

Gender, Age, Ethnic and Occupational Associations with Pathological Gambling in a New Zealand Urban Sample

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Demographic associations with pathological gambling are usually based on findings with population samples which include less serious problem gamblers. The present study examined the relative contribution of risk factors for pathological gambling in selected ethnic groups. A questionnaire which included the DSM-IV-TR symptoms of pathological gambling was completed by 345 South Auckland adults. Approximately 92% gambled and 38% of the gamblers met the criterion of at least five symptoms for current probable pathological gambling. Ethnicity and the interaction between gender and ethnicity were significant predictors of pathological gambling, after controlling for regular gambling, number of favourite continuous gambling activities, gender, age and occupation. Males and females were equivalently at high risk in New Zealand European and Māori groups, but not in the Pacific or Asian groups where males were at greater risk. The findings should be treated with caution owing to the non-representative nature of the sample. They suggest, however, that further research, including prospective investigation, is warranted to advance understanding of the development of problem gambling in different ethnic groups.

In 2004 we were contracted by the Health Research Council of New Zealand (HRC) to develop a methodology to study why people start and continue gambling in New Zealand (Tse et al., 2005). This investigation included a survey of gamblers and problem gamblers resident in South Auckland. A particular focus was on why some regular gamblers become problem gamblers. General population prevalence rates for serious current problem gambling (pathological gambling) typically range from 0.5 to 3.0 percent (Abbott & Volberg, 1999; 2000; Abbott, Volberg, Bellringer & Reith, 2004).

From a public health perspective, pathological gambling is considered not only as a product of biological and behavioural dimensions, but also

as a product of broader population-level factors such as ethnicity and employment (Korn & Shaffer, 1999; Shaffer & Korn, 2002; Volberg, 1994). With small numbers of people classified as pathological gamblers in population surveys, it has been difficult for researchers to determine the relationships between risk factors and their relative importance in relation to pathological gambling.

Typically pathological and less serious problem gamblers have been grouped together. The demographic characteristics of pathological gamblers have also been examined in clinical samples (Ladouceur, Sylvain, Boutin, & Doucet, 2002). In these situations it is unclear how representative they are of serious problem gamblers in the general population (Abbott et al.,

2004). Because our South Auckland respondents included a large number of probable pathological gamblers (38% of 317 gamblers), we decided to examine more closely the relative influence of demographic factors on the probability of being classified as a pathological gambler. Gender, age, ethnicity and occupation were included in the analysis, after controlling for regular and continuous gambling behaviour.

Definitions of Problem and Pathological Gambling

There is substantial international and Aotearoa/New Zealand literature on risk factors for problem gambling (Abbott & Volberg, 1999). Problem gambling is typically defined by respondents endorsing three or more symptoms on measures such as the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV-TR; 2000), within the category of disorders of impulse control. *Probable pathological gambling* is defined by five or more symptoms. The inclusion of "probable" is to distinguish respondents from pathological gamblers identified in clinical interviews (Abbott, 2001). The defining diagnostic characteristics (p. 674) include (1) a continuous or periodic loss of control over gambling; (2) a progression, in gambling frequency and amounts wagered, in the preoccupation with gambling and in obtaining money with which to gamble; and (3) continuation of gambling involvement despite adverse consequences.

To make a DSM-IV-TR diagnosis

of pathological gambling, a clinician is required to ascertain that any five of ten specified criteria are met. In contrast to most other mental disorders there is no requirement that these signs and symptoms are present at the time of or during a specified period preceding assessment. This reflects the assumption that pathological gambling is a progressive, chronic or chronically relapsing disorder, but there is some evidence from prospective studies of problem gambling that it may not be necessarily progressive or chronic (Abbott & Clarke, 2005). For the present study, respondents were asked if they had any of the symptoms in the past 12 months.

Risk Factors for Problem Gambling

Even though patterns of problem gambling distribution vary across jurisdictions and over time, several risk factors have been fairly consistently associated with problem gambling, which also includes pathological gambling in its definition. For the more serious category of pathological gambling alone, the same patterns also may appear (Abbott, 2001; Abbott & Volberg, 1999).

Previous research in New Zealand and other countries has found that compared to non-problem gamblers, problem gamblers play for money more frequently, on more activities and with greater amounts of money (Abbott, 2001; Abbott & Volberg, 1996; Bergh & Kuhlhorn, 1994; Brown, 1996; Clarke, 2003; Clarke & Rossen, 2000; Dubé, Freeston, & Ladouceur, 1996; Hendriks, Meerkerk, Van Oers, & Garretsen, 1997; Moore & Ohtsuka, 1997). Further, problem gamblers are more likely to be involved in continuous gambling, whereby winnings can be immediately risked again within the same session (Abbott, 2001; Clarke & Rossen, 2000). Continuous forms of gambling include scratch tickets, gaming machines, track betting, card games, and casinos.

Early general population surveys in a number of countries, including New Zealand in 1991, found that male gender, youth and young adulthood, non-Caucasian ethnicity, and low occupational status were almost universally risk factors for problem gambling (Abbott & Volberg, 1991, 1992, 1996; Becoña, 1996;

Dickerson, Baron, Hong, & Cottrell, 1996; Ladouceur, 1996; Shaffer, Hall, & Vander Bilt, 1997; Volberg, 1994, 1996; Volberg & Abbott, 1994). Non-Caucasian ethnicity, low occupational status and less formal education also emerged in a number of studies. Large city residence was an additional factor in some.

Relative to earlier studies, a number of recent national surveys have employed larger samples, superior methodologies and multivariate analysis to examine the relationships between risk factors and their relative importance as predictors of problem gambling. The most recent U.S. national surveys, like previous state-level surveys, found elevated prevalence rates for men, non-Caucasian people and low income households (Gerstein et al., 1999; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2004). Welte et al. (2004) also found that, while males had a higher rate of problem gambling, they did not differ from females with respect to more serious probable pathological gambling. Some recent sub-national North American studies have also found an erosion of previous gender differences (Volberg, 2003).

The most recent New Zealand and Australian national surveys and client (helpline and problem gambling counselling) presentation data paint a similar picture (Abbott, 2001; Abbott & Volberg, 2000; Productivity Commission, 1999). While males continued to outnumber females in the 1999 New Zealand survey, the difference was greatly reduced and confined to less serious problem gambling. This change in gender ratios followed the widespread introduction of electronic gaming machines and increased gambling participation of women.

Significant changes have occurred with respect to other risk factors in New Zealand (Abbott & Volberg, 2000). These changes included the age group most at risk shifting from 18-24 to 25-34 years, while unemployment and low occupational status were no longer significant risk factors. The 1999 findings point to problem gambling becoming more widely distributed throughout society, with proportionately more women, adults aged 25 years and over, people in the paid workforce, middle classes and some migrant groups

having problems.

While in part a consequence of problem gambling increasing in some of these groups relative to 1991, this change was also due to reductions in problem gambling among men, young adults, unemployed and some low income groups. The spread of problem gambling throughout society was also apparent in Australia, although in that country people aged 18 to 24 years remained at somewhat greater risk than older age groups (Productivity Commission, 1999). Although there were changes in youth problem gambling rates between the two New Zealand surveys, older adults (65 years and over) continued to have very low rates in both surveys.

Some indigenous populations, such as Māori and Native Americans, have particularly high rates of problem gambling (Abbott & Volberg, 1991; 2000; Volberg & Abbott, 1997; Zitzow, 1996). These groups have histories of colonisation, exploitation and oppression. They continue to be socially and economically disadvantaged to varying degrees and are at high risk for many health and social problems, including alcohol and drug problems. In addition, they are young demographically.

It has been shown that there are several sub-groups of people within the Asian population who are at risk to develop problem gambling. Those disproportionately affected by problem gambling include Asian immigrants who are employed in shift work (for example, restaurants, factories and takeaway food spots) and recent young Asian adult migrants studying English (Goodyear-Smith, Arroll, & Tse, 2004). A survey carried out by the Chinese Family Service for Greater Montreal in 1997 found that up to 19% of Chinese restaurant workers were pathological gamblers (Scalia, 2003), and a recent Christchurch survey found a similar trend (Tan & Tam, 2003).

Indigenous, ethnic minority and some migrant groups are typically characterised by multiple risk factors. Given this situation, it is unclear to what extent these factors, other than aspects of ethnicity and culture, account for their higher prevalence rates. Some studies (Abbott & Volberg, 1991, 1996, 2000; Abbott, Williams, & Volberg, 2004; Volberg, Abbott, Rönberg, &

Munck, 2001; Welte et al., 2004) have controlled for many of these other factors and found that ethnic group membership remained a significant risk factor. This was the case for Māori and Pacific peoples in both the 1991 and 1999 New Zealand national surveys. Even when all other significant demographic risk factors were included in multivariate analyses, Māori and Pacific ethnicity remained the dominant risk factors. This implies that ethnicity per se is important in this regard, rather than being an artefact of other variables associated with both ethnicity and problem gambling, such as age, income or urban residence.

The Present Study

On the basis of recent literature on risk factors for problem gambling, we predicted that the risk factors for pathological gambling in the South Auckland sample will include regular gambling and participation in continuous forms of gambling. There will be equivalent proportions of male and female pathological gamblers. Youth and young adulthood, and non-Caucasian ethnicity, but not low occupational status, will be risk factors. The relative importance of each of the demographic risk factors and relevant interactions will be examined in a hierarchical regression model, after controlling for regular gambling, participation in continuous forms of gambling and the other demographic factors in the model.

Method

Participants

The potential participants were 580 youth and adults from the four main ethnic population groups in South Auckland: Pākehā/New Zealand European, Māori, Pacific Islands (Niue, Samoan, Tongan and Cook Islands) and Asian (primarily Chinese). They were recruited from training/education institutions, cultural groups, social service agencies, sports groups and clubs, and through individual networks in the South Auckland area. The area was chosen because it provides the cultural diversity necessary to ensure that the methods were appropriate for different cultural groups. National surveys have also identified Auckland as an area of high gambling prevalence,

even after other factors are controlled for statistically (Abbott & Volberg, 2000).

To ensure input from various groups, the researchers selected individuals according to gender, age and ethnicity. The researchers were trained Pākehā, Māori, Pacific and Chinese interviewers who had worked on the first phase of the project. Of the 580 people approached, 345 (59%) agreed to participate, with the lowest rates for Pacific (48%) and Asian (52%) people. The convenience sample thus consisted of 345 respondents who completed the questionnaire. The numbers of probable pathological gamblers in the Pacific sub-groups were very small, so that data for these four ethnic groups were combined for analysis.

Compared with the 2001 census population for the South Auckland district (New Zealand Government Department of Statistics, 2001), there were proportionately more females (65% vs. 51%) in the sample, $\chi^2(1, N = 375,873) = 8.43, p < .01$. Ages ranged from 14 to 81 years, with an average age of 39.51 ($SD = 12.84$) years. The group aged 30 to 39 years was over-represented (34% vs. 18%), but the percentages for the other age groups were equivalent to the census data (<29, 24%; 40-49, 16%; 50+, 26%), $\chi^2(3, N = 275,933) = 19.03, p < .01$. Pākehā were under-represented (20% vs. 59%), Māori were equivalent (18% vs. 17%) and the proportions of Pacific (39%) and Asian (23%) groups were higher than the census population (22% and 13%, respectively), $\chi^2(3, N = 352,867) = 46.67, p < .001$.

Materials

The questionnaire was developed from themes emerging from interviews with focus groups, practitioners, problem gamblers and their families in the greater Auckland area. Respondents were first asked "Do you participate in any sort of gambling or betting or games, in which there is an element of luck or chance, for example, on TV, radio, or in newspapers, magazines, church, or Internet?" Those respondents who circled "no" were directed to the demographic questions, skipping the next sections. If they circled "yes", they then selected their favourite games and whether they gambled weekly or

more frequently (regular gambling).

The ten DSM-IV-TR (DSM-IV-TR; 2000) symptoms for pathological gambling followed to ascertain current (12 month) probable pathological gambling status. Respondents selected either "never" or "at least once" in the past year to items such as "Have you gambled to escape from problems or when you were feeling depressed, anxious or bad about yourself?" and "Have you sought help from others to provide money to relieve a desperate financial situation caused by gambling?" Probable pathological gambling is defined by selecting "at least once" for five or more of the ten symptoms (Abbott & Volberg, 1999). The coefficient of internal consistency (Cronbach's alpha) for the DSM-IV-TR scale for the sample was .89. After completing the DSM-IV-TR scale respondents were asked if they felt that they had a problem with gambling. Lastly, demographic questions about gender, age, ethnicity and occupation were asked.

Procedure

Ethics approval for the HRC project was obtained from the University of Auckland Human Participant Ethics Committee. Volunteers were treated in accordance with the *Code of Ethics for Psychologists Working in Aotearoa/New Zealand* (New Zealand Psychological Society, 2002). The information sheet included detail about the purposes of the survey, respondents' rights as participants, the handling and confidentiality of the anonymous data, and the contact details of various ethnic problem gambling agencies if they were distressed by the questionnaire. It clearly specified that all responses were confidential and that no identifying details such as name would be sought. The questionnaire took about 10 minutes to complete.

To develop the questionnaire to examine why people start and continue gambling in New Zealand, individual interviews were conducted with problem gamblers and professionals working with problem gamblers and family members affected by problem gambling. Data were also gathered from focus groups of mixed social and problem gamblers, and professionals and family members (T

et al., 2005).

To assess the demographic associations with probable pathological gambling, univariate logistic regression analyses were computed. Multivariate logistic regression analysis (Walsh & Ollenburger, 2001) examined the unique contributions of the demographic factors and of the interaction of gender with ethnicity, after controlling for regular gambling, continuous gambling and other demographic factors in the model. Data were analysed by SPSS 12.0.

Results

Most of the respondents (92%) gambled, 66% of the 317 gamblers gambled regularly (at least weekly), and 38% of the gamblers (58% of regular gamblers) met the DSM-IV-TR criterion of five or more symptoms of persistent and recurrent maladaptive gambling behaviours (probable pathological gamblers - PPG).

Of the 115 PPG who answered the question whether they thought that they had a gambling problem, 29% answered negatively, even though they had just endorsed at least five

symptoms. Male PPG (59%) were significantly less likely than female PPG (81%) to admit having a problem, $\chi^2(1, N = 113) = 6.45, p < .01$. Rates of acknowledgement for the Pacific and Asian groups (7% and 50%, respectively) were significantly less than the rates for Pākehā (91%) and Māori (79%), $\chi^2(3, N = 113) = 41.69, p < .001$. There were no significant differences in acknowledgement rates for the age and occupational groups.

Demographic Associations with Probable Pathological Gambling

Among the 317 gamblers, statistically significant differences in PPG rates were found for gender, age ethnicity and occupation (Table 1). For the age, ethnic and occupational groups, each sub-group was compared to the sub-group with the highest rate of pathological gambling for that group. These first categories were less than 29 years of age, Pākehā and unemployed/beneficiary, respectively. The confidence interval for each odds ratio indicates that the true estimate has a 95% probability of falling within this range. There were proportionately more male PPG (46%) than female

PPG (34%), $\chi^2(1, N = 315) = 4.48, p < .05$. Gamblers aged 30-39 years were less likely to be classified as PPG (26%) as those 14-29 years (52%), $\chi^2(3, N = 317) = 13.16, p < .01$. For the groups 40 to 49 and 50+ years of age, the rates (43 and 42%, respectively) were not significantly different from the youngest group's rate.

Pākehā (72%) and Māori (71%) rates were very high and equivalent. The Pacific and Asian groups had significantly lower proportions of PPG (16% and 14%, respectively) than the Pākehā and Māori groups, $\chi^2(3, N = 315) = 101.76, p < .001$. Among the occupational groups who gambled, only the office/clerical group had significantly fewer PPG (16%) than the unemployed/beneficiary group (49%), $\chi^2(5, N = 305) = 16.82, p < .01$.

Although data are not tabled, for Pākehā and Māori, there were equivalent proportions of male (64% and 75%, respectively) and female (76% and 69%, respectively) PPG, $\chi^2(1, N = 64) = 1.13$ and $\chi^2(1, N = 62) = 0.23$, respectively, $ps > .05$. For Pacific and Asian people, there were proportionately more male (34% and 28%, respectively) than female (9% and 15%, respectively) PPG, $\chi^2(1, N = 116) = 11.73$ and $\chi^2(1, N = 72) = 7.62$, respectively, $ps < .01$. There were no significant gender by age differences in PPG. Only the professional/managerial group had significantly more male (61%) than female (23%) PPG, $\chi^2(1, N = 58) = 8.52, p < .01$.

For the 287 gamblers with complete sets of data, logistic regression (Walsh & Ollenburger, 2001) was computed to ascertain the unique contribution of each of the demographic variables to the DSM-IV-TR classification of pathological gamblers, while controlling for the other variables in the model.

Regular gambling and number of continuous activities as favourites were entered in the first step, followed by the significant univariate risk factors of gender, age, ethnicity, occupation, and the gender by ethnicity interaction in the second step. Continuous gambling activities, in which winnings can be risked again immediately in the same session, included house/bingo, gambling at a casino, playing cards

Table 1: Numbers (row percentages) and Univariate Odds Ratios of Current Pathological Gamblers by Demographics (N = 317^a)

	Probable Pathological Gambler		Univariate Odds Ratio (95% Confidence Interval)
	Yes (%)	No (%)	
Gender			
Female	71 (34)	138 (66)	1.00
Male	49 (46)	57 (54)	1.67 (1.04, 2.69)*
Age (years)			
<29 ^b	34 (52)	32 (48)	1.00
30-39	29 (26)	83 (74)	0.33 (0.17, 0.63)***
40-49	32 (43)	43 (57)	0.70 (0.36, 1.36)
>49	27 (42)	37 (58)	0.69 (0.34, 1.37)
Ethnicity			
Pākehā ^b	47 (72)	18 (28)	1.00
Māori	44 (71)	18 (29)	0.94 (0.43, 2.03)
Pacific Island	19 (16)	97 (84)	0.08 (0.04, 0.16)***
Asian (Chinese)	10 (14)	62 (86)	0.06 (0.03, 0.15)***
Occupation			
Unemployed/beneficiary ^b	23 (48)	25 (52)	1.00
Student	12 (41)	17 (59)	0.77 (0.30, 1.95)
Homemaker	21 (42)	29 (58)	0.79 (0.36, 1.75)
Office/clerical	9 (16)	48 (84)	0.20 (0.08, 0.51)***
Factory/manual	30 (48)	33 (52)	0.99 (0.47, 2.10)
Professional/managerial	22 (38)	36 (62)	0.66 (0.31, 1.44)

* $p < .05$; *** $p < .001$

for money and electronic gaming machines. Table 2 shows the results of the final step in the regression. Because the Bonferroni correction for multiple statistical tests was not used, significant differences indicated at $p < .05$ need to be interpreted with caution.

In the first step (not shown), regular gambling and number of continuous activities were significant predictors in discriminating between pathological and non-pathological gamblers, accounting for 9% of the correct classification. When gender, age, ethnicity, occupation and gender by ethnicity were entered, the total correct classification increased by 13%. The Wald statistic is used to test for the significance of each predictor in the model. The Hosmer-Lemeshow goodness-of-fit test was not significant, $\chi^2(8, N = 287) = 6.92, p = .55$, indicating that there was an adequate fit to a perfect model (Tabachnick & Fidell, 2000). Overall, 84% of the

gamblers were correctly classified.

The odds ratio of 6.44 for regular gambling indicates that respondents who gambled weekly or more frequently were more than six times as likely to be pathological gamblers as those who were not pathological gamblers. With every increase in the number of favourite continuous games selected, there was a 41% increase in odds of being a pathological gambler.

Ethnicity and the interaction between gender and ethnicity emerged as significant unique predictors of pathological gambling, while gender, age and occupation did not. Pacific and Asian participants were less likely to be classified as pathological gamblers than Pākehā and Māori. Māori and Pākehā had equivalent classification rates. As noted previously, both male and female Pākehā and Māori were highly likely to be pathological gamblers, in contrast to the low rates for Pacific and Asian females.

Discussion

Although the number of respondents who completed this questionnaire was reasonably large, they were not representative of the South Auckland population. Pacific Island sub-groups were over-represented in the sample, but had too few probable pathological gamblers to consider each separately. A much larger sample would be needed to examine pathological gambling among each ethnic group by gender, age and occupational status. The information provided retrospectively by the respondents was probably subject to response bias and faulty recall.

Compared with current problem gambling rates among representative national populations in New Zealand and in other countries, typically ranging from 0.5 to 3.0% (Abbott & Volberg, 1999), the number of probable pathological gamblers (PPG) in the present sample of gamblers (38%)

Table 2: Multivariate Logistic Regression of Regular Gambling, Continuous Gambling and Demographics on Current Pathological Gambling Classification ($N = 287^a$)

Variable	B	S.E.	Wald	Odds Ratio	Confidence Intervals (95%)
Regular gambling	1.86	0.48	14.90***	6.44	(2.50, 16.58)
Continuous gambling	0.43	0.16	4.93*	1.41	(1.04, 1.91)
Gender	-0.74	0.71	1.08	0.48	(0.12, 1.93)
Age (years)				1.00	
<29 ^b					
30-39	-0.67	0.54	1.54	0.51	(0.18, 1.48)
40-49	-0.58	0.56	1.06	0.56	(0.19, 1.68)
>49	0.03	0.58	0.00	1.03	(0.33, 3.24)
Ethnicity				1.00	
Pākehā ^b					
Māori	-0.41	0.60	0.46	0.66	(0.20, 2.16)
Pacific Island	-3.36	0.64	27.49***	0.04	(0.01, 0.12)
Asian (Chinese)	-3.67	1.16	10.00***	0.03	(0.00, 0.25)
Occupation				1.00	
Unemployed/beneficiary ^b					
Student	0.52	0.75	0.48	1.68	(0.39, 7.34)
Homemaker	0.79	0.65	1.47	2.20	(0.61, 7.88)
Office/clerical	-0.36	0.69	0.28	0.70	(0.18, 2.71)
Factory/manual	0.80	0.59	1.85	2.23	(0.71, 7.12)
Professional/managerial	0.43	0.59	0.55	1.54	(0.49, 4.86)
Interaction of gender with:				1.00	
Pākehā ^b					
Māori	1.34	1.99	1.83	3.84	(0.55, 26.92)
Pacific Island	2.52	0.93	7.32**	12.36	(2.00, 76.46)
Asian (Chinese)	2.88	1.40	4.22*	17.74	(1.14, 276.18)
Constant	-1.12	0.81	1.93	0.33	

$R^2 = .418$; * $p < .05$, ** $p < .01$, *** $p < .001$

Note: ^aNumbers vary due to missing data for some variables. ^bReference sub-group.

was extremely high, especially among Pākehā and Māori. Also high were the proportions of probable pathological gamblers, mainly males, who did not admit to having a gambling problem.

Pathological Gambling Behaviour

The findings that regular gambling and increases in number of favourite gambling activities predicted pathological gambling are consistent with findings from other well-controlled studies (e.g., Welte et al., 2004). The rates for gambling on electronic gaming machines or in casinos, which generally range from 15 to 25% for people affected by problem gambling (Abbott & Volberg, 2000; Gerstein et al., 1999; Productivity Commission, 1999; Smith & Wynne, 2004), were greatly exceeded by the PPG in the present sample (66% and 64%, respectively). The preference for these two forms of gambling has been found consistently among problem gamblers in New Zealand and other countries (Abbott & Volberg, 1991).

The PPG preference for gaming machines is consistent with the recent finding that in New Zealand during 2003, approximately 90% of new gambling helpline callers and face-to-face counselling clients reported that their problems primarily involved gaming machines, predominantly in non-casino settings (Paton-Simpson, Gruys, & Hannifin, 2004). This change from earlier times has mirrored the increased accessibility of and rising proportion of total gambling expenditure on electronic gaming machines.

Previous studies (Abbott & Volberg, 2000; Volberg, 2001; Welte et al., 2004) reported that currently only a small percentage of people regularly gamble on the Internet and that it does not appear to be a significant risk factor for problem gambling. Internet gambling was not popular among the present sample but there is the possibility that Internet gambling could lead to more pathological gambling in the future (Tse et al., 2005).

Demographic Risk Factors for Pathological Gambling

The demographic characteristics: male gender, youth and young adulthood, and low occupational status (unemployed, beneficiary or manual worker) were risk factors for problem gambling in the 1991 New Zealand national survey,

but changed in the 1999 survey (Abbott & Volberg, 2000). The present study found that while males were more likely than females to be PPG, this finding was significant only for the Pacific and Asian groups. Although the prevalence of problem gambling in older age groups (40 years of age or older) is usually low, the rate of probable pathological gambling was high among gamblers in the present sample (42-43%). Females and males in all age and all occupational groups had high equivalent PPG prevalence rates. Students, homemakers, and participants employed in factory/manual and professional/managerial occupations, but not office/clerical workers, were as likely to be PPG as gamblers in the low occupational status group. With problem gambling becoming more widely distributed throughout society, the demographic patterns of associations with pathological gambling also may be changing.

Non-Caucasian ethnicity has been found to be a risk factor for problem gambling in some studies (Abbott & Volberg, 1999). Māori and Pacific Island adults had significantly elevated problem gambling prevalence rates in both the 1991 and 1999 New Zealand national surveys (Abbott & Volberg, 1991; 1996; 2000). While the prevalence of probable pathological gambling was very high among Māori in the present sample, it was relatively lower for the Pacific and Asian groups. This finding might be due mainly to the sampling process. Pacific and Asian participants were recruited from cultural or church groups, which might be expected to have fewer pathological gamblers. In contrast, Pākehā and Māori were recruited in more general settings such as Saturday morning flea markets and social clubs with gambling facilities.

Another explanation for this finding is that the latter two groups might have been reluctant to reveal problems listed as symptoms on the DSM-IV-TR scale. This reason was supported by the finding that the PPG among them were highly less likely to think that they had a gambling problem than the Pākehā group. Despite the likelihood of higher levels of gambling problems, research has indicated that Māori, Pacific peoples and Asians may be less likely to seek help for problems (Paton-Simpson et al.,

2004), possibly because of shame and lack of culturally appropriate helping agencies (Raylu & Oei, 2004).

Implications for Public Health and Future Research

With reference to the public health framework (Korn & Shaffer, 1999; Shaffer & Korn, 2002; Volberg, 1994), the opportunities for regular gambling and the availability of continuous forms of gambling in South Auckland are risk factors for pathological gambling, beyond individual factors. Almost all gender, age and occupational groups are at risk, but particularly Pākehā and Māori males and females.

While a relatively high proportion of people who met the probable pathological gambling criterion identified themselves as having a problem with gambling (71%), proportions were much lower for Pacific (7%) and Asian (50%) respondents. These apparent ethnic differences are potentially important in reaching problem gamblers and engaging them in treatment. Recent proposals for intervention have been made specifically for Asian immigrants in New Zealand (Tse, Wong, & Kim, 2004; Tse, Wong, & Kwok, 2004). Further research using additional and more representative samples is required.

It has been suggested that ethnic minority status remains a risk factor when other factors are controlled because minorities have much lower net financial worth, even at the same income levels as other groups (Welte et al., 2004). This means that they have fewer financial resources to draw on to buffer the effects of gambling losses. They also suggest gambling may be more likely to be regarded as a form of investment and means of escaping poverty.

While economic considerations may play a role in accounting for higher problem gambling prevalence among some indigenous, ethnic minority and recent immigrant groups, it seems probable that cultural values and beliefs, as well as social factors within minority subcultures are also implicated. For example, Bellringer, Cowley-Malcolm, Abbott, and Williams (2005) found that Pacific mothers' involvement in traditional gifting to community, extended family members and churches was associated with gambling participation. In a small

pilot study of 14 Samoans, Perese and Faleafa (2000) found that many of the participants reported gambling as a form of fundraising to meet gifting obligations.

Raylu and Oei (2004) have offered several reasons to explain elevated rates of problem gambling among indigenous people and immigrants, which also might apply to pathological gambling. First, gambling may be more available in comparison with the availability in the country of origin or they are targeted by gambling promotional activities. Secondly, gambling changes its meaning when individuals move to another country; for example, gambling is seen as a legitimate way for "quick, easy money". Thirdly, gambling is used as a coping mechanism to deal with difficulties while trying to adapt to the mainstream culture. Fourthly, the increased level of problem gambling among indigenous people and immigrants might be related to a successful acculturation process. That is, some minority group members who try to integrate with mainstream culture take up gambling because it is common, accepted, accessible and liberalised in the host country, such as New Zealand and Australia. Other research (Lopez-Viets, 2001; Zaranek & Chapelski, 2005) suggests a fifth reason: indigenous peoples and newcomers might find gambling venues places to gather socially with their respective ethnic groups in preference to the dominant cultures' venues.

Clinicians and researchers need to be aware that, unlike the DSM-IV-TR diagnosis for pathological gambling, symptoms need to be present within the past 12 months rather than over a lifetime to obtain a more accurate picture of current pathological gambling status. Earlier surveys that used lifetime measures might have overestimated the extent of problem and pathological gambling in community samples (Abbott & Volberg, 1996, 1999).

A large, representative sample of the South Auckland population should be surveyed to examine risk factors for pathological gambling, using methodology similar to the 1999 national survey (Abbott & Volberg, 2000). The area seems to have high numbers of pathological gamblers but little is known about their demographic characteristics.

Further, an investigation should be made into identifying effective preventative measures to assist people to gamble in moderate ways, and resist the social and cultural factors that might otherwise draw them into gambling patterns which lead to more serious pathological gambling. We also recommend a longitudinal study assessing the incidence of pathological gambling among resilient and at risk populations, including the associated risk factors that may lead to pathological gambling and protective factors that "inoculate" against pathological gambling.

Conclusions

Studies of pathological gamblers are usually based on clinical samples. The strengths of the present cross-sectional study lie in the setting and design. It was a convenience sample drawn from relevant groups, involving members of the Pākehā, Māori, Pacific and Asian communities, who were not pre-selected for pathology. Collecting data from one geographical location reduced the possible bias of inter-regional differences in access to gambling activities. However, because the sample was not representative, the findings can not be generalised to the general population of South Auckland.

Population groups should be encouraged and motivated to investigate their respective ethnic and cultural gambling issues in more depth. Our study lends some direction in the areas that demand attention; for example, the extent of participation in electronic machine gambling. Of greater importance, are the groups of people being targeted by gambling promotional activities, such as Māori and Pacific women, youth, the elderly and immigrants. A cost-benefit analysis for respective ethnic groups could be very useful.

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