

Efficacy Of Rational Emotive Behavioural Therapy In Reducing Academic Stress Among Basic Science And Biology Teachers: A Case Of Repeated Measures

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Abstract

This study investigated the efficacy of Rational Emotive Behavioural Therapy (REBT) in reducing academic stress among Basic Science and Biology teachers in secondary schools using a repeated measures design. The study adopted a randomized controlled experimental design involving 80 Basic Science and Biology teachers who were randomly assigned to the REBT treatment group and a control group. Data were collected using the Teachers' Academic Stress Scale (TASS) before treatment (pre-test), immediately after the intervention (post-test), and at follow-up. The REBT intervention, conducted over eight weeks, focused on helping teachers identify and modify irrational beliefs, develop rational thinking patterns, and adopt healthier coping strategies. Data were analyzed using repeated measures ANOVA. The findings revealed a significant reduction in academic stress among Basic Science and Biology teachers exposed to REBT compared to those in the control group, indicating both immediate and sustained treatment effects. The study concluded that REBT is an effective intervention for managing academic stress among Basic Science and Biology teachers. It was recommended that school administrators and policymakers should integrate REBT-based stress management programs into teacher professional development initiatives to enhance teachers' psychological well-being and instructional effectiveness.

Keywords: Rational Emotive Behavioural Therapy, Academic Stress, Basic Science Teachers, Biology Teachers, Repeated Measures, Psychological Intervention.

Introduction

Teacher stress is an established global concern that undermines teacher wellbeing, instructional quality, and student outcomes. Across the globe, teachers report stress arising from heavy workload, curriculum demands, large class sizes, inadequate teaching resources, classroom management challenges, and the emotional labour of supporting diverse learners (Kyriacou, 2011; Travers & Cooper, 1996). In the specific case of Basic Science and Biology teachers, stressors are often compounded by requirements for practical demonstrations, management of laboratory equipment and specimens, safety and ethical concerns, and the pressure to translate abstract scientific

concepts into accessible classroom activities. Prolonged exposure to such occupational stressors is associated with burnout, reduced job satisfaction, absenteeism, and diminished instructional effectiveness — outcomes that ultimately compromise learners' achievement (Lazarus & Folkman, 1984; Kyriacou, 2011).

In many developing-country school systems like Nigeria, science teachers face additional structural challenges: poorly equipped laboratories, limited access to consumables, overcrowded classrooms, and weak institutional support. These structural deficiencies intensify the emotional and cognitive demands on teachers who are expected to maintain curriculum standards and student outcomes despite limited means (Travers & Cooper, 1996). The COVID-19 pandemic (from 2020 onward) has further pressured educators by accelerating demands for remote and blended instruction, but even before 2020 there was ample evidence that teacher stress was an urgent problem requiring effective, accessible interventions.

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In Enugu State, multiple studies have provided strong evidence that teachers experience significant occupational stress and distress. For example, a study in the Udi Education Zone found that secondary school teachers perceived high stress levels associated with tasks such as writing lesson notes, grading scripts, and moral upbringing of students (Okonkwo, 2018). Another study of public secondary school teachers across six education zones reported a correlation between principals' leadership behaviours and teachers' job-related stress, with large samples showing stress is a prevalent issue in Enugu schools (Osunka & Unachukwu, 2019). A third study among primary school teachers in Nsukka Local Government Area reported a high levels of distress in this teacher cohort (Ogundu, Agbaje, & Nwoko, 2023). Collectively, these findings indicate that teacher stress is not only theoretical but empirically documented in Enugu State, thereby underscoring the relevance of interventions such as Rational Emotive Behaviour Therapy (REBT) for the study.

The Rational Emotive Behavioural Therapy (REBT) framework developed by Albert Ellis posits that emotional distress is largely maintained by irrational and maladaptive beliefs (e.g., "I must never make mistakes," or "I cannot cope unless everything is perfect"). According to REBT, it is not the activating events themselves that produce distress, but the beliefs and evaluations individuals hold about those events (Ellis, 1962; Ellis & Dryden, 2007). REBT aims to help clients identify, dispute, and replace irrational beliefs with rational alternatives, thereby reducing dysfunctional emotions and promoting adaptive behaviours. REBT helps individuals identify, challenge, and replace dysfunctional thoughts with more rational alternatives that promote emotional resilience and adaptive coping strategies (David, Lynn & Ellis, 2010). REBT is a cognitive behavioural approach which links belief-change with behavioural experiments and skills training (Ellis & Dryden, 2007). For teachers, REBT techniques typically include cognitive disputation of catastrophic or perfectionistic thoughts about classroom performance, behavioural rehearsal of assertive communication, stress-management skills (relaxation, time management), and homework assignments that promote experiment and evidence-building against irrational beliefs. Because REBT is directive, time-efficient, and focused on practical cognitive and behavioural change, it has been widely used in occupational and educational settings where brief, skills-based interventions are desirable.

A robust body of research supports the effectiveness of cognitive behavioural interventions (of which REBT is a principal form) for reducing anxiety, depression, and stress-related symptoms (Butler, Chapman, Forman, & Beck, 2006). Meta-analytic evidence indicates that CBT-based approaches produce moderate-to-large

effects across a range of emotional disorders and stress-related outcomes (Butler et al., 2006). While much of the evidence base has emphasized CBT generally, several randomized and quasi-experimental studies specific to REBT have documented reductions in maladaptive beliefs and emotional distress across clinical and non-clinical populations (Ellis & Dryden, 2007). In workplace and educational contexts, REBT has been applied to reduce test anxiety, improve academic performance, and enhance coping, suggesting plausible utility for teachers facing chronic occupational stress.

Applied to Basic Science and Biology teachers, REBT offers several conceptual advantages. First, it addresses teachers' cognitive appraisals (e.g., "If a lesson fails, I am a failure as a teacher") that perpetuate rumination, fear of failure, and avoidance behaviours (Eze, Eseadi, Onyishi, Igbokwe & Omede, 2018). Second, REBT's emphasis on behavioural experiments equips teachers with small, safe actions (e.g., trying a new classroom routine, delegating tasks) that can generate corrective feedback and reduce catastrophic expectations. Third, REBT's skills-based nature makes it adaptable to in-service training formats, peer-group workshops, or short-term group therapy, all feasible delivery models within school systems that cannot support long-term psychological care.

Despite this theoretical promise, empirical studies specifically assessing REBT's efficacy in reducing academic or occupational stress among in-service science teachers remain limited, especially in low- and middle-income educational contexts. Much of the literature has focused on student populations (e.g., test/anxiety interventions) or clinical samples. Some of the studies that focused on teachers were on other variables. For example, Warren and Gerler (2013) reported that REBT consultation programs for teachers led to decreased irrational thinking and improved emotional self-regulation. Other quasi-experimental studies conducted during this period supported similar outcomes, showing that teachers who underwent REBT-based interventions experienced significant reductions in job-related anxiety, perfectionistic tendencies, and emotional exhaustion (Ogba, 2020; Ugwoke & Eseadi, 2018). Hence, systematic investigation into whether REBT can meaningfully decrease levels of job-related stress, improve job satisfaction, and enhance classroom functioning among Basic Science and Biology teachers is needed. Such evidence would inform teacher professional development curricula, school-based mental health initiatives, and policy decisions on cost-effective teacher-support programs.

Given the persistent levels of teacher stress documented between 2010 and 2020, and the empirical support for REBT-based interventions, it is evident that REBT represents a scientifically grounded

and contextually relevant approach to teacher support. Investigating its efficacy among teachers, especially those in demanding fields like Basic Science and Biology remains essential for improving teacher wellbeing and sustaining effective instruction. Hence, this study is designed to further evaluate the efficacy of Rational Emotive Behavioural Therapy in reducing academic stress among Basic Science and Biology teachers. The purpose of this research is therefore to investigate whether REBT will have a substantial impact in managing Basic Science and Biology teachers' academic stress.

Materials and Methods

Research Design

This study adopted Randomized Controlled Trial (RCT) experimental design with a repeated measure approach. The design was considered most appropriate because it allows for the assessment of the causal effect of the Rational Emotive Behavioural Therapy (REBT) intervention on the management of stress among secondary school Basic Science and Biology teachers over time. In this design, participants were randomly assigned into two groups; an experimental group that received the REBT intervention and a control group that did not receive the intervention. Randomization was used to ensure that both groups were equivalent in relevant characteristics (such as age, gender, years of teaching experience, and baseline stress levels) before the commencement of treatment. This random allocation helped to control for extraneous variables and minimize bias, thereby improving the internal validity of the study (Cohen, Manion, & Morrison, 2018). The RCT design, therefore, provided a rigorous framework for evaluating the effectiveness and sustainability of the REBT intervention in reducing stress among Basic Science and Biology teachers. Its use ensured objectivity, controlled for confounding influences, and enhanced the reliability and validity of the study findings.

Instrument

Teachers' Academic Stress Scale (TASS) which was developed by the researchers was for collection. It is a 20 item instrument (after construct validity) with four response options of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). Face and construct validity were ensured for the instrument. The internal consistency reliability of the items was 0.89 using the Cronbach alpha method.

Participants and Procedure

Eighty (80) Basic Science and Biology teachers in Enugu State, Nigeria, who met the inclusion criteria constituted participants for the study. The participants were invited to express their willingness to take part in the research intervention program. Their eligibility was determined based on the following criteria: (1) being currently employed as a secondary school Basic Science

and Biology teacher in Enugu state, Nigeria, and (2) exhibiting symptoms or element of stress behaviour through the baseline Academic Stress Inventory (ASI). Eligible participants were then randomly distributed into two groups; REBT intervention group and control group. Volunteers who did not meet all the inclusion criteria were excluded from the study.

The study employed a pretest-posttest-repeated measure, where data were collected at three different stages: before the intervention (pretest), immediately after the intervention (posttest I) and after a follow-up period (posttest II). This approach provided an opportunity to determine not only the immediate impact of REBT on teachers' stress but also its sustained effect over time, consistent with recommendations by Pallant (2020).

The intervention covered the following key components:

1. Identification of Irrational Beliefs - Helping Basic Science and Biology teachers recognize negative and unrealistic thoughts contributing to stress feelings.
2. Disputation of Irrational Beliefs - Teaching participants how to challenge and replace irrational thoughts with rational alternatives.
3. Development of Rational Coping Statements - Encouraging teachers to adopt positive self-talk and emotional regulation strategies.
4. Behavioral Techniques - Incorporating relaxation, mindfulness, and stress management exercises.

Prior to the commencement of the experiment, the researchers assured participants of the confidentiality of all interactions and personal information shared during the self-disclosure process. A pre-treatment assessment (pre-test) was then administered using the Academic Stress Scale adapted for the study to obtain baseline data (Time 1) and to identify teachers exhibiting symptoms of academic stress, who constituted the focus of the study. To determine how stressed Basic Science and Biology teachers are at work, only the participants who had TASS scores from 40-80 were selected for the study. Subsequently, the experimental group participated in Rational Emotive Behavioural Therapy (REBT) sessions lasting 90 minutes per session, conducted twice weekly over an eight-week period. The REBT intervention program was structured around cognitive restructuring, emotional regulation, and behavioral modification strategies as proposed by Ellis (1994). Each session focused on identifying irrational beliefs, disputing maladaptive thoughts, and developing more rational and adaptive emotional responses to teaching-related stressors. A post-treatment assessment (Time 2) was carried out one week after the final session, while a follow-up assessment (Time 3) took place two months later to evaluate the persistence of treatment effects. The data obtained from the experimental group across the three evaluation points were compared with those from the

no-intervention control group. In contrast, the control group continued with their usual/normal school counseling activities without exposure to REBT during the study period.

Data Analysis

Data were analyzed using repeated measures analysis of variance (ANOVA) to determine differences in stress rating scores across the three measurement points. This statistical approach is appropriate for within-

subjects comparisons and helps detect changes in mean scores across time and between groups (Creswell, 2014).

Result

Research Question

What is the effect of rational emotive behavioural therapy in reduction of academic stress among secondary school Basic Science and Biology teachers?

Table 1: Mean analysis of the stress ratings Basic Science and Biology teachers exposed to the intervention and non-intervention groups at 3 different times.

Treatment	N	Pretest		Posttest		Follow-Up	
		Mean	SD	Mean	SD	Mean	SD
Intervention Group	41	63.76	5.12	43.80	10.36	39.59	10.00
Non- Intervention Group	39	63.72	8.42	54.46	9.63	52.10	9.76

Result in Table 1 revealed the mean academic stress levels of the Basic Science and Biology teachers in the intervention group and non-intervention groups were similar at pretest ($M = 63.76$, $SD = 5.12$), and ($M = 63.72$, $SD = 8.42$). Meanwhile, the Basic Science and Biology teachers in the intervention group had lower mean academic stress at the posttest and follow-up measurements ($M = 43.80$, $SD = 10.36$; $M = 39.59$, $SD = 10.00$) than the Basic Science and Biology teachers in

the non-intervention group ($M = 54.46$, $SD = 9.63$; $M = 52.10$, $SD = 9.76$).

Hypothesis

There is no significant difference in the mean academic stress response of Basic Science and Biology teachers exposed to rational emotive behavioural therapy and those not exposed.

Table 2: Repeated measure ANAOVA output for the effect of REBT on the reduction of academic stress among Basic Science and Biology teachers

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Time	Sphericity Assumed	14504.317	2	7252.159	150.655	.000	.659
Time * Treatment	Sphericity Assumed	1835.367	2	917.684	19.064	.000	.196
Error(Time)	Sphericity Assumed	7509.458	156	48.138			

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	671318.727	1	671318.727	4487.089	.000	.983
Treatment	3566.177	1	3566.177	23.836	.000	.234
Error	11669.673	78	149.611			

Result in Table 2 revealed a significant within-subjects effect of $F(2, 156) = 150.655$, $p = .000$ and a significant between-subjects effects of $F(1, 78) = 4487.089$, $p = .000$. A significant interaction effect between time and treatment (see Figure 1) was also found, $F(2, 156) = 19.064$, $p = .000$. This implies that REBT intervention reduced academic work stress of Basic Science and Biology teachers significantly.

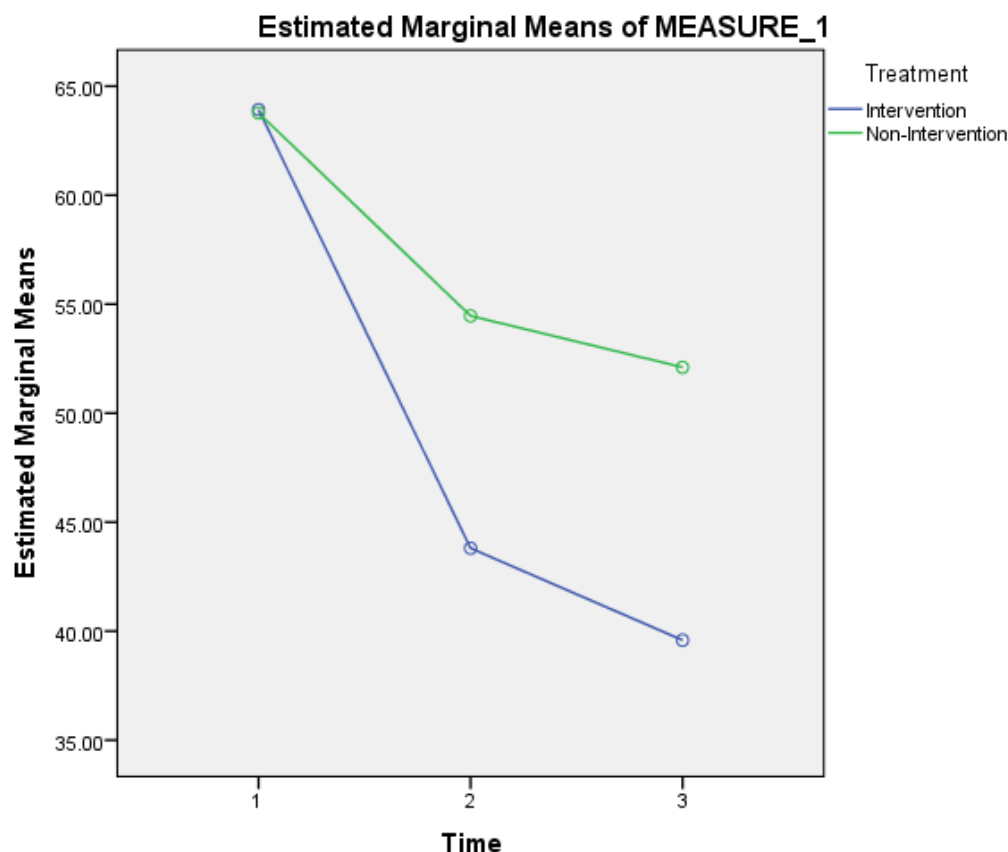


Figure 1: Interaction plot for treatment and time of measure

Discussion of Findings

The finding of the study revealed that Rational Emotive Behavioural Therapy (REBT) significantly reduced Basic Science and Biology teachers' academic stress. This outcome supports Ellis's (1994) theoretical postulation that irrational beliefs such as perfectionism, self-downing, and catastrophizing are core contributors to emotional distress. By helping teachers identify, challenge, and replace these maladaptive cognitions with rational alternatives, REBT promotes healthier emotional regulation and resilience (David, Lynn, & Ellis, 2010). The reduction in academic stress observed among Basic Science and Biology teachers can be attributed to the therapy's focus on cognitive restructuring, which enables teachers to reinterpret stressful academic situations, such as workload, student misbehavior, or performance evaluation, in less self-defeating ways (Turner & Barker, 2014).

The finding aligns with existing literature emphasizing the efficacy of REBT in managing occupational and psychological stress among educators. For example, this finding corroborates the work of Ede, Igbo, and Chukwu (2016), who reported that REBT effectively reduced burnout and stress symptoms among secondary school teachers in Nigeria. Similarly, Ugwoke, Eseadi, and Onuigbo (2018) found that REBT significantly improved emotional well-being and coping skills among teachers exposed to high occupational

stress. The implication is that when teachers develop rational thinking patterns, they become better equipped to handle instructional challenges, interpersonal conflicts, and curriculum demands without undue psychological strain. Furthermore, the finding is consistent with Nwokeoma and Okorie (2020), who observed that teachers trained in REBT strategies demonstrated enhanced emotional control and reduced work-related tension.

In essence, this study reinforces the role of REBT as a potent psychological intervention capable of mitigating the adverse effects of academic stress among science educators. Since teachers' stress have been linked to poor instructional quality, diminished motivation, and reduced students' achievement (Kyriacou, 2011), the observed stress reduction suggests potential positive ripple effects on classroom performance and students' learning outcomes. Thus, integrating REBT-based stress management programs into teacher professional development could serve as a proactive strategy for improving teachers' mental health and sustaining educational productivity.

Conclusion

The finding of this study demonstrated that Rational Emotive Behavioural Therapy (REBT) is an effective psychological intervention for reducing academic stress among Basic Science and Biology teachers. The

significant decrease in stress levels following the REBT intervention suggests that when teachers are equipped with rational thinking skills and strategies for managing irrational beliefs, they are better able to cope with occupational pressures, maintain emotional balance, and perform their professional duties more effectively. This outcome reinforces the relevance of REBT as a viable tool for promoting teachers' mental health and enhancing instructional efficiency in Nigeria's secondary school system, especially in Enugu State. Ultimately, by addressing teachers' emotional well-being through REBT, the quality of teaching and students' academic outcomes in science-related subjects are likely to improve, contributing to the broader goal of achieving educational excellence and sustainability.

Recommendations

The following recommendations were made based on the outcome of the findings;

1. Ministries of Education and school administrators should incorporate Rational Emotive Behavioural Therapy principles into teacher training and continuous professional development programs. This will equip teachers with practical cognitive-behavioral strategies for managing academic stress and maintaining psychological well-being.
2. Schools should establish functional guidance and counseling units staffed with trained REBT practitioners or counselors. These professionals can provide periodic stress management workshops and individualized therapy sessions for teachers experiencing academic or emotional strain.
3. Teacher training institutions, especially faculties of education, should include REBT-based stress and emotional regulation modules in their curriculum. This will help pre-service teachers acquire skills for managing occupational stress before entering the teaching profession.
4. Educational policymakers should design supportive school environments that minimize stressors, such as excessive workloads, inadequate instructional materials, and unrealistic administrative expectations. Creating a positive work climate will complement the gains of REBT intervention.
5. Regular psychological assessment programs should be conducted for teachers to identify early signs of academic stress and provide timely interventions, including REBT sessions, where necessary.

Conflict of Interests: The authors declare that they have no conflict of interest.

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