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Problem Gambling Among Urban and Rural Gamblers in Limpopo Province, South Africa: Associations with Hazardous and Harmful Alcohol Use and Psychological Distress

Linda Skaal · Heidi Sinclair · Dan J. Stein · Bronwyn Myers

Abstract   Little is known about the mental health correlates of problem gambling in low-and-middle-income countries such as South Africa and whether these correlates vary by urbanicity. To address this gap, we examined mental health factors associated with problem gambling among gamblers in Limpopo Province, South Africa disaggregated by rural, peri-urban and urban location. A survey of gambling behaviour and mental health was conducted among 900 gamblers. Overall, 28.3 % were at high risk and 38.1 % were at moderate risk for problem gambling. For the entire sample, hazardous/harmful alcohol use was associated with almost twofold increased chance of being at moderate risk (AOR 1.83; 95 % CI 1.08, 3.11) and almost sevenfold greater odds (AOR 6.93; 95 % CI 4.03–11.93) of being at high risk for problem gambling. Psychological distress was associated with being at high risk for problem gambling only (AOR 1.18; 95 % CI 1.14–1.22). After stratifying by urbanicity, hazardous/harmful alcohol use and psychological distress remained associated with high risk gambling across all locations. We found little knowledge of a free gambling helpline and other gambling services—particularly in less urbanised environments [χ^2 (2), 900 = 40.4; $p < 0.001$]. These findings highlight the need to increase

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awareness of free helpline services among gamblers and to ensure gambling services include screening and treatment for common mental disorders.

Introduction

Globally, the prevalence of gambling disorder (previously referred to as pathological gambling) is estimated to range between 0.5 and 2 % of the general population (Petry et al. 2005; Shaffer et al. 2004). Similarly, data from the South African National Urban Prevalence Study of Gambling Behaviour (NUPSGB) suggests that about 3 % of the general population are at high risk for pathological or problem gambling (PG) (Sharp et al. 2014). Problem gambling is a concern not only because of its negative impacts on the health and well-being of individuals but also because of its association with other comorbid psychiatric disorders (Goodyear-Smith et al. 2006). These comorbid disorders predict greater persistence and severity of PG (Ladd and Petry 2003; Quigley et al. 2014)—arguably making PG more difficult to treat effectively. Understanding how comorbid psychiatric disorders are related to PG is therefore critical for the design of effective intervention programs for PG.

Although the relationship between PG and other psychiatric disorders is well-established in treatment-seeking populations (see for example Cowlishaw et al. 2014), fewer studies have examined the association between PG and psychiatric disorders in non-treatment seeking gamblers (Lorains et al. 2011). These studies found strong associations between PG and risk of mood, anxiety and substance use disorders (referred to as common mental disorders). They have shown that problem gamblers are between two and four times more likely than non-problem gamblers to have a mood disorder, even after controlling for socio-demographic characteristics (Barry et al. 2013; Cunningham-Williams et al. 2000; Kessler et al. 2008; Petry et al. 2005). Similarly, they have demonstrated that problem gamblers are up to three times more likely to have an anxiety disorder diagnosis than non-problem gamblers (Kessler et al. 2008; Petry et al. 2005). These studies have also reported strong associations between PG and substance use disorders (Bischof et al. 2013; Lorains et al. 2011), with one nationally representative study demonstrating that PG increased the risk of a substance use disorder diagnosis almost sixfold (Kessler et al. 2008).

However, such epidemiological studies have been largely limited to the USA and other high-income countries. While these studies provide clear evidence of the comorbidity between PG and common mental disorders in high-income countries, it is unclear whether these patterns of comorbidity are similar in low-and-middle-income countries, such as South Africa. Sharp et al. (2014) provide initial evidence suggesting that problem gamblers in South Africa are two to four times more likely to have depression, anxiety, alcohol or a substance use disorder than non-problem gamblers; but this sample was limited to urban populations. The vast majority of South Africans reside in rural areas and are likely to differ from urban populations in their perceptions and beliefs about mental health, mental health risk factors, patterns of help-seeking, and access to mental health resources (Havenaar et al. 2008; Peer et al. 2013; van der Hoeven et al. 2012). Yet, apart from one study (with a very small sample size) that examined gambling in a rural area (Dellis et al. 2013) there has been no investigation of the prevalence or correlates of PG among rural

populations. A second limitation is that prior studies combined participants recruited from peri-urban settlements (known as "townships") with participants from urban communities and treated this as a homogenous urban population. This is problematic as peri-urban townships represent distinctly different risk environments than urban settings: they are less well-resourced in terms of services; populations residing in these environments are more socio-economically disadvantaged; and there are higher levels of substance misuse, violence, and psychiatric comorbidity in these communities compared with formal urban communities (Burns and Snow 2012; Coovadia et al. 2009; Mfenyana et al. 2006). Given these contextual differences, it is quite likely that mental health correlates of PG will vary among rural, peri-urban, and urban populations; however these potential location differences remain unexplored. This knowledge gap limits our ability to develop effective interventions tailored to address the specific mental health needs associated with PG among rural, peri-urban, and urban gamblers.

As a first step to addressing this gap, we examine socio-demographic and mental health factors associated with PG among gamblers in Limpopo Province, South Africa. We hypothesized that mental health correlates of risk for PG and awareness of gambling help services would be more evident among gamblers in urban settings compared to gamblers from less urbanized environments. Consequently, we also compared and contrasted the profile of variables associated with PG among gamblers in rural, peri-urban and urban locations.

Methods

Participants and Study Context

We conducted a survey of 900 adult gamblers, purposively selected from casinos in Polokwane, a large urban area; gambling venues in peri-urban areas (townships) surrounding Polokwane; and from rural villages adjacent to Polokwane.

Polokwane is the capital of Limpopo province, a mostly rural province in South Africa. The province has a population of 5.4 million people. Of these, 96.8 % are Black African, 2.6 % are White, 0.3 % are Coloured (of mixed race descent) and 0.3 % are Indian/Asian (Statistics South Africa 2012). During the apartheid years all South Africans were classified into these racial groups and the provision of services and access to housing and economic opportunities occurred along these racially segregated lines. As one of the poorest and least resourced provinces in the country, Limpopo spends less on health services, including mental health intervention and health promotion activities, than other provinces (Onya et al. 2012).

Procedure

In the urban and peri-urban location, field staff approached people in gambling venues, and requested verbal consent to screen them for study eligibility. In the rural location, field staff conducted house-to house screening due to the limited number of gambling venues. To be eligible, participants had to be at least 18 years old, self-report that they participated in gambling activities in the past 12 months, and be willing to be interviewed. Field staff obtained consent from eligible individuals and administered a pen-and-paper questionnaire in a private space chosen by the participant. The questionnaire took less than an hour to complete. Participants received a gift card to the value of R100.00 (12USD) as

compensation for their time. The study was approved by the Ethics Committee of the University of Limpopo.

Measures

For the current study, all measures were translated and back-translated into Sepedi, Tsonga, Tshivenda, or English—the primary languages spoken in the region.

Socio-demographic Measures

Socio-demographic variables were gender (male or female), race, age, employment status (employed or unemployed), and location of residence (urban, peri-urban, or rural).

Problem Gambling (PG)

Risk of PG was assessed using the Problem Gambling Severity Index (PGSI) module of the Canadian Problem Gambling Index which is a population-based screener of PG (Ferris and Wynne 2001). The PGSI comprises 9 items, 4 of which examine gambling-associated behaviors (e.g., betting, tolerance, chasing, and borrowing), and 5 which assess the negative consequences of gambling (e.g., guilt, health problems, financial difficulties, and concern from others) during the last year. Items are scored on a 4 point scale, with responses ranging from 0 (Never) to 3 (Almost always). Composite scores are used to classify people as non-problem gamblers (score of 0), low risk gamblers (scores of 1–2), moderate risk gamblers (Scores of 3–7), and high risk or problem gamblers (score $\geq$ 8). The reliability and validity of the PGSI is well-established (Orford et al. 2010). Criterion and construct validity of the PGSI has been demonstrated for South African populations (Dellis et al. 2014).

Psychological Distress

We used the 10-item Kessler psychological distress scale (K-10) to examine extent of psychological distress (Kessler et al. 2002). Questions ask about frequency of symptoms experienced in the past month, with responses ranging from 1 (None of the time) to 5 (All of the time). Composite scores range from 10 to 50, with higher scores indicating more symptoms of current nonspecific psychological distress. The K-10 has been validated as a community screen for psychiatric disorders in South Africa (Andersen et al. 2011; Spies et al. 2009a, b). As there is uncertainty about the correct cut-off score to use to predict the presence of mood and anxiety disorders in South African populations (16 vs. 28) (Peltzer et al. 2012), we used the K-10 as a continuous measure. This follows the same procedures used in other studies of comorbidity with problem gamblers (see Sharp et al. 2014).

Hazardous/Harmful Alcohol Use

The Alcohol Use Disorders Identification Test (AUDIT) developed by the World Health Organisation (Babor et al. 2001) was used to detect hazardous/harmful alcohol use. This 10-item tool consists of 3 items that assess frequency and quantity of alcohol consumption, 3 items that examine symptoms of alcohol dependence, and 4 items that explore adverse consequences of alcohol use. Responses to these items are rated on a 4-point scale from 0

(Never) to 4 (Daily or Almost daily). Composite sores range from 0 to 40, with a score ≥ 8 indicating hazardous or harmful alcohol use (Babor et al. 2001). The AUDIT has been validated for use in South Africa showing excellent sensitivity and specificity in detecting MINI-defined alcohol use disorders (Myer et al. 2008).

Awareness of Existing Services for Problem Gambling

We included items exploring awareness of a free helpline for gambling-related problems and awareness of any gambling-related services in the community. Both of these items had yes (1)/no (0) response options.

Data Analysis

We performed Chi square analyses and One-way Analysis of Variance tests to compare the socio-demographic characteristics of gamblers, as well as levels of psychological distress, hazardous/harmful alcohol use, and awareness of gambling services as a function of gambling problem severity. Due to the relatively low endorsement of the "no risk" and "low risk" PGSI categories, we combined these categories into a single category to increase power. Similar methods have been used in other studies of gambling comorbidity (e.g., Sharp et al. 2014). Thus, we had three categories of PG severity: low/no risk, moderate risk, and high risk). Multinomial logistic regression was used to identify and assess correlates of gambling problem severity while adjusting for the potential confounding influence of age, gender, and employment status. We did not adjust for race given that the majority of the sample belonged to a single race group. As we wanted to compare the profile of factors associated with gambling problem severity among adults in urban areas versus peri-urban and rural areas, subsequent analyses were stratified by location. The stratified analyses included descriptive statistics comparing and contrasting the distribution of characteristics in each stratum and multinomial logistic regression analyses where gambling severity was the outcome variable. The results of all regression models are reported as adjusted odds ratios (AORs) with 95 % confidence intervals (95 % CI). All statistical analyses were conducted using SPSS 22 (Armonk, New York).

Results

Description of Sample

The final sample comprised 900 participants, of which 26.6 % (n = 222) resided in a rural area, 48.8 % (n = 439) resided in a peri-urban township, and 24.7 % (n = 239) resided in an urban area. Participants were between 18 and 81 years of age (M = 34.5, SD = 9.8; Table 1). The majority of participants were African (95.6 %) and male (64.7 %). Close to two-thirds of the sample reported some form of employment (64.0 %).

Overall the prevalence of PG was high; 28.3 % of the sample (n = 255) were at high risk, 38.1 % (n = 343) were at moderate risk, and 33.6 % (n = 302) were at no or low risk for PG. In addition, 18.7 % of the overall sample were classified as hazardous/harmful drinkers. When participants who reported abstaining from alcohol were excluded from the sample (51.2 %, n = 335), the proportion of participants who reported hazardous/harmful alcohol use increased to 48.8 % (n = 319). There were also high levels of psychological

Table 1 Socio-demographic and mental health characteristics of adult gamblers (N = 900) from Limpopo province, South Africa by risk of problem gambling (PG)

	Total (N = 900)	No/low risk PG (n = 302)	Moderate risk PG (n = 343)	High risk PG (n = 255)	Chi-square/ F test (df)
Socio-demographic characteristics					
Age (M, SD)	34.5 (9.8)	33.8 (9.6)	34.4 (9.3)	35.5 (10.5)	2.2 (2)
Race (n, %)					
Black African	860 (95.6)	281 (93.0)	334 (97.4)	245 (96.1)	18.9 (6)**
Coloured	3 (0.3)	0 (0.0)	1 (0.3)	2 (0.8)	
Indian/Asian	35 (3.9)	21 (7.0)	8 (2.3)	6 (2.4)	
White	2 (0.2)	0 (0.0)	0 (0.0)	2 (0.2)	
Gender (n, %)					
Male	582 (64.7)	171 (56.6)	220 (64.1)	191 (74.9)	20.3 (2)***
Female	318 (35.3)	131 (43.3)	123 (35.9)	64 (25.1)	
Employment status (n, %)					
Unemployed	324 (36.0)	121 (40.1)	113 (32.9)	90 (35.3)	3.61 (2)
Employed	576 (64.0)	181 (59.9)	230 (67.1)	165 (64.7)	
Location of residence (n, %)					20.9 (4)***
Rural	239 (26.6)	85 (28.1)	92 (26.8)	62 (24.3)	
Peri-urban	439 (48.8)	139 (46.0)	191 (55.7)	109 (42.7)	
Urban	222 (24.7)	78 (25.8)	60 (17.5)	84 (32.9)	
Mental health characteristics					
K-10 score (M, SD)	16.0 (6.1)	14.3 (5.2)	14.6 (5.1)	19.8 (6.6)	84.9 (2)***
AUDIT score (n, %)					76.6 (2)***
<8 (low risk drinking)	732 (81.3)	278 (92.1)	291 (84.8)	163 (63.9)	
≥8 (hazardous/harmful drinking)	168 (18.7)	24 (7.9)	52 (15.2)	92 (36.1)	
Awareness of services					
Aware of gambling services (n, %)					14.8 (2) **
No	818 (90.9)	279 (92.4)	322 (93.9)	217 (85.1)	
Yes	82 (9.1)	23 (7.6)	21 (6.1)	38 (14.9)	
Aware of gambling helpline (n, %)					20.5 (2)***
No	694 (77.1)	225 (74.5)	291 (84.8)	178 (69.8)	
Yes	206 (22.9)	77 (25.5)	52 (15.2)	77 (30.2)	

M mean, *SD* standard deviation

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

distress in this sample, with K-10 scores ranging from 10 to 37 (M = 16.0, SD = 6.1; Table 1).

Socio-demographic and Mental Health Characteristics of Problem Gambling

Results show significant differences between the no/low, moderate and high risk PGSI categories for several variables (Table 1). Gender [χ^2 (2, 900) = 20.3, $p < 0.001$], race [χ^2 (6, 900) = 18.9, $p < 0.01$], and location of residence [χ^2 (4, 900) = 20.9, $p < 0.001$] differed significantly according to severity of gambling; with the prevalence of PG

increasing with growing urbanicity. There were significant differences in levels of psychological distress [F (2, 900) = 84.9, $p < 0.001$] and in rates of hazardous/harmful drinking [χ^2 (2, 900) = 76.6, $p < 0.001$] by gambling problem severity. Levels of psychological distress and the prevalence of hazardous/harmful drinking were elevated among participants at high risk for PG compared to moderate and no/low risk gamblers. We also found significant differences in the proportion of participants who were aware of gambling services in their community [χ^2 (2, 900) = 14.8, $p < 0.01$] and who were aware of a free gambling helpline [χ^2 (2, 900) = 20.5, $p < 0.001$] by gambling problem severity.

Factors Associated with Problem Gambling

Mental health and service variables associated with moderate and high risk PG, while adjusting for socio-demographic variables, are reflected in Table 2. Hazardous/harmful alcohol use was associated with both moderate and high risk gambling. Participants with hazardous/harmful alcohol use had almost double the odds of being at moderate risk (AOR 1.83; 95 % CI 1.08, 3.11) and almost sevenfold greater odds (AOR 6.93; 95 % CI 4.03–11.93) of being at high risk than at no/low risk for gambling problems. Psychological distress was associated with being at high risk for PG only. For every one unit increase in the K-10 score, the odds of being categorized as a high risk gambler increased 1.2 times (AOR 1.18; 95 % CI 1.14–1.22). For the service variables, moderate risk gamblers had almost twofold greater odds of not being aware of the gambling helpline than low risk gamblers (AOR 1.98; 95 % CI 1.22–3.12). In contrast, high risk gamblers had 60 % reduced likelihood of not being aware of gambling treatment services than low risk gamblers (AOR 0.40; 95 % CI 0.20–0.83).

Analyses Stratified by Location

Table 3 summarizes the prevalence of socio-demographic and mental health characteristics of participants in rural, peri-urban and urban locations. Age [F (1, 900) = 7.1, $p < 0.001$] and race [χ^2 (6, 900) = 53.1, $p < 0.01$] differed significantly according to location. Similarly, we found significant differences in mean scores of psychological distress

Table 2 Adjusted associations of factors associated with moderate and high risk gambling among adult gamblers in Limpopo Province, South Africa (N = 900)

Covariates	Moderate risk gambling		High risk gambling	
	AOR	95 % CI	AOR	AOR
Age	0.10	0.98–1.02	1.01	0.99–1.03
Gender (male)	1.30	0.93–1.82	1.46	0.98–2.16
Employment (No)	0.80	0.58–1.11	0.91	0.63–1.32
K-10 score	1.01	0.08–1.04	1.18***	1.14–1.22
Hazardous or harmful drinking	1.83*	1.08–3.11	6.93***	4.03–11.93
Not aware of gambling help services	0.76	0.37–1.55	0.40*	0.20–0.83
Not aware of free gambling helpline	1.98**	1.22–3.12	1.09	0.64–1.85

AOR adjusted odds ratio, *CI* confidence interval

* $p \le 0.05$; ** $p \le 0.01$, *** $p \le 0.001$

Table 3 Characteristics of gamblers in Limpopo Province South Africa, stratified by location

	Rural (n = 239)	Peri-urban (n = 439)	Urban (n = 222)	Chi square/ F test (df)
Socio-demographic characteristics				
Age (M, SD)	32.7 (8.7)	34.7 (9.3)	36.1 (11.4)	7.1 (2)***
Race (n, %)				
Black African	239 (99.2)	430 (97.9)	193 (86.9)	53.1 (6)***
Coloured	0 (0.0)	1 (0.2)	2 (0.9)	
Indian/Asian	2 (0.8)	8 (1.8)	25 (11.3)	
White	0 (0.0)	0 (0.0)	2 (0.9)	
Gender (n, %)				
Male	150 (62.8)	288 (65.6)	144 (64.9)	0.6 (2)
Female	89 (37.2)	151 (34.4)	78 (35.1)	
Employment status (n, %)				
Unemployed	78 (32.6)	162 (36.9)	84 (37.8)	1.7 (2)
Employed	161 (67.4)	277 (63.1)	138 (62.2)	
Mental health characteristics				
PGSI score (n, %)				20.9 (4)***
Low/no risk	85 (35.6)	139 (31.7)	78 (35.1)	
Moderate risk	92 (38.5)	191 (43.5)	60 (27.0)	
High risk	62 (25.9)	109 (24.8)	84 (37.8)	
K-10 score (M, SD)	15.6 (5.9)	15.7 (6.0)	16.9 (6.5)	3.2 (2)*
AUDIT score (n, %)				
<8 (low risk drinking)	191 (79.9)	360 (82.0)	181 (81.5)	0.45 (2)
≥8 (hazardous/harmful drinking)	48 (20.1)	79 (18.0)	41 (18.5)	
Awareness of services				
Aware of gambling services (n, %)				
No	223 (93.3)	406 (92.5)	189 (85.1)	11.9 (2)**
Yes	16 (6.7)	33 (7.5)	33 (14.9)	
Aware of gambling helpline (n, %)				
No	201 (84.1)	356 (81.1)	137 (61.7)	40.4 (2)***
Yes	38 (15.9)	83 (18.9)	85 (38.3)	

M = mean, SD standard deviation

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

$[F (2, 900) = 3.2, p < 0.05]$ and in rates of PG $[\chi^2 (4, 900) = 20.9, p < 0.001]$ by location. There were significant differences in the proportion of participants who were aware of gambling services in their community $[\chi^2 (2, 900) = 11.9, p < 0.01]$ and who were aware of a free gambling helpline $[\chi^2 (2, 900) = 40.4, p < 0.001]$ by location. Participants from urban areas were more likely to report psychological distress, be high risk gamblers, and be aware of both the gambling helpline and other gambling services.

The multinomial logistic regression analyses revealed similarities and differences in factors associated with moderate and high risk gambling for participants from rural, peri-urban and urban locations (Table 4). In peri-urban and urban settings, employment status was associated with PG. Relative to employed gamblers, those who were unemployed had twofolds greater odds of being a problem gambler (AOR 2.21; 95 % CI 1.24, 3.94). In

contrast, gamblers from urban settings who were unemployed had close to 70 % diminished odds of being a problem gambler (AOR 0.33; 95 % CI 0.16, 0.68). Hazardous/harmful alcohol use was only associated with high risk gambling and the strength of these associations was greatest for participants from urban settings. Relative to no/low risk drinkers, participants with hazardous/harmful alcohol use in rural settings had more than threefold greater odds (AOR 3.45; 95 % CI 1.29, 9.30), those in peri-urban settings had almost ninefold greater odds (AOR 8.89; 95 % CI 4.01–19.63), and those in urban settings had close to 16-fold greater odds (AOR 15.84; 95 % CI 4.19–59.93) of being a problem gambler.

Psychological distress was associated with being a high risk gambler across all locations, although the strength of these associations was greatest for participants from urban settings. For every one unit increase in the K-10 score, the odds of being categorized as a high risk gambler increased 1.2 times (AOR 1.15; 95 % CI 1.07–1.22) for rural participants, 1.1 times for participants from peri-urban settings (AOR 1.14; 95 % CI 1.09–1.20), and 1.3 times (AOR 1.34; 95 % CI 1.23–1.45) for urban participants. For participants in

Table 4 Adjusted associations of factors associated with moderate and high risk gambling among adult gamblers in Limpopo province South Africa, stratified by location

Covariates	Rural location		Peri-urban location (township)		Urban location	
	AOR	95 % CI	AOR	95 % CI	AOR	95 % CI
Moderate risk gambling						
Age	1.02	0.98–1.05	0.99	0.96–1.01	1.03	1.00–1.07*
Gender (male)	1.28	0.66–2.48	1.07	0.67–1.71	1.40	0.65–3.02
Employment (No)	0.79	0.22–1.48	0.93	0.58–1.50	0.54	0.26–1.15
K-10 score	1.07*	1.01–1.14	0.96*	0.92–0.99	1.06	0.99–1.15
Hazardous or harmful drinking	1.91	0.76–4.84	1.57	0.72–3.39	2.65	0.72–9.79
Not aware of gambling help services	0.58	0.13–2.61	1.12	0.35–3.54	0.45	0.12–1.77
Not aware of free gambling helpline	2.30	0.84–6.32	1.00	0.46–2.16	4.12**	1.51–11.21
High risk gambling						
Age	1.02	0.98–1.07	1.01	0.98–1.04	1.03	0.99–1.06
Gender (male)	1.47	0.67–3.21	1.30	0.70–2.42	1.44	0.68–3.05
Employment (No)	0.53	0.25–1.14	2.21	1.24–3.94**	0.33	0.16–0.68**
K-10 score	1.15***	1.07–1.22	1.14***	1.09–1.20	1.34***	1.23–1.45
Hazardous or harmful drinking	3.45*	1.29–9.30	8.89***	4.01–19.63	15.84***	4.19–59.93
Not aware of gambling help services	2.63	0.05–1.36	0.65	0.20–2.08	0.27*	0.07–1.00
Not aware of free gambling helpline	2.48	0.75–8.22	0.37*	0.16–0.86	3.63*	1.24–10.61

AOR adjusted odds ratio, *CI* confidence interval

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

rural and peri-urban settings, psychological distress was associated with being a moderate risk gambler. In rural settings, every one unit increase in the K-10 score raised the likelihood of being at moderate risk (AOR 1.07; 95 % CI 1.01–1.14). In contrast, every unit increase in the K-10 decreased the likelihood of being a moderate risk gambler in peri-urban settings (AOR 0.96; 95 % CI 0.92–0.99).

For the service variables, participants at moderate risk (AOR 4.12; 95 % CI 1.51–11.21) and at high-risk for gambling problems (AOR 3.63; 95 % CI 1.24–10.61) in urban areas had fourfold greater odds of being unaware of the gambling helpline relative to low risk gamblers from urban settings. In contrast, problem gamblers from peri-urban areas were less likely than low risk gamblers from this location to be unaware of this helpline (AOR 0.37; 95 % CI 0.16–0.86). Problem gamblers from urban areas were less likely than low risk gamblers from this location to be unaware of other gambling treatment services (AOR 0.27; 95 % CI 0.07–1.00).

Discussion

Previous studies of psychiatric comorbidity among problem gamblers in South Africa have been limited to urban samples (Sharp et al. 2014). Our study extends these findings through examining psychiatric disorders associated with PG among gamblers in rural, peri-urban, and urban settings in Limpopo province, South Africa. We expected similar patterns of psychiatric disorders identified in prior studies to emerge, but also anticipated that the strength of the associations between these disorders and PG would differ as a function of context and location. Unlike previous studies of PG in South Africa (Dellis et al. 2013; Sharp et al. 2014) and other countries (Gainsbury et al. 2014; Stucki and Rihs-Middel 2007), we found a remarkably high rate of PG among current gamblers, irrespective of type of location. In our community-recruited sample, more than a third of gamblers were moderate risk gamblers and more than a quarter were high risk or problem gamblers. Measurement and other methodological differences between our study and previous studies may account for this higher prevalence rate. Most other studies conducted household or telephone surveys of the general population to explore the prevalence of PG. In contrast, this study purposively recruited gamblers from gambling venues. As problem gamblers spend more time gambling than non-problem gamblers (Subramaniam et al. 2014), this recruitment strategy likely contributed to the elevated prevalence of PG in our sample. Nonetheless, while our sample is unlikely to be representative of the general population of gamblers in this region, this high level of PG in rural, urban and peri-urban settings underscores the need for effective interventions to address PG in each of these locations.

In keeping with findings from studies conducted in the United States (Kessler et al. 2008; Lorains et al. 2011; Petry et al. 2005) and South Africa (Sinclair et al. 2014; Sharp et al. 2014) demonstrating that PG is associated with alcohol use disorders, hazardous and harmful alcohol use was strongly associated with PG in our sample. In addition, we extend the findings of prior studies to show that hazardous and harmful alcohol use was associated not only with PG but also with moderate risk gambling—although the strength of these associations was much greater for PG. This relationship between PG, hazardous/harmful alcohol use remained constant, even when the sample was stratified by location. These findings of the co-occurrence of risky drinking and PG are not altogether surprising given the growing body of evidence indicating overlapping genetic contributions from family and twin studies (Slutske et al. 2013), shared neurobiological mechanisms (Grant et al.

2006), and similar cognitive processing of reward and decision-making (Grant et al. 2010; Harvanko et al. 2013) in PG and substance use disorders.

Similarly we demonstrated that PG is associated with psychological distress, echoing the findings of prior studies that reported significant associations between mood and anxiety disorders and PG (Lorains et al. 2011; Petry et al. 2005; Sinclair et al. 2014; Sharp et al. 2014). This relationship between PG, and psychological distress remained constant, even when the sample was stratified by location. The high propensity of problem gamblers to report psychological distress and to have co-occurring alcohol problems suggests that in order for gambling intervention services to be effective, they should screen all problem gamblers for potential alcohol use disorders as well and other psychiatric difficulties and provide treatments that address gambling, alcohol and other mental health difficulties in an integrated manner. Yet, South African services for gambling, mental health and substance use disorders generally operate in silos. Few substance abuse treatment programs screen patients for and intervene with PG, and most of these services do not offer comprehensive treatment for other psychiatric comorbidities (Myers and Fakier 2009). Although gambling intervention services in South Africa do screen for co-occurring substance use and other psychiatric difficulties (Pasche et al. 2013; Sinclair et al. 2014), many gambling treatment programs do not address these co-occurring problems in an integrated manner.

Although there has been significant investment in a gambling helpline that provides free telephone counseling for problem gamblers and refers those who require more specialised services for further (free) treatment (Pasche et al. 2013; Sinclair et al. 2014), more than 90 % of the gamblers in this study did not know of any services available for gambling disorder and more than three-quarters did not know about the gambling helpline. This lack of awareness of gambling services and the gambling helpline were particularly marked in less urbanised settings—a significantly greater proportion of gamblers from rural and peri-urban areas were unaware of gambling services relative to gamblers from urban settings. These findings suggest that much more needs to be done to extend the reach and awareness of these free gambling intervention services beyond urban settings. Even in urban settings, more needs to be done to increase awareness of available support for gambling problems. We observed that moderate and high risk gamblers in urban settings were significantly more likely to be unaware of the gambling helpline than no/low risk gamblers. This shows that efforts to market the gambling helpline are probably not reaching their intended audience (namely problem gamblers)—this may impact on the uptake of these services.

Although this study sheds light on the mental health correlates of PG, it does have methodological limitations. First, because we purposively sampled gamblers from gambling venues in Limpopo province (rather than through a representative survey), our sample may not generalize to all gamblers in the province or to gamblers from other rural provinces in the country. Second, the cross-sectional nature of the data makes it difficult to disentangle whether psychological distress and hazardous/harmful alcohol use preceded or followed PG. To address this limitation, future research should consider prospective designs that enable researchers to unpack the temporal associations between comorbid psychiatric disorders and PG. Understanding this temporal relationship will shed further light on the etiology of PG and may inform the development of interventions to prevent PG.

Conclusion

The high rates of PG across rural, peri-urban and urban settings indicate that more needs to be done to increase awareness of the risks associated with gambling in all communities.

Our findings also suggest that while services are available to address PG, awareness of and the reach of these services needs to be expanded to include peri-urban and rural settings. Findings also suggest that irrespective of location, interventions to address PG should screen gamblers for hazardous/harmful alcohol use and other common mental disorders (such as depression and anxiety). To mitigate the adverse treatment outcomes associated with untreated psychiatric disorders, health care providers should not only screen patients for these disorders but also ensure that patients either receive integrated care that addresses both PG and the comorbid condition or that they link patients to appropriate mental health care and ensure that they receive it.

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