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REVIEW PAPER

Gambling Patterns and Problem Gambling Among Youth in Sub-Saharan Africa: A Systematic Review

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Abstract
Mounting evidence suggests that youth in sub-Saharan Africa (SSA) find themselves increasingly drawn to gambling related activities; an issue, that if left unchecked, can lead to adverse consequences including financial difficulties, crime and mental health problems. To better understand the psychosocial mechanisms underlying problem gambling, there is a pressing need to conduct more research on gambling related disorders amongst this vulnerable stratum of society. Against this background, the present review explores gambling patterns, attitudes and behaviors among youth in SSA—in a manner aligning with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. We systematically searched 8 databases including PubMed, Science Direct, Scopus, ProQuest, Wiley Online, Google Scholar, PsycINFO and PsycARTICLES for published research articles up until July 2019. A total of 1624 articles were screened, of which, only 13 studies met inclusion criteria. All of these studies were cross-sectional in nature and the quality of each study was evaluated using the Newcastle–Ottawa Scale. Studies varied considerably ranging from neuropsychological and personality trait assessment to application of item response theory. Due to this study heterogeneity we could not conduct a meta-analysis. The results presented here suggest that the existing body of evidence pertaining to patterns of gambling-related harm among youth in SSA is weak. This study highlights the need for additional good quality studies focusing on gambling related behaviors and prevalence levels among the continent's youth. Additionally, the findings reported herein emphasise the need for implementing social policies alongside effective public health interventions to tackle gambling addiction.

Keywords Gambling · Gambling addiction · Interventions · Mental health · Youth · Sub-saharan africa

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Introduction

Gambling addiction among youth in sub-Saharan Africa (SSA) represents a growing public health concern (Ssewanyana and Bitanihirwe 2018). In recent years, increased attention has been paid to this issue with creative and informative documentaries such as "*Gamblers like Me: The Dark side of Sports Betting*" focusing on the negative impact of sports betting on youth on the continent (The BBC Africa Eye 2019). Beyond this aspect, there has been a surge in peer-reviewed published literature emerging from SSA highlighting the patterns, attitudes and characteristics of problem gambling among this vulnerable population (Abdi et al. 2015; Adebisi et al. 2020; Ayandele et al. 2020; Glozah et al. 2019; Hayk and Salier 2020; Kiwujja and Mugisha 2019; Odame et al. 2020; Ucheagwu et al. 2019; Uwiduhaye et al. 2020).

Consistent with the extant literature from developed countries describing gambling as a complex disorder involving bio-psychosocial and genetic components (Dowling et al. 2017; Floros, 2018; Fong 2005; Messerlian et al. 2005), gambling reports from SSA have shown that children of gambling addicts are at an increased risk of developing gambling problems (Rule 2000), suggestive of a genetic susceptibility to gambling addiction. Furthermore, social factors including peer influence, socio-economic status and lack of job opportunities in addition to environmental factors such as accessibility of gambling venues and advertisements are believed to have a direct effect on gambling habits among the continent's youthful population (Abdi et al. 2015; Adebisi et al. 2020; Bunn et al. 2020; Hayk and Salier 2020; Tagoe et al. 2018).

Like much of the world, youth in SSA have grown-up in an era where gambling opportunities are widely accessible via platforms including mobile phones and the internet (Calado et al. 2017). Furthermore, the dramatic increase in—legal and illegal—gambling establishments in SSA has been suggested to underlie the increased incidence and prevalence of gambling problems among youth, an issue that has been linked to adverse consequences including loss of household or personal money (e.g., school fees money), strained interpersonal relationships, psychological distress and crime (Ssewanyana and Bitanihirwe 2018). Despite a number of countries on the continent pushing gaming and gambling firms to establish restrictive measures including marketing regulation and age restriction, there is evidence to suggest that adolescents, in particular, may exhibit higher prevalence rates of gambling related behavior than adults (Gupta and Derevensky 2000; Volberg et al. 2010).

Although a strong focus has been placed on understanding patterns and behaviors of problem gambling among adolescents and youth in Western nations (Calado et al. 2017; Derevensky et al. 2014; Estévez et al. 2020), less emphasis has been placed on characterizing the extent of this epidemiological phenomenon among these strata in SSA (Ssewanyana and Bitanihirwe 2018). Against this background, the purpose of this review was to identify peer-reviewed literature concentrating on problem gambling among youth in SSA. Understanding patterns and problems of gambling is crucial for devising context relevant interventions and policy actions to address this growing public health concern. Here we provide a country-by-country analysis—where possible—in relation to prevalence rates, attitudes and behaviors among youth for that particular country.

Methods

This systematic review was conducted in accordance with the criteria of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al. 2009). For quality assessment of eligible studies, the Newcastle–Ottawa Scale (NOS) customized for cross sectional studies was applied (Wells 2008). The protocol for the present systematic review was registered on PROSPERO (No. CRD-42019123842).

Literature Search Strategy

A literature search was conducted including the following databases: PubMed, Science Direct, Scopus, ProQuest, Wiley Online, Google Scholar, PsychINFO and PsychARTICLES for original research articles published up until July 2019. The following search terms were used: “youth gambling prevalence”, “adolescent gambling”, “adolescent problem gambling”, “youth gambling addiction”, “youth compulsive gambling” and "sub-Saharan Africa". A snowballing process was applied to identify any potential references of interest cited in the studies that met the inclusion criteria.

Selection Criteria and Quality Assessment

Both authors independently reviewed the titles and abstracts of the retrieved publications in terms of inclusion criteria. All studies that passed this screening process were subsequently read in their entirety in order to determine their final eligibility for inclusion in the final review. Any uncertainties and discrepancies were resolved through discussion between the authors. The inclusion criteria consisted of adolescents and young people (with an age that could range from 10 to 35 years, based on the African Youth Charter) from SSA countries for whom the outcomes (psychological and socio-economic consequences) have been reported in peer-reviewed journals. In contrast, exclusion criteria involved studies not falling within the youth age group and those not documenting gambling-related outcomes. If a study did not explicitly report data (i.e., commentary, expert opinions and editorials) they were also excluded. As with the selection criteria process, quality assessment was conducted by both authors using the NOS adjusted for cross-sectional studies. This tool is divided into three sections that evaluate three quality parameters (selection, comparability, and outcome) divided across 7 specific items.

Data Extraction

The following data were extracted from the included studies: The first author’s name, publication year, country of study, sample characteristics (e.g., age range, gender), most prevalent form of gambling, gambling frequency, tools used to measure gambling outcomes and the implications of gambling.

Data Synthesis

Because studies varied broadly (i.e., marked heterogeneity between studies) in terms of outcome measurement such as neuropsychological profiles and personality traits, we opted to conduct a narrative synthesis as opposed to a meta-analysis.

Results

The electronic database search yielded 1624 studies. Following the article screening of titles and abstracts, 25 full-text articles were obtained for detailed eligibility assessment. Of these, 13 articles were included in this systematic review (Abdi et al. 2015; Agoucha et al. 2019; Akanle and Fageyinbo 2019; Dellis et al. 2013; Glozah et al. 2019; Kiwujja and Mugisha 2019; Muchimba et al. 2013; Peltzer and Pengpid 2014; Sharp et al. 2015; Surujlal and Akinwale, 2017; Tagoe 2018; Temitope, et al. 2019; Ucheagwu et al. 2019) (Fig. 1). Based on the Newcastle–Ottawa Scale, 6 of the 13 studies were of good quality, 4 were of satisfactory quality and the remaining 3 were unsatisfactory. Reviewers' evaluations matched 85–100% in each study.

Adolescent and Youth Gambling in SSA

Studies from Eastern Africa

Two cross-sectional studies were eligible from Eastern Africa (Abdi et al. 2015; Kiwujja and Mugisha 2019) (Table 1). One involved a student sub-population (12–21 years) from an urban setting of Ethiopia (Abdi et al. 2015) and the other study from a Ugandan suburban setting involved participants (15–24 years) drawn from community households (Kiwujja and Mugisha 2019). Both studies indicated a high prevalence of gambling among youth with one reporting that 62% of the participants gambled within the past 12 months (Abdi et al. 2015) and the other study found a 73% lifetime prevalence of gambling (Kiwujja and Mugisha 2019). Moreover, the study from Uganda indicates that a majority of participants (71%) initiated gambling while less than 18 years of age (Kiwujja and Mugisha 2019)—an issue of particular importance given that the jurisdiction in Uganda makes it illegal for individuals under the age of 25 to engage in betting and gambling (The National and Lotteries Regulatory Board 2016). Pathological or compulsive gambling was screened among 7–10% of the students in the Ethiopian study on a basis of two standardized measures for gambling viz., Diagnostic and Statistical Manual of Mental Health Fourth-version adapted for Juveniles (DSM-IV-J) and Gamblers Anonymous Twenty Questions (GA-20). In this same study, 44% of the gamblers were classified as problematic gamblers (Abdi et al. 2015). The Ugandan study reported that 40% of the youth gamblers were frequent gamblers and 91% of them screened positive for at least one gambling problem (Kiwujja and Mugisha 2019).

Drug use (e.g., hashish, cigarettes, alcohol); psychological problems such as feeling depressed, nervous and having disturbing thoughts after gambling; negative social impacts like problematic relationships, conflicts with family members and friends; and negative economic impacts such as chasing the bet, taking money from lunch and transport for betting, were all positively and significantly associated with higher scores on diagnostic screening tools for gambling among youths in Ethiopia (Abdi et al. 2015). Notably, in the Ugandan study, youth that screened positive for problem gambling and those who gambled more frequently, experienced greater odds of engagement in unprotected sex, having multiple sexual partners, engagement in cross-generational sex, and earlier on-set of sexual intercourse as compared to their peers who were less frequent or non-problem gamblers (Kiwujja and Mugisha 2019). In both study settings, card games, flipping coins, pool table games and sports betting were some of the most popular forms of gambling.

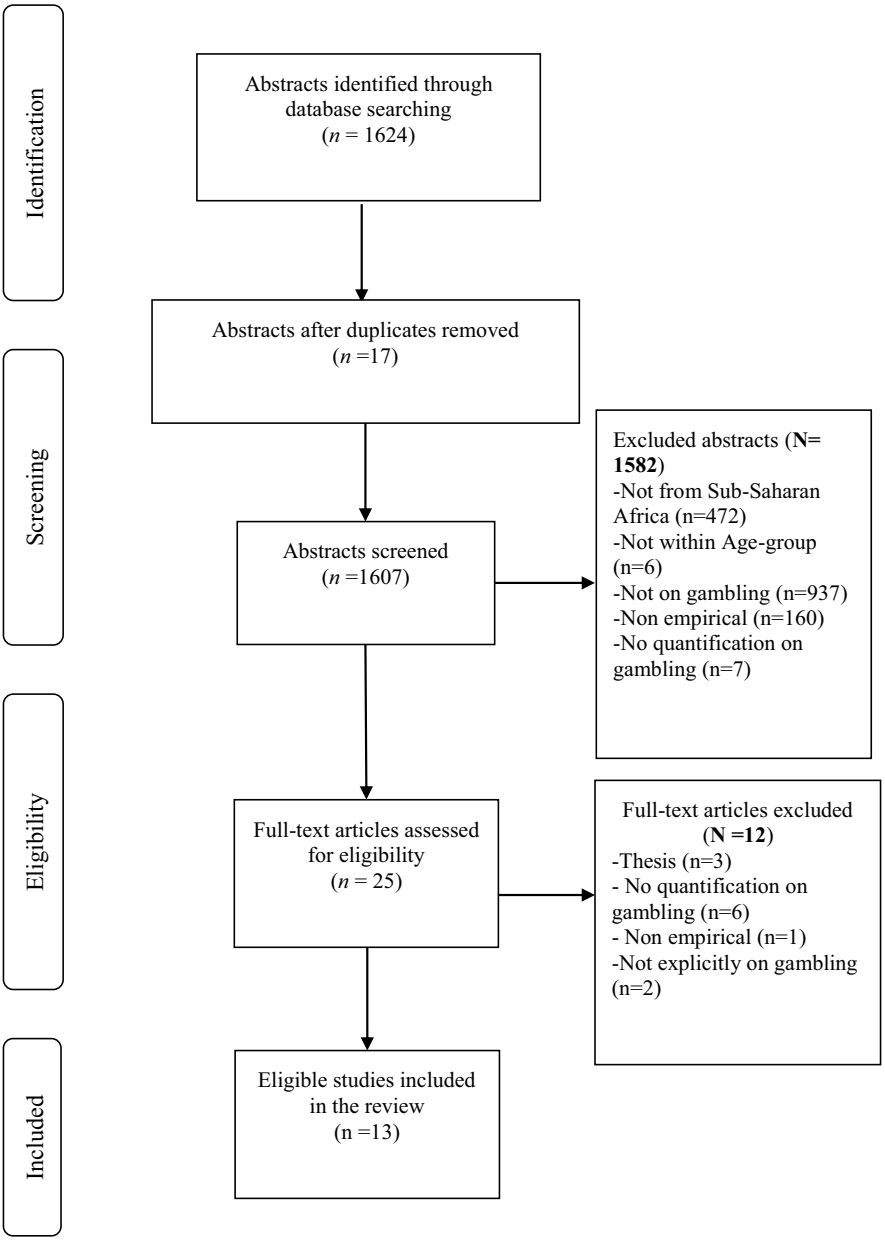

Fig. 1 Literature search procedure flowchart, following preferred reporting items for systematic reviews and meta-analyses (PRISMA) standards

Studies from Western Africa

Six eligible cross-sectional studies originated from the Western African countries of Nigeria (Agoucha et al. 2019; Akanle and Fageyinbo 2019; Temitope et al. 2019; Ucheagwu

Table 1 A summary of findings from the studies conducted in Eastern Africa

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/items	Quality of study (Newcastle–Ottawa Scale scores)[d]	Implication of gambling
Abdi et al. 2015 (Ethiopia)	422 high school students (of these 307 reported that they have/or had been gambling) Mean age (16.4, sd = 1.4)	Playing cards, flipping coins and pool gambling, video gaming were the most common forms of gambling. Internet gambling was among the least reported	Gambling frequency: 307 of 422 (73%) had ever participated i.e. 41% males and 32% females Problem gambling Based on DSM-IV-J: - 56.3% were non-problematic or social gamblers - 36.8% were at risk for severe problematic gambling - 6.9% were problematic or pathological gamblers Based on GA-20: -9.6% were compulsive gamblers	Diagnostic and statistical manual of Mental Health Fourth version Adapted for Juveniles (DSM-IV-J) Gamblers Anonymous Twenty Questions (GA-20)	8 (Good)	Drug use (hashish, cigarettes, alcohol) was significantly positively associated with increasing scores in DSM-IV-J and GA-20 ($p < 0.001$) Greater Psychological impacts were significantly positively associated with increasing scores in DSM-IV-J ($p = 0.035$) and GA-20 ($p = .002$) [a]Greater Social impacts were significantly positively associated with increasing scores in DSM-IV-J ($p = 0.001$) and GA-20 ($p = 0.011$) [b]Greater Economic impacts were significantly positively associated with increasing scores in GA-20 ($p = 0.028$)

Table 1 (continued)

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/items	Quality of study (Newcastle–Ottawa Scale scores)[d]	Implication of gambling
Kiwujja and Mugisha 2019 (Uganda)	397 (63% males) youths (15–24 years) recruited from households in Rubaga division, Kampala	Playing cards/dice, sports betting, flipping coins and pool gambling. Regular lottery was the least prevalent form of gambling	Participation in gambling during past 12 months 62% (74.1% among males; 41.1% among females) Frequency of gambling (gambling more than once a week) 40% gambled frequently Onset of gambling (early onset at less than 18 years) 71% started gambling at less than 18 years Having experienced a gambling problem 91% of gambling youth had at least 1 gambling problem	Items on gambling developed/modified from standardized tools such as the Gambling Behavior Scale for Adolescents (GBSA) and the South Oaks Gambling Screen-Revised for Adolescents	6 (satisfactory)	[c]The odds of engaging in sex were higher among gamblers VS non-gamblers (OR = 4.2, $p < 0.001$) The odds of ever having had sex were higher among frequent gamblers VS non-frequent gamblers (OR = 2, $p = 0.021$) The onset of sex (14.4yrs) was earlier among individuals that had ever gambled VS non-gamblers (16.3 yrs), $p = 0.017$ The onset of sex (12.6 yrs) was earlier in frequent gamblers VS non-frequent gamblers (14.9 yrs) $p = 0.026$ The onset of sex was earlier (13.9 yrs) among those with gambling problems VS non-problem gamblers (13.9 yrs) $p < 0.001$ The odds of sex in the last year were higher among individuals that had ever gambled VS non-gamblers (OR = 3.4, $p < 0.001$) The odds of sex in the last year were higher among frequent gamblers VS non-frequent gamblers (OR = 2, $p = 0.016$) The odds of unprotected sex (lifetime) were higher among problem gamblers VS non-problem gamblers (OR = N/A, $p = 0.051$) The odds of unprotected sex (last encounter) were higher among individuals who had ever gambled VS non-gamblers (OR = 1.9, p = 0.077) The odds of unprotected sex (last encounter) were higher among frequent gamblers VS non-frequent gamblers (OR = 0.3, $p < 0.001$) The odds of unprotected sex (last encounter) were higher among problem gamblers VS non-problem gamblers (OR = N/A, $p < 0.008$) The odds of multiple sexual partners (lifetime) were higher among those with gambling problems VS non-problem gamblers (OR = N/A, $p = 0.001$) The odds of multiple sexual partners (last 3 months) were higher among those with gambling problems VS those without gambling problems (OR = N/A, $p < 0.001$) The odds of cross-generational sex were higher among individuals who had ever gambled VS those who had never engaged in gambling (OR = 0.2, $p < 0.001$)

[a]Psychological impact *(feeling depressed after playing games involving money, feeling nervous, disturbing thoughts as a result of playing games)*

[b]Social impacts *(quarrelled or fought with friends on game playing, getting in conflict with family members, problematic relationships with friends due to playing games)*

[c]Greater economic impact *(e.g. losing all money one has, taking money from lunch or taxi to spend on betting, chasing the bet)*

[d]Newcastle-Ottawa Scale score*: Very good (9–10); good (7–8); satisfactory (5–6); unsatisfactory (0–4)*

et al. 2019) and Ghana (Glozah et al. 2019; Tagoe et al 2018) (Table 2). Three of these studies were conducted among student sub-populations (Agoucha et al. 2019; Glozah et al. 2019; Ucheagwu et al. 2019), with one study conducted among a mixture of students and out-of-school youths (Temitope et al. 2019), while the other two studies comprised of patrons recruited from gambling premises (Akanle and Fageyinbo 2019; Tagoe et al. 2018).

Findings from Student Sub-Populations

The studies from the student sub-populations in Western Africa generally indicated that sports betting and playing card games were the most common forms of gambling among high school students (Agoucha et al. 2019; Glozah et al. 2019; Temitope 2019), however, one study solely recruited university students and only focused on online football gambling (Ucheagwu et al. 2019). Noteworthy, none of these 4 studies utilized a standardized measure for gambling behavior, as they all focused on self-reported frequency of gambling. Although assorted measures for gambling behavior were used, both studies among high school students indicate that gambling behavior is highly prevalent, with one of the studies reporting a prevalence level of 57% in relation to lifetime gambling and a prevalence level of 78% (among lifetime gamblers) for individuals currently engaging in gambling activities (over the past 12 months) (Agoucha et al. 2019). The other study also reported, for instance, that 21% of the high school students "*very often or often*" engaged in sports betting (Glozah et al. 2019). The study among university students however did not report prevalence levels of gambling behavior as gamblers had been purposively selected and matched with non-gamblers to generate the study sample (Ucheagwu et al. 2019). Although correlational statistics were not reported, slightly more than a half of the high school students who had ever gambled reported having excessive financial spending on gambling and close to a third of them reported having experienced academic and substance use problems. There was also a nine-fold likelihood for having experienced problems with the authorities on the account of betting among current gamblers in comparison to non-current gamblers (Agoucha et al. 2019). Another study conducted among high school students in Ghana revealed that perceived social difficulties especially arising from friends were experienced by the students whose perceived positive economic benefits of gambling were high (Glozah et al. 2019). In the study by Temitope that utilized a standardized Gambling Behavior Scale (16 items) to assess gambling behavior among in-school and out-of-school youths in Nigeria (Temitope et al. 2019), it was reported that males scored higher than females (mean scores were 56.2 versus 48.2) on the scale. Increased scores on gambling behavior were significantly predictive of increase in financial strain among the youths ($p < 0.01$) (Temitope et al. 2019).

Findings Stemming from Gambling Venue Patrons

Both of the studies targeting gambling venue patrons were focused on sports betting, and the patrons were mostly male (79%) in the Nigerian study (Akanle and Fageyinbo 2019), whereas the study population in the study from Ghana was entirely comprised of male subjects (Tagoe et al. 2018). Both studies did not utilize standardized tools, with one reporting gambling frequency and betting patterns per week (Akanle and Fageyinbo 2019), while the other only captured participants' self-identification as a gambler (Tagoe et al. 2018). Up to 65% of the gambling patrons in the Nigerian study were frequent gamblers (betting thrice

Table 2 A summary of findings from the studies conducted in Western Africa

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/items	[h]Quality of study (Newcastle–Ottawa Scale scores)	Implication of gambling
Agoucha et al. 2019 (Nigeria)	507 students from 3 male only urban secondary schools Mean age (15.3 years, sd = 1.4)	Sports betting (63.6%) Playing cards (11.6%) Lottery (10.6%)	Gambling frequency: 57.2% had ever gambled i.e. lifetime gambling 77.6% of the gamblers were current gamblers i.e. having gambled in the past 12 months	Non-standardized but pretested semi-structured self-administered questionnaire	5 (Satisfactory)	60% of those who had ever gambled also experienced the following problems: Financial problems Excessive spending on gambling (52.3%) Academic problems Poor attention to academics (35.6%) Substance use behavior cigarette, cannabis, alcohol (32.2%) Stealing (12.1%) Legal problems The odds of current gambling were higher among students that had experienced problems with the authority on the account of betting compared to those who did not experience such problems (OR = 9.8; 4.7–20.4)
Glozah et al 2019 (Ghana)	770 students from 4 high school in Accra (65.5% males) Mean age (16.9 years)	The Study focused on 4 types of gambling Card games Sports betting Lotteries Poker machines	Gambling frequency based on 5-point Likert scale (never, not often, sometimes, often, very often). Latter categorized as low and high frequency Those reporting often/very often engagement were: Card games (4.5%) Sports betting (21%) Lotteries (1.7%) Poker machines (2.9%)	Non-standardized item (study did not mention about pre-test or adaptation)	5 (Satisfactory)	[a]Perceived social difficulties [b]Economic perception of gambling [c]Academic attainment Youth's perceived social difficulties arising from friends significantly increased if they had greater perception of positive economic benefits from gambling Youth's perceived social difficulties arising from family significantly decreased if they had greater perception of positive economic benefits from gambling There was an increasing trend of positive perception of economic benefits from gambling with a decreasing trend of educational attainment grade score, however this trend was not statistically significant

Table 2 (continued)

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/items	[h]Quality of study (Newcastle–Ottawa Scale scores)	Implication of gambling
Akanle and Fageyinbo 2019 (Nigeria)	300 (79% males) customers of legal, formal and registered football betting premises or bettors who are usually fans of European football clubs in an urban setting (Ibadan city) 68.4% were 30 years and below	Study focused on only football betting	Frequency and patterns of football betting Number of times of staking a bet per week: Once- 16% Twice- 18% Thrice- 14% Four times- 20% Everyday- 31% Timings for betting: Weekdays- 28.6% Weekends- 68% Everyday- 2.7%	Non-standardized item (study did not mention about pre-test or adaptation)	3 (unsatisfactory)	[d]Financial implications Amount of money (in Naira) spent per stake on average: Less than 100—7.3% 100–500- 73.1% Above 500—18.3% Highest winning (amount in Naira): Less than 1000–12% Between 1000–20,000–40.7% Above 20,000- 47.3%
Tagoe et al. 2018 (Ghana)	20 male self-identified gamblers recruited from two sport betting companies/sites in Greater Accra region of Ghana Age range (17–35 years)	Study focused on only sport betting	Self-identification as a gambler and duration of gambling experience 6 months–2 years of gambling (9 people) More than 2 years of gambling (11 people)	Semi-structured open-ended questions (qualitative format)	2 (unsatisfactory)	7 main themes surrounding positive perceived benefits of gambling emerged: -An avenue for socialization and stress relief -Self-empowerment (being able to care for oneself using proceeds from gambling) -Resolving problems through channeling energy to betting -Source of quick money (provision of easy means to make money) -Avenue for expressing knowledge about sports -Reduction of theft in community (legitimate means of money making)

Table 2 (continued)

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/items	[h]Quality of study (Newcastle–Ottawa Scale scores)	Implication of gambling
Temitope et al. 2019 (Nigeria)	320 in-school and out-of-school youths (18–40 years) from 4 selected local government areas	General gambling behavior (there was no breakdown of the forms of gambling activities)	Gambling behavior scores Mean score in males was 56.2 (sd = 13.1) Mean score in females was 48.2 (sd = 10.9)	Gambling Behavior Scale (16-items)	2 (unsatisfactory)	[e]Financial Strain Increase in financial strain significantly predicted increased scores on gambling behavior among youths ($p < 0.01$)
Ucheagwu et al. 2019 (Nigeria)	140 University students (both gamblers and Non-gamblers) Age range of 18–26 years	Study focused on Online football gambling	Engagement in gambling Gamblers- those who gambled on average 4 days in a week for a consecutive period of 6 months Non-gamblers- students who reported no gambling behavior for at least the past 12 months	Non-standardized items (study did not mention about pre-test or adaptation)	7 (Good)	[f]Neuropsychological outcomes : -On-line football gamblers had better speed of processing, better inhibition ability, and better capacity in set shifting than the non-gamblers -However, on-line football gamblers showed less efficient performance on a backward subtraction task, which measures more of divided Attention [g]Personality traits = On-line football gamblers scored higher than non-gamblers on personality traits of agreeableness, conscientiousness and openness to experience = On-line football gamblers scored lower on measures of neuroticism (negative emotionality) than non-gamblers

[a]Perceived social difficulties was measured using the 19-items version of Adolescent Stress Questionnaire

[b]Economic perception of gambling was measured using a 9-item Attitudes Towards Gambling Scale (ATG)

[c]Academic attainment was assessed based on grades in 4 core subjects most current terminal examination

[d]A US dollar is equivalent to approximately 360 Nigerian Naira

[e]Financial strain was assessed using the 18 item Financial Strain Scale

[f]Neuropsychological outcomes were assessed using the Self-Paced Auditory Serial Addition Task (PASAT), Stroop-Word Color Test, and the Trail Making Test

[g]Personality traits were assessed using the Big Five Personality Inventory

[h]Newcastle-Ottawa Scale score*: Very good (9–10); good (7–8); satisfactory (5–6); unsatisfactory (0–4)*

sd standard deviation, *OR* odds ratio

or more in a week) and notably 31% of them engaged in betting practices on a daily basis. Betting was mostly on the weekends (Akanle and Fageyinbo 2019). The financial implications of betting in the Nigerian study were reflected through reports on amount spent on average per stake and the highest amount of money ever won. About 80% of the participants spent 500 Nigerian Naira (about 1.5 US dollars) or less per stake, and 53% of the gamblers had won 20,000 Nigerian Naira (about 55 US dollars) or less as their largest win (Akanle and Fageyinbo 2019). The Ghanaian study reported 7 major themes on gamblers' perceived benefits of gambling which included socialization and stress relief, self-empowerment, source of quick money, and a source of problem resolution (Tagoe et al. 2018).

Studies from Southern Africa

Four studies (3 from South Africa (Dellis et al. 2013; Sharp et al. 2015; Surujlal and Akinwale 2017) and 1 from Malawi (Muchimba et al. 2013)) originating from Southern Africa were included in this review (Table 3). Three of these studies drew participants from a general community setting (Dellis et al. 2013; Muchimba et al. 2013; Sharp et al. 2015) while one of the studies focused on a university student sub-population (Surujlal and Akinwale 2017). The findings from two studies that provided a breakdown of gambling activities indicated that the most common forms were playing cards, regular lottery, betting on sports events (especially among students), scratch cards (especially among the general community) and local games such as dice, coin spinning, and bowling (Dellis et al. 2013; Surujlal and Akinwale 2017). Classification of problem gambling severity based on a standardized tool (i.e., Problem Gambling Severity Index) was only conducted in two community-based studies from South Africa. In this regard, the study by Dellis and colleagues reported a 2% occurrence of problem gambling (with 4% of this burden arising among peri-urban dwellers as opposed to no occurrence among the rural dwellers) (Dellis et al. 2013). In contrast the study conducted by Sharp and associates, which comprised 29% youths (aged 18–29 years), found that 3% of dwellers from 4 metropoles screened positive for problem gambling (Sharp et al. 2015). Specifically among the youth group (18–29 years), 85.9% screened as no/low risk while 14.1% screened positive for moderate to high risk gambling (Sharp et al. 2015). The findings among 2342 rural dwellers in Malawi indicated that 84.4% had never gambled (Muchimba et al. 2013) whereas the frequencies from the two South Africa studies indicated that only 31.7% (23.7% rural dwellers versus 8% urban dwellers) (Dellis et al. 2013) and 43.3% metropole dwellers had never gambled (Sharp et al. 2015). One South African study also reported that 41% of the gamblers were regular gamblers (Dellis et al. 2013). In this study regular gamblers were significantly younger than non-regular gamblers, with the average age of gambling debut being 23 years old (Dellis et al. 2013).

Two studies stemming from South Africa reported on financial expenditure on gambling activities. The study by Dellis and colleagues that targeted a general community setting highlighted that cards and dice games accounted for the highest amount of money most previously spent on a gambling activity i.e., R301 (about 41 US Dollars) and R150 (about 21 US Dollars). On average, about R80 (about 11 US Dollars) had been spent on gambling in the previous month but this spending was significantly higher among the problem gamblers (R483 (about 66 US Dollars)) in comparison to the low risk (R152 (about 21 US Dollars)) and no risk (R22 (about 3 US Dollars)) groups (Dellis et al. 2013). However, another study among university students revealed that 59% of the students interviewed spent less than 10% of their monthly allowance on gambling, with about 45% of students reporting

Table 3 A summary of findings from the studies conducted in Southern Africa

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/ items	[c]Quality of study (Newcastle–Ottawa Scale scores)	Implication of gambling
Dellis et al. 2013 (South Africa)	300 participants (150 rural and 150 peri-urban dwellers) 50% were males Mean age = 35 years (Age range = 18–81 years)	Regular lottery (34%) Cards (12%) Scratch cards (11%) Local games (coin spinning, caps, dice) (11%) Regular sport and animal betting (2%)	Problem gambling severity in the past 12 months: 31.7%- Never gambled (8% Peri-urban, 23.7% rural) 42.6%- No risk (21.6% Peri-urban, 21%rural) 13.7%- Low risk (9.4% Peri-urban, 4.3% rural) 10%- Moderate risk (18% Peri-urban, 2% Rural) 2%- Problem gamblers (4% Peri-urban, 0% rural) Severity of problem gambling increased with gambling participation ($p < 0.01$) with 11% of regular gamblers meeting the criteria for problem gambling Gambling history 68% had ever gambled (lifetime gambling) Frequency of gambling 41% were regular gamblers (daily, weekly or monthly) on at least 1 activity Average age of gambling debut was 23 years Regular gamblers were also significantly younger than regular lottery only and non-regular gamblers at gambling debut (Mean age = 19.6 vs. Mean age = 24.0, and Mean age = 24.9)	Problem Gambling Severity index Items on gambling history were designed and back and forward translated	8 (Good)	Expenditure on gambling Among those who ever gambled, the most money that was ever spent was on lottery (47%), cards (26%), slot machines (8%), and scratch cards (5%) [a]Average amount spent at last time of each activity was highest for: -Cards (M = R301, sd = 764) -Dice (M = R150, sd = 370) -Slots (M = R174, sd = 375) -Lottery (M = R22, sd = 66) -Scratch cards (M = R15, sd = 20) -Local games (M = R12, sd = 15) Average expenditure on gambling in the last month: -Among those who ever gambled was R80, sd = R287. Among those who were regular gamblers it was R131, sd = R360 Expenditure by severity group: The average last month expenditure was significantly different between risk severity groups: -No risk group (R22, sd = R102) -Low risk group (R152, sd = R226) -Problem gamblers (R483, sd = R768) Self-reported personal income was not related to risk severity or gambling regularity, but personal borrowing was significantly ($p < 0.05$) higher among problem gamblers compared to other gamblers (M = R842, sd = R1796.2 vs. M = R74.1, sd = R288.6)

Table 3 (continued)

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/ items	[a]Quality of study (Newcastle–Ottawa Scale scores)	Implication of gambling
Muchimba et al. 2013 (Malawi)	2,342 Malawians (57.5% female) recruited from a rural community and were part of an ongoing cohort Age range was 15–29 years (Mean age = 21.2, sd = 3.6)	General gambling behavior was not broken down	Lifetime gambling Those who ever gambled were 15.6% (10.8% in females and 22% in males)	Items used were adapted from the South Oaks Gambling Screen	7 (Good)	Alcohol use behavior The odds of gambling were higher among youths who started drinking alcohol before 16 years (OR = 1.88 (95% CI: 1.3–2.6) compared to those who did not do so Drug use The odds of gambling were higher among youths who ever used drugs (OR = 4.17 (95% CI: 2.6–6.7)) compared to those who did not do so Fights The odds of gambling were higher among youths that engaged in fights (OR = 2.26, 95% CI:1.7–2.9) compared to those who did not do so Theft The odds of theft were higher among youths who ever gambled (OR = 3.2 (95% CI: 2.4–4.4)) compared to those who had never gambled Vandalism The odds of vandalism were higher among youths who ever gambled (OR = 3.9 (95% CI: 2.3–6.8)) compared to those who had never gambled [b]Sexual risk behavior Increasing disinhibitory behaviour scores (*this composite score also comprised engagement in gambling*) were significantly associated with increased odds of engagement in multiple sexual partnerships (adjOR = 1.12 (1.1–1.2) and greater number of lifetime sexual partners (adjOR = 1.97 (1.6–2.5))

Table 3 (continued)

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/ items	[e]Quality of study (Newcastle–Ottawa Scale scores)	Implication of gambling
Sharp et al. 2015 (South Africa)	3,000 adults (18 years and above from 4 metropoles of South Africa 1012 (29%) of this sample were youths aged 18–29 years	Gambling activities were not broken down	Problem gambling severity in the past 12 months: Of the 1012 youths (18–29 years): =85.9%- No or low risk for problem gambling =14.1%- Moderate and high risk for problem gambling	Problem Gambling Severity index	7 (Good)	[c]Comorbid Mental illness : Among the 18–29-year group, 6.6% had comorbid problem gambling and anxiety or depression [d]Comorbid Substance use disorder Among the 18–29-year group, 2.6% had comorbid problem gambling and substance use disorder Overall, problem gambling was significantly associated with moderate and severe depression (adjOR=2.17); moderate and severe anxiety (adjOR=2.45); moderate and severe alcohol use (adjOR=3.88); and moderate and severe SUD (adjOR=3.09) while adjusting for socio-demographics and socio-economic factors

Table 3 (continued)

Author (Country)	Sample characteristics	Most prevalent forms of gambling	Gambling outcome	Source of measurement/ items	[e]Quality of study (Newcastle–Ottawa Scale scores)	Implication of gambling
Surujilal and Akinwale 2017 (South Africa)	210 university students (51% males) who engaged in any type of gambling Age range was 18–25 years	Playing cards Betting on sports events Dice games Going to legal casinos Betting on lotteries Slot/poker machine gambling Bowling and other skill games	Frequency of engaging in gambling per week (Not at all, Once a week, More than once a week)		5 (Satisfactory)	Largest amount of money gambled with on any one day -R1-R10 – 45% -R11 – R100 – 20% -R1001 – R 10,000 – 3% Percentage of monthly allowance spent on gambling: -Not spent any of the allowance–29% -10% or less–59% -Above 50%–2% Focusing less on studies, and having no hope of future and needing help were the most significantly correlated consequences of problem gambling Other statistically significantly correlated consequences: -Sale of personal property -Anxiety and depression -Alcohol and drug use -Anti-social behaviour -Bad feeling about gambling habit -Hiding from parents/guardian -Loss of self-respect

[a]Average amount of money was reported in South African Rands (R). By the study period, 1 United States Dollar was equivalent to 7.28 Rands

[b]The disinhibitory behavior score was a composite score that comprised of 6 items on: having drunk alcohol before the age of 16, lifetime licit and illicit substance use, fighting, theft, vandalism, and gambling

[c]Mental illness was assessed using the Beck Depression Inventory (for assessing state of depression) and the Beck Anxiety Inventory (for assessing state of anxiety)

[d]Substance use disorder was assessed using the World Health Organization Alcohol, Smoking and Substance Involvement Screening Test (WHO ASSIST)

[e]Newcastle-Ottawa Scale score*: Very good (9–10); good (7–8); satisfactory (5–6); unsatisfactory (0–4)*

OR odds ration, *adjOR* adjusted odds ratio, *sd* standard deviation

that the largest amount they ever gambled was R10 (about 1.4 US Dollars) or lower (Surujlal and Akinwale 2017). This study also identified a number of detrimental issues that significantly correlated with problem gambling including: sale of personal property, substance use, anxiety and depression, loss of self-respect as well as focusing less on academic pursuits (Surujlal and Akinwale 2017).

The study from Malawi found that the odds of gambling (i.e., those who ever gambled) were statistically significantly higher among youth who: started drinking alcohol before 16 years (OR = 1.9), ever used drugs (OR = 4.2), engaged in physical fights (OR = 2.3), engaged in theft (OR = 3.2), engaged in vandalism (OR = 3.9) (Muchimba et al. 2013). In this study, high scores on a composite score (which also comprised engagement in gambling behavior) were associated with increased odds of engagement in risky sexual behavior, such as multiple sexual partnerships (Muchimba et al. 2013).

One of the studies from South Africa found that 6.6% of the youth (18–29 years) had comorbid problem gambling and anxiety or depression, of which 2.9% had comorbid problem gambling and substance use disorder (Sharp et al. 2015). Importantly, this study found that problem gambling was still significantly associated with severe depression, severe anxiety, alcohol use and substance use disorder following an adjusted analysis.

Multi-Site Study

A multi-site cross-sectional study conducted among youth aged between 16–30 years old in 25 countries across Africa, the Americas and Asia (Peltzer and Pengpid 2014) was included in this review. Just over a quarter (25.1%) of the study population was comprised of youths (4652 with 42% males) who were residents of 7 countries in SSA i.e., Western Africa (Cameroon, Ivory Coast and Nigeria); Eastern Africa (Madagascar and Mauritius); and Southern Africa (Namibia and South Africa). The individuals in this study were all undergraduate students from universities located in capital cities or major cities. The aim of this study was to estimate the prevalence and correlates of physical fights (over the past 12 months) among university students. Gambling behavior, which was screened using the South Oaks Gambling Screen, was among the various correlates of physical fights which was reported in this study. The findings revealed that overall, 8% of the university students engaged in frequent gambling (gambling more than once in the past week). Furthermore, frequent gambling was positively and significantly associated with engagement in physical fights during the past 12 months (Adjusted Odds Ratio was 1.50 (95% CI: 1.23–1.83)) (Peltzer and Pengpid 2014).

Discussion

The findings from our review highlight a lack of research in relation to forms and patterns of gambling among youth in SSA. With less than 1% of global research output generated by Africa (Chu et al. 2014)—due to socio-economic difficulties—it is perhaps unsurprising that problem gambling remains low on the continent's research priority list, especially given the multitude of diseases (e.g., malaria, HIV/AIDS and tuberculosis) that continue to have a significant impact on mortality in Africa (Ngongalah et al. 2019). Generally, investment in research and intervention in the field of mental health is still insufficient within SSA's development agenda, for a number of reasons including: the lack of understanding on the contribution of mental health problems to morbidity

and mortality, competition for limited resources, lack of partnerships between health and the social development sectors, lack of inclusion of mental health in generic health indicators, and inadequate skills to effectively conduct national advocacy on mental health (Jenkins et al. 2010).

Most of the work identified in this study hardly utilized standardized assessment tools as a basis for screening for gambling severity. A plausible basis for this observation may stem from the aspect that problem gambling has only recently gained public health recognition within SSA. This notion is supported by the fact that most of the eligible studies were only published recently (i.e., majority (61%) in the past 3 years).

A variety of common gambling practices take place in SSA ranging from cards, dice games, animal betting, lottery and sports betting to more country specific practices such as *Carambolla* (Abdi et al. 2015). It was widely found that sports betting represents the most common form of gambling activity that youth actively engage in on the continent (Abdi et al. 2015; Agoucha et al 2019; Akanle and Fageyinbo 2019; Glozah et al. 2019; Tagoe et al. 2018; Ucheagwu et al. 2019). Sports betting is widely available in many countries in SSA through legal (and illegal) establishments but also, more recently, via online betting organizations such as *Naija Bet*, *Betway* and *Sunbet* that allow individuals to bet with relatively little money and within their convenience (Agoucha et al 2019). Perhaps notable in this respect are the findings by Ucheagwu and colleagues which revealed that individuals who regularly engage in online sports gambling exhibit stronger personality traits of ambition and gregariousness (viz., positive personality trait organization) in addition to better executive functions compared to non-gamblers (Ucheagwu et al. 2019).

Some of the more common motivations for youth to participate in gambling activities in SSA were that gambling can serve as a source of income viz., a means to ameliorate their economic situation (Temitope et al. 2019), it is a means to escape from reality/stress (academic) (Surujlal and Akinwale 2017), it represents a source of entertainment/fun (Surujlal and Akinwale 2017; Tagoe et al. 2018), it can assist in bolstering self-esteem (Abdi et al. 2015), dealing with social difficulties (Glozah et al. 2019), it is self-empowering (Tagoe et al. 2018) and in some contexts gambling can even serve as an expression of identity (Akanle and Fageyinbo 2019). These attitudes are believed to have their root in social learning and social networks (i.e., friends accept gambling) in addition to the familial environment (i.e., having siblings or parents that gamble) (Agoucha et al. 2019). An important implication of these observations is that interventions addressing gambling behavior need to be multi-faceted so as to target risk factors across various psychosocial variables (e.g., peers, family, community, and school/university) (Ssewanyana et al. 2020).

In relation to the psychological construct of gambling behavior, Muchimba and colleagues reported that young people from rural Malawi exhibited a propensity towards behavioral disinhibition that manifested in the form of impulsivity and sensation seeking in various forms including risky sexual behavior (i.e., engaging in sex with multiple sexual partners) and gambling (Muchimba et al. 2013). These observations were corroborated by the study by Kiwujja and Mugisha who showed that youth in an urban district in Kampala were prone to participating in gambling related activities as well as in engaging in risky sexual behavior (i.e., unprotected sex and having sex with multiple partners whom they do not know their HIV status) (Kiwujja and Mugisha 2019). This finding is consistent with the notion of health risk behavior clustering and accentuates the need for interventions which concurrently address multiple forms of risk behavior (Spring et al 2012). In passing, it should be mentioned that among a number of the studies that investigated both sexes in relation to gambling participation (Glozah et al. 2019; Kiwujja and Mugisha 2019; Muchimba et al. 2013; Peltzer and Pengpid 2014), males were found to engage more often

in gambling related activities consistent with the notion that females are more risk averse than males and are therefore more likely to have a negative perception towards gambling (Hing et al. 2016a).

Based on the present synthesis of the available studies in SSA, the severity of gambling behavior is commonly reported in terms of self-reported frequency of engagement in gambling activities and to a very low extent on a basis of screening for pathological gambling. In this respect, the findings on pathological gambling prevalence indicate a general variation ranging from 2–3% in Southern Africa (Dellis et al. 2013) to ~ 10% in Eastern Africa (Abdi et al. 2015). One Ugandan study also reported that almost all (91%) of youth gamblers presented with at least one gambling problem (Kiwujja and Mugisha 2019). There was also some indication that the burden of pathological gambling escalates in the presence of comorbidity as indicated by the high burden (6.6%) of pathological gambling associated with anxiety or depression in another South African study (Sharp et al. 2015). Noteworthy, these isolated studies may not sufficiently represent the overall burden of pathological/problem gambling in these respective regions of SSA and hence need to be interpreted with caution. We also suggest that these differences in pathological gambling prevalence rates may stem from the discrepancies in the data collection process; for example use of standardized gambling tools in Ethiopia (Abdi et al. 2015) as opposed to non-standardized gambling tools in the Ugandan study (Kiwujja and Mugisha 2019); and the population characteristics (i.e., high school adolescents against youths recruited from general community settings) in these studies.

In particular, we found that engagement in gambling is considerably high among youth within SSA, as across all the three regions, lifetime gambling was prevalent among more than a half of the study participants (57%—73%) (Abdi et al. 2015; Agoucha et al. 2019; Dellis et al. 2013; Sharp et al. 2015) with the exception of the study from Malawi (Muchimba et al. 2013) that reported 16% prevalence of lifetime gambling. Moreover, a majority of the lifetime gamblers tended to report recent or frequent engagement in gambling behavior (Agoucha et al. 2019; Akanle and Fageyinbo 2019). This finding accentuates the relevance of routine screening to identify youths at heightened risk for pathological gambling so as to intervene appropriately. Taken together, these findings provide a glimpse of the prevalence rates of gambling and gambling problems in SSA, however, more research is still required on this topic to provide a more representative scope of this public health problem. So as to improve comparability between national studies—in terms of youth gambling behavior and patterns—more collaborative efforts between different countries utilizing the same research instrument(s) will be of key importance. Besides, the use of standardized items or tools for assessing gambling behavior is the necessity for improved clinical and public health intervention and policy decision-making (Stinchfield 2010).

Our findings on popular youth gambling activities are similar to those reported among European youths (10–24 years), indicating a variety of options, for example card games, lotteries and scratch cards and sports betting (Calado et al. 2017). Moreover, similar to the SSA context, sports betting was also reported as one of the most played gambling activities by European problem gamblers (Calado et al. 2017). The findings on the prevalence of pathological or compulsive gambling which were verified by standardized assessment tools in SSA, indicate that the burden may be higher than that of European youths (ranging from 0.2–5.6%). For example, the prevalence estimates reported among Ethiopian students (Abdi et al. 2015) were found to be greater than those among European youths, whereas the prevalence levels reported among dwellers from 4 metropoles in South Africa (Sharp et al. 2015) was within range of prevalence in European youths (Calado et al. 2017). Our

findings in this review on the link between elevated risk of problem behavior such as substance use and problem gambling are similar to reports among youth gamblers in Europe (Molinaro et al. 2018) and North American (Barnes et al. 2009) regions. Although there seems to be cross-cutting perceived benefits of gambling among youths in both the European and SSA contexts, it seems that gambling for winning money is a motivation less mentioned by the problem gamblers within the European context (Calado et al. 2017), whereas it seems to be among key motivating factors reported by frequent or problem gamblers among various SSA contexts (Tagoe et al. 2018; Glozah et al. 2019). A shared challenge for research on gambling among youths in both SSA (based on findings in this review) and other contexts such as Europe and North America is the variation in assessment tools used and classification of gambling outcomes among different studies (Calado et al. 2017). However, based on our current review, the problem of the underutilization of standardized measures for screening problem gambling in research studies appears more tenuous among studies emanating from SSA.

Limitations and Conclusions

The findings reported here are subject to several limitations. Firstly, publication bias represents a limitation in the present review seeing as the authors solely focused on studies that had been peer-reviewed and published in academic journals. As such, we did not include any existing grey literature in this study. Secondly, our inclusion criteria focused on articles that had quantified patterns of gambling behavior and thus might have excluded some studies with important insights on gambling in general. Finally, the presence of few studies of good quality in this systematic review highlights the need to conduct more high-quality studies that focus on problem gambling behaviors among youth, but that also assess factors that are potentially associated with problem gambling among this vulnerable stratum of society.

These limitations notwithstanding, the present systematic review provides further credence regarding the significant impact of gambling among youth in SSA in relation to financial, social and psychological consequences. So as to truly appreciate the scale of this problem, further empirical evidence resulting from detailed and carefully crafted research involving youth across the continent will remain of importance. A key component of this research will lie in understanding any differences stemming from rural and urban populations. This information will prove integral in terms of shaping and tailoring the relevant interventions to curb gambling related harm among youth in SSA—a strategy that will involve targeting socio-cultural (i.e., attitudes, stigma), educational, regulatory, and commercial aspects at the community level (Gordon and Reith 2019; Hing et al. 2016b; Sapthiang 2020; Wardle et al. 2019). In this regard, policy makers, particularly those in central government will need to remain vigilant about the challenges pertaining to potential health effects and substantial social costs of gambling in order to fund, develop and implement the necessary strategies to combat gambling related harms.

Compliance with Ethical Standards

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

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

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