



Suicidal Behaviour Among Nigerian Undergraduates: Associations with Gambling Disorder and Emotional Dysregulation

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Abstract

Background: There is a high prevalence of suicidal behavior among Nigerian youths. However, the connections between suicidal behavior and precipitating factors, such as gambling disorder and emotional dysregulation (ED) in this population, are not well researched.

Objectives: The present study examined the associations between gambling disorder, ED, and suicidal behavior in Nigerian university undergraduate students.

Methods: This study was carried out during October 2020 - April 2021 on 1338 undergraduates with a mean \pm SD age of 19.84 ± 3.22 years selected using random and purposive sampling for the universities and participants respectively. Participants responded to the Attitudes Towards Gambling Scale, Difficulties in Emotion Regulation Scale, and Redeemer's University Suicidality Scale. Descriptive statistics (simple percentages) and inferential statistics (Pearson's correlation and regression analysis) were used for data analysis.

Results: The Pearson's correlation revealed that suicidal behaviour had significant positive correlations with the nonacceptance of emotional responses or distress ($r = 0.22, P = 0$), difficulties engaging in goal-directed behaviours ($r = 0.21, P = 0$), difficulties in impulse control ($r = 0.27, P = 0$), the lack of emotional awareness ($r = 0.14, P = 0$), limited access to emotional regulation strategies ($r = 0.33, P = 0$), the lack of emotional clarity ($r = 0.32, P = 0$), and difficulties in emotional regulation ($r = 0.4, P = 0$). Problematic gambling (PG) independently predicted suicidal behavior, while PG and ED dimensions jointly predicted suicidal behavior. The ED dimensions contributed 15% incrementally to the prediction of suicidal behavior and beyond the 2% variance accounted for PG in undergraduates.

Conclusions: Our results showed positive links between PG, ED, and suicidal behavior among Nigerian undergraduates. It suggests that the combination of PG and ED increases the severity of suicidal behavior among students.

Keywords: Emotional Dysregulation, Gambling Disorder, Nigeria, Suicidal Behavior, Undergraduates

1. Background

Suicide is one of the top ten causes of mortality in the overall population (1) and the second or third most common cause of death among people aged 15 - 34 years globally (2, 3). More than 800,000 people die annually by suicide worldwide, with estimates that for every suicide death, more than 20 others attempt suicide (4, 5). Statistics show that one person commits suicide every 40 seconds (4), and reports vary by country and location (6). Suicide connotes any self-initiated or committed action with the aim or expectation of dying, including active or passive self-inflicted acts (7). Three main suicidal behav-

iors are ideation, planning, and attempt (4). Suicidal behavior among adolescents has become a significant public health concern in many parts of the world due to its increased incidence (8, 9). Suicide deaths in Nigeria, as in many other countries, are augmenting at an alarming rate (10-12). In 2019, 3.5 suicide deaths were reported per 100,000 Nigerian population (13). Most deaths by suicide occur in the rural communities (14) of developing countries, such as Nigeria (10), and are primarily unreported (5). According to the World Health Organization (4) ranking, Nigeria tops African countries and ranks fifth in the countries with acute suicide cases worldwide. With 24,000,000 cases, South Korea leads the pack, followed by Russia

(18,000,000), India (16,000,000), and Japan (15,400,000) (15).

Suicidal behavior and gambling disorders have been linked in studies (16, 17). Gambling is a complicated phenomenon (18), influenced by genetic disposition (19), a family history of gambling or substance-use disorder (20), personality traits (21), socio-demographic and exposure variables (22), and hostile childhood events (23). Gambling is a common way for Nigerian undergraduates to make ends meet (12). This circumstance frequently predisposes gamblers to become pathological/compulsive gamblers (24), who exhibit symptoms such as an overwhelming drive to keep gambling despite its toll on their lives (25, 26).

Emotional dysregulation (ED) is a key aspect of the gambling problem (27, 28). ED is a multidimensional term that includes maladaptive responses to unpleasant emotional states and impulsivity (29). In addition, PG has been associated with impulsivity, particularly its emotional components (21). According to the evidence, emotion-driven impulsivity and ED are intimately linked (30). Compulsive gambling might be motivated by an impulsive need to avoid undesirable mood states (31). As a result, people with PG may use gambling to regulate their emotions (32). Success in lowering bad feelings through gambling involvement becomes a source of negative reinforcement, which keeps gambling going (33). Therefore, gambling to cope with negative emotions is associated with greater severity and poorer gambling outcomes (28, 32). Individuals with gambling disorder (IGD) are more likely to use maladaptive emotional control approaches, such as emotional suppression (34).

Suicidal behavior is pathological and is influenced by various biological, psychological, social, cultural, and spiritual variables. However, the association and pattern of the interaction between gambling problems, ED, and suicidal behavior remain unclear (35). They have not been studied sufficiently in Nigeria despite the high frequency of suicide (12), particularly among young people.

2. Objectives

This study evaluates the relationships between Nigerian students' gambling disorder, ED, and suicidal behavior. We hypothesized that the suicide behavior of participants would be significantly and jointly predicted by gambling disorder and ED. We also hypothesized that ED, in addition to gambling disorder, would have a significant incremental predictive influence on the severity of suicide behavior in the Nigerian university undergraduate students population.

3. Methods

3.1. Participants

The target of the study was selected university undergraduates in Osun state, southwestern Nigeria. The data were collected during October 2020 - April 2021, and a multi-stage sampling procedure was adopted in this study. Four universities were selected through simple random sampling in the first stage (using the ballot method). The clustered sampling method was employed at the second stage to ensure representativeness in selecting respondents from different already existing clusters. To this aim, various existing sub-groups to which the population already belonged in the chosen institutions were used. The subgroups used as clusters were gender, faculty, and levels of study. To ensure that the identified clusters were adequately sampled, the purposive sampling technique was used at the last stage in selecting 1338 respondents (mean \pm SD age of 19.84 ± 3.22 years) for the study.

3.2. Measures

Attitudes Towards Gambling Scale (ATGS-8), proposed by Orford et al. (36), is an 8-item variation of the original 14-item version of the British Gambling Prevalence Survey instrument developed in 2007 to measure attitudes towards gambling (36). The ATGS-8 items were assessed based on a Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). Four items (1, 4, 6, 7) were scored backward, and the total ATGS-8 score with a range of 8 - 40 was obtained as the sum of eight components. A score of 24 reflects a neutral attitude toward gambling and represents the middle. Scores above 24 suggest an average favorable attitude toward gambling, while scores below 24 indicate an unfavorable attitude toward gambling. In the British sample, the derived Cronbach's alpha value was 0.76, while item-total correlations ranged from 0.39 to 0.58 (36, 37).

Difficulties in Emotion Regulation Scale (DERS) by Gratz and Roemer (38) is a 36-item measure of ED. Each item is scored based on a 5-point Likert scale (almost never to almost always). DERS has six dimensions: Nonacceptance of emotional responses, difficulties engaging in goal-directed behaviors, difficulties in impulse control, the lack of emotional awareness, limited emotional regulation strategies, and the lack of emotional clarity. Our pilot study yielded a validity coefficient of 0.62 between the DERS and SIDES Affect Dysregulation Scale (39). The DERS has adequate psychometric properties in adults and adolescents (40).

Redeemer's University Suicidality Scale (RUSS) is a 19-item single-factor measure of suicidal behavior developed by the authors. An earlier study of the development and validation of RUSS involved initial item generation, expert

appraisal (content validity) of the initial pool of items, and exploratory factor analysis for item purification. The internal consistency of Cronbach's alpha of 0.93 was reported for the RUSS. A satisfactory validity coefficient ($r = 0.881$, $P = 0$) was observed between RUSS and The Suicide Ideation Scale by Rudd (41) and ($r = 0.605$, $P = 0$) between RUSS and General Health Questionnaire (42). This finding of the pilot study showed that RUSS was valid as a diagnostic tool for measuring suicidality among the general Nigerian population.

3.3. Statistical Analysis

The Statistical Package of Social Sciences (SPSS) version 23 was used to evaluate the data collected. The demographic characteristics of respondents were organized, summarised, and described using descriptive statistics (frequency and percentage), whereas the hypotheses were tested using inferential statistics (regression analysis).

3.4. Informed Consent

The respondents signed informed consent before administering the instruments. The study's goal was communicated to all participants, and only those who were willing to participate were invited to join. The respondents could leave at any point throughout the survey because participation was optional, and confidentiality was guaranteed.

4. Results

The socio-demographic characteristics of the participants in this study are summarized in Table 1.

The relationships between gambling, ED, and suicidal behavior are summarized in Table 2. A significant positive correlation was observed between gambling and suicidal behavior [$r(1336) = 0.14$, $P < 0.01$]. Moreover, suicidal behavior had significant positive correlations with nonacceptance of emotional responses or distress [$r(1336) = 0.22$, $P = 0$], difficulties engaging in goal-directed behaviours [$r(1336) = 0.21$, $P < 0.01$], difficulties in impulse control [$r(1336) = 0.27$, $P < 0.01$], the lack of emotional awareness [$r(1336) = 0.14$, $P < 0.01$], limited access to emotional regulation strategies [$r(1336) = 0.33$, $P < 0.01$], the lack of emotional clarity [$r(1336) = 0.32$], and difficulties in emotional regulation total [$r(1336) = 0.4$, $P < 0.01$]. Furthermore, a significant positive correlation was observed between age and suicidal behavior [$r(1336) = 0.13$, $P < 0.01$]. The implication of this finding is that suicidal behavior severities among participants increase with a rise in problematic gambling (PG) and difficulties in emotional regulation. Table 2 shows that the more the chronological age, the greater the likelihood of suicidal behavior.

Table 1. Socio-demographic Characteristics of Participants ^a

Variables	Values
Gender	
Male	512 (38.3)
Female	826 (61.7)
Total	1338 (100)
Age (mean \pm SD)	19.84 \pm 3.22
University	
Public Owned University	505 (37.7)
Privately Owned University	374 (28)
Total	1338 (100)
Level of education	
level 100	409 (30.6)
level 200	241 (18)
level 300	363 (27.1)
level 400	276 (20.6)
level 500	49 (3.7)
Marital status	
Single	1302 (97.3)
Married	33 (2.5)
Engaged	3 (0.2)
Total	1338 (100)

^a Values are expressed as No. (%) unless otherwise indicated.

A regression analysis, summarised in Table 3, was carried out to test the first hypothesis. The results demonstrated that PG independently predicted suicidal behavior severity by 14.8%. Further analysis revealed that PG and the dimensions of ED had a joint significant predictive influence on suicidal behavior severity in participants [$F(7, 1337) = 39.12$, $P = 0$]. The analysis suggested that PG and ED explained a 17.1% variance of suicidal behavior severity among the undergraduates. Further analysis of the joint regression showed that PG had no significant independent influence on suicidal behavior ($\beta = 0.04$, $P = 0.129$). The dimensions of ED that had a significant independent predictive influence on suicidal behavior were awareness ($\beta = 0.155$, $P = 0$), strategies ($\beta = 0.218$, $P = 0$), and clarity ($\beta = 0.161$, $P = 0$).

Hierarchical multiple regression was conducted to determine whether the factors of ED (nonacceptance of emotional responses or distress, difficulties engaging in goal-directed behaviors, difficulties in impulse control, the lack of emotional awareness, limited access to emotional regulation strategies, and the lack of emotional clarity) contributed incrementally to the prediction of suicidal behav-

Table 2. Pearson's Correlation Matrix Shows the Relationships Between Gambling, Emotional Dysregulation, and Suicidal Behavior (N = 1338)^a

Variables	1	2	3	4	5	6	7	8	9	10
1. Gambling	1									
2. Nonacceptance of emotional responses	0.09 **	1								
3. Difficulties in Goal-directed behavior	-0.04	0.55 **	1							
4. Difficulties in impulse control	0.1 **	0.57 **	0.61 **	1						
5. Lack of emotional awareness	0.19 **	-0.28 **	-0.23 **	-0.15 **	1					
6. Limited emotional regulation strategies	0.17 **	0.64 **	0.61 **	0.68 **	-0.14 **	1				
7. Lack of emotional clarity	0.17 **	0.38 **	0.36 **	0.38 **	0.24 **	0.41 **	1			
8. Difficulties in emotional regulation	0.18 **	0.75 **	0.72 **	0.8 **	0.1 **	0.85 **	0.67 **	1		
9. Age	0.24 **	0.05	-0.00	0.04	0.09 **	0.08 **	0.05	0.09 **	1	
10. Suicidal behavior	0.14 **	0.22 **	0.21 **	0.27 **	0.14 **	0.33 **	0.32 **	0.4 **	0.13 **	1
Mean	21.04	15.15	13.57	15.06	16.42	19.75	13.12	93.08	19.86	33.83
SD	5.04	5.82	4.31	5.09	5.32	6.73	3.96	20.51	2.95	15.85

^a **P < 0.01, *P < 0.05**Table 3.** Multiple Regression Analysis of the Joint Prediction of Problematic Gambling (PG) and Emotional Dysregulation (ED) on Suicidal Behavior in University Undergraduates (N = 1337)

Variables	PG and ED Total				PG and Dimensions of ED			
	B	β	t	P-Value	B	β	t	P-Value
(Constant)	2.791		1.213	0.225	1.449		0.574	0.566
PG	0.234	0.074	2.892	0.004	0.126	0.04	1.52	0.129
ED composite score	0.281	0.363	14.113	0.000				
Nonacceptance of emotional responses					0.087	0.032	0.89	0.373
Difficulties engaging in goal-directed behaviors					-0.008	-0.002	-0.058	0.954
Difficulty in Impulse control					0.159	0.051	1.325	0.185
Lack of emotional awareness					0.461	0.155	5.289	0.000
Limited emotional regulation strategies					0.513	0.218	5.486	0.000
Lack of emotional clarity					0.642	0.161	5.207	0.000
R	0.384					0.413		
R²	14.8					0.171		
F-ratio	115.6					39.12		
P-value	0.000					0.000		

ior above PG alone.

As summarised in Table 4, the composite score of PG was entered in step 1. Nonacceptance of emotional responses or distress, difficulties engaging in goal-directed behaviors, and difficulties in impulse control were entered in step 2. The lack of emotional awareness, limited access to emotional regulation strategies, and the lack of emotional clarity were entered in step 3. Results indicated that PG explained 2% of the variance in suicidal behavior ($R^2 = 0.02$, $P < 0.01$), nonacceptance of emotional responses or distress, difficulties engaging in goal-directed behaviors,

and difficulties in impulse control explained an incremental 7% of the variance in suicidal behavior, ($\Delta R^2 = 0.07$, $P < 0.01$) above PG. Furthermore, the lack of emotional awareness, limited access to emotional regulation strategies, and lack of emotional clarity explained an incremental 8% of the variance in suicidal behavior scores ($\Delta R^2 = 0.08$, $P < 0.01$) above the variance accounted for by PG, nonacceptance of emotional responses or distress, difficulties engaging in goal-directed behaviors, and difficulties in impulse control.

This result suggests that undergraduates with some

factors of ED are more likely to manifest a higher level of suicidal behavior than those with PG alone. Finally, undergraduates who display all the factors of ED (the lack of emotional awareness, strategies, and the lack of emotional clarity) will report a higher level of suicidal behavior than those who present with PG and a few of the factors of ED. In other words, additional factors of ED contribute incrementally to the prediction of the levels of suicidal behavior above the prediction score explained by PG alone among the undergraduates. According to the mentioned finding, it could be concluded that ED has significant incremental predictive influence over and above that of PG on the severity of suicidal behavior among university undergraduates in Osun state, Nigeria.

5. Discussion

This study revealed the significant predictive role of PG and ED for suicidal behavior among Nigerian undergraduate students. Moreover, we found significant positive correlations between gambling, ED, and suicidal behavior. The reported positive links between gambling disorder and suicidal behavior are consistent with the literature. Problematic gambling has been marked by a loss of control over gambling behavior (43) and is associated with numerous sequelae, including psychiatric problems (44). Precise prevalence estimates of the relationships between PG and suicidal behavior are unclear due to variances in sample makeup, the measurement of suicide factors, and nosological changes connected to PG (17). Suicidal ideation and attempts related to gambling were reported by 25.6% of callers to gambling helplines (17). Suicidal thoughts and attempt rates ranged from 49% to more than 80% (45, 46). Studies have shown that people with PG had greater rates of suicidal thoughts, planned suicide, and attempted suicide than the general population (16, 17).

Our findings on the link between ED and suicidal behavior are congruent with the literature. Suicide has been theorized by Baumeister (47) and Shneidman (48) as the ultimate escape from acute emotional agony. Researchers who confirm the association between a tendency to avoid or escape uncomfortable feelings (experiential avoidance) and suicidal ideation support the views of Baumeister and Shneidman (49-51). Similarly, research suggests that if other more adaptable answers to recurring stressful life occurrences are not examined, suicide may be viewed as a way out of emotional anguish (52). Furthermore, the literature supports hypotheses that link problem-solving deficiencies to suicidal thoughts (53). ED diagnosis and symptoms are linked to an increased risk of future suicide attempts (54-58).

Lack of emotional awareness, limited emotional regulation strategies, and the lack of emotional clarity were revealed to have a substantial independent influence on suicidal behavior among the six DERS characteristics studied. This conclusion does not invalidate the positive correlation discovered between other ED characteristics and suicidal behavior. However, it highlights that the linkage and pattern of the relationship between ED and suicidal behavior are complex and confusing (35). Anestis et al. (59) reported that elevated levels of ED were associated with suicidal desire while were inversely correlated with the acquired capability for suicide. As a result, the significant prediction of suicide behavior by the dimension of ED could be due to sample locations and sociocultural situations.

Moreover, theories of the suicide phenomenon and underlying emotional processes are consistent with the multidimensional approach to ED (47, 60). These theories suggest that several aspects of ED are involved in suicidal ideation and behavior (38, 56). Suicide is viewed as a technique of recognizing and validating negative impacts and avoiding self-awareness deficits (47). Likewise, the cry of pain hypothesis (61) proposed that suicidal behavior is a response function under stress. Both models argue that suicide behavior occurs when an extremely negative effect is regarded as intolerable (nonacceptance), and there is a lack of perceived strategies for good emotional control to alleviate the pain (strategies) (62). Therefore, our findings corroborate studies that note suicidal tendencies due to limited access to emotion regulation strategies (63, 64) and nonacceptance of emotional reactions (64).

Miranda et al. (63) previously revealed that the DERS tactics subscale had the strongest relationship with suicidal ideation compared to other DERS domains. There has also been evidence of the link between a low perceived ability to participate in effective coping strategies and a suicide attempt (65). Pisani et al. (66) and Rajappa et al. (67) found that the strategies domain of DERS highly predicted suicide attempts in teenagers. Some empirical investigations have linked the inability to control one's behavior when experiencing extreme effects (impulse subscale of DERS) to a higher risk of suicide. A relationship between impulsivity/impulsive behavioral reaction to distress and suicide attempts has been established (68). In conclusion, the strategies, nonacceptance, and impulse dimensions of ED are supported by empirical evidence as significant characteristics associated with suicide ideation and attempts in teenagers (69).

In our study, ED was found to significantly predict suicidal behavior severity by 15% over and above that of problematic gambling alone. In other words, the combination of problematic gambling and ED results in higher

Table 4. Hierarchical Regression of Gambling and the Factors of Emotional Dysregulation on the Severity of Suicidal Behavior (N = 1337)^a

Variables	Model 1			Model 2			Model 3		
	B	SE.B	β	B	SE.B	β	B	SE.B	β
Gambling	0.45	0.085	0.143						
Nonacceptance of emotional responses				0.234	0.092	0.086			
Difficulties engaging in goal-directed behaviors				0.168	0.131	0.046			
Difficulty impulse control				0.536	0.114	0.172			
Lack of emotional awareness							0.461	0.087	0.155
Limited emotional regulation strategies							0.513	0.093	0.218
Lack of emotional clarity							0.642	0.123	0.161
F			27.88**			33.13**			39.125**
R			0.143			0.301			0.413
R²			0.02			0.09			0.171
Adjusted R²			0.02						
ΔR²						0.07			0.08

^a **P < 0.01, *P < 0.05

suicidal behavior possibilities than each alone. This finding suggests a positive relationship between PG and ED among Nigerian undergraduates. The relationship between pathological gambling and ED has gained some scholarly attention, even though the same cannot be stated in Nigerian studies. In an attempt to explain the psychological aspects behind gambling disease, several authors have suggested that deficits in emotional regulation play a significant role in PG (18, 70).

Some hypotheses indicated that specific components of ED were involved in the psychological functioning deficits of pathological gamblers. According to the somatic marker of addiction (70), poor decision-making in problematic gambling is explained by impairments in emotion processing. The ED component, which includes the incapacity to reflect on one's own and others' interior mental states, sentiments, attitudes, aspirations, beliefs, and emotions, is implicated in some psychopathologies (71). These have also been associated with addictive behaviors, such as gambling (72).

According to research findings, there are inconsistent correlations between PG and ED. Some research failed to show significant correlations between ED and PG (73, 74), while others did (75, 76). Estevez Gutierrez et al. (77) discovered that most DERS subscales were connected to the severity of PG. However, investigations have shown that PG and problems with emotion regulation both predict suicide behavior independently. When the two variables were combined, we observed an increase in the risk of suicide behavior. Although our study did not assess the mecha-

nisms by which PG and ED impact each other, it does support previous research that found an independent positive connection between PG, ED, and suicidal behavior. In addition, Lorains et al. (78) proposed that ED could have a role in linking PG and mental illnesses, such as mood and anxiety disorders.

5.1. Conclusion and Recommendations

The current study focused on the relationships and predictive influences of pathological gambling (PG) and ED on suicidal behavior among Nigerian undergraduates. Our results established positive links between PG, ED, and suicidal behavior. It could be concluded that PG and ED are significant joint and independent predictors of suicidal behavior. Moreover, we concluded that a combination of PG and ED augments the severity of suicidal behavior among undergraduates more than each one alone. These findings underscore the need to assess gambling involvement, problematic gambling, and ED when treating undergraduates presenting with suicidal behavior. More importantly, suicide reduction in university undergraduates should be targeted by relevant authorities with every sense of urgency. To this aim, mental healthcare facilities should, by the act of government, be established and equipped adequately in all tertiary institutions where assessment for psychopathologies, especially depression and suicidal behavior, can be carried out. Appropriate psychological interventions (psychotherapies) should be performed on undergraduates diagnosed with pathological gambling, elevated ED, and suicidal behavior. Finally, for better and

more influential treatments, referrals to psychiatric hospitals should also be made for those at high risk for suicide.

5.2. Limitations

The present research was carried out on undergraduate students in some selected universities in southwestern Nigeria. Considering sociocultural differences in settings outside Nigeria, the findings should be generalized with caution. Furthermore, the mean age of our participants showed that the majority were young adults. Therefore, the relationships found between the variables of interest in this study might be different from other age categories.

Footnotes

Authors' Contribution: Study concept and design: B. A. Analysis and interpretation of data: E. A. and B. A. Drafting of the manuscript: B. A. and E. A. Critical revision of the manuscript for important intellectual content: B. A., E. A., and S. A. Statistical analysis: B. A., S. A., D. K., and E. A.

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

Data Reproducibility: The data presented in this study are openly available in one of the repositories or will be available on request from the corresponding author by this journal representative at any time during submission or after publication. Otherwise, all consequences of possible withdrawal or future retraction will be with the corresponding author.

Ethical Approval: Helsinki Declaration research ethics for human subjects were followed in the present investigation. The Internal Research Ethics Committee of Redeemer's University in Nigeria reviewed the research objectives and planned the procedures. This type of research is exempted from ethical norms (see National Code of Health Research Ethics, National Health Research Ethics Committee of Nigeria, item A in Section B). (nhrec.net/nhrec/wp-content/uploads/2018/10/NCHRE-Aug_07.pdf.)

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Informed Consent: The respondents signed informed consent before the instruments were administered. The aim of the study was communicated to all participants, and only those willing to participate were invited to join. The respondents could leave at any point throughout the survey because participation was optional, and confidentiality was guaranteed.

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