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A STUDY OF THE RELATIONSHIP BETWEEN STRESS AND MATHEMATICS ACHIEVEMENT OF HIGH SCHOOL STUDENTS IN RELATION TO THEIR GENDER

Ms. Monika Kumari
Assistant Professor
Abhilashi College of Education, Nerchowk, Mandi, H.P.

ABSTRACT
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. Mathematics is essential for the existence and progress of modern world. The main objective of the present study was to study the relationship between stress and mathematics achievement of high school students. In the present study, the investigator has selected the sample by purposive sampling. The sample consists of 200 students of X standard in government high schools of Mandi district of Himachal Pradesh. In the present study, it was found that Mathematics achievement of boys and girls high school students differ significantly, however scores describes that girls are better in mathematics than boys. Further, it is found that stress and mathematics achievement does not share any significant relationship but in case of girls there exist significant relationship between stress and mathematics achievement.

Keywords: Mathematics achievement, Stress, High school students, Education, Gender.

INTRODUCTION

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.

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). 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 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. 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.

NEED AND SIGNIFICANCE OF THE STUDY

Mathematics is a subject whose basic knowledge is quite essential for each and every individuals of the world. The Kothari Commission report (1964-66) rightly points out that study of Mathematics plays a prominent part in modern education. It says, "One of the outstanding characteristics of scientific culture is qualification". Mathematics therefore assumes a prominent position in modern

education. The National Policy on Education (NPE-1986) says, "Mathematics should be visualized as the vehicle to train a child to think, reason, analyze and articulate logically. Apart from being a specific subject, it should be treated as a concomitant to any subject involving analysis and reasoning".

In this scientific-oriented world of today, the knowledge of methods and application of mathematics has become an integral part of every new innovation. With recent introduction of computers in school education, computing and emergence of learning through the understanding of cause and effect relationships and the interplay of variables, the teaching of mathematics will be suitably redesigned to bring it in line with modern technological devices.

So in the present study academic performance is taken only in the subject of Mathematics. The choice of this subject is because of its relative importance in school curriculum as well as in the daily life of students.

REVIEW OF RELATED LITERATURE

From review we can say that, the researches conducted by Ravinder (1977), Soman (1977), Anand (1988), Barwal and Shaveta (2009), Barwal and Kumari (2011), Barwal and Sharma (2013), Pourmoslemi, Erfani and Firoozfar (2013) and Kaur (2014) in their independent studies found that there exist significant relationship between mathematics achievement and stress. Tripathi (1978), Sabapathy (1986), Gupta (1987), Ramachandran (1990), Khanna (1999) Vijayalakshmi and Lavanya (2006), Zakaria and Nordin (2008) and Singaravelu (2009) in their independent studies found significant negative correlation between academic achievement and anxiety. Homchaudhuri (1980) and Kumari and Gartia (2012) found that there is a significant positive relationship between academic achievement and stress. Kumari and Sen (2013) found that there is no significant relationship between academic achievement and academic anxiety. Mehrotra (1986) and Namrata (1992) found that there was an inverse relationship between academic achievement and stress.

OBJECTIVES OF THE STUDY

The following objectives were formulated for the present study;

1. To study the relationship between stress and mathematics achievement of high school students.
2. To study the relationship between stress and mathematics achievement of high school boys.
3. To study the relationship between stress and mathematics achievement of high school girls.

HYPOTHESES OF THE STUDY

In order to achieve the objectives of the study, the following hypotheses were formulated corresponding to each objective;

H_1 There exists significant relationship between stress and mathematics achievement of high school students.
H_2 There exists significant relationship between stress and mathematics achievement of high school boys.
H_3 There exists significant relationship between stress and mathematics achievement of high school girls.

DELIMITATIONS OF THE STUDY

The present study is delimited to certain aspects. These aspects are as under;

1. The present study is confined only to district Mandi of Himachal Pradesh.
2. The present study is confined to 200 sample of X standard students of government high schools.
3. The present study is confined to dependent variables (stress and mathematics achievement) and independent variables (gender).

RESEARCH METHOD

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

SAMPLING

In the present study, the investigator has selected the sample by purposive sampling. The sample of the present study comprised students of 10th standard studying in rural and urban government high schools of district Mandi, Himachal Pradesh.

VARIABLES

In the present study, the independent variable is gender and the dependent variables are stress and mathematics achievement.

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 purpose of the present study was to find out the relationship between stress and mathematics achievement of high school students in relation to their gender and locality. As such analyses have been made results along with their interpretation are presented in the following section.

1.1 Study of the Gender-wise Score Distribution on Mathematics Achievement of High School Students.

The mean value and standard deviation in case of both boys and girls have been presented in table-1

Table-1

Gender-wise Score Distribution on Mathematics Achievement of High School Students.

Category	N	Mean	Standard Deviation
Boys	100	46.42	8.60
Girls	100	48.51	11.68

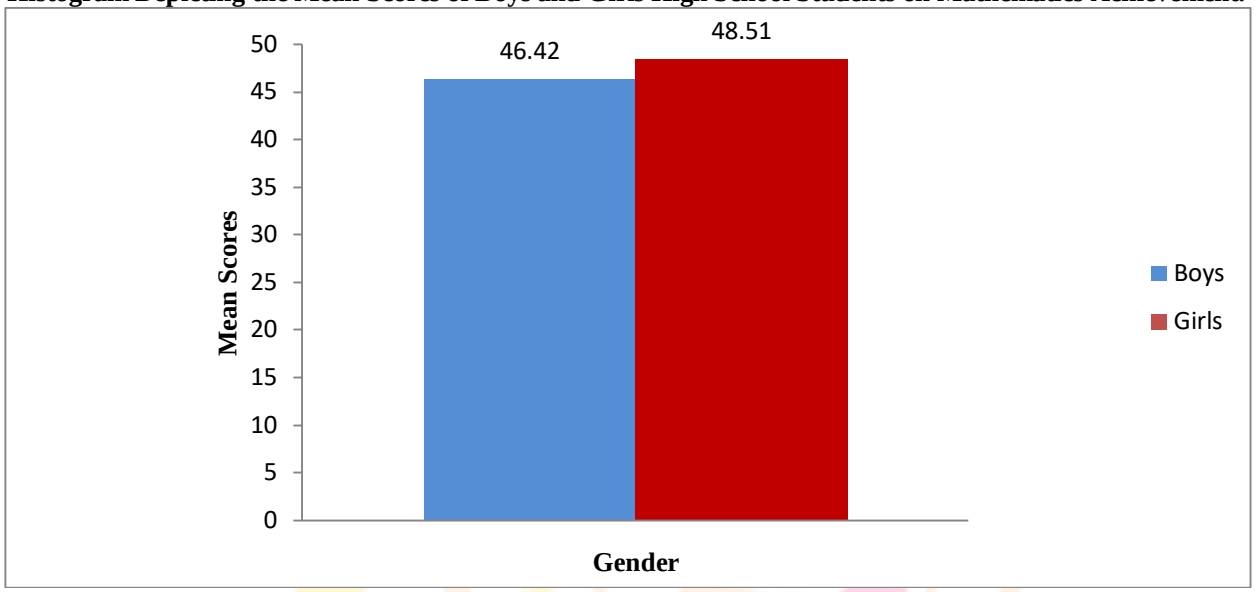
INTERPRETATION

An analysis of table-1 reveals that the mean scores of mathematics achievement of high school boys and girls are as 46.42 and 48.51 respectively. Further the standard deviation with respect to boys and girls are reported to be 8.60 and 11.68 respectively which indicates

that the level of mathematics achievement in case of girls is higher than that of boys. The gender-wise total mean scores of both boys and girls are presented in a histogram which has been presented in figure-1

Figure-1

Histogram Depicting the Mean Scores of Boys and Girls High School Students on Mathematics Achievement.



1.2 Study of the Gender-wise Score Distribution on Stress of High School Students.

The mean value and standard deviation in case of both boys and girls have been presented in Table-2

Table-2

Gender-wise Score Distribution on Stress of High School Students.

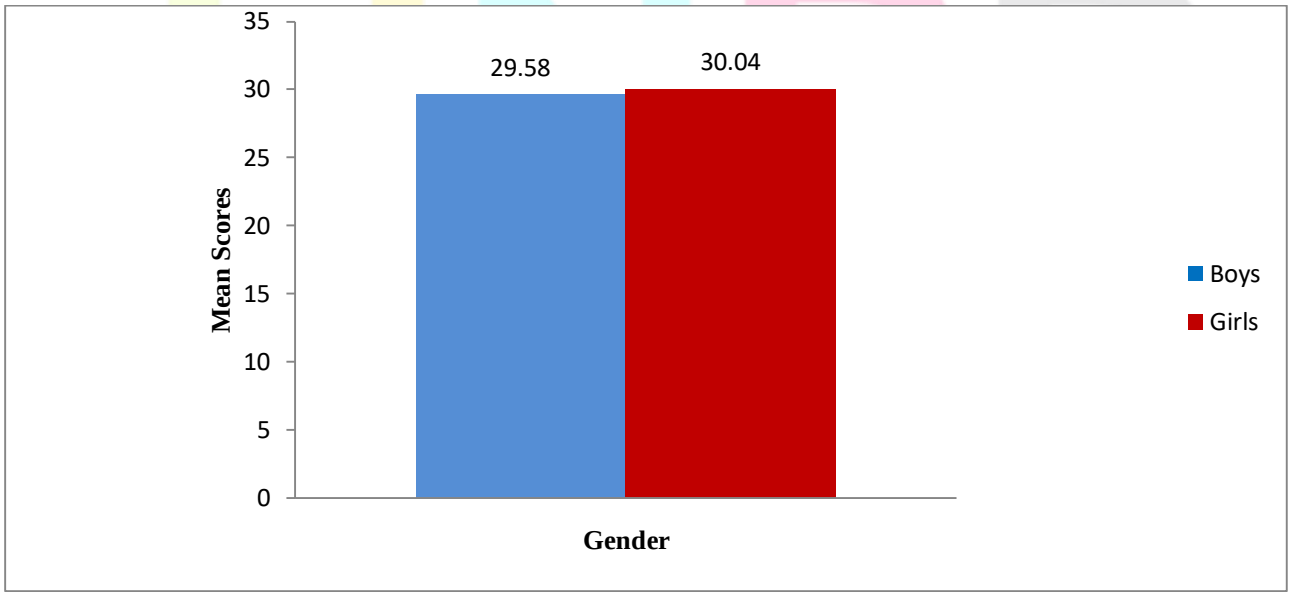
Category	N	Mean	Standard Deviation
Boys	100	29.58	5.35
Girls	100	30.04	4.77

INTERPRETATION

An analysis of table-2 reveals that the mean scores of stress of high school boys and girls are reported as 29.58 and 30.04. Further the standard deviation with respect to boys and girls are reported to be 5.35 and 4.77 respectively which indicates that the level of stress in case of boys is higher than that of girls high school students. The gender-wise total mean scores of both boys and girls have been presented in a histogram which has been presented in figure-2

Figure-2

Histogram Depicting the Mean Scores of Boys and Girls High School Students on Stress.



2.1 Study of the 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-3

Table-3

Relationship between Stress and Mathematics Achievement of High School Students.

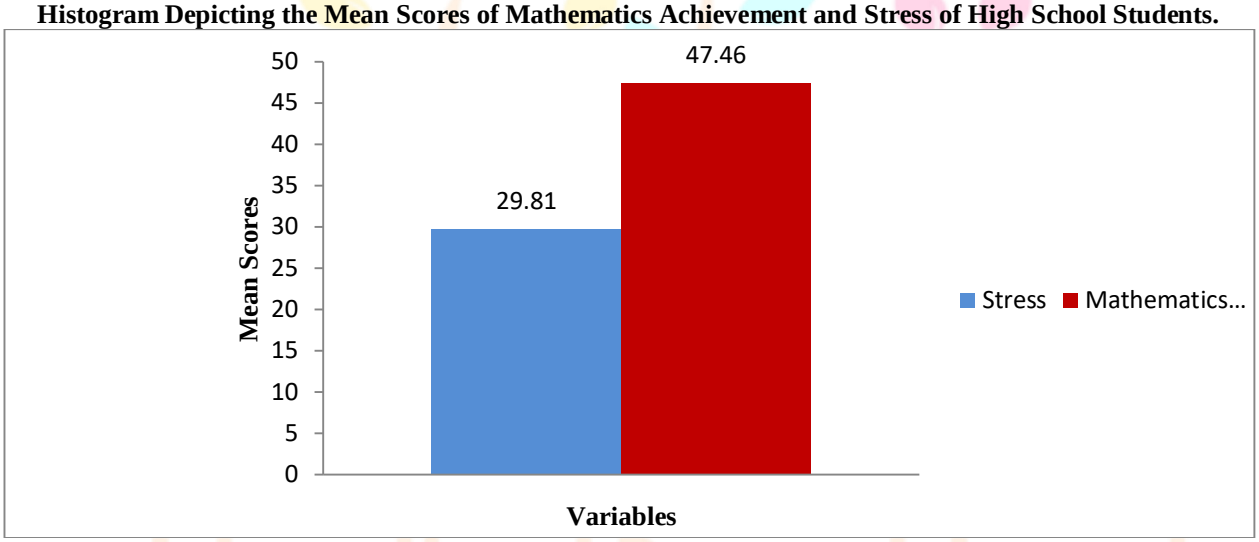
Variable	N	Mean	R	Remarks
Mathematics Achievement	200	47.46	-0.087	Not Significant
Stress	200	29.81		

INTERPRETATION

An analysis of table-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. Therefore, the **hypothesis (H_1)** there exist significant relationship between stress and mathematics achievement of high school students is rejected. Therefore, for its better understanding the data has been presented in figure-3

Figure-3

Histogram Depicting the Mean Scores of Mathematics Achievement and Stress of High School Students.



2.2 Study of the 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-4

Table-4

Relationship between Stress and Mathematics Achievement of High School Boys.

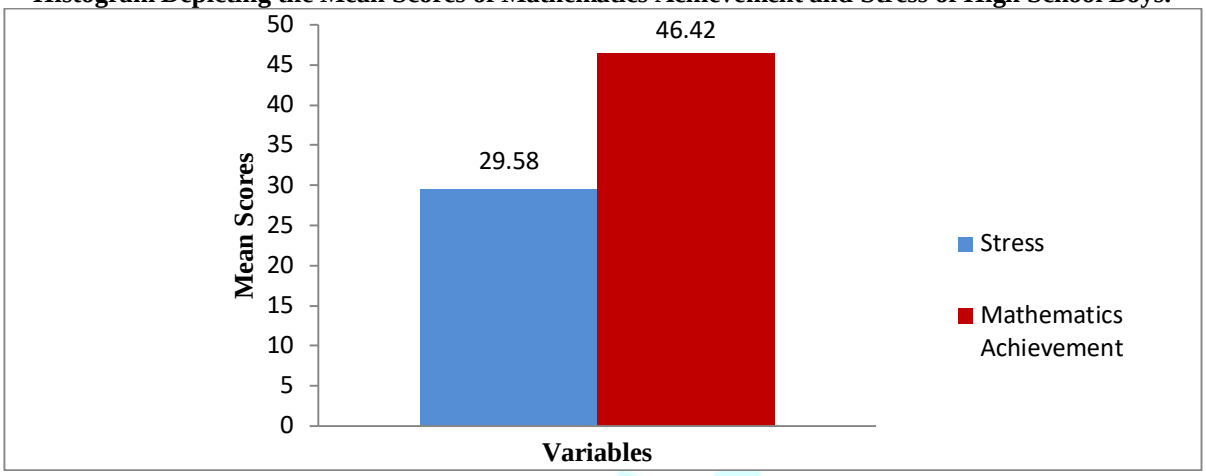
Variable	N	Mean	R	Remarks
Mathematics Achievement	100	46.42	0.133	Not Significant
Stress	100	29.58		

INTERPRETATION

An analysis of table-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. Therefore, the **hypothesis (H_2)** there exist significant relationship between stress and mathematics achievement of high school boys is rejected. Therefore for better understanding the data is presented in figure-4

Figure 4

Histogram Depicting the Mean Scores of Mathematics Achievement and Stress of High School Boys.



2.3 Study of the 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-5

Table-5

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		

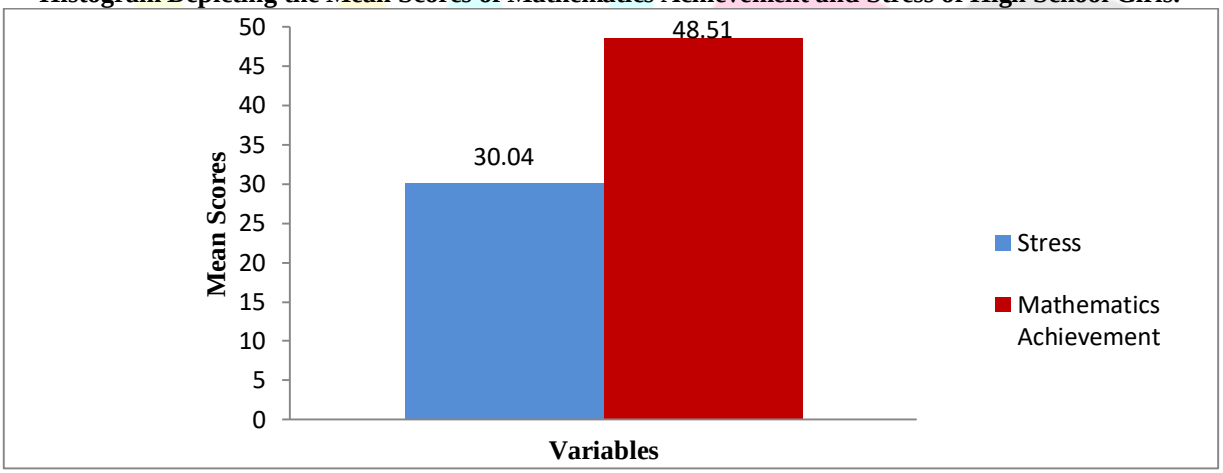
SIGNIFICANT AT 0.01 LEVEL

INTERPRETATION

An analysis of table-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. Therefore, the **hypothesis (H_3)** there exist significant relationship between stress and mathematics achievement of high school girls is accepted. Therefore, for its better understanding the data has been presented in figure-5

Figure- 5

Histogram Depicting the Mean Scores of Mathematics Achievement and Stress of High School Girls.



CONCLUSIONS

On the basis of analysis and interpretation of data, the following conclusions have been drawn;

1. There exists no significant relationship between stress and mathematics achievement of high school students.
2. There exists no significant relationship between stress and mathematics achievement of high school boys.
3. There exists significant relationship between stress and mathematics achievement of high school girls.

EDUCATIONAL IMPLICATIONS OF THE STUDY

Ignorance of mathematics will be a great handicap in the progress of his/her students in many other subjects. Mathematical application involves the solving of the problems of real world using algebra and calculus, typically learned in secondary schools. On the basis of above findings, the investigator is inclined to have the following 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. Never be shy about seeking help and advice on stressful situations.
    One of the problems with stress is that it can be self-reinforcing.
13. Students need proper counseling and guidance from the lecturers to
    create self –interest and motivation for better achievement.

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