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An Experimental Investigation of Counselling Reality Therapy in Reducing Mathematics Anxiety of in-School Adolescents in Oyo State, Nigeria

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Abstract

The study examined experimental investigation of counselling reality therapy in reducing Mathematics anxiety of in-school adolescents in Oyo State, Nigeria. Pretest-posttest, control group quasi-experimental design with a 2x2 factorial matrix was used in the study. Simple random sampling technique was used in sampling participants from 4 local government areas in the state. The respondents were measured with relevant adapted standardized instrument with .82 reliability coefficient. Data obtained was analyzed using t-test statistical analysis. Two (2) research hypotheses were formulated and tested at 0.05 level of significance. The result showed that there was significant difference in the Mathematics anxiety of students exposed to counselling reality therapy and those in the control group and there was significant difference in the Mathematics anxiety of students with high self-esteem and those with low self-esteem. In view of these findings, the study stressed that counselling psychologists should intensify their effort to organize conferences on the implications of counselling therapeutic intervention as effective tools in reducing Mathematics anxiety.

Keywords: Counselling Reality Therapy, Mathematics Anxiety and In-school Adolescents

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Introduction

Mathematics is one of the compulsory subjects that students must offer in Junior Secondary School (JSS), not minding whether such students intend to be in science, commercial, arts or social science in Senior Secondary School (SSS) class. In secondary school curriculum according to National Policy on Education (2013), Mathematics is one of the core subjects that for the students to further their studies in Senior Secondary School (SSS) or institutions of higher learning especially in University, students are expected to have credit in it. This makes Mathematics one of the essential subjects for students' advancement. However, Mathematics is one of the subjects that is taken very seriously in the school system, irrespective of country or level of education. It has been described as a model of thinking which encourages learners to observe, reflect and reason logically about a problem and in communicating ideas, making it the central intellectual discipline and a vital tool in science, commerce and technology.

From available statistics, the national average hovers around 32 per cent for Mathematics. Uwadie (2014) in support of the above assertion noted that it was only 48.88% of candidates who sat for November/December 2013 West African Senior School Certificate Examination (WASSCE) that has credit while the rest of 51.12% of the candidates failed in Mathematics. The 2014 May/June SSCE results also recorded mass failure by students across the country. In Mathematics, 242, 162 students sat for the examination with only 23,042 representing 9.52% obtaining distinction. 15, 752 representing 6.50% got credit while 101,321 representing 41.8% got pass. 94,162 representing 38.9% failed while 7,886 representing 3.26% were involved in malpractice (Adejumo, Oluwole, & Muraina, 2015). By implication, only 16.02% (distinction and credit percentage) is qualified for admission into universities and polytechnics.

Tobias (1993) defines Mathematics anxiety as feelings of tension and anxiety that interferes with the manipulation of numbers and the solving of Mathematical problems in a wide variety of ordinary life and academic situation. According to him, Mathematics anxiety can cause one to forget and lose one's self confidence. It is very real and it occurs among many students. The question that readily comes to mind then is why students should experience Mathematics anxiety since Mathematics as opined by Akinsola and Tella (2003) is an important school subject which is associated with more academic and/or career opportunities. Similarly, Burton cited in Agwah and Usman (2003) relate the importance of Mathematics to the scientific, industrial, technological and social progress of a society but it is very sad to note that many students' performance in the subject in recent time is not encouraging (Adesemowo, 2005; Owoyele & Muraina, 2016). This however, can be attributed to the fact that majority of students have phobia for Mathematics. This study therefore focuses on experimental investigation of counselling reality therapy in reducing Mathematics anxiety of in-school adolescents.

Counselling reality therapy (CRT) is an approach to counselling and problem-solving focuses on the here and now actions of the adolescents and the ability to choose a better future. Reality therapy was developed by Glasser (1960) as the method of counselling based on choice theory and aimed at helping individuals to gain more effective control over their lives. According to reality therapy all unhappy persons have similar problems and they are unable to get along well with the people they want to get along with because human beings tend to control others (Dike, 2013). Counselling reality therapy in this study refers to the process of examining and evaluating current behaviour, attitude and needs of the students and make plans to fulfill their needs in order to reduce Mathematics anxiety. Reality therapy was found to be effective in making individual to remain aware of what is needed and make choices that will ensure that such goals are achieved (Glasser, 1998; Asuzu & Akintola, 2009). Reality therapy maintains that what really drives human beings is their need to belong and to be loved.

Counselling reality therapy is a method of counselling which teaches people how to manage their own lives, make more effective choices, and how to develop the strength to cope with the stresses and problems of life (Glasser, 1998; Glasser, 2003). Since the conceptualization of reality therapy, dozens of studies have been done showing its ability to effectively treat a variety of human problems and disorders pertaining to both the young and old. These include the rearing of children (Glasser, 1965), delinquency (Cox, 2009; Glasser, 1998), paranoia and schizophrenia (Brink, 1981), Mathematics anxiety (Henker, 2009), dementia (Hanley, McGuire & Boyd, 1981), and communication and decision

skills (Schaughency, 2007; Glasser, 2003). While these have demonstrated the viability and versatility of reality therapy as a therapeutic model, there are many other areas of human interaction that reality therapy can be applied to and shown to be useful.

Self-esteem in this study refers to how in-school adolescents perceive themselves in relation to the learning of Mathematics. Branden (2009) defined self-esteem as a standard by which a person judges her/himself, an estimate, a feeling, and an emotion. This self-evaluation is the single most significant key to behaviour, which affects the thinking processes, emotions, desires, values, and goals. Research studies also confirm the relationship between Mathematics anxiety and self-esteem (Cassady, 2010; Dejong, 2002). Wilson and Rapee (2005) examined the contents of beliefs about self-attributes in Mathematics anxiety and the level of certainty of these beliefs. The researcher found that individuals with Mathematics anxiety have less positive beliefs about their personality characteristics in comparison to non-anxious persons. It was also found that Mathematics anxiety is associated with subjective confidence in self-descriptiveness ratings for personality. In another study, Dejong (2002) conducted a study to investigate the role of negative self-esteem in Mathematics anxiety.

The relation between self-esteem and Mathematics anxiety has only rarely been studied (Roberts, 2006). Cross-sectional studies have reported negative, medium-sized to strong correlations between the constructs (Lee & Hankin, 2009). However, individual are not aware of any longitudinal study that has explicitly focused on the prospective relation between self-esteem and Mathematics anxiety. Some studies postulate that self-esteem serves as a buffer against Mathematics anxiety (Crocker & Park, 2004). Self-esteem is closely associated with academic anxiety. According to self-presentational study of academic anxiety, self- esteem is an important component of self-presentational efficacy. If a person has low self- esteem, she or he has doubt about making favorable impression. Similarly self-esteem is related with academic desirability (a component of academic anxiety).

Despite the effort of scholars and researchers in finding lastly solution to the problems of Mathematics anxiety among students in the school, little studies have concentrated on the use of counselling reality therapy especially in reducing Mathematics anxiety. Also, studies related to the use of counselling reality therapy was majorly on reduction of delinquent behaviour and general anxiety and was studied mostly outside Nigeria and the need to use this therapy in reducing Mathematics anxiety make this present study a peculiar one.

Statement of the Problem

There is a negative perception among the students that Mathematics is a very difficult subject. As much as possible students tend to avoid taking Mathematics courses which make them to develop high Mathematics anxiety. Mathematics anxiety severely restricts the students to a limited field of study and jobs they can find nowadays. Also, Mathematics anxiety makes students to avoid so many field of study in the Universities, Polytechnics and Colleges of Education across science and non-science based courses because Mathematics is needed in all disciplines and serves as instruments that ease the learning of other disciplines. Inability of students to proceed their studies in the higher institution of learning as a result of Mathematics failure bring about academic dropout which has a lot of implications to the society such as disgrace to the family, disgrace to the students, low man power and involvement of students in different sort of hooliganism and crimes among others. This study is therefore concentrates on experimental investigation of counselling reality therapy in reducing Mathematics anxiety of in-school adolescents in Oyo State, Nigeria.

Objectives of the Study

The main objective of this study is to examine the experimental investigation of counselling reality therapy in reducing Mathematics anxiety of in-school adolescents in Oyo State, Nigeria. Specifically other objectives include to;

1. find out the difference in the Mathematics anxiety of in-school adolescents exposed to counselling reality therapy and those exposed to conventional lecture method
2. investigate the difference in the Mathematics anxiety of in-school adolescents with high self-esteem and those with low self-esteem

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance.

HO₁: There is no significant difference between the Mathematics anxiety of in-school adolescents exposed to counselling reality therapy and those exposed to conventional lecture method

HO₂: There is no significant difference between the Mathematics anxiety of in-school adolescents with high self-esteem and those with low self-esteem

Methodology

Research Design

The study adopted the pretest-posttest, control group quasi-experimental design with a 2X2 factorial matrix. In essence, the row consists of counselling reality therapy and the control. The row was crossed with self-esteem varied at two levels (high and low).

Population

The population for this study comprised of all in-school adolescents in public secondary schools in Oyo State, Nigeria. The researcher covered all in-school adolescents in 33 local government areas Oyo State, Nigeria.

Sample and Sampling Technique

Simple random sampling technique was used to select the participants for the study. The participants were selected from public secondary schools in Oyo State, Nigeria. Four local government areas (LGAs) were selected randomly in the State. One public secondary school was however selected randomly in each LGA. Thirty in-school adolescents were selected in each public secondary school through balloting. On the whole, 120 in-school adolescents were drawn for the study. However, the sampled participants were divided into 2 groups, one group formed counselling reality therapy class and the remaining one served as control group.

Research Instruments

Mathematics Anxiety Scale

This scale consists of fourteen (14) item instrument rated on four points type scale ranging from strongly agreed (SA) to strongly disagreed (SD). The instrument was adopted from Mathematics anxiety scale developed by Mahmood and Khatoon (2011). Example of the items in the scale was: 1. Mathematics makes me feel comfortable and easy; 2. I feel worried before entering the Mathematics class; 3. Solving Mathematics problems is always pleasant for me. The instrument has reliability coefficient of .89 with Cronbach's Alpha of .87.

Self-esteem Scale

The Self-Esteem Scale (SES) developed by Rosenberg (2003) was used as a measure of self-esteem among distance learning students. It consists of 10 items with a 4- point scores in which respondents rate their esteem from strongly agree (4) to strongly disagree (1). Examples of the items in the scale include: *At times I think I am not good at all; I take a positive view of myself; I take a positive view of myself and I wish I could have more respect for myself.* The internal consistency reliability coefficient of the instrument according to Rosenberg was .91.

Validity of the Instrument

For content and face validity of the instruments designed for the study, the researcher gave the instruments to experts in the field of Guidance and Counselling and experts in the area of Research and Statistics. After all these people had given their suggestions and made necessary correction on the instrument, the researcher then submitted them to the reviewers who made the final corrections.

Reliability of the Instrument

After content and face validity of the instruments, thirty (30) copies of the instruments were administered to in-school adolescents in Gombe, Gombe State in order to re-establish the

psychometric properties of the instrument. The test retest analysis of reliability was then used to test their reliability to ensure that they are consistent in measuring what they were designed to measure. The results from the analysis carried out yielded 0.82 reliability value.

Procedure for Data Collection

The study was carried out in four phases: pre-session activities, pre-test, treatment and post-test. At the pre-session, activities included the screening, recruitment and assignment of participants to the experimental and control group. Advertisement was made to request for participants in the university. A preliminary meeting was organised to familiarise with the interested participants and to solicit their willingness to participate in the study. At the pre-test stage, Mathematics anxiety scale was administered to the participants. Participants in the experimental group only were exposed to 5 sessions of treatment. Each session spanned for an average of 60 minutes. Though the control group was not treated, they were exposed to a lecture titled “History of Education”. The post-test was administered following the conclusion of the programme.

Methods of Data Analysis

T-test statistical analysis was employed to analyse the data in this study. T-test was used so as to establish any significant difference in the Mathematics anxiety of participant in treatment group and control as well as self-esteem level.

Results

The study examined the experimental investigation of counselling reality therapy on Mathematics anxiety of in-school adolescents in Oyo State, Nigeria. Two (2) null hypotheses were formulated and tested at 0.05 level of significance. The results are presented in tabular form:

Hypothesis One: There is no difference between the Mathematics anxiety of in-school adolescents exposed to counselling reality therapy and those in the control group

Table 1: Summary of t-test of Students Exposed to Counselling Reality Therapy and those exposed to Conventional Lecture Method

Groups	N	Mean	SD	Std. Error	DF	t	p	Remark
Reality Therapy	60	27.21	10.35	5.57	119	74.81	0.000	* S
Lecture Method	60	68.95	21.67	13.83				

* Significant at $p < 0.05$

The result in table 1 showed that there was significant difference between the Mathematics anxiety of in-school adolescents exposed to counselling reality therapy and those in the control group ($t = 74.81$; $p < 0.05$). The mean value of the table further revealed that the students in counselling reality therapy had lower Mathematics anxiety than their counterpart in the control group. This further meant that the treatment had significant influence on Mathematics anxiety of in-school adolescents.

Hypothesis Two: There is no difference between the Mathematics anxiety of in-school adolescents with high self-esteem and those with low self-esteem

Table 2: Summary of t-test of Students with High and Low Self-Esteem

Self-Esteem	N	Mean	SD	Std. Error	DF	t	p	Remark
High	44	16.74	3.27	1.51				* S
Low	76	45.82	10.78	5.47	119	53.15	0.001	

* Significant at $p < 0.05$

Table 2 showed that there was significant difference between the Mathematics anxiety of in-school adolescents with high self-esteem and those with low self-esteem ($t = 53.15$; $p < 0.05$). The mean value of the table further revealed that the students with high self-esteem had lower Mathematics anxiety than their counterpart with low self-esteem. This further meant that self-esteem had significant influence on Mathematics anxiety of in-school adolescents.

Discussion

The result in the Table 1 showed that there was significant difference in the Mathematics anxiety of students exposed to counselling reality therapy and those in the control group. The mean value of the table further revealed that the students in counselling reality therapy had lower Mathematics anxiety than their counterpart in the control group. This further meant that the treatment had significant influence on Mathematics anxiety of in-school adolescents. This is in line with the finding of Glasser (1998) and Asuzu and Akintola (2009) who found that reality therapy was effective in making individual to remain aware of what is needed and make choices that will ensure that such goals are achieved. Since the conceptualization of reality therapy, dozens of studies have been done showing its ability to effectively treat a variety of human problems and disorders pertaining to both the young and old. These include the rearing of children (Glasser, 1965), delinquency (Cox, 2009; Glasser, 1998), paranoia and schizophrenia (Brink, 1981), Mathematics anxiety (Henker, 2009), dementia (Hanley, McGuire & Boyd, 1981), and communication and decision skills (Schaughency, 2007; Karrass & Glasser, 1980). While these have demonstrated the viability and versatility of reality therapy as a therapeutic model, there are many other areas of human interaction that reality therapy can be applied to and shown to be useful.

The result in the Table 2 showed that there was significant difference in the Mathematics anxiety of students with high self-esteem and those with low self-esteem. The mean value of the table further revealed that the students with high self-esteem had lower Mathematics anxiety than their counterpart with low self-esteem. This further meant that self-esteem had significant influence on Mathematics anxiety of in-school adolescents. In consistent with this finding, research studies also confirm the relationship between Mathematics anxiety and self-esteem (Cassady, 2010; Dejong, 2002). Wilson and Rapee (2005) also examined the contents of beliefs about self-attributes in Mathematics anxiety and the level of certainty of these beliefs. The researcher found that individuals with Mathematics anxiety have less positive beliefs about their personality characteristics in comparison to non-anxious persons. It was also found that Mathematics anxiety is associated with subjective confidence in self-descriptiveness ratings for personality. In another study, Dejong (2002) conducted a study to investigate the role of negative self-esteem in Mathematics anxiety. Self-esteem is closely associated with academic anxiety. According to self-presentational study of academic anxiety, self-esteem is an important component of self-presentational efficacy. If a person has low self-esteem, she or he has doubt about making favorable impression.

Recommendations

Based on the findings in this study, the following recommendations were made;

1. Counselling/Educational psychologists should intensify their effort to organize seminars on the implications of counselling reality therapy as effective interventions towards reduction of Mathematics anxiety among adolescents in the school.
2. The researchers and stakeholders in education should not only focus on the students' achievement in Mathematics alone but also Mathematics anxiety. This is because Mathematics anxiety has a lot of influence on the Mathematics achievement of students.
3. Teachers and other stakeholders in the school system are to be trained on how to improve students' self-esteem. This will serve as collaborative efforts to assist the students in overcoming the challenges of low self-esteem which will in turn reduce the Mathematics anxiety among students.
4. The students in the school should be encouraged and trained on the effective usage of these interventions (counselling reality therapy). This will make the students to adopt effective attitude towards reducing Mathematics anxiety.
5. The parents/guardians should be enlightened on the significance of counselling reality therapy and self-esteem on Mathematics anxiety of students. This will go a long way in reducing Mathematics anxiety and enhance Mathematics achievement of students in the school system.

Conclusion

Base on the findings of this study, persistent high Mathematics anxiety of Nigerian secondary school students need not to continue indefinitely. There is hope that with the use of counselling reality therapy and self-esteem, the situation can be changed for the better. The study discovered that counselling reality therapy and self-esteem influence the Mathematics anxiety among secondary school students in the school. By and large, it was also concluded from this study that counselling reality therapy and self-esteem have a great impact on the students' Mathematics anxiety in the school. By implication, students' Mathematics anxiety can be reduced drastically through counselling reality therapy and high self-esteem.

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