Prevalence of Gambling Disorders in a Primary Care Setting

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**Background:** Pathologic gambling prevalence seems to be increasing as opportunities for gambling increase. Prevalence may be different in a primary care setting compared with population-based studies.

**Objectives:** To determine the gambling disorder prevalence in a primary care setting and to investigate associations between gambling disorders and proximity to a casino, substance abuse, health ratings, age, sex, and socioeconomic status.

**Design:** Cross-sectional survey of 1394 patients presenting to their primary care physicians between November 1, 1997, and April 1, 1998.

**Setting:** Three primary care clinics in Wisconsin.

**Patients:** Adults aged 18 years and older.

**Main Outcome Measures:** Gambling disorders, defined by scores of 3 or greater on the South Oaks Gambling Screen (SOGS), and information about drug use (alcohol, tobacco, and marijuana), overall health, specific health symptoms, age, sex, race, and socioeconomic status.

**Results:** A total of 1051 patients completed the survey. More than 80.0% of the patients had gambled, and 6.2% met the criteria for gambling disorders. Gambling disorders were more prevalent in men, nonwhites, and patients from lower socioeconomic groups. Patients with gambling disorders were more likely to use tobacco and abuse alcohol compared with nonproblem gamblers. No relation was seen between marijuana use and gambling disorders. Patients with gambling disorders rated their health more poorly and reported more severe symptoms of heartburn and backache.

**Conclusions:** A considerable percentage of patients presenting to primary care clinics are affected by their need to gamble. There is significant comorbidity with tobacco use and alcohol abuse. Primary care physicians should consider asking about gambling habits in high-risk patients.

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In 1980, the American Psychiatric Association included pathologic gambling in the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition.* Classified as a disorder of impulse control, pathologic gambling is characterized by a loss of control over gambling and a driving need for the “rush” gambling provides.

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As gambling becomes more available, the prevalence of pathologic gambling seems to be increasing. Studies investigating pathologic gambling prevalence before 1990 demonstrated lower rates compared with studies done after 1990. Also, the density of Gamblers Anonymous chapters is higher in states with legal opportunities to gamble at casinos, slot machines, sports betting, jai alai, and teletheaters. Since 1990, population-based telephone surveys using random population sampling techniques and the South Oaks Gambling Screen (SOGS) have been performed in Connecticut, Minnesota, Montana, North Dakota, South Dakota, Texas, Washington, Louisiana, and New York. These studies have shown a lifetime prevalence of gambling disorders from 2.8% to 6.3% and a present prevalence of 1.4% to 2.8%. A recent meta-analysis showed a lifetime prevalence of gambling disorders of 5.2% in adults and a past year prevalence of 3.9%. The terms “problem gambling” and “probable pathologic gambling” are used in these SOGS-based studies, since “pathologic gambling” is reserved for patients who meet *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*’ criteria by interview with a health care professional. Patients with gambling disorders are more likely than nonpathologic gamblers to be men,
PATIENTS AND METHODS

OVERVIEW

This is a cross-sectional study designed to determine the prevalence of gambling disorders at 3 primary care clinics. Gambling disorders include probable pathologic gambling and problem gambling, as defined by the SOGS.

SAMPLING

Between November 1, 1997, and April 1, 1998, patients aged 18 years and older were invited to complete a 39-question survey booklet at 3 primary care clinics in Wisconsin affiliated with the Department of Family Medicine, University of Wisconsin, Madison. Medical Associates Clinic (referred to as Baraboo) is approximately 10 km from the largest Native American–owned casino in Wisconsin. The clinic is situated in the rural community of Baraboo (population, 10,192) and has a predominantly white population. (The casino, which opened in 1992, is 7920 m² and features 48 blackjack tables, 1200 slot machines, and a bingo hall.) The Belleville Family Medical Center, located in Belleville (population, 1712), attracts patients from similar age and ethnic groups as the Baraboo clinic. The Wingra Family Medical Center is located in a low-income area of Madison (population, 197,000) but attracts patients from a wide spectrum of ages, races, and socioeconomic groups.

After checking in for appointments, patients completed the survey before meeting with the physician. Mentally retarded patients, prisoners, non–English-speaking patients, minors, and patients in immediate medical distress were excluded from the survey. Patients were asked specifically if they had already participated in the study to avoid duplication. To assess for nonresponder bias, the person distributing the survey recorded the age and sex of patients declining to participate. The survey was anonymous, and completed surveys were collected in a secure box. On average, the survey took 5 to 10 minutes to complete. Human subjects approval for the study was obtained from the Institutional Review Board of the University of Wisconsin.

The goal at each site was to enroll 500 patients. Since no previous prevalence studies have been done in this setting, we assumed the prevalence would be approximately 3%. Enrolling 500 patients per clinic provides the power to detect a statistically significant difference (at a level of .05) if the prevalence reaches 7% at either of the 2 other clinics, with a power of 80%.

RESEARCH INSTRUMENT

The SOGS is a 20-question instrument designed to evaluate patients for pathologic gambling based on Diagnostic and Statistical Manual of Mental Disorders, Third Edition criteria.11 The SOGS has been tested for validity and reliability in various settings. Probable pathologic gamblers are defined by scores of 5 or greater on the SOGS, and problem gamblers are defined by scores of 3 or 4. The term “gambling disorders,” as used in our study, is the composite of these 2 groups (Table 1). For this study, questions were asked based on lifetime gambling habits.

In addition to the SOGS, patients were asked about tobacco use (smoking tobacco in the past 6 months and number of cigarettes smoked per day), alcohol use (number of days a week using alcohol, number of drinks per day, and CAGE questions [C, have you ever felt the need to cut down on your drinking? A, have you ever felt anxious when you were trying to cut down? G, have you ever felt guilty about your drinking? E, have you ever taken a drink to make you feel better after a bad day?]), and marijuana use (number of times used in life and use in the past 6 months). Answering positively to 2 or more of the CAGE questions was considered positive for alcohol abuse.12 Taken from the Short Form 36, patients were asked about overall health as “In general, would you say your health is,” with possible responses being “excellent,” “very good,” “good,” “fair,” and “poor.” Questions about the frequency of backaches, heartburn or stomachaches, and headaches were asked using a Likert scale (scored from 1-5) as a response. Men were asked about impotence using the same scale.

To assess for depression or anxiety symptoms, patients were asked 3 yes or no questions about if they had any of the following problems with their work or other regular daily activities, as a result feeling depressed or anxious: These questions asked if they had (1) “cut down the amount of time you spent on work or other activities,” (2) “accomplished less than you would like,” and (3) “didn’t do work or other activities as carefully as usual.” Patients were considered to have significant depression or anxiety if they answered positively to 2 of 3 questions about the impact of those symptoms on their daily activities. Finally, information on age, sex, educational level, race, and socioeconomic status was included in the survey.

DATA ANALYSIS

Data were analyzed using computer software (SPSS; SPSS Inc, Chicago, Ill) for a personal computer (Macintosh; Apple Computers, Cupertino, Calif). t Tests were used to compare age differences between clinics, responders and nonresponders, and problem and nonproblem gamblers. Continuity-corrected χ² testing was done to determine sex differences between responders and nonresponders. Marital status, educational level, income, and ethnicity were treated as dichotomous variables (married vs nonmarried, less than high school education vs high school graduate, household income ≤$25,000 vs >$25,000 per year, and white vs nonwhite). Logistic regression was used to determine which variables were associated with gambling disorders controlling for age and sex. For questions asked with ranked categorical responses (number of days a week using alcohol, lifetime use of marijuana, and health ratings), logistic regression was performed, controlling for age and sex, to determine a test of trend for the odds ratios (ORs). Odds ratios and 95% confidence intervals (CIs) are used to report significant associations (P<.05).

While the prevalence of gambling disorders has been studied in population-based studies, drug and alcohol rehabilitation centers, and inpatient psychiatric facilities, to our knowledge, no published studies have looked at younger than 30 years, nonwhite, and unmarried. They are less educated and tend to have lower incomes.4,5 Gambling disorders are also associated with alcohol and drug abuse.8
prevalence in a primary care setting.9,10 Prevalence in primary care clinics may be lower since many young men only receive episodic medical care. Conversely, prevalence could be higher since patients with gambling disorders may present to physicians with health concerns related to their gambling.

The goal of this study was to determine the prevalence of gambling disorders in a primary care setting. Secondary questions included the following: (1) Is the prevalence higher in clinics closer to casinos? (2) Is the prevalence of gambling disorders higher in patients who use tobacco, alcohol, or marijuana? (3) Do patients with gambling disorders have more symptoms of depression or anxiety? (4) Do patients with gambling disorders have more complaints of headaches, abdominal pain or heartburn, low back pain, or impotence or differences in overall health ratings?

**RESULTS**

**RESPONSE RATE AND RESPONSE BIAS**

A total of 1394 patients were invited to participate in the study, and 1051 consented (response rate, 75.4%). Men were more likely to not participate than women (29.2% vs 23.4%; χ² = 6.33; P = .01). Nonresponders were older than responders (47.0 vs 41.8 years; t = 5.15; P < .005). The Wingra clinic had a higher nonresponse rate compared with the other 2 clinics (Table 2).

**Table 1. Definitions Used in Research With Pathologic Gambling as Evaluated by the South Oaks Gambling Screen (SOGS)**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathologic gambler</td>
<td>Meets 5 of 10 DSM-IV criteria for pathologic gambling</td>
</tr>
<tr>
<td>Probable pathologic gambler</td>
<td>Scores ≥5 on the SOGS</td>
</tr>
<tr>
<td>Problem gambler</td>
<td>Scores 3 or 4 on the SOGS</td>
</tr>
<tr>
<td>Gambling disorders</td>
<td>Problem gambling and probable pathologic gambling</td>
</tr>
</tbody>
</table>

*DMS-IV indicates Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.

**Table 2. Age, Sex, Socioeconomic Data, and Problem Gambling by Clinic*  

<table>
<thead>
<tr>
<th>Clinic</th>
<th>No. of patients enrolled</th>
<th>Response rate</th>
<th>Distance to closest casino, km</th>
<th>Age, mean (SD), y</th>
<th>Females</th>
<th>Less than a high school education</th>
<th>Not married</th>
<th>Income &lt;$25 000/y</th>
<th>White</th>
<th>8th grade</th>
<th>Less than a high school education</th>
<th>Age, mean (SD), y</th>
<th>Distance to closest casino, km</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belleville</td>
<td>297</td>
<td>80.1</td>
<td>96.0</td>
<td>45.7 (17.3)</td>
<td>63.8</td>
<td>5.7</td>
<td>33.3</td>
<td>29.6</td>
<td>99.5</td>
<td>297</td>
<td>45.7</td>
<td>96.0</td>
<td>45.7 (17.3)</td>
<td>80.1</td>
</tr>
<tr>
<td>Wingra</td>
<td>698</td>
<td>70.3</td>
<td>72.0</td>
<td>38.8 (12.7)</td>
<td>65.9</td>
<td>9.8</td>
<td>57.8</td>
<td>47.0</td>
<td>72.0</td>
<td>698</td>
<td>38.8</td>
<td>72.0</td>
<td>38.8 (12.7)</td>
<td>70.3</td>
</tr>
<tr>
<td>Baraboo</td>
<td>399</td>
<td>80.7</td>
<td>9.6</td>
<td>49.2 (18.1)</td>
<td>63.7</td>
<td>12.5</td>
<td>42.2</td>
<td>30.2</td>
<td>98.0</td>
<td>399</td>
<td>49.2</td>
<td>9.6</td>
<td>9.6</td>
<td>80.7</td>
</tr>
<tr>
<td>All Clinics</td>
<td>1394</td>
<td>75.4</td>
<td>9.6</td>
<td>43.1 (16.1)</td>
<td>63.8</td>
<td>8.8</td>
<td>47.6</td>
<td>33.6</td>
<td>79.6</td>
<td>1394</td>
<td>43.1</td>
<td>9.6</td>
<td>9.6</td>
<td>75.4</td>
</tr>
</tbody>
</table>

*Data are given as percentage of patients, unless otherwise indicated. SOGS indicates South Oaks Gambling Screen; ellipses, data not applicable.

**Table 3. Comparisons Between Patients With and Without Gambling Disorders by Drug Use**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Nongamblers</th>
<th>Problem and Probable Gamblers</th>
<th>Odds Ratio (95% Confidence Interval)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to closest casino, km</td>
<td>28.5</td>
<td>57.4</td>
<td>3.17 (1.69-5.95)</td>
</tr>
<tr>
<td>Income &lt;$25 000/y</td>
<td>9.0</td>
<td>16.7</td>
<td>1.46 (0.61-3.51)</td>
</tr>
</tbody>
</table>

*The odds ratio was calculated by logistic regression after adjusting for age and sex.
†CAGE indicates a questionnaire for alcoholism evaluation: C, have you ever felt the need to cut down on your drinking? A, have you ever felt annoyed by criticism of your drinking? G, have you ever felt guilty about your drinking? E, have you ever taken a drink (eye opener) first thing in the morning?

GAMBLING DISORDERS

More than 80% of patients who gambled at least once, and the lifetime prevalence of gambling disorders was 6.2% for all 3 clinics (Table 2). Differences in the lifetime prevalence of problem gambling (SOGS score 3 or 4) or probable pathologic gambling (SOGS score ≥5) between clinics were not statistically significant after controlling for age and sex.

There was no significant difference in age between patients with gambling disorders and those without (41.3 vs 38.2 years; t = 1.36; P = .18). Patients with gambling disorders were more likely to be men (OR, 2.48; 95% CI, 1.36-4.52), to be nonwhite (OR, 3.46; 95% CI, 1.72-6.97), and to have an annual income less than $25 000 (OR, 2.85; 95% CI, 1.51-5.24). They were also more likely to be nonmarried (OR, 2.00; 95% CI, 1.10-3.65) and to have less than a high school education (OR, 2.85; 95% CI, 1.24-6.46). If educational level is treated as a continuous variable, the average educational level of pathologic gamblers was less than that of nonproblem gamblers (12.5 vs 13.7 years; t = 3.26; P = .001).

The relation between gambling disorders and alcohol, tobacco, and marijuana use can be seen in Table 3. Patients with gambling disorders had higher rates of alcohol abuse, as measured by the CAGE questions. There was a positive relation between the number of drinks per day when drinking and gambling disor-
Gambling disorders rated their overall health as being worse compared with patients without gambling disorders. Eleven (55%) of the 20 men classified as having gambling disorders answered positively to 2 or more CAGE questions.

Along with the association with current tobacco use, people who smoked more cigarettes were more likely to have gambling disorders (logistic test of trend in ORs, P = .01). While there was no relation between marijuana use in the past 6 months and gambling disorders, there was a weak trend with patients who have used more marijuana in their lives being at a higher risk of developing a gambling disorder (logistic test for trend in ORs, P = .06).

Patients with gambling disorders rated their health as being worse compared with patients without gambling disorders (Figure). In addition, pathologic gamblers had more severe symptoms of heartburn or abdominal pains (P = .02) and backache (P = .01). No difference was seen between patients with gambling disorders and nonproblem gamblers in symptom ratings for headache or impotence.

There was a positive relation between patients with gambling disorders and those answering affirmatively to 2 of the 3 anxiety or depression questions (χ² = 6.76, P = .009). This relation was slightly stronger in men (OR, 2.51) vs women (OR, 2.08).

**COMMENT**

At all 3 clinics in our study, the prevalence of gambling disorders was 6.2%, within the range seen in population studies. Similar to previous studies, gambling disorders among study patients were associated with being men, being nonwhite, being unmarried, earning less than $25,000 per year, and not being a high school graduate. Gambling disorders continue to be associated with alcohol abuse and tobacco use. Patients with gambling disorders rate their overall health as being worse and may have more anxiety or depression symptoms. They also have worse symptom ratings for backache and abdominal pains. Our findings agree with the only other study looking at the interaction between pathologic gamblers and primary care physicians. Performed in New Zealand, the study found that problem gamblers were more likely to demonstrate higher rates of depression, anxiety, alcohol use, and stress-related problems compared with the general population. Unfortunately, few pathologic gamblers reveal their problem to a primary care physician. Only 27 of the 50 patients in the New Zealand study had seen a primary care physician in the past year, and just 1 had disclosed his gambling problem to his primary care physician.

Gambling disorder prevalence was identical at each clinic despite differences in proximity to a casino. There was a trend of probable pathologic gambling prevalence being related to proximity to a casino in our study. While not statistically significant, this trend may be limited by study power. The distance to a casino, however, may ultimately not be a significant risk factor for pathologic gambling. Interestingly, when the Belleville clinic patients were asked using the time frame of “over the past 3 months,” 27.8% reported gambling at a casino less than once a week and 2.1% reported gambling at a casino once a week. At the Baraboo clinic, 27.4% gambled less than once a week and 2.3% gambled once a week. Patients at the Wingra clinic gambled at a casino less than patients at either of the other 2 clinics (18.5% and 1.5%, respectively), possibly due to less access to transportation. Previous studies have shown that pathologic gambling prevalence increases with increasing gambling availability, and additional studies have shown that prevalence in individual states increases after casinos are opened in the state. One possible explanation for the lack of an association in our study could be the location of the clinics.

Because the Belleville clinic is only 10 km from the casino in Baraboo, this distance may not be far enough away to detect prevalence differences. As gambling availability increases, however, it will become more difficult to find populations more than 2 hours from a casino. Also, even if an actual casino is far away, gambling over the Internet and telephone with off-shore casinos is becoming easier and may provide pathologic gamblers the rush they desire.

The relation between gambling disorders and other mental health disorders, especially anxiety and depression, is interesting. Because of time and space limitations in our survey, our findings are not totally conclusive, but they do provide a basis for more investigation. Previous studies have shown that the relation between pathologic gambling and substance abuse disorders, affective disorders, anxiety or somatoform disorders, antisocial personality, and obsessive-compulsive disorder. Other studies have shown rates of suicide attempts from 17% to 24% in pathologic gamblers. Volberg grouped depression and anxiety and found a relation similar to that found in our study. While our 3 anxiety and depression questions were taken from a validated survey, the scoring of the questions has not been validated and is a limitation to our study. Also, in grouping these 2 symptoms...
together, it is difficult to fully define if the relation with gambling disorders is stronger for either anxiety or depression separately. Future studies will need to address these limitations in a more thorough manner by separating anxiety and depression and using validated instruments to measure these symptoms.

Few studies have looked at gambling disorders and the relation to physical symptoms. We chose to evaluate headaches, backaches, heartburn or abdominal pain, and impotence because there may be a psychological component to each of them, and they may be associated with pathologic gambling.18 With a cross-sectional study, it is difficult to determine whether these symptoms are a result of the gambling behavior or merely associated with the behavior. While causation is difficult to prove, there has been 1 case report18 of impotence associated with pathologic gambling and other reports of women with urinary tract infections secondary to sitting and gambling for 15 to 20 hours without voiding.19,20

Comparing the results from our clinic-based study with the results of previous population-based studies is difficult because of a few issues. Clinic populations are biased samples from general populations, and this bias could create differences in results. Another important difference between this study and previous studies is the method of administration of the SOGS. The SOGS was designed to be administered by interview or by self-administration, but previous prevalence studies2,4,5,9,10 have only used telephone or face-to-face interviews. To our knowledge, no studies have been published on how the method of administration changes the characteristics of the SOGS, especially for a behavior that is prone to underreporting. Most of the associations we found, however, are similar to those found in population-based studies.

Our study has some limitations, including generalizability to other clinic populations. The Wingra and Belleville clinics are residency training sites clearly identified with the University of Wisconsin. The third clinic (Medical Associates Clinic, located in Baraboo) became a rural training site for a pair of residents 2 years ago, but most patients are still seen by nonuniversity, private practice physicians. Most patients in the Belleville and Baraboo clinics were white, somewhat older, and from rural settings. Patients from the Wingra clinic contributed to some ethnic, age, and socioeconomic diversity in the study. Our study sample did include a few American Indian, Asian, and Hispanic patients, but most of the nonwhite patients were African American and from 1 clinic. Future studies should continue to look for patterns in particular ethnic and racial groups.

The gambling environment of Wisconsin may also affect generalizability to clinics in other states. The only previous study21 investigating pathologic gambling in Wisconsin found a prevalence of 0.9%, significantly smaller than the 6.2% in our study, but that study was limited by using a different survey instrument and by methodological issues. Gambling is a relatively popular activity in the state. During a 1-year period, 62% of the population participated in lotteries, 61% bought lottery tickets, 38% visited casinos, 30% bet on sports, and 21% played cards for money. The state also has 17 Native American–owned casinos on 11 reservations, mostly in the northern part of the state. Including casinos in neighboring states, most Wisconsin residents are within a 2-hour drive to a casino. At this time, only 2 states (Hawaii and Utah) have no legalized gambling, although other states differ in the availability of specific forms of gambling.

The nonresponder bias seen in our study is of some concern. Since nonresponders were more likely to be men and gambling disorder prevalence was higher in men, our estimate of gambling disorder prevalence is likely conservative. The age bias in our study, however, may cause us to overestimate prevalence. Nonresponders in our study were older than responders. Other studies have shown that pathologic gamblers tend to be younger, even though our study did not find this difference. If, in fact, nonresponders were nonproblem gamblers, we may be overestimating prevalence and creating the lack of association between pathologic gambling and age.

To recommend screening for a disease, several criteria must be met. These include proving early diagnosis leads to improved outcome; treatment for the disease is effective; the burden of the disease requires action; and the cost, accuracy, and acceptability of the screening tool are adequate.22 Relatively little research has been done looking at treatment outcomes for pathologic gambling, but in previous studies,17 1-year abstinence rates range from 8% to 55%. Knowing the disease prevalence helps establish the burden of the disease and must be known before recommending screening. Although further studies addressing other screening issues are needed before justifying routine screening, with a disease prevalence of more than 6%, physicians should consider asking about gambling behaviors in high-risk patients.

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REFERENCES


Author’s Comment

Because the study was completely anonymous, I was unable to interview any of the patients identified as having a gambling disorder to ask them more about their gambling and their reaction to the study. Since finishing the study, I have now been working as a family physician in Reno, Nev, for 1 year. During this time, I have seen patients with concerns about their gambling and have identified people with gambling problems. The following 2 cases (real names not used) will hopefully shed some light on the effect of pathologic gambling on patients and their families.

John is in his early 40s and has been addicted to video poker for the past 10 years. He has married with 2 children, and his gambling has primarily affected his relationship with his family. Two years ago, he won $40,000, but this year he has lost $60,000. Financially, he is managing to stay out of debt, but he has spent most of his retirement and savings on gambling. He has a steady job and denies losing any jobs or missing any work because of his gambling. However, on his way home from work, he would often stop by the casino to play for “just a few minutes.” Unfortunately, a few minutes frequently turns into 4 to 12 hours. As a result, the time he has spent gambling has severely damaged his relationship with his family. Interestingly, he does not drink while playing as this dulls the “high” he gets from gambling. He does admit to having some headaches because the study was completely anonymous, I was unable to interview any of the patients identified as having a gambling disorder to ask them more about their gambling and their reaction to the study. Since finishing the study, I have now been working as a family physician in Reno, Nev, for 1 year. During this time, I have seen patients with concerns about their gambling and have identified people with gambling problems. The following 2 cases (real names not used) will hopefully shed some light on the effect of pathologic gambling on patients and their families.

Jane is in her late 30s and primarily plays slot machines. She will play mostly in binges during which she goes to the casino and gambles away everything she has saved plus money she takes out on her credit card. She only visits the casino 2 to 3 times a month as she has learned to try to avoid gambling. When she does give in to gambling, however, she finds it almost impossible to walk away until she has lost all of her money or is in debt. She is also undergoing a fair amount of emotional stress because of her gambling. In the past, she has only told physicians that she was depressed. When I discussed the study with both patients, they were not surprised by the results. Had their primary care physician asked about their gambling behavior previously, both felt they would have been willing to discuss their problem. Like any addiction, however, they commented that they would often deny their problem or minimize it to friends and family members and may have done similarly with a physician. They also know other pathologic gamblers who still deny that they have a problem. They do feel that advice and counseling from a primary care physician could help pathologic gamblers realize they have a problem.

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