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IRJPES Research Journal Impact Factor (ISRA & SJIF): 7.436
Research Unique Number (RUN): 16.09.2022.2034
Website: www.sportjournals.org.in

A STUDY OF BODY HEAT AND PERSPIRATION OF UNIVERSITY KABBADI PLAYERS



Singh Vivek Kr.¹



Singh Priyanka²

¹Lecturer, DIET, Narwal, Kanpur, (U.P)-INDIA.
²Assistant Professor, ADNNMM Kanpur, (U.P)-INDIA.
Corresponding Author: Singh Priyanka
E. Mail: drpriyankaphysicaleducation@gmail.com

ABSTRACT

The objective of this study was to investigate the impact of engaging in the Kabaddi game on the body temperature and sweating patterns of collegiate athletes. Fourteen Kabaddi players, aged between 17 and 23, who were competing at the university level in Awadh University and CSJM University, Kanpur, were included as participants. Data was gathered during the inter university championship held at CSJM University, Kanpur. Body weight and body temperature were measured for each subject both before and after the Kabaddi match. A significance level of 0.05 was employed for the study. Standard methodologies were followed, and a paired 't' test was conducted to compare the pre and post effects. The resulting 'p' value demonstrated a significant difference at the 0.05 level of significance in oral temperature and sweating among Kabaddi players before and after the game. Analysis of the collected data on body weight and oral temperature indicated a notable difference before and after the game, with a significant decrease in body weight post-game, suggesting a substantial increase in sweat production.

Keywords: Sweat Amount, Oral Temperature, Kabaddi University Players, All India Interuniversity Tournaments.

INTRODUCTION

Humans are inherently inclined towards competition and strive for excellence in all athletic endeavors. This drive for superiority is not confined to individual achievement

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but extends to national levels, where countries vie to showcase their prowess by outperforming one another. This spirited rivalry acts as a catalyst, inspiring and propelling nations to exert themselves, aiming to sprint faster, leap higher, and showcase enhanced strength, endurance, coordination, and skill in today's fiercely competitive global arena. In modern competitive sports, athletes are in a perpetual race to surpass their competitors. Competitions have evolved into a fundamental means of human expression, with competitive sport being a pivotal element in garnering national and international recognition and prestige. The performance of athletes in competitive sports is influenced by various factors, including physical fitness, technique rooted in scientific principles, structured training regimens, and dietary habits. Additionally, environmental conditions such as heat, cold, altitude, and humidity wield a significant impact on the performance of athletes. There isn't a single definitive normal body temperature, as numerous measurements on individuals considered to be in good health have revealed a normal temperature range of about 36.1°C to 37.2°C when measured rectally. This rectal measurement tends to be around 37.8°C higher than when measured orally, which is typically considered an average normal body temperature of about 37.0°C (98.6°F). The body's temperature can fluctuate slightly due to factors such as physical activity and the ambient temperature, as the body's temperature regulation mechanisms are not entirely foolproof. During vigorous exercise, excessive heat production can cause the rectal temperature to elevate significantly, reaching levels between 38.3°C to 40.0°C (101°F to 104°F). The capacity to perceive and regulate body temperature is a crucial aspect of human survival. Deviating by $\pm 3.5^{\circ}\text{C}$ from the resting temperature of 37°C can lead to physiological impairments and even fatality. In conditions where exercise occurs in comfortable environmental settings, the primary concern revolves around effectively dissipating the excess heat generated by metabolic processes.

The increase in body temperature during exercise seems to result from a "resetting" of the hypothalamic "thermostat" to a higher level, akin to what occurs in clinical fever. Notably, height and Sweating 3 have proposed that this elevation of the body temperature

regulation set point post prolonged exercise is a consequence of the release of pyrogens from damaged cells, particularly in muscles and kidneys. The movement of neutrophilic leucocytes into circulation during exercise is a well-known phenomenon, and these cells become available to phagocytose the damaged tissue cells, subsequently releasing pyrogens. This orchestrated process ensures that heat loss aligns with heat production at an elevated body temperature. Additionally, given that a significant portion of excess heat is generated in active muscles, their temperature exceeds that of the entire body, as evidenced by oral and rectal temperature measurements.

OBJECTIVE OF THE STUDY

The objective of this study was to investigate the impact of engaging in the Kabaddi game on the body temperature and sweating patterns of collegiate athletes.

DESIGN OF THE STUDY

14 Kabaddi players with age ranging from 17 to 23 years. All were university level sportsman from Awadh University and CSJM University, Kanpur, were selected as subjects for the study. The data were collected for each variable by administering their respective tests. The weight and oral temperature of each subject was taken before the start of the Kabaddi match and again the weight and oral temperature was taken after the match to assess the amount of sweat loss and rise in temperature during the Kabaddi match, thermometer for temperature and body weighing method for sweat loss was used (AIS Nutrition Department).the analysis of data was realized using the statistical program SPSS for statistical analysis paired‘t’ test was employed.

RESULTS AND DISCUSSIONS

The data were collected and analyzed in order to draw a conclusion on influence on body temperature and also on sweat, and the scores are given bellow.

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Table No. 1
Descriptive statistics of Kabaddi players on Sweat Rate and on Body Temperature

No.	Variables	Mean		Standard Deviation	
		Pre	Post	Pre	Post
14	Sweat loss	64.1528	62.4	6.6563	6.93553
14	Body temperature	36.7458	38.1786	0.4191	0.56142

Table-1 reveals that Mean and Standard Deviation of Sweat rate for Pre-Data is 64.1528, ± 6.6563 , and for post data is 62.4000 ± 6.93553 and for body temperature mean and Standard Deviation for Pre-Data is 36.7458, ± 0.4191 , and for post data is 38.1786, ± 0.56142 respectively.

The mean scores of Pre and Post data on body temperature and sweat loss fluid loss in water and fluid loss on land has been represented graphically in figure no 1

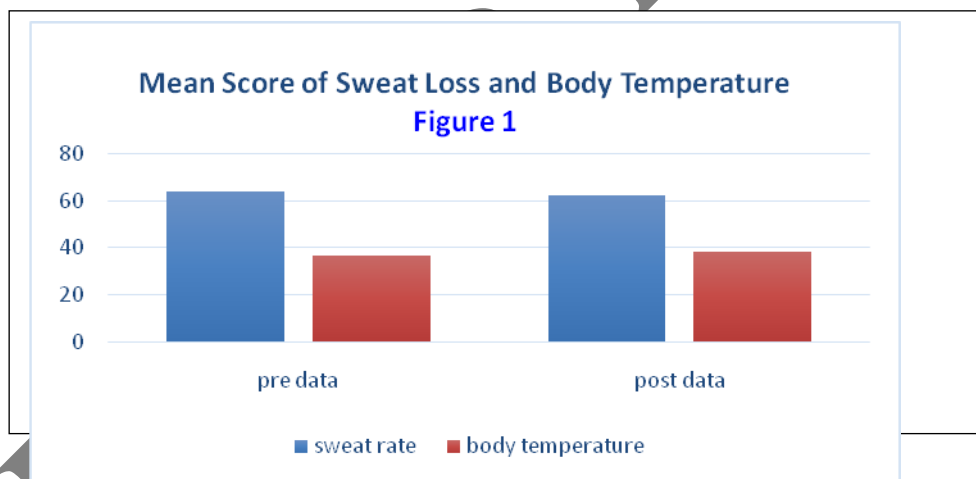


Table No. 2
Comparison of mean difference of Sweat Rate between Pre and Post Data among Kabaddi Players

Df	Mean Difference	Std. error Difference	t	Significance
13	1.64286	0.49725	12.362	0

It is evident from Table no. 2 that obtained p- value (0.000) is lesser than 0.05 thus indicating that there is significance difference among Kabaddi players before and after the match in term of sweat rate.

Table No. 3
Comparison of mean difference of Body Temperature between Pre and Post data among Kabaddi Players

Df	Mean Difference	Std. error Difference	t	Significance
13	-1.32286	0.56918	-8.696	0

It is evident from Table no. 3 that obtained p- value (0.000) is lesser than 0.05 thus indicating that there is significance difference among squash players before and after the match in term of body temperature.

DISCUSSION AND CONCLUSION

The data analysis unequivocally demonstrates notable discrepancies in body temperature before and after the game, as well as a discernible contrast in sweating levels pre and post-game. While the skin temperature likely experienced an initial rise during the early stages of the game, it returned to the pre-game levels after the match, potentially due to evaporative sweating that effectively cooled the body's surface temperature. The skin temperatures exhibit a strong correlation with the surrounding ambient temperature, a pattern consistent with the observations made by Saltine and Gage. Elevated core body temperature during muscular exertion corresponds to an escalation in metabolic rate. Given that mechanical efficiency can range from 0.25 percent onwards, a substantial proportion of the energy generated, at least 75 percent, converts into heat, leading to a rise in oral temperature. Maron, Wagner, and Horvath, in their research on

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marathon runners, observed a surge in core body temperature. Analysis of sweating data vividly indicates a significant loss of sweat within the group, directly tied to heightened body temperature during muscular activity. In such conditions, the blood vessels in the skin dilate, directing more blood to the periphery. Consequently, sweat glands are stimulated, drawing sweat from the blood and excreting it. Wells also documented similar outcomes, reinforcing these findings.

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