

Relationship between Parent's Attitude towards Math and Children's Math Anxiety

Mahjabeen Haque* and Kaniz Farhana

Department of Educational and Counselling Psychology, University of Dhaka, Bangladesh

*Corresponding author: Mahjabeen Haque, Department of Educational and Counselling Psychology, University of Dhaka, Bangladesh, Tel: 8801817583902; E-mail: mahjabeenhaque@yahoo.com

Received date: Jun 12, 2017; Accepted date: Aug 17, 2017; Published date: Aug 24, 2017

Copyright: © 2017 Haque M, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

The objective of the study was to investigate whether there is any relationship between parents' attitude towards math and their children's math anxiety. A cross sectional survey was conducted to explore the math anxiety among the student and their parents' attitude towards math. The data were collected from 200 participants (children n=100; parents n=100). The children age range was from 8-12 years, they were from different schools of Dhaka and parents' age range was from 27 to 55 years. "Math Anxiety scale for Secondary School Students" developed by Haque and Hossain (2013) was used to measure math anxiety of the children. 'Parents attitude towards math questionnaire' developed by the researcher was used to measure parents' anxiety. Correlation between parents attitude towards math and children's math anxiety was $r=0.410$. Result indicates that parent's attitude has significant effect on children's math anxiety, meaning that 17% of the math anxiety for secondary school student is due to parents' attitude towards math. Parents' gender has significant effect on math anxiety but children gender has no significant effect regarding math anxiety.

Keywords: Math anxiety; Attitude; Parent; Children

Introduction

Anxiety is the expectation of future threat [1]. Usually people facing anxiety may withdraw from situations which have provoked anxiety in the past [2]. The pioneers in the study of mathematics anxiety, Richardson and Suinn [3] defined mathematics anxiety as experience of fear and apprehension when faced with the prospect of doing math. Lee [4] found that worldwide math anxiety is associated with decreased math achievement. In a sense when students are anxious about math, they typically perform at a level that is below than that of their actual abilities. Attitude towards math also plays a vital role in developing math anxiety. Allport [5] defined attitude as a mental and neural state of readiness, organized through experience, exerting a directive and dynamic influence upon the individual's response to all objects and situations with which it is related. Parents attitude is also refer as a feeling or thinking about something or someone that reflects on their behavior. Although children begin their formal education with a very positive view of mathematics [6], as progressing through education, many develop negative feelings and attitudes [7]. Additionally, parent's perception on mathematics influences their child's perception and achievement in mathematics [8]. In a sense, if a parent makes apparent that they do not enjoy mathematics or not good at mathematics, can influence the way their child views mathematics. Similarly, Maloney et al. [9] explored how parents' anxiety about math relates to their children's math achievement. Indeed, if the parents having high fear of failure in mathematics, express negativity when child struggling, then children could also learn to fear of failing in mathematics and avoid engaging challenging situations [10]. In Bangladesh math's anxiety is very well-known and concerning issue in educational sector. A study conducted by Morshed [11] identified from several national studies that secondary students' math performance was among the lowest of all school subjects. Another study by Morshed

[11] study also reveals that high math anxious students used more avoidant and negative coping and performed poor in math. These findings highlight the fact that understanding and management of math anxiety is a demanding issue. Particularly, parents attitude towards math also have dynamic impact on child's perception. But unfortunately few works have been done on this particular arena in Bangladesh. With this contention, the present study aims to find relationship between parental attitude towards math and their children's math anxiety.

Materials and Methods

Sample

In the first phase of the study 28 parents were selected for the development of Attitude scale. Among them 14 were mothers and the rest were fathers. Their age range was in between 30 and 54 years. For the second phase 200 participants (100 children and their 100 parents) participated.

	Age	Gender		Total
		Male	Female	
Children	8-12	41	59	100
Parents	27-55	44	56	100

Table 1: Gender and age distribution of participants.

These parents mean age was 40.16 years and their children's mean age was 10 years. They were students of class five and six. All were selected by convenient sampling technique. Data were collected from two schools of Dhaka city. Gender and age distribution for each group is presented in Table 1.

Instruments

For data collection purpose, the following instruments were used: Math Anxiety Scale for Secondary School Students. It has total 20 items where 10 items are positive and rest are negative (item no. 2, 3, 4, 6, 11, 13, 15, 18, 19, and 20). It is a five point Likert-scale where the response options were-Strongly agree, Agree, Uncertain, Disagree, and Strongly Disagree. For positive items in 5,4,3,2, and 1 were consecutively assigned for the response options and a reverse order of scoring was followed for the negative items. High score in scale indicates high math anxiety. Internal consistency of items was significant. Cronbach's Alpha was found to be 0.87 to 0.90. Parent's Attitude towards Math Questionnaire (PAMQ): For research purpose parents' attitude towards math questionnaire was developed by the researchers. It has total 23 items where 10 items are positive and rest 13 items are negative (item no.2, 4, 6, 8, 9, 10, 15, 16, 18, 20, 21, 22, and 23). It is a four point Likert-scale where response options were - Never, Occasionally, Often, and Always. For positive items in the scale 1, 2, 3 and 4 were assigned and for negative items reverse order of scoring was followed. High scores indicate parents' negative attitude towards math. A demographic data form was included with the questionnaire for collection of information about participant's age, gender, education etc.

Procedures

First phase

Initially for the development of parents' attitude towards math questionnaire items were collected from different sources. Items of Mathematics Self-Efficacy and Anxiety Questionnaire (MSEAQ) Diana et al. [12], Perceived Parental Influence scale (PPI) Cao et al. [13] and Math Anxiety Scale for Secondary School Students were considered. FGD were conducted with parents and teachers which also served as a resource for constructing items. Furthermore, math anxiety related journals were reviewed. From all these, firstly 30 items were translated and/or constructed in Bangla language and thus the initial questionnaire was prepared. This questionnaire was given to three relevant professional experts to check the content validity of the items. The researchers incorporated the feedback regarding conceptual, linguistic, structure etc. and according to their suggestion 2 items were dropped. In this stage 28 items of parents' attitude questionnaire was retained and designed to 4-point Likert-type scale (response options were - Never, Occasionally, Often, and Always). Among the items 13 were positive and 15 were negative (item no 2, 4, 6, 8, 9, 10, 15, 16, 17, 19, 21, 22, 26, 27, and 28). This synthesized version was administered to 28 parents and feedback concerning eligibility of language was checked. The scale was finalized after this pilot study. Five items were dropped and the rest 23 items were retained in final format by applying appropriate statistical analysis (Cronbach's Alpha) where 10 items were positive and 13 negative (item no.2, 4, 6, 8, 9, 10, 15, 16, 18, 20, 21, 22, and 23). High scores indicate parent's unfavorable or negative attitude towards math.

Second phase

Data were collected from two schools of Dhaka city. Firstly permission was taken from the school authorities. The participants were approached in their individual classroom and briefed about the purpose, confidentiality of research and inform consent were taken. Their participation was voluntary. They were instructed both verbally and in written form regarding filling in the math anxiety scale. Their

parents specifically who help them to do math either father or mother were asked to fill in the attitude questionnaire.

Results

The first phase of data analysis was measuring psychometric properties of the Bangla Parents Attitude towards Math Questionnaire (PAMQ) and the second phase was computing correlation between parents' attitude towards math and children's math anxiety.

First phase

Item analysis: Item-total correlation was used for item analysis. For parents attitude towards math questionnaire (PAMQ) all 28 items were analyzed and corrected item-total correlation coefficients were determined. Table 2 shows highly significant (at 0.02 levels) correlation coefficients except for five items (Item no-15, 23, 24, 25 and 26) which has been eliminated because of negative value. The Cronbach's Alpha if each item deleted ranged from 0.900 to 0.912.

Item no.	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Item no	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PAMQ1	0.617	0.903	PAMQ15	0.080	0.913
PAMQ2	0.716	0.901	PAMQ16	0.782	0.901
PAMQ3	0.495	0.905	PAMQ17	0.695	0.902
PAMQ4	0.761	0.900	PAMQ18	0.539	0.904
PAMQ5	0.335	0.908	PAMQ19	0.553	0.904
PAMQ6	0.627	0.903	PAMQ20	0.708	0.901
PAMQ7	0.619	0.903	PAMQ21	0.613	0.904
PAMQ8	0.541	0.904	PAMQ22	0.290	0.908
PAMQ9	0.596	0.903	PAMQ23	-0.030	0.910
PAMQ10	0.640	0.903	PAMQ24	0.203	0.912
PAMQ11	0.793	0.899	PAMQ25	0.195	0.910
PAMQ12	0.611	0.903	PAMQ26	0.084	0.912
PAMQ13	0.746	0.900	PAMQ27	0.391	0.908
PAMQ14	0.431	0.906	PAMQ28	0.319	0.908

P<.01Reliability Analysis: The Alpha coefficient for the 28 items suggests that the items have acceptable internal consistency. After eliminating five items Cronbach's Alpha was found to be 0.928.

Table 2: Item-total correlations (r) and Cronbach's Alpha if item deleted of PAMQ.

Second phase

Co-relational analysis: The relationship between parental attitude towards math as measured by the Parents Attitude towards Math Questionnaire (PAMQ) and their children math anxiety as measured by the Math Anxiety Scale for Secondary School Student (MASSSS) was investigated using spearman rho correlation coefficient. There was significant positive correlation between the two variables, $r=0.410$, $n=100$, $p<0.01$, with medium levels of parental negative attitude

towards math associated with medium levels of children math anxiety. This suggested that parental attitude towards math help to explain nearly 17% of the variance in the children's math anxiety score on the Math Anxiety Scale for Secondary School Student (MASSSS).

Gender difference of parents: Independent sample t-test was calculated to find difference between parents attitude. It was found that there was significant difference in scores obtained from fathers' ($M=48.13$, $SD=10.7$) and mothers' ($M=53.5$, $SD=14.1$); ($t=-2.14$, $p<0.05$) in term of attitude towards math.

Gender difference of children: Independent sample t-test was calculated to find difference between children's math anxiety. It was found that there was no significant difference in the scores obtained for males ($M=39.9$, $SD=12.8$) and females ($M=40.0$, $SD=14.9$); ($t=-0.388$, $p>0.05$) in term of math anxiety.

Discussion

The aim of the research was to investigate the relationship between parents' attitude towards math and their children's math anxiety. To achieve the objective first a parent's attitude towards math was constructed. The newly constructed questionnaire shows high internal consistency and reliability. The corrected item-total correlation coefficients presented in Table 2 shows highly significant correlation coefficients values for all items except five items. High alpha coefficient value (0.928) was indicative of high internal consistency. Children's math anxiety was measured through MASSSS and their parent's attitude was also measured. From the result it was found that there is positive correlation between parents' attitude towards math and their children's math anxiety. Literature review has shown that parent's perception on mathematics influences their child's perception and achievement in mathematics [8]. Maloney et al. [9] also found that when parents are more anxious with math, their children learn significantly less math over the school year and have more math anxiety by the end of the school year. The present study supports the findings of the previous researches.

The result of present study also demonstrates gender difference of parents' attitude towards math. Mother has shown more math anxiety than father. Preis et al. [14] cited researches that found women, in particular older women often experience more math anxiety. Furthermore, there is no gender difference found in case of children's math anxiety.

The study has number of recommendations. The instruments need further study with large sample and diverse group of people from all over Bangladesh. Validity should be checked for the scale. In addition, it could be a way of assessment and intervention for math anxiety in Bangladesh.

References

1. American Psychiatric Association (2013) Diagnostic and Statistical Manual of Mental Disorders (5th edn.), American Psychiatric Publishing, Arlington, VA.
2. Barker P (2003) Psychiatric and Mental Health Nursing: The Craft of Caring. Edward Arnold, London.
3. Richardson FC, Suinn RM (1972) The Mathematics Anxiety Rating Scale: Psychometric Data. *J Counseling Psychol* 19: 551-554.
4. Lee J (2009) Universals and specifics of math self-concept, math self-efficacy, and math anxiety across 41 PISA 2003 participating countries. *Learn Individ Diff* 19: 355-365.
5. Allport GW (1935) Attitudes. In: Handbook of social psychology, Murchison C editor. Clark University Press, Worcester, Mass.
6. Moore AM, Ashcraft MH (2012) Mathematics Anxiety. *Encyclopedia Of Language And Literacy Development* (pp. 1-8). Canadian Language and Literacy Research Network, London, ON.
7. Dowker A (2005) Individual Differences. In: Arithmetic: Implications For Psychology, Neuroscience And Education. Psychology Press, Hove.
8. Yee DK, Eccles JS (1988) Parent perceptions and attributions for children's math achievement. *Sex Roles* 19: 317-333.
9. Maloney EA, Ramirez G, Gunderson EA, Levine SC, Beilock SL (2015) Intergenerational Effects of Parents' Math Anxiety on Children's Math Achievement and Anxiety. *Psychol Sci* 26: 1480-1488.
10. Elliot AJ, Thrash TM (2004) The intergenerational transmission of fear of failure. *Pers Social Psychol Bull* 30: 957-971.
11. Morshed MM (2013) Math anxiety and math achievement in rural junior-secondary students of Bangladesh. Proceedings from the Annual meeting of the 57th Annual Conference of the Comparative and International Education Society. New Orleans, LA.
12. Diana KM (2009) Mathematics Self-Efficacy and Anxiety Questionnaire. The University of Georgia.
13. Cao, Bishop A, Forgasz H (2006) Perceived Parental Influence on Mathematics Learning: A Comparison Among Students in China and Australia. *Educ Stud Math* 64: 85-106.
14. Preis, Christy, Biggs, Bobbie T (2001) Can Instructors Help Learners Overcome Math Anxiety? *ATEA J* 28: 6-10.