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Post-COVID gambling habits of adolescents and young adults in Aragon, Spain: a cross-sectional study

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Abstract

Background   Gambling has become increasingly normalized in Spain, with 49.3% of the population participating and high engagement among youth, particularly online. Despite legal restrictions, some studies have reported that over 20% of adolescents aged 14–19 reported gambling in 2022. These findings raise concerns about gambling disorder, which affects 4.7% of Spanish youth and is linked to other mental health problems. Factors such as advertising and the COVID-19 pandemic may have contributed to this trend. This study, part of the GAMBL-OUT project, examines gambling behaviors among young people in Aragon, Spain, focusing on prevalence, advertising exposure, post-COVID vs. pre-pandemic comparisons, and factors associated with problem gambling, while comparing high school and university students.

Methods   A cross-sectional study was conducted between November 2023 and March 2024 with 617 participants aged 16–25 from high schools, vocational centers, and universities. Measures included sociodemographic variables, gambling behaviors, advertising exposure, and psychological constructs. Standardized tools included the Problem Gambling Severity Index, Gambling Related Cognitions Scale, Gambling Motives Questionnaire, and UPPS-P Impulsive Behavior Scale.

Results   Nearly 60% of participants had gambled, 78.4% of whom had done so in the past 12 months. The overall prevalence of problem gambling in our sample was 3.5%. Among university students, 64.6% had gambled and 3.4% showed signs of problem gambling, which does not represent a significant increase compared to 2019 data. University students post-COVID reported significantly lower exposure to gambling advertisements and less knowledge of betting venues and websites, despite stable levels of preventive information. Although lifetime gambling increased (65.3% vs. 58.1%), riskier behaviors such as sports betting, online gambling, and microtransactions decreased. University students showed greater gambling participation and online awareness, while high school

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students showed higher impulsivity and stronger gambling intentions. Regression analyses identified enhancement motives, predictive control, negative urgency, and peer influence as factors associated with problem gambling.

Conclusions Gambling remains a prevalent issue among youth in Aragon, with problem gambling rates stable over time. Despite reduced advertising exposure, the normalization of gambling persists. Findings support the need for age-specific, psychologically informed interventions addressing both individual vulnerabilities and social contexts.

Keywords Gambling, Problem gambling, Addictive behavior, Adolescents, Young adults

Introduction

An increasing trend regarding the frequency of gambling behaviors has been observed all over the world in the last years, which suggests that gambling is becoming a normalized leisure activity [1, 2]. In Spain, according to the most recent report provided by the Dirección General de Ordenación del Juego [3], 49.3% of the population engages in some kind of gambling activity, with youngsters under 25 years old being among the most active age groups, particularly when it comes to online alternatives. In 2022, in a study conducted in the Autonomous Community of La Rioja, Spain, more than 20.0% of adolescents (aged 14–19) admitted having gambled in the previous twelve months, even when those aged under 18 had no legal access to gambling [4].

This trend constitutes a major public health issue since normalizing gambling puts youngsters at risk of developing gambling disorder, which is defined by a continuous and repetitive pattern of gambling behavior that causes significant distress or impairment [5]. In a study conducted with a sample from southern Spain, it was found that this problem affects 4.7% of youngsters [6], and is often associated with other mental health issues, including depression, anxiety, substance abuse and other behavioral addictions such as shopping and gaming [5, 7, 8]. Gambling disorder is associated with a significant decrease in quality of life and can have a very negative impact on the financial situation of the individual, which has been in turn related to increased risk of suicide [5, 9]. Gambling has negative effects on the health and wellbeing of individuals, families, communities and society [10] and is widely recognized as a public health problem [11, 12].

The possible reasons behind the generalized increasing popularity of gambling are multiple: on one hand, the effect of advertising campaigns needs to be considered [13–15]. They depict gambling as an interesting and enjoyable activity in which easy money can be made [16, 17], which renders gambling highly attractive to people with limited or no income, such as many youngsters, who might view it as a financial opportunity. Additionally, they may be motivated by the desire for entertainment, socializing, or alleviating negative emotional states [18]. In the case of Spain, noteworthily, gambling advertising is more strictly regulated since August 2021 (Royal Decree

958/2020), but these messages can still be accessed by vulnerable individuals under certain circumstances (e.g., being registered in gambling websites), which implies that exposure to gambling advertising is still likely to influence users' behaviors.

On the other hand, the COVID-19 pandemic has also been pointed out as a potential reason for the increase in the frequency of gambling behaviors among youngsters. During 2020 and part of 2021, the closure of schools and universities meant that many adolescents and young adults spent most of their time at home with very limited social interactions, which combined with the continuous access to the Internet constituted a risk factor for developing addictive behaviors [19–21]. Although these restrictions were temporary and the pandemic was declared officially over in May 2023, some authors argue that the habits formed during the various stages of COVID-19 lockdown may persist in the long term [10]. However, studies comparing pre- and post-pandemic gambling behaviors have reported heterogeneous results [20, 22–25], which leaves the door open for further research to clarify this aspect.

Therefore, the present study, which was part of the GAMBL-OUT project (Spanish Ministry of Health, EXP2022/008902), aimed at describing the gambling habits of a large sample of youngsters (aged 16–25) who live in the Spanish Autonomous Community of Aragon to report updated data that reflect how these habits might have changed post-COVID, in comparison to those observed by López-del-Hoyo et al. [26] in a study conducted with university students in the same region in the year 2019, i.e., prior to the COVID-19 pandemic. Aspects such as the prevalence of gambling disorder, the frequency, money and time spent on different types of gambling activities, the exposure to gambling advertising—which, considering the implementation of the new law in 2021, should be substantially reduced compared to 2019 data—and variables such knowledge, attitudes and intentions towards gambling, among others, were studied. On the other hand, the role of different sociodemographic and gambling-related variables as possible factors associated with the risk of pathological gambling was also evaluated exploratorily. Furthermore, in the present study, an additional comparison was made by subgroups between high school students (i.e., under 18 years of age)

and university students (i.e., over 18 years of age). This analysis aimed at determining possible differential patterns that might merit specific interventions in each case.

Methods

Design and participants

This was a cross-sectional study in which a sample of adolescents and young adults (aged between 16 and 25 years old) residents in the Autonomous Community of Aragon, Spain, were included. Participants were students in secondary schools, vocational training centers or universities, and no further inclusion criteria were considered other than having signed the informed consent. The sample size calculation estimated that 420 participants were needed to detect a prevalence of pathological gambling in the target population of 2.4%, as observed in a previous study [26]. This estimate, calculated using G*Power, assumed a precision of 1.5%, which yielded 95% confidence interval limits ranging from 1.15% to 4.35% (prevalence ± precision), calculated using the exact binomial method.

Procedure

During the 2023–2024 academic year, the GAMBL-OUT project was promoted through various media channels to inform educational institutions in Aragon about the opportunity to participate. We also proactively contacted different educational centers directly. Interested institutions were given an informational session on the GAMBL-OUT project, where the objectives and procedures were detailed.

In universities, project information was presented through posters and leaflets featuring a QR code linking to the online survey hosted on Survey Monkey, placing these materials in various locations across the campus for easy access by students. In secondary schools, homeroom teachers were requested to allocate time during a session to introduce the GAMBL-OUT project and guide students in completing the online survey using computers or smartphones. In universities and vocational training centers, a similar approach was taken, but students were expected to complete the survey during their free time rather than during class hours. The survey was available from November 2023 to March 2024. Prior to accessing the survey, participants were required to review the project information and electronically sign the informed consent form.

All study procedures adhered to the principles outlined in the 1964 Declaration of Helsinki and its subsequent amendments (7th revision, adopted by the 64th World Medical Association General Assembly, Fortaleza, Brazil). Participants provided signed informed consent before taking part, with legal guardians giving consent, if necessary, after being fully briefed on the study procedures, potential risks, and their right to withdraw at any time. The Research Ethics Committee of the Autonomous Community of Aragon approved the study (PI22/406). To ensure confidentiality, all data collected complied with the Spanish Data Protection and Digital Rights Act 3/2018 and was in alignment with the European Union's General Data Protection Regulation.

Measures

This study replicates the measures from the pre-COVID-19 research conducted by López-del-Hoyo et al. [26]. These variables include sociodemographic details (such as age, gender, nationality, city, educational level, employment status, and monthly leisure budget) and a range of tailored questions assessing interest in sports, physical activity frequency, social support, exposure to gambling options (e.g., local betting shops and online gambling sites), frequency of gambling advertising exposure, prevention message exposure, gambling knowledge (e.g., "Studies show that gambling begins at an early age"), attitudes towards gambling (e.g., "I think gambling should be more regulated"), presence of gambling problems among relatives and friends, future gambling intentions—measured using a 5-point Likert scale, as in León-Jariego et al. [27]—and engagement with gambling activities both in the past 12 months and over a lifetime. For those who had gambled in the past 12 months, the survey included:

The Problem Gambling Severity Index (PGSI) [28]: This 9-item scale assesses problematic gambling behaviors and related harm over the past year. Items are rated on a 4-point scale (0 = never, 3 = almost always), with scores ranging from 0 to 27. The following cut-off points are used for interpreting the total score: 0 = non-problem gamblers, 1–2 = low-risk gamblers, 3–7 = moderate-risk gamblers, and > 8 = problem gamblers. The Spanish adaptation has demonstrated strong psychometric properties, including high internal consistency ($\alpha = 0.97$) [29], which was also found in our sample ($\alpha = 0.90$).

The Gambling Related Cognitions Scale (GRCS) [30]: This scale evaluates various gambling-related cognitive distortions with subscales for perceived inability to stop gambling (5 items), interpretative bias (4 items), illusion of control (4 items), gambling-related expectancies (4 items), and predictive control (6 items). Responses are rated on a 7-point Likert scale (7 = "strongly agree," 1 = "strongly disagree"), with higher scores indicating more pronounced gambling-related cognitions. The Spanish version has shown solid psychometric properties [31], and the internal consistency in our sample was excellent ($\alpha = 0.97$).

The Gambling Motives Questionnaire (GMQ) [32]: This 15-item questionnaire measures gambling motives across three factors: enhancing positive emotions,

avoiding or reducing negative emotions, and fostering social affiliation. The Spanish adaptation has shown good internal consistency for its subscales and excellent test–retest reliability [33]. The internal consistency of the GMQ in our sample was excellent (α = 0.93).

The Impacts of Gambling Advertising Scale for Adolescents (IGAS) [14]: This scale examines three areas: attitudes, interests, and behaviors related to gambling ("Participation"); knowledge of gambling options and providers ("Knowledge"); and awareness of gambling advertising ("Awareness"). Comprising 9 items rated on a 4-point Likert scale, the Spanish adaptation has demonstrated robust psychometric properties [34]; in our sample, its internal consistency was acceptable (α = 0.77).

The UPPS-P Impulsive Behavior Scale [35]: This 20-item scale assesses five facets of impulsivity: sensation seeking, lack of premeditation, lack of perseverance, negative urgency, and positive urgency. The Spanish adaptation has exhibited good psychometric properties [36]. In our sample, the internal consistency was acceptable (α = 0.73).

In addition to these questionnaires, participants who had gambled in the last 12 months were presented ad hoc questions about various types of gambling (e.g., betting shops, online gambling, cryptocurrency, microtransactions in games, and sports betting), focusing on aspects like frequency and money spent.

Statistical analysis

The cross-sectional nature of this study implied the performance of descriptive analyses, reporting frequencies and percentages for categorical variables and means (M) and standard deviations (SD) for continuous variables, or medians (ME) and the interquartile range (IQR) in the case that data did not follow normality.

Chi-square test and Student's t-test were performed to analyze potential differences in gambling habits between subgroups, i.e., high school students vs. university students, and between pre-COVID data and our current dataset. A multiple linear regression model was calculated to explore the predictive role of different sociodemographic and gambling-related variables on the risk of pathological gambling, as measured by the PGSI. Missing data were handled using pairwise deletion, considering only the available data for each specific analysis. No data imputation procedures were applied. Although the number of valid responses is reported for each variable in the corresponding tables, a formal analysis of missing data was conducted using Little's missing completely at random (MCAR) test. Results indicated that the data were MCAR, as all *p*-values were greater than 0.05. This supports the validity of the pairwise approach used in the analyses.

An alpha level of 0.05 was set, using a two-tailed test. Data analyses were computed using SPSS v26.0.

Results

Sociodemographic characteristics of the sample

A total of 719 answers were received but only 617 were considered valid for descriptive analysis. The median age of the sample was 18 years (*IQR* = 3), and a higher proportion of females was observed (*n* = 417, 67.6%). Most of the sample was born in Spain (*n* = 564, 91.4%) and lived in the city of Zaragoza (*n* = 548, 88.8%) with their first-degree family, i.e., parents, siblings (*n* = 522, 84.6%). Regarding the variables related to the studies, almost half of the subjects were university students (*n* = 306, 49.6%), mostly in social and juridical sciences (*n* = 142, 46.7%). On the other hand, more than half of the high school students belonged to the science and technology specialty (*n* = 153, 56.9%). Concerning financial availability, more than half of the sample did not work (*n* = 405, 66.0%) and 72.7% (*n* = 445) stated that they had between €0–100 per month for their leisure expenses. Regarding interest and sports practice, more than half of the participants stated that they had a significant interest in sports (*n* = 321, 52.5%) and practiced it weekly (*n* = 359, 58.7%). Finally, 73.6% (*n* = 450) stated that they often felt support by their close ones when they needed it. Table 1 presents the participants' sociodemographic characteristics in detail.

Exposure to gambling and prevention messages

Regarding exposure to gambling advertising, among subjects who responded to this section of the survey (*n* = 609), most participants stated that they received this type of advertising in some frequency (*n* = 501, 82.3%). The vast majority (*n* = 524, 86.0%) claimed that they knew the location of at least one physical gambling establishment and 416 (68.3%) knew the name of at least one real money betting website or app. Regarding the impact of gambling advertising (assessed with the IGAS), the results obtained for each of the three subscales were generally intermediate, implying a low-to-moderate effect of the advertisements on the sample studied. On the other hand, almost half of the sample (*n* = 267, 44.1%) indicated that they had not received any prevention messages about the dangers of gambling. Those who had received preventive messages (*n* = 338) reported that these were provided primarily by the school, followed by family members and the Internet (see Table 2). Finally, and as can be seen in Table 2, 40.2% (*n* = 136) of these participants declared that they did not remember the last time they received preventive information about gambling.

Social environment, knowledge and opinions on gambling

Table 3 shows the results on the knowledge of gambling declared by the sample studied, highlighting that more

Table 1 Sociodemographic characteristics of the sample

	Total sample
Age, ME (IQR) (*n*=617)	18 (3)
Sex (*n*=617)	
Male, n (%)	194 (31.4)
Female, n (%)	417 (67.6)
Other, n (%)	6 (1.0)
Residence (*n*=617)	
Zaragoza capital, n (%)	319 (51.7)
Zaragoza province, n (%)	229 (37.1)
Huesca capital, n (%)	34 (5.5)
Huesca province, n (%)	29 (4.7)
Teruel capital, n (%)	1 (0.2)
Teruel province, n (%)	5 (0.8)
Cohabitation (*n*=617)	
First-degree family, n (%)	522 (84.6)
Second-degree family, n (%)	6 (1.0)
Friends, n (%)	50 (8.1)
Alone, n (%)	12 (1.9)
Other, n (%)	27 (4.4)
Country of birth (*n*=616)	
Spain, n (%)	564 (91.6)
Other, n (%)	52 (8.4)
Current studies (*n*=617)	
High school, n (%)	270 (43.8)
University, n (%)	306 (49.6)
Other, n (%)	41 (6.6)
Academic year (university) (*n*=304)	
First, n (%)	87 (28.6)
Second, n (%)	121 (39.8)
Third, n (%)	47 (15.5)
Fourth, n (%)	48 (15.8)
Sixth, n (%)	1 (0.2)
Field of study (university) (*n*=304)	
Arts and humanities, n (%)	53 (17.4)
Sciences, n (%)	5 (1.6)
Health sciences, n (%)	103 (33.9)
Social and juridical sciences, n (%)	142 (46.7)
Engineering/architectures, n (%)	1 (0.3)
Academic year (high school) (*n*=269)	
First, n (%)	163 (60.6)
Second, n (%)	106 (39.4)
Field of study (high school) (*n*=269)	
Arts, n (%)	6 (2.2)
Sciences and technology, n (%)	153 (56.9)
Humanities and social sciences, n (%)	104 (38.7)
General	6 (2.2)
Academic year (other studies) (*n*=42)	
First, n (%)	24 (57.1)
Second, n (%)	13 (31.0)
Fifth, n (%)	1 (2.4)
Sixth, n (%)	4 (9.5)
Hours per week working (*n*=614)	
Not working, n (%)	405 (66.0)
1 to 10 h per week, n (%)	99 (16.1)

Table 1 (continued)

	Total sample
11 to 20 h per week, n (%)	57 (9.3)
21 to 30 h per week, n (%)	32 (5.2)
31 to 40 h per week, n (%)	21 (3.4)
Monthly money for expenses (*n* = 612)	
€0 – €100, n (%)	445 (72.7)
€101 – €400, n (%)	141 (23.0)
€401 – €600, n (%)	18 (2.9)
€601 – €1000, n (%)	4 (0.7)
€1001 or more, n (%)	4 (0.7)
Interest in sports (*n* = 612)	
None, n (%)	44 (7.2)
A little, n (%)	247 (40.4)
Some, n (%)	165 (27.0)
A lot, n (%)	156 (25.5)
Weekly practice of sports (*n* = 612)	
Yes, n (%)	359 (58.7)
No, n (%)	253 (41.3)
Monitoring sports broadcasts (*n* = 612)	
Never, n (%)	148 (24.2)
Once a month or less, n (%)	178 (29.1)
More than once a month, n (%)	104 (17.0)
Once a week, n (%)	81 (13.2)
More than once a week, n (%)	101 (16.5)
Social support (*n* = 611)	
Seldom, n (%)	15 (2.5)
Sometimes, n (%)	146 (23.9)
Often, n (%)	450 (73.6)

than 50% reported that they knew that gambling problems tend to appear at an early age and that it is precisely adolescents and young people who are most at risk of developing this type of problematic behavior. They were also aware of the conflicts that gambling causes in the social environment of the people who suffer from it, as well as the loss of the recreational nature of gambling once it has become a pathology. A notable proportion of the sample (*n* = 193, 34.6%) stated that they had a friend with a gambling problem. Regarding the opinion of the participants about betting, the vast majority declared that they agreed with the sentences "young people bet on sports frequently" and "young people bet on the Internet frequently" (*n* = 491, 85.1%), although the percentage of participants decreased slightly when asked about betting in betting shops (*n* = 395, 68.5%). Furthermore, concerning physical betting establishments, 81.3% (*n* = 469) stated that there are currently many establishments where people can go to gamble. Regarding the opinion on currently existing advertising, 52.5% (*n* = 303) indicated that it should have greater limits while only 6.4% (*n* = 37) stated that it was already well regulated. On the other hand, 27.9% (*n* = 161) maintained the need to prohibit all types of advertising related to games of chance. Only 32.3% stated they were aware of the existence of a registry where a person can be prohibited from accessing betting establishments and websites. Finally, participants were very aware of the dangers of gambling, both on websites and in physical locations scoring particularly high (see Table 4).

Impulsivity and gambling intention

The scores obtained for each of the factors that constitute the UPPS-P suggest an overall moderate tendency towards impulsivity: "Lack premeditation" (*ME* = 7, *IQR* = 2), "Lack perseveration" (*ME* = 8, *IQR* = 3), "Sensation seeking" (*ME* = 10, *IQR* = 3), "Positive urgency" (*ME* = 9, *IQR* = 3), and "Negative urgency" (*ME* = 10, *IQR* = 4).

Regarding gambling intention, most respondents declared that they did not think about gambling at all (*n* = 407, 73.3%), had no need to play this type of game (*n* = 480, 86.5%), and had no intention of starting to gamble in the future (*n* = 424, 76.4%).

Gambling experiences

Table 5 shows the results obtained in relation to gambling experiences. Of the total sample that responded to the question about lifetime gambling participation (*n* = 555), more than half (*n* = 324, 58.4%) answered affirmatively.

Table 2 Exposure to gambling and prevention messages

	Total sample
Can locate a betting shop (*n* = 609)	
None, n (%)	85 (14.0)
A few, n (%)	286 (47.0)
Several, n (%)	158 (25.9)
Many, n (%)	80 (13.1)
Knows the name of websites or apps where to gamble (*n* = 609)	
None, n (%)	193 (31.7)
A few, n (%)	298 (48.9)
Several, n (%)	86 (14.1)
Many, n (%)	32 (5.3)
Frequency of exposure to gambling advertisements (*n* = 609)	
Never, n (%)	108 (17.7)
Infrequently, n (%)	266 (43.7)
Somewhat frequently, n (%)	148 (24.3)
Quite often, n (%)	62 (10.2)
Very often, n (%)	16 (2.6)
Daily, n (%)	9 (1.5)
Exposure to preventive information (*n* = 605)	
Yes, n (%)	338 (55.9)
No, n (%)	267 (44.1)
Preventive message source (*n* = 338)	
Internet, n (%)	157 (46.4)
Family, n (%)	179 (53.0)
School, High school, University, n (%)	192 (56.8)
Other, n (%)	19 (5.6)
IGAS (*n* = 587)	
Participation, ME (IQR)	8 (5)
Awareness, ME (IQR)	4 (3)
Knowledge, ME (IQR)	5 (2)
Last time preventative messages were received (*n* = 338)	
Less than 1 month ago, n (%)	53 (15.7)
Less than 6 months ago, n (%)	57 (16.9)
Less than 1 year ago, n (%)	44 (13.0)
Less than 2 years ago, n (%)	22 (6.5)
More than 2 years ago, n (%)	25 (7.4)
Don't remember it, n (%)	136 (40.2)
Never received this kind of information, n (%)	1 (0.3)

Among them, 78.4% (*n* = 254) reported gambling within the past 12 months. Regarding gambling motives, the median (*ME*) and interquartile range (*IQR*) scores for the GMQ factors were as follows: "Enhancement motives" (*ME* = 6, *IQR* = 3), "Social motives" (*ME* = 6, *IQR* = 3), and "Coping motives" (*ME* = 5, *IQR* = 0). The most frequently cited specific reason for gambling was that it was considered a fun activity (*n* = 134, 54%).

The total PGSI score indicates that the sample generally did not exhibit gambling dependence or related problems, with 71.6% classified as "non-problematic gamblers" and 3.5% as "high-risk gamblers". Regarding gambling-related cognitions, assessed with the GRCS, the scores were: total score (*ME* = 24, *IQR* = 10), interpretative control/bias (*ME* = 4, *IQR* = 2), illusion of control (*ME* = 4, *IQR* = 1), predictive control (*ME* = 6, *IQR* = 4), gambling-related expectancies (*ME* = 4, *IQR* = 3), and perceived inability to stop gambling (*ME* = 5, *IQR* = 0).

Regarding betting shops experiences, 115 participants (46.4%) had visited one at least once, with a median age of 18 at first exposure. Among them, 81 (70.4%) had wagered money. Of those with betting shop experience, 71.3% (*n* = 82) reported always being asked for identification, whereas 8.7% (*n* = 10) stated they had never been asked. Financially, 28.4% (*n* = 23) reported winning a substantial amount of money, while 9.9% (*n* = 8) admitted losing a large sum.

Regarding online gambling, 16.9% (*n* = 42) had accessed gambling websites at least once, with a mean age of 17.65 years (*SD* = 2.16). Almost half of them (*n* = 17,

Table 3 Knowledge about gambling

	Total sample
The result of games of chance does not depend on the player's strategies or skills (*n* = 599)	
Strongly disagree, n (%)	27 (4.5)
Disagree, n (%)	94 (15.7)
Neither agree nor disagree, n (%)	172 (28.7)
Agree, n (%)	178 (29.7)
Strongly agree, n (%)	128 (21.4)
They are based on the laws of probability (*n* = 599)	
Strongly disagree, n (%)	20 (3.3)
Disagree, n (%)	55 (9.2)
Neither agree nor disagree, n (%)	166 (27.7)
Agree, n (%)	247 (41.2)
Strongly agree, n (%)	111 (18.5)
Money or valuable assets are often wagered (*n* = 599)	
Strongly disagree, n (%)	18 (3.0)
Disagree, n (%)	18 (3.0)
Neither agree nor disagree, n (%)	71 (11.9)
Agree, n (%)	306 (51.1)
Strongly agree, n (%)	186 (31.1)
It has a playful nature (*n* = 599)	
Strongly disagree, n (%)	80 (13.4)
Disagree, n (%)	72 (12.0)
Neither agree nor disagree, n (%)	153 (25.5)
Agree, n (%)	178 (29.7)
Strongly agree, n (%)	116 (19.4)
Studies show that gambling starts at an early age (*n* = 599)	
Strongly disagree, n (%)	11 (1.8)
Disagree, n (%)	34 (5.7)
Neither agree nor disagree, n (%)	177 (29.5)
Agree, n (%)	281 (46.9)
Strongly agree, n (%)	96 (16.0)
Adolescents and young adults may be more likely to develop a gambling problem (*n* = 599)	
Strongly disagree, n (%)	11 (1.8)
Disagree, n (%)	22 (3.7)
Neither agree nor disagree, n (%)	107 (17.9)
Agree, n (%)	292 (48.7)
Strongly agree, n (%)	167 (27.9)
Problems with gambling can cause personal, family, and social deterioration (*n* = 599)	
Strongly disagree, n (%)	10 (1.7)
Disagree, n (%)	11 (1.8)
Neither agree nor disagree, n (%)	47 (7.8)
Agree, n (%)	205 (34.2)
Strongly agree, n (%)	326 (54.4)
During the development of a gambling problem, a person goes through different stages (*n* = 599)	
Strongly disagree, n (%)	8 (1.3)
Disagree, n (%)	9 (1.5)
Neither agree nor disagree, n (%)	88 (14.7)
Agree, n (%)	313 (52.3)
Strongly agree, n (%)	181 (30.2)
There are different types of gamblers depending on the degree of control they have over their gambling behaviors (*n* = 599)	
Strongly disagree, n (%)	11 (1.8)
Disagree, n (%)	16 (2.7)
Neither agree nor disagree, n (%)	102 (17.0)
Agree, n (%)	320 (53.4)

Table 3 (continued)

	Total sample
Strongly agree, n (%)	150 (25.0)
For the pathological gambler, gambling is no longer an entertainment to become a necessity (*n* = 599)	
Strongly disagree, n (%)	11 (1.8)
Disagree, n (%)	10 (1.7)
Neither agree nor disagree, n (%)	62 (10.4)
Agree, n (%)	196 (32.7)
Strongly agree, n (%)	320 (53.4)
Personal, family and socio-environmental characteristics could explain why a person starts gambling (*n* = 599)	
Strongly disagree, n (%)	15 (2.5)
Disagree, n (%)	41 (6.8)
Neither agree nor disagree, n (%)	214 (35.7)
Agree, n (%)	248 (41.4)
Strongly agree, n (%)	81 (13.5)
The reward obtained from the game is a factor for the person to continue gambling (*n* = 599)	
Strongly disagree, n (%)	15 (2.5)
Disagree, n (%)	20 (3.3)
Neither agree nor disagree, n (%)	81 (13.5)
Agree, n (%)	230 (38.4)
Strongly agree, n (%)	253 (42.2)

Table 4 Opinions on gambling

	Total sample
Young people bet on sports frequently (*n* = 577)[a]	491 (85.1)
Young people gamble in physical premises frequently (*n* = 577)[a]	395 (68.5)
Young people bet on the Internet frequently (*n* = 577)[a]	491 (85.1)
There are few physical premises where gambling can take place (*n* = 577)[a]	108 (18.7)
What do you think of gambling advertising? (*n* = 577)	
It is well regulated, n (%)	37 (6.4)
It should have stronger restrictions, n (%)	303 (52.5)
It should be banned, n (%)	161 (27.9)
Don't know/no answer, n (%)	76 (13.2)
How dangerous do you consider gambling online or in person? ME (IQR) (*n* = 577) [0–10]	9 (3)
Are you aware of the existence of a register where you can self-ban yourself from gambling premises and gambling websites? (*n* = 577)[a]	186 (32.2)

[a]Frequency (and percentage) of "Yes" is reported

42.5%) had a registered account. Among those who had accessed these platforms, 60.0% (*n* = 24) had wagered money, but only 50.0% (*n* = 12) had received a welcome bonus (*ME* = €10). The perceived importance of this bonus for placing their first bet was moderate (*M* = 4.93, *SD* = 3.81). Most participants with online gambling experience reported neither significant winnings (*n* = 17, 70.8%) nor major losses (*n* = 20, 83.3%).

Among those who had gambled in the past 12 months, a majority (*n* = 200, 82.6%) had not participated in sports betting. Of those who did, 23 (56.1%) placed bets at physical betting shops, and only 7 (17.1%) received a welcome bonus, which ranged from €5 to €20 and was rated as having minimal influence (*ME* = 1, *IQR* = 3.25). Among sports bettors, the median total expenditure was €25 (*IQR* = 81). Live betting was used by 27 participants (65.9%), and football was the most commonly bet-on sport (*n* = 39). More than half of sports bettors (*n* = 25, 61.0%) engaged in this activity only occasionally, while 75.0% (*n* = 31) reported never taking advantage of promotional offers such as double bets or special odds.

Regarding gambling frequency, most participants reported gambling less than once per week across all game types, though variability was observed for "bingo" (0–50). A significant proportion (*n* = 186, 79.1%) reported no weekly gambling activity, while 15.3% (*n* = 36) gambled occasionally (1–2 days per week). Similarly, the average weekly gambling time was under one hour for all games, though "slot machines" and "bingo" (0–21 h) and "betting websites" (0–20 h) exhibited wider ranges. Most participants (*n* = 183,

Table 5 Gambling experiences and associated variables

	Total sample
Have you ever gambled or bet in your life? (*n* = 555)[a]	324 (58.4)
Have you gambled or bet in the last year? (*n* = 324)[a]	254 (78.4)
PGSI, ME (IQR) (*n* = 285)	
Non-problem gamblers, n (%)	204 (71.6)
Low-risk gamblers, n (%)	49 (17.2)
Moderate-risk gamblers, n (%)	22 (7.7)
Problem gamblers, n (%)	10 (3.5)
GMQ (*n* = 282)	
Enhancement motives, ME (IQR)	6 (3)
Social motives, ME (IQR)	6 (3)
Coping motives, ME (IQR)	5 (0)
GRCS (*n* = 308)	
Total, ME (IQR)	24 (10)
Gambling expectancies, ME (IQR)	4 (3)
Illusion of control, ME (IQR)	4 (1)
Predictive control, ME (IQR)	6 (4)
Inability to stop gambling, ME (IQR)	5 (0)
Interpretive bias, ME (IQR)	4 (2)

[a]Frequency (and percentage) of "Yes" is reported

81.3%) reported no weekly gambling activity. In terms of money spent, the average weekly expenditure was near zero, though notable ranges were observed for "lottery" and "football pools" (€0–52) and the "national lottery" (€0–40). Subjectively, the majority (*n* = 182, 79.5%) considered their weekly gambling expenditure negligible, and only 23 participants (10.1%) reported winning more than €60 in a single day.

Digital assets and payments in video games

First, and considering only those people who had wagered money in any game in the last year, the vast majority of respondents (*n* = 211, 86.1%) stated that they had never used any type of cryptocurrency, and of those who did, only one person claimed to currently have. On the other hand, when asked about their relationship with other digital assets such as NFTs and Fan Tokens, of the 83 respondents to the question 95.2% (*n* = 79) said they had never owned any of them. These data are consistent with the perception that participants claimed to have about the considered probability of being able to make money with digital assets, obtaining low results: cryptocurrencies (*ME* = 3, *IQR* = 5), NFTs (*ME* = 1, *IQR* = 5) and Fan Tokens (*ME* = 2, *IQR* = 5). Finally, half of the respondents (*n* = 43, 51.8%) stated that they strongly disagreed with the statement that these digital products are a "good thing". Finally, in relation to paying money on video games on different platforms, 30.2% (*n* = 73) confessed having done so at least once, with 63.0% of them (*n* = 46) having spent €11 or more.

Comparison of gambling habits in university students pre-post COVID-19

The data in Table 6 reveal that, in the aftermath of COVID-19, certain gambling habits of university students had changed significantly compared to those reported in a similar study conducted in 2019. Specifically, participants in the present study reported significantly lower exposure to gambling advertisements ($\chi^2 = 85.72$, $p < 0.001$), and were less likely to know physical locations for betting ($\chi^2 = 29.60$, $p < 0.001$) or websites and apps where gambling is possible ($\chi^2 = 63.17$, $p < 0.001$). Despite these changes, the proportion of students who had received preventive information remained similar (51.8% vs. 45.8%), with no statistically significant difference ($\chi^2 = 2.74$, $p = 0.098$), and the main sources continued to be school, family, and the Internet.

Opinions about gambling also showed stability, although some differences emerged. Notably, the belief that "young people bet on the Internet frequently" increased significantly (90.3% vs. 75.2%; $\chi^2 = 24.68$, $p < 0.001$), and the perceived danger of gambling (on a 0–10 scale) was higher in the post-COVID sample (M = 8.84 vs. 8.08; $t = -6.85$, $p < 0.001$).

The prevalence of probable pathological gambling was slightly higher in the current sample: 3.4% (95% IC: 0.0–6.0) vs. 2.4% (95% IC: 1.0–3.7) in 2019, although this difference was not statistically significant ($\chi^2 = 0.44$, $p = 0.505$). A significantly greater proportion of students reported having gambled at least once in their life (65.3% vs. 58.1%; $\chi^2 = 4.12$, $p = 0.042$), yet fewer had placed a bet in a betting shop (21.4% vs. 44.2%; $\chi^2 = 26.40$, $p < 0.001$) or used betting websites (6.0% vs. 11.2%; $\chi^2 = 6.51$,

Table 6 Comparison of gambling habits in university students pre-post COVID-19

	Pre-COVID-19 (*N*=516)	Post-COVID-19 (*N*=318)*	Statistical test (*p* value)
Sociodemographic			
Age, M (SD)	20.57 (2.37)	20.43 (2.82)	0.72 (.471)
Sex			47.50 (<.001)
Male, n (%)	201 (39.0)	54 (17.0)	
Female, n (%)	314 (61.0)	262 (82.4)	
Other, n (%)	-	2 (0.6)	
Monthly money for expenses			17.12 (.002)
€0 – €100, n (%)	240 (46.5)	192 (61.1)	
€101 – €400, n (%)	215 (41.7)	99 (31.5)	
€401 – €600, n (%)	39 (7.6)	16 (5.1)	
€601 – €1000, n (%)	14 (2.7)	5 (1.6)	
€1001 or more, n (%)	7 (1.4)	2 (0.6)	
Knowledge and exposure to gambling			
Betting shop locations			29.60 (<.001)
None, n (%)	31 (6.0)	29 (9.6)	
A few, n (%)	173 (33.6)	150 (49)	
Several, n (%)	189 (36.7)	83 (27.6)	
Many, n (%)	122 (23.6)	39 (13.8)	
Names of websites or apps where to gamble			63.17 (<.001)
None, n (%)	71 (13.8)	106 (34.0)	
A few, n (%)	247 (47.9)	148 (47.4)	
Several, n (%)	139 (26.9)	46 (14.7)	
Many, n (%)	59 (11.4)	12 (3.8)	
Frequency of exposure to gambling advertisements			85.72 (<.001)
Never, n (%)	46 (8.9)	50 (16.0)	
Infrequently, n (%)	127 (24.6)	140 (44.9)	
Somewhat frequently, n (%)	141 (27.3)	84 (26.9)	
Quite often, n (%)	99 (19.2)	27 (8.7)	
Very often, n (%)	42 (8.1)	7 (2.2)	
Daily, n (%)	60 (11.6)	4 (1.3)	
Exposure to preventive information[1]	236 (45.8)	161 (51.8)	2.74 (.098)
Opinions about gambling			
How dangerous do you consider gambling online or in person? M (SD) [0–10]	8.08 (1.75)	8.84 (1.39)	−6.85 (<.001)
Young people bet on sports frequently[1]	472 (91.5)	276 (92.3)	0.05 (.825)
Young people gamble in physical premises frequently[1]	433 (83.9)	235 (78.6)	6.48 (.011)
Young people bet on the Internet frequently[1]	388 (75.2)	270 (90.3)	24.68 (<.001)
There are few betting shops where to gamble, n of No (%)	474 (91.9)	251 (83.9)	17.21 (<.001)
Gambling experiences			
Pathological gambling[2]	12 (2.4)	5 (3.4)	0.44 (.505)
Have you ever gambled or bet in your life?[1]	299 (58.1)	192 (65.3)	4.12 (.042)
Have you ever engaged in sports betting?[1]	200 (38.8)	27 (16.7)	27.01 (<.001)
Received bonus[1]	48 (24.0)	9 (2.8)	15.77 (<.001)
Live betting[1]	116 (22.5)	16 (5.0)	18.79 (<.001)
Current frequency of betting on sporting events[3]	194 (37.6)	23 (7.2)	29.27 (<.001)
Have you ever entered a betting shop?[1]	356 (69.0)	93 (29.2)	1.99 (.158)
Have you ever placed a bet?[1]	228 (44.2)	68 (21.4)	26.40 (<.001)
Have ever earned a substantial amount of money[1]	91 (17.7)	15 (4.7)	0.78 (.378)
Have you ever accessed a betting website?[1]	103 (20.0)	27 (8.5)	0.22 (.642)
Do you have an account on one of these websites?[1]	53 (10.3)	14 (4.4)	41.92 (<.001)
Have you used your real identification data to access?[1]	54 (10.5)	13 (4.1)	15.03 (.001)
Have you ever placed a bet?[1]	58 (11.2)	19 (6.0)	6.51 (.011)
Have you ever received a bonus?[1]	42 (8.3)	12 (3.8)	6.19 (.013)

Table 6 (continued)

	Pre-COVID-19 (N=516)	Post-COVID-19 (N=318)*	Statistical test (p value)
Have you ever earned a substantial amount of money?[1]	25 (4.8)	7 (2.2)	0.29 (.592)
Have you used microtransactions in a smartphone, tablet or computer game?[1]	133 (25.8)	30 (9.4)	3.56 (.059)

*Only the subsample of university students of the present study was considered (n=318) in order to facilitate a comparable sample to the one used in the other study

[1] Frequency (and percentage) of "Yes" is reported

[2] Different evaluation instruments (2019 data: CBJP, 2022 data: PGSI);

[3] "Sometimes" includes answers such as "On special occasions", "Once every two weeks", "Once per week", "More than once a week", and "Daily"

$p = 0.011$). Similarly, fewer reported using microtransactions in video games (9.4% vs. 25.8%), with this difference approaching significance ($\chi^2 = 3.56$, $p = 0.059$).

Comparison of high school students vs. university students

The results revealed significant differences in gambling-related behaviors and perceptions. University students were more aware of gambling venues ($\chi^2 = 8.97$, $p = 0.030$) but had received fewer prevention messages ($\chi^2 = 6.65$, $p = 0.010$). They were also more likely to have friends with gambling problems ($\chi^2 = 19.06$, $p < 0.001$) and perceived gambling among young people as more frequent ($\chi^2 = 31.47$, $p < 0.001$).

In terms of impulsivity, university students showed higher levels in negative urgency ($Z = -3.346$, $p = 0.001$), while high school students reported a greater need to gamble ($\chi^2 = 11.54$, $p = 0.021$). University students were more likely to have gambled at some point in their lives ($\chi^2 = 12.46$, $p < 0.001$), visited gambling venues more frequently ($\chi^2 = 48.45$, $p < 0.001$), and received higher online gambling bonuses ($Z = -2.169$, $p = 0.030$).

High school students spent more time on non-online card games ($Z = -2.488$, $p = 0.013$), while university students spent more money on slot machines ($Z = -2.846$, $p = 0.004$) and engaged in sports betting more often ($\chi^2 = 10.70$, $p = 0.005$). High school students also reported higher spending on video games ($\chi^2 = 20.89$, $p < 0.001$).

Factors associated with problem gambling

The multiple linear regression model to explore the predictive value of sociodemographic and study variables on PGSI ($F = 20.48$, $R^2 = 0.21$, $p < 0.001$) found that the following variables were significant associated factors: enhancement motives (GMQ subscale) ($B = 0.16$, $t = 3.22$, $p = 0.001$), predictive control (GRCS subscale) ($B = 0.17$, $t = 4.30$, $p < 0.001$), having friends with present or past gambling problems ($B = -0.14$, $t = -3.95$, $p < 0.001$), consideration of the dangers of gambling online and in physical venues ($B = -0.13$, $t = -3.65$, $p < 0.001$), coping motives (GMQ subscale) ($B = 0.14$, $t = 2.96$, $p = 0.003$), having a partner with current or past gambling problems ($B = -0.93$, $t = -2.56$, $p = 0.011$), negative urgency (UPPS-P subscale) ($B = 0.72$, $t = -1.98$, $p = 0.048$), and the frequency

in which sports broadcasts are watched ($B = 0.72$, $t = 1.97$, $p = 0.049$).

Discussion

The present study, focused on analyzing gambling patterns and the perception of gambling among young people in the Spanish Autonomous Community of Aragon, offers an updated and relevant view of gambling behavior in this population. One of the most notable findings is the prevalence of problem gambling in the sample studied: 3.5% of the participants were identified as problem gamblers, a notable proportion higher than the one reported in the same region in 2019 (2.4%) in a study conducted on university students [26], although this difference was not statistically significant. Previous research has consistently pointed to an increase in risky gambling behaviors among young people, particularly in contexts where access to gambling is widespread and gambling advertising is present [1, 2]. In this regard, our sample reported a less frequent usage of the different gambling alternatives (e.g., betting shops, websites) than that observed in the same region in 2019. This could suggest that some measures that have taken place in the period between 2019 and 2022 in Spain could have had a positive impact, such as the Royal Decree 958/2020, implemented in August 2021, which introduced stricter regulations on gambling advertising, limiting its broadcast to nighttime hours and prohibiting promotional bonuses for new users. It is well-known that frequent exposure to advertising messages presenting gambling as a socially acceptable and potentially lucrative activity can contribute to the perception of normality observed in the results of this study [13, 15, 18, 37]. Thus, the enforcement of this law could have had positively impacted public exposure to such messages in recent years: in the pre-pandemic study by López-del-Hoyo et al. [26], 62.3% of respondents reported receiving gambling advertisements frequently or daily, whereas in the present study, this percentage has decreased to 38.6%. However, despite these results, it should be noted that the observed differences may not solely reflect the impact of regulatory changes, since they could also be influenced by broader contextual factors such as public health measures implemented during the COVID-19 pandemic, which our study design did not specifically adjust for.

Despite regulations on gambling advertising, some young people continue to be exposed to advertisements on digital platforms, reinforcing the normalization of gambling and the adaptability of the gambling industry to continue to reach consumers through different marketing strategies [38, 39]. In this regard, it is important to mention that 44.1% of the sample had not received any prevention messages about gambling, which is only a small reduction to what was reported in the previous study (54.1%). This might suggest that while legislative measures may be reducing the reach of gambling advertisements, the normalization of gambling as a leisure activity persists due to the lack of preventive messaging. Although the literature has emphasized the importance of education in prevention, the results of this study indicate that current campaigns might not be sufficient to significantly change these perceptions. Systematic reviews have shown that the most effective approaches are those that combine education with behavioral and cognitive interventions, fostering emotional regulation and impulse control in youth [40, 41]. However, a review conducted by Tanner et al. [42] showed that many adolescents do not internalize the messages of mass preventive campaigns, suggesting that interventions need to be more targeted and personalized to be effective. In addition, meta-analyses indicate that preventive campaigns that involve the family and educators tend to have better results, creating a continuous supportive environment [43]. This highlights the importance of proactive interventions that not only limit access to gambling but also educate from an early age about the risks of gambling and demystify erroneous beliefs about controlling outcomes and winnings [44]. Likewise, preventive strategies should take advantage of digital channels and interactive tools, such as educational games and mobile apps, which have proven to be more effective in capturing the attention of young people [45].

For what concerns young people's preferences towards the use of online gambling platforms, our findings reveal that the most frequent alternative for gambling were betting shops, rather than websites, microtransactions, or other online options. These findings contradict recent studies that have documented an increase in online gambling among younger generations, who value the convenience and anonymity that these platforms offer [23, 46]. During the COVID-19 pandemic, social restrictions and the closure of physical establishments limited face-to-face gambling options, further driving the growth of online gambling [21], which did not have the same level of popularity as physical gambling before the pandemic [26]. Although this was not observed in our study, possibly due to some characteristics of our sample (e.g., a high representation of students of health sciences), the impact of such tendency in developing problem gambling needs

to be further studied: some previous works have reported a slight increase in problem gambling in certain vulnerable subgroups [22], while others have noted no widespread increase in cases of pathological gambling despite the increased use of online gambling [24]. Undoubtedly, the digital environment still presents risks, especially for young people, due to ease of access and aggressive promotions, which again highlights the importance of preventive interventions tailored to the post-pandemic context [44].

As for the comparison between adolescents and young adults, the results of this study have revealed significant differences in terms of their gambling habits and perceptions. On the one hand, university students reported greater exposure to gambling establishments and online gambling platforms, which may be related to their greater autonomy and economic capacity. However, high school students showed a greater need to gamble, indicating that, despite having less access to financial resources, they may experience greater vulnerability toward impulsive gambling [5, 47]. Recent research has pointed out that adolescents are particularly vulnerable to problem gambling due to their exposure to social networks and gambling advertising, despite legal restrictions preventing their access [1, 48]. In addition, it has also been observed that advertising and promotion of gambling on digital platforms influence the attitudes of young people, contributing to the normalization of gambling as a socially acceptable activity [37, 48]. These observed differences between subgroups underscore the need for tailored preventive interventions. High school adolescents could benefit from programs focused on emotional regulation, self-control, and early education about gambling risks [49]. On the other hand, college students, who have greater financial independence and easier access to online gambling, require intervention strategies that focus on informed decision-making, responsible financial management, and self-care [50, 51]. Despite increased exposure to preventive campaigns among college students, the high level of contact with gambling environments suggests that current interventions are not having the desired impact on this subgroup, reinforcing the need to develop more effective and targeted approaches [44, 52].

The results obtained in the regression analyses show that several sociodemographic and gambling-related variables were significantly associated with the risk of developing problem gambling. Among the main factors were emotional enhancement motives associated with gambling, predictive control, and negative impulsivity. These findings are consistent with previous studies that have indicated that cognitive distortions, such as the illusion of control and erroneous beliefs about the ability to predict outcomes, are key factors in the development of

pathological gambling [7, 30]. In addition, the relationship between impulsiveness and problem gambling has already been widely documented in the literature, indicating that people with higher levels of impulsivity tend to engage more in risky behaviors, including gambling [53]. Another relevant finding is the impact of having friends or partners with gambling problems on reducing the risk of developing problem gambling. This result suggests that, although social influence may lead to increased exposure to gambling, the presence of negative close experiences may also function as a protective factor, which is consistent with some studies suggesting that the observation of adverse consequences in the social environment may deter the development of problem behaviors [15, 54]. However, this relationship deserves further exploration, as other studies have found that the social environment may, in some cases, increase vulnerability to gambling [55]. The variables included in the regression model underline the importance of considering both psychological and contextual factors in the assessment of pathological gambling risk. However, it would be relevant in future studies to include additional variables that could provide greater precision to the model, such as the level of perceived stress, the presence of comorbidities such as depression or anxiety, or even socioeconomic factors such as unemployment or financial insecurity, which have been identified as important factors associated with gambling problems in previous studies [9, 20].

Despite the potential of the present study, it is not free of certain limitations that should be taken into consideration. Firstly, the information was collected from a convenience sample using a non-probabilistic sampling method, which limits the generalizability of the results to the broader population. Additionally, the sample was restricted to young people residing in the Autonomous Community of Aragon, which may not reflect the experiences or behaviors of youth in other regions of Spain or beyond. Secondly, all data were obtained through self-report measures, which may be affected by social desirability bias, recall bias, or misunderstanding of certain items, potentially compromising the accuracy of the responses. Moreover, not all participants who agreed to take part in the study completed all the questionnaires, resulting in different sample sizes for certain study variables. This discrepancy may reduce the statistical power and quality of some analyses, and the specific reasons why participants left some instruments incomplete were not recorded, although Little's test confirmed that the data were MCAR, reducing the potential for bias. Another limitation is that, due to the cross-sectional design and nature of the analyses, no causal inferences can be made regarding the relationships observed. Furthermore, comparisons made between the present study and the one conducted with data prior to the COVID-19 pandemic should be interpreted with caution, as different measurement instruments were used in some cases and the samples differed significantly in certain sociodemographic characteristics (e.g., gender distribution). Finally, future studies would benefit from including additional variables related to mental health (e.g., depression, anxiety) that could play a significant role in the initiation or maintenance of gambling behavior among young people.

Conclusions

The findings of this study provide an updated understanding of gambling behaviors among young people in the Autonomous Community of Aragon, highlighting that a high proportion of youngsters engage with gambling activities, with a similar rate of pathological gambling (3.5%) compared to the one observed in a previous study conducted in the same region in 2019. Although the implementation of gambling advertising regulations, among other measures, appears to have reduced exposure to promotional content, the normalization of gambling as a leisure activity persists, possibly due to a lack of preventive information. The study underscores the need for targeted interventions based on the different characteristics of adolescent and young adult gamblers. High school students, who exhibit a higher need to gamble despite having fewer financial resources, could benefit from programs emphasizing emotional regulation and impulse control. Meanwhile, university students, with greater financial autonomy and exposure to gambling environments, may require interventions that focus on responsible financial management and informed decision-making. Moreover, regression analyses have confirmed that psychological and contextual factors, such as cognitive distortions, impulsivity, and social influences, play a crucial role in the risk of developing problem gambling. These findings reinforce the importance of considering both individual and environmental aspects when designing prevention and intervention strategies. Future research should further explore additional risk factors, including mental health variables and socioeconomic conditions, to refine predictive models and enhance the effectiveness of preventive efforts.

Abbreviations

GMQ	Gambling Motives Questionnaire
GRCS	Gambling Related Cognitions Scale
IGAS	Impacts of Gambling Advertising Scale for Adolescents
IQR	Interquartile range
M	Mean
MCAR	Missing Completely At Random
ME	Median
PGSI	Problem Gambling Severity Index
SD	Standard deviations
UPPS-P	UPPS Impulsive Behavior Scale

Declarations

Ethics approval and consent to participate
The Research Ethics Committee of the Autonomous Community of Aragón (CEICA) evaluated and approved the study protocol in June 2023 (PI22/406). All study participants signed an informed consent.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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