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Past-year recreational gambling in a nationally representative sample: Correlates of casino, non-casino, and both casino/non-casino gambling

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Abstract

Data from the Gambling Impact and Behavior Study (GIBS), a national survey of 2,417 U.S. adults, were examined by multivariate analysis to investigate characteristics of past-year recreational gamblers who participated in casino-only, non-casino-only, and both casino and non-casino gambling. Compared to non-casino-only gamblers, individuals who gambled in both locations had higher rates of alcohol use and abuse/dependence, lower rates of drug use, more frequent gambling, and larger wins and losses. Compared to casino-only gamblers, individuals who gambled in both locations reported less drug use, poorer subjective health, earlier age of gambling onset, greater frequency of gambling, and larger wins and losses. Compared to casino-only or non-casino-only gambling, gambling in both locations was associated with more frequent and heavier gambling. Findings suggest aspects of recreational gambling, such as gambling venue, may have important public health implications and should be considered in guidelines for responsible gambling.

Keywords

gambling; alcohol; drug use; casino; public health

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1. Introduction

An estimated two of every three adults in the US have gambled within the last year (National Research Council, 1999; Shaffer and Korn, 2002), and up to 5% of the general adult population exhibits gambling problems (Shaffer et al., 1999a; Cunningham-Williams and Cottler, 2001); however, the majority of adults gamble “non-problematically” or “recreationally” (Gerstein et al., 1999; Shaffer and Korn, 2002). Recreational gambling has been defined as gambling that does not meet the threshold for problem or pathological gambling (Gerstein et al., 1999; Potenza et al., 2002a) and recreational gamblers do not experience the level of difficulties in life functioning that problem or pathological gamblers do (Desai et al., 2004). The terms “low-risk gambling” (Currie et al., 2006; Currie et al., 2008a; Potenza et al., 2011), “low-severity gamblers” (Yip et al., in press-a), “subsyndromal gambling” (Desai et al., 2004; Yip et al., in press-b), and “responsible gambling” (Currie et al., 2006; Currie et al., 2008a) have also been used to denote non-problematic or recreational gambling.

Terms such as recreational, low-risk, and responsible gambling often lack clear definitions across studies (Blaszczynski et al., 2004), and one problem facing researchers is the range of methods used to assess and determine whether gambling is classified as recreational or problematic. However, research suggests gambling behavior exists along a continuum, encompassing a wide range of gambling behavior from pathological levels of gambling to no gambling at all (Shaffer 2005; Currie et al., 2008a) and some negative health associations (e.g., substance use, psychiatric disorders) commonly associated with excessive and problem or pathological levels of gambling may extend to non-problematic gambling groups (Lynch et al., 2004; Desai and Potenza, 2008). Given the number of recreational gamblers in the general population, understanding the impact of recreational gambling on health and well-being becomes important, particularly as gambling research and policy efforts begin to focus on public health considerations such as economic and legal issues as well as responsible gambling efforts (Korn and Shaffer, 1999; Shaffer and Korn, 2002; Toce-Gerstein et al., 2003; Lynch et al., 2004; Potenza et al., 2006).

Health correlates of recreational gambling have been examined with respect to age and gender (Desai et al., 2004; Lynch et al., 2004; Desai et al., 2005; Potenza et al., 2006), and relationships between recreational gambling and substance use and psychiatric disorders have also been established (Blanco et al., 2006; Desai et al., 2006; Duhig et al., 2007; Liu et al., 2009; Potenza et al., 2002b; Welte et al., 2004a); however, one aspect of recreational gambling that has not been examined extensively is the relationship between gambling venue (e.g., casino gambling) and measures of health and well-being. Casino gambling, as compared to prevalent forms of non-casino gambling (e.g., lottery), may be performed less frequently but involve greater expenditures per gambling occasion. Certain forms of gambling (e.g., casino gambling) or their availability may be differentially associated with gambling problems. For example, individuals living in close proximity to US or Canadian casinos have been reported to have high rates of gambling problems (Welte et al., 2004b; Cox et al., 2005) and greater severity of gambling (Adams et al., 2007). Room and colleagues (1999) observed increased rates of gambling problems following the opening of a nearby casino, and Toneatto and colleagues (2003) reported increased frequency of casino gambling in treatment-seeking substance abusers following the opening of a nearby casino, as well as greater problem gambling severity amongst individuals engaging in weekly casino gambling. Other studies link casino gambling across age groups with gambling problems (Bazargan et al., 2000; Welte et al., 2007; Welte et al., 2009) and their severities (Welte et al., 2004a).

In a recently published longitudinal study with adolescents, preferred type of gambling was found to change over time, shifting from non-regulated games (e.g., card playing) to more regulated forms (e.g., casino/slot gambling) (Goudriaan et al., 2009). Additionally, engagement in more extensive card-based and other non-regulated forms of gambling was associated with drug and alcohol use and gambling problems (Goudriaan et al., 2009). International studies of electronic gaming machines (EGMs) demonstrate a relationship between EGMs and problematic gambling, and suggest that the relationship may be stronger for EGM gambling in non-casino, as compared to casino, locations (Dowling et al., 2005). Clarke and colleagues (2010) further investigated this and found that EGM gambling that took place in pubs, as compared to EGM gambling in casinos, was more strongly associated with current gambling problems. These studies indicate that the type of gambling taking place in different venues (i.e., gambling in casino and non-casino locations) are important to study, particularly with regards to health correlates. Data suggest casino gambling is associated with second-hand smoke exposure and high rates of tobacco smoking (Shaffer et al., 1999b) and nicotine dependence (Cunningham-Williams et al., 1998). Some have proposed that casino gambling may also be associated with cardiac arrests (Jason et al., 1990) and increased suicidal thoughts and behaviors (Phillips et al., 1997) although interpretations of these data have been challenged.

Other studies do not support the link between casino gambling and gambling problems; a prevalence estimate for pathological gambling of 0.3% was observed in 2000 in Nevada, a state with many casinos (Shaffer, 2004), at a time when a national estimate of 0.6% was observed (Gerstein et al., 1999). Although recreational gambling prevalence estimates appeared to increase, those of pathological gambling in Quebec did not increase from 1996 to 2002 despite the growth of casino gambling during that time (Ladouceur et al., 2005). Thus, although studies suggest that proximity to and availability of casino and non-casino gambling may influence recreational and problem gambling behaviors, at present this relationship is not well understood and requires additional research.

Studies to date have not systematically investigated recreational gambling categorized by gambling venue. As in prior studies from our group (Desai et al., 2004; Lynch et al., 2004; Desai et al., 2005; Desai et al., 2006; Potenza et al., 2006; Duhig et al., 2007; Barry et al., 2008; Pantalon et al., 2008; Liu et al., 2009), we used data from the Gambling Impact and Behavior Study (GIBS; Gerstein et al., 1999), a random digit dialing (RDD) survey database of 2,417 adults in the United States, to examine health and well-being characteristics of past-year recreational gamblers who engaged in casino gambling, non-casino gambling, or both. Given existing data, we hypothesized that casino-only recreational gambling as compared to non-casino-only recreational gambling would be more strongly associated with adverse health measures (e.g., substance use) and heavier (e.g., largest maximal daily wins and losses) albeit less frequent gambling. We also hypothesized that recreational gambling in both casino and non-casino locations, as compared to casino-only or non-casino-only venues, would be more strongly associated with adverse health measures (e.g., substance use) and heavier gambling.

2. Methods

2.1. Study Design

Data for the current analyses are drawn from the GIBS (Gerstein et al., 1999), a national study of gambling in the US civilian household population of individuals 18 years and older (Gerstein and Toce, 1999). The study was conducted via two distinct surveys, a telephone-based survey using a Random Digit Dialing (RDD) methodology (N=2,417) and a face-to-face survey of patrons at selected lottery points of purchase, pari-mutuel, and casino facilities (N=530) (Gerstein et al., 1999; Gerstein and Toce, 1999). Only data from the RDD

sample were included in the analyses as: 1) the questionnaires administered to the RDD subjects and gambling venue subjects were not identical; and 2) the gambling venue sample was interviewed to enrich the adult sample for individuals with problem and pathological gambling (Gerstein et al., 1999; Gerstein and Toce, 1999), and thus were derived from a biased recruitment and were not necessarily representative of the U.S. adult general population. Data for the RDD survey were obtained using a list-assisted approach and one⁺ sampling as described elsewhere (Engelmann and Wolter, 1999). Telephone numbers purchased from Survey Sampling, Inc. (SSI) were stratified by SSI by state lottery status and working residential numbers identified in part through screening by SSI (Engelmann and Wolter, 1999). The individual interviewed from the contacted household was determined via a variant of the Trolldahl/Carter/Bryant method (Engelmann and Wolter, 1999).

The telephone survey sample was designed and statistically weighted to ensure representation of the U.S. population of adults aged 18 and older. Comparisons of the final sample found it to be representative of the U.S. household adult population, although comparisons did indicate that respondents in the Northeast part of the U.S. were slightly overrepresented, while African-American respondents were slightly underrepresented. Complete data were obtained for 2,417 of the 3,160 interviews attempted, yielding a response rate of 76%. Potential differences between respondents and non-respondents were unable to be examined.

2.2. Measures

Variables described in the analyses were derived from those described in the GIBS (Gerstein et al., 1999), with responses to questions grouped as indicated in the text and tables in a manner similar to our prior investigations using GIBS data (Desai et al., 2004; Lynch et al., 2004; Desai et al., 2005; Desai et al., 2006; Potenza et al., 2006; Duhig et al., 2007; Barry et al., 2008; Pantalon et al., 2008; Liu et al., 2009).

2.2.1. Demographics—Data on gender, race/ethnicity, education, marital status, employment, age, and income were collected.

2.2.2. Health and Well Being Measures—Past-year alcohol use was defined as alcohol use at least once a month for at least 12 days over the past year. Individuals who met threshold criteria were asked follow-up questions based on DSM-IV (American Psychiatric Association, 1994) criteria for alcohol abuse/dependence (e.g., tolerance, withdrawal, adverse physical or social effects of alcohol use). Past-year substance use included alcohol and other substance abuse/dependence (e.g., cocaine or crack, marijuana, stimulants, tranquilizers) and was defined as use of a substance for non-medical reasons for at least 5 days over the past year. Individuals who met threshold criteria were also asked follow-up questions based on DSM-IV (APA, 1994) abuse/dependence criteria. Drug abuse and drug dependence were not included as separate variables but rather collapsed as one variable as done previously (Desai et al., 2004; Lynch et al., 2004; Desai et al., 2006). Two screening questions adapted from the NIMH Diagnostic Interview Schedule (DIS-IV; Robins et al., 1997) to assess depression asked about lifetime history of negative feelings (e.g. sad, empty, or depressed) or a loss of interest in enjoyable activities during a two week period. Mental health treatment was based on seeking treatment for problems with emotions, nerves, or mental health with a clinic, doctor, or counselor in the past 12 months. Past-year subjective general health was determined by asking “How would you describe your general health over the past 12 months?” with responses classified as “excellent,” “good,” “fair,” or “poor” (Gerstein et al., 1999). The GIBS did not contain objective measures of general health. Lifetime incarceration and bankruptcy were each assessed by “yes/no” items; the question about bankruptcy did not explicitly ask if bankruptcy was related to gambling.

2.2.3. Gambling Attitudes and Behaviors—Gambling measures (e.g., reasons for gambling, age of onset, quantity/frequency measures) were taken directly from the GIBS (Gerstein et al., 1999; Gerstein and Toce, 1999). As in prior studies (Desai et al., 2004; Lynch et al., 2004), we created categories grouping types of gambling. Strategic gambling was defined as any participation in track/off track, card room, private game, table game, sports, video poker, card game, roulette, dice, games of skill, pari-mutuel, auction, board game, or frog racing gambling. Machine gambling was defined as any participation in internet, machine, slot machine, video lottery, video poker, electronic game, or video machine gambling.

2.3. Data analysis

Data from individuals missing information on gambling status (n=4) or with probable past-year or lifetime problem or pathological gambling (n=51), as determined by either a past-year or lifetime NORC Diagnostic Screen (NODS) score of 3 or more, were excluded as previously done (Desai et al., 2004; Lynch et al., 2004; Desai et al., 2005; Desai et al., 2006; Potenza et al., 2006; Duhig et al., 2007; Barry et al., 2008; Pantalon et al., 2008; Liu et al., 2009) to examine recreational gamblers (N=2,362). Past-year gambling was defined as “placing a bet during the past 12 months on the outcome of a race or game of skill or chance, or playing a game—including for charity—in which one might win or lose money” (Gerstein and Toce, 1999) yielding a subsample of past-year recreational gamblers (N=1486). Data from individuals missing information on casino/non-casino gambling variable (N=18) were excluded yielding a final sample of past-year recreational gamblers (N=1468). Past-year non-casino gamblers (N=875) were defined by any acknowledgment of past-year participation in race track, jai alai fronton, off-track betting, lottery, bingo, charitable card room, private game, store, bar, restaurant, truck stop, or computer gambling. Past-year casino gamblers (N=93) were defined by acknowledgment of past-year participation in any game played at a casino. Individuals acknowledging both past-year casino and past-year non-casino gambling (N=500), as defined above, were classified accordingly leading to the three groups of past-year gamblers described in Tables 1, 2, and 3.

Data were analyzed using the SAS System (Cary, NC). Weighting factors used were those described previously for analysis of the RDD sample (Gerstein et al., 1999; Gerstein and Toce, 1999). The weighting procedure involved steps corresponding to: 1) base weight; 2) adjustment for unknown eligibility; 3) adjustment for screener response; 4) post-stratification to the total household within strata (lottery, non-lottery); 5) person weight; 6) adjustment for interview non-response within cells defined by stratum (lottery, non-lottery), sex, race and age; and, 7) post-stratification by stratum (lottery, non-lottery), sex, age and race (Gerstein and Toce, 1999).

Analyses proceeded in several steps. First, sociodemographic characteristics (e.g., gender, education, marital status, employment status) were compared across the three groups of gamblers using chi-square tests. Second, odds ratios relating outcome measures of health and well-being to casino/non-casino gambling and relating outcome measures of gambling to casino/non-casino gambling were estimated using a stepwise logistic regression procedure. For the stepwise procedure, all variables were considered for inclusion in each model for each outcome. Estimates presented were adjusted only for those variables retained in the final model for each particular outcome. Variables not retained were rejected by the stepwise procedure as not being sufficiently related to the outcome to warrant inclusion in the final model.

3. Results

3.1 Demographic Characteristics of Past-Year Casino and Non-Casino Gamblers

Significant differences were observed in the demographic characteristics of past-year casino-only, non-casino-only, and both casino and non-casino gamblers (Table 1). Compared with casino-only gamblers, individuals who engaged in both casino and non-casino gambling differed on measures of sex and employment, with larger proportions being male and employed full-time. Compared to non-casino-only gamblers, individuals who engaged in both casino and non-casino gambling differed on measures of education, employment and income, being more likely to report higher education, more employment, and greater incomes. Casino-only gamblers and non-casino-only gamblers differed with respect to years of education, with the former group characterized by more years of education.

3.2 Health-Related Characteristics of Past-Year Casino and Non-Casino Gamblers

Significant health-related differences were observed between past-year casino-only, non-casino-only, and both casino and non-casino gamblers (Table 2). Individuals who gambled in both casinos and non-casinos, compared to casino-only gamblers, were less likely to report using drugs in the past year and less likely to report good to excellent subjective general health. Individuals who participated in both casino and non-casino gambling, compared to non-casino-only gamblers, were more likely to report alcohol use and alcohol abuse/dependence, but less likely to report using drugs in the past year. No significant differences were observed between casino-only and non-casino-only gamblers.

3.3 Gambling Attitudes and Behaviors of Past-Year Casino and Non-Casino Gamblers

Comparisons for differences in measures of gambling attitudes and behaviors (e.g., reasons for gambling, earliest age gambled) for casino-only, non-casino-only, and both casino and non-casino gamblers are presented (Table 3). Individuals who participated in both casino and non-casino gambling, compared to casino-only gamblers, were more likely to report gambling to be around people, gambling for excitement, and gambling to win money, as well as gambling at an earlier age. These individuals also reported more frequent gambling, larger wins, larger losses, and greater engagement in all types of gambling in the past year, compared to casino-only gamblers.

Individuals who participated in both casino and non-casino gambling, compared to non-casino-only gamblers, were more likely to report gambling for social activity, for personal services, to be around people, and for excitement. These individuals also were more likely to report gambling with someone else, gambling more frequently, larger wins and losses, and engagement in both strategic and machine gambling, compared to non-casino-only gamblers.

Casino-only gamblers, compared to non-casino-only gamblers, gambled less frequently, and were more likely to report gambling for social activity, gambling with someone else, largest maximal daily losses of \$100-\$500, and machine forms of gambling. Non-casino-only gamblers, compared to casino-only gamblers, were more likely to report gambling to win money, gambling at an earlier age, and engaging in strategic gambling.

4. Discussion

Significant differences were observed in health and well-being characteristics as well as gambling attitudes and behaviors among past-year recreational gamblers who participated in

casino-only gambling, non-casino-only gambling, or both. These findings partially support our initial hypotheses, and the implications of these findings are discussed below.

4.1 Health-Related Characteristics of Past-Year Casino and Non-Casino Gamblers

The findings suggest that engagement in both types of gambling was typically, but not always, associated with adverse health measures including greater likelihood for alcohol use and abuse/dependence and reports of poorer general health. Frequencies of alcohol use and abuse/dependence in individuals who engaged in both casino and non-casino gambling were higher than those reporting non-casino-only gambling, indicating that gambling in a combination of venues is associated with greater alcohol use and abuse/dependence. It is possible that environmental factors may contribute to the observed relationship between multiple gambling venues and alcohol consumption. These factors may include the greater availability of alcoholic beverages at gambling locations leading to increased alcohol consumption among gamblers in those establishments. Drinking and gambling may also have an interactive influence, wherein individuals may gamble more when under the influence of alcohol (Kyrngdon and Dickerson, 1999; Richards et al., 1999). Other factors may also lead to this association (e.g., biological or behavioral factors that may promote engagement in risky or addictive behaviors). At present, no causal inferences can be made, and interpretations of the observed associations should be approached cautiously.

One unexpected finding was that of lower rates of past-year drug use in individuals who engaged in both casino and non-casino gambling. A possible explanation for this may be that drug use might limit the repertoire of gambling behaviors in which recreational gamblers engage, possibly through motivational, organizational, or financial mechanisms. For example, it may be that in drug users greater saliency is given to using money to purchase drugs than to gamble, or perhaps drug use might interfere with the desire or capacity to travel to gambling venues. Given limitations in interpreting these data (e.g., multiple forms of casino and non-casino gambling, multiple forms of illicit drug use), and the fact that the findings are associative in nature, more research is needed to clarify the relationships between specific forms of recreational gambling and illicit drug use.

Casino-only gamblers reported better subjective health compared to individuals who engaged in both casino and non-casino gambling. One explanation for this finding may be that certain aspects about casino gambling may facilitate more social interaction (e.g., chatting while playing slot machines, socializing on a bus ride to the casino) amongst gamblers, which may enhance subjective feelings of well-being (Potenza et al., 2002a). More detailed research and an improved understanding of both positive and negative health factors associated with different gambling venues as well as with the specific types of gambling activities may help to elucidate further the nature of some of these observed relationships.

4.2 Gambling Attitudes and Behaviors of Past-Year Casino and Non-Casino Gamblers

The findings suggest that on measures of gambling attitudes and behaviors, people who engaged in both casino and non-casino gambling were significantly different from casino-only or non-casino-only gamblers. Specifically, individuals who gambled in both locations endorsed more reasons for gambling (e.g., to be around people, to win money) than individuals who engaged in casino-only or non-casino-only gambling. They also reported greater frequency of gambling, greater maximal wins and losses, and greater engagement in strategic and machine forms of gambling than casino-only or non-casino-only gamblers.

While casino-only and non-casino-only gamblers demonstrated some significant differences when compared to each other on both reason to gamble variables (e.g., gambling for social

activity) and gambling behavior variables (e.g., gambling with someone else), there are fewer differences between these two groupings than between those endorsing gambling in both locations as compared to those reporting gambling only in casino-only or non-casino locations. These data suggest that engagement in multiple gambling activities in different venues may be associated with more reasons for gambling, greater frequencies of gambling, greater monetary wins and losses, and greater engagement in a variety of strategic and machine gambling. The findings also suggest that the propensity towards a wider range of attitudes, beliefs, and behaviors in recreational gamblers who engage in both casino and non-casino forms of gambling may put these individuals at-risk for more negative health and behavior consequences. Engagement in a wider variety of recreational gambling may also put individuals at risk for later gambling problems (Goudriaan et al., 2009). Additional studies, particularly longitudinal, are important in testing this hypothesis. If upheld, it would suggest that identifying individuals who report gambling in multiple venues, as a sub-population of recreational gamblers, may be important in responsible gambling education efforts, as well as in developing specialized prevention and treatment programs.

5. Conclusions

The current study uses data from a large, national survey to systematically examine characteristics of three groups of past-year recreational gamblers (casino-only, non-casino-only, and both casino and non-casino gamblers). The findings add to the literature by demonstrating both positive and negative measures of health and well-being are associated with past-year recreational gambling exclusive of problem and pathological gambling. The results support those of previous research with recreational or subthreshold or low-risk gamblers indicating the association of negative health- and well-being-related measures with gambling is not limited to problem or pathological levels. The findings demonstrate significant differences in mental health and gambling-related attitudes and behaviors among recreational gamblers grouped by types of gambling (casino and non-casino) and contribute to the literature by suggesting that preferred types of recreational gambling, defined by gambling venue, may be an important aspect to consider as research and public policy efforts encompass recreational and responsible gambling.

Prevention and treatment efforts to date have focused on groups of individuals who engage in problem and pathological levels of gambling, as these individuals tend to experience greater problems and distress related to gambling. We are not suggesting that all sub-syndromal levels of gambling are risky or have negative effects; however, if research continues to demonstrate there are significant health- and gambling-related consequences that may affect individuals who gamble at non-problematic or non-pathological levels, then identifying groups of recreational or low-risk gamblers and further investigating their characteristics may be an important first step in understanding the full impact of gambling at recreational levels. Other researchers have been examining the relationship between gambling behaviors (including “normal” and low-risk) and gambling-related harm using empirically-derived low-risk gambling limits, and suggest that quantitative limits may be useful in informing some of the responsible gaming guidelines that are presently being implemented (Currie et al, 2006; 2008a; 2008b). Taken together, findings from the present study and others examining non-problematic and non-pathological forms of gambling highlight the need to further investigate forms of recreational, low-risk, or responsible gambling to better understand their potential impact.

Limitations of the present study include the: 1) lack of formal diagnostic measures for disorders other than pathological gambling; 2) use of self-reported general health rather than more objective measures; 3) a relatively small number of respondents acknowledging past-year casino-only gambling; 4) the limited ability to explore differences in types of drugs

used due to relatively small numbers of individuals abusing or dependent on any one class of drug; 5) the heterogeneity inherent in using categories of casino-only, non-casino-only, and both casino and non-casino to identify groups of recreational gamblers; and, 6) lack of uniformly agreed-upon criteria for describing an individual as having a gambling problem. With regard to this final point, we used the NODS criteria utilized by the GIBS to define problem and pathological gambling (Gerstein et al., 1999; Gerstein and Toce, 1999). The cut-off value (3 or more past-year or lifetime diagnostic criteria) used to exclude individuals from the category of recreational gamblers in the present study is less stringent than that currently used in DSM-IV-TR to define pathological gambling (five or more criteria) (Potenza et al., 2001a) and is similar to our prior studies of recreational gambling using the GIBS data (Desai et al., 2004; Lynch et al., 2004; Desai et al., 2005; Desai et al., 2006; Potenza et al., 2006; Duhig et al., 2007; Barry et al., 2008; Pantalon et al., 2008; Liu et al., 2009). General limitations of surveys also apply to the present study. Strengths of the study include the use of a national survey employing a well-designed RDD format and statistical weighting measures.

Given that two-thirds of the general adult population engages in past-year recreational or non-problematic forms of gambling, the findings of studies that include investigations of subsyndromal gambling have implications for a large group of people. Information gained from investigations of gambling along a spectrum may help to better understand the range of effects that even non-problematic forms of gambling have on individuals. These findings may help to guide both clinical efforts such as identification of recreational gambling in specific populations who may be more at-risk for gambling-related problems (e.g., adolescents, elderly adults, substance users). The findings also suggest that more thorough screenings at general health and other mental health appointments, akin to the current practice of asking individuals if they presently smoke and how often, be performed with respect to assessing gambling behaviors. Additionally, public policy efforts related to responsible gambling specifically target populations of individuals who gamble recreationally, and assumedly without gambling-related or health-related difficulties. Having a better understanding of the potential effects of gambling within these groups of gamblers may better inform policy makers who are developing and implementing responsible gambling regulations.

Within these contexts, it will be important to better understand the manner in which specific forms or patterns of recreational gambling (e.g., types of gambling, frequency of gambling) may influence aspects of individuals' health. Most importantly, these findings, combined with those of previous studies, highlight the need for a greater consideration of recreational gambling within a public health framework. Like with problem and pathological gambling, further investigation into the potential effects of recreational gambling on both personal and public health and well-being should be a continued focus to best inform researchers, clinicians, and policy makers about effective education, prevention, and treatment efforts within this population of gamblers.

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Table 1
Sociodemographic measures of past-year casino, non-casino, and both casino and non-casino gamblers

Variable	Category	Gambling Participation			χ^2 statistics			df
		Past-Year Casino and Non-Casino Gambling (N=500)	Past-Year Casino-Only Gambling (N=93)	Past-Year Non-Casino-Only Gambling (N=875)	Both vs. Casino-Only	Both vs. Non-Casino-Only	Casino-Only vs. Non-Casino-Only	
Age	18–29 years	22.8	27.6	22.8	2.39	4.21	5.13	4
	30–39 years	24.6	23.4	25.9				
	40–49 years	20.9	15.0	21.6				
	50–64 years	19.8	22.1	15.8				
	65+ years	11.9	11.9	13.9				
Sex	Female	49.0	61.4	47.7	4.85	*	6.34	1
	Male	51.0	38.6	52.3				
Race/Ethnicity	Caucasian	71.7	76.1	73.9	1.37	1.10	1.03	3
	African American	9.6	7.8	8.2				
	Hispanic	11.2	7.9	11.0				
	Other	7.5	8.2	6.9				
	< 12 years	5.9	4.9	12.4	2.25	16.97	9.73	2
Education	12 years	29.4	22.5	30.8				
	> 12 years	64.7	72.6	56.8				
	Married/Cohabiting	58.1	67.2	60.0	4.38	4.01	3.03	3
Marital Status	Divorced/Separated	10.6	6.1	11.4				
	Never Married	28.7	22.5	24.6				
	Widowed	2.6	4.2	4.0				
	Full time	71.9	58.1	63.6	8.31	*	1.26	2
Employment	Part time	7.2	14.4	11.2				
	Unemployed	20.9	27.5	25.2				
Income	< \$24,000	22.3	30.0	28.8	2.63	10.80	0.60	3
	\$24,000–\$50,000	31.2	29.8	33.1				
	\$50,001–\$100,000	35.4	31.3	28.3				

Variable	Category	Gambling Participation			χ^2 statistics			df
		Past-Year Casino and Non-Casino Gambling (N=500)	Past-Year Casino-Only Gambling (N=93)	Past-Year Non-Casino- Only Gambling (N=875)	Both vs. Casino-Only	Both vs. Non-Casino-Only	Casino-Only vs. Non-Casino-Only	
	> \$100,000	11.1	8.9	9.8				

Sample sizes (N) listed indicate weighted values;

* p<0.05;
** p<0.01;
*** p<0.001

Table 2
Health and well-being measures of past-year casino, non-casino, and both casino and non-casino gamblers

Groups, Variables	Gambling Participation			Adjusted Odds Ratios		
	Past-Year Casino and Non-Casino % (N=500)	Past-Year Casino-Only % (N=93)	Past-Year Non-Casino-Only % (N=875)	Both vs. Casino-Only	Both vs. Non-Casino-Only	Casino-Only vs. Non-Casino-Only
Alcohol use, past-year	48.8	37.5	41.4	1.23 (0.74–2.04)	1.29 (1.01–1.65)	0.93 (0.57–1.52)
Alcohol abuse, past-year	11.3	4.5	7.9	2.12 (0.72–6.17)	1.55 (1.04–2.33)	0.69 (0.24–1.96)
Drug use, past-year	2.9	6.8	5.6	0.34 (0.12–0.91)	0.47 (0.25–0.89)	1.31 (0.52–3.26)
Drug abuse, past-year	1.3	1.4	3.0	0.69 (0.10–4.81)	0.55 (0.20–1.22)	0.63 (0.10–3.93)
Any substance abuse, past-year	11.8	5.9	9.5	1.82 (0.71–4.70)	1.32 (0.90–1.95)	0.71 (0.28–1.81)
Depression, lifetime	30.5	26.2	29.4	1.22 (0.71–2.09)	1.09 (0.85–1.41)	0.91 (0.54–1.51)
Mental health treatment, Past year	6.9	5.6	6.1	1.32 (0.47–3.78)	1.03 (0.64–1.68)	0.90 (0.33–2.44)
Subjective general health, good or excellent	87.4	94.0	87.4	0.35 (0.13–0.95)	0.83 (0.56–1.22)	2.24 (0.86–5.88)
Incarceration, lifetime	4.5	2.4	4.7	1.29 (0.29–5.62)	1.11 (0.63–1.97)	0.67 (0.16–2.79)
Bankruptcy, lifetime	7.5	6.5	5.2	0.88 (0.34–2.27)	1.35 (0.84–2.18)	1.49 (0.60–3.71)

Sample sizes (N) listed indicate weighted values;

* p<0.05;

** p<0.01;

*** p<0.001

The stepwise logistic regression models for substance use and depression measures included for adjustment the sociodemographic variables of age, sex, race/ethnicity, education, marital status, employment, and income. The sociodemographic variables in addition to substance use and depression variables were included for adjustment in the models for the subsequent variables in Table 2.

Variables rejected in the stepwise procedure as not being sufficiently related to the outcome to warrant inclusion in the final model were removed.

Table 3
Gambling measures of casino, non-casino, and both casino and non-casino gamblers

Groups, Variables	Gambling Participation			Adjusted Odds Ratios		
	Past-Year Casino and Non-Casino % (N=500)	Past-Year Casino-Only % (N=93)	Past-Year Non-Casino-Only % (N=875)	Both vs. Casino-Only	Both vs. Non-Casino-Only	Casino-Only vs. Non-Casino-Only
Reasons for gambling						
social activity	48.1	42.8	30.8	1.10 (0.69–1.78)	2.05 (1.62–2.59)	1.90 (1.21–3.01)
personal services	25.0	22.9	17.1	1.16 (0.67–2.02)	1.77 (1.33–2.36)	1.67 (0.97–2.87)
to be around people	37.3	24.7	24.8	1.76 (1.02–3.02)	1.85 (1.44–2.38)	1.06 (0.63–1.79)
for excitement	49.6	31.7	31.5	2.16 (1.30–3.58)	2.29 (1.80–2.92)	1.05 (0.64–1.73)
to win money	66.2	41.8	63.7	2.93 (1.82–4.74)	1.15 (0.90–1.48)	0.38 (0.24–0.61)
Earliest age gambled						
Less than 18 years	25.4	8.3	25.2	3.53 (1.61–7.78)	1.13 (0.85–1.49)	0.29 (0.13–0.64)
Gamble with someone	69.3	76.3	59.0	0.84 (0.48–1.46)	1.68 (1.31–2.16)	2.08 (1.23–3.51)
Frequency gambled in past year						
Daily	5.3	0.0	2.3	not estimable.	2.61 (1.27–5.36)	not estimable
1–3 times per week	24.1	0.9	21.7	6.31 (0.49–81.96)	0.94 (0.68–1.31)	0.22 (0.02–2.58)
1–2 times per month	29.7	4.2	25.2	Reference Category	Reference Category	Reference Category
A few days per year	34.5	39.1	38.7	0.13 (0.05–0.40)	0.71 (0.53–0.96)	6.30 (2.11–18.9)
Only once per year	6.5	55.8	12.1	0.01 (0.003–0.04)	0.42 (0.26–0.69)	26.0 (8.82–76.4)
Largest win in past year						
< \$100	31.1	59.5	58.6	Reference Category	Reference Category	Reference Category
\$100–\$500	38.7	34.5	29.4	2.07 (1.23–3.49)	2.75 (2.08–3.64)	1.44 (0.88–2.37)
> \$500	30.2	6.0	12.1	10.05 (3.67–27.5)	5.52 (3.90–7.82)	0.49 (0.18–1.34)
Largest loss in past year						
< \$100	52.6	72.8	79.8	Reference Category	Reference Category	Reference Category
\$100–\$500	43.8	25.2	18.0	1.88 (1.10–3.21)	3.97 (3.04–5.18)	2.17 (1.27–3.70)
> \$500	3.6	2.0	2.2	4.78 (0.50–45.8)	3.41 (1.67–6.96)	0.59 (0.07–5.20)
Type of gambling performed in past year						

Groups, Variables	Gambling Participation			Adjusted Odds Ratios		
	Past-Year Casino and Non-Casino % (N=500)	Past-Year Casino-Only % (N=93)	Past-Year Non-Casino-Only % (N=875)	Both vs. Casino-Only	Both vs. Non-Casino-Only	Casino-Only vs. Non-Casino-Only
Strategic	44.7	6.8	23.9	10.58 (4.48–25.0)***	2.74 (2.11–5.56)***	0.27 (0.12–0.63)**
Machine	43.4	31.6	6.6	1.90 (1.13–3.19)*	12.6 (8.93–17.8)***	6.27 (3.56–11.03)***

Sample sizes (N) listed indicate weighted values;

* p<0.05;

** p<0.01;

*** p<0.001

Sociodemographic variables (Table 1) and health and well-being variables (Table 2) were included for adjustment in the stepwise logistic regression models contributing to Table 3. Variables rejected in the stepwise procedure as not being sufficiently related to the outcome to warrant inclusion in the final model were removed.

Note: Odds ratios for daily frequency of gambling could not be estimated for comparisons including past-year casino only gamblers due to the zero value in the frequency of reports of daily gambling for this group.