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The Efficacy of Virtual Reality Therapy on Mental Health of Tertiary Education Students in Bayelsa State, Nigeria

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ABSTRACT

The study evaluates the efficacy of virtual reality therapy on mental health of tertiary education students in Bayelsa State, Nigeria. The objectives of the study were to evaluate the efficacy of VRT on mental health of tertiary education students and determine the influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria. Two research questions and two hypotheses tested at 0.05 level of significance guided the study. Sample comprised 60 students selected through purposive sampling technique comprising 30 males and 30 females. Three stages were used in collecting data: pre-treatment, treatment and post-treatment. Quasi-experimental design was adopted for the study. Two instruments were used, the Patient Health Questionnaire–9 (PHQ-9) developed by Spitzer et al. (1999) and Mental Health Inventory-18 (MHI) by Veit and Ware (1983). Reliability of the instruments was established through test-retest; coefficients obtained were 0.85 and 0.88 for PHQ-9 and MHI-18 respectively confirming their reliability for use in the study. The data were analyzed using mean and standard deviation to answer research questions while the hypotheses were tested using independent t-test statistics. The results revealed that there was a significant effect of VRT on mental health of tertiary education students and that gender had significant influence on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria. Based on the findings of the study, it was recommended that educational institutions should embrace personalized AI-driven counselling to enhance students' engagement, and that educational institutions should foster continuous professional development, promoting collaboration to create more effective, efficient, and equitable support systems for students.

Keywords: Efficacy, Virtual Reality Therapy, Mental Health, Tertiary Education Students

INTRODUCTION

Mental health is increasingly becoming an important global concern. Mental health is a concept that is related to the social and emotional well-being of individuals, communities and societies the world over. It refers to an individual's emotional, psychological and social well-being. It affects how an individual thinks, feels, acts and functions. It also determines how people handle stress, relate to others, and make healthy choices. Mental health as defined by World Health Organization (WHO, 2020) is 'a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stress of life, can work productively and fruitfully, and is able to make a contribution to his or her community'. Ruch (2018) opined that being mentally healthy involves having the resilience to overcome difficulties and challenges, possessing confidence and self-esteem, making decisions, and believing in oneself.

According to Keyes (2014), there are three components of mental health, which include emotional well-being, psychological well-being and social well-being. Emotional well-being includes happiness, interest in life, and satisfaction; psychological well-being includes liking most parts of one's own personality, being good or managing the responsibilities of daily life, having good relationship with others and being satisfied with one's own life; social well-being

refers to positive functioning and involves having something to contribute to society (social contribution), feeling part of a community (social integration), believing that society is becoming a better place for all people (social actualization), and that perceiving society as logical and meaningful (social coherence). Mental health issues can affect peoples' mental ability, energy level, happiness, optimism, dependability, concentration, sleep, etc. Mental health implies fitness rather than freedom from illness (Teibowei, 2025, Ayannuga, 2020).

Denga (2015) opined that traumatic life experiences can have adverse effects on mental health. Individuals experiencing life stress and difficult emotions such as the loss of a spouse or loved one, loss of a job, accidents, prolonged health issues, marital challenges, career issues and the like may develop symptoms of depression, which can negatively impact their mental health. Depression is a group of conditions associated with the elevation or lowering of a person's mood such as sadness (with or without crying), anxiety, lack of energy or motivation, temper outbursts, irritability, sleeping too much or too little, changes in appetite (eating too little or too frequently), withdrawal from friends and family, loss of interest in activities usually enjoyed, unexplained fear (even if there is no conscious reason), feelings of extreme guilt or shame, inability to concentrate, poor memory, increased use of alcohol or drugs, worsening grades, skipping school or classes, self-critical remarks, feelings of helplessness and hopelessness, suicidal thoughts etc. When four or more of the symptoms are observed or suspected for more than two weeks, an assessment by a mental health professional is necessary. Such professional assessment is done by a mental health counsellor or other professionals in related field by applying mental health counselling (Uzobo, Teibowei, Moroyei & Dennis, 2022).

Mental health counselling involves relevant counselling techniques and therapies to address mental health issues. It is the use of variety of psychotherapy methods and techniques which are being used to help people experiencing psychological distress. Most therapies involved physical one –on-one interaction between the client and the counsellor but with the rise in technology, virtual platforms can be utilized to meet clients' needs without physical contact. Virtual reality is one of such mental health counselling platforms that can be employed in handling mental health (Lawan, Hassan, Ibrahim & Kibiya, 2023, Sani, Molteni & Sarai, 2022).

Virtual reality (VR) is an artificial intelligence (AI) application that holds promise for school counselling. VR environments can simulate challenging social situations or provide relaxation exercises, offering students a safe space to practice coping strategies and build resilience (Oliveira, Prada & Paiva, 2021, Aduwari, 2022). Moreover, AI facilitates data-driven decision-making in counselling, enabling counsellors to track student progress and tailor interventions to individual needs more effectively (Schwarz, Calvin & Banos, 2020). AI-powered VR exposure therapy supports students with anxiety disorders, post traumatic stress disorder (PTSD), and phobias, enhancing counselling outcomes. Immersive VR experiences can simulate real-world scenarios, helping students confront and overcome their fears in a safe and controlled environment. AI-driven VR systems can also adapt to individual student needs, ensuring personalized support (Zawacki-Richter & Jung, 2019; Efuntade, 2022).

AI algorithms can tailor VR Exposure Therapy to individual students' needs and progress. AI can analyze student data, such as heart rate and skin conductance, to measure their emotional response to VR simulations. This data informs the AI system, allowing it to adjust the VR experience to optimize the student's exposure therapy. AI can also provide personalized feedback and encouragement to students, enhancing their motivation and engagement in the therapy process.

VR Exposure Therapy is particularly effective in schools because it overcomes barriers to traditional therapy, such as stigma and access. Students can participate in VR Exposure Therapy in the comfort of their own schools, without the need for expensive hardware or

transportation to external therapy sessions. AI powered VR Exposure Therapy also provides schools with a cost-effective solution, reducing the need for lengthy and resource-intensive therapy sessions. Moreover, AI-powered VR Exposure Therapy can address a range of mental health concerns, from social anxiety to specific phobias. For instance, VR simulations can help students overcome fears of public speaking, heights, or enclosed spaces. AI can also tailor VR experiences to address specific student needs, such as anxiety related to bullying or academic performance (Gorriz & Medina, 2020; Chukwu & Molokwu, 2022). However, AI and VR Exposure Therapy are transforming school counselling and guidance services. By providing personalized, accessible, and effective treatment, AI-powered VR Exposure Therapy is helping schools promote student mental health, well-being, and resilience. As AI technology continues to evolve, it is likely to play an increasingly important role in shaping the future of school guidance and counselling services.

Artificial Intelligence (AI) is modernizing mental health support in school counselling and guidance services. AI-powered tools and platforms are enabling schools to provide more accessible, personalized, and effective mental health support to students. AI-driven chatbots and virtual assistants are offering students instant support and guidance, helping them navigate mental health concerns, such as anxiety, depression, and stress. Virtual mental health platforms, such as crisis chatbots and online counselling services, provide students with safe and confidential spaces to discuss their concerns which can also analyze student feedback, identifying early warning signs of mental health issues and enabling proactive interventions (Winkler-Schwartz & Chen, 2019).

According to Yoshija (2024), AI provides mental health support platforms which enable schools to identify at-risk students and provide early interventions. By analyzing student data and behaviour patterns, AI algorithms can detect early warning signs of mental health concerns, allowing school counsellors and mental health professionals to provide targeted support and interventions. This proactive approach will help schools reduce the stigma associated with mental health and ensure that students receive the support they need to thrive. One of the significant benefits of AI in mental health support is its ability to provide personalized support and resources to students. AI platforms can analyze individual student needs and preferences, providing tailored guidance and support. For instance, AI can suggest coping strategies, mindfulness exercises, and relaxation techniques to help students manage stress and anxiety (Yoshija, 2024).

Additionally, AI can connect students with mental health professionals and support groups, ensuring they receive the help they need. AI is also enhancing the effectiveness of mental health support services in schools. By analyzing student outcomes and programme effectiveness, AI can provide insights into what works and what does not, enabling school counsellors and mental health professionals to refine their approaches and make data-driven decisions. This data-driven approach is helping schools optimize their mental health support services, ensuring that students receive the most effective support possible (Winkler-Schwartz & Chen, 2019).

Oyebisi, Anyama and Ahimie (2024) conducted a study on Enhancing Student Support: Exploring the Potential of Artificial Intelligence in School Counselling and Guidance Services. The study delved into the transformative potential of in revolutionizing school counselling and guidance services. Oyebisi et al. (2024) argues that AI can provide personalized, data-driven insights that enable counsellors to identify and address students' academic, emotional, and social needs more effectively. By leveraging AI tools, such as predictive analytics, Chatbots, and virtual counselling platforms, schools can offer timely interventions and support tailored to individual student profiles. Additionally, AI can streamline administrative tasks, allowing counsellors to focus more on direct student engagement.

Rakap (2023) and Steele (2023) carried out a study on AI-driven predictive analytics as a game-changer in identifying at-risk students and enabling early interventions. The study found that by analyzing vast amounts of data, including academic performance, attendance, and behavioural patterns, AI algorithms can predict student outcomes, such as dropout risk or mental health concerns. This enables school counsellors and educators to provide targeted support, ensuring students receive the help they need to succeed.

Adiguel, Kaya, and Candy (2023) and Denver and Bach (2020) conducted a study on AI-driven systems and discovered that AI systems provide personalized guidance, considering individual students' strengths, weaknesses, and interests. By analyzing student data and learning patterns, AI can suggest tailored academic and career paths, helping students make informed decisions about their future. This personalized approach also enables school counsellors to focus on high-touch, high-impact support, rather than generic guidance. AI in schools offers a revolutionary approach to supporting students' academic, social, and emotional development thereby promoting their mental health. This personalized guidance helps schools address the unique needs of diverse student populations.

Yoshija (2024) and Winkler-Schwartz and Chen (2019) in their study on Artificial Intelligence, found that virtual therapy is modernizing mental health support in school counselling and guidance services. Virtual therapy platforms are enabling schools to provide more accessible, personalized, and effective mental health support to students.

Oliveira et al. (2021) conducted a study on AI Applications and found that VR is another AI application that holds promise for school counselling. VR environments can simulate challenging social situations or provide relaxation exercises, offering students a safe space to practice coping strategies and build resilience. VR facilitates data-driven decision-making in counselling, enabling counsellors to track student progress and tailor interventions to individual needs more effectively. In a related study, Schwarz et al. (2020) and Teibowei and Balogun (2022) revealed that VR exposure therapy supports students with anxiety disorders, PTSD, and phobias, enhancing counselling outcomes. Immersive VR experiences can simulate real-world scenarios, helping students confront and overcome their fears in a safe and controlled environment.

Research and personal experience reveal that mental health issues are increasing rapidly in society. More so, student population in tertiary institutions increases on yearly basis while the numbers of counsellors remain the same for many years increasing workload which can affect counsellor effectiveness. The counsellor needs assistance to cope with wide variety of students, work pressure and deliver results timely and efficiently too. This study aims to address this issue by conducting a thorough research on the efficacy of virtual reality therapy on mental health counselling of tertiary education students in Bayelsa State, Nigeria.

Objectives of the Study

The objectives of the study include the following:

1. To evaluate the efficacy of VRT on mental health of tertiary education students in Bayelsa State, Nigeria.
2. To determine the influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria.

Research Questions

1. What is the effect of VRT on mental health of tertiary education students in Bayelsa State, Nigeria?
2. Is there any influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria?

Hypotheses

1. VRT does not have significant effect on mental health of tertiary education students in Bayelsa State, Nigeria.
2. There is no significant influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria.

METHODOLOGY

The study adopted the quasi experimental non-equivalent group pre-test post-test design. The design was adopted because it can be used to test hypotheses concerning cause and effect and has the advantage of testing the result obtained from the post-test in order to analyze the effectiveness or otherwise of the treatment when compared with the control group pre-test. De-Rue et al. (2012) posit that quasi experimental design is used to estimate the impact of an intervention on its population without random assignment. Quasi experimental design, according to Shuttleworth (2018) is the most accurate form of experimental research in that it tries to prove or disprove a hypothesis mathematically with statistical analysis. Quasi experimental design is used in this study because it tries to prove or disprove a hypothesis mathematically with statistical analysis.

Population of the study consisted of 224 students of Federal University Otuoke, who showed symptoms of mental health problems, and were undergoing therapy at the Counselling unit of the University. A sample of 60 students was selected through purposive sampling technique comprising 30 males and 30 females. The instruments for data collection comprised of the Patient Health Questionnaire–9 (PHQ-9) developed by Spitzer, Williams and Kroenke (1999) and Mental Health Inventory-18 (MHI) by Veit and Ware (1983) which were adapted for the study. The PHQ-9 is a 9-item self-administered tool used to screen for depression and other mental health disorders. Major depression is diagnosed if five or more of the nine depressive symptom criteria have been present at least for two weeks. The MHI-18 made up of 18 items. The instruments are measured on a four point scale of 1 (Not at all), 2 (Several days), 3 (More than half the days) and 4 (Nearly every day) for the PHQ-9 and 1 (Strongly agree), 2 (Agree), 3 (Disagree) and 4 (Strongly Disagree) for the MHI-18. The instruments were used both for pre-test and post-test. To ascertain validity, the instrument was presented to three experts in Psychology, Guidance and Counselling and Measurement and Evaluation from the Faculty of Education, Federal University Otuoke. To ascertain reliability, a pilot testing of the instrument was conducted with 15 students who showed symptoms of mental health issues in Federal University Otuoke, who were not part of the sample. Test-retest method was used to obtain the coefficients (r). After an interval of two weeks, a second test was administered on the same 15 students. The data was analyzed using Pearson Product Moment Correlation. The coefficients obtained were 0.85 and 0.88 for PHQ-9 and MHI-18 respectively which confirmed the instruments reliability for use in the study.

Treatment was done in three phases of pre-test, treatment and post-test. The pre-test phase consisted of informing participants about the essence of the exercise and administering the two instruments to obtain their pre-test scores. The treatment session was done for a period of eight consecutive weeks involving only the experimental group. Each session lasted for a period of one hour of VRT. The researcher conducted a post-test by administering the instruments to the two groups to determine the effect of VRT. The result of the pre-test mean scores of respondents' mental health was compared for effects. The extent of mental health symptoms mean score was used to determine the effect of the VRT intervention. Data were analyzed using mean and standard deviation to answer research questions while the hypotheses were tested using independent sampled t-test statistics.

RESULTS

Research Question 1: What is the effect of VRT on mental health of tertiary education students in Bayelsa State, Nigeria?

Table 1: Mean score of Pre-test and Post-test effect of VRT on mental health of tertiary education students in Bayelsa State, Nigeria

Variable	Group	N	Mean	Std. Dev.
Virtual Reality Therapy (VRT)	Pre-test	30	52.175	19.3221
	Post-test	30	8.325	5.66445

Table 1 shows that the calculated mean scores of the pre-test and post-test were 52.175 and 8.325 respectively. The result indicates a significant reduction in mental health symptoms after exposure to VRT as shown by the pre-test and post-test mean scores. The reduction in mean by 43.83 implies that VRT was effective in mental health of tertiary education students in Bayelsa State, Nigeria.

Research Question 2: What is the influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria.

Table 2: Pre-test and Post-test Mean Score on the influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria

Technique	Gender	N	Pre-test Mean	Post-test Mean	Std. Dev	Lost Mean
VRT	Male	15	22.075	5.75	19.157	16.325
	Female	15	30.1	2.575	19.396	27.35

Table 2 shows that male respondents had Pre-test Mean score of 22.075 and Post-test mean of 5.75 while female respondents had a Pre-test Mean score of 30.1 and Post-test Mean score of 2.575. Lost mean for males was 16.325 while lost mean for females was 27.35 showing that there is a significant difference between the effectiveness of VRT on mental health of male and female tertiary education students in Bayelsa State, Nigeria.

Hypothesis 1: VRT does not have significant effect on mental health of tertiary education students in Bayelsa State, Nigeria.

Table 3: Independent Sampled t-test statistics on effect of VRT on mental health of tertiary education students in Bayelsa State, Nigeria

Variable	Group	N	Mean	Std. Dev	Df	t-cal	p-value	Decision
VRT	**Pre-test**	30	52.175	19.3221	28	6.898	0.00	Rejected
	Post-test	30	8.325	5.66445				

Table 3 shows that the p-value of 0.00 is less than 0.05 alpha level of significance with t-cal of 6.898 and Df of 28. This shows that there was a significant effect of VRT on mental health of tertiary education students in Bayelsa State, Nigeria. Therefore, the null hypothesis which stated that VRT does not have significant effect on mental health of tertiary education students in Bayelsa State, Nigeria is rejected.

Hypothesis 2: There is no significant influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria.

Table 4: Independent Sampled t-test statistics on the influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria

Variable	N	Mean	SD	DF	t-cal	t-crit	Remark
Male	15	45.6	19.157	28	5.582	1.96	Significant
Female	15	53.25	19.396				

Table 4 shows that the calculated t-value of 5.582 is greater than the t-critical value of 1.96. This shows that there was a significant influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria. The influence is more on female gender than male. Therefore, the null hypothesis, which stated that there is no significant influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria is rejected.

DISCUSSIONS OF FINDINGS

The finding of the study based on research question one and hypothesis one indicated that there was a significant effect of VRT on mental health of tertiary education students in Bayelsa State, Nigeria. Therefore, the null hypothesis which stated that VRT does not have significant effect on mental health of tertiary education students in Bayelsa State, Nigeria was rejected.

The finding is in tandem with Yoshija (2024) and Winkler-Schwartz and Chen (2019) in their study on Artificial Intelligence found that virtual therapy is modernizing mental health support in school counselling and guidance services. Virtual therapy platforms are enabling schools to provide more accessible, personalized, and effective mental health support to students. AI-driven chatbots and virtual assistants are offering students instant support and guidance, helping them navigate mental health concerns, such as anxiety, depression, and stress. The finding also agrees with Schwarz et al. (2020) who revealed that VR exposure therapy supports students with anxiety disorders, PTSD, and phobias, enhancing counselling outcomes. Immersive VR experiences can simulate real-world scenarios, helping students confront and overcome their fears in a safe and controlled environment. The similarity in findings can be attributed to the fact that VR environments can simulate challenging social situations or provide relaxation exercises, offering students a safe space to practice coping strategies and build resilience. They also enable counsellors reach out to a wide range of clients at the same time offering assistance with short periods.

The findings of the study based on research question two and hypothesis two indicated that there was a significant influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria. Therefore, the null hypothesis which stated that there is no significant influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria is rejected.

The finding is supported by Winkler-Schwartz and Chen (2019) who conducted a study on the impact of AI on the effectiveness of mental health support services in schools and found significant positive relationship between gender and effectiveness of mental support services in schools. The finding corroborates with Teibowei (2025) study on efficacy of financial therapy intervention on financial stress and mental well-being of families in Yenagoa Metropolis. The study found that client age and gender contributed significantly to the mental health of client as the variables affected clients' reaction to stressful events and also development of coping strategies for stress which contributed significantly to the mental health

of client as the variables affected clients' reaction to stressful events and also development of coping strategies for trauma. In a related study, Uzobo et al. (2022) studied Correlates of Adolescent Depression in Orphanage Homes in Yenagoa City and found that gender had significant influence on development of depression among adolescents, revealing that females suffer depression than their male counterparts.

CONCLUSION

The study concludes that Virtual Reality Therapy significantly contributes to the effectiveness of mental health and that there is significant influence of gender on the effectiveness of VRT on mental health of tertiary education students in Bayelsa State, Nigeria.

RECOMMENDATIONS

Based on the findings of the study, it was recommended that:

1. Educational institutions should embrace personalized AI-driven counselling to enhance students' engagement.
2. Educational institutions should foster continuous professional development, promoting collaboration to create more effective, efficient, and equitable support systems for students.

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