

Stress Management Intervention among University Nursing Students Using Rational Emotive Behaviour Therapy

Baptista C. Chigbu¹, Agu Patricia Uzoamaka^{2*}, Oguejiofor Chidumebi Ngozi³,
Eziamaka Chika Nnoye⁴ & Ogbo Rosita Nwaribeaku⁵

1,2.Department of Educational Foundations, University of Nigeria, Nsukka, Nigeria.
3,4,5.Department of Educational Mangement and Policy, Nnamdi Azikiwe University, Awka.
*Corresponding Author Email: uzoamaka.agu@unn.edu.ng

Abstract

Rational-emotive behavioural therapy (REBT) has been validated to be effective in reducing and managing work-related stress. The aim of this study is to evaluate the effects of REBT as stress management intervention among undergraduate university nursing student. The study adopted the pretest-posttest group randomized control trial design. A sample of 352 undergraduate nursing students of University of Nigeria who met the inclusion criteria with high stress scores were randomly assigned to the treatment (176 students) and control (176 students) groups. REBT was administered on the participants for 90 minutes each week for a period of twelve weeks. The students' stress levels were measured before (baseline), at the end (post-intervention) and three months after (follow-up) the intervention using perceived stress scale (PSS). Repeated measures analysis of variance (ANOVA) was used to analyze the data. Results show that stress levels very high at baseline but was reduced for the treatment group post-intervention and follow-up. Year of study ($F = 3.520$, $p = 0.011$), monthly allowance ($F = 3.363$, $p = 0.014$), sponsor ($F = 3.303$, $p = 0.015$) and residence ($F = 4.619$, $p = 0.035$) had significant impact ($p < 0.05$) on the treatment groups' response to stress management while gender did not. In general, REBT significantly reduced the stress level among the undergraduate nursing students, and therefore recommended for stress management for nursing students.

Keywords: *Emotive Behaviour; Intervention; Nursing Students; Repeated Measures; Stress Management; Treatment and Control Groups.*

INTRODUCTION

Stress reflects the thoughts, attitudes and feelings about certain emotional, psychological and physiological phenomena which could be viewed as threatening and/or damaging in the absence of sufficient facilities, skills and resources to control the situation^[1]. Stress occurs in three stages of development: alarm, resistance and exhaustion, and is presently considered a serious health challenge globally^[2]. Having been exposed to stress agents, the body tries to adjust or eliminate the problem in a bid to return to the state of balance or equilibrium. Failure to eliminate or adjust to the stress agent, the body begins to suffer from impairments such as depression, insomnia, ulcer, high blood pressure, anxiety, among others^[2,3].

Stress among nursing students has been acknowledged to be one of the most challenging stress issues in present time^[4,5]. Nursing education is embodied with mental, physical and emotional challenges which exerts stress on the academic and psychological well-being of the nursing students and is considered a major risk factor to cardiovascular disease^[6,7]. The nursing students are confronted with long hours of study, lack of/insufficient time for other activities,

lack of timely feedbacks after academic/clinical activities, fears of personal clinical competence, long periods of standing, dealing with uncooperative patients, among others^[8-10].

Studies have shown that nursing students experience greater levels of stress than students of other professional courses like pharmacy, social works, medicine, and so on^[11]. The short-term and long-term effects of stress on the well-being of nursing students have been the subject of many studies. Pulido-Criollo et al.^[12] pointed out that because of the young age of the nursing students, the effects of stress could last until adulthood and increase the risk of suffering mental disorder, among other health challenges. Berhe and Gebretensaye^[13] identified thoughts, behavioural and physical effects of stress on nursing students to include memory loss, depression, lack of self-esteem, substance addiction, and fatigue. Pulido-Criollo et al.^[12] revealed that the health impacts of acute, episodic and chronic stress classifications range from emotional agony, persistent headache, hypertension, violence, nervous breakdown, stroke, heart attack, cancer to even suicide. This was further emphasized by Chaabane et al.^[14]

Different coping strategies and interventions have been developed and/or adopted to manage, reduce and/or eliminate stress among nursing students. Shdaifat et al.^[15] used the coping behaviour inventory (CBI), developed by Sheu et al.^[16], to ascertain the coping strategies among college nursing students. Ab Latif and Nor^[17] adopted the Brief COPE Inventory for Diploma nursing students. Beanlands et al.^[18] used the Dialectical Behaviour Therapy-Skills Group (DBT-SG) on senior undergraduate nursing students while Cognitive Behavioural Therapy (CBT) was employed by Brunero et al.^[19] to reduce emotional distress in nurses. There is scanty literature on the adoption of the well-known Rational Emotive Behavioural Therapy (REBT) in stress management among the nursing students of Nigerian universities. The REBT has been adopted for stress management among teachers, electronic works students, special education teachers, English education students in Nigeria^[20-24]. However, the use of REBT has not been extended to the management and control of stress among nursing students in Nigerian universities. Therefore, this study evaluated the impact of REBT as stress management intervention on the stress levels of undergraduate nursing students of the University of Nigeria.

REBT was developed by Albert Ellis in the 1950's and has been the dominant approaches to the management and treatment of stress-related psychological challenges^[25]. The foundation of REBT is the belief that it is not the events that bring about stress but rather the views about the events that brings about depression, anger, anxiety, etc. According to Cherry^[26], REBT is an action-oriented cognitive behavioural therapy (CBT) that is focused on helping people deal with their irrational beliefs about events and help them to learn how to manage their emotions, thoughts and behaviours in order to live a healthier life. The undergraduate university nursing students in Nigeria experience a lot of stress arising from their exposure to inter-faculty courses, challenges of new academic and social environment, coping with new academic curriculum, clinical practice experiences, the pressure of passing examinations to avoid expulsion from the course, heavy academic and clinical workloads, and son on^[21,27]. As the nursing students get overwhelmed, they become nervous, withdrawn, lose self-confidence and hardly share their experiences for early assistance^[28]. The researchers have observed reported cases of undergraduate nursing students experiencing burnouts, breakdowns, mental disorder and being rushed to the university's medical facility for urgent medical attention. Therefore, it is imperative that the undergraduate nursing students should be exposed to the evidence-based stress management intervention, REBT, for early detection, intervention, and treatment of stress among the nursing students. However, some socio-demographic factors such as age,

gender, marital status, place of residence, year of study, sponsorship and financial status^[29,30] may affect the students' level of response to the stress management intervention. Therefore, the effects of the socio-demographic factors will be investigated in the study. It is the belief of the researchers that the findings of this study will provide the students and university administrators the needed information and guide to help undergraduate nursing students handle the stress associated with their nursing experiences.

RESEARCH METHODOLOGY

Study design

This study adopted the experimental pretest and posttest group randomized control trial design. According to Fraenkel and Wallen^[31] and Mahfar et al.^[32], the group randomized control trial experimental research design is good for this type of study because it is most effective in controlling any form of threat to internal validity of the study. Dimitrov and Rumrill^[33] stated that the pretest-posttest randomized control group design are widely used in behavioural research for the purpose of assigning respondents randomly to either receive an intervention (treatment group) or not (control group) and measurements are taking before (pretest) and after the intervention (posttest). This made the research design suitable for this study.

Participants and inclusion criteria

A total of 396 Bachelor of Science (B.Sc.) nursing students of University of Nigeria, Nsukka, were randomly selected as participants for the study from a population of 2,209 nursing students. The sample size of 396 was obtained using the online Sample Size Calculator by the Australian Bureau of Statistics at 95 % level of confidence, standard error of 0.0206 and proportion of 0.05 from the nursing students that satisfied the inclusion criteria. The inclusion criteria were: the student has regular access to WhatsApp online platform; agrees to participate and complete the intervention programme; and not currently participating in another intervention programme. The nursing students who did not satisfy these criteria were excluded before sample selection. Systematic random sampling was adopted for the selection of the 396 samples of nursing students. A WhatsApp group was created for regular updates, feedbacks, monitoring and follow-ups.

Measurements

The instrument for measurement is a structured questionnaire made up of two components: the demographic questionnaire and the Perceived Stress Scale (PSS). Information on the demographic characteristics of the participants were obtained with the aid of the demographic questionnaire. The questionnaire sought for data on the age, gender, marital status, place of residence (on-campus or off-campus), monthly allowance (highly insufficient, insufficient, manageable, sufficient and highly sufficient) and source of sponsorship for the programme (parent(s), guardian/spouse, sibling, self and scholarship). On-campus residence refers to hostel accommodations for students and boy's quarters attached to staff quarters inside the university.

The perceived stress scale (PSS), developed by Sheu et al.^[34], was used to measure the stress level of the nursing students. The PSS is a 5-point Likert-type scale which consists of 29 items grouped into six factors. The items have responses ranging from 'never' to 'very often' and coded as follows: 4 = very often, 3 = fairly often, 2 = sometimes, 1 = almost never, and 0 = never. The 29 items were grouped into six factors as follows: eight items related to stress

from taking care of patients; six items related to stress from teachers and nursing personnel; five items related to stress from assignments and workload; four items related to stress from peers and daily life; three items related to stress from lack of professional knowledge and skills; and three items related to stress from the clinical environment. The total perceived stress score ranged from 0 to 116, where higher score indicated higher degree of stress. The psychometric assessment of the PSS was conducted by Sheu et al.^[16] while the Cronbach's Alpha reliability coefficient of 0.89 was reported by Ahmed and Mohammed^[35].

The stress levels of the respondents were determined from their perceived stress scale (PSS) scores at baseline, after intervention and follow-up of the REBT intervention. The PSS scores were classified, according to Employee Assisted Program^[36], as low stress (for scores ranging from 0 – 13), moderate stress (for scores ranging from 14 – 26) and high stress (for scores ranging from 27 – 40).

Experimental Procedure

The preliminary activities consisted in scheduled meetings with the students at different academic levels (first year to final year) considering their lecture and clinical schedules. The students were adequately educated on the mission and the need for the study, their required roles and participation. The students were assured of the confidentiality of the entire experimental process, including their responses and that the entire procedure will not interfere with their studies or affect their grades. Consent forms to indicate their willingness to participate in the study were distributed, completed by the students and retrieved. The students who were not convinced about the study were allowed to withdraw from further proceedings while the contact details, phone numbers and e-mail addresses, of the volunteers were documented. The e-mail addresses were used to distribute the perceived stress scale (PSS) while the students were notified through text messages. The due date for the return of the PSS was 14 days from the date of distribution while reminders were sent through text and WhatsApp messages to facilitate timely completion and returns. At the end of the 14 days, a total of 352 students out of the sampled 396 students returned their perceived stress scale (PSS), which were scored and the total stress scores obtained for each candidate. From the analysis of their responses, 64 of the student nurses were diagnosed with low stress level, 124 were diagnosed with moderate stress level while 164 students were diagnosed with high stress level (Table 2). The 288 students who were diagnosed with moderate to high stress levels were recruited for the intervention while those with low stress were dropped from further participation in the study. The stages of the study with the participants were summarized using the flow diagram of Figure 1.

The 288 students were randomly assigned by the investigator to two groups using a random sequence generated using the table of random numbers. The procedure outlined by Onuigbu et al.^[20] was used to assign the students to the two groups. Group one is the intervention group with 144 students while group two is the control group (no-intervention group) with the second 144 students. The timelines of measurement of stress level were divided into three: the baseline measurement (which is the pretest), the stress measurement immediately after the intervention (posttest) and measurement after three months of the intervention (follow-up). The baseline measurement helps to ascertain the stress level of the student nurses before the REBT intervention in order to adequately observe the effect of the intervention on the students' stress level. The posttest (after intervention measurement helps to ascertain the immediate (short-run) impact of the REBT on the stress level of the nurses while the follow-

up measurement helps to ascertain the long-run impact of the intervention. Baseline measurement accompanied the preliminary activities.

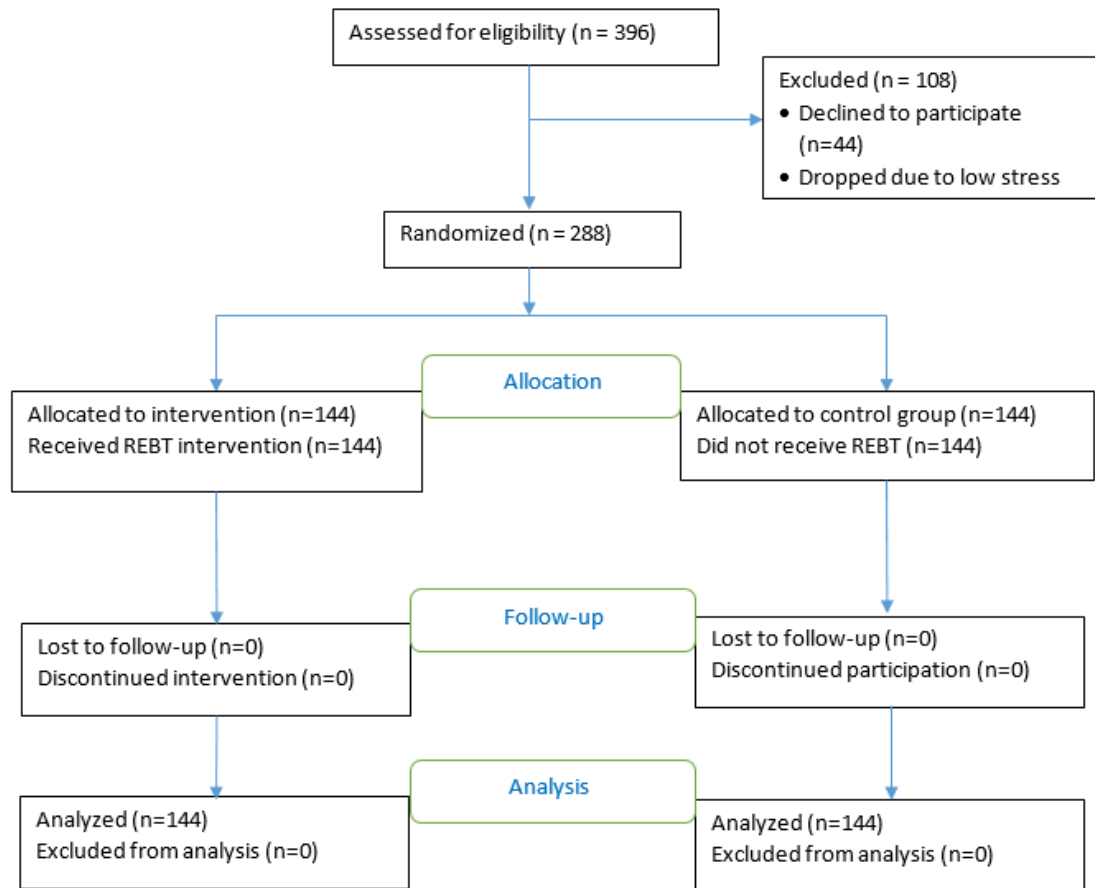


Figure 1: Study Flow Diagram

REBT was administered by the researcher on the treatment/intervention group for 90 minutes a week for 12 weeks while the control group participated only in weekly updates through the group's WhatsApp forum. During the weekly interactive meetings with the researcher, the participants in the intervention group were guided through the REBT procedures aimed at reducing stress, ABCDE model^[26] of the REBT was effectively utilized to guide the students. At the end of the twelve weeks, the stress levels of the treatment and control groups were again obtained using the PSS. This was repeated after three months as REBT intervention follow-up programme.

Method of Data Analysis

The demographic characteristics of the respondents were analyzed using mean, frequencies and percentages. The repeated measures analysis of variance (ANOVA) was used to analyze the three sets of data for the treatment and control groups. Times (baseline, post-intervention, follow-up) of measurements were used as within-subjects variables while groups were used as between-subjects variables^[37]. The Bonferroni pairwise comparison test was used to compare the pairwise estimated mean scores whereas the Student-Newman-Keul's post-hoc test was used for multiple comparison analysis. Furthermore, the Mauchly's test of sphericity was used to determine if the sphericity assumption was violated for the repeated measures

ANOVA data. All the statistical tests of significance were conducted at 0.05 level of significance. At $P > 0.05$ (p is the p -value) and sphericity assumed, the ANOVA tests of within-subjects effects were ascertained. The test of within-subjects contrast was used to determine the linear or quadratic trend in the decrease in stress from baseline to follow-up. The profile plot, using the time of stress measurement as horizontal variable, was used to visualize the trend relationship. Some stress factors, such as year of study, monthly allowance, gender, sponsorship and place of residence were also analyzed as between-subjects variables to ascertain their effects on the students' responses to stress management using the REBT as intervention therapy. Data analysis was facilitated using the IBM SPSS version 26.

Ethical considerations

Approval for this study was sought and obtained from the Research Ethics Committee of the Department of Educational Foundations, University of Nigeria, Nsukka, Nigeria with unique identification number: REC/FE/2024/00034. All the participating students completed and submitted informed consent form to participate in the study. Also, the research ethics statement of the American Psychological Association (APA) and the Helsinki research declarations of the World Medical Association (WMA) were strictly adhered to in this study.

RESULTS

Demographic Characteristics of Respondents

The demographic characteristics of the respondents were summarized in Table 1. The age range of 79.5 % of the students was 27 years or less with a mean age of 24.9 years. About 75.0% of the nursing students were females, 25.0% were males while 81.8 % were single, with 70.5% living on-campus. More than half (58.0 %) of the respondents were in their first or second year whereas 71.6% experienced insufficient income every month. Furthermore, 60.2% were sponsored by their parents, guardian or spouse, 4.5 % were under scholarship while 5.7 % were self-sponsored.

Table 1: Frequency Analysis of Characteristics of Respondents

Characteristics of Respondents		Frequency	Percent	Cumulative Percent
Age	18-22 years	84	23.9	23.9
	23-27 years	196	55.7	79.5
	28-32 years	48	13.6	93.2
	33-36 years	24	6.8	100.0
	Mean Age	24.8977 years		
Gender	Male	88	25.0	25.0
	Female	264	75.0	100.0
Marital Status	Married	64	18.2	18.2
	Single	288	81.8	100.0
Year of study	First year	100	28.4	28.4
	Second year	104	29.5	58.0
	Third year	56	15.9	73.9
	Fourth year	48	13.6	87.5
	Fifth year	44	12.5	100.0
Place of residence	On-campus	248	70.5	70.5
	Off-campus	104	29.5	100.0
Monthly income	Highly insufficient	116	33.0	33.0
	Insufficient	136	38.6	71.6
	Manageable	56	15.9	87.5
	Sufficient	36	10.2	97.7

	Highly sufficient	8	2.3	100.0
Sponsor of education	Parent(s)	172	48.9	48.9
	Guardian	40	11.4	60.2
	Sibling	52	14.8	75.0
	Self	20	5.7	80.7
	Scholarship	16	4.5	85.2
	Spouse	52	14.8	100.0

Respondents' Stress Level Following REBT Intervention

The results in Table 2 showed the percentage students (treatment and support groups) and their stress levels at baseline (before intervention), after intervention (post-intervention) and follow-up. As much as 84.1% of the nursing students in the treatment group and 79.5% in the control group had moderate to high level of stress at the baseline. The percentage of students in the treatment group with high level of stress reduced to 30.6% after intervention and to 8.3% at follow-up while the percentage with low and moderate stress levels increased to 23.6% and 45.8%, respectively, after intervention and to 37.5% and 54.2%, respectively at follow-up. The stress levels of the control group remained almost the same from baseline to follow-up.

Table 2: Stress Level among the Student Nurses from Baseline to Follow-up

Time of Measurement	Group	Stress Level		
		Low Stress	Moderate Stress	High Stress
Baseline	Treatment	28(15.9%)	60(34.1%)	88(50.0%)
	Control	36(20.5%)	64(36.3%)	76(43.2%)
After Intervention	Treatment	34(23.6%)	66(45.8%)	44(30.6%)
	Control	28(19.4%)	61(42.4%)	55(38.2%)
Follow-up	Treatment	54(37.5%)	78(54.2%)	12(8.3%)
	Control	30(20.8%)	55(38.2%)	59(41.0%)

Repeated Measures ANOVA for Stress Factors

The repeated measures ANOVA results for the effects analysis between the three measurement timelines (baseline, after intervention and follow-up) and the two groups (treatment and control) were presented in Table 3. The between-subjects effect of the treatment group on the stress score across time intervals is statistically significant ($F = 542.948$, $p = 0.00$) at 0.05 level of significance, where 1 and 86 are the degrees of freedom. This could be observed in the steady decrease of the mean stress scores for the treatment group from baseline (31.19) through intervention (21.31) to follow-up (12.71). The significant decrease could be observed in the profile plot (Figure 1). The mean stress scores for both treatment and control groups are the same at baseline, as expected. However, there are significant differences between the mean stress scores of the treatment and control groups at post-intervention and follow-up.

Table 3: Repeated Measures ANOVA for Time of Measurement

Time	Group	Mean	F	P-value	Wilk's lambda (P)	Mauchly's Chi-square (P)
Baseline	Treatment	31.19	542.948	0.00	0.065(0.00)	
	Control	32.08				
After intervention	Treatment	21.31				
	Control	29.60				
Follow-up	Treatment	12.71				
	Control	33.82				
Within-subjects contrast	Linear		1234.371	0.00		
Sphericity	Sphericity assumed		562.678	0.00		0.714(0.70)

The test of within-subjects contrasts measures the nature of trend exhibited by the mean stress level across groups. The results (in Table 3) suggests that across the two study groups, the mean level of stress exhibited significant linear trend across the three points of measurement ($F = 1234.371$, $p = 0.00$). The linearity of the trend behaviour of the stress levels is clearly shown in Figure 2 where the treatment plot (thick line) is linear from baseline to follow-up. The sphericity assumption is important for all univariate tests of main effects and interactions and verifies that the population variances of all possible stress scores are equal. The Mauchly's test of sphericity ($\chi^2_{(2)} = 0.714$, $p = 0.70$) shows sphericity assumption was not violated. Therefore, the within-subject effects analysis indicates that the main effect of time on stress score is statistically significant ($F = 562.678$, $p = 0.00$), sphericity assumed.

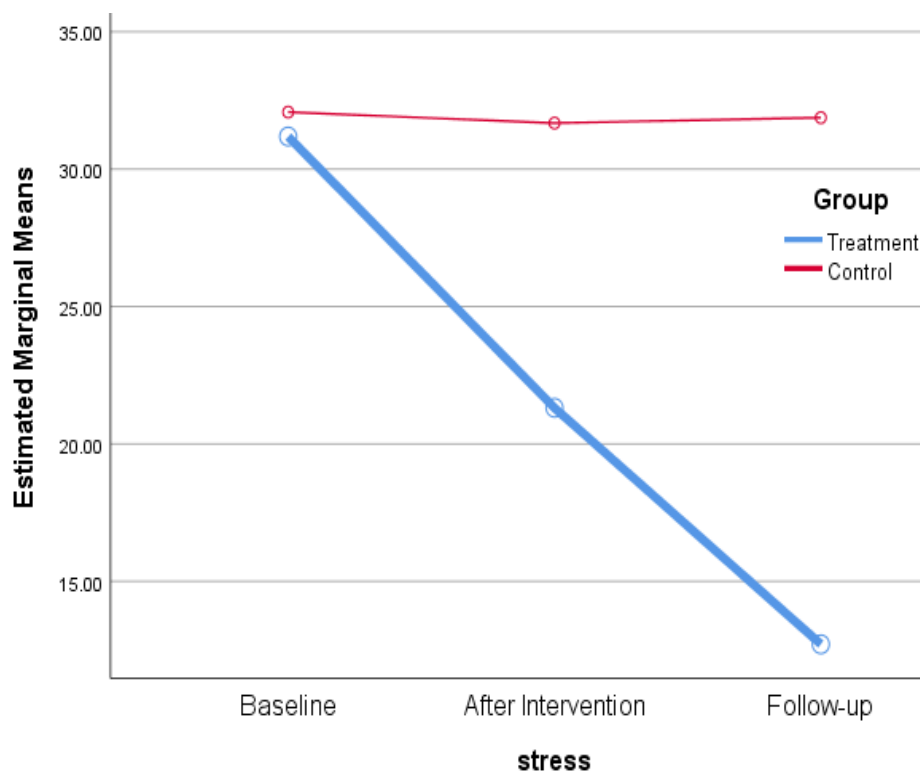


Figure 2: Profile Plot of Estimate Marginal Mean of Group Stress Scores at Time Intervals

The Bonferonni pairwise comparison test between the estimated marginal means for the treatment (21.74) and the control (31.88) groups shows that there is significant difference ($p < 0.00$) between the mean stress scores. The treatment group displayed lower estimated marginal mean stress score than the control group with mean difference of 10.14, indicating that the REBT intervention reduced stress among the nursing students in the treatment group. However, stress level among the control group remained high from the baseline to follow-up.

The study analyzed the effects of year of study, gender, monthly allowance, sponsor, and residence on the use of REBT intervention from baseline to follow-up. The results were presented in Table 4. The mean stress scores of nursing students in the control group, from first year to final year, did not differ significantly from baseline to follow-up. However, the stress scores of the treatment group decreased from baseline to post-intervention and reduced further at follow-up. These show that the REBT intervention succeeded in reducing the stress level of

the nursing students from first year to fifth year. The third, fourth and fifth year students have lower stress scores than the first and second year students.

Table 4: Repeated Measures ANOVA for Stress Factors by Time and Group

Stress factor	Time	Group	First Year	Second year	Third year	Fourth year	Fifth year
Year of study	Baseline	Treatment	32.0833	32.7500	30.0000	29.5714	30.2500
		Control	33.2308	31.5000	31.2000	31.0000	33.0000
	After intervention	Treatment	23.5000	23.0000	18.7778	19.2857	20.1250
		Control	32.3077	31.2857	31.6000	31.2000	31.6667
	Follow-up	Treatment	12.9167	12.8333	12.8889	12.0000	12.6250
		Control	32.8462	30.2143	29.6200	31.4700	32.6667
Between-subjects effects			F = 3.520	P = 0.011			
Within-subjects contrast			F = 4.868	P = 0.03 (Quadratic)			
Within-subjects effects			F = 474.816	P = 0.00 (Sphericity assumed), $\chi^2 = 1.88$, P = 0.395			
Gender			Male	Female			
	Baseline	Treatment	30.4286	31.5000			
		Control	32.0000	32.0938			
	After intervention	Treatment	21.1429	21.3824			
		Control	32.5000	31.4688			
	Follow-up	Treatment	12.2143	12.9118			
		Control	31.8750	31.8750			
	Between-subjects effects			F = 0.119	P = 0.731		
Within-subjects contrast			F = 852.355	P = 0.00 (Linear)			
Within-subjects effects			F = 392.196	P = 0.00 (Sphericity assumed), $\chi^2 = 0.54$, P = 0.763			
Monthly Allowance			Highly insufficient	Insufficient	Manageable	Sufficient	Highly sufficient
	Baseline	Treatment	32.0952	31.4375	29.0000	29.2000	30.5000
		Control	34.1250	31.0556	33.1250	31.2500	30.5000
	After intervention	Treatment	30.5000	21.8750	21.5000	18.0000	21.6190
		Control	30.5000	31.3333	32.0000	30.5000	33.0000
	Follow-up	Treatment	30.0000	13.6667	12.9048	12.8000	12.9048
		Control	30.0000	32.7500	33.2500	31.0000	33.2500
	Between-subjects effects			F = 3.363,	P = 0.014		
Within-subjects contrast			F = 620.852	P = 0.00 (Linear)			
Within-subjects effects			F = 265.010	P = 0.00 (Sphericity assumed), $\chi^2 = 1.882$, P = 0.390			
Sponsor			Parent(s)	Guardian/Spouse	Sibling	Self	Scholarship
	Baseline	Treatment	31.3182	30.7857	32.2000	35.0000	27.7500
		Control	32.0476	31.4444	32.6250	33.0000	27.7500
	After intervention	Treatment	21.8636	21.5000	24.6000	26.0000	16.5000
		Control	31.6190	31.5556	31.7500	32.5000	27.5000
	Follow-up	Treatment	12.5455	13.0714	15.0000	19.6667	10.5000
		Control	32.0476	31.3333	31.8750	32.5000	27.5000
	Between-subjects effects			F = 3.303,	P = 0.015		
Within-subjects contrast			F = 6.375	P = 0.014 (Quadratic)			

	Within-subjects effects		F = 321.317, P = 0.00 (Sphericity assumed), $\chi^2 = 1.981$, P = 0.371			
Residence			On-Campus	Off-Campus		
	Baseline	Treatment	31.8710	29.9412		
		Control	32.2581	31.4444		
	After intervention	Treatment	21.7742	20.4706		
		Control	31.8710	31.0000		
	Follow-up	Treatment	12.7742	12.5882		
		Control	32.1290	31.0000		
	Between-subjects effects		F = 4.619,	P = 0.035		
	Within-subjects contrast		F = 989.539,	P = 0.00 (Linear)		
Within-subjects effects		F = 435.209, P = 0.00 (Sphericity assumed), $\chi^2 = 1.293$, P = 0.524				

The between-subjects effects ANOVA in Table 4 have F = 3.520 and p = 0.011, which shows that the mean stress scores significantly differ at 0.05 level of significance from baseline to follow-up and according to year of study and group. The Student-Newman-Keul’s multiple comparison test shows that first year (28.013) and second year (27.423) have the highest mean stress scores which are significantly different (p < 0.05) from the mean stress scores of the third year (24.833), fourth year (24.404) and fifth year (24.121). The within-subjects contrasts analysis (F = 4.868, p = 0.03) have significant quadratic trend. This indicates that the decrease in stress level due to the intervention according to year of study followed quadratic trend from baseline to follow-up. This is validated by profile plot of Figure 3 where the plots of marginal means for third, fourth and fifth year students showed curvature from post-intervention to follow-up. The lines for the first and second year students maintained linear trend from baseline to follow-up with higher marginal mean stress. The value for the Mauchly’s test of sphericity is $\chi^2_{(2)} = 1.88$, p = 0.39, which shows that sphericity assumption was not violated for year of study. Therefore, the within-subjects effects analysis indicated that the main effect of year of study on stress scores is statistically significant (F = 474.816, p = 0.00).

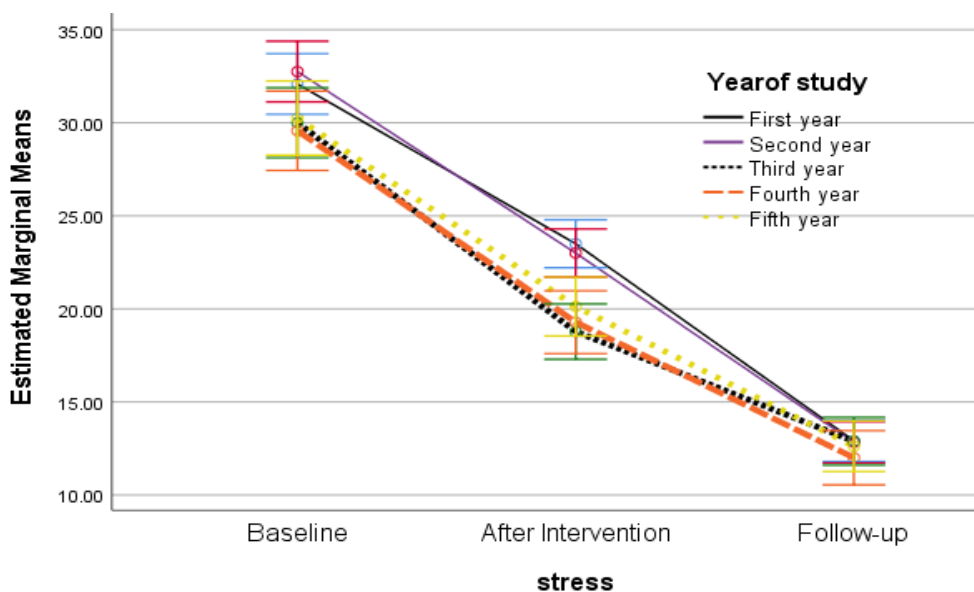


Figure 3: Profile Plots of Year of Study for Treatment Group

The decrease in the stress level of the nursing students in the treatment group from baseline to follow-up due to the intervention was not significantly influenced by the students' gender ($F = 0.119$, $p = 0.731$). The within-subjects contrast showed significant linear ($F = 852.355$, $p = 0.00$) trend in decrease in mean stress scores for the treatment group from baseline to follow-up.

Since Mauchly's test of sphericity ($\chi^2 = 0.54$ and $p = 0.73$) shows that the sphericity assumption was not violated, then, the within-subjects effects results indicate that the main effect of gender on mean stress scores is statistically significant, sphericity assumed ($F = 474.816$, $p = 0.00$).

The effect of the students' monthly allowance on the REBT stress management intervention was also analyzed. The results (Table 4) showed that there was significant difference ($F = 3.363$ and $p = 0.014$) in the between-subjects effects, which indicates that the level of monthly income has significant influence on the decrease in the stress level of the students in the treatment group across the time intervals.

The within-subjects contrast shows significant linear trend ($F = 620.852$, $p = 0.00$) in decrease in the mean stress of the students in the treatment group from baseline to follow-up.

Moreover, the Mauchly's test of sphericity assumption is $\chi^2_{(2)} = 1.88$ with $p = 0.39$, indicating that sphericity assumption was not violated for the effect of monthly allowance. Hence, the within-subjects effects results show that the main effect of monthly allowance on stress level is statistically significant ($F = 474.816$, $p = 0.00$), sphericity assumed.

The repeated measures ANOVA (Table 4) for the between-subjects effects shows significant difference between the mean stress scores due to source of sponsorship from baseline to follow-up ($F = 3.303$, $p = 0.015$).

The student-Newman-Keul's multiple comparison results showed that the nursing students under scholarship have the lowest mean stress score of 18.9167, which is significantly different from the mean stress scores for sibling (28.0513), self-sponsor (27.60), guardian/spouse (25.5652) and parents (26.7906).

The within-subjects contrasts show significant ($F = 6.375$, $p = 0.014$) quadratic trend in the decrease in stress level among the treatment group of nursing students under sponsorship.

The profile plot of Figure 4 shows that the trend line for students under scholarship has curvature after intervention and is lower than the other trend lines, indicating that the students under scholarship responded faster to decrease in stress level up to follow-up.

The chi-square value for the Mauchly's test of sphericity assumption is $\chi^2_{(2)} = 1.981$, $p = 0.371$, which shows that the sphericity assumption was not violated for the effect of source of sponsorship. Therefore, the within-subjects effects results indicate that the main effect of source of sponsorship on stress level is statistically significant, sphericity assumed ($F = 321.317$, $p = 0.00$).

Students' response to the REBT intervention could also be affected by the students' place of residence for the nursing degree programme. The results of the between-subjects effects show that there is significant difference (F , $p = 0.035$) between the mean stress scores of on-campus and off-campus nursing students with the students living off-campus showing lower mean stress scores after intervention while the mean score is similar at follow-up.

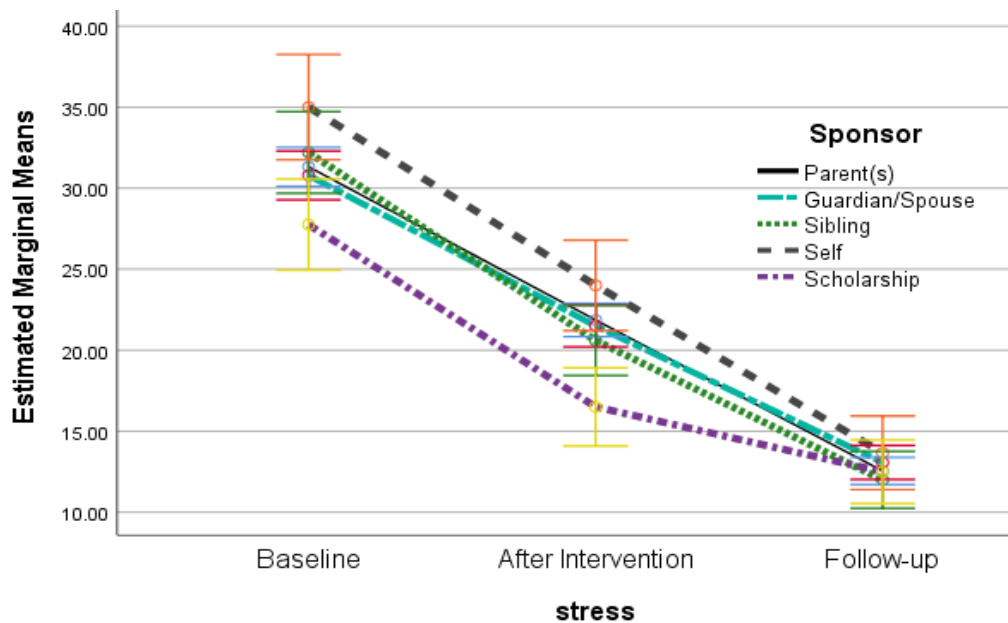


Figure 4: Profile Plot for Source of Sponsor for Treatment Group

The within-subject contrast ANOVA shows significantly ($F = 989.539$, $p = 0.00$) linear trend in the decrease in stress level from baseline to follow-up. Again, the Mauchly's test of sphericity ($\chi^2_{(2)} = 1.293$, $p = 0.524$) shows that the sphericity assumption was not violated for the effect of place of residence of nursing students. Therefore, the within-subjects effects show that the main effect of place of residence on stress level is statistically significant ($F = 435.209$, $p = 0.00$), sphericity assumed.

DISCUSSION

There was remarkable effect on the stress level of the nursing students who received the REBT intervention. The results showed that there was almost a 100.0% increase in the number of students with low stress level at follow-up compared to the number at baseline. The decrease in the number of students with high stress level from baseline to follow-up is also substantial with over a 100.0% decrease, reflecting the positive impact of the REBT intervention on stress management and control. These clearly indicated that the REBT stress therapy reduced stress among the undergraduate university nursing students.

In corroborating the findings of this study on reducing stress through REBT, Noormohamadi et al.^[38] revealed similar where REBT reduced the anxiety scores of university students from 52.77 before intervention (baseline) to 18.0 post intervention, indicating a decrease in anxiety with over a 100.0%.

Similar results were obtained by Ogbuanya et al.^[23] where it was revealed that REBT intervention on students' burnout reduced the level of burnout among undergraduate students of Electronics Works, University of Nigeria, Nsukka, indicating that REBT is effective in dealing with stress and burnout among undergraduate students of Nigerian universities.

Furthermore, the effects analysis of the study groups and the REBT timelines revealed that there were significant differences between the nursing students' stress levels for the treatment from baseline to follow-up. There was steady significant decrease of the mean stress scores for the treatment group from baseline (31.19) to follow-up (12.71).

The repeated measures ANOVA results showed that, at 0.05 level of significance, the decrease of the mean stress score across the timelines was statistically significant ($F = 542.948$, $p = 0.00$), indicating progressive positive impact of the REBT intervention on the stress levels of the undergraduate nursing students. Conversely, the mean stress scores of the control group remained the same across the timelines. Similar results were obtained by Onuigbo et al.^[20] in a study which revealed significant decrease in the mean stress levels of special education teachers treated using REBT from post-intervention to follow-up.

Although the treatment subjects differed, the results are similar due to the similarity in the study area (Nigeria's Southeast) and the aim of stress management using REBT in Nigerian schools. Again, the decrease in mean stress level of the students agree with the findings of Ugwoke et al.^[21], who in a study involving control group repeated measurement, revealed significant decrease in stress level at follow-up using rational-emotive stress management therapy. These findings reflect the submission made by Benjet^[39] that stress management interventions like the REBT reduce stress, anxiety and symptoms of depression.

The findings revealed that the third, fourth and fifth year undergraduate nursing students had significantly lower stress scores than the first and second year students. The profile plot (Figure 2) showed that mean stress scores for third, fourth and fifth year students displayed significant quadratic trend line from post-intervention to follow-up while those of first and second year students maintained linear trend from baseline to follow-up. These imply that while the undergraduate nursing students in the treatment group experienced steady decrease in the level of stress from baseline to follow-up, the third, fourth and fifth year students experienced faster decrease in stress level from post-intervention to follow-up, explaining the sharp curvature at post-intervention. These indicate that the undergraduate nursing students responded to REBT stress management intervention but the third, fourth and fifth year students responded better than the first and second year students. Similar findings by Aedh et al.^[4] showed that the students' academic year is directly associated with the level of stress. However, their results indicated that the third year students experienced higher stress level than students of other academic years. The findings by Roberson et al.^[40] revealed that undergraduate nursing students in higher academic years experienced higher level of stress than students in lower academic years, contradicts the findings of the present study. They argued that the nursing students in higher academic years have started experiencing clinical rotations, which contributes to stress, unlike the students in lower academic years. However, in the present study and university environment, the first and second year undergraduate nursing students experiencing higher stress levels could be attributed to factors such as difficulties related to being new to nursing academic programmes^[41], difficulties associated with registrations, securing accommodation as freshers and settling down^[42], attending inter-factor courses, among others. The students in higher academic years have adapted to these stress-inducing factors and could respond better to stress management.

Furthermore, the study revealed that socio-demographic factors such as the gender of the undergraduate nursing students have no significant impact on the students' responses to the REBT stress management intervention. This result seemed obvious since the population of undergraduate nursing students was dominated by female and therefore will not impact on the the outcome of the REBT intervention. On the other hand, the students' monthly allowance, source of academic sponsorship, and place of residence had significant impact on the students' responses to the REBT stress management intervention, and hence the stress levels. Students under scholarship for their academic sponsorship responded better to REBT intervention with

significant quadratic trend line and low stress level from post-intervention to follow-up. Similar results were obtained by Kulingtang et al.^[43] who revealed that monthly income, academic year and living conditions had significant impact on the stress levels of undergraduate nursing students from different universities in the Philippines. Their study also revealed that gender had no significant impact on reducing the stress level of the students since female students dominated the undergraduate nursing populations in the universities, further corroborating the findings of this study.

On the other hand, the findings that the students' economic status (income and sponsorship) significantly impacted their responses to the stress management intervention contradicted the recent findings by Phu et al.^[44,45].

Their study revealed that the economic status of undergraduate nursing students of Tra Vinh University, Vietnam has no significant impact on their responses to stress management, although their study revealed that students who were financially well-off had high stress level (38.8%) compared to students who were average or not financially well-off with stress level of 33.3%.

CONCLUSION

This research work examined the effects of rational emotive behavioural therapy (REBT) in reducing and managing stress among first degree nursing students of University of Nigeria, Nsukka, Nigeria.

The results revealed that the rational emotive behavioural therapy reduced the level of stress among the nursing students at the post-intervention and follow-up phases compared to the control group. Year of study, sponsorship, monthly allowance and place of residence were identified to have effect on stress management using REBT while gender did not affect stress management among the treatment group. The first and second year nursing students, the self-sponsored students, students with highly insufficient monthly allowance and students living on-campus have higher stress levels.

The stress levels diminished drastically after three months, post-intervention, as indicated in the follow-up results. The rational-emotive behavioural therapy is recommended for adoption by the personnel of medical and health establishment.

Study limitations:

The study was conducted at the university of Nigeria, Nsukka, the oldest university in the Southeast region, which constituted a limitation to the study outcome. Involved other nursing students in the universities and nursing schools in the region in the study may have provided more robust and different outcomes.

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