	2.32	0.17	0.584
2	Z-Z Run	25.20	1.18	24.34	0.94	4.229**
3	6- ibs. Ball	12.12	1.09	10.75	1.28	6.009**
4	50Y-Run	6.37	0.43	6.33	0.36	0.576
5	KWFT	9.96	0.19	9.94	0.3	0.381
6	12Min. R. W.	2.41	1.99	2.62	3.05	4.355**

SBJ= Standing broad jump; Z-Z Run= Zig-zag run; 6- ibs. Ball= 6-Ibs Medicine Ball; 50Y-Run= 50 yard run; KWFT= Kraus-Weber Floor Touch; 12 Min. R. W.=12 min. run and walk, No. of players: Kabaddi (54); Kho-kho (54); Degree of freedom = 106, **Significant at 0.01 level of confidence

Table-2
Statistics and Z-ratio of Physical fitness variables for Kabaddi and Wrestling players

Sr. No.	Variables	Kabaddi		Wrestling		Z–ratio
		Mean	S.D	Mean	S.D.	
1	SBJ	2.31	0.15	2.19	0.19	3.306**
2	Z-Z Run	25.20	1.18	26.79	1.15	6.909**
3	6-Ibs. Ball	12.12	1.09	11.09	1.44	4.144**
4	50 Y-Run	6.37	0.43	6.75	0.49	4.131**
5	KWFT	9.96	0.19	9.94	0.31	.455
6	12 Minute R Walk	2.41	0.20	2.48	0.28	1.627

SBJ= Standing broad jump; Z-Z Run= Zig-zag run; 6- ibs. Ball= 6-Ibs Medicine Ball; 50Y-Run= 50 yard run; KWFT= Kraus-Weber Floor Touch; 12 Min. R. W.= 12 min. run and walk, No. of players: Kabaddi (54); Wrestling (50); Degree of freedom = 102, **Significant at 0.01 level of confidence

Table-3
Statistics and Z-ratio of Physical fitness variables for Kho-kho and Wrestling players

Sr. No	Variables	Kho-Kho		Wrestling		Z-ratio
		Mean	S.D.	Mean	S.D.	
1.	SBJ	2.32	0.17	2.19	0.19	3.658**
2.	Z-Z Run	24.34	0.94	26.79	1.15	11.951**
3.	6-Ibs. Ball	10.75	1.28	11.09	1.44	1.287
4.	50Y- Run	6.33	0.36	6.75	0.49	4.984**
5.	KWFT	9.94	0.3	9.94	0.31	.074
6.	12 Minute R Walk	2.62	0.3	2.48	0.28	2.435*

SBJ= Standing broad jump; Z-Z Run= Zig-zag run; 6- ibs. Ball= 6-Ibs Medicine Ball; 50Y-Run= 50 yard run; KWFT= Kraus-Weber Floor Touch; 12 Min. R. W.= 12 min. run and walk, No. of players: Kho-kho (54); Wrestling (50); Degree of freedom = 102, *Significant at 0.05 level of confidence, **Significant at .01 level of confidence

A perusal of table 3 above reveals that, scores of Standing Broad Jump Test of Kho-kho and wrestling show a mean difference is 3.658, which is significant at 0.01 level of confidence in favour of Kho-kho players meaning that, *Kho-kho players have better leg power ability than Wrestling players,* similarly, Zig-zag run test (mean difference, 11.951), 50-yard Dash Test (mean difference, 4.984) and 12-Minute Run Walk Test (mean difference = 2.435) were found to be significant at 0.01 level of confidence for Kho-kho players meaning that, *Kho-kho players have better agility, speed ability and endurance compared to the wrestling players.* However, mean difference for 6- Ibs Medicine Ball Put Test (1.287) and Kraus-Weber Floor Touch Test (mean difference 0.074), was found to be insignificant meaning that, flexibility and arm strength of players of both the games are almost the same.

Discussion: Kabaddi and Kho-kho players have similar leg power, because both the games involve backward and forward movements and also jumping all through the play. These actions help in the development of the leg power. The duration of the play and the movements of speed are almost same in both the games. Hence, no significant differences exist between speed ability of the players. However, leg power and speed ability of Kabaddi and Kho-kho players is better than Wrestling players. This may be because; backward and forward movements and jumping actions are not involved in Wrestling. In Kabaddi and Kho-kho, the players have to face the attack of a raider, who executes many skills with speed – such as touching with hands, back kick, and crossing the bonus line. At the same time the defenders also apply many techniques to hold the raider – such as ankle hold, thigh hold, knee hold, and chain hold etc. the element of agility plays an important role in these movements. Wrestling on the other hand is a combating game therefore; agility of Kabaddi and Kho-kho players is better than wrestling players, however; the body contact takes place in which one to one fight occurs very closely, the techniques used by the wrestlers do not involve speed component as much as it is done in case of Kabaddi players are better with respect to the speed component than the wrestlers so the speed movements do not take place as in the game of Wrestling hence, lesser speed ability of wrestlers compared to Kabaddi and Kho-kho players. In all the three games, however; movement of bending forward is performed by the defenders to execute many skills such as ankle hold, thigh hold, and knee hold (for Kabaddi and Kho-kho) whereas; on the commencement of the bout and during the bout, the wrestlers perform bending movement many times while applying skills such as ‘ek put’ ‘do put’ etc. in Wrestling. Hence, the players of all the games develop equal flexibility of the trunk.

Endurance components of Kho-kho players are better as compared to that of Kabaddi players probably because, Kho-kho field area is bigger than the Kabaddi field area. Thus, while playing, the Kho-kho players cover more distance by running as

compared to the Kabaddi players, where the field is much smaller. Also, in Kho-kho, the skill of running dominates. In this game a team of nine players chases the defenders with maximum speed to put them out and at the same time the defenders run with the maximum speed not to be put out. This process continues till a term of 9 minutes. There are four terms of 9 minutes in Kho-Kho game, whereas; in Kabaddi the continuous running of 9 minutes does not take place. This may be the reason why the Kho-kho players show better results on 12-Minute Run Walk Test as compared to Kabaddi players. However, the endurance of Kabaddi players is same as that of Wrestlers because, the intensity of load is less and duration is more in Kabaddi whereas; in Wrestling the intensity of load is high and duration is less, so, there are almost equal chances of endurance development in both the games. Running movements are not involved in wrestling, therefore; the Kho-kho players are better on the endurance component as compared to wrestling players.

Kabaddi players show the better results on 6-Is Medicine Ball Put Test as compared to the Wrestling players. This may be due to the reason that in case of Kabaddi the movement of pushing, pulling and throwing the opponents takes place frequently during the play which helps in the development of the explosive strength of arms while in case of Wrestling these activities occur with the maximum strength. As the explosive strength plays an important role in the throwing events,. In case of both Kho-Kho and Wrestling the involvement of hands is maximum in the execution of almost all the skills of these games. For example getting up from square, pole turn, pole dive etc in Kho-kho, and in the execution of techniques such as Dhobipat, Kalajang, Bangri, and Bridge etc. in Wrestling. Therefore, there are almost equal chances of arm strength development in both the games. Hence, no significant difference is observed in the results of the players of both Kho-kho and Kabaddi.

Conclusion

From the findings above we infer that, Kabaddi and Kho-kho players have equal leg power ability, flexibility and speed ability. Agility of Kho-kho players was the best followed by Kabaddi players with minimum scores for Wrestlers. Endurance of Kho-kho players is the best followed by Kabaddi and Wrestling players which have equal endurance. The arm strength of Kabaddi players was the best whereas; Kho-kho and Wrestling players performed equally. Hence, as per the requirement of the respective game all the players are physically fit but, in comparision to Kabaddi and Wrestling players, Kho-kho players address a better fitness.

The findings of the study have a number of implications for coaches, physical education teachers, trainers and players of Kadaddi, Kho-kho and wrestling. One of the major implication of the study is the it could help in developing physical fitness of Kabaddi, Kho-kho and Wrestling players. The findings of the study can be further used for the purposes of screening and designing training programmers, and for providing guidance and counseling to the youngsters. Exercise to develop leg power, agility, arm strength and speed can be included in such programmers in order to improve the performance of the Kabaddi players. Similarly, other findings related to differences between various groups of players on different components of physical fitness variables can be used for the purposes of screening and designing training program for the players of Kabaddi, Kho-kho and Wrestling. Similar findings were made by Vanderford *et al.*[3], Selma *et al.*[4] and Sunil Kumar *et al.* [5].

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