

A Study of the Relationship between Stress and Mathematics Achievement of High School Students

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Abstract

The present study has been designed to investigate the relationship between stress and mathematics achievement of high school students. The sample of the study consisted of 200 students of 10th standard studying in rural and urban government high schools belonging to Mandi district of Himachal Pradesh. Stress inventory for school students was developed by investigator for data collection and marks of mathematics scores obtained in their previous year end examination were considered for achievement. Analysis and interpretation of data was carried out by using coefficient of correlation 'r'. The major findings of the study are that 1) Boys have more amount of stress than girls. 2) Girls had higher mathematics achievement than the boys. 3) There exists no significant relationship between stress and mathematics achievement of rural and urban high school students. 4) There exists significant relationship between stress and mathematics achievement of high school girls.

Key Words

Stress, Mathematics Achievement, High school Students, Gender and Locality.

I. Introduction

Education is as old as the human race. It is never ending process of human growth and development, its period stretches from cradle to grave. Education is the most talked about subject today as it is considered to be an instrument for the development of human resources. The major aim of the modern education is all round development of child, which includes intellectual, physical, spiritual as well as social personal growth. Schools have an avoidable role in acquainting the students with the nature of changing field of education and in making necessary changes in the instructional techniques. In the modern world of technological innovations, all educational institutions are trying to improve their quality in terms of facilities and academic outputs.

Education plays a significant role in everyone's life. All school subjects like- Science, Mathematics, Hindi, Social Study and English etc. are equally important for every student. But the knowledge of mathematics is very essential in everyone's life because it is useful in our day-to-day activities, without this life cannot be imagined. Mathematics is also known as, "Ganita", which means "science of calculation". It is the science of numbers and space, science of measurement, quantity and magnitude that helps us in solving the problems of life needing numeration and calculation. The importance of Mathematics is very much increased and its uses are indispensable in every walk of life. Mathematics is essential for the existence and progress of modern world.

Mathematics is one of the compulsory subject of secondary education. The main aim of teaching mathematics is to train the mind, develop the power of understanding and critical thinking among pupils. Mathematics is essentially a program of education which fosters higher order mental processes such as questioning, reasoning, analyzing, inducing and logical thinking.

Stress and anxiety are universal aspects of existence that are shared by individuals in all societies. They have always been and always will be an indispensable part of life. Stress is an emotional and physiological response to a stressor that triggers the sympathetic division of the autonomic nervous and endocrine system into preparation for change (Hayes 1994). Psychological stress is one of the most insidious phenomena of our time and it affects people in all walks of life. Stress implies pressure, tension of worry resulting

in problems in all walks of life. Some amount of stress is necessary and is always with us. Depending on the situation in the same person or person-to-person it varies in its intensity. Stress acquires importance because of its consequences. Though, stress causes both positive and negative effects, excessive stress produces not only psychological disturbance but also several harmful effects on the bio-system. The era of competition makes students more anxious and the eagerness of whether they can pass in exams or perform well in academic activities may adversely affect the mental health of the students.

The main goal of educational institution is the optimum development of the personality of students but if students are not free from all stresses, worries, anxieties and tension this goal cannot be achieved; beside it high anxiety leads to disturbance in thinking, lack of concentration in work, lack of interest in life, fearfulness etc. Also the anxiety is considered a major cause of impaired academic performance. It should be properly addressed otherwise it can have many serious and long lasting problems such as disinterest in a particular subject or teacher, poor performance in school work and activities, absence from classes etc. Therefore, it is necessary that our students who are the future of the nation should be free from all anxieties and stresses.

II. Relationship between Stress and Mathematics Achievement

Mathematics is considered to be an abstract subject and each and every concept in mathematics is abstract in nature. Many students find it very difficult to score good marks in mathematics. Even students with high intelligence and aptitude are not able to do well in exams because of high level of test anxiety. The very nature of learning mathematics is quite different from other subjects, because it needs logical thinking and mental efforts, which in turn is the factor for stress. Moreover, it requires more time to be spared in understanding the concepts. Students at this age face many situations that may lead to stress like psychological adjustment, academic pressures, diversification and opting other subjects, societal demands etc. The escalating demands on student's parents, environment, fear of success or failures in academic endeavors and adjustment with peers result in mental tension, chaos and

confusion and these in turn leads to stress.

III. Methodology

In order to accomplish the objectives of the present study, the descriptive survey method was considered appropriate for exploring the relationship between stress and mathematics achievement of high school students.

Tools

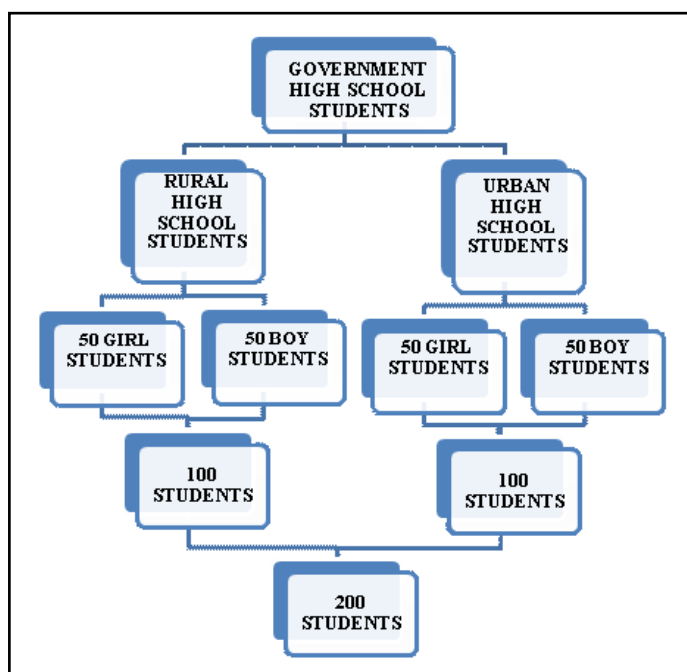
The main objective of the present study is to find out the relationship between Stress and Mathematics achievement of high school students. To attain this objective the investigators constructed the following tool viz., Stress Inventory for School Students (SISS) to measure the amount of stress. The tool includes 45 statements in which '24' statements are positive statements which receive scores like 1 & 0 respectively for 'yes', and 'no' and remaining '21' statements are negative statements which receive 0 & 1 scores respectively for yes and no. The marks of Mathematics scores obtained in their previous year end examination were considered for achievement.

Variables

Gender and locality were considered as independent variables, whereas stress and mathematics achievement as dependent variables.

Sample Design

The purposive sampling method is used for the purpose of sample selection using the variable Sex and Area. The sample comprised of 200 students of 10th standard studying in rural and urban government high schools of district Mandi, Himachal Pradesh.



IV. Statistical Analysis

In the present investigation Mean and Standard Deviation scores were calculated from the scores in Mathematics and scores in stress inventory for school students. Correlation coefficient 'r' was used to find out the relationship between Stress and Mathematics achievement of high school students.

The following formula was used for correlation coefficient 'r';

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \Sigma y^2}}$$

V. Objectives

- To study the relationship between stress and mathematics achievement of high school students.
- To study the relationship between stress and mathematics achievement of high school boys.
- To study the relationship between stress and mathematics achievement of high school girls.
- To study the relationship between stress and mathematics achievement of rural high school students.
- To study the relationship between stress and mathematics achievement of urban high school students.

VI. Hypotheses

- There exists significant relationship between stress and mathematics achievement of high school students.
- There exists significant relationship between stress and mathematics achievement of high school boys.
- There exists significant relationship between stress and mathematics achievement of high school girls.
- There exists significant relationship between stress and mathematics achievement of rural high school students.
- There exists significant relationship between stress and mathematics achievement of urban high school students.

VII. Analysis and Interpretation of The Data

Hypothesis - I

There exists significant relationship between stress and mathematics achievement of high school students. The results pertaining to the relationship between stress and mathematics achievement of high school students have been presented in Table-1

Table 1: Relationship between Stress and Mathematics Achievement of High School Students.

VARIABLE	N	MEAN	r	REMARKS
MATHEMATICS ACHIEVEMENT	200	47.46	-0.087	NOT SIGNIFI-CANT
STRESS	200	29.81		

An analysis of table 4.3 reveals that the mean scores of mathematics achievement and stress are found to be 47.46 and 29.81 respectively. When the scores of both the variables are correlated, the coefficient of correlation was found to be -0.087. It shows no significant relationship between two variables.

Hypothesis - II

There exists significant relationship between stress and mathematics achievement of high school boys. The results pertaining to the relationship between stress and mathematics achievement of high school boys have been presented in table-2

Table 2 :Relationship between Stress and Mathematics Achievement of High School Boys.

VARIABLE	N	MEAN	r	REMARKS
MATHEMATICS ACHIEVEMENT	100	46.42	0.133	NOT SIGNIFICANT
STRESS	100	29.58		

An analysis of table 4.4 reveals that the mean scores of mathematics achievement and stress are found to be 46.42 and 29.58 respectively. When the scores of both the variables are correlated, the coefficient of correlation was found to be 0.133. It shows no significant relationship between two variables.

Hypothesis - III

There exists significant relationship between stress and mathematics achievement of high school girls. The results pertaining to the relationship between stress and mathematics achievement of high school girls have been presented in table-3

Table 3: Relationship between Stress and Mathematics Achievement of High School Girls.

VARIABLE	N	MEAN	r	REMARKS
MATHEMATICS ACHIEVEMENT	100	48.51	-0.285	SIGNIFICANT
STRESS	100	30.04		

SIGNIFICANT AT 0.01 LEVEL

An analysis of table 4.5 reveals that the mean scores of mathematics achievement and stress are found to be 48.51 and 30.04 respectively. When the scores of both the variables are correlated, the coefficient of correlation was found to be - 0.285. It shows significant relationship between stress and mathematics

achievement.

Hypothesis - IV

There exists significant relationship between stress and mathematics achievement of rural high school students. The results pertaining to the relationship between stress and mathematics achievement of rural high school students have been presented in table -4

Table 4: Relationship between Stress and Mathematics Achievement of Rural High School Students.

VARIABLE	N	MEAN	r	REMARKS
MATHEMATICS ACHIEVEMENT	100	47.66	-0.036	NOT SIGNIFICANT
STRESS	100	30.26		

An analysis of table 4.6 reveals that the mean scores of mathematics achievement and stress are found to be 47.66 and 30.26 respectively. When the scores of both the variables are correlated, the coefficient of correlation was found to be -0.036 which is non-significant and shows no significant relationship between two variables.

Hypothesis - V

There exists significant relationship between stress and mathematics achievement of urban high school students. The results pertaining to the relationship between stress and mathematics achievement of urban high school students have been presented in table-5

Table 5: Relationship between Stress and Mathematics Achievement of Urban High School Students.

VARIABLE	N	MEAN	r	REMARKS
MATHEMATICS ACHIEVEMENT	100	47.27	-0.128	NOT SIGNIFICANT
STRESS	100	29.04		

An analysis of table 4.7 reveals that the mean scores of mathematics achievement and stress are found to be 47.27 and 29.04 respectively. When the scores of both the variables are correlated, the coefficient of correlation was found to be -0.128. It shows no significant relationship between two variables.

VIII. Conclusions

1. There exist no significant relationship between stress and mathematics achievement of high school students.
2. There exist no significant relationship between stress and mathematics achievement of high school boys.
3. There exist significant relationship between stress and mathematics achievement of high school girls.
4. There exist no significant relationship between stress and mathematics achievement of rural high school students.
5. There exist no significant relationship between stress and mathematics achievement of urban high school students.

IX. Educational Implications

1. Teaching should emphasize more on fundamental knowledge than on subject matter. More emphasis should be laid on organized and meaningful learning than mechanical learning.
2. Better student-teacher understanding and relationships, better adaptation of teaching-learning, encouragement of students towards acceptance of responsibility of learning, greater satisfaction of student with his learning, etc., should be given importance.
3. Finding answers to problems through various methods, verification and testing of results, etc., may help in developing mathematical creativity and reducing their anxiety level.
4. The curriculum in mathematics should be need-based and life-oriented so that students get interested and increase achievement in mathematics.
5. The teacher training institute should train the teachers well and make them competent in teaching the subject like mathematics.
6. Pupils should be provided with free and conducive environment at home and school for learning mathematics and developing their own creativity, attitude and motivation and reducing their anxiety level.
7. Teachers should encourage and help pupils to participate in quiz programmes, exhibitions and other competitive tests related to mathematics.
8. If a student has subject anxiety, teacher should use interesting and innovative teaching methods.
9. Teachers should try to inculcate and develop good study habits among students to enable them to overcome anxiety.
10. Teacher should give the students proper training in time management skills.
11. Teachers should use proper motivational techniques during teaching.
12. Teachers and parents should not put unnecessary pressure on students.

13. Parents should compare their child's past and present academic performance and satisfy themselves but not compare with other children.
14. Never be shy about seeking help and advice on stressful situations. One of the problems with stress is that it can be self-reinforcing.
15. Students need proper counseling and guidance from the lecturers to create self-interest and motivation for better achievement.

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