

**COMPARATIVE STUDY ON THE PHYSIOLOGICAL VARIABLES OF DIFFERENT  
LEVEL MALE ARCHERS**Ridham Harod<sup>1</sup> and Dr. Ramesh Chand Yadav<sup>2\*</sup><sup>1</sup>Research Scholar, Lakshmibai National Institute of Physical Education, NERC, Guwahati, India.<sup>2</sup>Assistant Professor, Lakshmibai National Institute of Physical Education, NERC, Guwahati, India.**\*Corresponding Author: Dr. Ramesh Chand Yadav**

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**ABSTRACT**

**Background & Objective:** The aim of study was to find out the differences in physiological parameters of national and state level male archers. **Method:** In this comparative study **independent sample t-test** was used to compare both the groups. A total of ten male (N=10) archers participated in this study, of which five were National level archer and five were state level archer. Resting heart rate RHR, resting respiratory rate RRR, blood glucose level BGL, passive breathe holding capacity PBHC, and systolic and diastolic blood pressure SBB, DBP was measured of all archers. **Conclusion:** On comparing the outcomes of independent sample t-test at 0.05 level of significance it was interpreted that Blood glucose level was high in National level archers and Systolic Blood Pressure was low in State level archers but there was negligible difference interpreted in Resting Heart rate, Breathe Holding Capacity, Resting Breathe Count and Diastolic Blood Pressure of both level archers.

**KEYWORDS:** Archers, Physiological Variables.**INTRODUCTION**

Archery, an ancient sport with its roots dating back thousands of years, has evolved into a prominent Olympic discipline known for its blend of skill, concentration, and precision. The ability to consistently shoot with accuracy and maintain focus over a set amount of time is crucial for success in archery.<sup>[1]</sup> While technical proficiency and mental fortitude are often highlighted as key factors in archery performance, the role of physiological variables cannot be overlooked.

Physiological parameters such as heart rate, blood pressure, respiratory rate, and breath-holding time are vital indicators of an athlete's physical capabilities and can significantly impact shooting performance.<sup>[2]</sup> Understanding the physiological differences between archers of various skill levels can shed light on the specific adaptations and requirements for achieving success in this sport.

Although several studies have investigated the physiological demands of archery, there is a paucity of research focused specifically on comparing physiological variables among male archers at different skill levels. This study aims to address this gap by conducting a comparative analysis of physiological parameters, providing valuable insights into the physiological profiles of archers at different stages of their training and competitive careers.

**MATERIAL AND METHODS****Selection of the Subject**

For the purpose of these study 5 National level male archers and 5 State level archers, with the age group 17-22 years were selected as subjects for this study. The performance of each subject was measured on the basis of following criteria.

**Table 1: Criterion Measures.**

S.No.	Physiological Components	Equipment	Unit
1	Blood pressure	Sphygmomanometer	mmHg
2	Blood Glycogen Level	Glucometer	mmol/L
3	Positive Breath holding time	Digital stop watch	Min/sec
4	Resting Respiratory Rate	Digital stop watch	Per/min
5	Resting Pulse Rate (radial artery)	Digital stop watch	Per/min

Systolic Blood Pressure SBP measurement was performed by using a Medigold Conventional Sphygmomanometer, the measurement was taken at relaxed sitting position from left hand side. The blood pressure cuff was attached securely and inflated then stethoscope was placed to hear the pulsation from bend of the elbow, further by releasing pressure manually the systolic blood pressure SBP was recorded, and Resting Pulse Rate RPR was calculated from radial artery the palpation was noted for a minute with the use Casio digital stopwatch, palpation was noted for a minute with the use Casio digital stopwatch also the resting respiratory rate RRR was recorded in term of the total number of inhalation and exhalation per minute which was physically analysed. Breathe Holding Capacity BHC was measured while archer was asked to inhale completely to their maximum capacity and further asked to exhale out completely, after exhaling the volunteer was told to hold the breath and simultaneously timer on stopwatch started and then stopped at any sign of discomfort or at stop signal. Blood glucose level BGL was obtained through using Onetouch automatic Glucometer.

**Statistical Analysis**

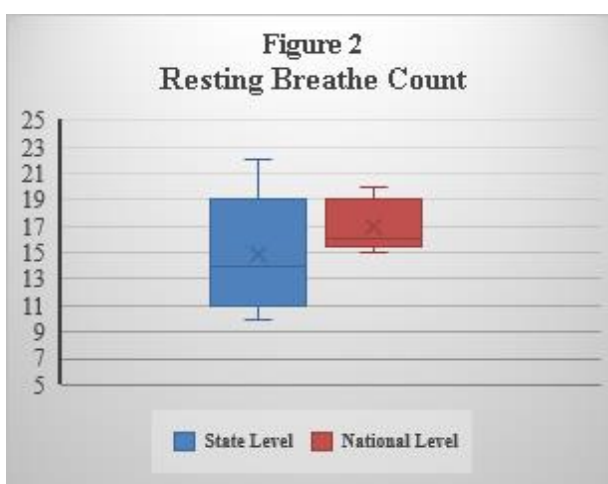
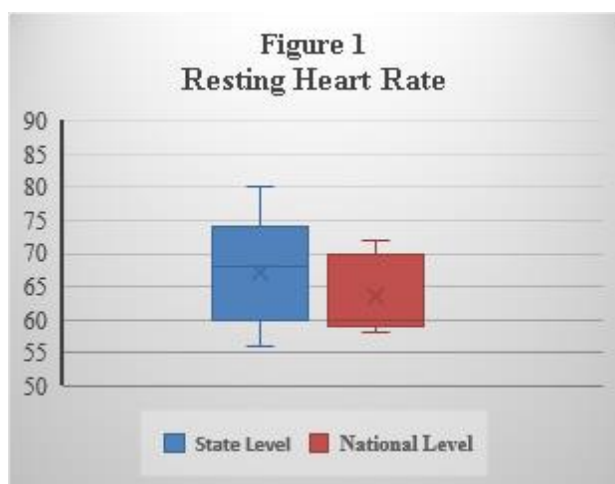
SPSS 21.0 Software was used to analyse the result for study. Mean, standard deviation, standard error was used to find out whether there is difference in the physiological attributes of National Level Archers and State level Archers; Independent two sample t-test will be used to compare both the groups. The level of significance will set at 0.05.

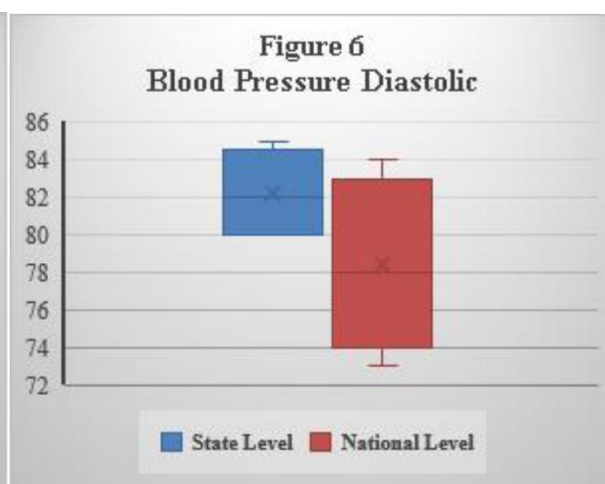
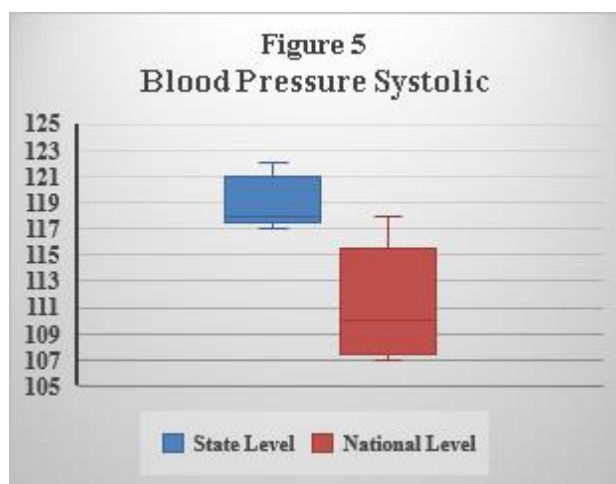
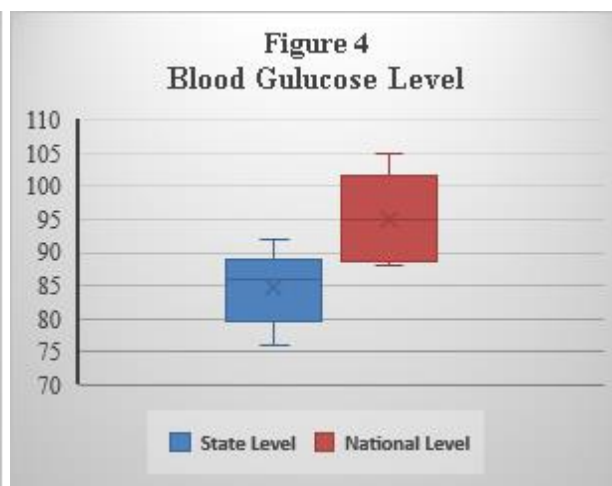
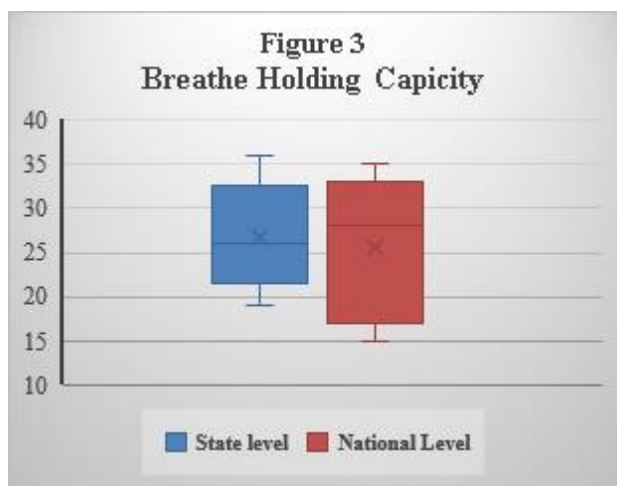
**RESULTS**

Table 2 revealed the descriptive statistics of national and state level data which includes mean, standard deviation and standard error. Resting heart rate of national and state level archer’s mean, SD was 67.20±8.67, 63.60±6.07 and SEM 3.88;2.71 respectively, Breathe Holding Capacity of national and state level archer’s mean, SD was 26.8±6.30, 25.6.\$8.35 and SEM 2.82;3.74 respectively, Resting breathe count 14.80\$4.60, 17.00±2.00 SEM 2.06;.89 respectively, Blood Glucose Level of national and state level archer’s mean, SD was 84.60±5.81,95.00±6.96 SEM 3.11;0.89 respectively, Blood Pressure Systolic of national and state level archer’s mean, SD was 119.00±2.00, 111.20±4.44 and SEM 1.98, Blood Pressure Diastolic of national and state level archer’s mean, SD was 82.20±2.28, 78.40±4.62 and SEM 1.02;206 respectively.

**Table 2: Descriptive statistics for Physiological Variables (N=5).**

Variables	Level of player	Mean	Std. Deviation	Std. Error Mean
Resting heart rate	State level	67.20	8.67	3.88
	National level	63.60	6.07	2.71
Breathe holding capacity	State level	26.80	6.30	2.82
	National level	25.60	8.35	3.74
Resting breathe count	State level	14.80	4.60	2.06
	National level	17.00	2.00	0.89
Blood gluucose level	State level	84.60	5.81	2.60
	National level	95.00	6.96	3.11
Blood pressure systolic	State level	119.00	2.00	0.89
	National level	111.20	4.44	1.98
Blood pressure diastolic	State level	82.20	2.28	1.02
	National level	78.40	4.62	2.06





**Table 3: Independent Sample t-test for Physiological variables (N=10)**

Variables	Level of Player	Mean	S.D.	95% Confidence Interval of the Difference		df	t value	Sig. (2-tailed)
				Lower	Upper			
Resting Heart Rate	State Level	67.2	8.67	-7.31	14.51	8	0.761	0.469
	National Level	63.6	6.07	-7.54	14.74			
Breathe Holding Capacity	State Level	26.8	6.3	-9.59	11.99	8	0.256	0.804
	National Level	25.6	8.36	-9.74	12.14			
Resting Breathe Count	State Level	14.8	4.6	-7.38	2.98	8	0.98	0.356
	National Level	17	2	-7.83	3.43			
Blood Glucose Level	State Level	84.6	5.81	-19.76	-1.04	8	2.563	0.033
	National Level	95	6.96	-19.81	-0.99			
Blood Pressure Systolic	State Level	119	2	2.78	12.82	8	3.583	0.007
	National Level	111.2	4.44	2.37	13.23			
Blood Pressure Diastolic	State Level	82.2	2.28	-1.51	9.11	8	1.657	0.137
	National Level	78.4	4.62	-1.87	9.47			

Table 3 reveals that the calculated value of independent 't' test for resting heart rate, breath holding capacity, resting breathe count, diastolic blood pressure is 0.761, 0.256, 0.98, 1.657 respectively and (p- value) was 0.469, 0.804, 0.356 respectively which was insignificant at 0.05 level of significance indicates that resting heart rate, breath holding capacity, resting breathe count, diastolic blood pressure of national and state level

archers do not have significant difference simultaneously the calculated 't' value for blood glucose level and Systolic Blood Pressure was 2.563, 3.583 respectively and (p-value) was 0.033, 0.007 respectively, which is significant at 0.05 level reveals that the blood glucose level and Systolic Blood Pressure of national and state level archers differs significantly.

### Discussion of findings

The study was based on two groups i.e., National level archers and State level archer. Different tests were conducted to examine the selected physiological attributes (resting heart rate, resting breathe count, breathe holding capacity, blood glucose level, Systolic and diastolic blood pressure) in both national and state level archers. The data was collected specifically at early morning to obtain true result.

The result of the study shown that physiological variables i.e. resting heart rate, resting breathe count, breathe holding capacity and diastolic blood pressure shown insignificant mean difference. It was concluded that experienced archers exhibit better accuracy with lower heart rate compared with inexperienced archers.

### CONCLUSION

Archers are kind of athletes who need to be fit, in all aspects like physical physiological and psychologically. Testing fitness on the basis of psychological attributes help to find out the appropriate functioning of body according to requirement of sport. However, there is innumerable supportive evidence for importance of physiological functioning of body for good performance has been based on a vast body of anecdotal reports.

Archers at different level can have similar physiological state of body, it was concluded from this study but due to several limitations there are still possibilities of further research on same research problem.

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