

Relationship between Physiological Status and Academic Achievements of University Level Students of Vidarbha – A Study

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1.0 Introduction

The health benefits of regular physical exercise are widely acknowledged. Even though the benefits of physical exercise are acknowledged, physical education in public schools is viewed as an extracurricular activity and physical education teachers have experienced firsthand when money is tight and/or when there is pressure to improve test scores, physical education is one of the first activities to be cut back or eliminated. However if there is evidence that physical education has a direct positive effect on important educational domains such as reading and mathematics, it could be argued that physical education is not extracurricular. Rather, it is a vital component in student's academic success (Singh and McMahan, 2006).

Hence, an understanding of the relation between health and academic performance of a student has significant implications in devising new education policies. As good academic performance is directly related to better higher education opportunities and job opportunities, it has always been a matter of concern for both parents as well as students (Mikkila et al., 2003). In days of ever tightening budgets and ongoing criticism of the academic records of public schools, the tendency to cut funding for extra-curricular activities and physical education is stronger than ever which in return contributes to the overall problem of health, missed school days and school performance. Student's health is on the decline and the current increase in the prevalence of childhood obesity has become one of the most important public health concerns in the developed as well as developing world (Kim et al., 2003). There are a number of studies, which indicate the overweight and obese children are more likely to have low self-esteem and that they have higher rates of anxiety, disorders, depression and other psychopathology (Zametkin et al., 2004). Hence, in view of the above information the purpose of this study is to examine the relationship between physiological status of the collegiate level students of Gondwana University, Gadchiroli and R.T.M. Nagpur University Nagpur with their academic performance.

2.0 Research Methodology

2.1 Selection of Subjects

The subjects for this study were randomly selected from the two universities of Maharashtra namely Gondwana University, Gadchiroli and R.T.M. Nagpur University Nagpur. The age of the subjects ranged between 18 and 25 years. A total of 240 students were selected (120 from each of the university).

2.2 Tests for physiological status and academic achievement measurements

The physiological parameters like blood pressure (systolic and diastolic), resting pulse rate and lung capacity were determined by using standard methods. The academic achievement of the collegiate level students was determined using a structured interview schedule, which was developed by the researcher to know the academic proficiency of students.

2.3 Administration of the tests

Prior to data collection process, the researcher called a meeting with the subjects in their respective colleges. The entire test related procedures and requirements were explained to them in details so that there was no doubt in their minds regarding the effort and strain needed for providing the data. The necessary data related to the study was collected from the students of Gondwana University Gadchiroli and Rashtrasant Tukadoji Maharaj Nagpur University Nagpur for the statistical analysis.

2.4 Reliability of data

The reliability of data was ensured by establishing the instruments reliability, tester’s competency and reliability of the test. To ensure that the investigator is well versed with the technique of conducting the test, the investigation had number of practice session in the testing procedure under the guidance of the expert. The tester’s competency was also evaluated together with the reliability of the test.

2.5 Statistical techniques employed

The data generated during the study was processed using various statistical tests with the aid of Statistical Package for Social Sciences 18.0 software. The data characteristics such as mean, standard deviation, range etc. were determined and the Pearson Product Moment Correlation coefficients were determined to assess the relationship between physical fitness and academic achievement of the students.

3.0 Results and discussion

3.1 Resting Blood Pressure - Systolic

Table 1: Comparative assessment of the systolic blood pressure of the students

Students from	Mean	±SD	Min	Max	MD	t	P
Gondwana University	116	±10	95	130	6.0	2.107	<0.05
RTM Nagpur University	122	±11	100	140			

SD: Standard deviation; **Min:** Minimum; **Max:** Maximum; **MD:** Mean difference; **t:** ‘t’ ratio; **P:** Probability

Blood pressure is the amount of force (pressure) that blood exerts on the walls of the blood vessels as it passes through them. Systolic blood pressure is the amount of pressure that blood exerts on vessels while the heart is beating. Above Table 1 presents the systolic blood pressure of the students from Gondwana University and RTM Nagpur University. The mean systolic blood pressure for students belonging to Gondwana University was 116±10 mmHg. However, for students belonging to RTM Nagpur University, it was 122±11 mmHg.

3.2 Resting Blood Pressure - Diastolic

Table 2: Comparative assessment of the diastolic blood pressure of the students

Students from	Mean	±SD	Min	Max	MD	t	P
Gondwana University	68	±6	60	85	3.0	0.819	NS
RTM Nagpur University	71	±7	60	90			

SD: Standard deviation; **Min:** Minimum; **Max:** Maximum; **MD:** Mean difference; **t:** ‘t’ ratio; **P:** Probability

Diastolic blood pressure measures the pressure in blood vessels between heartbeats (when the heart is resting). Represented by the bottom number in a blood pressure reading, diastolic blood pressure is considered low when the blood pressure reading is below 60; a diastolic blood pressure reading higher than 90 is considered high. The Above Table 2 presents the diastolic blood pressure of the students from Gondwana University and RTM Nagpur University. The mean diastolic blood pressure for students belonging to Gondwana University was 68±6 mmHg. However, for students belonging to RTM Nagpur University, it was 71±7 mmHg.

3.3 Resting Pulse Rate

Table 3: Comparative assessment of the resting pulse rate of the students

Students from	Mean	±SD	Min	Max	MD	t	P
Gondwana University	62	±4	50	72	8.0	2.845	<0.05
RTM Nagpur University	70	±7	58	78			

SD: Standard deviation; **Min:** Minimum; **Max:** Maximum; **MD:** Mean difference; **t:** ‘t’ ratio; **P:** Probability

Pulse rate is nothing but the number of times the heart beats in a minute. And resting pulse rate is the heart rate when the body is resting. The resting heart rate reflects the health of a person and

hence is an important health factor that should be measured. Pulse rate tells, how efficiently our heart and lungs work. Lower the resting heart rate, healthier is the person. There are certain factors that govern one's resting heart rate; they are, sex, age, physical fitness, anxiety, medication, etc. The Above Table 3 presents the resting pulse rate of the students from Gondwana University and RTM Nagpur University. The mean resting pulse rate for students belonging to Gondwana University was 62±4 beats/min. However, for students belonging to RTM Nagpur University, it was 70±7 beats/min.

3.4 Lung Capacity

Table 4: Comparative assessment of the lung capacity of the students

Students from	Mean	±SD	Min	Max	MD	t	P
Gondwana University	6800	±422	6100	7600	450	4.239	<0.05
RTM Nagpur University	6350	±514	5200	7100			

SD: Standard deviation; **Min:** Minimum; **Max:** Maximum; **MD:** Mean difference; **t:** 't' ratio; **P:** Probability

The Above Table 4 presents the lung capacity of the students from Gondwana University and RTM Nagpur University. The mean lung capacity for students belonging to Gondwana University was 6800±422 litre. However, for students belonging to RTM Nagpur University, it was 6350±514 litre.

3.5 Academic Achievement

Table 5: Academic performance of students of Gondwana University, Gadchiroli and RTM Nagpur University, Nagpur

Academic performance	Gondwana University		RTM Nagpur University	
	Nos.	Per	Nos.	Per
Good	12	10.0	20	16.7
Satisfactory	54	45.0	60	50.0
Average	36	30.0	26	21.7
Below Average	18	15.0	14	11.7
Total	120	100	120	100

Above Table 5 presents results of comparative assessment of academic performance of students from Gondwana University and RTM Nagpur University. 10% students of Gondwana University and 16.7% students of RTM Nagpur university have good academic performance. In addition to it 45% of the Gondwana University and 50.0% students of RTM Nagpur University have satisfactory academic achievement, whereas 30% and 21.7% students of Gondwana University and RTM university performed averagely. Furthermore, 15% and 11.7% students of Gondwana University and RTM Nagpur university have below average academic performance.

3.6 Relationship between academic achievement and physiological variables

Table 6: Relationships between academic achievement and physiological variables of the students from Gondwana University, Gadchiroli and RTM Nagpur University, Nagpur

Physiological variables	Correlation between Academic Achievement and physiological variables	
	Gondwana University	RTM Nagpur University
Systolic Blood Pressure	0.227	0.422*
Diastolic Blood Pressure	-0.497*	-0.417*
Resting Pulse Rate	-0.529*	-0.302*
Lung Capacity	0.406*	0.441*

* : Significant at p 0.05 level

** : Significant at p 0.01 level

The Above Table 6 presents results regarding the relationships between academic achievement and physiological variables of the students from Gondwana University and RTM Nagpur University. The study results indicated that there is positive relationship between academic achievement and physiological variables (especially, systolic blood pressure and lung capacity) of

students belonging to Gondwana University, Gadchiroli as well as those belonging to RTM Nagpur University, Nagpur. However there is negative relationship between academic achievement and physiological variables (especially, diastolic blood pressure and resting pulse rate) of students belonging to Gondwana University, Gadchiroli as well as those belonging to RTM Nagpur University, Nagpur.

4.0 Conclusions

4.1 Resting Blood Pressure - Systolic

- The comparative assessment showed that there is significant ($P<0.05$) difference in the resting systolic blood pressure of students belonging to different universities.

4.2 Resting Blood Pressure - Diastolic

- The comparative assessment showed that there is significant ($P<0.05$) difference in the resting diastolic blood pressure of students belonging to different universities.

4.3 Resting Pulse Rate

- The comparative assessment showed that there is significant ($P<0.05$) difference in the resting pulse rate of students belonging to different universities.

4.4 Lung Capacity

- The comparative assessment showed that there is significant ($P<0.05$) difference in the lung capacity of students belonging to different universities.

4.5 Academic Achievement

- The comparative assessment showed academic performance of students of Gondwana University, Gadchiroli and RTM Nagpur University Nagpur is of satisfactory level.

4.6 Relationship between academic achievement and physiological variables

- The study results indicated that there is positive relationship between academic achievement and physiological variables (especially, systolic blood pressure and lung capacity) of students belonging to Gondwana University, Gadchiroli as well as those belonging to RTM Nagpur University, Nagpur.
- However there is negative relationship between academic achievement and physiological variables (especially, diastolic blood pressure and resting pulse rate) of students belonging to Gondwana University, Gadchiroli as well as those belonging to RTM Nagpur University, Nagpur.

5.0 Bibliography

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