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A STUDY ON MENTAL HEALTH AND ACADEMIC ACHIEVEMENT IN MATHEMATICS OF SECONDARY STUDENTS

B Senthamarai Kannan* **Dr. C. Sivapragasam****
**Research Scholar, Gandhigram Rural Institute – Deemed University, Dindigul.*
***Professor, Gandhigram Rural Institute - Deemed University, Dindigul.*

Abstract
This paper reports on a study on mental health and academic achievement in mathematics of secondary students. The sample consisted of 200 ninth standard students. Mental health inventory scale and mathematics achievement test was used to get the data from 9th standard students. Percentage analysis, t-test, ANOVA and Pearson correlation co-efficient were used for analyzing the data. The results revealed that there is significant difference in their mental health and mathematics achievement of secondary students with respect to instruction languages and also mental health and mathematics achievement have highly positive correlated.

Keywords: Mental Health, Mathematics Achievement, Secondary School.

Introduction

"Mental health is the various strains of the environment we meet in life and mental hygiene as the means we take to assure the adjustment"

----Norma E. Cuts & Nicholas Mosely

Now a day, education is very important role in human life. Education differentiates the human from animals. Education gives the shapes for society. In Tamil Nadu educational system has samacheer syllabus, it contains the subjects as Tamil, English, Mathematics, Science and Social Science. Some secondary students have mental illness in between study progress. Mental illness slightly affects the academic achievements of secondary students. A physically healthy person may be incapable in all respects due to his mental sickness. So, in the present complex development of human civilization, mental health is as important as physical health. These persons adopt various types of defense mechanisms in the process of effecting their personal adjustment in society. Some parents fail to give proper care and affection to their children, because they consider them obstructions in the fulfillment of their desires. The problems of such parents may be solved with the help of a psychoanalyst. The concept mental health and academic achievement are closely related.

Need for the Study

A mentally healthy person a) is supposed to have a positive attitude towards life and people b) is highly adjustable never complaining and remains contented c) knows his/her strengths and weakness and d) emotionally stable, happy, reasonable and tolerant. These traits enable an individual to achieve better in his/her curricular as well as co-curricular activities. Mental health and achievements are two facts which are closely associated for the process of development. Educated persons may have good mental health when compared to uneducated persons. Some mental illness factor affected the mathematics achievement such as anxiety, bad temper, inferiority, impatience and prejudice. Therefore the investigator feels that it is the need of the hour to find out the relationship between mental health and academic achievement of secondary students in mathematics. Hence, the present study is undertaken.

Statement of the Problem

The investigator was working two years at secondary school. The investigator felt that mental health and academic achievement was very important for secondary students like as two sides of the coin and mathematics achievement was affected by mental health. So the investigator has selected the present study with the aim of knowing the correlation between mathematics achievement and mental health of secondary students. Therefore, it has been entitled as "**A Study of Mental Health and Academic Achievement in Mathematics of Secondary Students".**

Definition of the terms used

- **Mental Health:** Mental health is a level of **Error! Bookmark not defined.** well-being, or an absence of mental illness. It is the psychological state of someone who is functioning at a satisfactory level of emotional and behavioral adjustment. Mental health needs care and attention today in the world full of complex and complicated problems.

- **Secondary School:** The secondary school consists of IX and X standard students in the Tamil Nadu educational system. It was followed by samacheer syllabus. The present study only selected IX standard students.

- **Mathematics Achievement:** This test is intended to evaluate the achievement in mathematics of the students of standard IX. The samacheer syllabus of mathematics for standard IX of Tamilnadu state for the academic year 2016 - 17 was analyzed.

Objectives of the Study

- To find out the mental health of secondary students.
- To find out the significant difference if any, in the mental health of secondary students with respect to the variables such as :
    1. Gender
    2. Language of instruction
    3. Locality
    4. Nature of school
    5. Parental educational qualification
    6. Parental occupation
- To find out the academic achievement in mathematics of secondary students.
- To find out the significant difference if any, in the academic achievement in mathematics of secondary students with respect to the variables such as:
    1. Gender
    2. Language of instruction
    3. Locality
    4. Nature of school
    5. Parental educational qualification
    6. Parental occupation
- To find out the correlation between mental health and academic achievement in mathematics of secondary students.

Hypotheses of the Study

- The level of mental health of secondary students is moderate in nature.
- There is no significant difference in their mental health of secondary students with respect to variables such as:
    a) Gender
    b) Language of instruction
    c) Locality
- There is no significant difference in their mental health of secondary students with respect to variables such as:
    1. Nature of school
    2. Parental educational qualification
    3. Parental occupation
- The level of mathematics achievement of secondary students is moderate in nature.
- There is no significant difference in their mathematics achievement of secondary students with respect to variables such as:
    a) Gender
    b) Language of instruction
    c) Locality
- There is no significant difference in their mathematics achievement of secondary students with respect to variables such as:
    1. Nature of school
    2. Parental educational qualification
    3. Parental occupation
- Correlation between mental health and academic achievement in mathematics of secondary students.

Variables of the Study

Dependent Variables

- Mental Health Inventory Test
- Achievement test in English

Independent Variables

- Gender
- Language of instruction
- Locality
- Nature of school
- Parental educational qualification
- Parental occupation

Method of the Study

The investigator has chosen the survey method for studying the problems of this study.

Sample

The population for the study was secondary students in Dindigul district, Tamil Nadu, India. From among them 200 students studying IX standard were taken as the sample. Multi –stage random sampling technique has been adopted in this study.

Table 1

Nature of school	High School	Higher Secondary school	Total
Government school	1	1	2
Government - Aided school	1	1	2
Private school	1	1	2
			6

Tools Used

- "Achievement test in Mathematics" developed and standardized by the investigator.
- "Mental Health Inventory" developed by Jegadeesh Srivatsa.

Data Collection

The investigators got permission from the Headmaster of various schools of Dindigul district, Tamil Nadu, India. The investigator visited the 9th standard students of high schools and higher secondary schools, personally and collected the data from the respondents. The investigators conducted the mathematics achievement test and distributed the tool to 9th standard students and assured them that their responses would be confidential and used for research purpose only. Clear the instruction about the tool and test were given to 9th standard students. The investigator gathered the data from 9th standard students and scored the data for statistical analysis.

Statistical Used

Mean, Standard deviation, 't' – test, ANOVA, Correlation and Percentage analysis were used to analyze the data.

Findings

Hypothesis: 1

The level of mental health of secondary students is moderate in nature.

Table 2: Mental Health of Secondary Students

Category	Total sample	Low		Medium		High	
		No.	%	No.	%	No.	%
Mental Health	200	43	21.5	125	62.5	32	16

From the above table, it is inferred that the calculated moderate value 62.5 % is higher than the other two values. This implies that the level of mental health of secondary students (9th standard) is moderate in nature.

Hypothesis: 2

There is no significant difference in their mental health of secondary students with respect to variables such as gender, language of instruction and locality.

Table 3: Significant Difference in Their Mental Health of Secondary Students With Respect to Different Variables

S. No	Variables	Category	N	Mean	S.D	CR value	Table Value	Results
1	Gender	Boys	105	52.17	19.899	1.451	1.96	Not Significant
		Girls	95	48.06	20.092			
2	Language of Instruction	Tamil	101	53.10	19.166	2.068	1.96	Significant
		English	99	47.28	20.590			
3	Locality	Rural	107	50.87	20.891	0.490	1.96	Not significant
		Urban	93	49.47	19.115			

The obtained value 1.451 is less than the table value of 1.96 at 0.05 level significant. Therefore the null hypothesis is accepted and it is concluded that there is no significant difference in their mental health of secondary students with respect to gender. Thus there is no evidence in this study to show that the gender of secondary students can cause significant difference in their mental health.

The obtained value 2.068 is greater than the table value of 1.96 at 0.05 level significant. Therefore the null hypothesis is rejected and it is concluded that there is significant difference in their mental health of secondary students with respect to instruction languages. Moreover, Tamil instruction language of secondary students (Mean = 53.10) are found to be better than English instruction language of secondary students (Mean = 47.28) in their mental health. Thus there is evidence in this study to show that the instruction languages of secondary students can cause significant difference in their mental health.

The obtained value 0.490 is less than the table value of 1.96 at 0.05 level significant. Therefore the null hypothesis is accepted and it is concluded that there is no significant difference in their mental health of secondary students with respect to locality. Thus there is no evidence in this study to show that the locality of secondary students can cause significant difference in their mental health.

Hypothesis: 3

There is no significant difference in their mental health of secondary students with respect to variables such as nature of school, parental educational qualification and parental occupation.

Table 4: Difference in their mental health of Secondary Students with Respect to Nature of School, Parental Educational Qualification and Parental Occupation

Variable	Sources of variation	Sum of squares	Degrees of freedom	Mean square	F-value	p-value	Results
Nature of school	Between sample	2838.539	2	1419.269	3.625	0.028	Significant
	Within sample	77133.781	197	391.542			
Parental Educational Qualification	Between sample	830.426	2	415.213	1.947	0.145	Not significant
	Within sample	79141.894	197	401.736			
Parental Occupation	Within sample	874.624	2	437.312	1.089	0.339	Not significant
	Within sample	79097.624	197	401.511			

In nature of school, it is inferred that F- value is 3.625 and its associated p-value is 0.028 is less than 0.05 (0.028 < 0.05). Thus the null hypothesis is rejected and it is concluded that there is significant difference in their mental health of secondary

students with respect to nature of school. Thus there is evidence in this study to show that the nature of school of secondary students can cause significant difference in their mental health.

In parental educational qualification, it is inferred that F- value is 1.947 and its associated p-value is 0.145 is greater than 0.05 (0.145 >0.05). Thus the null hypothesis is accepted and it is concluded that there is no significant difference in their mental health of secondary students with respect to parental educational qualification. Thus there is no evidence in this study to show that the parental educational qualification of secondary students can cause significant difference in their mental health.

In parental occupation, it is inferred that F- value is 1.089 and its associated p-value is 0.339 is greater than 0.05 (0.339 > 0.05). Thus the null hypothesis is accepted and it is concluded that there is no significant difference in their mental health of secondary students with respect to parental occupation. Thus there is no evidence in this study to show that the parental occupation of secondary students can cause significant difference in their mental health.

Hypothesis: 4
The level of mathematics achievement of secondary students is moderate in nature.

Table 5: Mathematics Achievement of Secondary Students

Category	Total sample	Low		Medium		High	
		No.	%	No.	%	No.	%
Mathematics achievement	200	41	20.5	129	64.5	34	17

From the above table, it is inferred that the calculated moderate value 64.5 is higher than the other two values. This implies that the level of mathematics achievement of secondary students is moderate in nature.

Hypothesis: 5
There is no significant difference in their mathematics achievement of secondary students with respect to variables such as gender, language of instruction and locality.

Table 6: Significant Difference in Their Mathematics Achievement of Secondary Students With Respect to Different Variables

S. No	Variables	Category	N	Mean	S.D	CR value	Table Value	Results
1	Gender	Boys	105	53.10	18.440	1.367	1.96	**Not Significant**
		Girls	95	49.52	18.640			
2	Language of Instruction	Tamil	101	54.04	17.277	2.046	1.96	**Significant**
		English	99	48.71	19.535			
3	Locality	Rural	107	51.91	19.318	0.413	1.96	**Not significant**
		Urban	93	50.82	17.770			

The obtained value 1.367 is less than the table value of 1.96 at 0.05 level significant. Therefore the null hypothesis is accepted and it is concluded that there is no significant difference in their mathematics achievement of secondary students with respect to gender. Thus there is no evidence in this study to show that the gender of secondary students can cause significant difference in their mathematics achievement.

The obtained value 2.046 is greater than the table value of 1.96 at 0.05 level significant. Therefore the null hypothesis is rejected and it is concluded that there is significant difference in their mathematics achievement of secondary students with respect to instruction languages. Moreover, Tamil instruction language of secondary students (Mean = 54.04) are found to be better than English instruction language of secondary students (Mean = 48.71) in their mathematics achievement. Thus there is evidence in this study to show that the instruction languages of secondary students can cause significant difference in their mathematics achievement.

The obtained value 0.413 is less than the table value of 1.96 at 0.05 level significant. Therefore the null hypothesis is accepted and it is concluded that there is no significant difference in their mathematics achievement of secondary students

with respect to locality. Thus there is no evidence in this study to show that the locality of secondary students can cause significant difference in their mathematics achievement.

Hypothesis: 6

There is no significant difference in their mathematics achievement of secondary students with respect to variables such as nature of school, parental educational qualification and parental occupation.

Table 7: Difference in Their Mathematics Achievement of Secondary Students With Respect To Nature of School, Parental Educational Qualification and Parental Occupation

Variable	Sources of variation	Sum of squares	Degrees of freedom	Mean square	F-value	p-value	Results
Nature of school	Between sample	2761.352	2	1380.676	4.127	0.018	Significant
	Within sample	65904.648	197	334.541			
Parental Educational Qualification	Between sample	734.312	2	367.156	1.065	0.347	Not significant
	Within sample	67931.688	197	344.831			
Parental Occupation	Within sample	810.603	2	405.302	1.177	0.310	Not significant
	Within sample	67855.397	197	344.444			

In Nature of school, it is inferred that F- value is 4.127 and its associated p-value is 0.018 is less than 0.05 (0.018 < 0.05). Thus the null hypothesis is rejected and it is concluded that there is significant difference in their mathematics achievement of secondary students with respect to nature of school. Thus there is evidence in this study to show that the nature of school of secondary students can cause significant difference in their mathematics achievement.

In parental educational qualification, it is inferred that F- value is 1.065 and its associated p-value is 0.310 is greater than 0.05 (0.310 >0.05). Thus the null hypothesis is accepted and it is concluded that there is no significant difference in their mathematics achievement of secondary students with respect to parental educational qualification. Thus there is no evidence in this study to show that the parental educational qualification of secondary students can cause significant difference in their mathematics achievement.

In parental occupation, it is inferred that F- value is 1.177and its associated p-value is 0.310 is greater than 0.05 (0.310 > 0.05). Thus the null hypothesis is accepted and it is concluded that there is no significant difference in their mathematics achievement of secondary students with respect to parental occupation. Thus there is no evidence in this study to show that the parental occupation of secondary students can cause significant difference in their mathematics achievement.

Hypothesis: 7

Correlation between mental health and mathematics achievement of secondary students.

Table 8: Correlation between Mathematics Achievement of Secondary Students and Their Mental Health

Category	Total sample	'r' value calculated	p-value	remarks
Mathematics Achievement and Mental Health	200	0.985	0.000	**Significant**

Mental health and mathematics achievement correlation are highly positive correlated, the correlation coefficient is 0.985 and it is statistically significant ($p < 0.05$).

Suggestions

- The government should be trained the mathematics teachers in the task of developing mental health of the students.
- Necessary facilities should be provided to the schools in evaluating and improving the mental health of the students.
- Mental health of the students should be checked periodically and students with low mental health should be given extra care.
- The mathematics teachers should be trained in finding out the psychological problems of students in learning Mathematics and in the modalities to overcome them.

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