Analysis of Problem Gambling Among Staff and Students in a Public University in Kenya

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Abstract

This paper presents study findings on gambling among university staff and students in Kenya. Data were collected from 21 staff and 385 students using questionnaires, interview guide and focused group discussions. The collected data focused on the respondents' demographic profiles and measured the Problem Gambling Index (PGI), whose score range was 29 to 98 points. Data were analyzed using the SPSS Version 27 software. Findings showed that 69% of the students were distributed in the third and fourth quartiles of the PGI score, while 95% of staff were in the first and second quartiles. Male and female respondents were engaged in gambling behaviours, though the male gender dominated. For staff, there were positive relationships ($p = 0.05$) between PGI and gender, birth position, marital status and age, but significant for family financial status ($\lambda = 0.5$, $p < 0.05$). For students, there were positive relationships between PGI and birth position, marital status, family financial status and age, and significant for gender ($\chi 2 = 24.5$, $df = 9$, $p < 0.05$) and duration in gambling ($\chi 2 = 25.8$, $df = 15$, $p < 0.05$). Students transacted over 20,000 USD per week in gambling activities, an indication of addictive gambling behavior resulting in alarming cases of stress, depression, suicidal tendencies and family conflicts. This study recommends adoption of responsible gambling through policy guidelines, psycho social support and establishing gambling support centers for recreation and rehabilitation.

Keywords: addictive gambling, gambling behavior, psycho-social, Problem Gambling Index (PGI), public university

1. Introduction

In recent times, gambling has become a significant preoccupation of most people, and widely accepted activity (Stinchfield, Hanson, & Olson, 2006), especially among the youth and young adults in the age group of 18 to 40 years old (Ogachi, et. al., 2020; Kaggwa et. al, 2022). A majority of these are university and college students and unemployed youths who have the time to participate in various gambling activities over the day. Gambling per se may be a pleasurable and enjoyable activity (Ogachi, et.al., 2020). However, it may end up being harmful in social and health respects. The specific focus of this paper is on problem gambling, defined as gambling behavior that creates negative consequences for the gambler, others in his or her social networks or for the community (Ferris, et. al., 2001; UoB, 2024). Further, the National Council on Problem Gambling (NCPG) describes problem gambling as "gambling addiction" or "gambling disorder" - as gambling behavior that is damaging to a person or their family, often disrupting their daily life and career. Anyone who gambles can be at-risk of developing a gambling problem.

1.1 Background

The paper is generated from a field research conducted on students and staff participating in gambling in a public university in Kenya. The research was conducted in response to a call by Bristol Hub for Gambling Hams Research under the University of Bristol, UK Seedcorn Project for January to July 2024. The main interest of gambling harms projects was to deliver significant impact on the gambling research landscape, both within Great Britain and across the globe, by bringing new disciplines, theoretical perspectives and methodologies into gambling harms research.

The Hub takes a broader view of gambling, to include newer gambling-like products and practices that may cause harm (University of Bristol, 2023) in the online space (some of which fall outside regulation). These include video game practices such as opening loot boxes, e-sports betting, real-money video gaming, token wagering and social

casino spending. In financial services, users of trading apps can be exposed to high-risk, unregulated investments (such as Bitcoin and Non-Fungible Tokens) and these apps may blur the lines between online investing and gambling-like behavior

In the context of this call, gambling harms are generally understood to be the short- and long-term adverse impacts from gambling on the health and well-being of individuals, families, communities and society. These include financial stress, relationship breakdown, family violence, mental illness and suicide. Gambling can lead to serious harms to health. The legacy of gambling harm can endure throughout one's life and transmittable through generations (WHO, 2024).

Gambling harms are diverse but the three most commonly referenced are resource harms (e.g., economic and housing instability, debt and bankruptcy, engagement in criminal activity); relationship harms (e.g. disruption or breakdown of intimate and family relationships; emotional and social isolation; erosion of trust); and health harms (physical ill health, stress, depression, suicidal behavior, and other associated mental health problems). Harmful gambling is a public health issue because it is associated with these wide and deep harms to individuals, families, communities and wider society and can exacerbate existing social and spatial inequalities. It therefore requires a broad-based population-level response rather than a narrow focus on individuals with gambling problems.

Gambling harms have considerable real and social costs to governments, societies and individuals. The National Council on Problem Gambling (NCPG) estimates that the annual national social cost of problem gambling in the USA is $14 billion (NCPG, 2023). On the other hand, in Great Britain, the cost of these harms is estimated to be between £1.05 and £1.77 billion, (about $1.39-$2.34 billion) while in Kenya, the amount spent on gambling is about $ 6.17 billion (Kshs 800 billion) (Amalemba, 2025; Daily Nation, 2025).

Gambling is a reality in many societies across the globe. Gambling opportunities abound in the contemporary society. The practice has attracted people of diverse sociocultural backgrounds, age and gender. There have been cases in Kenyan Universities where students committed suicide as a result of losing money meant for college fees through betting and gambling (Koross, 2016). Online betting was only legalized in Kenya in 2011, though sports' betting has been in operation in since 1966 (Koross, 2016). With the proliferation of the many gambling sites and mobile money banking, one can place a bet anywhere anytime. Today, gambling activities such as e-sports betting is just a click away on one's cell phone. The number of licensed gambling and betting companies in Kenya has sharply increased from 3 in 2013, 99 in September 2023 and 128 in January, 2024 (Betting Control and Licensing Board, 2024). The gambling sites are predominantly e-sports platforms such as Betika, M-bet, Sportpesa, Betway, Bet365, 22bet.co.ke, Mozzartbet, Megapari, Pakakumi, Aviator among others.

A study by Kaggwa et. al. (2022) showed that gambling activities and associated mental health problems have become a topic of increased concern globally and that many individuals with severe gambling disorder have gambling-related suicidal inclinations. The study investigated the press media reporting of gambling-related suicide cases from the East African Countries. The results showed that the victims were all males aged 16 to 40 years and that the most prevalent reason for the deaths was that the university students had used up their university tuition fees for gambling and lost the money in the process. The study further indicated that all the suicide deaths were in Kenya (10/18), Uganda (7/18), and Tanzania (1/18) and that betting on soccer was the most common type of gambling reported, and hanging was the most used mode of suicide. Although the problems associated with gambling cut across almost all age groups, the university space provides a fertile ground for the blossoming of gambling activities.

1.2 Theoretical Framework

Determinants of gambling are a complex array of interactive factors that are multi-disciplinary. Several theories (Dymond, et.al.,2007; Veno, et al.,2023) have been advanced in an effort to ground and explain why people gamble and develop addiction. Some of these are Learning/Behavioral theories, Cognitive theory, Biomedical/Neurochemical theory, Psychoanalytic theory, Social learning theory and Economic/Rational Addiction theory. These theories explain the compulsion for gambling through cognitive distortions/illusions, biological factors (dopamine/brain chemistry), expectation of rewards, as a way of coping with emotional issues so as to escape personal problems, as a response initiated through observation of gambling by peers or family members and unsatisfied gambling cravings for economic gain (Thomas, et.al., 2018). Each of these theories plays a role in explaining gambling behavior among the youth, and especially university students, given that they come from diverse socio-economic backgrounds and experiences (Dymond, et.al.,2007).

2. Methodology

This study focused on identification of and intervention in gambling harm effects among students and staff in a public university in Kenya. The harmful effects were determined through measuring the magnitude of problem gambling index (PGI). A mixed methods approach to research was employed. Data was collected from students and staff as the respondents. The formula for determining sample sizes from a given population by Krecjie and Morgan (1970) was used to arrive at a sample size of 426 students. The sample for staff was purposively determined at 32. The snowball method was then used to identify specific respondents for the study. Purposive sampling technique was applied in selecting staff, student leaders and university administrators in order to provide specific information on gambling behaviors by students and staff.

Data was collected using a questionnaire, interview schedule and Focus Group Discussions (FGD). Interview guides were used to collect data from nine (9) university administrators, specifically the Deputy Vice-chancellor in charge of academics, student affairs and Research (DVC-ASAR), the Registrar, academic and student affairs, Deputy Registrar, Human Resources, Director University Special Services, Director Information Communication Technology, University Medical Officer, Registrar, Planning and Administration, Dean of Students and the University Students' Counsellor. Focus Group Discussions (FGD) was used to collect data from 70 respondents comprising the University Students' Governing Council, Faith-based groups, Peer Counselors, Peer Educators, students and staff engaged in gambling activities. Each of the seven groups had 10 respondents. The questionnaire contained 42 items and collected data from both students and staff. It was divided into two sections - section A which had 12 items that sought demographic data, while section B, with 30 closed ended items, sought data that measured the presence or absence of attributes of problem gambling.

All the instruments were physically administered by members of the research team on campus during office working time for purposes of ensuring high return rate. The questionnaire was administered on 385 students and 21 staff, representing a return rate of 90.4% and 65.6% for students and staff respectively. First to be administered were the interview guides, which took three weeks to conclude, followed by the Focus Group Discussions which lasted a week. Lastly, the questionnaires took one week to administer and have them returned. In total, the data collection exercise lasted five weeks.

This study generated items that were used to measure the magnitude or severity of gambling behavior among the respondents. One item measured the frequency of involvement in gambling, one other item measured the intensity or period of engagement in gambling at any one given time and four other items considered the amounts of money transacted. Further to these, twenty-four (24) other items measured the presence or absence of various attributes associated with gambling. All these items were summed up so as to generate the Problem Gambling Index (PGI). Section A of the Questionnaire comprised 12 items - variables 1 to 12 which collected demographic data of the respondents in terms of gender, age, level of education, marital status, position at birth, current year of study, career expectations, employment status, and income/student allowance received monthly, financial ability and religion.

On the other hand, section B had variables 13 to 42, which total 30 variables, was used to generate a score referred to as the Problem Gambling Index (PGI). The generated score determined the magnitude of problem gambling among the subjects in terms of the presence or absence of attributes associated with gambling behavior. The PGI was adapted from the Canadian Problem Gambling Index (CPGI) model (Ferris et. al., 2001). The adaption was necessitated so as to comprehensively contextualize some of the initial variables by incorporating additional manifest items for clarity of understanding for the respondents and ease of measurement and computation (Shin, 2018; Bollen, 2002). In this case, the 30 variables used in this study are generated from the initial nine (9) constructs used to generate the problem gambling severity index and the thirty-one (31) measures of the Canadian Problem Gambling Index (Ferris, et al. 2001). These items capture prevalence rate of gambling behavior and manifest indicators of gambling, such as frequency of gambling play, amounts spent, addictive tendencies and correlates of gambling effects all of which sum up to indicate the magnitude of problem gambling.

The numerical variables in the questionnaire specifically collected data measuring money transacted in the gambling processes and were re-coded into ten clusters (or groups) with codes 1 to 10 as possible scores for computational purposes.

The total score ranged from a minimum of 30 to a possible maximum of 98 in a continuum. The range of 30 to 98 (68 points) was divided into four clusters, with intervals of 17 and coded 1 to 4 to produce the four levels of gambling clusters as follows:

(1) 29-46: Non-Problem Gambling

(2) 47-64: Low Risk Gambling

(3) 65-82: Moderate Risk Gambling

(4) 83-100: Problem Gambling

Ferries et. al. (2001) gives five clusters measuring gambling behaviors, starting with a cluster of no gambling. This study adapted the clustering but starting with non-problem gambling cluster as representing the lowest score on the Problem Gambling Index. The four clusters describe the magnitude of gambling among the respondents, with the lowest cluster of scores of 29 to 47 representing no problem gambling to the highest cluster of 83 to 100 indicating high or serious problem gambling. (Ferris, et. al., 2001; IPSOS, 2023)

The data were entered into an SPSS version 27 spreadsheet and analyzed using descriptive and inferential statistics as determined by the type of data and study objectives. Specifically, demographic data was analyzed using frequency counts, mode, median and mean while the problem gambling index (PGI) was cross tabulated with some selected independent variables and analyzed using chi-square (χ^2), gamma (γ) and lambda (λ).

3. Results

3.1 Respondents' Demographic Profiles

The findings of this study are presented as per the objectives using tables followed by narrations on the observations on descriptive data. The initial part of the findings focuses on the respondents' demographic profiles, such as age, gender, income/allowances received, financial ability and year of study, just to highlight some examples.

3.1.1 Respondents' Age

Table 1. Distribution of respondents by age

Age (Years)	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
18-21	-	-	195	50.6
22-25	1	4.8	169	43.9
26-29	2	9.5	12	3.1
Above 29	18	85.7	9	2.4
18-21	**21**	**100.0**	**385**	**100.0**

Source: Field data.

Table 1 shows the age distribution of respondents, with the majority (85.7%) of staff being above 29 years old. Most (50.6%) of the students were in the 18-21 age bracket. About 94% of the students are between ages 21 and 25 years old. This finding agrees with a study by Geo-poll (2019) conducted in Kenya which found that 57% of 600 respondents surveyed were 18+ years old. A study by Barnfield-Tubb and Harris (2017) in Great Britain showed high levels of gambling participation among youth aged between 16 and 34 years. Generally, other studies (Maina, 2020; Seal, et. al., 2022) show that rates of gambling participation were seen to have increased among young individuals aged 25-34 years compared to older individuals.

3.1.2 Respondents' Gender

Table 2. Distribution of Respondents by gender

Gender	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
Male	20	95.2	266	69.1
Female	1	4.8	117	30.4
Other	-	-	1	0.3
Non-disclosure	-	-	1	0.3
Total	**21**	**100.0**	**385**	**100.0**

Source: Field Data.

Data summarized in table 2 shows that the male gender made up the majority (95.1%) among the staff members compared to students (69.1%). There was one female among the staff compared to 117 (30.4%) among the students. Other studies, such as Kagwa, et. al., (2017); Maina, (2020); Seal, et. al. (2020) Cassandra, et. al. (2022) and Mbiriri, (2023) agree with this finding and confirm from their respective studies that gambling is a male dominated activity.

3.1.3 Respondents Birth Position

Table 3. Respondents' birth position

Birth Position	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
1st Born	10	47.6	121	31.4
2nd Born	2	9.5	104	27.0
3rd Born	6	28.6	42	10.9
Other	1	4,8	72	18.7
Last Born	2	9.5	46	11.9
Total	**21**	**100.0**	**385**	**100.0**

Source: Field data.

This study was interested in finding out the family birth position of the respondents. Table 3 gives the summary of the findings and indicates that the 1st born respondents made up the majority among both staff (47.6%) and students (31.4%) compared to the other birth positions in the family. First and 2nd born respondents together made up a total of 58.4% among the students compared to 57.1% among the staff.

The interest on birth order was born from studies linking birth order to some personality traits which may or may not influence risk taking behavior. First borns are associated with some characteristics - achievement driven, leaders, people pleasers, parenting other siblings, confident and perfectionists. Eldest children score higher on conscientiousness than children in any other position in psychological testing (Tomas & Renato, 2019). This trait compliments first-born characteristics such as reliability, responsibility and dependability. Therefore, there is a likelihood of first borns having a higher affinity for gambling as an investment for generating funds so as to "parent' the younger siblings (Tomas & Renato, 2019; Cassandra, 2022).

3.1.4 Year of Study

The study sought to find out the year of study of the students. The data was collected through the student questionnaire. The findings are presented in table 4.

Table 4. Distribution of respondents by year of study (N = 385)

Year of Study	Frequency	Percentage
1st Year	77	20.0
2nd Year	202	52.5
3rd Year	45	11.7
4th Year	47	12.2
Not Applicable	14	3.6
Total	385	100.0

Source: Field data

Table 4 indicates that the majority of students engaged in gambling were second year cohort at 52.5%. The least participative group was third year at 11.7% with forth years making 12.2%. This agrees with the findings by Mbiriri (2023), but contradict other findings such as Lind & Kääriäinen, (2020); Watanapongvanich et al, (2021) and, Salonen et al, (2016) which indicate that people with higher levels of education are more analytical and intelligent, and therefore less likely to engage in gambling behavior. Higher levels of educational attainment have been shown to correlate positively with strategic gaming (Lind & Kääriäinen, 2020), and higher abilities in evaluating risk (Watanapongvanich et al, 2021). That is, educated individuals well informed, analyze the betting market and therefore are expected to spend less on gaming than their counterparts with lower educational attainment (Watanapongvanich et al, 2021). Salonen et al, (2018) conducted a study on the Finnish students and found that holders of a Master's degree spent significantly less on gambling than individuals holding lower qualifications. In Japan, Watanapongvanich et. al, (2021), established that university graduates were significantly less likely to gamble than those without university training.

3.2 Respondents' Income/Allowances

This study sought to find out if the respondents were receiving income or allowances. The findings are summarized in table 5.

Table 5. Respondents' Incomes/Allowances

Income received	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
Yes	19	90.5	180	46.8
No	2	9.5	175	45.4
Not Applicable	-	-	30	7.8
Total	**21**	**100.0**	**385**	**100.0**

Source: Field data

Data summarized in table 5 shows that about 90% of staff were receiving some income/allowances compared to about 47% of the students. About 45% of the students were not receiving any form of income/allowances. It is noted that students rely on funding support from their parents/guardians and receive allowances/loans from the High Education Loans Board/University Funding Board. A few other students were able to secure additional funding from the National Government-Constituency Development Fund that is disbursed to Constituencies. This study did not scope to establish this particular source of income so as to determine the proportion of student beneficiaries.

Further to this, the study sought to determine how much income/allowances were received by the respondents. The findings are summarized in table 6.

Table 6. Respondents income/allowances

Respondents Income (Kshs)*	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
No Income	3	14.3	241	62.6
Less than 10,000	1	4.8	87	22.6
10,000/= to 15,000/=	2	9.5	36	9.4
15,001/= to 20,000/=	-	1	9	2.3
20,001/= to 25,000/=	-	1	2	0.5
25,001/= to 30,000/=	1	4.8	1	0.3
More than 30,000/=	14	66.7	9	2.3
Total	**21**	**100.0**	**385**	**100.0**

Source: Field data; *Current exchange rate; 1 $ is about Kenya Shillings (Kshs)130.

Table 6 shows that most staff (71.5%) were receiving more than Kenya Shillings 25,000 per month compared to about 15% receiving less than this amount. Only 3 of the 21 staff were not receiving income, most likely staff hired on casual employment terms. On the other hand, about 63% of the students indicated not receiving any income/allowances. About 34% of the students were receiving between Kenya Shillings 10,000 and 25,000. Ten (2.6%) of the students received more than Kenya Shillings 25,000.

Research has shown that gamblers are individuals with low or no income, and as such consider gambling as an income venture (Lusago, et al. 2024). According to Geopoll Survey (2019), 40 percent of the low-income gambling participants are not employed, with 29% of them being students. Consequently, a significant proportion of the low-income gamblers depend on gambling as a source of income (Kemunto, 2019; Lusago, et.al, 2024).

3.3 Family Financial Status

This study collected data on the respondents' perceptions about their family financial status. The responses were rated on a five-point Likert scale of highly able to not able at all on a continuum, on a scale of 5 to 1 respectively. The findings are summarized in table 7.

Table 7. Perception on family financial status

Family Financial Status	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
Highly Able	1	4.8	16	4.2
Moderately Able	6	28.6	110	28.5
Able	12	57.1	96	24.9
Not Able	2	9.5	115	29.9
Not Able at All	-	-	48	12.5
Total	**21**	**100.0**	**385**	**100.0**

Source: Field data

Table 7 shows that most of the staff considered themselves 'able' (57.1%) or 'moderately able' (28.6%), adding up to a total of 85.7%. On the other hand, 24.9% of the students considered themselves 'able' and 24.9% 'moderately able', making up a total of (53.4%). Students who regarded themselves 'not able' and 'not able at all' made up 42.4% compared to about 10% of the staff. Similarly, students who considered themselves 'highly able' were 4.2% compared to 4.8% of the staff. Research has shown that low financial status is a significant factor in compelling individuals to develop and participate in gambling behaviors (GeoPoll, 2019; Kemunto, 2019; Lusago, et al. 2024).

3.4 Measures of Respondents' Gambling Behavior

This study generated items that were used to measure the magnitude of gambling behavior among the respondents. One item measured the frequency of involvement in gambling, one other item measured the intensity or period of engagement in gambling at any one given time and four other items considered the amounts of money transacted. In

addition to these, twenty-four (24) other items measured the presence or absence of various attributes associated with gambling behavior. All these items were summed up so as to generate the Problem Gambling Index (PGI).

3.4.1 Frequency of Involvement in Gambling

This study sought to find how often the respondents were involved in and spent money on gambling. This information is summarized in table 8.

Table 8. Frequency of involvement in gambling

Involvement in Gambling	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
Not involved at all	4	19.0	45	11.7
Not sure	1	4.8	49	12.7
One times yearly	3	14.3	15	3.9
One times monthly	3	14.3	25	6.5
One times weekly	5	23.8	82	21.3
One times daily	4	19.0	90	23.4
Many times, daily	1	4.8	79	20.5
Total	**21**	**100.0**	**385**	**100.0**

Source: Field data

Table 8 shows that some respondents – about 24% of the staff and similar proportion of the students were either not involved at all or were not sure of their level of involvement in gambling. On the other hand, about 76% of the staff and a similar proportion of students were involved in gambling at least one times yearly. About 48% of the staff and 65% of the students were involved in gambling at least one times weekly. More students (43.9%) compared to staff (23.8%) were involved in gambling daily (one times and many times daily). These findings are consistent with the findings of other studies, such as Diaz, et. al., (2023); Diaz & Periz, (2021) and Okunna, *et. al*., (2016) who indicate that younger generations started and were more involved in gambling compared to older generations. Similarly, other literature, (Hira & Monson, 2000; Shin & Montalto, 2015; and Wackwire, *et. al*.,2007) report a general high prevalence of gambling among university students.

3.4.2 Duration of Time Spent in Gambling

This study sought to determine the length of time taken by the respondents in gambling activities at any one given time. The specific item was…kindly tell how long you take in a gambling activity at any one given time. The results are summarized in table 9.

Table 9. Duration of time spent in gambling at any one given time

Time Taken in Gambling	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
Less Than 1 Hour	12	57.1	187	48.6
1 to 3 Hours	6	28.6	131	34.0
4 to 6 Hours	1	4.8	36	9.4
7 to 9 Hours	2	9.5	18	4.7
Over 9 Hours	-	-	13	3.4
Total	**21**	**100.0**	**385**	**100.0**

Source: Field data.

Table 9 shows that most of the staff (57.1%) and students (48.6%) engaged in gambling for less than one hour at any one given time. Cumulatively, 85.7% of the staff and 82.6% of the students engaged in gambling for between less than one hour to three hours at any one given time. No staff engaged in gambling for more than nine hours compared to 3.4% of the students who did so at any one given time.

It is, however, noteworthy to state that the number of hours taken in gambling vary from country to country and cohort to cohort. According to the Human Rights report in Uganda, gambling takes place around the clock under different forms: playing cards, sports betting, casino gambling, lotteries/play lotto, slot machines, betting on animals (e.g., horse and dog racing), gaming, online betting, scratch cards and pool betting, virtual soccer and board games (Ssewanyana & Bitanihirwe, 2018).

3.4.3 Amount of Money Transacted in Gambling

Using open ended items in the questionnaire, respondents were asked to indicate the amount of money involved in betting transactions in the following areas:

(1) On average, amount of money (Kshs) spent in gambling activity(ies) in one week

(2) Highest amount of money ever won through gambling activity(ies) at any one time

(3) Amount of money (Kshs) ever lost through the gambling activity(ies) at any one time

(4) Amount of money (Kshs) ever bet in a gambling activity(ies) at any one time.

This information covering the students is analyzed and summarized in table 10.

Table 10. Amount of money (Kshs) transacted through gambling by students (N = 385)

Measures	**Amount Spent Per Week**	**Highest Amount Ever Won**	**Highest Amount Ever Lost**	**Amount Bet in Gambling**
Mean	3,284.11	9,131.63	9,975.43	5,839.59
Median	500.00	2,000.00	700,000.00	500,000.00
Mode	500.00	0	0	0
Skewness	15.765	6.006	16.521	15.581
Std Error of Skewness	.124	.125	.124	.124
Kurtosis	276.1	47.965	294.067	256.356
Std Error of Kurtosis	.278	.248	.248	.248
Range	400,000.00	225,000.00	1,500,000.00	1,000,000.00
Minimum	0	0	0	0
Maximum	400,000.00	225,000.00	1,500.000.00	1,000,000.00
Sum	**1,264,384.00**	**3,506,545.00**	**3,763,540.00**	**2,248,244.00**

Source: Field data

Table 10 shows that students spent on average, about Kshs 3,300/= on gambling per week, won about Kshs 9,000/= lost about Kshs 9,900/= and bet about Kshs 5,800/=. The total sum of money transacted is about Kshs 10 million. Measures of Kurtosis and skewness indicate the variability in the amount of money spent by individual respondents on the various cases. This finding agrees with others, for example Amalemba, (2025) and Daily Nation, (2025) which show that individuals involved in gambling activities transact high level of monies amounting to about $ 6.17 billion (Kshs 800 billion) on a yearly basis. Other indirect costs are associated with health care and legal litigation.

3.4.4 Measures of Gambling Behavior

An additional 24 items sought to establish the absence or presence of specific attributes of gambling behavior among respondents. The information is summarized in table 11.

Table 11. Measures of gambling behavior by staff and students

Measures of gambling behavior	**Staff (N=21)**		**Students (N=385)**	
	Yes	No	Yes	No
Gamble more than could afford	28.6	71.4	57.9	42.1
Gamble more money than wanted to in a gamble	28.6	71.4	65.7	34.3
Need to gamble with large amounts of money	33.3	66.7	71.7	28.3
Gamble to recover money lost In a previous gamble	28.6	71.4	65.2	34.8
Borrowed/sold property in order to gamble	23.8	76.2	35.6	64.4
Lied to family/other people in order to gamble	33.3	66.7	41.9	51.9
Felt having a problem or uncomfortable with gambling	57.1	42.9	55.6	44.4
Wished to stop gambling	47.6	52.4	65.2	34.8
Gambling caused depression/ anxiety/worry	33.3	66.7	51.7	48.3
Been criticized due to gambling behavior	42.9	57.1	50.1	49.9
Gambling caused financial problems to family/self	52.4	47.6	48.1	51.9
Felt guilty about gambling and what happens	70.4	29.6	55.1	44.9
Family member with gambling problem	42.9	57.1	35.1	64.9
Family member with drug/alcohol problem	33.3	66.7	38.2	61.8
Used alcohol or drugs while gambling in the last 12 months	42.9	57.1	20.5	79.5
Gambled while drunk or high in the last 12 months	57.1	42.9	20.0	80.0
Felt having an alcohol or drug Problem in the last 12 months	47.6	52.4	21.6	78.4
Felt the urge to gamble if something painful happened	38.1	61.9	35.6	64.4
Felt the urge to drink if something painful happened	47.7	52.3	35.1	64.9
Felt the urge to use drugs if something painful happened	47.6	54.4	38.2	61.8
Ever been under medication due to physical/emotional stress	47.1	52.9	35.3	64.7
Ever felt seriously stressed	42.9	57.1	47.1	52.9
Ever thought about or attempted suicide due to gambling	57.1	42.9	14.5	85.5
Ever been to a rehabilitation center due to gambling	**61.9**	**38.1**	**8.8**	**91.2**

Source: Field data

Table 11 shows the distribution of the presence or absence of specific attributes associated with gambling among the respondents and constitute part of the problem gambling severity measure, or index. In some cases, there exist differences between staff and students with respect to absence or presence of a given measure. For example, serial numbers 1 – 5, 15 – 20, and 23 – 24 where staff are negative while students are positive. In other cases, both staff and students are generally in agreement, such as serial numbers 7, 14, 18 and 22.

3.4.5 Distribution of Respondents on the Problem Gambling Index

The respondents were distributed according to the sores on the problem gambling severity index. Table 12 and figures 1 and 2 present the summary of the results.

Table 12. Distribution of respondents by magnitude of gambling

Magnitude of gambling	**Staff (N=21)**		**Students (N=385)**	
	Frequency	Percentage	Frequency	Percentage
29 – 46: Non-Problem Gambling	11	52.4	58	15.1
47 – 64: Low Risk Gambling	9	42.9	61	15.8
65 – 82: Moderate Risk Gambling	1	4.8	160	41.6
83 – 100: Problem Gambling	0	0	106	27.5
Total	**21**	**100.0**	**385**	**100.0**

Source: Field data

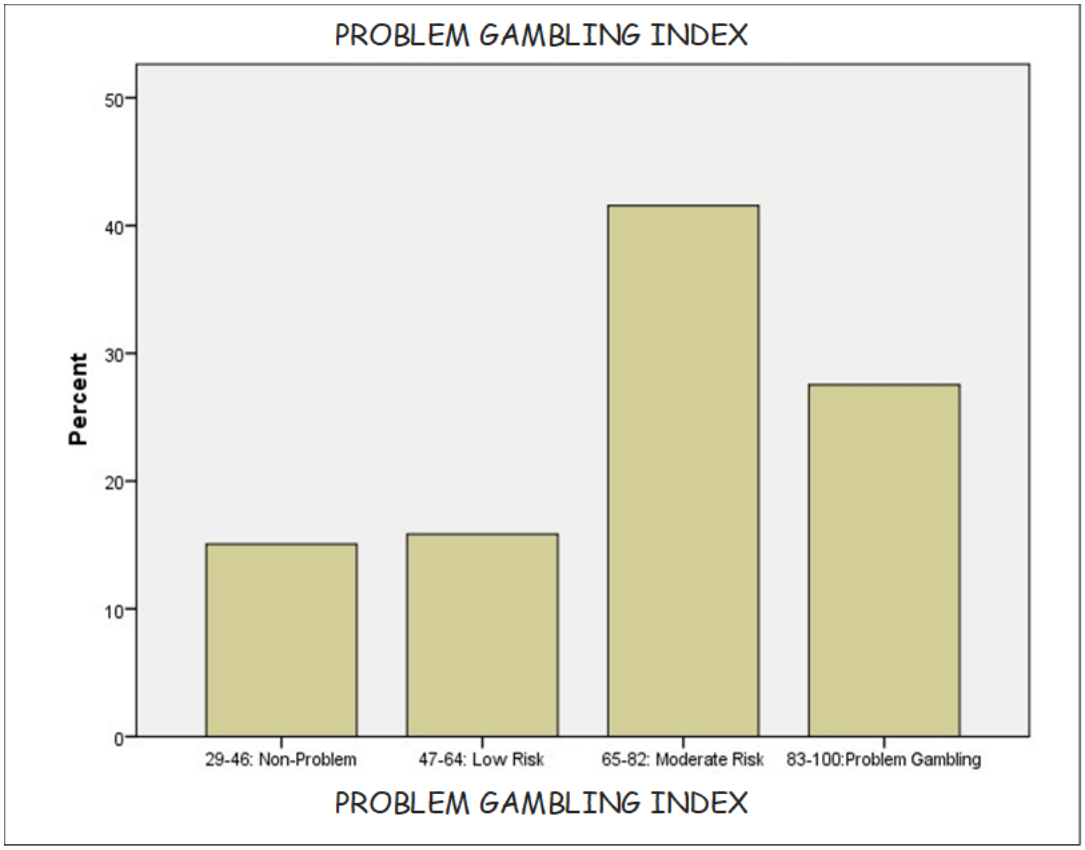

Figure 1. Problem gambling index - students

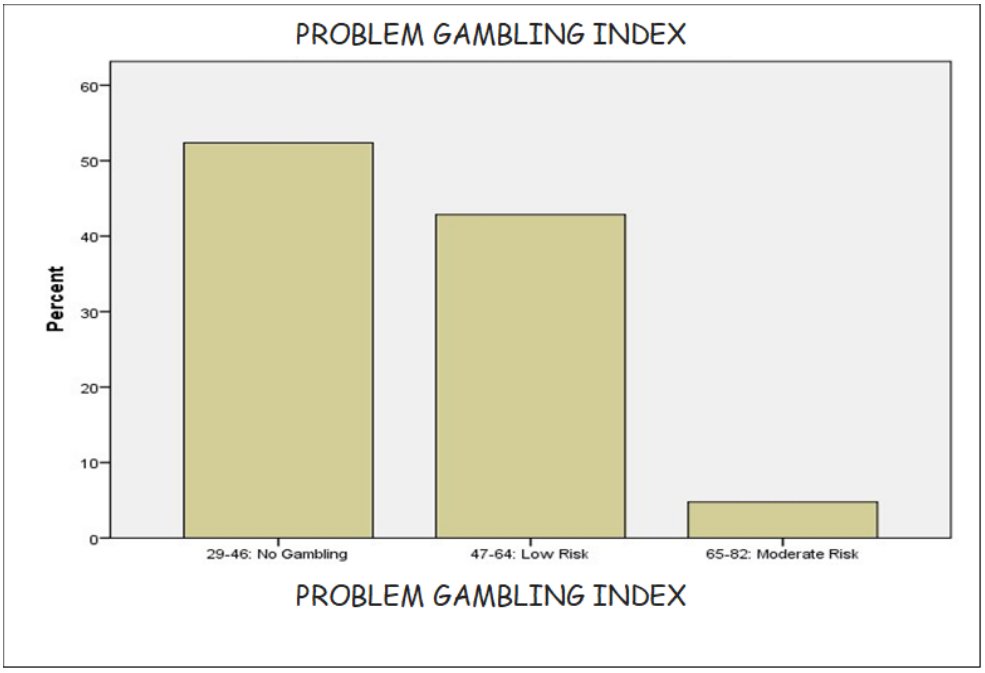

Figure 2. Problem gambling index - staff

The data summarized in table 12 and further illustrated by figures 1 and 2 show the magnitude of gambling amongst the respondents. Figure 1 representing gambling behavior among students, indicates a negative skew, while Figure 2, for staff indicates a positive skew. Most (69.1%) of the students were distributed at Moderate Risk Gambling (41.6%) and Problem Gambling (27.5%) which are the third and fourth quartiles in the distribution. About 30% of the students were in the first and second quartiles. There was no staff at the fourth quartile, while one (4.8%) was at the third quartile representing Moderate Risk Gambling. Most (95.3%) of the staff were at Non-Problem Gambling (52.4%) and Low Risk Gambling (42.9%).

The Problem Gambling Severity Index (PGSI) is a standardized and validated tool for assessing problem gambling harm and severity. It's based on research on the signs and consequences of problematic gambling. It uses a 9-item questionnaire to assess gambling behavior and identify individuals at different levels of risk, including low-risk, moderate-risk, and problem gambling (IPSOS, 2023). It is also used by Gamble-aware to help inform the development of prevention campaigns and the evaluation of treatment and support services. This finding can be supported by a study conducted in the UK in 2017 by Barnfield-Tubb and Harris (2017). According to Problem Gambling Severity Index (PGSI), 0.8% of individuals surveyed had problem gambling while 3.9% were considered to be moderate and low risk (Maina, 2020).

3.5 Measures of Relationship

Selected variables were subjected to further statistical analysis to show relationships with the PGI. The results were cross tabulated in contingency tables and analyzed using Chi-Square ($\chi 2$), lambda (λ) and gamma (γ) statistics. The selected variables were either categorical or ordinal. Specifically, the PGI, was the dependent variable which was converted from interval to ordinal scale. The selected independent variables were either continuous, nominal or ordinal.

The Chi-square ($\chi 2$) statistic is a value calculated to determine if the differences between observed and expected frequencies in a contingency table are statistically significant, meaning they are unlikely to have occurred by chance alone. It is used in statistical tests to evaluate relationships between categorical variables. A larger chi-square value indicates a greater discrepancy between observed and expected frequencies, suggesting a stronger relationship between the variables (Dhamaraja, & Dipayan, 2018; Landau & Brian, 2004; Dee, 2023). The interpretation also involves comparing the calculated Chi-square value with a critical value. If the chi-square calculated value is greater than the chi-square critical value, then the null hypothesis is rejected at given degrees of freedom and significant level. If the chi-square calculated value is less than the chi-square critical value, then the null hypothesis is not

rejected, implying there is no significant relationship between the categorical variables. The reverse will be true (Landau & Brian, 2004; Dee, 2023).

Lambda (λ) as a measure of association between two nominal variables takes values between 0 and 1. A value of 1 means that the independent variable perfectly predicts the dependent variable (perfect association between the two variables). A value of 0 means that the independent variable is no help in predicting the dependent variable. (Landau & Brian, 2004; Dee, 2023). It indicates the extent to which knowing the value of one variable helps predict the value of the other. It also measures the proportional reduction in error (PRE) when using the independent variable to predict the dependent variable. A value of 0 means no association, while a value of 1 means perfect association (Dhamaraja & Dipayan, 2018; Dee, 2023).

The Gamma statistic (γ) is a measure of rank correlation that assesses the strength and direction of association between two ordinal variables (Dee, 2023). It indicates the extent to which the order of the data is consistent across the two variables, ranging from -1, (perfect negative association) to +1 (perfect positive association). A value of 0 indicates no association. The strength of the association can be interpreted as follows: γ = 0.00: no association, ±.01-.09: weak association, ±.10-.29: moderate association, ±.30-.99: strong association, ±1.00: perfect association (Landau & Brian, 2004; Dee, 2023).

The selected variables in the case of staff were gender, age, birth position, duration of time in gambling and marital status. In addition to these, the selected variables for students were year of study, religion and career placement. Tables 13 and 14 present summaries of the statistical measures between the selected independent variables and the PGSI for staff and students respectively.

Table 13. Measures of relationship between selected input variables and PGI (Staff)

Input variables	**Statistic**					**Remarks**
	$\chi 2$	λ	γ	df	p-value	
Gender and PGI	9.97	0.05	0.68*	14	> 0.05	Not significant
Birth position and PGI	64.2	0.00	0.32	56	> 0.05	Not significant
Marital status and PGI	3.2	0.1	0.3	4	> 0.05	Not significant
Family financial status and PGI	8.9	-0.5*	0.5*	6	< 0.05	Strong/Significant
Duration in gambling and PGI	7.2	0.3	0.4	6	> 0.05	Not significant
Age and PGI	**25.1**	**0.1**	**0.1**	**28**	**> 0.05**	**Not significant**

Source: Field data

Table 13 shows results of statistical analysis between the independent variables and the PGSI as the dependent variable. Judging from these results, there are varied strengths in the relationships between the independent and dependent variables, with the strongest, but not significant being gender and PGI (γ =0.68), and lowest being age and PGI (γ =0.1). The relationship between family financial status is strong and significant (λ= -0.5 $p<0.05$; γ =0.5, $p<0.05$). The results for gamma statistic show a strong relationship between birth position and PGI (γ = 0.32), hence implying that birth position may likely influence gambling behavior among staff members. Similar findings are shown for marital status (γ = 0.3), family financial status (γ = 0.4) and duration in gambling activity (γ = 0.4).

Other studies, for example Petry and Mallya (2004) found gambling to be prevalent among University medical staff. The most common forms of gambling were lottery and scratch tickets, slot machines, card playing, sports betting, bingo, track on the internet. Most of the respondents in this study were classified as problem gamblers and pathological gamblers, and were male, single, employed full time and with low income and educational levels.

Table 14. Measures of Relationship between selected variables and PGI (Students)

Input variables	**Statistic**					**Remarks**
	$\chi 2$	λ	γ	df	p-value	
Gender & PGI	24.5*	0.03	0.12	9	<0.05	Significant
Birth Position &PGI	10.2	0.01	0.06	12	>0.05	Weak
Marital Status & PGI	12.2	0.03	0.09	15	>0.05	Weak
Family Financial Status & PGI	19.7	0.04	0.12	15	>0.05	Weak
Duration in Gambling & PGI	125.8*	0.10*	0.63*	15	<0.05	Strong/Significant
Age & PGI	13.74	0.004	0.16	12	>0.05	Weak
Year of Study &PGI	18.3	0.013	0.13	12	>0.05	Weak
Religion & PGI	29.1*	0.004	0.16	15	<0.05	Significant
Career Placement &PGI	**24.6**	**0.009**	**0.14**	**18**	**>0.05**	**Weak**

Source: Field data

Table 14 shows results of statistical analysis between independent variables and the PGI as the dependent variable for the case of students. From the results, there is a significant relationship between gender and PGI ($\chi 2 = 24.5$, df = 9, $p < 0.05$) duration in gambling ($\chi 2$=125.8.df=15, p<0.05) and religion ($\chi 2 = 29.1$, df = 15, $p < 0.05$). Similarly, the results show a strong association between duration in gambling and PGSI ($\gamma = 0.51$). The other variables, namely birth position, family financial status, age, year of study, and career placement had weak relationships with PGI.

Literature shows that gambling among university students and adolescents is predominantly associated with various factors, such as age, being male, peer pressure, family environment, substance abuse, entertainment/socialization, stress and low socio-economic status (Mbiriri, 2023; Gonz áez, et al. 2023; Veno, et.al., 2023). The influence of these factors on gambling and gambling harms is different in one region compared to the other. Similarly, some of these factors have been accepted and culturalized in other societies as normal (WHO, 2024) which subsequently encourage gambling among the members of society. The normalization of gambling has been accentuated in various countries through commercialization and advertising, availability of and easy access to gambling products, official sports promotions, online promotional activities, gambling as a source of national tax revenue, acceptable gambling venues and official policy on regulations (Thomas, et.al., 2018: Nsereko, et al., 2023).

4. Conclusions

Results acquired and analyzed from this study produced anticipated findings as well as possible implications for policy intervention at both the university and society's level concerning gambling. First, similar to other studies, this work showed that many university students are actively engaged in gambling, and that about 70% of them are at the moderate to problem gambling levels (3^{rd} and 4^{th} quartiles) on the PGI continuum. The implications of this trend can be serious given that university students represent a youthful population at the age of 18 to 25 years, the highly trained and skilled labour-force of the country and characteristically influence the rest of society. It was also noted that among these students, there were cases of suicidal inclinations, stress and addictive tendencies.

Further, the findings also show relatively heavy spending of money on various aspects of gambling in the form of placing a bet, winning and losing in gambling activity. These are likely to predispose the gamblers into possibilities of lying to get money for betting, stressful tendencies and relationships, family breakdowns, academic failures and high costs associated with remedial and corrective interventions.

Although gambling can be a preoccupation for all and any persons, statistical analysis indicates possible characteristics of individuals likely to develop gambling behaviors and even slip into problem gambling. Generally, individuals who occupy first born positions in the family, are catholic by religious faith, gamble longer hours, belong to the male gender, come from able families with stable financial backgrounds and are married are more likely to engage in gambling behaviors.

5. Limitations and Future Research

The findings of this study should be interpreted and generalized within certain methodological limitations and assumptions. Although the sample size was determined from the student and staff populations, respondents were identified and selected through snowball method. The snowball sampling method suffers primarily from a possibility

of high sampling bias and limited generalizability because participants refer others similar to themselves, likely creating a homogeneous sample in the process, with a possibility of having no control over the sample composition, and may not represent the broader population accurately. Nonetheless, the sample selected was of diverse demographics in terms of gender distribution, courses of study, class level (year 1,2, 3 and 4), religion, family socio-economic background and duration and intensity of involvement in gambling. Similarly, sample selection and determination were scientifically guided by using the formula for determining sample sizes from a given populations by Krejcie and Morgan (1970). The sample was determined and selected from a large population of about 12,000 students and 500 staff.

Similarly, the PGI comprises constructs generated from the Canadian Problem Gambling Index (CPGI) that have been validated and utilized in other studies initially (Currie, et. al., 2013) and as advocated by IPSOS, (2023). In this study, additional items were generated and customized so as to measure a given construct more comprehensively. These items were tried through piloting in a neighboring University and found to generate useful and relevant data. Since there is increased research interest on gambling harms, these items may need further validation as measures of problem gambling for future studies.

6. Recommendations

The findings from this study have important implications for intervention so as to help remedy and mitigate likely negative consequences. Since it appears that gambling behavior has been generally accepted and normalized, it is vital for emphasis to be placed on responsible gambling so as to avoid addiction and its negative externalities. Therefore, institutional policies modelled alongside a national policy and legal framework might be a necessary intervention. The legal and regulatory framework will provide standards for controls so as to guide institutional implementation. Further, at institutional level, a gambling intervention policy can be generated through stakeholder involvement, so as to determine, among other parameters, times, durations, venues and amount of money to be availed for gambling per month. In order to enhance the policy framework, and encourage responsible gambling habits, it would be important for students and staff to be trained on financial literacy.

The study findings confirmed that students and staff involved in gambling experience negative psychosocial effects, such as anxiety, depression, stress, difficult social relationships with friends and family, and low production and academic outputs. A psycho-social intervention through organized guidance and counselling may help such individuals. Therefore, institutions need to create gambling harms intervention centers and helplines with adequate resources and appropriately trained staff for individualized and effective counselling programmes. The counselling programmes may include parents/guardians so as to stem the parental/guardian involvement in encouraging early gambling behavior among students (Gonzalez, et al., 2023).

7. Conflict of Interest

The authors declare no conflict of interest.

8. Data Availability Statement

All data that supports these findings are stored electronically and can be availed by the corresponding author upon official request.

9. Ethical Clearance

Ethical clearance to undertake this study was obtained from the Ethics Review Committee (ERC) of Jaramogi Oginga Odinga University of Science and Technology (JOOUST), approval reference, JOOUST/DVC-ASAR/ERC/E4 dated 4th February 2024. The respondents were duly informed about the study and those who gave their written informed consent were recruited for the study.

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References

Amalemba, Robert. (2025). *Betting on Disaster: The Hidden Cost of Kenya's Gambling Craze - From Insomnia to Suicides.* https://willowhealthmedia.org/betting-on-disaster-the-hidden-cost-of-Kenya's-gambling-craze-from-insomnia-to-suicides/

Bollen, A.K. (2002). Latent Variables in Psychology and the Social Sciences. *Annual Review of Psychology, 53*(1), 605-34. https://doi.org/10.1146/annurev.psych.53.100901.135239

Cassandra K. D., Michelle, G., Nerilee, H., Matthew, R., Matthew, B., Alex, R., & Lisa, L. (2022). *The role of parents in youth gambling*. Sydney: New South Wales, Office of Responsible Gambling

Cooper, A., & H.H. Marmurek. (2023). Separating Behaviors and Adverse Consequences in the Problem Gambling Severity Index (PGSI): A Confirmatory Factor Analysis and Rasch Analysis. *Journal of Gambling Studies, 39*, 1523-1536. https://doi.org/10.1007/s10899-023-10243-w

Currie, S. R., Hodgins, D. C., & Casey, D. M. (2013). Validity of the problem gambling severity index interpretive categories. *Journal of gambling studies, 29*, 311-327. https://doi.org/10.1007/s10899-012-9300-6

Daily Nation. (2025). *Hasten Move to Reign-in Gambling Frenzy.* https://nation.africa/kenya/blogs-opinion/editorials/hasten-move-to-rein-in-gambling-frenzy--5008454. Accessed 18th April 2025.

Dymond, S., Austin, J.L., Hoon, A., & Minster, S.T. (2007). Review of Gambling: Behavior Theory, Research, and Application" By Patrick, M. G., Charles A. L., Mark R. D., and Ginger R. W. (Eds.)," *Analysis of Gambling Behavior, 1*(2), Article 7. Available at: https://repository.stcloudstate.edu/agb/vol1/iss2/7

Dhamaraja, S., & Dipayan, D. (2018). *Introduction to Statistical Methods, Design of Experiments and Statistical Quality Control (eBook)*. Springer Nature Singapore. https://doi.org/10.1007/978-981-13-1736-1

Dee Britton. (2023). *SPSS eTutor: Measures of association and correlation*. SUNY Empire. https://subjectguides.sunyempire.edu/c.php?g=659059&p=4626955#:~:text=Gamma%20is%20a%20measure%20of,perfect%20relationship%20between%20those%20variables

Díaz, A., García, J., & Pérez, L. (2023). Gender differences in the propensity to start gambling. *Journal of Gambling Studies, 39*(4), 1799-1814. https://doi.org/10.1007/s10899-023-10232-z

Díaz, A., & Pérez, L. (2021). Gambling and substance use: A cross-consumption analysis of tobacco smoking, alcohol drinking and gambling. *Substance Abuse, 42*(4), 1016-1021. https://doi.org/10.1080/08897077.2021.1903657

GeoPoll Survey. (2019). *Custom Reports on Gambling in Kenya.* Geo-Poll Data on Gambling. Nairobi: Geo-Poll. https://knowledge.geopoll.com/gambling-data-kenya

González, A.P., Calderón, F.F., Newall, P.W.S., & Jariego, J.S.L. (2023). Peer and Parental Social Norms as Determinants of Gambling Initiation: A Prospective Study. *Journal of Adolescent Health, 73*(2), 296-301. https://doi.org/10.1016/j.jadohealth.2023.02.033

Hira, T. K., & Monson, K. W. (2000). A social learning perspective of gambling behavior among college students at Iowa State University, USA. *Journal of Consumer Studies & Home Economics, 24*(1), 1-8. https://doi.org/10.1046/j.1365-2737.2000.00111.x

IPSOS. (2023). *Problem Gambling Severity Index, Final Report*. https://www.gambleaware.org/media/fvsfn1j0/pgsi-tech-reportt.pdf

Kaggwa, M., Mohammed A.M. Sarah, N., Moses M., Moses, K., Rahel, N., Alain, F., Raymond, B.K., Gideon, M., Innocent, A., Godfrey, Z.R., & Mark, D.G. (2022). Gambling-related Suicide in East African Community Countries: Evidence from Press Media Reports. *Springer Nature Journal, 22*, 158. https://doi.org/10.1186/s12889-021-12306-2

Kemunto, B. O. (2019). *Gambling Behavior of Low-Income Youth in Dandora*. MA Thesis. Nairobi: University of Nairobi Repository.

Krejcie, R.V., & Morgan, D.W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement, 30*(3), 607-610. https://doi.org/10.1177/001316447003000308

Landau, S., & E.S.Brian. (2004). *A Handbook of Statistical Analyses Using SPSS.* London: Chapman & Hall/CRC Press LLC. https://doi.org/10.1201/9780203009765

Lusago, J.K., J.J. Kilamiya, & M.A. Bingwe. (2024). Impact of Socioeconomic and Demographic Variables on Student Engagement in Gambling Activities: Insights from Mkuranga District. *African Journal of Empirical Research, 5*(1), 339-348. https://doi.org/10.51867/ajernet.5.1.33

Maina, M.M. (2020). *Factors Influencing Growth of Gambling Activities in Kenya.* MBA Thesis. Nairobi: Strathmore University. http://hdl.handle.net/11071/10425

Mbiriri, M. (2023). Predictive Factors for Gambling and Prevalence of Problematic Gambling among Students in Selected Public Universities in Kenya. *African Multi-Disciplinary Journal of Research, 8*, 111-135. https://doi.org/10.71064/spu.amjr.8.1.221

NCPG. (2023). *What is Problem Gambling?* https://www.ncpgambling.org/help-treatment/faqs-what-is-problem gambling/#:~:text=What%20is%20the%20national%20social,%2C%20bankruptcy%2C%20and%20other%20consequences. Accessed 16th April 2025.

Nsereko, N.D., Mark Mohan Kaggwa, M.M., Adebisi, T., Ssewanyana, D., Veronika, Basa, V., Hussain, S., Kihumuro, R.B., Ssewante, N., & Bbosa, S. (2023). Gambling Prevalence and Factors Associated with Gambling Participation among University Students in Uganda. *Qeios Journal, 5*. https://doi.org/10.32388/QL6YC1.2

Ogachi, F. M., Muchiri Karega, D., & Mvungu, E. N. (2020). *Prevalence and Factors Associated with Gambling Disorder Among Kenyan University Students Involved in Sports Betting*. https://www.ijern.com/journal/2020/April-2020/11.pdf

Petry, N.M., & Mallya, S. (2004). *Gambling participation and problems among employees at a university health center*. PubMed. National Center for Biotechnology Information. PMID: 15060331. https://doi.org/10.1023/B:JOGS.0000022307.09299.f5

Perez, L., & Humphreys, B. R. (2011). The income elasticity of lottery: New evidence from micro data. *Public Finance Review, 39*(4), 551-570. https://doi.org/10.1177/1091142111403620

Salonen, A.H., Matilda, H., Tiina, L., & Sari., C. (2018). *Gambling Participation, Gambling Habits, Gambling-Related Harm, and Opinions on Gambling Advertising in Finland in 2016*. https://doi.org/10.1177/1455072518765875

Seal,E. Buly A. C., Matthew, N., Alex, D., Paul, H., Erica, R., & Kiera, S. (2022). The Gambling Behavior and Attitudes to Sports Betting of Sports Fans. *Journal of Gambling Studies, 38*, 1371-1403. https://doi.org/10.1007/s10899-021-10101-7

Shin, H.C. (2018). Commentary on a scale as a sum of manifest variables. *Annals of Epidemiology, 28*(10). October 2018. Page 736-738. https://doi.org/10.1016/j.annepidem.2018.08.003

Shin, S. H., & Montalto, C. P. (2015). The role of impulsivity, cognitive bias, and reasoned action in understanding college student gambling. *Journal of Youth Studies, 18*(3), 376-395. https://doi.org/10.1080/13676261.2014.963537

Thomas, S., Pitt, H., Bestman, A., Randle, M., McCarthy, S., & Daube, M. (2018). *The determinants of gambling normalization: causes, consequences and public health responses*. Melbourne: Victorian Responsible Gambling Foundation.

Ssewanyana, D., & B. Bitanihirwe. (2018). Problem Gambling Among Young People in Sub-Saharan Africa. *Frontiers in Public Health, 6*(23). https://doi.org/10.3389/fpubh.2018.00023

Tomás, L., Renato, F., Daniel, D.S., & Ralph, H. (2019). *No Effect of Birth Order on Adult Risk Taking.* https://doi.org/10.1073/pnas.1814153116

Veno, D.K., Laily, T.S., & Erfan, R. (2023). Understanding the socioeconomic determinants of gambling harm: a population-based study. *Journal of Public Health, 46*(1), e199-e200. https://doi.org/10.1093/pubmed/fdad172

Wickwire, E. M., Whelan, J. P., West, R., Meyers, A., McCausland, C., & Leullen, J. (2007). Perceived availability, risks, and benefits of gambling among college students. *Journal of Gambling Studies, 23*, 395-408. https://doi.org/10.1007/s10899-007-9057-5

WHO. (2024). *Gambling*. World Health Organization. https://www.who.int.>news-room>fact-sheets>detail 2nd December 2024.