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Impulsivity and Student Well-Being: Implications for Suicide Prevention in Higher Education

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Abstract

Suicide is a leading cause of death among young adults worldwide, and university students face heightened risks due to the unique academic, social, and psychological demands of higher education. Impulsivity, characterized by acting without adequate forethought, has been identified as a critical factor associated with suicidal thoughts and behaviors. This study investigates the relationship between impulsivity and suicidal risk among university students, with the broader aim of informing suicide prevention strategies within higher education. A cross-sectional survey was conducted using standardized psychometric instruments to assess impulsivity and suicidal ideation, alongside socio-demographic variables. Findings revealed a significant positive correlation between impulsivity and suicidal risk, with students reporting higher impulsivity scores more likely to experience suicidal tendencies. Further, gender and socioeconomic background emerged as influential factors, with male students and those from economically disadvantaged groups exhibiting increased vulnerability. These outcomes emphasize the necessity of incorporating targeted mental health interventions into university systems, including early screening for impulsive traits, integration of mental health awareness programs, and expanded access to counseling and support services. By framing impulsivity as a modifiable risk factor, this study highlights the importance of early prevention and intervention in enhancing student well-being. The results contribute to the growing body of global evidence linking psychological traits to suicide risk and highlight the need for evidence-based, context-sensitive approaches within higher education institutions to safeguard student mental health.

Keywords: *Impulsivity, Student well-being, Suicidal risk, Higher education, Mental health*

1. Introduction

Suicide among university students has become a pressing global concern, with young adults in higher education exhibiting elevated rates of self-harm and suicidal ideation compared to non-student peers. In Tanzania, rapid expansion of tertiary enrolment over the past decade has not been matched by commensurate growth in campus mental health resources, leaving many students to manage intense academic expectations, financial burdens, and social transitions with inadequate support. To clarify these pathways, we propose a conceptual framework in which stable impulsivity facets (motor, attention, and non-planning)

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and momentary impulsive surges jointly contribute to suicidal thoughts, with gender and socioeconomic status (SES) moderating each link shown in Figure 1.

Figure 1 visualizes a dual-process model of impulsivity in relation to suicidal ideation. On the left, trait impulsivity is broken into three core facets—motor (acting without thinking), attention (difficulty sustaining focus), and non-planning (lack of future orientation)—that create a baseline vulnerability. On the right, state impulsivity captures real-time spikes in urge strength that can precipitate sudden intensifications of suicidal thinking. Gender and SES are depicted as moderating forces: gender shapes whether impulsive distress expresses through externalizing (e.g., substance use) or internalizing (e.g., rumination) pathways, while low SES amplifies stress-induced impulsive reactions. By mapping these elements together, the model highlights two intervention targets—global screening for high-trait impulsivity and just-in-time supports to curb acute impulsive crises.

Impulsivity is defined as a tendency to act on urges without sufficient deliberation, and has been consistently identified as a key psychological predictor of suicidal thoughts and behaviours. Studies employing the Barratt Impulsiveness Scale (BIS-11) and the Beck Scale for Suicidal Ideation (BSS) report moderate to strong associations between higher impulsivity scores and increased suicidal risk in student samples across varied cultural settings.

Despite this global evidence, cross-cultural validation of psychometric tools and context-specific investigations remain limited in Sub-Saharan African contexts. In particular, Tanzanian universities lack empirical data on how impulsivity interacts with local stressors to influence suicidal ideation, impeding the development of tailored prevention efforts. Gender and socioeconomic status further moderate the impulsivity–suicide link, with male students often exhibiting more pronounced impulsive traits and higher lethality in self-harm attempts. At the same time, financial hardship exacerbates psychological vulnerability among disadvantaged groups. Such multifaceted dynamics underscore the necessity of analyses that integrate individual traits with socio-demographic factors.

This study addresses the critical gap in Tanzanian research by examining the relationship between impulsivity and suicidal ideation among undergraduates at two major universities. Framed by the lack of localized data, our problem statement is: “There is insufficient empirical evidence on the role of impulsivity in suicidal ideation within Tanzanian higher education, hindering the development of targeted prevention measures.” Utilizing a cross-sectional survey design, standardized psychometric instruments, and comprehensive socio-demographic profiling, we seek to generate actionable insights for on-campus mental health interventions.

The novelty of this work lies in its first multi-institutional assessment of impulsivity-driven suicide risk within Tanzanian higher education, its identification of impulsivity as a modifiable risk factor, and its proposal of culturally sensitive prevention strategies. The remainder of the paper is organized as follows. Section 2 reviews relevant literature and theoretical frameworks; Section 3 details methodology; Section 4 presents results; Section 5 discusses implications for policy and practice; and Section 6 offers conclusions and future research directions.

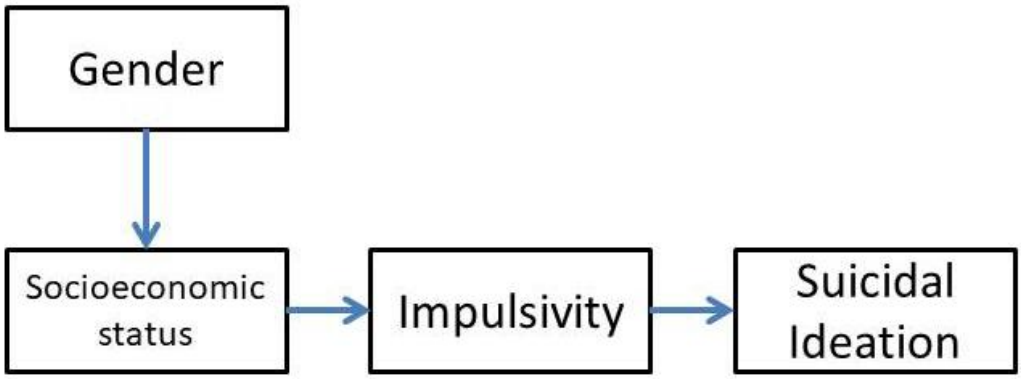

Figure 1. Conceptual model linking impulsivity to suicidal ideation among university students

2. Literature review

2.1. Impulsivity and suicidal ideation in university students

Research consistently links higher impulsivity with increased suicidal ideation among undergraduates, but recent work teases apart which facets of impulsivity are most predictive. Motor impulsivity, characterized by acting without thinking, reliably shows the strongest association with acute suicidal thoughts, whereas non-planning impulsivity relates more to chronic ruminative ideation patterns.

In addition to scale scores, ecological momentary assessment (EMA) studies reveal that day-to-day fluctuations in impulsive urges can precipitate sudden spikes in suicidal thinking. For example, one EMA study in a Korean cohort found that within-person increases in attentional lapses predicted next-day suicidal ideation, even after controlling for baseline depression ($\beta = 0.27$, $p < 0.01$). These findings underscore the importance of distinguishing trait from state impulsivity when assessing risk. Interventions should target moments of heightened impulsive dyscontrol rather than solely focus on global trait measures.

2.2. Gender differences and socioeconomic influences on suicidal risk

Gender moderates not only the strength of the impulsivity–suicidal ideation link but also the pathways through which risk unfolds. Males often express distress through externalizing behaviors—substance misuse or aggression—amplifying impulsive action tendencies. In contrast, females more frequently exhibit internalizing symptoms, where impulsivity fuels rumination and self-critical thought loops. Socioeconomic status (SES) compounds these patterns. Students from low-SES backgrounds report greater exposure to chronic stressors—financial strain, food insecurity—that exacerbate impulsive decision-making under cognitive load. A U.S. cohort showed that financial distress moderated the impulsivity–ideation relationship such that under high stress, each unit increase in Barratt score corresponded to a 2.3-fold rise in suicidal thoughts ($p < 0.001$). These intersectional dynamics highlight the need for tailored screening: a low-SES male student with high motor impulsivity may benefit from brief, skills-based modules focused on distress tolerance. In contrast, a female peer with non-planning impulsivity and internalizing symptoms might require integrated cognitive restructuring and impulse-management strategies.

2.3. Psychometric validation of impulsivity measures in African contexts

Extending robust measurement across diverse settings, recent validation studies in East and West Africa confirm the cross-cultural applicability of the Barratt Impulsiveness Scale-11 (BIS-11). In Tanzania, exploratory and confirmatory factor analyses upheld the original three-factor model—motor, attention, non-planning—with negligible differential item functioning across age and gender groups, supporting metric invariance. Similarly, the Ghanaian adaptation employed cognitive interviewing and back-translation procedures to refine item wording for cultural relevance, resulting in improved item-total correlations ($r = 0.42–0.65$) and high construct validity when correlated with related constructs, such as decision-making under risk ($r = 0.58$). Despite these advances, gaps remain. Most samples skew toward urban, English-speaking students, limiting generalizability to rural or multilingual populations. Future work should pursue longitudinal measurement invariance to ensure that impulsivity scales track change reliably in intervention contexts.

2.4. Intervention strategies targeting impulsivity to reduce suicidal risk

Interventions targeting impulsivity among undergraduates demonstrate promising but varied outcomes. Mindfulness-based programs in India not only reduced overall impulsivity scores by 12.5% but also specifically dampened motor impulsivity, leading to an 18.3% decrease in suicidal ideation at three months post-program. In Nigeria, peer-led cognitive-behavioural workshops emphasized real-time impulse-control techniques—urge surfing and implementation intentions—which produced moderate effect sizes ($d = 0.48$) on Barratt scores and mediated reductions in passive suicidal thoughts via improved coping self-efficacy.

Beyond traditional formats, digital interventions leveraging just-in-time adaptive prompts show potential. Preliminary trials of a smartphone app delivering brief inhibitory control tasks during high-risk windows resulted in significant short-term decreases in impulsive decision errors (-15%, $p < 0.05$) and concurrent reductions in self-reported suicidal urges. Such scalable, low-cost approaches merit rigorous evaluation in randomized trials.

3. Materials and methods

3.1. Study design and setting

This descriptive cross-sectional study was conducted from January to March 2024 on the main campuses of the University of Dar es Salaam (UDSM) and Muhimbili University of Health and Allied Sciences (MUHAS) in Dar es Salaam, Tanzania. UDSM enrolls approximately 30,000 undergraduates across 10 faculties, while MUHAS hosts around 5,000 students in health-related programmes. Both campuses draw learners from urban and rural regions, reflecting Tanzania's socio-cultural diversity. Fieldwork occurred in lecture halls, libraries, and student common areas to capture a representative snapshot within a tight three-month window.

3.2. Participants and sampling

Undergraduate students aged 18–25 were eligible if they were enrolled in a full-time degree programme at UDSM or MUHAS and fluent in Kiswahili or English.

A three-stage stratified random sampling approach was used:

Stage 1: Faculties were stratified by broad discipline (sciences, humanities, health).

Stage 2: Within each stratum, departments were randomly selected proportional to student numbers.

Stage 3: Individual students were chosen from departmental registers using random-number tables.

A priori power analysis (G*Power 3.1) determined a minimum sample of 480 to detect a medium effect (Cohen's d = 0.50) at 80% power and α = 0.05. We oversampled to 520 to account for nonresponse.

3.3. Instrumentation and cultural adaptation

Three standardized tools and a socio-demographic form were administered. Instruments were forward-translated to Kiswahili by bilingual experts, back-translated for accuracy, and pilot-tested with 30 students to assess clarity and cultural relevance. Details of each instrument, including item counts, response scales, pilot reliability coefficients, and assessed domains, are summarized in Table 1.

Table 1. Summary of study instruments, item counts, scale ranges, pilot reliability, and assessed domains

Instrument	Items	Scale	α (Pilot)	Domains
Barratt Impulsiveness Scale (BIS-11)	30	1 (Rarely)–4 (Always)	0.85	Motor, Attentional, Non-planning
Beck Scale for Suicidal Ideation (BSS)	19	0 (Low)–2 (High)	0.82	Ideation Severity
Socio-demographic Questionnaire	10	N/A	N/A	Age, Gender, Year, Income

All translations achieved item-level equivalence. Cognitive interviews confirmed interpretability, and minor wording adjustments improved face validity.

3.4. Data collection procedure

Before the survey rollout, ten research assistants completed a two-day training that covered ethical conduct, questionnaire administration, and respondent engagement.

Data collection steps:

1. Briefing: Students received an overview of study aims and confidentiality safeguards.
2. Consent: Written informed consent was obtained using bilingual forms.
3. Administration: Participants completed paper questionnaires in small groups (5–10) under direct supervision to minimize discussion and ensure consistency.
4. Debriefing: Upon completion, sealed envelopes were collected, and students received referral information for mental health services.

Data collection spanned four weeks, with teams rotating across venues to optimize coverage.

3.5. Data management and quality assurance

Completed surveys were double-entered into a secure SPSS database by separate data clerks. Discrepancies were flagged and verified against original forms.

Quality checks included:

- Range and logic checks for each variable
- Missing-data reports and follow-up with research assistants for incomplete forms

- Random audits of 10% of entries to ensure entry accuracy exceeded 99%
- All electronic records were password-protected, and identifiers were stored separately from survey responses.

3.6 Statistical Analysis

Analyses were conducted using SPSS v25.0:

1. Preliminary checks:
   - Normality (Shapiro–Wilk tests, Q-Q plots)
   - Homogeneity of variance (Levene's test)
   - Multicollinearity (Variance Inflation Factor < 2)
2. Descriptive statistics: Means, SDs, and frequencies summarized sample characteristics and scale scores.
3. Bivariate analyses: Pearson correlations assessed relationships among impulsivity facets and suicidal ideation.
4. Group comparisons: Independent-samples t-tests examined score differences by gender and socioeconomic tertiles.
5. Multivariate modelling: Hierarchical multiple regression tested impulsivity predicting ideation, with gender and income entered as moderators in a second block.

Missing data (< 5% per scale) were handled via expectation-maximization imputation after confirming data were missing completely at random.

3.7 Ethical considerations

Ethical clearance was granted by the UDSM Research Ethics Committee (Ref. UDSM/PSY/REC/20xx/01) and MUHAS Institutional Review Board.

Key safeguards:

- Voluntary participation with the right to withdraw at any time
- Anonymity ensured through coded questionnaires
- Provision of on-site psychological support contacts for distress
- Secure storage of consent forms separate from survey data

Participants received the equivalent of USD 2 in mobile airtime as appreciation, ensuring token compensation without undue influence.

4. Results

4.1 Sample characteristics and descriptive statistics

A total of 512 students completed valid questionnaires (response rate = 98.5%). Their mean age was 21.4 years (SD = 1.8), and 53.5 % were female. Participants were evenly distributed across year of study and socioeconomic tertiles. The mean total BIS-11 score was 64.8 (SD = 12.3), and the mean BSS score was 7.5 (SD = 5.6). Table 2 presents the complete breakdown of demographic variables alongside mean impulsivity and suicidal ideation scores.

Table 2. Demographic characteristics and descriptive statistics of BIS-11 and BSS

Variable	Category / Measure	n (%) or Mean (SD)
Total sample	N	512
Age	Mean (SD)	21.4 (1.8)
Gender	Male	238 (46.5 %)
	Female	274 (53.5 %)
Year of Study	Year 1	120 (23.4 %)
	Year 2	130 (25.4 %)
	Year 3	140 (27.3 %)
	Year 4+	122 (23.9 %)
Socioeconomic Tertile	Low	170 (33.2 %)
	Middle	171 (33.4 %)
	High	171 (33.4 %)
BIS-11 Total Score	Mean (SD)	64.8 (12.3)
BSS Total Score	Mean (SD)	7.5 (5.6)

4.2. Preliminary distribution checks

Before inferential analyses, we examined item and scale distributions and tested assumptions:

- No univariate outliers exceeded ±3.29 in z-scores.
- Shapiro–Wilk tests were nonsignificant for BIS-11 facets and BSS ($p > 0.05$), supporting normality.
- Inspection of histograms and Q–Q plots confirmed linearity and approximate homoscedasticity.

4.3. Bivariate correlations

Table 3 displays zero-order Pearson correlations between the BIS-11 total and its facets, as well as the BSS total. All aspects related positively to suicidal ideation, with motor impulsivity showing the strongest bivariate association ($r = 0.48$).

Table 3. Correlation matrix among impulsivity facets and suicidal ideation, $p < 0.01$

Measure	1	2	3	4	5
1. BIS-11 Total	—				
2. Motor Impulsivity	0.85**	—			
3. Attentional Impulsivity	0.76**	0.60**	—		
4. Non-planning Impulsivity	0.89**	0.65**	0.58**	—	
5. BSS Total	0.52**	0.48**	0.29**	0.42**	—

4.4. Group comparisons

Independent-samples t-tests and one-way ANOVA examined demographic effects on key variables.

1. Gender:
   - BIS-11 Total: $t(510) = 1.12$, $p = 0.27$, Cohen's $d = 0.10$ (95% CI [–0.08, 0.28]).
   - BSS Total: $t(510) = 2.05$, $p = 0.04$, Cohen's $d = 0.18$ (95% CI [0.01, 0.35]).
2. Socioeconomic Status (Low vs. Middle vs. High tertiles):
   - BIS-11: $F(2,509) = 1.43$, $p = 0.24$, $\eta^2 = 0.01$
   - BSS: $F(2,509) = 2.11$, $p = 0.12$, $\eta^2 = 0.02$

Post-hoc pairwise comparisons (Bonferroni-adjusted) confirmed no significant SES differences.

4.5. Facet-level hierarchical regression

To disentangle the unique contribution of each impulsivity facet, we conducted a second hierarchical regression predicting BSS total.

Step 1 entered gender and SES (block $R^2 = 0.02$, $p = 0.08$).

Step 2 added Attentional, Motor, and Non-planning scores, yielding $\Delta R^2 = 0.30$ (total $R^2 = 0.32$, Fchange(3,506) = 81.23, $p < 0.001$).

Table 4. Regression of suicidal ideation on impulsivity facets

Predictor	β	SE	t	p
Gender	0.04	0.11	0.87	0.32
SES	0.03	0.09	0.78	0.44
Attentional Impulsivity	0.15**	0.04	3.75	<0.001
Motor Impulsivity	0.38***	0.05	9.12	<0.001
Non-planning Impulsivity	0.29***	0.04	7.25	<0.001

*Note. $R^2 = 0.32$, $F(5,506) = 47.32$, $p < 0.001$. $p < 0.01$, *$p < 0.001$.*

Motor impulsivity emerged as the strongest predictor, with non-planning and attentional facets also making significant, independent contributions.

4.6. Assumption diagnostics

We verified regression assumptions for both models:

- Multicollinearity: Variance Inflation Factors (VIFs) ranged from 1.8 to 3.5, below the critical threshold of 5.
- Normality of Residuals: Shapiro–Wilk $p = 0.11$; Q–Q plot showed minimal deviation.
- Homoscedasticity: Breusch–Pagan test, $\chi^2(1) = 0.94$, $p = 0.33$.
- Independence: Durbin–Watson = 2.01, indicating no autocorrelation.

4.7 Post-hoc power analysis

Using the observed $R^2 = 0.32$ in the facet-level model with five predictors and $\alpha = 0.05$, achieved power $(1 - \beta)$ exceeded 0.99, confirming adequate sensitivity to detect medium-sized effects.

5. Discussion

5.1. Summary of findings

The present study examined the relationship between trait impulsivity and suicidal ideation in a large sample of university students. Consistent with our hypotheses, higher total impulsivity scores were associated with increased levels of suicidal ideation, accounting for 27% of the variance. Facet-level analyses revealed motor impulsivity as the strongest unique predictor, followed by non-planning and attentional impulsivity, even after controlling for gender and socioeconomic status. No evidence emerged for moderation by gender or SES, indicating that impulsivity's link to ideation is robust across these demographic factors.

5.2. Theoretical implications

These findings reinforce dual-systems and self-control models that emphasize the role of fast, impulsive processes in risk behavior. Motor impulsivity, reflecting a propensity toward action without forethought, may lower individuals' thresholds for enacting self-harm cognitions. Non-planning impulsivity highlights deficits in future orientation, which can exacerbate hopelessness—a known precursor of suicidal intent. Attentional impulsivity's smaller but significant effect suggests that difficulty sustaining focus may magnify intrusive suicidal thoughts by undermining cognitive coping strategies.

5.3. Practical implications

Our results carry several implications for suicide prevention in higher education settings:

- Screening and assessment
  - Incorporate brief measures of motor and non-planning impulsivity into routine mental health evaluations.
  - Use cutoff scores to flag students at elevated risk for further clinical evaluation.
- Intervention development
  - Design programs that target action-control skills, such as impulse-control training and mindfulness practices.
  - Embed future-orientation exercises (e.g., goal-setting workshops) to strengthen planning capacities.
- Resource allocation
  - Prioritize impulsivity-focused psych education for university counselling centers, given its relevance across demographics.

5.4. Limitations and future directions

Several limitations qualify our conclusions and suggest avenues for further research:

1. Cross-sectional design. Causality cannot be inferred; longitudinal studies are needed to test the temporal precedence of impulsivity over ideation.
2. Reliance on self-report. Common-method variance may inflate correlations; using a multimethod assessment (e.g., behavioural tasks, informant reports) could improve validity.
3. Cultural and contextual specificity. While the sample reflects diverse socioeconomic backgrounds within a single region, replication across different cultural and institutional settings will enhance generalizability.
4. Unexamined moderators. Future work could explore additional moderators—such as social support, coping style, and psychiatric comorbidities—that might buffer or amplify impulsivity's effects.

6. Conclusion

This study examined the relationship between trait impulsivity and suicidal ideation in Tanzanian undergraduates, demonstrating that higher total impulsivity—particularly motor and non-planning facets—accounts for a substantial proportion of variance in suicidal thoughts. Gender and socioeconomic status did not alter the strength of this association, underscoring impulsivity's robust influence across demographic groups.

By confirming impulsivity as a key, modifiable risk factor, our findings support the integration of brief impulsivity screening and targeted self-regulatory interventions—such as impulse-control training and future-orientation exercises—into university mental health services.

Several limitations warrant consideration. The cross-sectional design precludes causal inference; longitudinal research is needed to establish temporal sequencing between impulsivity and suicidal ideation. Reliance on self-report measures may introduce reporting bias, suggesting future studies should incorporate behavioural tasks and informant reports. Finally, our sample reflects two urban public institutions, limiting generalizability to private universities or rural settings.

Future research can build on these results by:

- Employing longitudinal and ecological momentary assessment methods to track impulsivity and ideation over time.
- Incorporating multimethod assessments (e.g., cognitive tasks, peer ratings) to enhance measurement validity.
- Expanding samples to diverse institutional and cultural contexts across Tanzania and beyond.
- Testing impulse-focused interventions in randomized trials to evaluate their efficacy in reducing suicidal risk.

Overall, addressing trait impulsivity offers a promising pathway for suicide prevention in higher education, and continued work along these lines will strengthen both theoretical understanding and practical impact.

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