

Intervention for burnout among chemistry education undergraduates in Nigeria

Journal of International Medical Research

48(1) 1–6

© The Author(s) 2019


Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/0300060519867832

journals.sagepub.com/home/imr



Florence Obiageli Ezeudu¹,
Ijeoma Hope N. Nwoji¹ ,
Priscilla O. Dave-Ugwu¹,
Deborah Oluchi Abaeme¹,
Nnonye Rebecca Ikegbunna¹,
Chiegeonu Valentina Agugu¹,
Mary Nneora Muoneke¹,
Ayodeji Olorunmeye Alabi¹ and
Bartholomew Chinweuba Nwefuru²

Abstract

Objective: The aim of this study was to determine how effectively rational emotive behavior therapy (REBT) could help university undergraduate students in chemistry to manage academic burnout.

Methods: We surveyed 468 undergraduates in the chemistry education program for eligibility and included the first 30 students who showed symptoms of high burnout. We randomly assigned 15 students each to the experimental and control groups. The Oldenburg Burnout Inventory for college students was used to assess students' burnout at two different periods. The intervention was delivered using a manual for managing burnout.

Results: Pre-test results indicated no significant difference in the burnout scores of the control group (mean = 51.43, standard deviation (SD) = 2.74) and experimental group (mean = 52.31, SD = 3.59), $t(28) = 0.749$. At post-test, the main effect of time on students' burnout was significant: $F(2,27) = 41.91$, $\eta_p^2 = 0.599$. The main effect of group on undergraduates' burnout was also significant: $F(1,28) = 1043.67$, $\eta_p^2 = 0.974$. There was a significant time \times group interaction effect on burnout among participants: $F(2,27) = 41.43$, $\eta_p^2 = 0.597$.

¹Department of Science Education, University of Nigeria Nsukka, Enugu State, Nigeria

²Department of Educational Foundations, University of Nigeria Nsukka, Enugu State, Nigeria

Corresponding author:

Ijeoma Hope N. Nwoji, Harden Building, Department of Science Education, University of Nigeria Nsukka, P.M.B. 410001, Enugu State, Nigeria.
Email: drijeoma.nwoji@gmail.com



Conclusion: Our study findings showed that chemistry students could be helped to manage burnout symptoms, based on REBT theory. REBT methodology should be promoted among university undergraduates with symptoms of academic burnout.

Keywords

Burnout, chemistry students, chemistry education, Nigeria, rational emotive behavior therapy, intervention

Date received: 11 June 2019; accepted: 15 July 2019

Introduction

Academic burnout among students has generated a lot of attention recently, given the large pool of extant literature establishing its prevalence. Studies conducted in different parts of the world report prevalence rates of academic burnout between 7.2% and 70.6%.¹⁻⁴ Burned-out students show high levels of exhaustion and a negative attitude toward school work.⁵ In Nigeria, studies have shown that most university students across different disciplines exhibit a high degree of burnout symptoms. In particular, it has been reported that the prevalence rate of academic burnout among Nigerian undergraduates is 68%.⁶ Undergraduates in chemistry education programs in Nigeria are at risk of burnout.⁷ In response to this unsatisfactory state of affairs, it is important to seek a means of combating this problem given the critical role of undergraduates in realizing the goals and objectives of chemistry education in Nigeria of producing skillful and competent chemistry teachers at secondary school level who are knowledgeable in instructional design and delivery and capable of assuming leadership positions as well as pursuing further studies in chemistry.⁸

Achieving the above goals and objectives of undergraduate chemistry education programs may be impossible if students

experience high levels of burnout as they will lack the physical and psychological drive to successfully cope with the demands of academic life. Albert Ellis put forth the theory of rational emotive behavior therapy REBT in 1955. Ellis assumed that people's problems stem from illogical thoughts, views, and beliefs.⁹ The goal of REBT is to combat unhealthy behaviors by seeking to refute and change those irrational thoughts, views, and beliefs that in turn generate such behaviours.¹⁰ To bring about this positive change, REBT utilizes a series of cognitive, behavioral, and emotive techniques.⁷ In the present study, we aimed to determine the effectiveness of REBT in managing burnout symptoms among chemistry undergraduates.

Methods

The researchers obtained the approval of the Research Ethics Committee at the Faculty of Education, University of Nigeria in Nsukka, and the study was conducted in accordance with the stipulations of the Declaration of Helsinki. Research guidelines followed in conducting this study were as prescribed by the American Psychological Association. Individuals who participated in this research were informed of the study goals and procedures and they all gave their consent in writing to

participate. To determine eligibility for possible inclusion in this study, we surveyed a total of 468 undergraduate students of chemistry, from the first to the final year of study. Of these, 245 (54.3%) students met the eligibility criteria for a high level of burnout, i.e., a total score of 49 and above on the Oldenburg Burnout Inventory for students (OLBI-S) at pre-test. Other inclusion criteria considered included undergraduate student in chemistry education, not be involved in any other burnout intervention program during the study period, not currently or previously diagnosed with mental illness, and willing to commit to completing the program once begun. Financial constraints made it impossible for us to include all eligible students for a large-scale intervention. The minimum sample size required for an effective study was determined using G*power 3.1 software,¹¹ with statistical power $\alpha = 0.81$. Random allocation software¹² was used to generate the allocation sequence with which participants were allocated randomly to each group. The allocation sequence was enclosed in sealed, opaque envelopes so as to blind those assigning participants to the groups.

The OLBI-S consists of 16 items designed to measure academic burnout in two dimensions: exhaustion (owing to the demands of studying) and disengagement (an attitude of detachment from academic studies), with eight questions each. The total score of the two subscales represents the student's level of burnout. Each subscale of the OLBI-S has been validated in previous studies and found to be very reliable.¹³ For the present study, the reliability of the subscales (Cronbach's alpha) was 0.831 for exhaustion and 0.869 for disengagement.

We collected participants' demographic information using a questionnaire designed by the researchers; these data included level of study, place of residence, study hours, age, sex, type of institution, and sponsor.

We used an REBT student burnout treatment manual for undergraduates in the experimental group to treat burnout symptoms. The intervention lasted for 10 weeks. This manual was adapted from REBT manuals used in previous evidence-based studies on burnout and stress.^{10,14} We adopted a treatment-as-usual approach for students in the control group. Control students received normal counseling services and programs developed in Nigerian universities. Three facilitators implemented the REBT intervention. We checked our data for violation of test assumptions, and the study data met all test assumptions. No data were missing after screening.

Statistical analysis

Demographic data were analyzed using frequency and percentage. Pre-test scores of the two groups were compared using a *t*-test. A two-way repeated measures analysis of variance (ANOVA) was then performed to determine the main effects of treatment and time and the time by group interaction effect. We used partial eta-squared (η_p^2) as the effect size measure. IBM SPSS version 20 was used to perform all statistical analyses and data screening (IBM Corp., Armonk, NY, USA).

Results

We chose the first 30 chemistry undergraduate students who met all the inclusion criteria for the study. Of the 30 selected students, we assigned 15 students each to the experimental and control groups. According to participants' demographic data, more than half of participants were female students (63%). Most participants were second- and third-year students (36% and 30%, respectively). Only five students were from private universities; the remainder attended public federal universities. A total 14 (46.67%) participating students

were living off-campus whereas 16 (53.33%) resided in a university hostel. The age range of participants was 17–25 years, with the mean age in the control and experimental groups 21.32 ± 4.56 and 21.44 ± 5.01 years, respectively. A total 80% of students were sponsored by their parents, and only three students were married. Most participants (53%) studied between 2 and 3 hours daily.

The results of the independent-samples *t*-test indicated no significant difference in the pre-test burnout scores of the control group (mean = 51.43, standard deviation (SD) = 2.74) and experimental group (mean = 52.31, SD = 3.59), $t(28) = 0.749$.

At post-test, the two-way mixed ANOVA analysis result indicated a significant overall within-subject effect on the main effect of time on student burnout: $F(2,27) = 41.91$, $P < 0.001$, $\eta_p^2 = 0.599$. Similarly, the results for the between-subject effect on the main effect of group on student burnout were significant: $F(1,28) = 1043.67$, $P < 0.001$, $\eta_p^2 = 0.974$. Again, the ANOVA result showed a significant time \times group interaction effect: $F(2,27) = 41.43$, $P < 0.001$, $\eta_p^2 = 0.597$.

Discussion

The purpose of the present study was to ascertain the efficacy of REBT in managing burnout among undergraduate students of chemistry in Nigeria. The results showed that 54.3% of the chemistry education students initially surveyed had high burnout. This finding is in line with results of previous studies indicating that burnout is prevalent among the student population in Nigeria.^{1–4,6} Our results showed that chemistry undergraduates had high pre-test burnout. However, following introduction of the REBT program in the experimental group, we observed that students' burnout levels had dropped substantially at post-test, as compared with their pre-test levels

as well as those of students in the control group who did not participate in the REBT intervention. This finding suggests that the REBT program was an effective intervention for reduction of burnout symptoms among chemistry undergraduates. These findings corroborate previous studies that have reported the effectiveness of REBT in enabling students and other groups to manage stress-related symptoms and burnout.^{9,11,15–17}

The present study has several important implications. First, apart from bringing to light the high prevalence of burnout among chemistry education undergraduates in particular, our findings showed that burnout could be effectively managed and reduced via psychotherapy. This calls for more evidence-based studies in this direction, to validate the REBT intervention with the aim to yield greater acceptance and generalizability. Second, few studies have provided practical solutions for managing psychological problems among students in Nigeria, such as burnout. Given growing concerns about burnout syndrome among undergraduates in South-East Nigeria universities, we suggest that REBT is efficacious in managing student burnout and should be incorporated in students' academic programs, to equip them with skills to better manage their psychological and mental health. Given that burnout affects medical and nursing students, physicians, and other health professionals, it is hoped that the present study outcomes will influence the adoption of REBT interventions for managing burnout in these groups, to promote health and well-being. It is our expectation that these data regarding burnout among undergraduate students in chemistry education will be useful to researchers in future, to help improve students' psychological well-being, academic engagement, and school achievement. This may result in better understanding of the symptoms of burnout among our study

population of university students, as well as the factors linked to these symptoms. Another implication of this study is that the design and implementation of interventions to address burnout among chemistry undergraduates, like the present REBT intervention, may result in more students being able to learn how to manage academic burnout while at school. School health policies should be aligned to accommodate REBT burnout intervention for undergraduate students, given the clinical utility of this therapy as demonstrated in this study.

The current study has some limitations. The sample size in this study is arguably small, which could limit the extent to which the findings can be generalized. However, future researchers can consider the present study as foundational for conducting further studies with greater scope and better generalizability. In future, researchers should track the attendance of participants, the mean number of class sessions attended or missed, as well as the percentage of participants who attend all class sessions.

Conclusion

This present research revealed that 54.3% of the chemistry education undergraduates surveyed had high burnout. At pre-test, burnout symptoms among participants in the two study groups were high, with no significant difference. However, following application of the REBT intervention program, burnout levels among students in the experimental group were significantly reduced, as evident in their post-test scores. These findings demonstrated the efficacy of REBT in enabling chemistry undergraduate students to manage burnout syndrome. Given these results, attention should be directed toward the mental health of chemistry education undergraduates, as the prevalence of academic burnout is high in this group. REBT methodology

for coping with burnout should form a part of the educational program in undergraduate chemistry education, to equip students with the necessary skills to cope with burnout and other associated mental health challenges. It is hoped that this study outcome will influence the adoption of REBT interventions for managing burnout among medical and nursing students, physicians, and other health workers.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ORCID iD

Ijeoma Hope N. Nwoji  <https://orcid.org/0000-0001-6102-600X>

References

1. Al-Alawi M, Al-Sinawi H, Al-Qubtan A, et al. Prevalence and determinants of burnout syndrome and depression among medical students in Sultan Qaboos University: a cross-sectional analytical study from Oman. *Arch Environ Occup Health* 2019; 74: 130–139. doi: 10.1080/19338244.2017.
2. Wickramasinghe ND, Dissanayake DS and Abeywardena GS. Prevalence and correlates of burnout among collegiate cycle students in Sri Lanka: a school-based cross-sectional study. *Child Adolesc Psychiatr Ment Health* 2018; 12: 26. Available at: <https://capmh.biomedcentral.com/articles/10.1186/s13034-018-0238-z>
3. Boni RADS, Palva CE, de Oliveira MA, et al. Burnout among medical students during the first years of undergraduate school: prevalence and associated factors. *PLoS One* 2018; 13: e0191746.
4. Almeida GC, de Souza HR, de Almeida PC, et al. The prevalence of burnout syndrome

- in medical students. *Arch Clin Psychiatry* 2016; 43: 6–10. doi: 10.1590/0101-60830000000072.
5. Demerouti E, Mostert K and Bakker AB. Burnout and work engagement: a thorough investigation of the independency of both constructs. *J Occup Health Psychol* 2010; 15: 209–222. doi: 10.1037/a0019408.
 6. Adekeye AO, Alao AA, Odukoya AJ, et al. Predicting perceived psychological burnout among sophomore students of Covenant. *Soc Sci* 2017; 12: 2022–2027.
 7. Nwefuru BC, Otu MS, Eseadi C, et al. Stress, depression, burnout and anxiety among chemistry education students in Universities in South-East, Nigeria. *J Consultancy, Train Serv* 2018; 2: 46–54. Available at: <https://www.jconsulttrainserv.com/>
 8. Department of Science Education University of Nigeria Nsukka. *Department of Science Education Undergraduate Handbook*. Nsukka, Nigeria: Prince Press, 2017.
 9. Igbokwe UL, Nwokenna EN, Eseadi C, et al. Intervention for burnout among English education undergraduates: implications for curriculum innovation. *Medicine* 2019; 98: e16219.
 10. Terjesen MD and Kurasaki R. Rational emotive behavior therapy: application for working with parents and teachers. *Estudos de Psicologia: Campinas* 2009; 26: 3–14.
 11. Ogbuanya TC, Eseadi C, Orji CT, et al. Effect of rational emotive behavior therapy program on the symptoms of burnout syndrome among undergraduate electronics work students in Nigeria. *Psychol Rep* 2019; 122: 4–22. doi: 10.1177/0033294117748587.
 12. Faul F, Erdfelder E, Buchner A, et al. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav Res Methods* 2009; 41: 1149–1160.
 13. Saghaei M. Random allocation software for parallel group randomized trials. *BMC Med Res Methodol* 2004; 4: 26. doi: 10.1186/1471-2288-4-26.
 14. Ries D, Xanthopoulou D and Tsaousis I. Measuring job and academic burnout with the Oldenburg Burnout Inventory (OLBI): factorial invariance across samples and countries. *Burnout Res* 2015; 2: 8–18.
 15. Ugwoke SC, Eseadi C, Onuigbo LN, et al. Effect of rational-emotive stress management for reducing burnout and dysfunctional distress intervention among special education teachers. *Medicine* 2018; 97: e0475.
 16. Onuigbo LN, Eseadi C, Ugwoke SC, et al. Effect of rational emotive behavior therapy on stress management and irrational beliefs of special education teachers in Nigerian elementary schools. *Medicine* 2018; 97: e12191.
 17. Ugwoke SC, Eseadi C, Igbokwe CC, et al. Effect of rational-emotive health education intervention on stress management and irrational beliefs among technical college teachers in Southeastern Nigeria. *Medicine* 2017; 96: e7658.