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**Original Article**

# Factors Associated with the Prevalence of Online and Offline Gambling Among Medical Sciences Students in Central-Southern Iran: A Cross-Sectional Study

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**Abstract**

**Introduction:** Gambling, as a high-risk behavior among university students, may pose a serious threat to their mental and physical health. This study aimed to identify the primary determinants of online and offline gambling prevalence among students.

**Methods:** This cross-sectional study was conducted on 892 students selected from three major medical universities in Central-Southern Iran, using convenience sampling. Lifetime and past-year online and offline gambling using a structured questionnaire. Survey-weighted univariate and multiple logistic regressions examined associations between variables and gambling prevalence.

**Findings:** The prevalence of offline gambling was [17.89% (95% CI: (15.45%, 20.61%)] in the past year and [26.48%, 95% CI: (23.63%, 29.53%)] over a lifetime. The prevalence of online gambling was [13.61%, 95% CI: (11.45%, 16.09%)] in the past year and [19.45%, 95% CI: (16.92%, 22.26%)] over a lifetime. Excitement and challenge [OR = 3.22, 95% CI: (1.43,7.26)] and having suicidal thoughts [OR = 2.98, 95% CI: (1.18,7.49)] were both factors that increased the odds of lifetime offline gambling. Also, factors such as earning money [OR = 4.44, 95% CI: (1.69, 11.70)], the use of mobile phones and computers [OR = 3.14, 95% CI: (1.50, 6.60)], and having a sexual relationship outside of marriage [OR = 2.22, 95% CI: (1.19, 4.14)] increased the odds of lifetime online gambling. Participating in sports activities reduced the odds of lifetime online gambling [OR = 0.23, 95% CI: (0.10, 0.54)].

**Conclusion:** High-risk activities increase the chance of constantly engaging in gambling. Seeking excitement and spending more time on mobile and computer games puts students at greater risk of gambling. Effectively preventing harm requires addressing youth challenges, promoting responsible digital engagement, and developing recreational facilities, especially sports venues.

**Keywords:** Gambling, Students, Iran

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**Introduction**Gambling is defined as any activity involving monetary or material stakes with an uncertain outcome[1] is considered a high-risk behavior with potential physical and psychological consequences.[1] Although gambling may be considered a recreational activity, it is recognized as a high-risk behavior due to its potential to lead to addiction and a wide range of psychological and social consequences.[2] In many societies, gambling is regarded not only as a moral or legal issue, but also as a significant public health concern.[3]

Despite the illegality of gambling in Iran,[4] it remains prevalent among young people.[5] The rise of online platforms and mobile applications has made access to gambling easier than ever, contributing to increased participation and associated risks.[6] This trend raises concerns about the potential for addiction, financial instability, and adverse psychological effects.[7] Gambling, as a behavioral addiction, is associated with severe physical and psychological consequences, including financial distress, social relationship deterioration, and cognitive distortions, such as overestimating personal control over gambling outcomes.[8]

Among university students, gambling is a significant public health concern due to its potential to exacerbate adverse outcomes, including poor academic performance, criminal behavior, and mental health disorders.[9] Moreover, gambling-related problems may persist beyond graduation and continue to impact individuals' lives.[10] Studies have shown that a significant majority of adult gamblers stated that past gambling exposure played an important role in shaping their current gambling habits.[11]

Multiple factors contribute to gambling behavior among students, including financial incentives, recreational aspects, and the increasing accessibility of online gambling platforms.[12] The economic pressures in Iran, may further amplify the appeal of gambling as a perceived means of financial relief, increasing the risk of associated mental health issues, such as depression and suicidal ideation.[13] Economic motivations also contribute, as the prospect of winning large sums of money can be particularly enticing for students.[14]

Furthermore, factors such as the excitement of competition, the thrill of risk-taking, and the opportunity for social interaction may increase the appeal of gambling to young individuals, especially students.[15] Gambling may sometimes serve as a coping mechanism or a form of escapism from everyday stressors.[16]

The shift to online learning during the COVID-19 pandemic further increased students' internet usage, exposing them to online gambling advertisements and platforms,[17] while reduced face-to-face peer interactions may have driven engagement in gambling as a form of entertainment.[18,19] Studies suggested that addiction to the internet and computer games may increase the prevalence of online gambling.[20,21]

Medical students face unique stressors, including demanding coursework, emotional strain in clinical settings, and limited time for recreational activities. These stressors may increase vulnerability to high-risk behaviors such as gambling. Furthermore, as future healthcare providers, medical students' engagement in gambling behaviors is particularly concerning, given the potential long-term impact on their personal and professional lives.

This study was conducted at three leading medical universities in Central-Southern Iran—Kerman, Shiraz, and Yazd—to examine the prevalence and determinants of both online and offline gambling among medical sciences students. Understanding the factors influencing gambling prevalence within the university student population is of critical importance. However, the identification of all contributing factors is inherently challenging due to the multifaceted and complex nature of gambling, which involves social, psychological, environmental, and economic dimensions. Accordingly, the present study aimed to explore the most significant factors associated with the prevalence of online and offline gambling, with a specific focus on medical sciences students in Central-Southern Iran. Rather than concentrating on problematic gambling or gambling addiction, this study assessed students' engagement in gambling activities over the past year as well as throughout their lifetime. The findings of this research may provide valuable insights for policymakers to develop targeted interventions aimed at mitigating gambling-related harms among students.

## Methods

### *Study Population*

This cross-sectional study was conducted among students enrolled at the three universities of medical sciences in central and southern Iran —Kerman, Shiraz, and Yazd. Each of the Kerman and Yazd Universities of Medical Sciences has more than 5,000 students, while Shiraz University of Medical Sciences has approximately 11,000 students. These universities are affiliated with the Ministry of Health and Medical Education and offer a comprehensive range of academic programs, including medical, paramedical, and healthcare disciplines, at the undergraduate, graduate, and doctoral levels.

### *Inclusion and exclusion criteria*

To ensure a homogeneous and relevant study population, we included students aged 18 to 47 years. Only students who had been enrolled at the university for at least one academic year, to guarantee sufficient exposure to the university environment and associated stressors, were eligible. Additionally, only students who completed the questionnaire completely and provided informed consent were included in the study. Students with incomplete questionnaire responses were excluded from the analysis.

### *Sampling procedure*

Using data from a recent Iranian study indicating an 8.9% prevalence of online gambling, a sample size of 779 was initially calculated. The formula $n = z^2 * [p * (1-p)]$

/ $d^2$ was used, where $n$ is the sample size, $z$ represents the 97.5th percentile point of the standard normal distribution ($\alpha = 0.05$), $d$ is the desired margin of error (2%), and $p$ is the estimated proportion (8.9%). Assuming sample attrition and non-response, a total of 892 students were ultimately recruited from various faculties using a convenience sampling method that completed the questionnaires.

Data were collected through the administration of a self-administered questionnaire. The study employed a convenience sampling method to recruit students who met the predefined inclusion criteria and were accessible during the data collection period. Data were collected using a self-administered, paper-based questionnaire, which was distributed during class breaks and in common areas. To minimize potential selection bias, efforts were made to engage students across various settings, including classrooms and dormitories as well as at different times throughout the day. To maintain data integrity, 10 respondents with incomplete questionnaires were excluded from the final analysis.

Of those, who completed the questionnaires, 315 were from Kerman University of Medical Sciences, 369 from Shiraz University of Medical Sciences, and 208 from Yazd University of Medical Sciences.

### *Ethical considerations*

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The research protocol was reviewed and approved by the Ethics Committee of Kerman University of Medical Sciences (Ethical code: IR.KMU.REC.1402.002).

All individuals gave their informed consent to participate in the study. The consent process ensured that participants were fully informed about the study's purpose, procedures, and potential benefits. They were clearly informed that participation was entirely voluntary and that they could withdraw from the study at any time without any consequences.

To protect participants' privacy and ensure data confidentiality, no personally identifiable information (names, student identification numbers, or contact details) was collected. Participants were explicitly assured that their responses would remain confidential and would be used solely for research purposes. To address the cultural and legal context of gambling in Iran, we avoided framing questions in a way that could incriminate participants, focusing instead on voluntary self-reporting of behaviors.

### *Instruments*

The questionnaire used in this study consisted of two sections. The first section focused on online gambling, and the second section addressed offline gambling. To ensure clarity and specificity, gambling was defined as any activity involving monetary or material stakes with an uncertain outcome, excluding non-wagering recreational activities. The gambling activities assessed were adapted from a validated Persian-language gambling tool developed for a Persian-speaking population, which demonstrated high reliability (Cronbach's alpha:0.938 for past-year items and 0.960 for lifetime items).[22] This instrument included a comprehensive list of gambling activities tailored to the Iranian cultural context. Given the absence of prior data on prevalent gambling behaviors among Iranian students, these activities were utilized to effectively assess their gambling participation.

The offline gambling activities were as follows: (1) card games, (2) sports teams or sports team players, (3) games in which dice are used, (4) gambling on animals, (5) sports activities with others, and (6) betting on one's skills with others. Moreover, the online gambling activities assessed in this study were as follows: (1) online card games, (2) online gambling on sports teams or sports team players (3) online games in which dice are used, and (4) online computer games.

Participants were asked to indicate whether they had engaged in these activities over their lifetime and within the past year.

### *Dependent variables*

The dependent variable consisted of participation in gambling activities both online and offline during the past year and over the lifetime. This variable was treated as a binary variable with responses coded as Yes or No.

### *Independent variables*

The independent variables in this study were categorized into four main groups. The first group included demographic information and the history of gambling among family and friends. Variables in this category were age, gender, the student's place of residence (whether in a private home, university dormitory, or with family), father's education level (below diploma, diploma, or bachelor's degree and higher), and any history of gambling within the student's family and friends.[23]

The second group focused on the reasons for gambling, which were measured using binary responses (Yes/No). These reasons included using gambling as a way to escape or distract from everyday problems, as a means to socialize with friends, for seeking excitement or challenge, as a way of earning money or income, and as a source of entertainment and fun.[24]

The third group examined the time spent on leisure activities related to social media and sports. This section included questions with three response options (daily average of more than one hour, daily average of less than one hour, or not at all). The activities assessed were spending time on social networks (such as checking emails or reading news), searching for scientific sources and reading articles online, playing mobile and computer games, and exercising.[25]

The fourth group addressed engagement in risky behaviors. This category included questions with either two response options (daily, sometimes, and never) or binary responses (Yes/No). Variables included smoking (cigarettes, tobacco, etc.), use of narcotics (such as opium

and its derivatives, marijuana, and heroin), consumption of alcoholic beverages, suicidal thoughts (whether the participant had ever thought about suicide), suicide attempts (whether the participant had ever attempted suicide), and having sexual relations outside of marriage (whether the participant had ever engaged in sexual relations outside of marriage).[25]

### *Statistical analysis*

In our study, we applied different weights to subjects sampled from different universities to account for their relative proportions within each university. For each survey respondent, the weight $W$ was calculated using the following formula: $W_i = \frac{P_i}{n_i}$, where $Wi$ is the weight for individual $i$, $Pi$ represents the total number of students at the university where the study was conducted, and $ni$ is the number of individuals sampled from that university in our dataset. We conducted survey-weighted multivariable logistic regression (Stata svy commands) to estimate adjusted odds ratios (AOR).

Predictors were selected based on their theoretical relevance within the problem behavior framework and prior empirical associations with gambling. We then applied a significance threshold of $P<0.20$ in univariate tests to prioritize variables for multivariable modeling. Variables with $P<0.2$ were included in the multiple regression model. Using a backward elimination approach, variables with $P<0.05$ were retained in the final model. Finally, the odds ratios and 95% confidence intervals for the significant variables were reported. The results section is based on the multiple logistic regression model, and the univariate logistic regression results are given in the appendix. Hosmer-Leme show goodness-of-fit tests for multiple logistic regression models, conducted using the 'svylogitgof'' command in Stata, yielded non-significant results ($P>0.05$), indicating adequate model fit. All statistical analyses were performed in Stata version 17.

## Results

### *Demographic data*

Of the total of 892 students who participated in this study, 39.7% (341 students) were male. About 63.9% (542 students) lived in university dormitories. In addition, 346 (40.4%) of the students reported that their fathers had a diploma or lower levels of education and 510 students (59.6%) reported that their fathers had a higher education level (Table 1).

**Table 1**. Demographic characteristics of the participants (N = 892)

| Demographical variable | Frequency (%) |
|---|---|
| **Gender** | |
| Male | 341(39.7) |
| Female | 551(61.8) |
| **Living arrangement** | |
| With family | 249(29.4) |
| University dormitory | 542(63.9) |
| Private house | 57(6.4) |
| **Father's education level** | |
| Diploma or lower | 346(40.4) |
| Higher education | 510(59.6) |

### *Making time for leisure*

Approximately two-thirds of the students in this study reported spending more than an hour per day on social networks, checking emails, and reading news. However, approximately 11% of them reported spending very little time searching scientific sources or reading articles. Approximately 46% of students, and over half of the students (54.7%), indicated that they spent less than an hour per day on mobile phone use, computer use, and exercise (Table 2).

### *The frequency of high-risk behaviors among students*

The data revealed that 199 students (23.3%) experienced suicidal ideation, and 24 students (2.8%) reported having attempted suicide. Moreover, 147 students (17.3%) reported having a sexual relationship outside of marriage. Alcohol consumption was reported by 23.8% of students, either occasionally or daily. Furthermore, approximately 6.8% of students reported using drugs—such as opium and its derivatives, marijuana, and heroin either occasionally or daily (Table 3).

### *The prevalence of online and offline gambling*

The prevalence of offline gambling was 17.89% (95% CI: 15.45%, 20.61%) in the past year and 26.48% (95% CI: 23.63%, 29.53%) over a lifetime. The prevalence of online gambling was 13.61% (95% CI: 11.45%, 16.09%) in the past year and 19.45% (95% CI: 16.92%, 22.26%) over a lifetime. Both lifetime and past-year prevalence rates of offline gambling were significantly higher than those of online gambling ($P<0.01$).

### *The risk factors associated with life time gambling behavior*

*Online Gambling*

**Table 2**. The mean time spent on various leisure activities

| All kinds of activities | Nothing (%) | Less than an hour (%) | More than an hour (%) |
|---|---|---|---|
| Spending time on social networks, checking email, and reading news | 23(2.7) | 266(31.0) | 570(66.3) |
| Spending on the Internet to search for scientific sources, reading articles | 95(11.0) | 564(65.6) | 201(23.4) |
| Mobile and computer games | 312(36.4) | 394(45.9) | 152(17.7) |
| Exercise | 243(28.3) | 470(54.7) | 146(17.0) |

**Table 3.** The frequency of high-risk behaviors among students

| Risky behavior | Never (%) | Sometimes or daily (%) |
|---|---|---|
| Smoking (cigarettes, tobacco, etc.) | 593(69.0) | 267(31.0) |
| Drug use (opium and its derivatives, marijuana, heroin) | 785(93.2) | 57(6.8) |
| Consumption of alcoholic beverages | 655(76.2) | 205(23.8) |

Multiple regression analysis revealed that earning money and having a source of income were the most significant motivators for online gambling among students. Thus, the odds of engaging in online gambling among students who gambled to earn money were 4.44 times higher than among those motivated by other reasons. Students who played mobile or computer games for more than one hour per day were 3.14 times more likely to gamble compared to those who did not play such games. Conversely, students who exercised for more than one hour per day were 0.23 times as likely to gamble online as those who did not exercise at all. In addition, students who reported having a sexual relationship outside of marriage were 2.22 times more likely to engage in online gambling (Table 4). The risk factors associated with offline gambling behavior.

The most important reason for students to engage in offline gambling was its exciting and challenging nature. Thus, students who identified excitement and challenge as their primary motivation were 3.22 times more likely to engage in offline gambling than those with other motivations. In addition, the students with suicidal ideation were 2.98 times more likely to gamble offline than other students (Table 4).

### *The risk factors for gambling in the last year*

*Online gambling*

The odds of engaging in online gambling among male students were 0.58 times those of female students. Students who played mobile or computer games for more than one hour per day were 5.56 times more likely to engage in online gambling, compared to those who did not play these games at all. Similarly, students who played mobile or computer games for less than one hour per day had 2.39 times higher odds of gambling online than those who did not play at all. The odds of online gambling were lower among students who engaged in daily exercise compared to those who did not exercise. Additionally, students who used tobacco products (e.g., cigarettes, hookah) either daily or occasionally were 3.86 times more likely to engage in online gambling than students who did not use tobacco. The results are presented in Table 5.

*Offline gambling*

The odds of engaging in offline gambling among students who did so for excitement or challenge during the past year were 2.68 times higher than those of other students. Additionally, students who spent more than one hour per day using mobile phones or computers had 2.73 times greater odds of engaging in offline gambling compared to their peers. The odds of offline gambling among students

**Table 4**. The risk factors in the lifetime gambling prevalence among students

| Risk factors | OR (95% Confidence Interval [CI]) | *P*-value |
|---|---|---|
| ***lifetime gambling online*** | | |
| **Earn money and income** | | |
| Yes | 4.44 (1.69, 11.70) | 0.003 |
| No | Ref | - |
| **Mobile and computer games** | | |
| More than an hour | 3.14 (1.50, 6.60) | 0.003 |
| Less than or equal to one hour | 2.21 (1.22, 4.01) | 0.009 |
| Nothing | Ref | - |
| **Exercise** | | |
| More than an hour | 0.23 (0.10, 0.54) | 0.003 |
| Less than or equal to one hour | 0.74 (0.40, 1.38) | 0.340 |
| Nothing | Ref | - |
| **Having a sexual relationship outside of marriage** | | |
| Yes | 2.22 (1.19, 4.14) | 0.010 |
| No | Ref | - |
| ***lifetime gambling offline*** | | |
| Excitement or challenge | | |
| Yes | 3.22 (1.43, 7.26) | 0.005 |
| No | Ref | - |
| **Suicidal ideation** | | |
| Yes | 2.98 (1.18, 7.49) | 0.020 |
| No | Ref | - |

**Table 5**. The risk factors for the last year prevalence of gambling among students

| Risk factors | OR (95%CI*) | *P*-value |
|---|---|---|
| ***Online gambling in the past- year*** | | |
| **Gender** | | |
| Male | 0.57 (0.35, 0.92) | 0.020 |
| Female | Ref | - |
| **Mobile and computer games** | | |
| More than an hour | 5.56 (3.04, 10.17) | <0.001 |
| Less than or equal to one hour | 2.45 (1.40, 4.29) | 0.002 |
| Nothing | Ref | - |
| **Exercise** | | |
| More than an hour | 0.20 (0.09, 0.47) | <0.001 |
| Less than or equal to one hour | 0.63 (0.40, 0.99) | 0.047 |
| Nothing | Ref | - |
| **Smoking (cigarettes, tobacco, etc.)** | | |
| Daily, sometimes | 3.80 (2.47, 5.85) | <0.001 |
| Nothing | Ref | - |
| ***Offline gambling in the past-year*** | | |
| Excitement or challenge | | |
| Yes | 2.68 (1.55, 4.63) | <0.001 |
| No | Ref | - |
| **Mobile and computer games** | | |
| More than an hour | 2.73 (1.33, 5.59) | 0.006 |
| Less than or equal to one hour | 1.35 (0.75, 2.41) | 0.310 |
| Nothing | Ref | - |
| **Smoking (cigarettes, tobacco, etc.)** | | |
| Daily, sometimes | 1.99 (1.14, 3.45) | 0.015 |
| Nothing | Ref | - |

*Confidence Interval.

who used tobacco products (e.g., cigarettes, hookah) daily or occasionally were 1.99 times higher than those of non-users (Table 5).

## Discussion

The present study examined the key factors influencing the prevalence of both offline and online gambling among university students in Central-Southern Iran. The findings indicated that lifetime and past-year prevalence of offline gambling exceeded online gambling. Factors associated with increased offline gambling included seeking excitement and challenge, excessive use of mobile phones and computers, tobacco use, and suicidal ideation. In contrast, factors such as a desire to earn money, frequent use of mobile and computer games, having a sexual relationship outside of marriage, and being female linked to higher odds of online gambling. However, engaging in regular physical activity was identified as a protective factor that reduced the odds of online gambling.

While offline gambling activities (26.4%) remain prevalent in the region, this study found that nearly one in five university students had engaged in online gambling at some point in their lives. The data also revealed that 17.8% engaged in offline gambling and 13.6% in online gambling in the past year. In line with these findings, a national study in Australia also found that the prevalence of offline gambling (39.5%) was higher than that of mixed gambling (12.8%) and exclusively online gambling (4.6%).[26] Additionally, a study on Canadian adolescents showed that the majority (77.6%) engaged only in offline gambling, a smaller proportion (20.6%) engaged in both online and offline gambling, and a small minority (1.8%) exclusively engaged in online gambling.[27] Thus, the relative popularity of offline and online gambling in Iran aligns with trends observed in other countries.[26-29] Despite the growing expansion of online gambling and its ease of access, offline gambling remains more prevalent among young people.[30] However, the present study revealed that Iranian women exhibited higher odds of engaging in online gambling compared to men. Historically, gambling has been predominantly viewed as a male-dominated activity. However, in recent years, female participation in gambling has significantly increased.[31] It has also been documented that certain types of gambling establishments were once perceived as unwelcoming and stigmatizing for women.[32] Nevertheless, this landscape has undergone a significant transformation, driven by the emergence of modernized gambling venues and, notably, the surge in online gambling, which offers increased anonymity and privacy.[33] Women's engagement in online gambling appears to be increasing at a faster rate than that of men,[33] and the risks of gambling, especially for women, are greater than previously anticipated.[34] Research indicates that gambling is increasingly becoming normalized among women, and therefore the risks associated with gambling are expected to increase over time in this population. Evidence suggests that the normalization of gambling is not solely the result of individual choice, but is influenced by a combination of social, cultural, economic, technological, and market-design factors. For example, new technologies, such as online gambling, mobile applications, and remote access, have reduced the stigma or taboo associated with physically attending gambling venues. Additionally, increasing independence and gender equality in society have contributed to gambling being perceived as a more ordinary activity. Nevertheless, women should receive particular attention in the prevention of gambling-related harm, as the normalization of gambling among women can have cascading effects on broader communities, including children and families.[35]

These findings also have practical implications within Iran and internationally. In Iran, they can guide the development of targeted prevention programs for students, such as reducing excessive mobile and computer use, promoting physical activity, and teaching healthy coping strategies. Special attention should be given to female students who are more likely to engage in online gambling. Internationally, these results align with global trends and can inform cross-cultural prevention programs and youth harm-reduction strategies. Evidence demonstrates that online gambling can pose significant risks for vulnerable individuals due to its inherent situational and structural characteristics, including ready availability, affordability, anonymity, and convenience.[36] The findings of this study further supported the importance of structural factors and the ease of access in facilitating gambling behavior. Students who spent more than one hour per day playing mobile and computer games were more likely to engage in online gambling. In contrast, spending time engaging in physical exercise demonstrated a protective effect against gambling.[37] Therefore, reducing mobile and computer gaming time and increasing physical exercise could serve as effective adjunct treatments for gambling disorders and associated psychiatric conditions.[37] Consistent with these results, research has indicated that implementing physical activity programs can significantly decrease gambling cravings, as well as symptoms of depression and anxiety in individuals with pathological gambling. These findings suggest that exercise may be a valuable complementary approach in the treatment of this disorder.[38]

Studies on undergraduates indicate that students who drink to cope are also more likely to gamble to cope, resulting in greater gambling-related harms. This highlights that maladaptive coping strategies in one domain (e.g., alcohol use) can carry over to other risky behaviors like gambling.[39]

Mood disorders—including major depressive disorder, anxiety disorders, and personality disorders—are commonly associated with gambling disorder.[37] The severity of anxiety disorder is also associated with current suicidal thoughts. Evidence suggests that the lifetime prevalence of suicide is higher in individuals with pathological gambling. A study in the United Kingdom showed that people with suicidal thoughts were more likely to report problem gambling, depression, and

anxiety.[40] This study found that students who had suicidal ideation were three times more likely to have engaged in offline gambling activities during their lifetime. In addition, the potential interaction of gambling activity with substance use (e.g., smoking and alcohol use) has become a significant social concern. The data in this study showed that students who reported daily or even occasional use of tobacco, alcohol, and other substances had a higher odd of engaging in both online and offline gambling. Indeed, alcohol and tobacco are strong predictors of gambling among young people.[41] Research in Great Britain indicated that individuals who smoke or consume alcohol are not only more prone to gambling but also tend to spend larger amounts of money on it, underscoring the need for interventions addressing both substance use and gambling prevention.[42]

Moreover, earning money and income emerged as the most important reasons for gambling among students who had experienced online gambling at least once in their lifetime. Poverty and unemployment commonly associated with an increased motivation to risk money in the hope of financial gain. Pathological gamblers often face financial problems and poverty as a result of persistent gambling behavior,[37] and this vicious cycle seems to perpetuate itself as they continue to gamble in an attempt to recoup their losses. Finally, this study reported that another motivating factor that draws students to gambling is the desire for excitement and challenge. Students who reported this motivation were more than 2.5 times more likely to engage in offline gambling activities. However, other cross-sectional and prospective studies have shown the relationship between sensation seeking, impulsivity, and gambling behavior in adolescents.[11,43]

## Conclusion

Engagement in high-risk activities increases the likelihood of persistent gambling behavior. Moreover, seeking excitement and spending excessive time on mobile and computer games place students at a greater risk of developing gambling habits. Therefore, in addition to reducing harmful activities, effective planning should address youth's need for challenge, provide training on the appropriate use of digital games, and promote the development of recreational facilities—especially sports venues—as essential components of gambling prevention. Preventive strategies should focus on the early identification of at-risk students and the development of evidence-based, healthy recreational alternatives.

## Limitations and future directions

The limitations of this study can be categorized into seven main areas.

1. ***Generalizability***

One notable limitation of this study is the use of a convenience sampling method. It may have introduced sampling bias, as the participants may not be fully representative of the broader student population. Consequently, the findings should be interpreted with caution.

2. ***Restricted Study Setting***

Due to budgetary and logistical constraints, this study was limited to three medical universities in Central-Southern Iran (Kerman, Shiraz, and Yazd Universities of Medical Sciences), which may restrict the generalizability of the findings to other medical sciences universities or non-medical educational institutions in Iran.

3. ***Social desirability and Recall bias***

A key limitation of this study is the reliance on self-reported measures for assessing gambling activities, which were evaluated through items on participation in online and offline gambling over lifetime and past-year periods. This approach was chosen to maintain questionnaire brevity and feasibility in a large student sample, but self-reports are susceptible to biases such as recall inaccuracies, social desirability effects, or underreporting due to the stigma associated with gambling in Iran, where it is largely prohibited. As a result, the interpretations should be made with caution.

4. ***Design of the study***

This study adopted a cross-sectional design, so inferring a causal relationship is not possible.

5. ***Absence of Measures of Gambling Severity***

Another limitation of this study is that it focused exclusively on the prevalence of gambling participation and its associated factors, without examining problematic gambling or gambling addiction.

6. ***Possible Limitations in Presenting Gambling Activities***

The gambling activities assessed were extracted from a validated instrument originally developed for individuals with substance use disorders. However, this instrument has not been validated among the student population and may therefore not fully capture the range of gambling activities commonly observed among Iranian students.

7. ***Single-Item Assessment for Suicidal Ideation and Attempts***

A notable limitation of this study pertains to the assessment of suicidal ideation and suicide attempts, which relied on single-item binary questions ("Have you ever thought about suicide?" and "Have you ever attempted suicide?"). This approach was adopted to minimize the overall length of the questionnaire and reduce respondent burden in a large student sample, thereby interpretations of the associations between suicidal ideation/attempts and gambling behaviors (e.g., having suicidal thoughts was a factor that increased the odds of lifetime offline gambling) should be made with caution.

## Future directions

Additionally, we recommend that future studies employ probabilistic sampling methods, such as stratified or cluster sampling, and include a wider range of universities and institutions to improve representativeness. Future studies should utilize standardized, multi-item questionnaires to more accurately assess suicidal ideation and suicide attempts, enabling a more comprehensive evaluation of their relationship with gambling behaviors. Since this study focused solely on university students, further research is also suggested to investigate gambling behaviors among individuals in other age groups. Future research should conduct preliminary qualitative studies to identify gambling activities specific to the student population and employ standardized international tools to measure both participation and severity of gambling behaviors representativeness.

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**Competing Interests**

The authors declared no conflict of interest.

**Disclosure statement**

The authors declare no conflict of interest, real or perceived.

**Ethical Approval**

The Ethics Committee of Kerman University of Medical Sciences approved the study protocol (IR.KMU.REC.1402.002)

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