Educational Administration: Theory and Practice
2024, 30(5), 16118 - 16121
ISSN: 2148-2403
https://kuey.net/

Research Article

Physiological Performance Structure of Female Kho-Kho Players

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Citation: Rukhmani Yadav, et.al (2024). Physiological Performance Structure of Female Kho-Kho Players , *Educational dministration: Theory and Practice*, 30(5) 16118 - 16121
Doi: 10.53555/kuey.v30i5.11483

ARTICLE INFO

ABSTRACT

The purpose of the study was to find out the relationship between selected physiological variables and playing ability of national level Kho-Kho Players. For the present study, researcher fifty (N=50) elite Kho-Kho players were randomly selected as subjects from the different district of Chhattisgarh. All the subjects were in regular training schedule. The selected physiological measurements were taken with the help of different method. Resting heart rate was measured by pulse rate, blood pressure was measured by Sphygmomanometer, force vital capacity was measured by peak flow meter, and Vo2max was measured by Queens College step test. The performance of the subjects was measured by judges rating scale during the match. Product moment method for inter-correlation was applied for analysis of data. Resting heart rate, Systolic blood Pressure, Force vital capacity was significant with the performance in 0.05 levels. Diastolic blood pressure and Vo2 max are significant with the performance in 0.01 levels. It can be concluded from the findings of the present study that heart rate, Systolic blood Pressure, Force vital capacity, Diastolic blood Pressure and Vo2 max measurements contribute significantly in Kho-Kho performance.

Keywords: Physiological parameters, vo2 max, Sphygmomanometer, Queens College step test, judges rating scale.

Introduction

The structure of sports performance is a complex interplay of various elements that shape an athlete's capabilities. It consists of numerous influencing factors—some internal, others external; some controllable, while others remain beyond the athlete's control. Performance in Kho-Kho is particularly dependent on **speed, stamina, endurance, strength, and technical skills**, with dodging and controlled sprinting adding excitement to the game. As players advance in their performance level, they naturally develop a high degree of physical fitness. Studies, such as those by Peter and Haliski (1950), emphasize that **successful participation in sports is closely linked to physical fitness**. Bernard (1966) observed that individuals engaging in regular exercise tend to see an improvement in their fitness levels. Additionally, Bosco (1975) found that elite gymnasts exhibited a **lower heart rate**, a key indicator of strong endurance and superior fitness.
The structure of sports performance is divided into several key components:
Physical Component – Concentrates on developing motor abilities essential for athletic excellence.
Technical Component – Focuses on mastering sport-specific skills through structured learning.
Tactical Component – Enhances strategic execution and decision-making during competition.
Physiological Component – Aims at optimizing an athlete's overall capability for peak performance. Would you like further refinements or additional insights on any specific aspect?
.For the present study researcher delimited the study on Physiological component.

Objective of the Study

- To study the physical parameters (viz. height, weight) of national level Kho-Kho players.
- To study the physiological profile of national level Kho- Kho players in detail.
- To study the impact of the physiological variables (i.e. Resting Heart Rate, Blood pressure -systolic & diastolic both in resting condition, Force vital capacity and Vo2 max) on kho- kho performance.

Methodology

here are the Process of Methodology.

Selection of Subjects

Fifty elite female Kho-Kho players at the state level were selected as participants for this study. All athletes were actively engaged in Kho-Kho, training regularly under the guidance of experienced and certified coaches. They were recognized as bona fide state-level Kho-Kho players and belonged to the age group of 15 to 24 years.

Sl. No.	Physical parameters	Use of tools	Unit of measurements
1	Age	from their date of birth	Years
2	Height	using anthropometric rod adopting standard procedure	cm
3	Weight	Using Weighing Machine	Kg

Methods were used for measuring Physiological parameter

S l. no.	Physiological parameters	Test Items tools	Unit of Measurement
1	Heart rate	Pulse Rate	beats / min
2	Blood Pressure	Sphygmomanometer	mm of hg
3	Force Vital Capacity	Peak Flow Meter	ml / min
4	Vo2 max	Queens college step test	ml/ kg /min

Measuring Kho-Kho playing Ability

Kho-Kho playing ability was measuring by Judges rating Scales.

Statistical analysis

To determine the relationships, Pearson's Product moment method for inter-correlation was applied and the alpha level was set at 0.05.

Results and Discussion

The results of the study are given below in the following Tables

Table 1: Mean and Standard deviation of the Physiological Profile and Kho- Kho playing ability of the subjects (N= 50)

SL. No.	Parameters	Mean	Standard Deviatation
1.	Resting Heart Rate	65.44	±1.94
2.	Systolic blood Pressure	122.36	±4.411
3.	Diastolic Blood Pressure	71.24	±8.28
4.	Force vital capacity	707.7	±81.973
5.	Vo2 max	43.758	±1.934
6.	Kho-Kho playing ability	56.8	±3.521

According to Table No. I, the mean heart rate of the selected Kho-Kho players was recorded at 65.44 beats per minute, with a standard deviation of 1.94 beats per minute. The mean systolic blood pressure was measured at 122.36 mmHg, with a standard deviation of 4.11 mmHg, while the mean diastolic blood pressure was 71.24 mmHg, with a standard deviation of 8.28 mmHg. Additionally, the mean forced vital capacity of the selected players was 707.7 ml/min, with a standard deviation of 81.973 ml/min. Lastly, the mean VO_2 max was calculated at 43.758 ml/kg/min, with a standard deviation of 1.934.

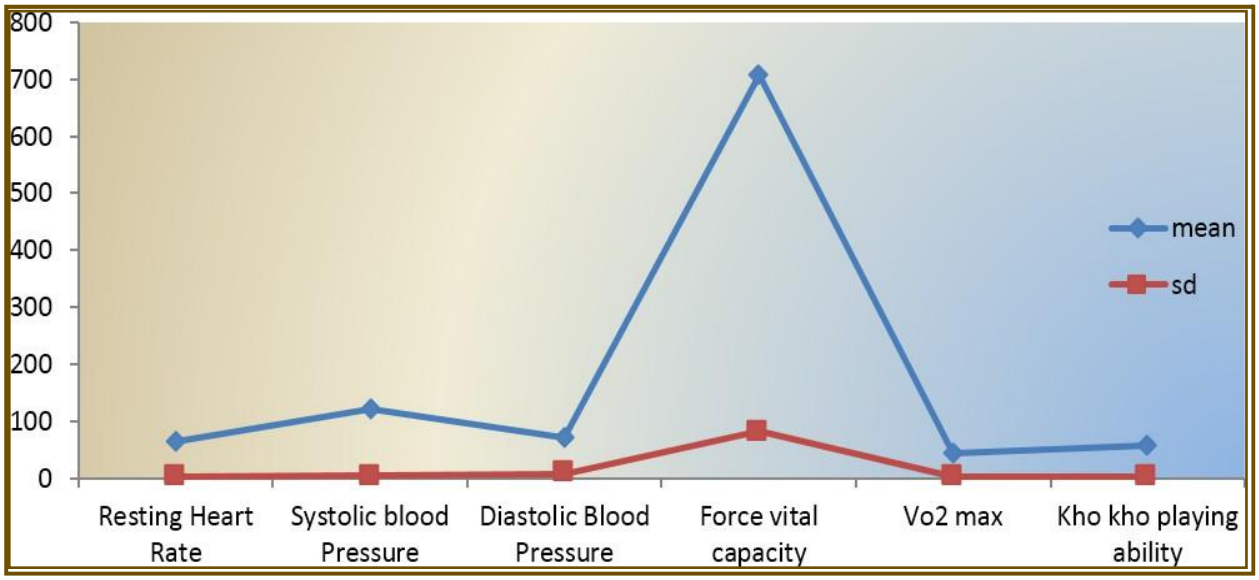

Fig 1: Graphical presentation of Mean and SD of the Physiological Profile and kho- kho playing ability of the subjects (N= 50)

With the knowledge of mean values of selected, physiological parameters, the co-efficient of correlation between performance ability and the selected physiological parameters were computed. Table -6 shows the results.

Table 2: Coefficient of correlation between performance ability and the physiological parameters

SL. No.	Parameters	Co-relation with Playing Ability
1	Resting Heart Rate	0.27*
2	Systolic blood Pressure	0.283*
3	Diastolic Blood Pressure	0.566**
4	Force vital capacity	0.262*
5	Vo2 max	0.503**

*Significant at 0.05 level **Significant at 0.01 level

The coefficient of correlation between playing ability and heart Rate was .27. The coefficient of correlation between playing ability and Systolic Blood Pressure was – 0.283. The correlation between playing ability and Diastolic Blood Pressure was - 0.566. The correlation between playing ability and Force vital capacity was 0.262. The correlation between playing ability and vo2 max was 0.503.

Discussion

The results of the study clearly show that the kho- kho plying ability is significantly and positively related to the physiological parameters. Out of five physiological parameters Diastolic Blood Pressure and Vo_2 max are significant in 0.01 levels. Resting Heart Rate, Systolic blood Pressure, Force vital capacity was significant in 0.05 levels. Positive and significant force vital capacity and Vo_2 max indicates the goodness of energy liberation system which is very much useful for performance in Kho-Kho. Whereas Positive and significant lowering of resting heart rate indicate the efficient heart (Athletic heart) i.e. accelerate and decelerate the speed quickly. Positive and significant increment of Diastolic and Systolic blood Pressure during playing situation indicate more blood supply to the active muscle; which is very necessary for good performance. The findings of the study are in complete agreement with the results of the earlier studies reported by Brooks, Fahey and White (1996) that systolic blood pressure rises steadily during exercise, in a similar trend to that of heart rate.

Conclusion

Research findings indicate that in many sports, playing ability is closely linked to physical and physiological components. Kho-Kho players with higher VO_2 max tend to perform better in the game, as these attributes are strong predictors of Kho-Kho skills. Players with average or lower fitness levels may find the game unsuitable. Kho-Kho athletes are recognized for their endurance and strength, with national-level players exhibiting superior physical and physiological capabilities. There exists a strong interrelationship between physiological factors and playing ability.

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