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Effect Of Cognitive Restructuring On The Management Of Mathophobia Among Secondary School Students In Onueke Education Zone Of Ebonyi State, Nigeria

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Abstract
This study investigated the Effect of Cognitive Restructuring on the management of mathophobia among secondary school students in Onueke education zone of Ebonyi state, Nigeria. Two research questions and two null hypotheses guided the study. The study employed quasi-experimental research design. The study sample comprised 60 participants consisted 30 males and 30 females drawn from the entire population of 13,283 senior secondary school 11 student in 65 secondary schools in the zone. A 21-item validated researchers' structured response questionnaire titled: Students Mathophobic Assessment Questionnaire (SMAQ) was the instrument used for data collection. Data collected were analyses using mean, standard deviation and t-test statistics to answer the two research questions and two null hypotheses that guided the study. Results showed that cognitive restructuring was an effective therapeutic approach for managing mathophobia among secondary school students notwithstanding their sex differences. This was evident in the higher cognitive and follow-up mean scores of the students in the treatment group in contrast with their control group counter parts. Hence, the null hypothesis 2 was rejected for the alternative. The implication of the findings is that cognitive restructuring should be a must therapy for all students to develop interest in studying mathematics. The study, among others; recommended that every school have at least, one professional guidance counselor to work more closely with mathematics teachers in the cognitive restructuring of students with mathophobia.

Keywords: *Cognitive Restructuring, Mathophobia, Secondary School Students, Quasi-Experimental Design, Guidance and Counseling*

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I. Introduction

Education is the most powerful tool for self and societal development. This is because it equips and prepares individuals with necessary basic skills, knowledge and capacities to develop both themselves and the general society towards ever nobler ends. Little wonder Nworie (2022) documented that no developed country in the world that did not give proper attention to the education of its citizens. As a matter of fact, no nation can advance in development above the level of education of its citizens. This is due to the fact that the citizens' intellectual and functionality can only be developed through the quality of education they acquire. Nations that toy with their education system often find themselves backward in term of national development; while those that are committed to qualitative education of their citizens may advance toward very rapidly. It is in recognition of this fact that government of all nations commit immense resources to ensure the provision of quality education for their citizens at all levels and also tailor their education policies towards ensuring it is made accessible and affordable to the generality of their citizenry.

All the same, education as a body of knowledge is organized in various fields of study or subject areas with each having a unique content. Content, according to Ogah, Eze, Mba and Emesini (2009), refers to knowledge, skills attitude and values to be learned in each subject area. That is, what is being taught to the learner in each subject or course of study. For instance, there are many subjects or courses taught in secondary schools. One of such subjects in mathematics. Targetstudy (2014) defined mathematics as a discipline which deals with the logic of quantity, shape and measurement. It enables a person to be accurate in doing virtually everything in life. Targetstudy noted that mathematics is all around us, which means one cannot do without mathematics. On daily basis commercial activities take place, quantity of products are bought and sold, bank deposits and withdrawals are made, even in cooking and baking as well as in dress making and room decorations, mathematics is involved; these go on and on.

For Sule, Hussaint, Bashir and Garba (2016) mathematics is the central intellectual discipline of any technological society, without which the understanding of natural problems would be superficial. Ernest-Ehibudu and Wayii (2017) in the same view, noted that mathematics is an important subject that has been made compulsory

for admitting candidates into almost all the disciplines in tertiary institutions in Nigeria and beyond. Therefore, mathematics at the secondary school level is classified as a compulsory subject for all students. In a similar vein, Okafor and Anduaka (2013) considered mathematics as a compulsory subject offered in Nigeria secondary and primary schools and is taught daily in all the schools or at least four times in a week. This is because of its importance which cannot be over emphasized in both academic in every day human life. This implies that mathematics is simply inescapable because if you run away from it at one level of education, it will be waiting for you at another level.

Unfortunately, some people view mathematics as a subject for the privileged; that is a subject understandable only to the few with very high intelligence. Many of these people with such view end up having fear for mathematics. In this regard, Hamilton (2015) asserted that mathematics for this category of students tends to be so precise and demanding by its nature; most of its answers are cut and dried, no room available for the students of the students develop severe fear or mathematics generally referred to as mathophobia.

Mathophobia, otherwise simply known as mathematics anxiety is the abnormal feelings of tension and irrational fear that interfere with the manipulation of members and the solving of mathematical problems in a wide variety of ordinary life and academic situations (Rossnan, 2006). Similarly, Selvargi (2011) defined mathophobia as intense feelings of anxiety that people have about their ability to understand and solve mathematics. It is a psychological condition that not only scare but also prevents some individuals form the learning and using of mathematics in their daily lives due to los of interest and confidence in the subject. Nworie (2022) observed that the situation causes many people to freak out and panic at tests, quiz and from more difficult work involving mathematics. Such negative experiences commonly remain throughout most individual adult lives and consequently block millions of them from maximizing professional and personal opportunities because of their unfounded fear or poor performance in the subject. Nworie pointed out and specifically made it clear that the phobia students have for mathematics is not just an academic problem that prevents many of them from entering into certain careers of their choice or interest but also interferes with work performance and productivity levels of some people in work organizations as well.

The problem, according to Egbochukwu and Obodo (2005), Yeo, ton and Lew (2015), Marshall (2020) and Nworie (2022), seems to cut across male and female learners in all school levels regardless of location. Some writers including Pliasance (2009) and Home School Math (2015) traced the root cause of fear of mathematics in students to the way the teachers teaching the subject feel about it while teaching it in the classroom. They contended that I the teachers teaching mathematics show some level of enthusiasm, students would develop interest and improve in their understanding of the subject. That is to say, mathematics anxiety in students in the opinion is caused as a result of teacher-related behavior. Others including Ressman in Nworie (2022) traced it to the unfounded prior negative knowledge or experiences of the students about mathematics. Rossman believed that students develop mathophobia as a result of their prior negative experiences when learning mathematics in the classroom or at home on their own. Such negative experiences when transferred into thoughts of any future mathematics exercise commonly result in some difficulties in understanding the subject (mathematics). Those who traced the root cause of mathophobia to the students' unfounded prior negative knowledge about mathematics like Rossman argued that cases exist where the mathematics teachers are enthusiastic about the subject, yet some students still end up having mathophobic behavior. Therefore, mathematic teachers, in the view of Rossman and group, is the only cause of mathophobia among students.

Notwithstanding the cause of mathophobia among students, the problem needs to be seriously addressed in order to restore their interest and confidence in the study and use of mathematics in their daily lives. To this end, cognitive restructuring has been suggested as approach for tackling mathophobia among male and female students across school levels. Cognitive structuring is a core technique in Cognitive Behavior Therapy (CBT) for treating common mental issues like anxiety and depression (Wingnall, 2019). Therapist Aid (2021) considered cognitive restructuring as a therapeutic process of identifying and challenging negative and irrational thoughts among those who are psychologically sick. The approach is designed to help clients to eliminate negative emotional reactions by making them to develop the mental capacity to think accurately. As Egbule in Nworie (2022) noted, clients' emotional behavior stem from "self –talk" or internalized sentences firmly rooted in negative or irrational beliefs, expectations assumptions or which in turn inform/influence their approaches/ reactions to events in their lives with far-reaching implications for the society.

Interestingly, cognitive restoring functions in replacing negative perceptions about things with positive views; from "I cannot do it "to "I can do it". On finding out the effect of cognitive restructuring on the management of mathophobia among male and female secondary school students in Onueke education zone of Ebonyi State Nigeria.

Statement of the problem

Mathophobia is observed as a persistent problem among male and female secondary school students, notwithstanding their location. Its major causes may be traced to some mathematics teachers for their bad method

of teaching the subject and the unfounded prior negative belief of some students about mathematics as a dry hard subject. The problem makes it difficult for many of the students to be able to manipulate figures. Reports from various examination bodies like, the West African Examination council (WAEC) and the National Examination Council (NECO) have shown that the situation has affected secondary school students' performance in mathematics examinations. It has sometimes prevented some students to study the courses of their choice or interest and so, restricted them from entering into certain courses. Developing such an unusual fear for mathematics may also have negative consequences throughout the students' adult lives if not addressed and can permeate the whole society and the nation's economy as well when people due to mathophobia avoid certain courses. In an attempt to find a therapy to the fear for mathematics, cognitive restructuring has been suggested. It is therefore on this basis that this is asking, what effect has cognitive restructuring on the management of mathophobia among male female secondary school students in Onueke education zone of Ebonyi State, Nigeria?

Objective of the study

The study sought to:

1. Determine the effect of cognitive restructuring on the management of mathophobia among male and female secondary school students in Onueke education zone of Ebonyi State, Nigeria.
2. Ascertain the effect of cognitive restructuring on the management of mathophobia among male and female secondary school students after six weeks treatment interval in Onueke education zone of Ebonyi State, Nigeria.

Research Questions

The following research questions guided the study:

1. What is the mean effect of cognitive restructuring on the management of mathophobia among male and female secondary school students in Onueke education zone of Ebonyi State, Nigeria?
2. What is the mean effect of cognitive restructuring on the management of mathophobia among male and female secondary school students after six weeks' treatment interval in Onueke education zone of Ebonyi State, Nigeria?

Research Hypotheses

The following null hypotheses were tested at a 0.05 level of significance in this study.

H_{01}: There is no significant difference in the mean scores of male and female secondary school students exposed to cognitive restructuring in Onueke education zone of Ebonyi State, Nigeria.

H_{02}: There is no significant difference in the mean scores of male and female secondary school students treated to cognitive restructuring and those in the control group after six weeks' treatment interval in Onueke education zone of Ebonyi State, Nigeria.

Theoretical Framework

This study is anchored on the Rational Emotive Theory propounded by Albert Ellis in 1976, based on his belief in the cognitive control of behavior. Ellis, in the theory, assumed that human emotional feelings and reactions derive/stem from a person's perception, evaluation and interpretation of events and situations that challenge the person's psychological and emotional resources. Ellis, with this belief, asserted that personality consists of beliefs, constructs or attitudes. This simply means that there is marked disparity between thinking and emotion. That is to say, the two processes overlap and for all practical purposes, the two processes are the same thing. Emotion, according to attitudinal and cognitive process. Therefore, thought processes and emotions are critical factors in determining human behavior, be it happiness or unhappiness, largely depends on whether the individual is rational or irrational in his/her thinking about what he/she experiences in life.

The core idea in Ellis' Rational Emotive Theory is that people often get disturbed or upset not because of the event that happened to them but because of the negative or irrational ways from which they perceive and interpret events or situations (realities) in their lives. That is to say, peoples' emotional problems or neurotic behaviors such as mathophobic of some secondary school students result basically from their irrational thoughts and self-defeating ideas and belief system about mathematics. Ellis, by the theory stated with his conviction that such irrational and self-defeated ideas and beliefs among people can be restructured. This basic premise underlies the applicability of the rational emotive theoretical orientation to this study, which seeks using cognitive restructuring inherent in the theory to assist secondary school students with mathophobia to change their sets of attitudes and assumptions that are irrational and self-defeating to create a legacy of strength that will enhance their living for societal progress and wellbeing.

II. Methodology

The study employed a quasi-experimental research design. A quasi-experimental research design is a study involving the introduction of independent treatment variables under controlled conditions followed by

observing the effects of this introduction on one or more dependent variables (Nworie, 2022). This design is considered ideal for the study because it involves finding out the effect of the independent variable that was introduced on the dependent with view to dispelling unfounded fears for mathematics among secondary school students, which if not checked may not only continue to have negative consequences throughout their adult lives but can also permeate the entire society and the nation's economy.

The area of the study was Onueke education zone of Ebonyi State. Ebonyi State is one of the six states that were created by Abacha's Administration on October 1 1996 with Abakaliki as the capital. It is located in the South East of Nigeria. The state is bounded to the North by Benue State, to the West by Enugu State, to the East by Cross River State and South by Abia State. The State has three education zones: Abakaliki, Onueke and Afikpo education zones.

The population of the study comprised thirteen thousand two hundred and eighty-three (13,283) Senior Secondary Two (SS II) students; made up of six thousand two hundred (6200) males and seven thousand eighty-three (7083) females in the sixty-five (65) secondary schools in the zone as at the time of the study (Ebonyi State Secondary Education Board (EBSEB, 2018). Senior secondary two (SS II) students were chosen because they were not yet in the external examination class but are in their early preparatory stage for the external examination. The efficiency of the treatment would help to avoid mathematics anxiety among the students.

However, participants in the study consisted of sixty (60) SS II students composed of thirty (30) males and thirty (30) females who were drawn from the entire population size and were assigned into the experimental and control groups of fifteen (15) males and fifteen (15) female students totaling 30 students per group using randomized sampling procedure to guarantee the equivalence of the two groups of the study. Only those in the experimental group were exposed to cognitive restructuring while those in the control group were not but were compensated with general counselling centered on study habits and the need to take one's studies seriously.

Validated structured questionnaire developed by the researchers titled: Students' Mathophobia Assessment Questionnaire (SMAQ) composed of 21 items constructed on a 4-point Likert rating scale with the response format of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) weighted accordingly as 4,3,2 and 1 was the data gathering instrument. The instrument has two sections. Section A focused on personal data of respondents in respect of name of school, education zone and sex. Section which contained the main items of the instrument designed for answering the research questions required the respondents to respond honestly to the items by ticking (✓) under the column provided with response options: SA, A, D and SD that best indicated their opinions with respect to the statement items. The instrument was trial tested on small group of 20 respondents outside the study area. Using the Cronbach Alpha statistical approach, the calculated reliability index of the instrument was 0.80, meaning it was adequate enough for the study.

Data were collected with the help of two mathematics teachers for the SS II class briefed on the purpose. The warm cooperation of the mathematics teachers and the direct as well as the on the spot approach in the administration and collection of the completed questionnaire forms from respondents made for a hundred percent return of the questionnaire administered. The data collected from the treatment and follow-up tests were statistically analyzed using descriptive statistics involving mean scores and standard deviations to answer the research questions which were answered on the individual item basis with a criterion mean value of 2.50 as the decision rule. The null hypotheses were tested at an alpha 0.05 level of significance using the t-test.

III. Results

Results of the data analysis conducted on the research questions hypotheses that guided the study are presented in tables 1 – 4 as follows:

Research Question One: What is the mean effect of cognitive restructuring on the management of mathophobia among male and female secondary school students in Onueke education zone of Ebonyi State, Nigeria?
Data analysis answering research question 1 is presented in table 1.

Table 1: Descriptive statistics showing mean scores and standard deviation analysis of the effect of cognitive restructuring on the management of mathophobia among male and female secondary school students I Onueke education zone o Eboni State, Nigeria.

S/N	Item	Mean Male No. 15	Std. Male	Decision	Mean Female No.15	Std. Female	Decision
1.	Mathematics is a very hard subject in school	2.06	0.59	D	2.26	0.59	D
2.	I feel scared each time I hear the word "mathematics"	1.86	0.35	SD	2.00	0.73	D
3.	I so much like to study mathematics	3.80	0.41	SA	3.53	0.51	SA
4.	I feel sick anytime 1 heard of mathematics class	1.73	0.45	SD	1.86	0.35	SD
5.	Mathematics is a subject for special						

	other than me	1.93	0.25	SD	2.00	0.37	D
6.	I always visit my friends during mathematics						
	class	1.93	0.45	SD	2.13	0.35	D
7.	Mathematics is an interesting subject	3.66	0.48	SA	3.53	0.51	SA
8.	My mathematics teacher is wicked	1.83	0.35	SD	1.93	0.25	SD
9.	Mathematics is for those who want to do						
	sciences only	1.86	0.35	SD	2.00	0.37	SD
10.	Mathematics is one of my favourite subjects	3.73	0.45	SA	3.80	0.41	SA
11.	I just manage to give mathematics a try	3.20	0.41	A	3.40	0.50	A
12.	I enjoy our mathematics classes so much	3.86	0.35	SA	3.96	0.25	SA
13.	I consider mathematics as a subject for the						
	intelligent ones	1.93	0.25	SD	1.73	0.45	SD
14.	I hardly participate in our mathematics lessons						
	for a lack of interest in the subject.	1.86	0.35	SD	1.73	0.45	SD
15.	I do not believe that mathematics is all that						
	difficult	3.66	0.48	SA	3.60	0.50	SA
16.	Having a fine mathematical brain is a matter of						
	developing interest in the subject	3.73	0.45	SA	3.86	0.35	SA
17.	Good knowledge of mathematics makes one						
	sharp in thinking or reasoning with						
	accuracy	3.86	0.35	SA	3.73	0.45	SA
18.	I hardly stay one day without trying to solve						
	mathematics	3.86	0.35	SA	3.80	0.41	SA
19.	I just hate mathematics	1.20	0.41	SD	1.33	0.48	SD
20.	Nothing can make me to develop interest for						
	mathematics	1.46	0.63	SD	1.26	0.45	SD
21.	I have no fear for mathematics any more	3.73	0.45	SA	3.80	0.41	SA
	Grand Mean	2.70	0.41		2.72	0.43	
	Source: Field Work, 2021						

Table 1 results of the data analysis indicated that the experimental group of the study which consisted of 5 males and 15 females treated with cognitive restructuring had the male and female group mean responses of 2.70 and 2.72 points respectively on the 4 points rating scale of the research instrument with a marginal difference of just 0.02 points in favour of the female group. This marginal difference in the mean score achievements of male and female groups of the students exposed to cognitive restructuring suggested that the effects on the mathophobic behavior of the male and female students were just same. Again, a close look at the grand mean scores of the male and female groups showed that each group scored reasonably above the criteria mean of 2.50 adopted for answering the research questions. This impressive treatment result that cut across the male and female groups in the experimental group of the study indicates that the mean effect of cognitive restructuring in the management of mathophobia among male and female secondary school students I Onueke education zone of Ebonyi State, Nigeria is impressively very high.

Research Question Two: What is the mean effect of cognitive restructuring on the management of mathophobia among male and female secondary school students after six weeks' treatment interval in Onueke education zone of Ebonyi State, Nigeria?

Data analysis answering research question 2 is presented in table 2.

S/N	Item	Mean Treat No. 30	Std. Treat	Decision	Mean Control No. 30	Std. Control	Decision
1	Mathematics is a very hard subject in school	2.16	0.59	D	3.66	0.47	SA
2	I feel scared each time I hear the word						
	"mathematics"	1.93	0.36	SD	3.56	0.50	SA
3	I so much like to study mathematics	3.66	0.47	SA	1.43	0.50	SD
4	I feel sick anytime I heard of mathematics class	1.80	0.40	SD	3.13	0.34	A
5	Mathematics is a subject for special people other						
	than me	1.96	0.31	SD	3.56	0.50	SA
6	I always visit my friends during mathematics						
	class	2.03	0.41	D	3.33	0.47	A
7	Mathematics is an interesting subject	3.60	0.49	SA	1.16	0.37	SD
8	My mathematics teacher is wicked	1.90	0.30	SD	3.50	0.50	SD
9	Mathematics is for those who want to do						
	sciences only	1.93	0.36	SD	3.06	0.25	A
10	Mathematics is one of my favourite subjects	3.76	0.34	SA	1.73	0.44	SD
11	I just manage to give mathematics a try	3.30	0.46	A	1.86	0.34	SD
12	I enjoy our mathematics classes so much	3.90	0.30	SA	1.26	0.50	SD
13	I consider mathematics as a subject for the						
	intelligent ones	1.83	0.37	SD	3.40	0.49	A
14	I hardly participate in our mathematics lessons						
	for a lack of interest in the subject.	1.80	0.40	SD	3.93	0.25	SA

15	I do not believe that mathematics is all that difficult	3.63	0.49	SA	1.20	0.40	SD
16	Having a fine mathematical brain is a matter of developing interest in the subject	3.80	0.40	SA	1.46	0.01	SD
17	Good knowledge of mathematics makes one sharp in thinking or reasoning with greater accuracy	3.80	0.40	SA	1.76	0.43	• SD
18	I hardly stay one day without trying to solve mathematics	3.83	0.37	SA	1.06	0.25	SD
19	I just hate mathematics	1.26	0.44	SD	3.00	0.26	A
20	Nothing can make me to develop interest for mathematics	1.36	0.55	SD	3.06	0.25	A
21	I have no fear for mathematics any more	3.76	• 0.43	SA	1.06	0.25	SD
	Grand Mean	**2.71**	**0.41**		**2.43**	**0.37**	
Source: Field Work, 2021							

Table 2: Descriptive statistics of the mean and standard deviation analysis of the effect of cognitive restructuring on the management of mathophobia among secondary school students after six weeks' treatment interval in Onueke education zone of Ebonyi State, Nigeria.

From the summary results of the data analysis after six weeks treatment interval shown in the table 2, the 30 student that constituted experimental group of the study had an average score of 2.71 points per respondent with a standard deviation of 0.41 on the 4-point rating scale of the research instrument; while their counterparts in the control group numbering 30 as well scored a follow –up mean score of 2.43 points per person with a standard deviation of 0.37. Clearly from the results here, the respondents in the treatment group maintained the criteria mean score of 2.50 and above adopted for answering the research questions; while their counterparts in the control group never scored up to that. By these results, it means that the mean effect of cognitive restructuring in the management of mathophobia among secondary school students after six weeks treatment interval in Onueke education zone of Ebonyi State, Nigeria remained consistently very high.

Hypothesis: There is no significant difference in the mean scores of male and female secondary school students exposed to cognitive restructuring in Onueke education zone of Ebonyi State, Nigeria.
The t-test analysis of null hypothesis 1 is presented in table 3.

Table 3: t-test analysis of difference between the mean scores of male and female secondary school students exposed to cognitive restructuring in Onueke education zone of Ebonyi State, Nigeria

SN	Sex	N	Mean	Std.	t-calculated	t-critical	Decision
1	Males Females	1515	2.06 2.26	0.59 0.59	0.92	2.04	Accept
2	Males Females	1515	1.86 2.00	0.35 0.37	1.00	2.04	Accept
3	Males Females	1515	3.80 3.53	0.41 0.51	1.56	2.04	Accept
4	Males Females	1515	1.73 1.86	0.45 0.35	0.89	2.04	Accept
5	Males Females	15 15	1.93 2.00	0.25 0.37	0.56	2.04	Accept
6	Males Females	1515	1.93 2.13	0.45 0.35	1.34	2.04	Accept
7	Males Females	1515	3.66 3.53	0.48 0.51	0.72	2.04	Accept
8	Males Females	1515	1.86 1.93	0.35 0.25	0.59	2.04	Accept
9	Males Females	1515	1.86 2.00	0.35 0.37	1.00	2.04	Accept
10	Males Females	1515	3.73 3.80	0.45 0.41	0.41	2.04	Accept
11	Males Females	1515	3.20 3.40	0.41 0.50	1.18	2.04	Accept
12	Males Females	1515	3.86 3.93	0.35 0.25	0.59	2.04	Accept
13	Males Females	1515	1.93 1.73	0.25 0.45	1.47	2.04	Accept
14	Males Females	1515	1.86 1.73	0.35 0.45	0.89	2.04	Accept
15	Males Females	1515	3.66 3.60	0.48 0.50	0.36	2.04	Accept
16	Males Females	1515	3.73 3.86	0.45 0.35	0.89	2.04	Accept
17	Males Females	1515	3.86 3.73	0.35 0.45	0.89	2.04	Accept
18	Males Females	15 15	3.86 3.80	0.35 0.41	0.47	2.04	Accept
19	Males Females	1515	1.20 1.33	0.41 0.48	0.80	2.04	Accept
20	Males Females	1515	1.46 1.26	0.63 0.45	0.98	2.04	Accept
21	Males Females	1515	3.73 3.80	0.45 0.41	0.41	2.04	Accept
	Grand Mean				0.85	2.04	Accept

Source: Field Work, 2021

Table 3 results of the t-test analysis of difference indicated that the mean scores of the male and female groups of the students exposed to treatment in the study did not differ significantly. This followed the calculated grand t-value of 2.04 at a 0.05 percent level of significance with 28 degree of freedom (0.85 <2.04) in the table. As a result, the null hypothesis I was retained and concluded that there is no significant difference in the mean scores of secondary school students exposed to cognitive restructuring in Onueke education zone of Ebonyi State, Nigeria.

Hypothesis 2: There is no significant difference in the mean scores of male and female secondary school students treated to cognitive restructuring and those in control group after six weeks treatment interval in Onueke education zone of Ebonyi State, Nigeria.

The t-test analysis of null hypothesis 2 is presented in table 4.

ITEM	Methods	N	Mean	Std.	t-calculated	t-critical	Decision
1	Treatment Control	30 30	2.16 3.66	0.59 0.47	10.78	2.04	Reject
2	Treatment Control	30 30	1.93 3.56	0.36 0.50	14.37	2.04	Reject
3	Treatment Control	30 30	3.66 1.43	0.47 0.50	17.58	2.04	Reject
4	Treatment Control	30 30	1.80 3.13	0.40 0.34	13.67	2.04	Reject
5	Treatment Control	30 30	1.96 3.56	0.31 0.50	14.68	2.04	Reject
6	Treatment Control	30 30	2.03 3.33	0.41 0.47	11.24	2.04	Reject
7	Treatment Control	30 30	3.60 1.16	0.49 0.37	21.28	2.04	Reject
8	Treatment Control	30 30	1.90 3.50	0.30 0.50	14.77	2.04	Reject
9	Treatment Control	30 30	1.93 3.06	0.36 0.25	13.96	2.04	Reject
10	Treatment Control	30 30	3.76 1.73	0.34 0.44	17.89	2.04	Reject
11	Treatment Control	30 30	3.30 1.86	0.46 0.34	13.52	2.04	Reject
12	Treatment Control	30 30	3.90 1.26	0.30 0.50	24.79	2.04	Reject
13	Treatment Control	30 30	1.83 3.40	0.37 0.49	13.70	2.04	Reject
14	Treatment Control	30 30	1.80 3.93	0.40 0.25	24.37	2.04	Reject
15	Treatment Control	30 30	3.63 1.20	0.49 0.40	20.29	2.04	Reject
16	Treatment Control	30 30	3.80 1.46	0.40 2.01	6.22	2.04	Reject
17	Treatment Control	30 30	3.80 1.76	0.40 0.43	18.81	2.04	Reject
18	Treatment Control	30 30	3.83 1.06	0.37 0.25	33.22	2.04	Reject
19	Treatment Control	30 30	1.26 3.00	0.44 0.26	18.22	2.04	Reject
20	Treatment Control	30 30	1.36 3.06	0.55 0.25	15.23	2.04	Reject
21	Treatment Control	30 30	3.76 1.06	0.43 0.25	29.61	2.04	Reject
	Grand Mean				17.53	2.04	Reject

Table 4: t-test analysis of difference between the mean scores of students treated to cognitive restructuring and those in the control group after six weeks treatment interval in Onueke education zone of Ebonyi State, Nigeria

Table 4 results of the t-test of difference showed that the calculated grand t-value of 17.53 is greater than the critical/tabulated t-value of 2.04. Consequently, the null hypothesis 2 was rejected, implying that there is significant difference in the mean scores of the experimental group of the students and those in the control group after six weeks treatment interval in Onueke education zone of Ebonyi State, Nigeria in favour of those in the treatment group.

IV. Discussion

The findings of the study clearly demonstrated the effectiveness of cognitive restructuring in improving mathophobic students' cognition and well-being having dispelled their fears for mathematics. This is evident from the results of data analysis of the research questions and hypotheses presented in Tables 1 – 4 which showed significant differences in the cognitive mean scores of students treated to cognitive restructuring and those in the control group in favour of the students in the experimental group. The analysis result in Table 1 indicated that the 15 male students in the experimental group treated with cognitive restructuring technique had a group mean score of 2.70 points and a standard deviation of 0.41; while their female colleagues also numbering 15 has a group average score of 2.72 points and a standard deviation of 0.43 with a marginal difference of just 0.02 points in each case in favour of the female group. Clearly from the results the difference that exist in the mean score achievements of male female groups in very marginal, indicating no significant variation in the responses of male and female respondents to the efficacy of cognitive restructuring in the treatment mathophobia among them.

The finding was affirmed by the t-test result as presented in Table 3, which showed no significant difference between the mean ratings of male and female groups of the students exposed to treatment in the study. This followed the calculated grand t-value of 0.85 that is less than the critical grand t-value of 2.04 at the alpha level of 0.05 on the Table 3, which indicated that both the male and female students had the same experimental exposure with equal cognitive improvement in interest and attitudes toward mathematics shown in their common cognitive mean responses. This impressive cognitive improvement/treatment results that cut across the male and female boundaries of the students in the experimental group of the study indicate that cognitive restructuring is male female friendly and therefor, an effective treatment technique for the management of mathophobia among student irrespective of sex.

The finding corroborated Onwuka and Tibi (2014) who had earlier on reported cognitive restructuring as an effective counselling technique for the treatment of mathematics anxiety across male and female secondary school students with an equal treatment effect. The finding also conformed to assertion of Mills, Reiss and Dombeck (2015) that cognitive restructuring is a technique that can help people to identify, challenge and alter stress including thought patterns and beliefs that are irrational and self-defeating. The findings of this study were further affirmed and buttressed by the results of the data analysis in Table 2 indicated that mean effect of cognitive restructuring on the management of mathophobia among secondary school student after six weeks treatment interval in Onueke education zone of Ebonyi State, Nigeria remained considerably very high based on the consistent higher mean score advantage of the experimental group of the research subjects with 2.71 points over their control group counterparts with a follow-up mean score of 2.43 points. This finding indicated the significant lasting effect of cognitive restructuring in improving the cognitive status of the experimental student population. The findings were further affirmed by the result of the t-test analysis of research hypothesis 2 in Table 4, which succinctly showed that cognitive mean scores of the research subjects in the treatment group and those in the control group after six weeks treatment interval in Onueke education zone of Ebonyi State, Nigeria remained significantly different in favour of the students in score advantage over their colleagues in the control group of the study. The findings stemmed from the calculated grand t-value of 17.53 which is greater than the tale grad value of 2.04 at an alpha in Table 4. Hence, the null hypothesis 2 was rejected for the alternative.

The findings are in line with research findings of Otubo (2015) who had in his own study reported the strength of cognitive restructuring approach to counselling in helping individuals to reverse their earlier negative attitudes and belief systems for a better living. This is evidently clear in the positive attitudes toward the learning of mathematics demonstrated by students in the treatment group who were counselled with cognitive restructuring approach in contrast to their counterparts in the control group of the study who were not exposed to the treatment package. The findings equally proved the efficacy of cognitive restructuring in alignment with Wignall (2019) who had previously postulated that cognitive restructuring is a core technique in Cognitive Behavioral Therapy (CBT) and the most effective approach for treating young people of common mental health issues such as unfounded fears/phobias and depression resulting from distorted cognitive or thinking error.

Counselling Implications of the Study

The counselling and educational implications of the findings of this study in sum is that cognitive restructuring technique as a treatment strategy for the management of mathophobia among secondary school students has no sex boundaries. From the impressive results of the treatment group of the students involved in this study that were exposed to the treatment package, the technique has proven to be an effective approach for the treatment of mathophobia among male and females phobia patients or victims across all school levels. This calls for the concerted collaborative efforts of governments and school authorities, as well as school counsellors to liaise closely with the mathematics teachers saddled with the mandate to teach the young generation across school levels in a way that would enable them identify and recognize the inaccuracies in their thoughts and behavioral reactions which disable millions of them from maximizing professional and personal opportunities because the fear or perform poorly in mathematics. This will not only help the youngsters to restructure and root

out their dysfunctional cognitive biases for mathematics but also embrace al the desirable educational experiences offered them both within and outside the formal school system to develop their potentials to the maximum and use the same to improve themselves and the society for the benefit of all.

V. Recommendations

Based on the research findings and implications the study recommends the following:

1. Cognitive based counselling techniques like cognitive restructuring should adopted as a conventional counselling approach in the treatment of mathophobia students to enable them improve their cognitive adjustment and well-being. This measure may help them become more rational in thinking and behavior in the course of their academic pursuit.
2. Students across school levels should be adequately sensitized through seminars and workshops and encouraged to always seek the expert services of their school counsellor to clear any area of doubt or challenges as they sojourn in the course of their school life. This would not only assist them to re-discover themselves the more for positive use, life with minimal stress for improved academic work and career performance.
3. School administrator and counsellors should endeavor to work more hand in hand with the mathematics teacher in motivating student interest and confidence in mathematics through the use of cognitive restructuring.
4. Every school and indeed, all educational institutions in the country and the world over should a functional counselling unit or center with at least, one professional counsellor who should be saddled with the sole mandate to work more closely with student and pupils on regular basic. This will help in no small measure to cater for the varied counselling need of the student population through the provision of adequate cognitive and psychosocial services, which only counselling can provide to them for their overall growth and national development.

VI. Conclusion

In conclusion, the findings of this piece of research have brought into limelight the effectiveness of cognitive restructuring in helping mathophobic student to dispel their fear for mathematics which is not only detrimental to their academic success, but also affect their careers as well as work performance. In view of the findings and given the crucial role mathematics plays in human life as well as the negative consequences of developing an unusual fear for mathematics throughout the student's adult lives which can permeate the whole society and the nation's economy as well when people due to mathophobia avoid certain careers and nothing is done to allay their tears, the need for an intensive and consistent cognitive restructuring of student in general and phobia patients in particular across school levels is quiet obvious and indispensable for accomplishment if the aims and objectives of school instruction are to be achieved. It is from these basic premises that the researchers in conclusion which to enjoin parents, teacher, healthcare professional and self-care behavior among student and pupils at school levels to work closely to ensure academic excellence and proficiency in work performance for a better society.

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