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# Contextual, behavioural and individual factors associated with problem gambling among Italian adolescents

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**Abstract:** Gambling is a very widespread activity in Italy. As terrestrial and online gambling opportunities expand rapidly, there are rising concerns over the growing accessibility to gambling in vulnerable populations. The present study examined gambling behaviours and the factors associated with problem gambling in a sample of 1,399 Italian adolescents (aged 14 to 20; 68.5% male) from the province of Varese. Participants completed a questionnaire that assessed environmental variables related to gambling, individual dimensions, gambling behaviour, and problem gambling. Statistical analyses included principal component factor analyses and sequential binary logistic regressions. The findings show that approximatively 25% of the participants had gambled in the past year, of which 66.4% were offline gamblers only, 1.4% were online gamblers only, and 32.2% engaged in a mix of both. According to the SOGS-RA, 12% of the past-year gamblers were problem gamblers (3% of the sample). Logistic regression analyses indicated the odds of being at-risk of problem gambling were significantly related to age, perceived access to offline gambling, using gambling as a way of feeling good, and offline gambling frequency. These findings suggest that gambling prevention programs combining structural, environmental and educational interventions should be implemented to target this population.

**Keywords**: Adolescence, Gambling, Problem Gambling, Italy.

## Introduction

Although often overlooked, problem gambling is a particularly important health issue among adolescents (Derevensky & Gilbeau, 2015; Valentine, 2016; Vitaro et al., 2004). Over the past few decades, gambling has become widespread in Italy through successive legalization acts and the privatization of both terrestrial and online gambling markets (Esposito, 2014; Fiasco, 2019). The government of Italy regulates the gambling market, and thereby has a monopoly on the industry (ADM, 2021), granting concessions for all gambling-related games with the exception of three municipal casinos (Venice, Saint Vincent and Sanremo) within the borders of Italy. At the same time, while the government is responsible for preventing gambling problems and ensuring adequate treatment for pathological gamblers (Decree-law no 158, 2012), it remains evasive and inactive in this responsibility, despite actively promoting and expanding gambling facilities. Because the first national action lines for treatment and prevention were published belatedly in 2021 (Decree-law no 136, 2021), there is still very little public awareness or concern about the risks associated with gambling in Italy, particularly for young people. Moreover, as the availability and accessibility of gambling increases, it is becoming easier for minors to gamble despite being prohibited by law (Ferrara et al., 2019; Molinaro et al., 2014).

According to the European School Survey Project on Alcohol and Other Drugs, conducted in 2019 with 35 European countries (ESPAD Group, 2020), 22% of 15 to 16 years old Europeans had gambled offline in the past year, and approximatively 8% had gambled online—and in Italy these rates were 32% and 7.6%, respectively. Another study showed that around 29% of 14 to 17 year-old Italian students participated in gambling in the past year (Mortali et al., 2019). Even more concerning, Bozzato et al. (2020) reported that a much larger proportion of Italian adolescents in their sample were past-year gamblers: 77% (Bozzato et al., 2020). The ESPAD report also showed that boys were considerably more likely to be engaged in gambling than girls in all countries (ESPAD Group, 2020).

Youth gambling is a serious issue in itself. In Italy, it is illegal for those under age 18 and can lead to the development of gambling problems later in adulthood (Johansson et al., 2009)—or indeed during adolescence itself. Gambling Disorder is defined as "persistent and recurrent problematic gambling behaviour leading to clinically significant impairment or distress" (APA, 2013). The less restrictive term "problematic gambling" can describe an individual gambling more frequently or for longer periods of time, and spending more money than they intended and could afford (Ladouceur et al., 2000). Even for a teenager, the progressive loss of control over gambling behaviour is associated with negative consequences in multiple spheres of life (Browne et al., 2016; Derevensky & Gilbeau, 2015; Ferrara et al., 2018), and lead to disrupted relationships

(including conflict or breakdown), social isolation, emotional or psychological distress (e.g., anxiety or depression), detriments to health (e.g., disturbance in motor activities, eating or sleep habits), reduced performance when studying (e.g., compromised vocational projects), deviant behaviour (e.g., lies, theft and deception, use of illegal drugs), and/or financial harm. Furthermore, adolescents are more likely to show problem gambling behaviours than the adult population, with rates amongst adolescent past-year gamblers varying between 0.2% and 12.3% worldwide (Calado et al., 2017). According to the ESPAD Group (2020), 5% of European 15 to 16 year-old past-year gamblers met the criteria for problem gambling overall, and 3.9% in Italy. However, in their study using the SOGS-RA (Winters et al., 1993a), Mortali et al. (2019) found that 3% of 14 to 17 year-old Italians were problem gamblers overall, with the rate of 10.3% for past-year gamblers, of which approximatively 90% were males and 4.8% were technical school students. More specifically to the Italian province of Varese, Bozzato et al. (2020) show that 3.8% of its adolescents were problem gamblers.

There are multiple factors that have been found to explain gambling behaviours leading to problem gambling, not only related to individual characteristics (Gupta & Derevensky, 1998; Riley et al., 2021; Shead et al., 2010). For instance, a growing body of research confirms the existence of link between health outcomes and various environmental factors (Pyper & Cave, 2014; Gonzalez-Roz et al., 2017). Amongst these are the number of known people close to the individual who are gamblers (Deans et al., 2017; Langhinrichsen-Rohling et al., 2004), having family members with gambling disorders (Gupta & Derevensky, 1997), the individual ease of accessing gambling opportunities (Jacques et al., 2000; Kang et al., 2019; Welte et al., 2007), and exposure to gambling advertising (Deans et al., 2017; Lopez-Gonzalez et al., 2017; Nyemcsok et al., 2018). Other explanatory factors for problem gambling relate to specifics of the gambling behaviours themselves, such as modes of access (e.g., online or offline), variety of games played, gambling frequency, time spent gambling, and amount of money wagered (Derevensky & Gilbeau, 2015).

Finally, there are factors related to the individual's psychology (Hardoon et al., 2004), including impulsivity (Cosenza et al., 2019; Secades-Villa et al., 2016), risk taking (Gupta et al., 2006), shortened time horizons, sensitivity to immediately available rewards (Donati et al., 2019; Hodgins & Engel, 2002), and motivations to gamble such as enjoyment, arousal, money, self-enhancement, relief of boredom or loneliness, satisfying other psychological needs, relief from daily stressors, and socialization (Donati et al., 2021; Gillespie et al., 2007b; Shead et al., 2010). There are also powerful gambling-relevant cognitive distortions (Cosenza & Nigro, 2015) playing a role, which include the magnification of gambling skills, minimization of other gambler's skills, superstitious beliefs (e.g. talismanic, behavioural, and cognitive superstitions), interpretive biases (e.g., internal attributions, external attributions, the gambler's fallacy,

chasing, anthropomorphism, reframed losses, hindsight bias), temporal telescoping, selective memory, predictive skill, illusion of control over luck (e.g., luck as an uncontrollable variable, luck as a controllable variable, luck as a trait variable, luck as a contagion), and illusory correlation. These also include gambling-relevant beliefs about the self, including entitlement, omnipotence, and magical thinking (Toneatto, 1999; Toneatto, 2002).

Among these cognitive distortions, adolescent respondents frequently report chasing losses and display irrational beliefs about their level of control when gambling (Delfabbro et al., 2009; Taylor et al., 2014). Taylor et al. (2014) found that a 5-factor model comprising illusion of control, predictive control, interpretative bias, gambling-related expectancies, and perceived inability to stop gambling had the best fit to the data in their adolescent sample.

**Objectives**

The purpose of this study was to further investigate gambling behaviours and problem gambling amongst adolescents in Italy. Specifically, we examined environmental, gambling-related and individual factors that are potentially associated with problem gambling. We adopted an ecological approach (Bronfenbrenner, 1979), according to which the association of both environmental and individual factors with problem gambling were analyzed in a multidimensional fashion (Lussier et al., 2014). The basis of this approach is the idea that the environment and the people who interact within it have an influence on the individual's behaviour (Bronfenbrenner, 1979), an assumption that is pertinent in the context of gambling behaviours (Hodgins et al., 2011). On this basis, we evaluated the odds of being at-risk of being a problem gambler by relating them to environmental, personal and behavioural factors as multiple concurrent dimensions.

To this end, we administered a multidimensional questionnaire to high school and technical school students from the province of Varese in northern Italy. Varese is a province with approximately 890,000 inhabitants, with a yearly per capita income of 24,101 euros (€) on average (Varese Chamber of Commerce, 2021)—about €2,300 higher than Italy overall. More than a thousand establishments are licensed to provide gambling activities in the province, mostly bars. Further, in Italy Slot Machines are widely present in tobacconist and kiosks, where lottery ticket (including instant lottery tickets) are sold, and where it is also possible to bet on sport. Therefore, all these locations are easily accessible to anyone, including minors. Opportunities to gamble are continuing to increase rapidly in Varese as well as all over Italy, and gambling illegally to legal games by minors is not strictly enforced.

We expected past-year gambling rates to be around 30%, with 3% to 4% for problem gambling, in line with data from previous surveys conducted with adolescents in Italy (Bozzato et al., 2020; ESPAD Group, 2020; Mortali et al., 2019). With regard to the association of environmental,

gambling-related and individual factors with problem gambling, as our approach was exploratory in nature, no specific hypotheses were formulated.

## Method

### Sample

The initial sample was constituted of 1,598 individuals. Due to missing values, 185 respondents (12%) were excluded from further analyses. In addition, participants who were younger than 14 years ($n$ = 2) or older than 20 years ($n$ = 12) were excluded from the sample since the size of these age groups was too small to be considered for weighting. Hence, the final sample comprised 1,399 respondents aged 14 to 20 years old (68.5% male; 31.5% female), 76.9% of whom were under the age of 18. Technical school students made up 75.1% of the participants, while the other 24.9% were high school students.

### Setting

This study was conducted between January 31st and May 4th, 2018 in the province of Varese, Italy. It involved 82 classes from three high-schools and two higher-education technical schools, selected for their large student populations. After receiving an information sheet with a definition of gambling and instructions on how to respond, as well as assurances that their data would be confidential and anonymous, students completed a paper-pencil questionnaire during class time. The participants were also asked to write down the last three digits of their cellphone number and a nickname that could serve as an identification code in case a second follow-up measurement was required. The questionnaire was divided into two parts, the first being for everybody, and the second for only past-year gamblers. The questionnaires were administered by a researcher, which took about one hour. Teachers of the class remained in the room to supervise the students, but did not interfere in any way.

### Statistical Analyses

All analyses were performed using IBM SPSS 26. Descriptive analyses were performed to examine the distribution of gambling variables. We performed Principal Component Factor Analyses (PCFA) with a Varimax rotation to define a reduced and more manageable set of measures. We then determined the internal consistency of each factor retained through Cronbach's α, or Spearman-Brown $r$ coefficients in the case of two-item factors (Eisinga et al., 2013). The reduced measures were computed as the mean of the variables explaining the retained factor with a score equal to or higher than 0.50. Sequential Binary Logistic Regression (SBLR) were performed to examine the association between the various factors and problem gambling, classifying as either "No problem" or "At-risk/Problem gambling."

Three models were estimated. Model 1 included environmental factors related to gambling and problem gambling (number of gamblers known, parents with problem gambling, gambling as a subject of conversation among friends, peer pressure, gambling advertising, gambling accessibility, gambling proximity). Model 2 added individual factors (broad life satisfaction, positive and negative memories, gambling-related cognitions, risk taking, acting without thinking, gambling expectancies). Model 3 added gambling-related behaviours (mode of access, variety of games played, gambling frequency, weekly gambling-time, number of online gambling accounts). Gender and age were included in the models as adjustment variables. Two predictors, the number of online games played and online gambling frequency, violated the assumption of collinearity due to strong correlations with the mode of access to gambling (both >.80), and were excluded from the regression. Finally, Mahalanobis distance analyses identified 22 outliers which were excluded the analyses.

## Measures and Data Reduction

### *Environmental Variables*

**Number of Gamblers Known and Parents with Problem Gambling**. The respondents indicated how many people they knew who gambled (none, 1 to 10, or more than 10), and whether (according to their own perspectives) one or both of their parents had experienced gambling problems.

**Gambling-Related Attitudes and Behaviours Involving Friends**. The respondents completed a list of 20 items that examined the gambling attitudes and behaviours of their friends (e.g., "My friends talk about their losses at gambling"; "I talk about betting with my friends when we meet") with a response from 1 to 5 (1 = "Never", 2 = "Seldom", 3 = "Sometimes", 4 = "Often", 5 = "All the time"). The PCFA with the 20 items yielded five factors (cumulative variance explained = 59%). Only factor 1 was retained (20.5% of variance) as the other factors explained little variance. Factor 1 was explained mainly by seven items that related to talking about gambling with peers, with internal consistency of $\alpha = .87$. On this basis, we computed the mean of the seven items, wherein greater values indicated a greater frequency of conversations with friends about gambling. Table 1 displays a summary of the factors retained from the PCFAs.

**Peer Pressure**. We measured peer pressure with four items (e.g., "If I refuse to bet money, my friends respond by mocking me") rated from 1 ("Never") to 5 ("All the time"). The PCFA extracted one unique factor (48.5% of the variance) consisting of three items with $\alpha = .70$. The mean of these items constituted the final measure of peer pressure, where a higher score indicated more peer pressure.

**Gambling Advertising**. Seven items examined the degree to which the participants had noticed gambling-related advertising from billboards and in the media (e.g., "Advertising present gambling as being enjoyable"), rated from 1 ("Never") to 5 ("All the time"). One unique factor (40.3% of

the variance) was extracted by the PCFA. Five items saturated the factor (α = .75), and these were averaged to compute the measure for which a higher score corresponded to more frequently seeing targeted gambling advertisement.

**Offline and Online Gambling Accessibility**. Six items measured the perceived accessibility of gambling, rated 1 ("Never") to 5 ("All the time"). Three factors were extracted by the PFCA and retained as measures (cumulative variance explained = 71.7%). Factor 1 (26.3% of explained variance) underlined the ease of opening online gambling accounts, explained by two items that related to a facilitated entry ("I've opened an online gambling account where I started gambling for free" and "I've opened an online gambling account without prior bonus"), with Spearman-Brown $r$ = .70. The second factor (24.7% of variance) was explained by two items (Spearman-Brown $r$ = .63) measuring the respondents' perceived gambling accessibility ("Games are easily available" and "There are gambling venues that are within reach, at a walking distance from my school"). The third factor (20.5% of variance) was also explained by two items, but with weak reliability (Spearman-Brown $r$ = .38), and was therefore dropped. The items contributing to factors 1 and 2 were averaged to compute the final measures of offline and online accessibility, respectively, where higher scores corresponded to more perceived access to gambling.

**Gambling Proximity.** To assess the proximity of gambling venues, the respondents reported the estimated walking time (in minutes) they need to reach a gambling venue from their regularly frequented spots (e.g., home, school, gym).

**Gambling Behaviour and Problem Gambling**. The respondents reported their past-year online and offline gambling habits separately. For each game type, they indicated their frequency of gambling during the past year, their average weekly time spent gambling, and the number of online gambling accounts they had. Based on these responses, we computed the mode of access to gambling (i.e. offline and online), and the variety of games played. As the following sections of the questionnaire targeted past-year gamblers only, a filter question differentiated between past-year gamblers, gamblers who had not gambled in the past year, and people who had never gambled in their life. This item was considered for determining gambling prevalence.

To assess problem gambling, past-year gamblers completed the Italian version of the South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA; Colasante et al., 2014; Winters et al., 1993b), a 12-item scale for measuring problem gambling severity, with 1 for "yes" and 0 for "no." Individual scores were computed by summing the 12 items, resulting in a score between 0 and 12. Problem gambling was classified as follows: 0 to 1 = "No problem;" 2 to 3 = "At risk;" 4 or higher = "Problem gambling."

### *Individual Variables*

**Broad Life Satisfaction.** To assess the participants' broad life satisfaction, we used the Substance Use Risk Profile Scale, (SURPS; Woicik et al., 2009), a 23-item scale with 4-point responses (1 = "Totally disagree" to 4 = "Totally agree"). The SURPS develops across four scales (sensitivity to anxiety, distrust/despair, sensation seeking, and impulsiveness) that enable the identification of risk profiles. Answers on these four scales can be used to classify respondents according to two of the three typologies that are recognized in the pathways model, emotionally vulnerable gamblers and antisocial impulsive gamblers (Blaszczynski & Nower, 2002). The scale was translated into Italian by the current authors, and trialed with a small group of students and adjusted where necessary to ensure the items were understandable. The PCFA extracted five factors (cumulative variance explained = 49.2%). One factor was retained (14.7% of variance), explained by seven items that referred to broad life satisfaction (e.g., "Generally, I feel satisfied;" "I am happy"), with internal consistency of $\alpha = .81$. The average score of the seven items defined the final measure of the individual's life satisfaction, with a higher score corresponding to more life satisfaction.

**Gambling-Related Cognitions.** To investigate the participants' cognitions about gambling, we used the Italian version of the Gambling Related Cognitions Scale-Revised for Adolescents (GRCS-RA; Donati et al., 2015), which includes 14 items rated on a 5-point scale from 1 ("Totally disagree") to 5 ("Totally agree"). The PCFA extracted one unique factor (46.9% of variance), and all items contributed to it with factorial scores higher than 0.50, and internal consistency of $\alpha = .91$. The final score for gambling–related cognitions was computed as the mean of all of the items, with higher scores indicating more strongly erroneous cognitions.

**Positive and Negative Memories.** We assessed perspectives on past experiences (negative and positive) with the Italian version of the Short Zimbardo Time Perspective Inventory (SZTPI-15; Segatto & Sciandra, 2014; Zhang et al., 2013). The SZTPI-15 includes 15 items rated on a 5-point response scale from 1 ("Totally untrue") to 5 ("Totally true") comprising 5 sub-scales: Positive Past (e.g., "I often remember happy memories of the good times"), Negative Past (e.g. "I think about the bad things that have happened to me in the past"), Present Hedonism (e.g., "Taking risks takes boredom away from my life") Present Fatalism (e.g., "since what will be will be, what I do now is irrelevant"), and Future (e.g., "when I want to achieve something, I set goals and I evaluate ways to reach them").

The PCFA extracted five factors (cumulative variance explained = 64.8%), but only two of these were retained. The first (15.2% of the variance) was explained by the three items representing the Negative Past dimension, with internal consistency of $\alpha = .82$. The second factor (13.8% of the variance) was explained by three Positive Past items expressing positive memories about the past, with satisfactory internal consistency ($\alpha$

= .72). The items contributing to these two factors were averaged to define the two final measures of participants' perspective on the past.

**Impulsivity.** The Impulsive Behaviour Scale-Short (UPPS-P; D'Orta et al., 2015; Whiteside & Lynam, 2001) consists of 20 questions for measuring impulsiveness and sensation seeking, answered on 4-point response scales from 1 ("Totally disagree") to 4 ("Totally agree"). Four factors were extracted (cumulative variance explained = 54.8%), and two were retained.

Factor 1 explained 21.2% of the variance, and was saturated by five items that measure the tendency to act without regard to the consequences (e.g., "When I'm upset, I often act without thinking;" "In the heat of an argument, I will often say things that I later regret"). Internal consistency for the five items was sufficient (α = .74). Factor 2 explained 18.2% of the variance, and was explained by four items representing risk-taking (e.g., "I quite enjoy taking risks," "I sometimes like doing things that are a bit frightening") with internal consistency of α = .79.

**Gambling Expectancy Questionnaire (GEQ).** We used the Gambling Expectancy Questionnaire (Gillespie et al., 2007a; Gillespie et al., 2007b) to assess gambling motivations, wherein statements about gambling (e.g., "I gamble because it makes me feel more relaxed"; "I gamble because friends consider me cool"; "I gamble because I can't stop"), are rated on a 5-point frequency scale from 1 ("Never") to 5 ("All the time").

Seven factors were extracted from PCFA (cumulative variance explained = 64.0%), of which three that were equivalent in terms of explaining the variance were retained. The first (11.2% of variance) was saturated by four items describing gambling to be motivated by the possibility of earning money (e.g., "Gambling attracts me"; "I want to become rich") with internal consistency of α = .78. The second factor (11.0% of variance) was explained by five items relating to the beneficial and relaxing effects of gambling (e.g., "Gambling makes me feel more relaxed"; "Gambling makes me feel good"), with internal consistency of α = .84. The third factor (10.2% of variance) was saturated by four items referring to gambling to cope with shame and guilt, and to obtain social acceptance (e.g., "I gamble so that others accept me more;" "I gamble because I feel ashamed of myself"). Internal consistency for these items was α = .81.

**Table 1**
*Summary of the Principal Component Factor Analyses for the Scales Used*

| Scales | Factors retained | Variance explained (%) | Internal consistency |
|---|---|---|---|
| **Environmental Variables** | | | |
| Gambling-related attitudes/ behaviours involving friends (5; 59.0%) | (1) Gambling-as subject of conversation | 20.5 | α = .87 |
| Peer pressure (1; 48.5%) | (1) Peer pressure | 48.5 | α = .70 |
| Gambling advertising (1; 40.3%) | (1) Gambling advertising | 40.3 | α = .75 |
| Gambling accessibility (3; 71.7%) | (1) Access to online gambling | 26.3 | SB *r* = .70 |
| | (2) Access to offline gambling | 24.7 | SB *r* = .63 |
| **Individual Variables** | | | |
| SURPS (5; 49.2%) | (1) Broad life satisfaction | 14.7 | α = .81 |
| GRCS (1; 46.9%) | (1) Gambling-related cognitions | 46.9 | α = .91 |
| SZTPI (5; 64.8%) | (1) Negative memories | 15.2 | α = .82 |
| | (2) Positive memories | 13.8 | α = .72 |
| UPPS-P (4; 54.8%) | (1) Risk taking | 21.2 | α = .74 |
| | (2) Acting without thinking | 18.2 | α = .79 |
| GEQ (7; 64.0%) | (1) To cope with shame/guilt | 11.2 | α = .78 |
| | (2) To feel good | 11.0 | α = .84 |
| | (3) To earn money | 10.2 | α = .81 |

*Notes:* α = Cronbach's alpha; SB *r* = Spearman-Brown *r* coefficient; SURPS = Substance Use Risk Profile Scale; GRCS = Gambling Related Cognitions Scale–Revised for Adolescents; SZTPI = Short Zimbardo Time Perspective Inventory; UPPS-P = Impulsive Behavior Scale–Short Version; GEQ = Gambling Expectancy Questionnaire.

## Results

### Gambling Status

About half (48.1%) of the students reported having gambled at some point in their lifetime, while the other half (51.9%) reported they had never gambled. In the scope of the past year, 25.3% said they had gambled, while 22.8% had not despite reporting gambling in their lifetime.

### Descriptive Analyses

Descriptive statistics on the environmental variables, gambling behavioural variables and problem gambling amongst past-year gamblers are displayed in Table 2.

### Environmental Variables

As far as the social environment is concerned, almost all of the gamblers (98.9%) knew at least one other gambler, and 46% knew more than 10 people who gambled. Regarding close family, 3.4% of the past-year gamblers reported having a parent with gambling problems. On average, gamblers had conversations with friends about gambling between seldom and sometimes ($M$ = 2.49), but were rarely put under pressure from their peers to gamble ($M$ = 1.24).

With regard to the physical context, 97% of the young gamblers reported seeing clearly targeted advertising about gambling, but overall, they did not report noticing it frequently ($M$ = 3.01). They perceived offline gambling as very easily accessible ($M$ = 3.89), but not online gambling ($M$ = 1.25). Finally, 45% of the young gamblers reported they needed less than 15 minutes on foot from a regularly frequented spot to reach a gambling venue.

### Gambling Behavioural Variables

The majority of past-year gamblers played exclusively offline (66.4%), while very few (1.4%) gambled online only (33.2% used both forms). Sports betting was the most popular game type, both offline (58.5%) and online (25.4%), as were scratch cards (56.4%). Offline gambling involved a higher variety of games ($M$ = 2.84) and a higher gambling frequency (39.3% at least once per week) than online gambling (variety $M$ = 0.59; 14.5% had gambled at least once per week). Past-year gamblers reported spending 5.41 hours per week on gambling, 17.2% had at least one online gambling account, and 75.9% reported having lost money in the past year (66.2% between 1 and 50 euros, 9.7% more than 50 euros).

### Problem Gambling

Among past-year gamblers, 12% met the criteria for problem gambling (2.9% of the total sample) and 19.8% were categorized as being at risk of developing it (4.7% of the total sample), whereas more than two thirds of past-year gamblers (68.3%) did not present any problem gambling.

Males were more often found to be problem gamblers or at-risk (33.1%) than females (18.5%), $\chi^2(1, N = 334) = 5.307$; $p < .03$. There were no significant differences in problem gambling between age categories.

**Table 2**
*Environmental and Past-Year Gambling Behavioural Variables (n = 354)*

| **Environmental variables** | | *N* | % | *M* | *SD* |
|---|---|---|---|---|---|
| Number of gamblers known | 0 | 4 | 1.1 | | |
| | 1-10 | 186 | 52.8 | | |
| | > 10 | 162 | 46.0 | | |
| Parents with gambling problems | | 12 | 3.4 | | |
| Gambling as a subject of conversation among friends | | | | 2.49 | 0.85 |
| Peer pressure | | | | 1.24 | 0.48 |
| Gambling advertising | | | | 3.01 | 0.91 |
| Accessibility to offline gambling | | | | 3.89 | 1.01 |
| Accessibility to online gambling | | | | 1.25 | 0.62 |
| Gambling proximity: Walking time (minutes) to gambling venues from regularly frequented spots | < 5 | 28 | 8.3 | | |
| | 5-9 | 43 | 12.7 | | |
| | 10-14 | 82 | 24.2 | | |
| | > 15 | 186 | 54.9 | | |
| **Gambling behaviour variables** | | | | | |
| Mode of access to gambling | | | | | |
| | Offline only | 235 | 66.4 | | |
| | Online only | 5 | 1.4 | | |
| | Offline and online | 114 | 32.2 | | |
| Variety of games played offline | | | | 2.84 | 1.89 |
| Games played offline | | | | | |
| | Sports betting | 203 | 58.5 | | |
| | Betting with friends | 202 | 58.0 | | |
| | Scratch cards | 199 | 56.4 | | |
| | Lottery tickets | 87 | 24.8 | | |
| | Card games | 79 | 22.5 | | |
| | Betting on virtual events | 64 | 18.3 | | |
| | Lottery and “10 e lotto” | 45 | 12.9 | | |
| | VLT & Slot in bars | 37 | 10.5 | | |
| | VLT & Slot in venues | 31 | 8.9 | | |
| | Bingo | 31 | 8.9 | | |
| | Casino | 26 | 7.4 | | |
| Variety of games played online | | | | 0.59 | 1.21 |

**Table 2 (continued)**

| | | *N* | % | *M* | *SD* |
|---|---|---|---|---|---|
| Games played online | | | | | |
| | Sports betting | 89 | 25.4 | | |
| | Betting on virtual events | 24 | 6.9 | | |
| | Card games | 18 | 5.2 | | |
| | Lottery and “10 e lotto” | 15 | 4.3 | | |
| | Casino | 14 | 4.1 | | |
| | Scratch cards | 14 | 4.0 | | |
| | Bingo | 13 | 3.7 | | |
| | Lottery tickets | 11 | 3.2 | | |
| | VLT & Slot | 11 | 3.1 | | |
| Offline past-year gambling frequency | | | | | |
| | Never | 3 | 0.8 | | |
| | Once a month | 129 | 36.4 | | |
| | 2-3 times per month | 83 | 23.4 | | |
| | Once a week | 73 | 20.6 | | |
| | 2-3 times a week | 41 | 11.6 | | |
| | Daily | 25 | 7.1 | | |
| Online past-year gambling frequency | | | | | |
| | Never | 233 | 66.4 | | |
| | Once a month | 42 | 12.0 | | |
| | 2-3 times per month | 25 | 7.1 | | |
| | Once a week | 22 | 6.3 | | |
| | 2-3 times a week | 19 | 5.4 | | |
| | Daily | 10 | 2.8 | | |
| Hours spent gambling weekly | | | | 5.41 | 5.60 |
| Number of online gambling accounts | 0 | 293 | 82.8 | | |
| | 1 | 40 | 11.3 | | |
| | 2 | 14 | 4.0 | | |
| | ≥ 3 | 7 | 2.0 | | |
| Past-year gambling losses | 0 | 80 | 24.2 | | |
| | 1-50 | 219 | 66.2 | | |
| | > 50 | 32 | 9.6 | | |
| Problem gambling | | | | | |
| | No problem | 228 | 68.3 | | |
| | At risk | 66 | 19.8 | | |
| | Problem gambling | 40 | 12.0 | | |

**Individual Variables**

Descriptive analyses on the individual variables are displayed in Table 3.

Overall, past-year gamblers showed a high level of life satisfaction ($M$ = 3.09; $SD$ = 0.45), reflecting high scores on the positive memories dimension ($M$ = 3.88; $SD$ = 0.85) and low scores for negative memories ($M$ = 2.90; $SD$ = 1.05). They scored quite low on the gambling related cognitions scale ($M$ = 2.02; $SD$ = 0.70), indicating that many of these gamblers correctly understand the principles underlying gambling. With regard to impulsivity, the respondents overall reported taking risks ($M$ = 2.79; $SD$ = 0.60) and acting without prior thinking ($M$ = 2.53; $SD$ = 0.57). Finally, the participants' gambling activities appeared to be motivated more by the need to cope with feelings of shame and/or guilt ($M$ = 2.31; $SD$ = 0.96), than by the need to feel good ($M$ = 1.44; $SD$ = 0.64) $t(353) = 18.059$, $p < 0.001$, or the desire to earn money ($M$ = 1.20; $SD$ = 0.50), $t(353) = 21.081$, $p < .001$.

**Table 3**
*Results for Individual Variables (n = 354)*

| Individual variables | Min. and max. response options | *M* | *SD* |
|---|---|---|---|
| Broad life satisfaction | (1 = Totally disagree; 4 = Totally agree) | 3.09 | 0.45 |
| Negative memories | (1 = Totally untrue; 5 = Totally true) | 2.90 | 1.05 |
| Positive memories | (1 = Totally untrue; 5 = Totally true) | 3.88 | 0.85 |
| Gambling-related cognitions | (1 = Totally disagree; 4 = Totally agree) | 2.02 | 0.70 |
| Risk taking | (1 = Totally disagree; 4 = Totally agree) | 2.79 | 0.60 |
| Acting without thinking | (1 = Totally disagree; 4 = Totally agree) | 2.53 | 0.57 |
| Gamble to cope with shame/guilt | (1 = Never; 5 = All the time) | 2.31 | 0.96 |
| Gamble to feel good | (1 = Never; 5 = All the time) | 1.44 | 0.64 |
| Gamble to earn money | (1 = Never; 5 = All the time) | 1.20 | 0.50 |

**Association Analyses**

We performed a sequential logistic regression analysis with three sets of factors. Table 4 reports the results of the final model. The first model included the environmental factors related to gambling (i.e., number of gamblers known, parents with problem gambling, gambling as a subject of conversation among friends, peer pressure, gambling advertising, gambling accessibility, gambling proximity). The model yielded a good fit, $\chi^2(10, N = 333) = 23.251$, $p < .02$, and showed that gambling as a subject of conversation was the only factor significantly associated with at-risk/problem gambling (OR = 1.667; $p < .02$). The second model added the individual factors (i.e., broad life satisfaction, positive and negative memories, gambling-related cognitions, risk taking, acting without thinking, gambling expectancies), which yielded a significant improvement, $\chi^2(19, N = 333) = 49.546$, $p < .001$. Gambling as a subject of conversation was no longer significant in this iteration, but access to offline gambling (OR = 0.669; $p < .04$) and the need to feel good as a motivation to gamble (OR = 2.180; $p < .005$) were now the only factors significantly associated with at-risk/problem gambling. Finally, the gambling-related behaviour variables were added in the third model (i.e., mode of access, number of games played, gambling frequency, weekly gambling-time, number of online gambling accounts owned), which further improved the model fit, $\chi^2(24, N = 333) = 61.592$, $p < .001$. The significant predictors of at-risk/problem gambling in this third and final model were age (OR = 1.274; $p < .05$), access to offline gambling (OR = 0.675; $p < .05$), the need to feel good as a motivation to gamble (OR = 1.837; $p < .03$), and offline gambling frequency (OR = 1.467; $p < .03$).

**Table 4**
*Final Binary Logistic Regression Model for At-Risk/Problem Gambling (n = 333)*

| | *B* | *SE* | Exp(B) | 95% CI for Exp(B) | | Wald $\chi^2$ | *p* |
|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | | |
| Gender | -0.311 | 0.501 | 0.733 | 0.274 | 1.958 | 0.384 | .535 |
| Age | 0.242 | 0.120 | 1.274 | 1.008 | 1.611 | 4.091 | .043 |
| Environmental factors | | | | | | | |
| No. of gamblers known | -0.201 | 0.399 | 0.818 | 0.374 | 1.788 | 0.254 | .614 |
| Parents with gambling problems | -1.141 | 0.880 | 0.320 | 0.057 | 1.793 | 1.680 | .195 |
| Gambling as a subject of conversation among friends | -0.196 | 0.283 | 0.822 | 0.472 | 1.431 | 0.480 | .488 |
| Peer pressure | -0.056 | 0.416 | 0.945 | 0.418 | 2.136 | 0.018 | .893 |
| Gambling advertising | 0.167 | 0.200 | 1.182 | 0.799 | 1.750 | 0.699 | .403 |
| Access to online gambling | -0.334 | 0.428 | 0.716 | 0.309 | 1.657 | 0.609 | .435 |
| Access to offline gambling | -0.392 | 0.193 | 0.675 | 0.463 | 0.986 | 4.141 | .042 |
| Gambling proximity | -0.114 | 0.178 | 0.893 | 0.630 | 1.264 | 0.409 | .522 |
| Individual factors | | | | | | | |
| Broad life satisfaction | -0.573 | 0.442 | 0.564 | 0.237 | 1.342 | 1.677 | .195 |
| Negative memories | 0.287 | 0.189 | 1.333 | 0.921 | 1.930 | 2.319 | .128 |
| Positive memories | 0.162 | 0.237 | 1.176 | 0.739 | 1.872 | 0.468 | .494 |
| Gambling-related cognitions | -0.259 | 0.300 | 0.772 | 0.429 | 1.389 | 0.746 | .388 |
| Risk taking | 0.058 | 0.327 | 1.060 | 0.558 | 2.012 | 0.031 | .859 |
| Acting without thinking | -0.080 | 0.330 | 0.923 | 0.483 | 1.765 | 0.058 | .809 |
| Gambling to cope with shame/guilt | 0.657 | 0.485 | 1.929 | 0.746 | 4.987 | 1.837 | .175 |
| Gambling to feel good | 0.608 | 0.262 | 1.837 | 1.099 | 3.069 | 5.380 | .020 |
| Gambling to earn money | 0.226 | 0.413 | 1.254 | 0.558 | 2.818 | 0.299 | .584 |
| Gambling behavioural factors | | | | | | | |
| Mode of access to gambling | 0.063 | 0.208 | 1.065 | 0.708 | 1.602 | 0.091 | .763 |
| No. of offline-games played | 0.074 | 0.124 | 1.077 | 0.845 | 1.372 | 0.356 | .551 |
| Offline gambling frequency | 0.383 | 0.173 | 1.467 | 1.045 | 2.059 | 4.897 | .027 |
| Weekly gambling-time | 0.055 | 0.045 | 1.057 | 0.968 | 1.153 | 1.526 | .217 |
| No. of online gambling accounts | 0.241 | 0.395 | 1.272 | 0.587 | 2.758 | 0.372 | .542 |

## Discussion

The results of this study show that about half of participants had never gambled, whereas approximately one quarter had gambled in the previous year. These proportions are smaller than most of those observed in other European countries (Calado et al., 2017). In the Italian context, they are in line with those reported by Mortali et al. (2019) with Italian students aged 14 to 17 years from the North-West of Italy. On the other hand, they are much lower than those found in our area by Bozzato et al. (2020), but they have acknowledged that the gambling rates they observed were higher than those yielded by previous surveys in Italy, so their data may be an outlier. They attributed the discrepancy to the presence of adults (i.e., age 18 and over) in their sample, however 23% our sample were also over 18, which calls this explanation into question. Another explanation by Bozzato et al. (2020) was that the higher prevalence rate they observed may have been due to the inclusion of specific games within the item assessing past-year gambling. Indeed, the inclusion of such examples may contribute to increasing the prevalence rate as it makes respondents aware of games they played that they had not originally considered to be gambling.

The descriptive statistics on the past-year gamblers show that gambling was present both in the social and physical environments of these youths. Indeed, while a relatively small proportion of participants reported having parents with gambling problems, almost half knew more than ten gamblers in their family and friendship circle. Furthermore, gambling was commonly cited as a subject of conversation among friends, but for most this did not appear to be associated with peer pressure.

With regard to the physical environment, gambling was perceived as being widely available. While young people frequently identified well-targeted advertising in public places and the media, this factor did not seem to be very relevant. This finding is in line with the work of Torrance et al. (2020), indicating that young adults are aware of the potential risks associated with gambling advertising and are therefore supportive of regulatory reform. Our young participants perceived gambling venues as easily accessible, within a short walking distance from their home or school. Previous research has reported that liberal gambling policies are associated with enhanced gambling activities (Ho, 2017; Raisamo et al., 2020; Ricijaš et al., 2016), including in underage youths (ESPAD Group, 2020; Kristiansen et al., 2015; Meyer et al., 2009). On the other hand, our young participants perceived online gambling as less accessible, perhaps because newcomers must register and identify themselves and their age. Accordingly, online gambling concerns a minority of young people, and is less frequent than offline gambling.

With regard to gambling behaviours, two thirds of this population gambled exclusively offline, which shows that offline gambling is still more popular among youths than online gambling (less than 2% gambled exclusively online), in keeping with the results of the ESPAD Group (2020).

Regardless of the mode of access, the adolescents in our sample gambled more than five hours per week. This is relevant in light of research showing that time spent on gambling is associated with increased levels of adolescent problem gambling (Kang et al., 2019) and a reduced quality of life (Lin et al., 2010).

Moreover, sports betting was reported as the most popular game type, both offline and online. Indeed, the interest in sports—particularly football (soccer)—is typical in the Italian school-age population, and this is a powerful trigger for engaging in sports betting (Kristiansen et al., 2015). Scratch cards were also popular among our adolescent participants. Both betting and scratch cards are available in public establishments such as tobacco stores and bars. Because of their high degree of social normalization, sports betting is not generally viewed as a true gambling activity (De Luigi et al., 2018; Delfabbro et al., 2014; Molinaro et al., 2018; St-Pierre et al., 2011). However, it may constitute a gateway to more serious gambling for adolescents (Lopez-Gonzalez et al., 2017; Malischnig et al., 2020). This should be a major consideration when developing prevention policies, given that gambling opportunities have been shown to be particularly harmful when placed in public spaces such as bars (Leblond, 2007).

The analyses on the magnitude of problem gambling revealed that about 20% of those in our sample who had gambled in the past year were at risk of developing a gambling addiction, while 12% had met the criteria for problem gambling. These rates are in line with those found by Bozzato et al. (2020). They are the highest observed rates for adolescent gambling worldwide (Calado et al., 2017; Mortali et al., 2019), which is worrying at a time when gambling opportunities are still rapidly expanding, particularly on the Internet. One element that may contribute to the high rate of problem gambling is that three in four respondents were students from technical schools. This type of school appears to have higher proportions of problem gamblers compared to other post-compulsory secondary schools, such as high-schools, professional schools and artistic high-schools (Mortali et al., 2019, p. 74).

With regard to the individual psychological characteristics of these youths, our findings show that the past-year gamblers were relatively satisfied with their lives and had rather positive memories about their past. They also scored relatively low on erroneous beliefs about gambling, thereby showing a decent understanding of the mathematical principles underlying gambling. On the other hand, they reported taking risks and acting impulsively at times, which is a common trait in adolescents (Chambers & Potenza, 2003).

Finally, when asked why they gambled, the strongest motivation to participate appeared to be the need to cope with shame and/or guilt. Gambling as a means to escape from problems and unpleasant feelings is a prevalent motivation to gamble for adolescents (Calado et al., 2017). Indeed, gambling can be viewed as a maladaptive coping strategy for

handling stress and/or depression (Blaszczynski & McConaghy, 1989). This result on the association between coping as a motive to gamble and problem gambling in young people confirms findings from previous research (Estévez et al., 2021).

The main purpose of the study was to identify the factors that most strongly relate to at risk/problem gambling behaviours amongst young people in our jurisdiction. We achieved this by using a multidimensional perspective taking environmental, gambling-behavioural and individual factors into account. Therefore, we performed a sequential logistic regression analysis to include these three dimensions into the model, introduced sequentially starting with the set of environmental factors and ending with the individual factors. The resulting final model yielded age, perceived gambling accessibility, offline gambling frequency and gambling in order to feel good as the factors most strongly associated with being at-risk or suffering from gambling problems. Age, which was not significantly related to at-risk/problem gambling by itself or when considering the environmental dimension, did emerge as a significant factor when considered together with the three dimensions. This suggests that the relationship between perceived access to offline gambling, gambling frequency, gambling to feel good, and the likelihood of being at-risk or being a problem gambler grows stronger as adolescents age. Perceived accessibility of offline gambling was negatively associated with being at-risk or a problem gambler, meaning the less the gamblers perceived gambling venues as being easily accessible, the greater the likelihood that they were problem gamblers. This may be due to the fact that, as gambling becomes an increasingly compelling need to be satisfied, accessing to it may be perceived as more and more difficult.

Concerning the behavioural variables, offline gambling frequency had the strongest relationship with problem gambling. This factor is widely recognized as an indicator of problem gambling, as far as land-based gambling in concerned (Derevensky & Gilbeau, 2015). Amongst the individual psychological factors, motivational reasons for undertaking gambling activities, such as the need to feel good, were the strongest predictors of at-risk/problem gambling. This is consistent with previous research on the relationship between gambling-related expectancies and problem gambling in adolescents (Taylor et al., 2015). Similarly, Ste-Marie et al. (2006) found anxiety and social stress to be correlated to adolescent gambling behaviours.

The main reason for adopting an ecological approach was to identify the strongest associations with at-risk and problem gambling when environmental and individual factors are considered concurrently. We should note that the environmental factors measured were based on participants` subjective perceptions, rather than objective reality. This is in line with the postulation that the environment *as it is perceived* contributes more to the understanding of behaviour than the environment as an objective physical entity (Bronfenbrenner, 1979). In this respect, our

multidimensional analyses have provided us with two interesting results. First, at risk/problem gambling related more to the individual's perception of gambling accessibility than with the estimated actual physical proximity to gambling opportunities. In other words, the individual's judgement about gambling accessibility emerges as a stronger correlate of problem gambling than the estimation of a physical distance. Second, gambling to satisfy the need to feel good appears to be the strongest motivational factor related to problem gambling. This is a worrying result that says a lot about the stressful conditions many adolescents face and how they engage in risky activities to cope with them. We therefore agree with Derevensky and Gilbeau (2015) that greater attention should be given to young peoples` motivations, as these may lead to adolescent problem gambling.

## Limitations

This study comes with a few limitations. First, the sample was not representative of adolescents from the province of Varese in terms of occupation, since the respondents were all secondary level students. It did not include youths in vocational training programs and in the labour market (i.e., wage earning, unemployed) who may differ in gambling behaviours. For example, vocational trainees have been found to be more likely to have gambling problems than their high-school counterparts (Tozzi et al., 2013), so it is likely that the problem-gambling rate would have been higher had our sample included vocational trainees and employees.

The generalizability of the findings are also limited to the province of Varese. Further investigations into Italian youth gambling behaviours should extend to other regions of Italy. Furthermore, while cross-sectional studies are good for measuring prevalence rates and describing gambling behaviours in a large sample, they are limited when it comes to interpreting the relationships between variables, especially causal relationships. Part of their limitation is also due to the use of self-administered questionnaires. These are cost-efficient and practical for inquiry of large samples, but may result in high rates of missing responses, and measurement errors due to misunderstanding of the questions or the survey layout. Finally, the Italian version of the SURPS questionnaire (Woicik et al., 2009) did not stem from a full validation study.

## Conclusion

Our study has highlighted the extent to which a population of Italian adolescents are concerned by the diffuse and pervasive presence of gambling in their lives. This reflects the leniency over age controls in establishments that offer gambling products, a situation that should be of major concern to public health stakeholders in government, whose responsibility to define more protective gambling policies than those currently in place. Furthermore, the present study shows the extensive impact of the social environment on youth gambling behaviour. As such, protective gambling policies should include information and prevention-

oriented interventions, including particularly adults who have an influential/educational role towards minors (parents, family members, teachers, coaches, etc.). Further, by increasing adults' awareness of the risks of gambling, adults may contribute effectively in the broader effort to limit gambling activities amongst adolescents. Finally, with the development of online gambling, it is crucial for prevention and treatment purposes that young peoples' gambling behaviours are also monitored on a long-term basis specifically on this type of gambling.

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**Declaration of conflict of interest**

The authors declare that they have no conflict of interest.

**Availability of data and material**

Available upon request.

**Author's contributions**

DC conducted the study. AT conducted the analyses. DC & TA wrote the paper.

**Ethics and informed consent**

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

The research was conducted in accordance with the ethical code of the Italian Psychology Association (AIP; http://www.aipass.org/node/11560) and with the Italian Code concerning the protection of personal data (Legislative Decree no. 101/2018).

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