

# A study of South Korean casino employees and gambling problems

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<b>Background</b>	Casino employees are exposed to disproportionately high levels of gambling, drinking and smoking compared to other occupations. Because of their occupation, they have the opportunity to detect and prevent pathological gambling (PG).
<b>Aims</b>	To identify differences in the mental health status and social attitudes towards PG among casino workers in South Korea depending upon whether they report any gambling problems.
<b>Methods</b>	Data were collected from 388 full-time casino employees. This data provided information about the prevalence of gambling problems, alcohol and tobacco use and depression. Employees were grouped according to their scores on the Korean version of South Oaks Gambling Screen (SOGS), and those employees who gambled without experiencing any gambling problems (Group NP: SOGS = 0) and those who reported any gambling problems (Group P: SOGS > 0) were compared. An exploratory factor analyses identified the domains of casino employee social attitudes towards gambling.
<b>Results</b>	Employees who reported gambling problems (Group P) reported a higher prevalence of smoking, alcohol problems and depression ( $P < 0.01$ ) compared to employees who did not report gambling problems (Group NP). The primary employee social attitude towards gambling was identified by the factor of 'Disease concept/social awareness'. Group NP reported more positive attitudes in this domain than Group P ( $P < 0.01$ ).
<b>Conclusions</b>	Employees who reported any gambling problems reported a less positive attitude towards developing the public health system to be responsive to gambling problems. These findings indicate a need to develop health education programmes that focus more specifically on casino employees with gambling problems.
<b>Key words</b>	Casino employees; mental health; pathological gambling; social attitudes.

## Introduction

Casino employees are at greater risk of a variety of health problems compared to the general work force [1–3]. They are exposed to, become familiar with, and have ready access to gambling, alcohol and tobacco. Casino workers have increased proximity to and knowledge of gambling and at the same time are also at the frontline

for detecting and preventing pathological gambling (PG). Consequently, some casinos are teaching employees how to identify problem gamblers and direct them to helpline resources [4,5]. We hypothesize that employee experience of gambling problems will influence how they report their mental health and social attitudes towards PG. Employee gambling-related experience might be a crucial factor in determining whether responsible gambling programmes intended to prevent and reduce gambling-related harms are going to operate well within casinos.

The aims of this study were to identify the prevalence of gambling problems, alcohol use problems, tobacco use and depression among casino employees; to investigate differences between employees who reported no gambling problems and those who reported any gambling problems and to identify employee social attitude differences towards gambling depending upon whether they reported gambling problems or not.

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## Methods

The survey was administered at two casino sites of South Korea. Two site managers agreed to cooperate with study protocols. We distributed a study survey to full-time casino employees at each of the two sites during February 2005. Casino management provided the researchers time during the morning staff meetings to describe the study and the survey administration process and to build support for the research. At the staff meetings, employees were instructed on the procedure for completing the survey forms and assured that participant confidentiality would be maintained. Participation in the study was anonymous and voluntary. Employees who chose to participate in the study signed an informed consent form indicating their agreement to participate. This research study was approved by the Seoul National Hospital Institutional Review Board before initiation.

Casino managers distributed the surveys and written instructions to employees shortly after the morning meeting. Employees were able to take the surveys home and were not supervised when completing them. Assistance was given to those who could not read or had questions about survey items. Employees returned the completed surveys the next day at the morning staff meetings. Respondents were given a coupon for stationery (\$1.5) as an incentive to participate.

The Korean Version of South Oaks Gambling Screen (SOGS) [6] was utilized to assess PG symptoms. The SOGS yields a score ranging from 0 to 20; because this is a dichotomous yes–no scale, each item receives one point for a positive response. The questions are written in a lifetime mode. The Korean version of SOGS has been shown to be valid and to have high internal consistency, exhibiting a Cronbach's alpha coefficient of 0.95 [6].

We dichotomized the respondents into two groups based on their SOGS scores; employees who reported no gambling problems (SOGS = 0) were labelled Group NP and those who reported any gambling problems (SOGS > 0) were labelled as Group P.

Shaffer and Hall [7] suggested categorizing gambling problem experiences using a public health strategy. A SOGS score of five or more positive responses yields a Level 3 gambler (i.e. a clinical case, for example, 'pathological'). Level 1 represents respondents who score 0 on the SOGS (i.e. gamblers who have not experienced any gambling-related problems).

The Korean Version of the Alcohol Use Disorder Identification Test (AUDIT-K) was used to assess the severity of alcohol use disorders (AUDs). AUDIT consists of 10 questions regarding alcohol consumption, drinking behaviour, adverse reactions, and alcohol-related problems during the last year [8]. The Korean version of AUDIT (AUDIT-K) has its optimal cut-off point as 12. The sensitivity and specificity of AUDIT-K were 0.84 and 0.85 [9].

Since depression and tobacco smoking have been shown to be associated with gambling problems in general [10], and USA casino employees in particular [3], we also assessed depression and tobacco smoking in this sample of Korean casino employees. With respect to depression, the Korean Version of Beck Depression Inventory (BDI-K) was used as the measure. The BDI-K is a 21-item self-report instrument including emotional, cognitive and physical symptoms of depression. Participants were asked to rate how they have been feeling for the past 2 weeks. The total score equals the sum of item scores and range from 0 to 63, a higher total score indicating a greater depressive symptom [11]. The BDI-K has been shown to be valid and to have high internal consistency, exhibiting a Cronbach's alpha index of 0.78 in the general population. A score below nine falls within the normal range [12].

Tobacco use was assessed by two questions: 'Do you smoke cigarettes?' and 'In a typical day, how many cigarettes do you smoke?' We derived these questions from previous studies [1,3,13]. Because nicotine products other than cigarettes are in poor demand in Korea, it is very rare to find these other nicotine products in a tobacconist's shop in Korea. Therefore, we did not ask whether they used other nicotine products.

Because there was no prior research about social attitudes for PG among casino employees in Korea, we derived measurement items from Lee *et al.* [14], who explored social attitudes for behavioural problems related to gambling, alcohol and Internet addictions among the general population. These items were sent to casino managers and representatives of the casino employees to determine whether the items were appropriate for assessing casino employees' attitudes towards gambling. After this initial review, questions that were poorly understood were reworded for clarity. These procedures yielded a list of 14 survey items. Responses to all 14 items were measured using a five-point Likert scale where 1 indicated 'strongly disagree', 3 indicated 'neutral' and 5 indicated 'strongly agree'.

We factor analysed the social attitude items to delineate underlying dimensions. Because these social attitude items had not been investigated previously among casino employees, we employed an exploratory factor analysis. We conducted a principal component analysis with no assumptions about the potential number of expected factors. Initially, we employed an oblique (oblimin) rotation to allow the factors to be correlated. In this oblique solution, the correlations among extracted factors were not significant. Consequently, to facilitate interpretation, in the following results, we present a solution employing an orthogonal (varimax) rotation. All factors with eigenvalues >1 were retained as being significant. In addition, all items with a factor loading  $\geq 0.5$  were included; all items with factor loading <0.5 were removed. A reliability coefficient (i.e. Cronbach's  $\alpha$ ) was computed to

check the internal consistency of items within each dimension. For parametric data, independent *t*-tests were used to examine any significant differences between Group NP and Group P. For non-parametric data,  $\chi^2$  tests were employed to examine group differences. SPSS for Windows (version 12.0, SPSS Inc, Chicago, IL, USA) was used for all data analyses.

## Results

This study recruited 440 eligible employee participants from two casino sites, of whom 405 (92%) responded to this survey. We analysed data for the 80% (353/405) who completed the questionnaire.

Table 1 summarizes demographic and job classification characteristics. The mean age of the entire sample was 31.4 years (minimum age, 20; maximum age, 56). Group NP included 234 employees (male 112; female 122) and Group P included 119 employees (male 76; female 43). There were roughly equal numbers of men (48%) and women (52%) in Group NP, whereas nearly two-thirds (64%) of Group P were men ( $\chi^2 = 8.11$ ,  $df = 1$ ,  $P < 0.01$ ).

Nine (3%) of the casino employees met SOGS criteria for lifetime Level 3 (five or more at-risk SOGS responses) gambling. Sixty-six per cent of the respondents reported no gambling-related problems (a score of zero on the SOGS: Group NP).

Table 2 presents data about the prevalence of smoking among the sample. Overall prevalence of smoking was 41%. Group P (50%) had significantly more smokers than Group NP (35%) ( $\chi^2 = 7.31$ ,  $df = 1$ ,  $P < 0.01$ ).

Eighty-three per cent of the respondents reported no alcohol-related problem (a score of  $<20$  on AUDIT-K) and 6% of respondents had some problem with drinking (scores between 20 and 23 on AUDIT-K). The prevalence of past-year alcohol dependence (a score of 24 or more AUDIT-K) among these casino employees was 7%. When the proportion of employees with an AUDIT-K score indicating some problem (20 or higher) across gambling groups was compared, Group P had significantly more problem drinkers (20%) than Group NP (8%); Group NP ( $\chi^2 = 9.51$ ,  $df = 1$ ,  $P < 0.01$ ).

Seventy-two per cent of the respondents did not report any depressive symptoms (a score of 9 or less on BDI-K). Using the conventional BDI-K scoring system, 7% of the casino employees were classified with moderate depression (scores between 16 and 23 on BDI-K), and 3% of the respondents reported symptoms that classified them within the severe depression range (a score of 24 or above on BDI-K). The number of subjects with higher BDI-K scores ( $\geq 10$ ) was statistically more common among Group P (37%) than Group NP (23%,  $\chi^2 = 6.728$ ,  $df = 1$ ,  $P < 0.01$ ). Table 3 presents the characteristics of smoking rates, alcohol problems and depression rate for Group NP and Group P.

**Table 1.** Demographic characteristics of female and male responders

Gender	Male ( <i>N</i> = 188) <i>N</i> (%)	Female ( <i>N</i> = 165) <i>N</i> (%)	Total ( <i>N</i> = 353) <i>N</i> (%)
Age (year)			
20–29	74 (21)	108 (31)	182 (52)
30–39	61 (17)	47 (13)	108 (31)
40–49	36 (10)	9 (3)	45 (13)
50–59	11 (3)	0 (0)	11 (3)
>60	6 (2)	1 (0)	7 (2)
Education			
High school	25 (7)	6 (12)	31 (9)
Junior college	69 (20)	85 (24)	178 (44)
College	85 (24)	68 (20)	161 (44)
Other	5 (1)	6 (2)	12 (3)
Marital status			
Married	95 (27)	9 (3)	104 (30)
Never married	92 (26)	155 (44)	268 (70)
Primary work duty			
Dealer	154 (45)	130 (38)	284 (83)
Security	14 (4)	10 (3)	24 (7)
Money changing	2 (1)	13 (8)	15 (4)
Office	5 (2)	6 (2)	11 (3)
Other	6 (2)	1 (0)	7 (2)
Income (US dollars per month)			
<1000	32 (9)	15 (4)	47 (13)
1001–2000	51 (15)	65 (19)	116 (33)
2001–3000	38 (11)	45 (13)	83 (24)
3001–4000	38 (11)	26 (7)	64 (18)
>4000	28 (8)	11 (3)	39 (11)

**Table 2.** Casino employee prevalence of smoking

Non-smoking	Male 71 (20)	
<i>N</i> (%)	210 (60)	Female 139 (39)
Smoking		Male 117 (33)
<i>N</i> (%)	143 (41)	Female 26 (7)
1–10 cigarettes per day		74 (44)
11–20		73 (46)
21–40		10 (6)
40 more		1 (1)

The Kaiser–Meyer–Olkin coefficient for the social attitudes towards gambling data was 0.77 and the Bartlett's test of sphericity was statistically significant ( $\chi^2 = 716.1$ ,  $df = 91$ ,  $P < 0.001$ ), indicating that properties of the correlation matrix satisfied factor analytic criteria making such an analytic application appropriate. Kaiser's criterion (Eigenvalue  $> 1$ ) suggested a four-factor solution comprising 13 of the original 14 items that accounted for 50% of the total variance. A varimax rotation to simple structure was performed and all items with factor loadings  $>0.5$  are reported in Table 4. The interpretation of the items loading on each of the four factors

**Table 3.** Comparison of alcohol and depression between Group NP (SOGS = 0) and Group P (SOGS > 0)

	Group NP, N (%)	Group P, N (%)	Group difference
Tobacco smoking			
Yes	83 (35)	60 (50)	$\chi^2 = 7.31$ , $df = 1$ , $P < 0.01$
No	151 (64)	59 (50)	
Alcohol problem (AUDIT-K $\geq$ 20)	18 (8)	23 (20)	$\chi^2 = 9.51$ , $df = 1$ , $P < 0.01$
No alcohol problems (AUDIT-K < 20)	203 (92)	94 (80)	
Depressed (BDI-K $\geq$ 10)	53 (23)	42 (37)	$\chi^2 = 6.728$ , $df = 1$ , $P < 0.01$
Not depressed (BDI-K < 10)	175 (77)	73 (64)	

**Table 4.** Results of exploratory factor analysis of social attitudes: varimax rotated factor pattern

Social attitudes factors and items	Factor loading			
	1	2	3	4
Factor 1: disease concept/social awareness				
Testing is required when frequency of visiting a casino and a wager is on the increase, even though there is no illegal act to pay the gambling debt.	0.699			
Gambling behaviour could be considered a pastime. However, it should be treated as a disorder if one's gambling behaviour makes a problem in one's social, financial or job areas.	0.668			
Gambling within a recreation level can be allowed, but habitual gambling should be banned by a rule.	0.710			
Gambling should be permitted in licenced places.	0.513			
The tax on gambling should be distributed to problem gambling treatment.	0.507			
Testing is required if wasting money and time for gambling is often beyond your plan.	0.738			
Factor 2: support for legal gambling				
Gambling should not be banned by a law.		0.573		
A gambling industry is valuable to our society, because of the tax obtaining from it.		0.737		
Gambling should not be considered to be a disorder if the gambling does not cause any problem in social, occupational aspects.		0.573		
Factor 3: personal liberty				
People have a right to gamble.			0.645	
The reason clinging to at-risk gambling is that gambling in terms of pure recreation is rare.			0.735	
Factor 4: social consequences from gambling				
Gambling itself is not a problem, but its social repercussions are a problem.				0.750
The tax on gambling should be distributed to problem gambling treatment.				0.511
Eigenvalue	3.04	1.77	1.20	1.03
Variance explained (%)	21.69	12.64	8.55	7.37
Cronbach's alpha	0.723	0.455	0.187	0.277

indicated four clear dimensions: Factor 1, 'disease concept/social awareness'; Factor 2, 'supporting for legal gambling'; Factor 3, 'personal liberty'; Factor 4, 'social consequences for gambling'. One item (e.g. the tax on gambling) was compounded between Factor 1 and Factor 4.

The first factor incorporated six social attitude items (e.g. testing is required when frequencies of visiting casino or wagers on betting are rising). The relatively large

proportion of the total variance accounted for by Factor 1 (disease concept/social awareness) represents a central casino employee attitude towards gambling. The second factor comprised three social attitude items (e.g. objection to ban gambling, not viewing gambling as a disease). The third factor contained two social attitude items (e.g. supporting a right to gamble). The fourth factor consisted of two social attitude items (e.g. gambling itself is not a problem, but social repercussion is a problem).

As shown in Table 5, Group NP (mean  $4.20 \pm 0.58$ ) reported significantly more positive attitudes towards disease concept/social awareness than Group P (mean  $3.97 \pm 0.71$ ) ( $t = 3.20$ ,  $df = 344$ ,  $P < 0.01$ ). The groups did not differ on the other gambling attitude factors.

Table 6 reveals the rates of depression, alcohol problems and Level 3 gambling problems among Korean casino employees. Except for the Level 3 gambling rates, these estimates exceed prevalence rates associated with the general adult population [15–17].

## Discussion

These results are generally consistent with previous studies [1–3], but unexpectedly, the rate of Level 3 gambling among casino employees did not exceed the rate in the general population. There is some debate in the literature as to whether a professional group (e.g. medical personnel, casino employees) that has consistent exposure and access to an activity associated with addiction place them at increased risk for developing the problem. For example, previous studies examining the risk of substance abuse and dependence among physicians, medical students and dentists who have greater familiarity with and access to psychoactive substances than other workers have reported that medical personal and dentists are no more likely to abuse substances than other professionals [18–20]. In our study, casino employees evidenced Level 3 gambling at a similar rate to the general population. However, Shaffer *et al.* [2,3] reported that the US casino employees evidenced a higher prevalence of Level 3 gambling compared to the general population. Additional research is necessary to clarify these issues.

In this study, employees who reported gambling problems included disproportionately more men than those who did not. This finding confirms results from previous studies [21,22] that male gender is a significant risk factor associated with gambling disorders.

Consistent with other reports [3,10], employees who reported problem gambling experienced more alcohol-related problems, tobacco smoking and depression. This finding suggests that casino employees with gambling

problems experienced reduced mental health compared to their counterparts without such difficulties. Furthermore, despite this group having more health risk factors, they showed less positive attitudes towards developing a public health system for problem gambling.

Factor analysis revealed four-factor structures that underlie the social attitudes towards gambling among employees; disease concept/social awareness, support for legal gambling, personal liberty and social consequences from gambling. Comparisons between employees reporting gambling problems and those not revealed a meaningful difference along the disease concept/social awareness dimension. The other gambling attitude factors did not reflect any significant differences between these two groups. The disease concept/social awareness factor consisted of items indicating that PG is a mental disease and that there is need to develop the public health system to care for PG. The employees who reported having gambling problems were more reluctant to acknowledge PG as a disease than their counterparts who did not report such problems. Similarly, employees with gambling problems were reluctant to recognize the need to develop the public health system to be more responsive to PG. The ‘fundamental attribution error theory’ provides insight into this relationship. According to Ross [23], people tend to perceive ‘false consensus’, that is, to see their own behavioural choices and judgements as relatively common and responsive to existing social circumstances. People also tend to view the behaviour of others as motivated by internal traits. Consequently, people who experience gambling problems tend to view their gambling problems as more common and a consequence of the social setting; therefore, projecting less need to develop a public education system directed towards gambling problems than will those who do not experience any gambling problems. Nevertheless, there are probably some employees who do not report gambling problems who are likely to oppose gambling, which might affect the extent of this group’s positive attitude towards disease concept/social awareness. More research is necessary to determine the mediators of this finding.

This study has four central limitations. The major limitation is that our self-selected convenience sample of

**Table 5.** Differences on key measures between Group NP (SOGS = 0) and Group P (SOGS > 0)

Variable	Group NP (N = 234)	Group P (N = 119)	Group difference
Gender	N (%)	N (%)	$\chi^2 = 8.11$ , $df = 1$ , $P < 0.01$
Male	112 (48)	76 (64)	
Female	122 (52)	43 (36)	
	Mean (SD)	Mean (SD)	
Cigarettes per day	5.2 (8.2)	7.2 (9.0)	$t = -2.10$ , $df = 351$ , $P < 0.05$
BDI-K	5.7 (6.0)	8.8 (9.0)	$t = -3.27$ , $df = 166.7$ , $P < 0.01$
AUDIT-K	9.2 (6.4)	11.4 (8.5)	$t = -2.455$ , $df = 188.66$ , $P < 0.05$
F1: disease concept/social awareness	4.20 (0.58)	3.97 (0.71)	$t = 3.20$ , $df = 344$ , $P < 0.01$

**Table 6.** Comparison of prevalence rates between casino employees and the general population

	Casino workers (%)	Korean adult population (%)
Major depressive disorder <sup>a</sup> (BDI-K $\geq$ 24)	3	2
Alcohol problems <sup>a</sup> (AUDIT-K $\geq$ 20)	17	7
Tobacco smoking <sup>a</sup>	41	30
Level 3 gambling problems <sup>b</sup>	3	3

<sup>a</sup>Past-year prevalence rates.<sup>b</sup>Lifetime prevalence rates.

casino employees might not reflect the larger population of Korean casino employees in general. This recruitment method might have limited the study sample to only those who have narrow interest in compensation or self-disclosure. Second, the dependent variables in this study were self-report measures subject to social desirability and recall biases. Third, we compared this group of participants with national prevalence data for gambling disorders, tobacco smoking, alcohol problems and depression. These comparisons provide information about the relative severity of these four problems within the sample of casino employees; however, differences in instrumentation and methodology might account, in part, for the observed differences between the study sample estimates and the national estimates. Finally, the data presented here are cross-sectional and this limits our ability to infer causality.

Despite these limitations, our results suggest a need to develop programmes directed towards public health education about gambling problems that focuses more specifically on employees who have gambling problems. Responsible gaming programmes are emerging as a central concern for the gaming industry worldwide. In particular, gaming companies are beginning to develop special education programmes that target their employees [4,5]. As mentioned earlier, casino employees meet their clients face to face in their workplace. Well-educated employees might be able to provide a timely remark, brief screen or intervention that could serve as a very important brief intervention. In the same way that brief screening and intervention efforts may have been successful with alcohol problems, the efforts of casino employees could limit the development of PG. More research will be necessary to determine the efficacy of such programmes. However, as the problem gambling group has a tendency to ignore the disease concept of PG, special education programmes should be prepared to improve their insight about PG as a disease.

Given casino employees' increased proximity to and knowledge of gambling, they might be at greater risk for

gambling and other mental health problems. However, at the same time, they have opportunities to detect the problem gambling behaviour of their clients; this provides them with the occasion to give information about responsible gambling programmes to their clients. Our research supports the hypothesis that casino employee's mental health was associated with less favourable status when they also reported any gambling problem. Paradoxically, the group who reported gambling problems were reluctant to acknowledge PG as a disease and they were reluctant to recognize the need to develop the public health system to be more responsive to PG. Therefore, our study indicates a need to develop a health education programme that focuses more specifically on employees reporting problems.

### Key points

- Given casino employees' increased proximity to gambling, alcohol and tobacco, they might be at greater risk for developing gambling and other mental health problems. At the same time, they are at the forefront for detecting and preventing PG.
- Casino employees who report having any gambling problems have a higher prevalence of smoking, drinking and depression problems compared to the group without gambling problems.
- Paradoxically, the group reporting problems reported a less positive attitude towards developing the public health system to be responsive to gambling problems.

### Funding

Institute of Mental Health at Hanyang University, Seoul, South Korea (YHKIM-05-IMH) to T.K.L.; The National Center for Responsible Gaming; the Institute for Research on Pathological Gambling and Related Disorders; bwin Interactive Entertainment, AG.

### Acknowledgements

The authors would like to acknowledge and extend a special thanks to the staff and faculty of the Division on Addictions at the Cambridge Health Alliance, an affiliate of Harvard Medical School for their important contribution to this paper.

### Conflicts of interest

None declared.

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