

A free ride? An analysis of the association of casino bus tours and problem gambling among older adults

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ABSTRACT

Background and aims Little research has examined the relationship between incentives used by gambling venues to attract customers and the experience of gambling-related harm. Organized and subsidized bus tours are a common example of such incentives. The aim of this study was to examine whether bus-tour patronage was associated with increased odds of problem gambling among older adults. This study also compared rates of bus-tour use by socio-demographic characteristics and gambling behaviours. **Design** Pearson's χ^2 tests and Mann–Whitney *U*-tests were applied for bivariate analyses. Multivariate generalized mixed-effects regression modelling was used to examine the relationship between bus-tour patronage and problem gambling while controlling for possible confounding factors. **Setting** Seven gambling venues located in Central and Southwestern Ontario, Canada. **Participants** A total of 1978 gambling venue patrons over the age of 55 years. **Measurements** Problem gambling as indicated by the Problem Gambling Severity Index, bus-tour patronage in the 12 months prior to the survey, spending per gambling visit and past-month slot machine participation. **Findings** Regression analyses showed that bus-tour patronage was associated with higher odds of problem gambling [odds ratio (OR) = 1.71, confidence interval (CI) = 1.06, 2.76] after controlling for several demographic characteristics, type of gambling and gambling expenditures. Bivariate analyses showed past-year bus-tour patronage was associated with more frequent slot machine play ($\chi^2 = 48.16$, $P < 0.001$), more past-year gambling venue visits ($P < 0.001$) and lower spending on gambling per casino visit ($P < 0.001$). Compared with non-patrons, bus tour patrons were more likely to be female ($\chi^2 = 21.92$, $P < 0.001$), born outside Canada ($\chi^2 = 113.18$, $P < 0.001$), above the age of 75 ($\chi^2 = 24.02$, $P < 0.001$) and retired ($\chi^2 = 16.60$, $P < 0.001$). **Conclusions** When adjusting for potential confounders among older adults, using bus tours to access Canadian gambling venues is associated with increased risk of problem gambling. Bus-tour patrons are more likely to be female, born outside Canada and above the age of 75 years.

Keywords Bus, casinos, gambling, leisure, older adults, problem gambling, survey.

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INTRODUCTION

Gambling is an attractive leisure activity for older adults, as it offers them an opportunity to socialize, experience excitement and win money in a relatively safe environment [1]. Organized bus tours are a common tactic used by casinos to increase the number of patrons they serve [2]. Bus tours are also one example of the various marketing strategies to increase access to gambling among older adults [3]. As such, bus tours are a disproportionately popular way for

older adults to access gambling venues. For example, an intercept study of casino gamblers in the American Midwest found that 64.7% of those over the age of 65 years had come to the casino through an organized bus trip compared to younger cohorts, which ranged from 5.1% (21–34) to 17.7% (55–64) [4]. To date, one Australian study has found an association between the perceived importance of shuttle service and problem gambling. However, this study was not able to examine the relationship between actual bus-tour usage and problem gambling due

to a low number of participants reporting the use of bus tours (seven of 377 respondents) [5]. This lack of knowledge on the possible contribution that casino bus tours present to problem gambling is troubling, considering their popularity among older adults. This study will attempt to address this lack of knowledge by examining the relationship of gambling venue bus-tour patronage and problem gambling in a large sample of casino-going older adults (+55).

The connection between greater access to gambling opportunities and problem gambling has been well established. The proximity of gambling opportunities is associated with problem in several countries, including the United States [6], New Zealand [7], Canada, [8] and Australia [9]. In a review of the literature surrounding the accessibility and availability of gambling opportunities, St Pierre *et al.* [10] point out that accessibility to gambling can be fitted into three categories: geographical, temporal and social. Organized bus tours represent a way of increasing access to gambling among older adults who experience greater restraints on transportation [11]. Bus tours may increase accessibility of gambling by decreasing the importance of geographical distance, having extensive regular schedules available throughout the year and presenting casino visits as a safe and socially acceptable leisure activity.

Rates of gambling participation are slightly lower among older adults compared to the general adult population, but still high and relatively stable over time. For example, a 2001 representative sample of adults in Ontario, Canada [12] found a past-year participation rate of 83% for the overall sample and 74.4% for older adults. In comparison, a sample of Ontario adults collected in 2011 [13] found rates of 82.9 and 76.7%, respectively. This high rate of participation is concerning, as older adults represent an increasingly large proportion of the population in North America. For example, the proportion of adults aged 65 and over in Ontario grew from 12.9 to 14.6% of the total population between 2001 and 2011 and is projected to reach 24% of the Canadian population by 2038 [14–16]. Cognizant of this trend, casinos and other gambling venues have taken care to market to the needs of older adults specifically by advertising and organizing trips through retirement homes, booking performers who began their careers in the 1960s and 1970s from Paul Anka to ZZ Top and offering medical services such as oxygen tanks and needle disposal for insulin treatment [17]. Promotions targeting older adults are varied and widespread, but relatively little is known about their connection to problem gambling, making it difficult to assume where they fit into strategies aimed at addressing problem gambling. Some have claimed that comprehensive harm minimization strategies should target the regulation of inducements offered by gambling providers, as they have

the potential of exposing vulnerable populations to greater harm [18], with other suggesting that they should be made illegal [19], and others that strict regulations targeting older adults specifically are overly paternalistic, suggesting that educational programmes geared towards the needs of older adults may be accepted more readily by members of that age group [20].

Gambling is an attractive leisure activity to older adults for several reasons. Gambling can offer opportunities to socialize, to participate in economic activity and to take risks that may otherwise be less available to them [17,21,22]. These benefits become particularly attractive at a stage in life when options for leisure tend to become more constrained due to declining physical health and limited opportunities for access [23]. Gambling-related harm is also less common among older adults. Those aged more than 65 have lower rates of problem gambling compared to younger cohorts [13,24].

Despite the proposed benefits of gambling as leisure activity, there are several features of older age that can increase the severity of the harm experienced as a result of gambling. Problem gambling has been associated closely with negative emotional states such as depression and anxiety [25,26] and lower cognitive function [27]. Older age can bring with it a decline in cognitive functions that may make it harder to control one's gambling [28]. Research has also shown that comorbidity of problem gambling and mental illness was significantly more common among adults aged 55 and older when compared to the overall rate [27]. Financial constraints of being on limited or fixed incomes can also exacerbate the negative consequences of gambling losses for older adults. Research focused upon older adults has shown that reduced income is associated with increased rates of problem gambling [29–31]. Advanced age can bring with it decreased social networks and reduced options for interaction [32,33]. Feelings of loneliness and isolation are also associated with higher rates of problem gambling among older adults [33]. Strategies to increase access to gambling venues targeted at older adults such as bus tours may exacerbate the vulnerabilities to problem gambling associated with older age. Despite these potential harms, older adults still show relatively low rates of problem gambling, leading some researchers to suggest that concern over older adult gambling is based more on moral constructions of older adults as risk-averse and vulnerable, rather than real potential for harm [22].

The goals of the current study were to (1) determine whether the use of bus tours to gambling venues was associated with increased risk of problem gambling for adults over the age of 55 and (2) to identify whether the rate of bus tour patronage was associated with different gambling behaviours and demographic characteristics. To accomplish this, generalized mixed-effects logistic

regression models were applied to a sample of older adult (55+) gambling venue patrons. Bivariate associations between past-year bus-tour patronage and various gambling behaviours and demographic characteristics were also explored.

METHODS

Design overview

Generalized mixed-effects logistic regression models were run to examine the association between past-year bus-tour patronage and screening as a problem gambler on the Problem Gambling Severity index in a sample of older adult gambling venue patrons (+55). Models controlled demographic characteristics and variables related to gambling involvement.

Data collection

Data were obtained from a survey of 2103 participants who were selected randomly while exiting or entering one of seven gambling venues in Central and Southwestern Ontario. These seven venues represented all Ontario Lottery and Gaming Corporation (OLG) operated gambling venues in the geographical area. Surveys were collected throughout 6 weeks in the late summer of 2013. The gambling venues included one casino and six horse-racing tracks with slot machines and some table games (racinos). Potential participants were eligible if they were over the age of 55, able to complete the survey in English and were permanent residents of Ontario. Surveys were completed on tablet computers with the assistance of trained interviewers. Participants were informed of the project and gave consent to participate voluntarily. Participants were given \$CAD10 gift cards to a province-wide restaurant chain. The survey lasted typically between 15 and 20 minutes. The fieldwork for the project was conducted by (removed for blind review), and the project was reviewed and approved by the Research Ethics Board of the (removed for blind review) as Protocol no. 086/2013.

Stratified cluster sampling was used to ensure even representation across age, sex, frequency of casino visit and nature of casino visit (e.g. alone or with a group). A total of 4345 patrons were intercepted on site, 1468 (33.8%) of whom declined to participate, and 774 (18%) were disqualified because they were too young, their age strata had been satisfied previously, there were language barriers or they were not residents of Ontario. The survey had an overall response rate of 66%, ranging from 61 to 73% throughout the seven sites. After listwise deletion for valid responses on study variables, a total of 1978 respondents were included in the analyses.

Measures

Outcome

Problem gambling was identified using the Problem Gambling Severity Index (PGSI), a validated and widely used measure of gambling problems [34]. The PGSI was used as a dichotomous measure to identify problem gambling (score of 8 or higher) in the multivariate regression analysis.

Predictor

The main predictor was whether or not the participants used bus tours to visit the casino in the past year in response to the following question: 'In the past year (12 months), how many times did you go to a casino/gambling venue as part of an organized bus tour or group visit?'. Responses were grouped to create a binary measure to divide one or more visits and zero visits in the last year.

Covariates

Several covariates were examined. The number of past-year visits to a gambling venue was included as a continuous measure and based on participant response to the following question: 'In the past year (12 months), about how many times have you gone to a casino/slots locations?'. Per visit monetary spending on gambling, a continuous measure, was constructed from the question: 'On average, how much money do you spend gambling at the casino or slots location each time you go?'. A variable reflecting slots participation was examined and constructed from the following question: 'How often did you spend money on slot machines in slots locations/casinos in the past year (12 months)?'. This variable was dichotomized as those who reported slots play on a less than monthly (0) or monthly or more frequent basis (1).

Several demographic variables were also included in the analyses. Sex was divided into self-identified male or female. Alternative options for other gender identifications were available but not indicated by participants. Age was divided into five categories (see Table 1). Marital status was divided into four categories: married (reference), single, separated/divorced and widowed. Employment status was divided into employed (including full-time, part-time and self-employed), unemployed (including home-maker, disabled, and other) and retired. In the regression analysis, this variable was used as a dichotomous variable, retired and all other categories. Place of birth was dichotomized for regression analysis as Canadian versus foreign-born.

Analysis

Bivariate comparisons between those who did and did not patronize organized bus tours to visit a gambling

Table 1 Bivariate results for demographic variables.

	<i>Bus-tour patronage in past 12 months</i>		<i>Total</i>	χ^2	<i>P</i>
	<i>No</i>	<i>Yes</i>			
Sex					
Male	583 (64.5%)	320 (35.5%)	903	21.92	< 0.001
Female	580 (54.2%)	491 (45.8%)	1071		
Age (years)					
55–59	197 (62.3%)	119 (37.7%)	316	24.02	< 0.001
60–64	249 (67.9%)	118 (32.1%)	367		
65–69	218 (59.5%)	148 (40.5%)	366		
70–74	200 (55.9%)	158 (44.1%)	358		
75+	299 (52.8%)	268 (47.2%)	567		
Marital status					
Married	786 (60.6%)	510 (39.4%)	1296	7.45	0.059
Separated/divorced	133 (58.4%)	95 (41.6%)	228		
Single	74 (59.4%)	51 (40.6%)	125		
Widowed	169 (52.2%)	154 (47.8%)	323		
Place of birth					
Canada	748 (69.7%)	325 (30.3%)	1073	113.18	< 0.001
Elsewhere	415 (46.1%)	486 (53.9%)	901		
Retired					
No	375 (66.0%)	193 (34.0%)	568	16.60	< 0.001
Yes	787 (56.0%)	617 (44.0%)	1404		

venue in the last year were made using Pearson's χ^2 tests for categorical variables. For continuous variables included in the bivariate comparisons, significant skewness statistics were identified for both per-visit spending [7.27, standard error (SE) = 0.05] and for the number of gambling venue visits during the past year (2.46, SE = 0.054); as such, Mann–Whitney *U*-tests were used for bivariate statistical comparisons. Natural log-transformation of per-visit spending was used in the generalized mixed-effects regression models. For bivariate analyses listed in Tables 1 and 2, weighting by location

and frequency of visit was performed to account for bias in the sampling strategy. Generalized mixed-effects regressions were used to examine the relationship between bus tour patronage and problem gambling, accounting for the clustered data collection design. To ensure that the results were not biased as a result of over-representation of regular gamblers, multivariate analyses were weighted by frequency of gambling venue visit. All analyses were completed using the Statistical Package for Social Scientists (SPSS) version 21 [35] and the R package for statistical computing [36].

Table 2 Bivariate results for gambling-related variables.

	<i>Bus-tour patronage in previous 12 months</i>		χ^2	<i>P</i>
	<i>No</i>	<i>Yes</i>		
PGSI category				
No risk	517 (62.7%)	308 (37.3%)	20.62	< 0.001
Low risk (1–2)	355 (58.0%)	257 (42.0%)		
Moderate risk (3–7)	234 (58.2%)	168 (41.8%)		
High risk (8+)	56 (42.1%)	77 (57.9%)		
Slots play				
Less than monthly	309 (73.7%)	110 (26.3%)	48.16	< 0.001
Monthly or more	854 (55.0%)	700 (45.0%)		
Mean spending per visit ^a	142.0 (SD = 194.5)	135.5 (SD = 215.2)	NA	< 0.001
Mean visits per year ^a	34.6 (SD = 37.1)	44.3 (SD = 41.6)	NA	< 0.001

^aNon-parametric Mann–Whitney *U*-tests used. PGSI = Problem Gambling Severity Index; NA = not applicable; SD = standard deviation.

RESULTS

Table 1 displays the distribution of past-year bus-tour patronage across demographic variables. The table shows that bus-tour patronage was significantly more common among women compared to men, those born outside Canada compared to native-born and retired participants compared to the employed and otherwise not working. Significant variation was observed across age, with bus tours being more popular in older age groups. Marital status did not show significant variation across past-year bus-tour patronage. The high rate of bus-tour patronage for foreign-born participants appears to be driven by two ethnic groups. Specifically, past-year bus-tour patronage was reported by 67 and 76% of participants identifying as 'Asian' and 'East Indian', respectively. These rates are disproportionately high compared to the overall rate of 41% (East Indian: $\chi^2 = 43.50$, $P < 0.001$, Asian: $\chi^2 = 68.09$, $P < 0.001$).

Table 2 describes bivariate comparisons for participants who had and had not used bus tours in the last year by gambling-related variables. Bus-tour patronage was significantly more popular among participants who played slot machines on a monthly or more frequent basis. Significant variation was also shown across PGSI categories where the majority of those identified as problem gamblers had used bus tours in the last year. There was a significantly higher

number of past-year gambling-venue visits among bus-tour patrons compared those had not patronized bus tours. Per-visit spending was significantly lower among bus-tour patrons, as indicated by a non-parametric Mann-Whitney *U*-test.

Mixed-effects models

Table 3 describes the results of a series of generalized mixed-effects logistic regressions predicting odds of being classified as a problem gambler on the PGSI (8+). In the unadjusted model there was no significant relationship between bus-tour patronage and problem gambling.

In model 2, with demographic covariates included, bus-tour patronage was a significant predictor of problem gambling. Age was associated significantly with problem gambling, such that older participants had lower odds of problem gambling. Those who were separated or divorced had 2.72 times higher odds of problem gambling compared to married respondents. Being non-native to Canada was associated with 2.46 times higher odds of problem gambling. Identifying as female or retired was not associated with problem gambling. The reduction in the Akaike information criterion (AIC) score of model 2 compared to model 1 indicates that model 2 provides improved fit to the data.

The final model included two variables related to gambling participation. Past-month slot-machine participation

Table 3 Generalized mixed-effects models predicting problem gambling (PGSI 8+).

	Model 1	Model 2	Model 3
Random effects	Variance (SD)	Variance (SD)	Variance (SD)
Location	0.16 (0.40)	0.01 (0.10)	0.03 (0.17)
Fixed effects	OR (2.5%, 97.5%)	OR (2.5%, 97.5%)	OR (2.5%, 97.5%)
Intercept	0.04 (0.03, 0.06)	0.14 (0.05, 0.42)	0.00 (0.00, 0.01)
Bus tour			
Yes	1.40 (0.91, 2.16)	1.64 (1.03, 2.60)	1.71 (1.06, 2.76)
Sex			
Female		0.88 (0.57, 1.38)	0.98 (0.62, 1.55)
Age		0.69 (0.57, 0.84)	0.70 (0.58, 0.85)
Marital status			
Single		1.40 (0.61, 3.20)	1.45 (0.62, 3.43)
Separated/divorced		2.72 (1.60, 4.64)	2.88 (1.65, 5.03)
Widowed		1.75 (0.89, 3.44)	1.48 (0.74, 2.96)
Retired			
Yes		0.62 (0.37, 1.02)	0.63 (0.37, 1.06)
Born in Canada			
No		2.46 (1.51, 4.03)	2.17 (1.34, 3.51)
Past-month slots participation			
Yes			5.48 (2.07, 14.53)
Spending per visit ^a			
Ln (SCAN)			2.10 (1.65, 2.67)
AIC	744.5	699.9	642.20
logLik	-396.3	-339.9	-309.10

^aResults reflect log transformations. PGSI = Problem Gambling Severity Index; SD = standard deviation; AIC = Akaike's information criterion.

was associated with increased odds of problem gambling by a factor of 5.48. The log-transformation of per-visit spending (\$CAD) was also associated with approximately doubled odds of problem gambling. Bus-tour patronage remained a significant predictor of problem gambling at 1.71 times greater odds compared to those who had not patronized bus tours in the last year. The significance and associations of the demographic variables introduced in the previous model remained relatively unchanged with the inclusion of the gambling-related covariates. The third model showed improved fit over model 2, as indicated by the reduction in AIC score.

DISCUSSION

The primary aim of the current study was to determine whether patronizing organized bus tours to gambling venues was associated with problem gambling. The findings indicate that past-year patronage of organized bus tours to a gambling venue was associated with a 1.71 increase in odds of problem gambling after controlling for socio-demographic variables and gambling behaviour. Bus-tour patronage was also associated with more venue visits per year, regular slot-machine participation and lower per-visit spending.

Southwell *et al.* argued that bus tours target older adults [3]. To the knowledge of the research team, this study provides the first systematic analysis of the connection between bus tour patronage and problem gambling. Identifying the connection of problem gambling to organized bus tours is crucial to understanding their potential for gambling-related harm among older adults, given their popularity in this age group [4]. Examining whether the relationships observed in this research are present in samples representative of the general population is an important step for future research.

The association of bus tours with problem gambling has important implications for the use of inducements by gambling venues to attract customers. Courtesy and subsidized bus transportation to casinos has been a regularly used tactic to increase participation since the 1980s [2]. The current study shows that inducements to gambling that target older adults [3] are associated with greater gambling-related harm and supports assertions that greater restrictions should be placed on such tactics in order to reduce the risk of problem gambling among older adults [18]. Conversely, Higgins suggests that limiting bus tours is not likely to be supported by older adults, as they are very popular at older adult recreation programmes and reducing access may have the unintended effect of discouraging participation in social activities [20]. This leads Higgins to suggest that policy addressing casino tour patronage among older adults may be most effective when developed at local level rather than through larger

governmental restrictions [20]. However, the centralized organization of gambling in Canada and similar policy environments will probably necessitate larger system-wide regulation. This means that greater information needs to be collected on the size and scope of the casino bus tour industry to direct system-level change, rather than relying upon the more informal policies of individual older adult recreation centres.

The current study found high rates of problem gambling among gambling venue going older adults. Our results show a combined moderate to severe problem gambling rate of 28.8%. In comparison, general population estimates for this measure of problem gambling among older adults in Ontario are approximately 2.0% [12]. This means that the rate of problem gambling found at gambling venues through randomized sampling methods was more than 14 times higher than in the general population. This suggests that gambling venues are a suitable target information and referral to appropriate resources and services designed for the treatment and prevention of problem gambling among older adults.

A secondary aim of the study was to identify whether the bus tour patronage varied by socio-demographic characteristics. Women, older adults (75+), retirees and Asian and East Indian participants were more likely to use bus tours. This study also provided insight into whether inducements to visit a gambling venue, such as subsidized transportation, may expose some groups of older adults to greater harm than others. Recent reviews of research focused on gambling among older adults have identified a need for research to recognize the variety of gambling experiences within the rather diverse category of older adults [37,17]. The above results show significantly higher rates of tour patronage for the oldest cohort in the study [37] and for specific cultural groups and, as such, these groups may be placed at greater risk of problem gambling as a result of inducements to visit a gambling venue. Determining whether these differences are the result of direct targeting of certain groups or a matter of self-selection by these groups requires further investigation.

LIMITATIONS

There are several limitations within the current study. The current sample was collected at gambling venues within a specific geographical area, and as such was not representative of all older adults. Instead, our study used a stratified randomized sample with weighting procedures to ensure that the data were representative of older adult gambling-venue participants in Ontario. The findings are reflective of this population.

Requirements of participation may have excluded certain groups or characteristics that are at increased risk of problem gambling from the study. For example, completion of the survey required fluency in English. This means that some members of minority ethnic groups may have been excluded due to poor English skills. Considering the disproportionately higher rates of bus-tour patronage among foreign-born participants, it is possible that a larger proportion of regular bus-tour patrons from these groups were excluded due to language restraints compared to those who do not use the tours.

CONCLUSIONS

This study found that patronizing organized bus tours to visit a gambling venue in the past year was associated with greater odds of problem gambling in a sample of older adult gambling-venue patrons. This relationship was significant after controlling for important covariates shown to be associated with problem gambling. Rates of bus-tour patronage vary by gender, age, place of birth and ethnicity, potentially exposing some groups to greater risk of problem gambling. While restrictions on casino bus-tour operations and other inducements to gamble exist in a few jurisdictions [20], some have called for greater regulation [18]. The present results suggest that stricter regulation of incentives to visit gambling venues could be useful for preventative strategies targeting problem gambling among older adults.

Declaration of interests

N.E.T. reports that he has received a grant from Ontario Lottery and Gaming to help them evaluate a prevention initiative for problem gamblers who reinstate after self-exclusion. The award has nothing to do with the current research paper and does not represent any actual conflict of interest with the outcome of this paper. The other authors declare no conflicts of interest.

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