Research Article

Moderated-Mediation Analyses of Cognitive Distortions and Youth Preoblem Gambling among a Nigerian Sample

Izuchukwu LG Ndukaihe[1], Angela C. Awuloha[1] and Larry O. Awo[2]*

[1]Department of Psychology, Alex Ekwueme Federal University, Nigeria

[2]School of General Studies, Federal Polytechnic of Oil and Gas, Nigeria.

Abstract

The present study investigated parental monitoring and age as pathways to understanding association between cognitive distortions and gambling problems among adolescents drawn from betting centers in Abakaliki, South-east Nigeria ($N = 237$, $Mean\ Age = 17.03$ years, $SD = 4.01$). Data were obtained from the youths by neans of the Inability to stop gambling scale, the Parental Monitoring Scale, and the South Oaks Gambling Screen-Revised for Adolescents. Moderated-mediation analysis results showed that age was positively associated with problem gambling and mediated the association between inability to stop gambling and gambling problems and this mediation was further moderated by parental monitoring. Specifically, the inability to stop gambling was linked to higher gambling problems through age for youths with low parental monitoring but not for those with high parental monitoring. We suggest that problem gambling prevention and intervention programs should target youths with low parental monitoring.

INTRODUCTION

Gambling problems have been listed among disorders with several psychological and economic impacts [1]. Problems associated with gambling are tied in with losing cash as well as its effect on self-esteem, relationships, physical and mental health, and work performance, among others [2]. Regardless of the aforementioned negative consequences of gambling, individuals who indulge in this behavior barely at any point consider it to be an issue; consequently, the course of the disorder is chronic with fluctuating side effects [3,4].

The persistence of gambling problems seems to be partly because of disordered belief about the likelihood of success in outcomes held by gamblers [5]. These disordered thought patterns also known as cognitive distortions are not because of realities. Donati et al.[6], in their model on cognitive distortions described gambling problems as arising from the tendency to commit the gambler's fallacy and to be superstitious which gives rise to distorted cognitions about gambling.

Cognitive distortions among gamblers are numerous typically including illusions of control, fixation with absolute occurrences, superstitions or illusory correlation, and misunderstanding of probability [7,8]. The illusion of control, for instance, describes a gambler's belief in his or her probability of personal success that is unjustifiably high [9], or as can be seen in fixation with absolute occurrences, a gambler measures their success in a game by looking only at their earnings while discarding their losses [10,11], thereby rationalizing the gambling activities and thus it's continuous indulgence.

Studies have shown that high levels of cognitive distortions are associated with high levels of gambling frequency and play an important role in the development of gambling problems [12-14]. Consistently, cognitive distortions related to gambling predict the frequency of gambling [6,15], and are strong predictors of gambling problems [6,16,17].

Age as a mediator

Gambling rates vary significantly according to age [18]. Gambling problem has been found to develop during late adolescence, with increased access to legal gambling after 18years, and become established by the age of 20years [19]. In literature, it has been shown that the prevalence of gambling in Nigeria is high among young Nigerians aged between 18 to 35 years [20]. Positive attitudes toward gambling have been found common among young people in Nigeria with most of them reporting a previous gambling activity [21,22]. Among British participants, similar results have been obtained where 48% of British adults indicated that they have previously participated in a gambling activity [23].

McCarthy et al. [24], stated that 45% of women aged 16 – 34 years in Australia gambled more than once a week, likewise, 40.5% of respondents in Uganda gambled at least once [25]. A rapid survey conducted among 3,879 youths in Africa revealed that the majority of them (54%), had indulged in gambling at

some point [26], while another poll indicated that 41% of 1000 randomly selected youths in Nigeria had previously gambled [27]. Older age (i.e., youths aged over 24 years) is linked to positive attitudes towards gambling [23,28-30].

The youth's vulnerability to gambling problems can be described by cognitive immaturities/distortions, such as an illusion of control over outcomes [31], and a poor understanding of statistical probability [32]. These can lead to pursuing losses, a common gambling problem. Among young people, executive function is yet to be developed fully, which increases impulsivity and risk-taking behaviors [33]. This immaturity in self-regulation can increase the rate of placing bets, impulsively, especially in a game sports betting. The youths may also have heightened susceptibility to environmental factors that can determine gambling including family and peer influences [34]. However, it is important to explore factors conducive to change to effectively reduce the risk of gambling problems among youth. One of those factors includes parental monitoring.

Parental monitoring and gambling problems

Parental monitoring is an important factor when considering gambling problems. Parental monitoring involves parents' willingness to be cognizant of their children or ward's doings and whereabouts both at home and in the company of peers [35-37]. It helps to hinder deviant behavior (e.g gambling problems) by reinforcing the parents' capacity to control their children's behaviour [38,39]. Adolescents whose parents do not know how and with whom they spend their leisure time may have greater opportunities to gamble and may experience fewer parental sanctions for doing so; hence, they may gamble more frequently and experience more gambling problems [40].

Studies examining the moderating role of parental monitoring in gambling problems are scarce, in the few available studies; mixed findings are owing to different study designs. Some cross-sectional studies have shown that low levels of parental monitoring increase the odds of gambling among youths [35,41-43]. But one longitudinal study found no such association [44]. Another longitudinal study by Lee et al. [39], reported that differences in stable and declining patterns of parental monitoring are associated with a significant increase in the risk for a gambling problem.

The present study

This study aims to explain cognitive distortions about gambling problems and the extent to which age and parental monitoring pathways could boost or downplay incidences of cognitive distortions and gambling problems among Nigerian youths. According to Beck et al. [45], cognitive model, a negative outlook on reality, sometimes called negative schemas, is a factor in symptoms of emotional dysfunction and poorer subjective well-being. Negative thinking patterns, therefore, reinforce negative emotions and thoughts. During difficult circumstances such as gambling, these distorted thoughts can contribute to an overall negative outlook on the world and a depressive or anxious mental state [45]. Hence, challenging and changing cognitive distortions is a key element of cognitive-behavioral therapy (CBT).

Understanding age in this study as a mediating factor in associations between cognitive distortions and gambling problems, or parental monitoring as a moderating factor in associations between cognitive distortions and gambling problems, may result in stronger empirically based cognitive-behavioral interventions for youths with low levels of parental monitoring. Studies examining the association between cognitive distortions and gambling problems have been able to establish that cognitive distortions precipitate irrational statements among gamblers, tend to make them rationalize their actions in gambling, lead to a frequency of gambling, and then emerge gambling problems [6,12,13], however, these studies did not examine factors that can mediate or moderate this association (e.g., age and parental monitoring).

To the best of our knowledge, only one study has examined the relationship between gambling problems and parental monitoring in Nigeria [35], but did not consider parental monitoring as a moderator in the association between cognitive distortions and gambling problems. Besides, several studies have examined the direct impact of age in the prevalence and frequency of gambling [19,27,46], but to our knowledge, no study has examined age as a mediator in the association between cognitive distortions and gambling problem. We aim to fill this knowledge gap and therefore hypothesized that: an increase in cognitive distortions will predict greater gambling problems. Again, we expect that an increase in age will predict greater gambling problems. Finally, we anticipate that age will mediate the prediction of gambling problems by cognitive distortions and that this effect will be stronger for those with lower parental monitoring than for those with higher parental monitoring. The conceptual model of the moderated mediation is shown in Figure 1.
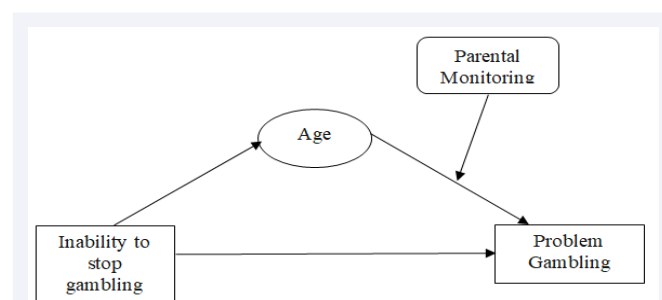
METHOD

Participants

Participants in this study were 237 youths with ages ranging from 15-18 years (mean age = 17.03 years, *SD* = 4.01 years). They consisted of males 193 (71.7%) and females 44 (28.3) drawn from sports betting centres in Abakaliki Metropolis, South-eastern Nigeria.

Instruments

Participants completed the South Oaks Gambling Screen-

Figure 1 Conceptual model of moderated-mediation for the effects of age and parental monitoring on the link between inability to stop gambling and gambling problems.

Revised for Adolescents [47], the Gambling Related Cognition Scale-Inability to Stop subscale, and Parental Monitoring Scale [14].

SOGS-RA: The SOGS-RA [47], was used in this study to access problem gambling among adolescents and emerging adults. The South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA) is a self-report instrument that consists of 12 items used to determine the severity of problem gambling. All the items require dichotomous (YES or NO) responses except for the first item, which is scored on a 4-point Likert scale (never, some of the time, most of the time, every time). This response was, however, dichotomized (i.e., never/some of the time or most of the time/every time) in scoring. Participants who scored 0 are credited to youths with no record of gambling (level 0), those who scored 1 are credited to youths with non-problem gambling (level 1), those who scored 2 to 3 are categorized as youths with gambling risks (level 2), whereas those who scored 4 and above are categorized as youths with problem gambling (level 3). The administration time for the scale was 15 minutes related to earlier studies [35,48]. Good internal consistency was reported for the SOGS-RA among Nigerian adolescents by Awo et al. (2021: α = 0.81), and the scale yielded related reliability in the present study (α = 0.72).

GRCS-IS: The GRCS-IS [14], was used in this study to assess the perceived inability to stop gambling. The Inability to Stop (IS) subscale of the Gambling Related Cognition Scale (GRCS) is a 5-item measure of respondents' erroneous beliefs and perceived inability to control their gambling behavior (e.g., "My desire to gamble is so overpowering"). The respondents are required to indicate the extent to which they agree with each statement on a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores reflecting an elevated number of cognitive errors or distortions. Total scores for this scale vary from between 5 to 35. For ease of interpretation, total scores were reversed such that greater scores indicated higher gambling-related cognitive distortions. Among clinical and non-clinical samples, the GRCS-IS has high internal consistency (Cronbach's α = 0.89) and discriminant validity for the classification of gambling severity [14]. In this study, the internal consistency of the GRCS-IS was α = 0.81.

PMS: The PMS [49], was used in this study to access parental monitoring. Responses to the 8-item scale (such as "My parent knows where I am after school") had been primarily based on a 5-point Likert scale from "Never" (rated 1) to "Always" (rated 5). Parental monitoring was determined by calculating an individual's mean score on the 8-items. Higher mean scores imply a greater feeling of parental monitoring. Psychometric properties of the instruments amongst this populace were assessed using estimates of internal consistency. The composite Cronbach's alpha for the scale was 0.86 for males. A high-reliability alpha was reported for the present study (α = 0.78).

Procedure

All procedures performed in this study were under the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Participants were further

informed both orally and in writing that participation in the study was voluntary, highly confidential, and that they were free to withdraw from the study at any point in time without any form of penalty. The youths were requested to take part in research on the well-being of gamblers in Nigeria. Those who consented to participate in the study were given the questionnaire form for completion. Inclusion criteria were a minimum age of 18 years, ability to read and understand the English language, and self-reported engagement in sports betting.

Only youths who have previously engaged in gambing or betting were recruited to participate in the study. The youths who volunteered to partake in the study were asked if they enjoyed sports to the extent that they could have a bet or if they have previously betted on it. They were then asked to participate in a study that aimed at understanding what they think makes them bet in games. The participants were presented with the SOGS-RA along with the GRCS-IS and PMS with additional questions about their gender and age. Participants responded to the options that best suit their opinions and after which the scales were returned to the researchers for scoring and analysis. From the 300 questionnaires administered, 297 copies of the scale were properly completed and were subjected to further statistical analysis, while the remaining 3 sets of questionnaires were dropped due to improper filling.

Design/Statistics

The study is a cross-sectional design that employed a multi-method approach of hypotheses testing to establish intercorrelation among study variables and a test of a moderated mediation model. Pearson's correlation was used to establish the associations between the demographic and major variables of interest. For the major aims of the study, moderated mediation was carried out with model 58 of PROCESS macro for SPSS [50]. A similar procedure was employed in a recent study [51,52].

RESULTS

Result of the descriptive statistics and correlation analysis which considered the level of significance and correlation among the study's variables is presented in Table 1, while the Hayes Process Macro regression results were presented in Tables 2 and 3 respectively.

Results of correlational analyses showed that gender was significantly and negatively associated with gambling problems (r = -.20, p = .001), but, age was significantly and positively associated with gambling problems (r = .40, p = .000). Also, the result indicates that cognitive distortion was significantly and positively associated with gambling problems (r = .19, p = .001), whereas parental monitoring was significantly and negatively associated with gambling problems (r = -.14, p = .016).

In Table 2, it was observed that cognitive distortions predicted age positively {B = .17, t = 3.06, 95% CI = [.06; .28], p = .002}. Parental monitoring did not predict age nor moderated the association between cognitive distortions and age.

In Table 3, it was observed that cognitive distortions positively predicted gambling problems {B = .07, t = 2.21, 95% CI = [.01; .13], p = .028}. Also, age of the participants positively predicted gambling problems {B = .20, t = 6.23, 95% CI = [.14;

Table 1: Mean, standard deviation, and intercorrelations among study variables (n = 297).

	Variables	M	SD	1	2	3	4	5
1	Gender	1.28	0.45	1	-	-	-	-
2	Age	17.03	4.01	-0.02	1		-	-
3	CD	22.63	3.42	-0.04	.18**	1	-	-
4	PM	24.52	4.03	0.11	-0.08	-.14*	1	-
5	GP	7.74	1.2	-.20**	.40**	.19**	-.14*	1

Note: * = p<.05; ** = p<.001; CD-Cognitive Distortions; PM-Parental Monitoring; and GP-Gambling Problems.

Table 2: Regression results predicting age by cognitive distortions and parental monitoring.

Predictors	B	SE	t	p	95% CI
Cognitive Distortions (CD)	.17*	.06	3.06	.0024	[.06; .28]
Parental Monitoring (PM) -.04	.05	-.89	.3734		[-.14; .05]
PM X CD	.00	.01	.15	.8804	[-.03; .03]

Note: * = $p < .05$; $R^2 = .04$; $\Delta R^2 = .00$

Table 3: Regression results predicting gambling problems by cognitive distortions, age, and parental monitoring.

Predictors	B	SE	t	p	95% CI
Cognitive Distortions	.07*	.03	2.21	.0280	[.01; .13]
Age	.20**	.03	6.23	.0000	[.14; .27]
Parental Monitoring	-.05*	.03	-1.97	.0498	[-.10; .00]
Age x Parental Monitoring	.02*	.01	2.62	.0092	[.01; .04]

Note: * = $p < .05$; ** = $p < .001$; $R^2 = .21$; $\Delta R^2 = .02$

.27], *p* = .000}. But, parental monitoring negatively predicted gambling problems {*B* = -.05, *t* = -1.97, 95% *CI* = [-.10; .00], *p* = .050}. However, parental monitoring moderated the association between age of the participants and gambling problems {*B* = .02, *t* = 2.62, 95% *CI* = [.01; .04], *p* = .009}, given that the interaction effect between age of the participants and parental monitoring on gambling problems was significant.

Slope of the conditional effect of age on gambling problems (see, Figure 2), indicates that high parental monitoring predicted increased gambling problems {*B* = 0.29, *t* = 7.21, 95% *CI* = [0.21, 0.37]. *p* = 0.000}, but low parental monitoring predicted decreased gambling problems {*B* = 0.12, *t* = 2.35, 95% *CI* = [0.02, 0.22], *p* = 0.020). The predictor variables accounted for 21% of the variance in gambling problems {R^2 = 0.21, *F*(4, 292) = 18.86, *p* < 0.001}.

Similarly, our expectation of a moderated mediation effect was supported as evidenced by a significant indirect effect of cognitive distortions on gambling problems through age among high parental monitoring {*B* = 0.05, 95% *CI* = [0.01, 0.11]}, but not low parental monitoring {*B* = 0.02, 95% *CI* = [0.00, 0.05]}. Note that the moderated mediation is significant when the 95% *CI* did not include zero as shown in the case of high parental monitoring.

DISCUSSION

We tested a moderated mediation model of the effect of age and parental monitoring on the association between cognitive distortions and gambling problems among Nigerian youths. The results showed that increase in cognitive distortions is associated with increased gambling problem. Age of the participants positively predicted gambling problem. The association between cognitive distortions and gambling problem was strengthened by age and this indirect effect was found to be stronger for those with lower parental monitoring. In other words, the ability to stop gambling was linked to higher gambling problems through age for youths with low parental monitoring but not for those with high parental monitoring. These results add to our understanding of the relationships between cognitive distortions, age, parental monitoring, and gambling problems in Nigeria.

The result reveals that the relationship between cognitive distortions and gambling problems is a function of the gambler's age and this can be put in check when there is high parental monitoring but not with low parental monitoring. Specifically, the mediating effect found for age on the association between cognitive distortions and gambling problems supports for explanatory value of young people's vulnerability to gambling problems as described by their cognitive immaturities [31], and a poor understanding of statistical probability [32].

The finding that high level of cognitive distortions was association with increased gambling problem scores provides support for existing literature [6,16]. Our study, also, confirms Taylor et al. [17], observation that emerging adults who hold more erroneous beliefs about gambling are at a higher risk of developing gambling problems. The inclusion of parental monitoring into the model, provided insight on how parents' cognisance behaviour towards their children's endeavours can minimize or exacerbate gambling behaviour and its related problems.
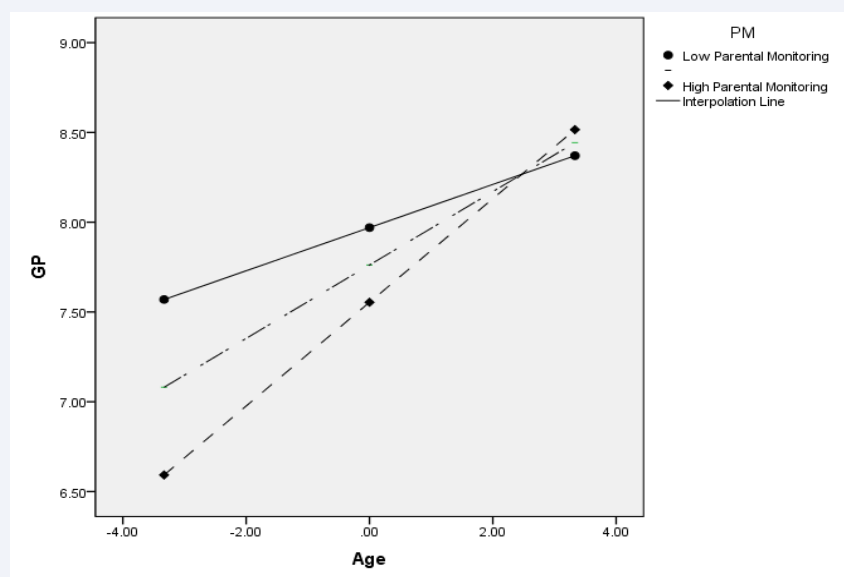
Figure 2 Slope of the interaction effect of age and parental monitoring on gambling problems.

The finding that high level of parental monitoring is associated with decreased gambling problem is consistent with past studies [35,36,41]. Our finding provided support for the argument that emerging adults whose parents do not know how and with whom they spend their leisure time may have greater opportunities to gamble and may experience fewer parental sanctions for doing so; hence, they may gamble more frequently and experience more gambling problems [40].

Implications, limitations and future research

Our study does not dispute the observation [6,16,17], that increased levels of cognitive distortions increases gambling problems of emerging adults. However, the moderated mediation effect found for age and parental monitoring in the association between cognitive distortions and gambling problems suggests that age of the gambler might be insightful while developing potential preventive programs and interventions for gambling problems especially for those with low level of parental monitoring.

A major strength of this study was the ability to assess demographic and social indices (e.g., age and parental monitoring) influences on cognitive distortions and gambling problems of emerging adults. The present study emphasized that the inability to stop gambling was linked to higher gambling problems through age for emerging adults with low parental monitoring but not for those with high parental monitoring. Future research could expand this knowledge by examining other demographic variables and social indices (e.g., ethnicity and unemployment) in relation to cognitive distortions and gambling problems.

In addition to its strength, this study has several limitations. First, we acknowledge that the data were based on youths' self-reports and these may not have accurately captured the constructs of the variables measured (i.e., cognitive distortion, gambling problems, and parental monitoring). Semi-structured interview or longitudinal study may produce different results from those of the self-reported questionnaires used in the study. Second, as a cross-sectional study, this study failed to draw conclusions about the cause and effect relationships among variables. While age and parental monitoring can be viewed as regulating factors for and against gambling problems, our design did not allow testing this assertion. Future research should address this concern by employing a between-subjects design to test the effect of changes in cognitive distortion on parental monitoring and gambling problems. Possibly a longitudinal approach can be adopted to measure the mediation of age in this association.

CONCLUSION

The present study examined the influences of age and parental monitoring in the association between cognitive distortions and gambling problems of emerging adults in Abakaliki metropolis in South-eastern Nigeria. Our findings provide insights into the association between cognitive distortions and gambling problems. But, the most salient finding was that the relationship between cognitive distortions and gambling problems was a function of the gambler's age and can either be heightened or diminished by the level of parental monitoring. Thus potential gambling problems prevention and intervention programs should be directed at emerging adults and especially imperative for those with low parental monitoring.

DECLARATIONS

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Informed consent

All participants consented to be part of the study by filling and signing the consent form

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