

EVIDENCE BRIEF: RELATIONSHIP OF 24-HOUR ACCESS TO PROBLEM GAMBLING AND RISK

This brief examines evidence regarding the relationship between 24-hour access to gambling and problem gambling, including whether:

- There is evidence of significantly greater risk of problem gambling to those who gamble in the overnight hours, as compared to other times of day;
- Shutdowns during late night/early morning hours significantly reduce problem gambling behaviour; and
- The field would benefit from more detailed understanding of time-of-day play patterns across the spectrum of risk, for both land-based and online sites, to inform responsible gambling?

There is scant peer-reviewed literature examining these issues. Consulting firms in Nova Scotia, Canada and two Australian states have evaluated shutdowns, although those evaluations appear to lack methodological rigour. The weak evidence to date suggests that problem gamblers may be largely indifferent to the shutdown, finding times and places to gamble before or after the early morning hours. Williams, West, and Simpson (2012) noted that research on the effectiveness of reduced hours of operation is limited and unlikely to have a significant benefit unless reductions are “meaningful and substantial” (at p. 42). To date, no definitive research identifies the nature and level of limitation in operating hours that would lead to reductions in problem gambling.

Shutdowns during late night/early morning hours significantly reduce problem gambling behaviour

In the absence of rigorous evidence on the impact of shut-downs, this brief provides a broader analysis of key factors that would facilitate a deeper understand the relationship between time-of-day and problem gambling. Three new studies in New Jersey provide analyses on aspects of gambling and time-of-day, both in land-based casinos and online. The studies combine self-report with analysis of play-by-play online gambling data. They support the adoption of an alternate and potentially more efficacious approach to the relationship of time-of-day and problem gambling.

Drawing on the New Jersey data, this brief proposes a framework, the Multidimensional Accessibility Model (Thomas, et al. 2011), to guide research on the relationship of 24-hour access to problem gambling.

Shutdowns

ONTARIO, CANADA

Toronto Public Health (TPH) prepared a 2012 report, outlining key issues and current research on the public health impacts of gambling. The TPH report cites a 2011 report by the Center for Addiction and Mental Health (CAMH) that expressed concern over the 24/7 extended hours of operation because “a disproportionate number of people with gambling problems play EGMs between midnight and closing” (Center for Addiction and Mental Health, 2011, at p. 4). As evidence, the CAMH report cites a 2010 Problem Gambling Institute of Ontario (PGIO) study in which treatment providers reported that extended hours negatively impacted their clients (this report is no longer publicly available.) Reducing hours of operation theoretically could reduce access which is associated with risk of harm (Toronto Public Health, 2012).

NOVA SCOTIA, CANADA

In April 2005, the Government of Nova Scotia introduced a comprehensive gaming strategy that included: removing 800 machines, disabling the stop button feature and reducing speed of play for the remaining machines, and shutting down of machines at midnight. Corporate Research Associates (CRA) evaluated the impact of each of these initiatives on player spending, time played and play patterns (Corporate Research Associates, 2006).

The report did not detail the specific sampling and measurement procedure employed, the midnight shutdown was reportedly evaluated on the basis of telephone surveys conducted in Nova Scotia with 1,200 individuals in the general population and 545 machine players, operationalized as “anyone who had played a VL [machine] in the last year.” It appears from the report that the sampling strategy changed

and the actual sample was smaller, combining people who identified as

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VL players from the population sample with the machine player sample to increase the sample size (Corporate Research Associates, 2006, at p. 3). This methodology does not meet the standard of scholarly research with generalizable findings; and fails to target machine players across the problem severity spectrum and/or to trace the trajectory of play before and after the institution of the shutdown. The report did not include an overall evaluation strategy a detailed analytic strategy, specification of sample size and power calculation. These gaps weaken the results to the level of anecdotal.

AUSTRALIA

Governments in three states mandated machine shutdowns of various durations in clubs and hotels, though not casinos. Three evaluations were conducted to determine the effect of shutdowns on problem gambling and harm reduction efforts, in New South Wales (NSW) in 2003 and 2008, and in the Australian Central Territory (ACT) in 2005. These evaluations are summarized below.

NSW, AUSTRALIA (A.C. NIELSEN, 2003)

A study for the NSW Department of Gaming and Racing assessed whether a mandatory three-hour shutdown (6 a.m. to 9 a.m.) of gaming machines at clubs and hotels reduced problem gambling. The study surveyed participants in different sectors: Ten problem gamblers and five family members; five face-to-face and 40 telephone interviews with support agency personnel; ten face-to-face and 111 telephone interviews with managers of hotels and clubs; 300 telephone interviews with recreational gamblers recruited from venues; and nine telephone interviews with council general managers.

Although the sample size of any one group was insufficient to yield statistically significant information, the study did highlight that:

- Shift workers in the study indicated they played at peak times as well as between 9 a.m. and midday, not specifically overnight
- Gambling during late night hours was one of several factors that influenced gambling; other factors included gambling during the day when spouses were away or during working hours,

- Gambling was also influenced by a number of factors unrelated to time: access to money, convenience, flexibility, and interest in the games.

Overall, gamblers in the survey reported they were largely unaffected by the shutdown because the period was too short and/or most problem gamblers would have been gambling for hours before the shutdown occurred. The findings suggest that the relationship of time-of-day to problem gambling was highly variable and possibly tied to individual lifestyles rather than time of day.

ACT, AUSTRALIA (MCMILLEN & PITT, 2005)

A second Australian study evaluated a mandatory shutdown period – from midnight to 4 a.m. – in a small sample of 33 recreational and 12 self-identified problem gamblers. Overall, most of the gamblers indicated they gambled primarily between 6 p.m. and midnight and fewer than a third had ever gambled during the shutdown period prior to enactment. Gamblers in the study indicated that the shutdown had not impacted their gambling; they either went home or went to another club when the shutdown began; overall spending remained unchanged.

NSW, AUSTRALIA (TUFFIN & PARR, 2008)

In 2008, Tuffin and Parr of Blue Moon Research conducted 270 face-to-face interviews in hotels and clubs (casinos excluded) during three time periods: morning (10 a.m. to 1 p.m.), early evening (6 p.m. to 9 p.m.) and late night (12 a.m. to 4 a.m. or 6 a.m., depending on closing hours). Of the total sample, 29% (n=79) were classified as “problem gamblers” on the CPGI, and an additional 27% (n=74) were considered to be at moderate risk of developing problems.

There was little statistical analysis, aside from the reporting of percentages. A majority of gamblers, including problem and at-risk gamblers, gambled during periods outside the shutdown period. Six at-risk and 12 problem gamblers indicated they gambled during the shutdown period from 4 a.m. to 10 a.m.

TIME-OF-DAY PLAY PATTERNS AND RISK

Three studies in New Jersey combined self-report with analysis of online gambling data to provide in-depth analyses on various aspects of

gambling and time-of-day, both in land-based casinos and online.

The New Jersey Prevalence Study (Nower, Volberg, & Caler, 2017)

In 2016, the Division of Gaming Enforcement in New Jersey funded a state-wide prevalence study of gambling and related behaviours. Conducted by the Center for Gambling Studies at Rutgers University, the study included representative samples of New Jersey residents over 18 years in both online and telephone (cell and landline) panels (N=3,634).

- Rates of problem gambling were high – 6.3% -- likely due, in part, to the range of gambling offerings in the state, proximity to other jurisdictions with gambling offerings, and the use of an online panel of respondents, who typically report higher rates than a traditional telephone panel alone.
- Significant correlates of problem gambling were: lower levels of education (high school diploma or GED), ethnic minority membership, high frequency gambling (once a week or more), psychiatric comorbidity, gambling both at land-based and online venues, and playing multiple games.
- Those who gambled in both forms (land-based and were significantly more likely than those who preferred only one form exclusively to report high rates of gambling problems. A majority of gamblers wagered in casinos; about 5.3% of the sample gambled only online. Nearly 20% of the sample gambled both online and at casinos/racetracks.
- Higher problem gambling severity corresponded to higher gambling frequency and participation in more gambling activities.
 - ◆ Nearly half of non-problem gamblers (42.4%) gambled less than once per month (low frequency) but, 89.4% of high risk problem gamblers gambled once a week or more.
 - ◆ Number of gambling activities increased significantly with level of problem gambling severity: from two activities for non-problem to more than three for low risk, four for moderate risk, and seven for high risk problem gamblers who would likely meet classification for disorder.

89.4% of high risk problem gamblers gambled once a week or more

Gambling at work: Notably, three-fourths of gamblers in the study were employed. Of those, nearly 13% were self-employed and 87% were

employed for wages. Employed gamblers were asked whether they gambled online while at work.

- More than 16% of the self-employed group had gambled online at work; among those who reported gambling both at land-based and online venues, nearly 60% gambled at work and 10% gambled three to five days per week.
- More than 10% of those employed for wages stated they gambled online at work. Those numbers were highest among the group who gambled both on land and online, with nearly 10% gambling at **work three to five days a week** and 15% gambling online at least one or two days per week.

The findings from the prevalence study provide a significant snapshot of the multidimensional nature of problem gambling. The findings from the prevalence study are enriched by the analyses of play behaviour during the first two full years of legalized online gambling in New Jersey.

Year One: Online Gambling in New Jersey (Nower, Caler, & Guan, 2016; Nower, Caler, & Peters, 2017)

The Center for Gambling Studies at Rutgers University receives data from all licensed sites in the State of New Jersey and prepares yearly reports on that data for the Division of Gaming Enforcement. A report on data from 2014, the first full year of legalized gambling in New Jersey, analyzed betting patterns of approximately 67,994 players (76.7% male, 23.2% female) by time of day (Nower, Caler & Guan, 2016).

- Mean wagers for those who played casino games (versus poker or poker tournament) were largest between 3 a.m. and 6 a.m. (\$5.00 per bet), followed by midnight to 3 a.m. (\$4.69 per bet) and 6 a.m. to 9 a.m. (\$4.31 per bet).
- The average maximum wager (highest single bet) was greatest during the 9 a.m. to noon time slot (\$36,750) followed by the period from noon to 3 p.m. (\$30,150).
- Overall, players in one or more of the state's 15 casino websites wagered the most from 9 p.m. to midnight (\$603 million), followed by midnight to 3 a.m. (\$502 million) and 6 to 9 p.m. (\$479 million).
- Women and men placed bets in similar proportions across time categories. About 22% of bets by women and 21% of bets by men were placed online between the hours of 9 p.m. and midnight, followed by 6 p.m. to 9 p.m. (17.8% men, 18.6% women), and 12

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a.m. to 3 a.m. (15.1% man, 14.0% women). Only 7% of the total sample gambled between the hours of 3 a.m. and 6 a.m., where men were slightly overrepresented; the period between 6 a.m. and 9 a.m. had the lowest participation rate of 6% for both genders.

Thus, the time periods that are traditionally the targets of shutdowns have the smallest percentage of players overall, suggesting that a significant proportion of problem gamblers likely gamble during other time periods. The study found that about **one-third of bets (110 million) were placed during traditional work hours, between the hours of 9 a.m. and 6 p.m.**, with more bets placed by women than men.

By Age: Online gamblers, irrespective of age, placed the largest number of bets between 9 p.m. and midnight, followed by the time periods before (6 p.m. to 9 p.m.) and after (midnight to 3 a.m.). Overall,

- 45 to 54-year-olds placed the highest number of total bets (208.86 million); nearly 13 million of those bets were made between the hours of 6 a.m. and 9 a.m., the highest proportion of for any age group.
- Between 9 a.m. and noon, 45 to 54-year-olds once again placed the most bets (17.94 million) but the proportion of their betting during these hours was second to those in the 65 and older category (8.6% of total vs 10.5%); adults 65 and older placed the most bets between 6 p.m. and 9 p.m. (11.88 million), followed by 9 p.m. to midnight.
- Younger gamblers, ages 21 to 24 and 25 to 34 placed nearly equal proportions of bets across time categories, gambling most frequently between 9 p.m. to midnight, followed by 6 to 9p.m.; however, just over 9% of the bets placed by 25 to 34-year-olds occurred between 3 and 6 a.m., the highest proportion of any age category.

Year Two: Online Gambling in New Jersey

Data analysis from the second year of operation, 2016, was completed in 2017 (Nower, Caler & Peters, 2017). Of 860 million wagers, the mean wagers among those playing casino games were largest between 3 a.m. and 6 a.m. (\$4.50 per bet), followed by 12 a.m. to 3 a.m. (\$3.84 per bet) and 6 a.m. to 9 a.m. (\$3.53 per bet). This outcome mirrors the results from the prior report, which found that the highest mean wagers were placed between 3 a.m. to 6 a.m., followed by 12 a.m. to 3 a.m. Similarly, players continued to bet the most from 9 p.m. to 12 a.m. (188.2 million bets) followed by 6 p.m. to 9 p.m. (162.8 million bets). Overall, online

The mean wagers among those playing casino games were largest between 3 a.m. and 6 a.m.

casino gamblers wagered the most between 9 p.m. and 12 a.m. (\$565.8 million) accounting for 21.9% of all bets, followed by 6 p.m. to 9 p.m. (\$449.3 million) and 12 a.m. to 3 a.m. (\$430.5 million).

NJ ONLINE GAMBLERS: CASINO WAGERS BY TIME CATEGORY IN 2016 (N= 859,842,357)

Time Category	# of Bets (mill.)	Percent of Bets	Max Wager amount	Mean Wager	Std. of Wager	Sum Wager
6 a.m.–9 a.m.	53.1	6.2	10,110.00	3.53	22.37	187,260,206
9 a.m.-12 p.m.	78.8	9.2	20,900.00	3.08	19.99	242,937,084
12 p.m.-3 p.m.	98.5	11.5	16,000.00	3.08	19.10	303,217,020
3 p.m.-6 p.m.	118.6	13.8	10,400.00	3.03	16.88	359,676,759
6 p.m.-9 p.m.	162.8	*18.9	8,250.00	2.76	18.76	449,342,993
9 p.m.-12 a.m.	188.2	21.9	16,406.00	3.01	26.17	565,865,892
12 a.m.-3 a.m.	112.0	*13.0	9,490.00	3.84	26.17	430,500,205,
3 a.m.-6 a.m.	47.9	*5.6	35,996.00	4.50	32.26	215,242,581

$p \leq .000$ Source: Nower, L., Caler, K. & Peters, E. (2017). *The Prevalence of Online and Land-Based Gambling in New Jersey*. New Brunswick, NJ: Authors. *

There was a notable shift in play in the 2016 calendar year from gambling outside traditional work hours to wagering in the middle and early part of the working day. for example,

- Between the hours of 9 a.m. and noon, there were about 79 million bets placed, about 7 million more than statistically expected.
- Similarly, from noon to 3 p.m., about 99 million bets were placed, about 5.5 million more than expected.
- Those proportions increased between 3 p.m. and 6 p.m. this year, with about 119 million bets placed, nearly 10 million more than expected.
- These findings suggest that an increasing proportion of online gamblers are gambling during traditional working hours.

By gender, women and men placed bets in similar proportions across time categories. Similar to 2014, nearly a fourth of bets by both males (21.3%) and females (22.5%) were placed between 9 p.m. and 12 a.m., followed by the 6 p.m. to 9 p.m. time slot (18.4% of men, 19.6% of women). Unlike 2014, however, the third most popular time for play was 3 p.m. to 6 p.m. (14.1% of male bets, 13.6% of female bets). The

least popular time to gamble on online casino games was 3 a.m. to 6 a.m. with the bets placed in this time slot accounting for only 5.5% of all bets placed. About one-third of all bets, 295.9 million, were placed during traditional work hours, between 9 a.m. and 6 p.m., with more bets placed by women than men. Men were more likely to gamble between 9 a.m. and 3 p.m. and less likely to gamble between midnight and 3 a.m. than they were in the previous year. Similarly, women were more likely to bet between 9 a.m. and 9 p.m. in 2015 and less likely to bet between midnight and 6 a.m.

NJ ONLINE GAMBLERS: CASINO WAGERS BY TIME CATEGORY IN 2016 (N= 859,842,357)

Time Category	Male		Female		Missing		Total	
	# of Bets (mill.)	% of total	# of Bets (mill.)	% of total	# of Bets (mill.)	% of total	# of Bets (mill.)	% of total
6 a.m.–9 a.m.	22.8	6.0	26.8	6.2	3.4	6.5	53.0	6.2
9 a.m.-12 p.m.	34.7	9.2	39.6	9.2	4.6	8.8	78.8	9.2
12 p.m.-3 p.m.	43.4	11.5	49.2	11.5	5.9	11.3	98.5	11.5
3 p.m.-6 p.m.	53.2	14.1	58.2	13.6	7.2	13.6	118.6	13.8
6 p.m.-9 p.m.	69.7	18.4	*83.9	19.6	9.1	17.4	162.8	18.9
9 p.m.-12 .am.	80.6	21.3	*96.7	22.5	10.8	20.6	188.2	21.9
12 a.m.-3 a.m.	51.7	13.7	52.7	12.3	7.6	14.5	111.9	13.0
3 a.m.-6 a.m.	22.1	5.8	21.9	5.1	3.8	7.3	47.8	5.5
Total	378.2	100.0	429.1	100.00	52.4	100.0	859.8	100.0

p ≤ .000 Source: Nower, L., Caler, K. & Peters, E. (2017). *The Prevalence of Online and Land-Based Gambling in New Jersey*. New Brunswick, NJ: Authors. *

By age, players in the 45 to 54 age group placed the highest number of total bets (267.8 million) in 2016 – 30% more than the next highest betting group of 35 to 44-year-olds (186.6 million). A majority of players bet between 9 p.m. and 12 a.m., except for adults over 65, who were more likely to gamble between 6 p.m. and 9 p.m., followed by 55 to 64-year-olds. In addition, the oldest group of players had the highest proportionate representation in the earlier time periods, from 6 a.m. to 6 p.m., compared to other age categories. Players in the youngest group, 21 to 24, placed the highest percentage of bets

among all age groups in the midnight to 3 a.m. and 3 a.m. to 6 a.m. time slots.

Compared to the prior year, the youngest players were significantly more likely than all other gamblers to bet during the overnight hours. For example,

- Players aged 21 to 24 were less likely than the prior year to bet between 9 a.m. and 9 p.m. and more likely to bet between 9 p.m. and 9 a.m.
- Players' ages 25 to 34 years placed more bets between 9 p.m. and 6 a.m. and 9 a.m. to 3 p.m. than they did in the prior year, suggesting they were gambling both overnight and during normal working hours.
- 45 to 54-year-olds, who consistently placed the highest number of bets in both years, tended to gamble more during the day (9 a.m. to 9 p.m.) and less late and overnight (9 p.m. to 6 a.m.).
- Among 55 to 64-year-olds there was a significant increase in 2015 over 2014 in the amount of bets placed between 9 pm and midnight.

IN SUMMARY

Taken together, findings from the New Jersey prevalence study and online gambling studies suggest that a majority of gamblers are employed, and a notable proportion gamble at work. Those findings are inferentially supported by analyses by time of day and suggests that day-time hours may be a better target for intervention than overnight shutdown. About one-third of bets online in New Jersey were placed during traditional work hours, between 9 a.m. and 6 p.m., with more bets placed by women than men. As indicated in the New Jersey reports, these findings, combined with those in the prevalence study, serve as a cautionary tale to employers that restrictions may be needed to guard against online gambling during the work day. Popular time frames for gambling online generally correspond with those found in studies of casino populations.

A bigger concern, than time of day, however, is the multimodal nature of gambling in the advent of interactive gambling and expanding opportunities. Increased frequency of play, combined with playing

Increased frequency of play, combined with playing across multiple games in multiple forms, appears to correlate with the most severe gambling problems.

across multiple games in multiple forms, appears to correlate with the most severe gambling problems. To that end, it might be useful to reconceptualize the concept of time-of-day as “access” in its many forms, which is most likely to foster frequency and play across forms and venues.

AN OPTIMAL FRAMEWORK: MULTIDIMENSIONAL ACCESSIBILITY MODEL

Several theoretical distinctions are relevant to assessing the relative effect of shutdowns and/or time-of-day on problem gambling.

- Problem gambling is a multidimensional behaviour with bio-psycho-social and genetic origins (Blaszczynski & Nower 2002; King et al., 2017; Sharp, 2002).
- Accessibility to gambling products is an essential precursor to developing a gambling problem (Thomas et al., 2011), although the facets of the construct are poorly understood and under-researched.
- Research has identified links between accessibility of gambling products and higher rates of problem gambling, beginning with The Productivity Commission report (1999) in Australia and subsequent studies (Adams, et al., 2007; Marshall, 2005; Pearce, Mason, Hiscock, & Day, 2008),
- Findings on accessibility have varied across studies (See St.-Pierre, Walker, Derevensky & Gupta, 2014, for a review).
 - ◆ LaPlante & Shaffer (2007) suggested that a complex array of factors likely determines when gambling becomes a public health “toxin” through exposure versus when it results in adaptation or desensitization to gambling products, which stabilizes or lowers those rates.
 - ◆ Young, Markham, & Doran (2012) assert that findings regarding proximity to a gambling venues, or “spatial accessibility,” rely on assumptions about behaviour, and are based on associations between availability of venues in the local area and their distance from origin points such as (Welte et al., 2004) or census tract centroids (Pearce et al., 2008; Rush et al., 2007). These associations do not account for individual behavioural choice.
 - ◆ In their study, Young and colleagues concluded that, aside from neighbourhood pubs with gaming machines, demographic factors (education, male gender, gambling alone, household

structure, and decreased occupational skill level) were more

predictive of gambling participation than proximity, because a **majority of respondents chose venues geographically distant from their homes.**

Evidence from the recent New Jersey reports suggests that:

A majority of problem gamblers gamble at land-based venues, but also online on tablets, computers, and mobile phones.

- Online play is essentially unrestricted, because even geo-fencing imposed by regulation is ineffective for regulating play on off-shore gambling sites.
- Problem gamblers gamble more frequently and on more activities than non-problem gamblers, suggesting that the key factors may be time to gamble irrespective of time-of-day, and access to finances.
- Most gambling takes place outside of the shutdown time frame, and a key period for gambling, including problem gambling, is **during normal working hours.**

These findings suggest that overnight shutdowns may have minimal effect on a majority of problem gamblers, and that substantial social costs may be unknowingly born by employers whose time and resources are expended on daytime gambling.

Thomas and colleagues (2011) propose a multidimensional framework of accessibility that is particularly relevant to the issues in this review. They assert three separate dimensions of accessibility for gambling:

1. Geo-temporal accessibility combines the concepts of geography, proximity, and temporality: Is the gambling opportunity geographically convenient – a factor that is virtually irrelevant to gamblers with a mobile phone or tablet – and available when the gambler has the time to play?
2. Social and personal accessibility focuses on the existence of a “safe” environment with appealing games where the gambler can choose to interact with peers or totally isolate with a game: Does the gambling opportunity have few or limited barriers and allow me to enjoy a social experience and/or a retreat from the pressures of my everyday life? And;
3. Financial accessibility refers to the ease with which gambles could get and transfer money to play: Does this gambling opportunity

easily allow me to use credit, bank transfers etc. when I want to gamble or continue gambling?

Shutdowns focus on one aspect of the geo-temporal dimension of accessibility: Whether a forced break in play during early morning hours will arrest or otherwise positively forestall problematic play. The literature suggests it will have little if any effect on a majority of gamblers.

FUTURE RESEARCH

To fully explore the relationship of accessibility to problem gambling, research should examine all three suggested dimensions of accessibility rather than one component of one dimension. Specifically, select future investigations could explore:

- **Geo-Temporal**

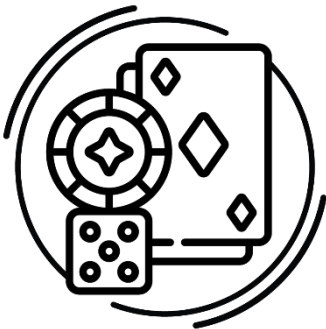
- ◆ Play patterns across times of day for three groups: those who play in casinos only, in casinos and online, and online only.
- ◆ The relationship of physical distance from home/work to casinos and patterns of play.
- ◆ Gambling from work: Who gambles from work? When? On what?
- ◆ What is the relationship of time spent gambling, overall number of bets, escalation in play, breaks in play to time-of-day?

- **Social/Personal**

- ◆ The relationship of motivation to gamble and betting patterns.
- ◆ The relationship of time-of-day, time spent gambling and breaks in play to game type, max bet size, and expenditure.

- **Financial**

- ◆ Jackpots with and without player card.
- ◆ The relationship of cash in/cash out to theoretical wins in each gambling session and overall expenditure per session.
- ◆ The relationship of bank accounts, credit cards and other credit usage to play patterns, win/loss, and frequency and intensity of gambling.



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