

Cognitive Load as a Predictor of Depression among Undergraduates in Nigerian Universities

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Abstract

In spite of increased mental health care resources at universities, depression rates continue to rise. This study examined cognitive load as a predictor of depression among undergraduate students at Nigerian universities. A correlational survey paradigm was utilized. A total of 1026 first-year students of the Faculty of Education and Pharmaceutical Sciences at the University of Nigeria were included in this study. In the study, 300 undergraduate students [100 males and 200 females] from Nigeria's University of Nigeria were surveyed. The study collected data using the Cognitive Load Questionnaire (CLQ) and Beck's Depression Inventory (BDI). CLQ had a reliability coefficient of 0.93, while BDI had a reliability coefficient of 0.90. Two research assistants administered the instruments to respondents. Simple regression was utilized for the research questions. A Fisher Z-test was used to test hypothesis two, while a linear regression t-test was used to test hypothesis one. In Nigerian universities, cognitive load does not significantly predict depression among undergraduates. Among Nigerian undergraduate students, 2.2% of their depressive symptoms are associated with cognitive load as a result of their gender. Other factors that influence depression among undergraduates in Nigerian universities, such as stress, need to be identified and appropriate measures taken to ameliorate the increasing trend of depression among undergraduates.

Keywords: *Cognitive load, Depression, Undergraduates, Nigerian Universities*

Introduction

In the field of mental health, depression is one of the most common disorders around the globe (Salleh, 2018; Sarokhani et al., 2013). Depression negatively impacts how people feel, think, and act (American Psychiatric Association, 2000). It is characterized by sadness, excessive sleep, loss of appetite, withdrawal from social gatherings and activities once enjoyed, and a low mood. Also, an individual's thoughts, behavior, motivation, feelings, and sense of well-being can be impacted by mental health issues. According to Aqeel et al. (2022), students' learning will negatively impact their mental well-being, leading to mental health issues like depression. As human beings, depression can affect the way we perceive ourselves as well as the world around us in a variety of ways (Stankovska et al., 2020). Research has long explored the interaction between cognition and emotion in major depressive disorder (MDD) (Cambridge et al., 2018). Depressed individuals may experience sadness, hopelessness, or despair, but these aren't the only symptoms. Aalbers et al (2019) suggest depression can contribute to sorrow, hopelessness, or despair. In addition to causing alcoholism and suicide, depression negatively impacts attention, memory, and decision-making capabilities (Gvion & Levi-Belz, 2018).

To gain a better understanding of MDD, clinicians and researchers have focused on cognitive processes and depressive cognition (Zuckerman et al., 2022). Depression can be

characterized by a manifestation of negative self-concept, recurrent and uncontrollable negative thoughts. Depressive episodes may not only be correlated with cognitive biases, but may also increase vulnerability to depression onset and recurrence (Platt et al., 2017). The symptoms include sadness, difficulty thinking and concentrating, as well as an increase or decrease in appetite and sleeping time (Fekadu et al., 2017). Depression can cause feelings of rejection, despair, and even suicidal thoughts (De-Zwart et al., 2019). Moods, behaviour, and overall health are affected by depression. The result is prolonged sadness, emptiness, and hopelessness (Dunn et al., 2015).

Previous studies indicate that university undergraduate students have a higher prevalence of depressive symptoms than the general population (Wathelet et al., 2020). As a student, academic stress, heavy workloads, examination anxiety and financial worries are some of the most prevalent concerns (Frankham et al., 2020) and exposure to patient suffering are all factors implicated in psychological morbidity (Ibrahimnet et al. 2013); abuse and maltreatment of students (Cook et al, 2014). Students suffering from depression are more likely to engage in drug abuse or manifest decreased compassion and suicidal ideation (Pillay, Ramlall & Burns, 2016). Depressive disorders can become serious when they last for a long time. Depression can lead to suicidal thoughts or suicide (Parvin et al., 2019). High cognitive load is an important factor in depression in undergraduates (Hawthorne et al, 2019).

Cognitive load measures the sum of intellectual exertion devoted to solving a problem that is not automatic (Hinman, 2018). According to Zsidó et al. (2022) cognitive load equals attentional capture divided by the time allowed to perform a task. Working memory capacity depends on the type of task and how much attention is required for it to be completed (Sepp et al., 2019; Sweller, 2020). Working memory capacity measures how much information can be held at a time. Working memory overload can increase cognitive load. A working memory is a cognitive system that holds information temporarily. Working memory can be affected by the amount of credit load and academic pressure undergraduates face.

Working memory (WM) is a brain function that manages information in real time. Almost everything we do when learning is affected by it. As a result of their small capacity and short duration, human working memories are susceptible to cognitive load and overload (De Jong, 2010). The amount of academic work students faces, particularly in medical school, has always been viewed as a source of stress. Among university undergraduates, heavy academic workload dominates 90% of the top ten stressors according to Weerasinghe et al. (2012). It is possible to experience stress as a result of academic workload or cognitive load. Having a heavy cognitive load and academic workload can lead to nervousness, frustration, and anxiety, which could lead to depression if prolonged. In the absence of proper management, this could lead to depression.

Cognitive load and depression in university students are strongly influenced by gender. As a socio-cultural concept, gender describes the expectations of society based on a person's gender (Owodunni, 2009). According to Adelowokan (2005), gender is defined by practices, symbols, representations, social standards, and values defining appropriate roles. According to Okeke (2003) and Ezeh (2013), gender refers to any physical or behavioural difference between males and females. Accordingly, gender is acquired through a complex individual social process that is not inherent, but learnt and outlived. Males and females have varying levels of manifestations of mental health issues. Women are more likely to manifest depressive and anxiety symptoms than men (Nolen, 2009). It is suggested that mental health care and counselling should be conducted to thoroughly screen and assist individuals with depressive symptoms.

In spite of increased awareness about mental health care, depression rates among university students continue to rise (Pedersen & Paves, 2014). Cognitive load and depression are examined in this research. Cognitive load is examined as a depression predictor. In Nigeria, less has been done on this subject due to stigmatization. Depression is on the rise, especially among undergraduates. Many students struggle with frustration with lecturers, academic workload, understanding complex learning materials, assimilating broad lesson content, meeting deadlines, finances, and social issues. Mental health experts and related professionals can use the statistics on depression in Nigeria to guide their work.

Research Questions

1. What is the predictive power of cognitive load on depression of undergraduates in Nigerian Universities?
2. What is the predictive power of cognitive load on depression of undergraduates in Nigerian Universities as moderated by gender?

Hypotheses

1. There is no significant predictive power of cognitive load on depression among undergraduates in Nigerian Universities.
2. There is no significant predictive power of cognitive load on depression of undergraduate in Nigerian Universities as moderated by gender.

Method

The research design used in this study was a correlation survey research design. Seeram (2019) states that correlation survey designs are used in order to determine whether or not there is a relationship between two or more variables within the sample. Studies of this type usually indicate how the variables are related while trying to determine their magnitude and direction. To establish a relationship between cognitive load and depression, the researchers employed a correlation design. This study involved 1026 first-year students from the Faculty of Education and Pharmaceutical Sciences at the University of Nigeria. Among the nine faculties at the University of Nigeria Nsukka, two faculties were selected by purposeful sampling. With the help of a multistage sampling procedure, 300 first year students were selected from the two faculties (100 boys and 200 girls). For the purpose of drawing students from the two faculties, proportionate stratified sampling was used. The study involved 300 respondents, 100 from the Faculty of Pharmacy and 200 from the Education Faculty.

Two instruments were employed in this research: the Cognitive Load Questionnaire (CLQ) and Beck's Depression Inventory (BDI). Cognitive load information was elicited by the CLQ. There were two sections: A and B. The researcher gathered personal information from the respondent in section A, while 20 items were developed from the literature by the researcher following a standard procedure in section B. A number of steps were involved, including identification of the concept, construction of the items, validity testing, and reliability testing of the items. On the other hand, the BDI elicited information about depression. There were also two sections in the BDI; A and B. Students' personal information was collected in section A, while depression symptoms were collected in section B using 20 items adopted from Beck's depression inventory. With a numerical value of 4,3,2, and 1, we have Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD), indicating our levels of agreement in the CLQ and BDI instruments. In order to establish the instruments' reliability, a trial test procedure was conducted. A reliability coefficient of 0.93 was obtained for CLQ and 0.90 for BDI. Two research assistants assisted the researchers in administering the instruments to the

respondents. In the data analysis, simple regression was used for the research questions. While t-test was used for hypothesis one, the Fisher Z-test was used for hypothesis two.

Results

Table 1: simple regression on the prediction of cognitive load on depression

Model R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.388 ^a	.150	.148
			6.801

According to the data in Table 1, there was a correlation coefficient of 0.388 between cognitive load and depression of undergraduate students in Nigerian Universities. Based on the findings of this study, it appears that there is a positive low relationship between cognitive load and depression among undergraduate students at Nigerian universities. As a result of the analysis, it was also discovered that the coefficient of determination (R^2) associated with the correlation coefficient of 0.380 was 0.150. It has been found that the coefficient of determination (R^2) of 0.150 indicates that cognitive load accounts for 15% of depression among undergraduate students in Nigerian universities. The results of the research indicate that 85% of the variation in depression among undergraduate students in Nigerian Universities can be attributed to factors other than cognitive load as the cause of the depression.

Table 2: simple regression on the prediction of cognitive load on depression based on gender

Model	Gender	N	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	Male	100	.250 ^a	.063	.060	8.963
2	Female	200	.291 ^a	.085	.080	8.21708

The data presented in Table 2 indicate that for male and female undergraduates, respectively, the correlation coefficients (r) between cognitive load and depression were .250 and .291, and that the coefficients of determinant (R^2) were .063 and .085 based on R^2 for the relationship between cognitive load and depression. Based on the coefficients of determinant (R^2) of .063 and .085, it can be concluded that 6.3% and 8.5% of the variability in depression of undergraduate students across Nigerian universities can be attributed to male undergraduates and female undergraduates, respectively. In terms of cognitive load, the difference in the variation of male and female undergraduates, as predicted by cognitive load, is 2.2% in favor of female undergraduates. As a result, the undergraduate gender moderates 2.2% of the relationship between cognitive load and depression of undergraduates in Nigerian universities as measured by the moderated effect of gender.

Table 3: t-test associated with simple regression on the prediction of cognitive load on depression

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	30.896	2.853		10.828	.000
	Cognitive load	.376	.052	.388	7.265	.000

Using the data from Table 3, we can see that the t-value for the model is 7.265 and the probability value for the model is 0.00. In this study, 0.00 was found to be significant because it is significantly less than 0.05, which made it significant. Therefore, the null hypothesis that there is no significant relationship between cognitive load and depression was rejected. It is therefore evident that cognitive load is a significant predictor of depression among undergraduate students at Nigerian universities.

Table 4: Fisher z-transformation on the prediction of cognitive load on depression based on gender

Model	Gender	N	R	R ²	Fisher's z-score	Sig
1	Male	100	.250 ^a	.063	0.28	.61
2	Female	200	.291 ^a	.085		

In Table 4, we were able to obtain a Fisher's z transformation score of 0.28 and a probability value of 0.61 from the analysis. Thus, it was accepted that the null hypothesis of no significant prediction of cognitive load on depression of undergraduate students in Nigerian universities as moderated by gender was true. The reason behind this is that the probability value of 0.61 was greater than the significance level of 0.05 alpha level at the level of significance. In light of this, it can be concluded that there is no significant correlation between cognitive load on depression among undergraduate students in Nigerian universities as moderated by gender.

Discussion

The current study indicates a significant association between cognitive load and depression among undergraduate students in Nigerian universities, but the correlation is low. In Nigerian universities, cognitive load has very little effect on depression among undergraduate students. The cognitive load of students does not really predict whether they will suffer from depression. Depression among undergraduate students at Nigerian universities is also heavily influenced by other factors. Additionally, academic content and teaching methods may not impose much cognitive stress on students, or the method of teaching (lecture) may not be highly stressful. Furthermore, students may follow the academic calendar ardently to prepare for upcoming academic activities. Consequently, it does not pose a threat to students' mental health. The findings of this study align with Rude, Valdez, Odom & Ebrahimi (2003). Resolving ambiguous verbal information predicts subsequent major depressions in cognitive models of depression. Negative biases on the SST only predicted subsequent major depression when administered under cognitive load. We can observe cognitive biases that contribute to depression vulnerability when volitional control is reduced. Furthermore, the study by Geral, Haffel, Lyn, and Abramson (2007) supports these findings.

It is a basic tenet of the dual process theory that the explicit cognitive style of a person is a greater vulnerability factor than the implicit cognitive style of a person when it comes to predicting future depressive symptoms. As a result of the overloading of the brain caused by anxiety, the current findings is not in line with Sarigiannidis, Kirk, Roiser and Robinson (2020). Among undergraduate students in Nigerian universities, gender moderated 2.2% of the association between intellectual load and depression. This relationship is influenced by gender. The hypothesis showed that there is no substantial prediction of cognitive load on depression among undergraduate students in Nigerian universities moderated by gender. This implies that cognitive load has very little effect on depression among male and female undergraduate

students in Nigerian universities. Depression may not be significantly influenced by the cognitive load of males and females. Other factors may also have a substantial impact on males and females at Nigerian universities. There is also a possibility that the learning environment does not predispose the male and female students to a high cognitive load or the method of teaching (lecture) does not pose a high cognitive load. It is also possible that students follow the academic calendar ardently in order to prepare for academic activities. Therefore, it does not pose a mental health challenge to students. There was a good deal of agreement between the findings of this study and those of Mi Li, Shengfu Lu, Gang Wang, and Ning Zhong (2015). It has been found that women are more likely to suffer from depression over a longer period of time, are more likely to relapse, and are more likely to suffer from major depression in the future, due to these findings. According to the present study, female students in the sample also had poorer mental health than male students, which is in line with Ezenna, Michael, Stephen, Mark, and Croix (2017).

Conclusion

Using these findings as a basis for conclusions, it can be said that cognitive load has little or no effect on depression and suicidal ideation of undergraduates at University of Nigeria Nsukka. Thus, it was concluded that cognitive load did not significantly differ between males and females in terms of its predictive power on depression and suicidal ideation among University of Nigeria Nsukka undergraduates. It is possible that academic load has other subtle ways in which it impacts on students' mental health. Thus, academic stress, financial issues, emotional and psychological challenges may contribute to suicidal ideation and depression among undergraduates in Nigeria. It is recommended that future research should focus on the management of academic workload and optimization of mental health among university students.

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