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Demystifying mathematical phobia among students

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Abstract
The present study has been carried to explore the mathematical phobia of male and female students. In context to same, the researcher selected the selected 200 students from Anantnag District. The study was carried in context of descriptive research. The data was collected with the help of descriptive as well as inferential statistics. Keeping in view, the researcher found that there seems significant difference between male and female students on the basis of their mathematical phobia. Male students were seen with high level of mathematical phobia as compared to female students. Thus, it can be interfered that gender has significant impact on the level of mathematical phobia.

Keywords: demystifying mathematical phobia, students

Introduction

Mathematics is much more than a collection of techniques for getting answer and much more than a collection of definitions, theorems and proofs. It is a richly woven fabric of connections that involves visualizing, imagining, manipulating, analysing, abstracting an associating ideas. Mathematical phobia, which is exhibited by many students, is the persistent, illogical, intense fear of not succeeding in mathematics. It is the belief that one is unable to handle the difficulty associated with learning mathematics. Robert, M. & Sari K.B. (1992) [11]. Many people incorrectly assume that math phobia and an inability to be successful in mathematics are inherited from one's parents. Several legitimate factors contribute to, and increase the severity of, this perception. Mathematics phobia is 'fear' of mathematics. It is usually defined as a persistent fear of mathematical problems in which the sufferer commits to great lengths in avoiding, typically disproportional to the actual danger posed, often being recognized as irrational. In the event the phobia cannot be avoided entirely, the sufferer will endure the mathematical problem with marked distress and significant interference in social or occupational activities. Roy, A. (2011) [12]. Thus, the above studies provide ample opportunity for the research to conduct a research study which reads as:

Statement of the research problem: In the present study an attempt has been made by the investigator to study the research problem which reads as:

Operational definitions of terms and variables: The operational differentiation of the terms and variables are reported as under:

A. **Mathematical phobia:** Mathematics phobia is 'fear' of mathematics. It is usually defined as a persistent fear of mathematical problems in which the sufferer commits to great lengths in avoiding, typically disproportional to the actual danger posed, often being recognized as irrational. In the present study it refers the set of score made by the respondents on mathematical; phobia scale developed by M. Ramachandran (2016).
B. **Students:** Students in the present secondary refers those secondary school students who are reading in 9th, 10th, 11th, 12th. However, in the present study the research made dichotomy of the students on the basis of their sex.

Objectives of the study: The objectives for the present study are reported as under:
1) To explore the mathematical phobia among male and female students on below mentioned dimensions:

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a) Content related phobia.
b) Personal related phobia.
c) Teacher-parent related phobia.

Hypothesis
The statement of the hypothesis ids reported as under:
1) There exists no significant difference between male and female students on below mentioned dimensions of mathematical phobia:
a) Content related phobia
b) Personal related phobia
c) Teacher-parent related phobia

Delimitations of the study
During the whole research process lot or constraints were faced by the investigator. However, investigator made ample efforts to delimit these constraints upto maximum extent. Consequently, the research delimited the present study to following domains:
1) The study will be delimited to Anantnag districts of South Kashmir
2) The study will be delimited to two hundred students with due representation of the gender.
3) The study will be delimited respondents within the age group of 14-18 years.

Methodology
The methodology of the study has been stated in the following sub-headings:

Design of the study: The present study has been operated through descriptive survey method. Further, design if the study is based on below mentioned parameters.

Sampling procedure
The researcher made a list of higher secondary schools of Anantnag district. The sample was bifurcated on the basis of gender of the respondents. The total sample for the present investigation consists of 200 respondents. The parameters involved in the study are as under:
▪ **Sample:** The sample for the present study consists of 200 respondents. These respondents were selected from higher secondary schools of Anantnag District.
▪ **Sapling technique:** The required sample was selected with the help of random sampling technique.
▪ **Mathematical phobia scale:** The investigator used mathematical phobia scale developed by M. Ramachandran (2016).

Analysis of the data
The data has been analysed with the help of suitable statistical treatment. Descriptive and comparative analysis was used for processing the data. The detailed description of the statistical treatment is given as under:

Table 1: Showing the descriptive analysis of the male and female students on mathematical phobia

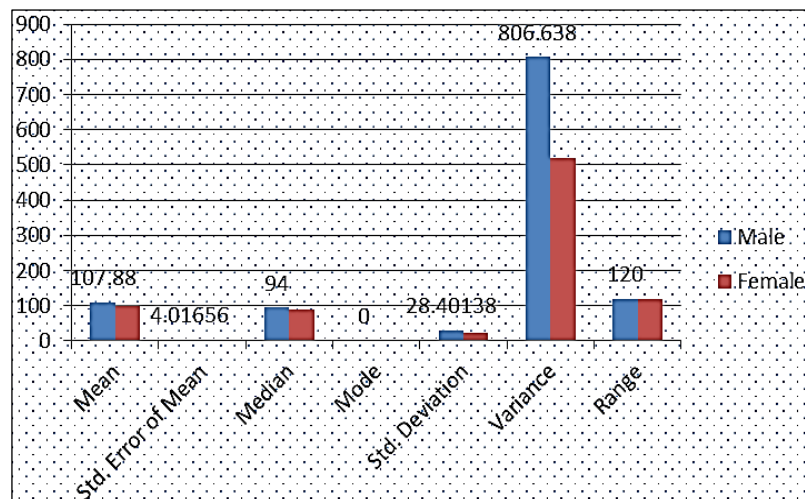| Mathematical Phobia		Male Students	Female Students
Number	Valid	50	50
	Missing	100	100
Mean		107.8800	97.8600
Std. Error of Mean		4.01656	3.21857
Median		94.0000	89.0000
Mode		82.00[a]	86.00[a]
Std. Deviation		28.40138	22.75873
Variance		806.638	517.960
Range		120.00	120.00
Percentiles	25	86.0000	85.0000
	50	94.0000	89.0000
	75	125.0000	96.0000
Multiple modes exist. The smallest value is shown			

Fig 1: Showing the descriptive analysis of male and female students on their level of mathematical phobia

While glancing towards the above reported table (Please refer table 1, fig. 1) gives the detailed information about the descriptive analysis of male and female students on the mathematical phobia. The results reveal that incase of male students, the range was seen 120.00 and the total variance was reported 806.63. In pursuance to same, the researcher found that the standard deviation was seen 28.40. The median of male students was reported 94.00 with standard error mean 4.01. The man score of male students on mathematical phobia was seen 107.88. The results reveal that incase of female students, the range was seen 120.00 and the total variance was reported 517.96. In pursuance to same, the researcher found that the standard deviation was seen 22.75. The median of female students was reported 89.00 with standard error mean 3.21. The mean score of male students on mathematical phobia was seen 97.86.

Table 2: Showing the prevalence of mathematical phobia of male and female students

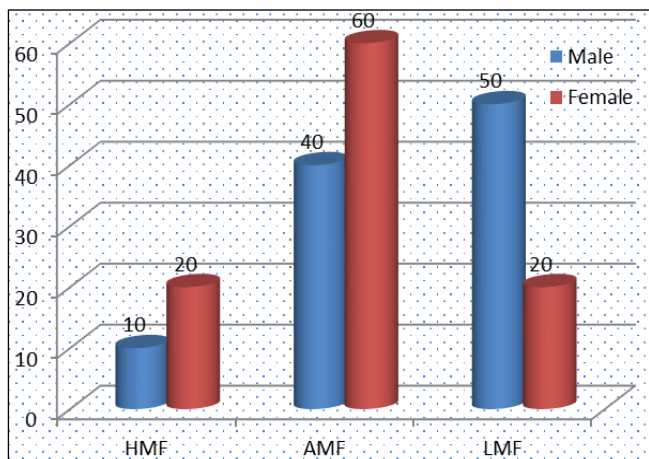| Variables	Male Students		Female Students	
	Frequency	Percentage	Frequency	Percentage
HMF	10	10.00	20	20.00
AMF	40	40.00	60	60.00
LMF	50	50.00	20	20.00
Total	100	100	100	100

Fig 2: Showing the graphical representation on various levels of mathematical Phobia among male and female students

Interpretation: The results revealed in the above reported table indicate that among male students 10% (F=10.00) were seen with high level of mathematical phobia. In addition to this, it was seen that F=40 (40.00) were seen with moderate level of mathematical phobia. Further, from the same table, it was seen that 50.00% (F=50) respondents were seen with low level of mathematical phobia. Coming towards the female students, it was found that 20 (20.00) were seen with high level of mathematical phobia. The results reveal that 60 (60.00) female students were seen moderate level of mathematical phobia. In addition to this, the results justify that 20.00% (20%) female students were seen with low level of mathematical phobia.

Table 3: Showing the mathematical phobia among students in aggregate analysis

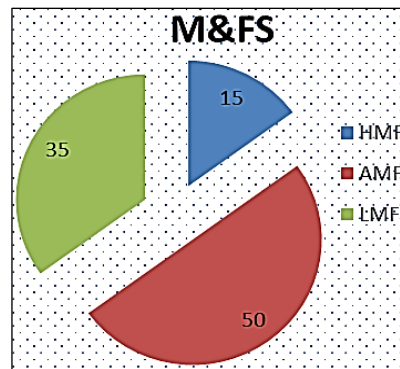| Variables	Male and female Students	
	Frequency	Percentage
HMF	30	15.00
AMF	100	50.00
LMF	70	35.00
Total	200	100

Fig 3: Showing the graphical representation on the mathematical phobia among students in aggregate analysis

Interpretation: The results revealed in the above reported table indicate that among male and female students 15% (F=30.00) were seen with high level of mathematical phobia. In addition to this, it was seen that F=100 (50.00) male and female students were seen with moderate level of mathematical phobia. Further, from the same table, it was seen that 354.00% (F=70) male and female students were seen with low level of mathematical phobia. Thus, results reveal that maximum of the students were seen with average level of mathematical phobia.

Table 4: Showing the significance of mean difference between male and female students on their composite score of mathematical Phobia. (N=100 each)

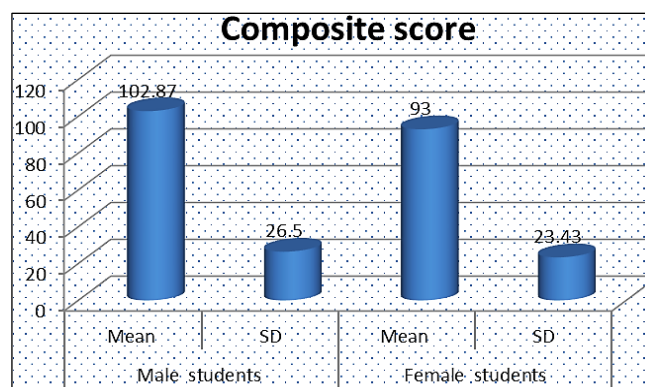| Variable	Male students		Female students		't' value
	Mean	SD	Mean	SD	2.65 @
CS	102.87	26.50	93.00	23.43	
Significant at 0.1 level of confidence					

Index:
- CS= Composite Score.

Fig 4: Showing the significance of mean difference between male and female students between male and female students on their composite score of mathematical Phobia of mathematical Phobia

Interpretation: The perusal of the above reported table gives information about the mean comparisons of male and female students on their composite level of mathematical phobia. On the comparative analysis it was found that the mean score of male students was 102.87 which is high then the mean value of female students (M=93.00). In the same comparative analysis the calculated 't' value came out to be 2.65, which is high than table value at 0.05 level of confidence. Thus, it can be interfered that male students hold low level of mathematical phobia as compared to male

students. The results may attribute to this fact that there seems low level of self-efficacy among female students.

Indeed significant difference has been reported between male and female students on their mathematical phobia. In pursuance to same, the status of the hypothesis is reported as under:

Hypothesis: "There seems no significant difference between male and female student on their mathematical phobia".

"Status: Rejected."

Conclusions of the study

The present study has been carried to explore the mathematical phobia of male and female students. Keeping in view, the researcher found that there seems significant difference between male and female students on the basis of their mathematical phobia. Male students were seen with high level of mathematical phobia as compared to female students. Thus, it can be interfered that gender has significant impact on the level of mathematical phobia.

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