Modeling the Factors Influencing Physical Education Students' Tendency Toward Online Sports Betting: An Interpretive Structural Modeling (ISM) Approach

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Abstract

Purpose : This study used interpretive structural modeling (ISM) to examine factors associated with online sports betting among physical education students.

Method : Sixteen students with online sports betting experience were purposively selected for semi-structured interviews. Interview transcripts were analyzed thematically. The same participants then completed a pairwise comparison questionnaire to assess perceived relationships among the identified factors.

Results : Thematic analysis identified 13 subfactors across cultural, economic, and social categories. The seven-level ISM model placed access to sports prediction websites, smartphone availability, and sensational advertising at level seven. Peer pressure occupied level six, while betting addiction, competitiveness, and interest in betting occupied level five. The prospect of getting rich quickly appeared at level four, unemployment and economic hardship at level three, and winning and excitement at level two. Level one included factors such as risk-taking, football prediction skills, and enjoyment. MICMAC analysis identified environmental and technological factors as key drivers.

Conclusion : Potential prevention strategies include regulating betting advertisements, promoting digital literacy, and providing alternative recreational activities. Media awareness campaigns may also help students recognize betting-related harms. The findings reflect the perspectives of a small, purposively selected sample and should be treated as exploratory when considering their applicability to the broader student population.

Keywords: Leisure Time, Social Media, Online Betting, Interpretive Structural Modeling, Sensation Seeking.

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Introduction

Sports betting, described as betting on the outcomes of sports competitions and related events (Andreff, 2024), has rapidly expanded through digital technologies, moving to online platforms and mobile applications as one of the most prosperous sectors of the gambling industry (Lopez-Gonzalez & Griffiths, 2018). The online sports betting market has expanded to adjacent industries such as electronic sports, and features such as ease of access, immediacy of results, and visual attractions have attracted a wider audience, especially young people (Torrance, O'Hanrahan, Carroll, & Newall, 2024). The convenience of access through mobile devices provides immediate and constant accessibility to betting platforms (Hing, Thorne, & Russell, 2024). Given the importance of sports activities in the lives of various societal groups, especially among adolescents and young adults, understanding this type of betting appears essential. The repercussions of this phenomenon extend beyond individuals to affect broader social institutions, including family structures, economic stability, and societal well-being (Song, Byon, & Pedersen, 2024).

Literature Review of Contributing Factors

A growing body of literature has identified multiple factors influencing sports betting behavior across different contexts. These factors can be organized into several thematic clusters.

Individual and Psychological Factors

At the individual/psychological level, research has shown that online sports bettors are more likely to encounter betting-related problems compared to offline bettors, with approximately 29% of online sports bettors experiencing betting problems or disorders (Shen, 2023). Psychological vulnerabilities such as sensation-seeking, cognitive distortions, and the illusion of skill in football prediction make adolescents and young adults particularly susceptible to betting engagement (Helfrich, 2025). From a neurodevelopmental perspective, Helfrich (2025) argues that adolescents and young adults are particularly vulnerable to online sports betting due to the intersection of an underdeveloped prefrontal cortex, an overactive reward system, and peak sensation-seeking tendencies. This is consistent with the concept of cognitive distortions in gambling, where individuals overestimate their ability to influence uncertain outcomes (Raylu & Oei, 2004). Psychology researchers believe that the inclination toward betting can gradually lead to addictive behaviors, with Gambling Disorder classified alongside substance-related disorders (Gainsbury, 2015). Through psychological mechanisms such as immediate reward and constant availability, online sports betting can lead to addictive-like behaviors, operating similarly to addiction to online games or social networks (Wirkus, Czernecka, Bühringer, & Kräplin, 2024).

Social Factors

At the social level, peer pressure and social learning have been consistently highlighted as powerful drivers of betting behavior. Research has shown that students are particularly susceptible to peer influence, especially when betting is normalized within their social circles (Oksanen, Sirola, Savolainen, Koivula, Kaakinen, Vuorinen, & Paek, 2021). Consistent with social learning theory (Bandura, 1977), studies have confirmed that social media platforms such as Facebook, Twitter, Instagram, and WhatsApp positively influence betting behavior by providing information and reinforcing social norms (Mwadime, 2017). A large-scale Canadian study of over 74,000 adolescents found that income inequality and environmental factors significantly increase the odds of online gambling participation among young people (Pabayo, Patel, Patte, & Leatherdale, 2024). Similarly, a longitudinal study of over 4,200 Irish youth found that online gaming at age 17 was associated with

1.4 times higher odds of more frequent online gambling at age 20, and online gaming at age 20 was associated with 1.7 times higher odds of online gambling (Mohan, 2025).

Economic Factors

At the economic level, financial pressures and economic hardship increase the likelihood of gambling participation. Studies from developing countries have reported significant correlations between economic pressures and gambling behaviors among youth (Yimer, 2025). For students facing financial difficulties, betting may be perceived as a viable solution to economic problems, despite the associated risks (Kitole, Kihwele, Kalimasi, Ojo, & Elhindi, 2025). Research indicates that the majority of individuals engaged in sports betting are men aged between 21 and 40 years, and the largest source of income for sports betting is salaries and wages, which indicates that employed individuals have a greater tendency to participate (Mwadime, 2017). The appeal of rapid financial gain and the excitement of winning are powerful drivers that reinforce continued participation, particularly in contexts where economic opportunities are limited (Balsdon, Fong, & Thayer, 2007; Burge, Pietrzak, Molina, & Petry, 2004).

Technological Factors

At the technological level, the availability of smartphones and predictive websites provides constant and immediate access to betting platforms, lowering barriers to participation (Torrance et al., 2024; Hing et al., 2024). Technology has played a major role in strengthening the gambling and betting industry, particularly through the proliferation of online platforms and data-driven innovations (Galekwa, Tshimula, Tajeuna, & Kyandoghere, 2024). The online environment has turned sports betting into a faster and perhaps more harmful form of gambling (Torrance et al., 2024).

Cultural Factors

At the cultural level, sensational advertisements and the normalization of betting through media have been identified as key drivers of initial engagement among young adults. Recent systematic reviews have confirmed the powerful role of advertising in shaping gambling behavior (McGrane, Pryce, Field, Gu, Moore, & Goyder, 2025; Di Censo, Delfabbro, & King, 2025). The ubiquitous presence of betting advertisements on social media and sports broadcasts normalizes betting, reduces perceived risks, and promotes betting services to establish mutually beneficial relationships between companies, sports fans, and customers (Lopez-Gonzalez & Griffiths, 2018; Hing, Breen, & Gordon, 2012). The perception of betting as a leisure activity, particularly among students with limited recreational alternatives, resonates with the social ecological model of problem gambling, which emphasizes the role of environmental contexts in sustaining behavior (Oksanen et al., 2021).

The Iranian Context

In the Iranian context, research has highlighted legal ambiguities and cultural specificities that create a unique environment for online betting. Despite religious and legal prohibitions, cultural and economic factors have contributed to the growth of online gambling among young Iranians (Mazoochi, Yousefikhah, & Rabiei, 2024). Recent analysis of Iranian legislation reveals that existing laws, including the 2009 Computer Crimes Law, lack specific mechanisms to regulate digital gambling and targeted advertising (Ahmadi Natour, Mansour Abadi, Shams Nateri, & Mirkhalili, 2019; Fazeli, Javan Jafari, & Sadati, 2024). This legal ambiguity, combined with easy access to betting websites and smartphones, has increased the vulnerability of young people, including students (Pirani, Abbasi, & Ghorbani, 2023; Yaraghi Esfahani & Hajian, 2024). Research has shown that the influence of the environment and psychological needs have been identified as the most important factors

affecting the tendency toward internet betting (Sajedi Sabegh, Hosseini, & Emami, 2023). Empirical evidence indicates that students are especially vulnerable to betting involvement due to social influences from peers, financial constraints, and the perception of gambling as a fast route to financial gain (Kitole et al., 2025). These Iranian-specific findings have been integrated within the corresponding thematic clusters above, reflecting the multi-dimensional nature of the phenomenon in this context.

Research Gap and Aim

Despite this growing body of literature, there remains a lack of understanding regarding how the identified cultural, economic, and social factors are hierarchically structured and which of these factors exert greater influence on students' tendency toward online sports betting. In particular, no study has employed interpretive structural modeling to examine the interrelationships and hierarchical prioritization of these factors within a student population in Iran. Therefore, the present study provides an exploratory model based on the perspectives of 16 participants. Given the small sample size and the context-specific nature of the findings, this model should be considered preliminary and hypothesis-generating, rather than confirmatory or generalizable. Future research with larger and more diverse samples is needed to validate and extend these findings.

Materials and methods

1. Research Design

This research employs a mixed-metods design with an applied purpose, combining qualitative thematic analysis and quantitative interpretive structural modeling (ISM) to identify and model the factors influencing physical education students' participation in online sports betting. The qualitative phase involved semi-structured interviews and thematic analysis to extract key factors, while the quantitative phase utilized a pairwise comparison questionnaire and ISM to establish the hierarchical relationships among the identified factors. Data were collected from March to September 2025. and the subsequent phases including transcription, thematic analysis, questionnaire development, ISM modeling, and manuscript preparation—required extensive time due to the iterative nature of qualitative analysis and the complexity of the ISM matrix calculations. The authors confirm that the findings remain current and relevant, as the factors influencing betting behavior are structural and persistent rather than time-sensitive.

2. Participants and Sampling

Semi-structured interviews were conducted with 16 physical education students who had experience in online sports betting. Given the illegal nature of online betting in Iran and the difficulty of accessing participants, the sample size was limited. This is acknowledged as a study limitation**.** Participants were selected through purposive sampling combined with a snowball approach. Initially, two eligible participants who met the inclusion criteria were identified through personal contacts of the research team. After completing their interviews, each participant was asked to refer other physical education students who had experience with online sports betting. This process continued until no new participants could be identified (after the 16th participant). The snowball method was necessary due to the sensitive and illegal nature of online betting in Iran, which makes direct recruitment extremely difficult. Inclusion criteria were: (a) being a physical education student, (b) having at least one year of experience in online sports betting, (c) willingness to participate, and (d) ability to provide detailed information about their experiences. Exclusion criteria included having less than one year of betting experience or being unwilling to discuss sensitive aspects of the topic. Theoretical saturation was assessed during the data collection process. After each interview, the researchers transcribed and

coded the data. By the 14th interview, no new codes or themes emerged. Two additional interviews (15th and 16th) were conducted to confirm saturation, and no new information was identified. Therefore, saturation was achieved with 16 participants. The age range of participants was 19 to 27 years, comprising 2 females and 14 males. The gender imbalance in the sample (14 males, 2 females) reflects the well-documented demographic reality that online sports betting is predominantly a male activity (Mwadime, 2017; Shen, 2023). This distribution is consistent with previous studies in the Iranian context, where cultural and legal factors further limit female participation in betting activities (Ahmadi Natour et al., 2019; Maarefvand et al., 2016). The snowball sampling method may also have contributed to this pattern, as participants tend to refer others with similar characteristics. Moreover, consistent with gender role expectations within the Iranian cultural context, risk-taking and betting activities are predominantly associated with men, and women are generally less willing to discuss sensitive or taboo topics such as betting. Since betting is considered a sensitive issue in Iran, female students were notably less inclined to participate in this study. Additionally, the fact that the lead interviewer was male may have further reduced female participation, as women may feel less comfortable disclosing their experiences in sensitive contexts to a male interviewer.

Table 1. Demographic characteristics of participants

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	14	87.5
	Female	2	12.5
Age (years)	19–22	9	56.2
	23–27	7	43.8
Educational Level	Undergraduate	10	62.5
	Master's	6	37.5
Betting Experience	1 year	5	31.3
	2 years	6	37.5
	3 years	5	31.3

3. Data Collection

Data were collected through semi-structured face-to-face interviews conducted in private and quiet settings chosen by participants (e.g., university meeting rooms or quiet cafés) to ensure comfort and confidentiality. All interviews were conducted in-person; no online platforms were used. Each interview lasted between 45 to 60 minutes and was audio-recorded with participants' informed consent. Prior to each session, participants were reminded of the voluntary nature of the study and their right to withdraw at any time. All interviews were conducted in Persian (Farsi) by the first author, who had prior training in qualitative interviewing techniques. An interview guide was developed based on the research objectives and a review of the relevant literature. The guide included open-ended questions exploring participants' experiences with online sports betting, the factors influencing their engagement, and their perceptions of cultural, economic, and social drivers. Examples of key questions included: 'What motivated you to start online sports betting?' 'How do your friends or peers influence your betting behavior?' and 'What role do advertisements and technology play in your betting activities?' Probing questions were used to encourage deeper elaboration. Theoretical saturation was monitored throughout the data collection process. After each interview, the researchers transcribed and

coded the data. By the 14th interview, no new codes or themes emerged. Two additional interviews (15th and 16th) were conducted to confirm saturation, and no new information was identified, confirming that saturation was achieved with 16 participants. All interviews were transcribed verbatim in Persian within 48 hours of each session to preserve accuracy and contextual nuances. Participants were assigned pseudonyms to ensure anonymity, and any identifying information was removed during transcription. Field notes were also taken during and immediately after each interview to capture non-verbal cues and contextual observations that could enrich the analysis.

4. Ethical Consideration

All participants were informed about the purpose of the research, the voluntary nature of their participation, and their right to withdraw from the study at any time without penalty. Written informed consent was obtained from all participants prior to the interviews. To ensure confidentiality, all identifying information was removed, and pseudonyms were used in the transcripts and reporting. Participants were assured that their responses would be used solely for research purposes and would not be shared with any third parties. Due to the sensitive nature of the topic (online betting, which is illegal in Iran), extra care was taken to protect participants' identities and data.

5. Thematic Analysis

The transcribed interviews were analyzed using thematic analysis (Braun & Clarke, 2006) with the assistance of MAXQDA software. Two researchers independently coded the transcripts. The initial codes were reviewed and discussed to reach a consensus. The final codes were then classified into three main themes (cultural, economic, and social factors) and 13 sub-themes (see Table 2). To ensure reliability, the coding process was reviewed by a third researcher, and any disagreements were resolved through discussion. The inter-coder reliability was calculated as 87%, indicating a high level of agreement.

6. Interpretive Structural Modeling (ISM)

The 13 identified sub-themes were used as criteria for ISM analysis. These included: addiction to betting, peer pressure, sense of competition, entertainment and lack of leisure, controversial advertisements, availability of smartphones, attractiveness and enjoyment, availability of predictive websites, interest in betting, winning and excitement of the game, quick and easy way to get rich, unemployment and poor economic conditions, and risk-taking and skill in football prediction.

A pairwise comparison questionnaire was developed on the 13 identified factors. The questionnaire was designed in a matrix format where each factor was compared with every other factor using four directional symbols (V, A, X, O).

Face validity of the pairwise questionnaire was assessed by three experts in sport management and survey methodology. They reviewed the clarity, relevance, and comprehensiveness of the comparisons. Minor wording adjustments were made based on their feedback. A pilot test was conducted with four physical education students who had betting experience (not included in the main sample). They completed the pairwise questionnaire and confirmed that all comparisons were clear and understandable. No further modifications were needed. The final questionnaire was then completed by the same 16 participants who had been interviewed. Given the sensitive and illegal nature of online betting in Iran, which severely limits access to individuals with betting experience, these participants were considered as 'experiential experts' due to their direct and prolonged engagement with online sports betting platforms. Their practical knowledge of the factors influencing betting behavior provided a valid foundation for establishing the

hierarchical relationships among the identified factors. This approach is consistent with previous ISM studies conducted in sensitive or hard-to-reach contexts, where practical experience substitutes for formal expertise (Boroujerdi, Mansouri, & Asadi, 2023; Mansouri et al., 2022). Each participant was provided with written instructions and, if needed, verbal explanations to ensure accurate completion.

The perspectives of the 16 participants were used to establish the structural self-interaction matrix (SSIM).

Interpretive structural modeling, proposed by Warfield, is a methodology for understanding the relationships among components of a complex system; in other words, ISM is a methodology for structuring and configuring the relationships between elements of a system and creating order among them. The present study utilized fixed guidelines from the interpretive structural modeling method (Boroujerdi, Mansouri, & Asadi, 2023; Mansouri, Boroujerdi, Dickson, & Hossini, 2022).

The SSIM was then converted into an initial reachability matrix by replacing V, A, X, and O with 0 and 1 according to standard ISM rules: V → (i, j) =1, (j, i) =0; A → (I, j) =0, (j, I) =1; X → (i, j) =1, (j, i) =1; O → (i, j) =0, (j, i) =0.

The initial reachability matrix was then modified to obtain the final reachability matrix by applying the transitivity rule. Transitivity means that if factor A relates to factor B, and factor B relates to factor C, then factor A relates to factor C. This was performed using Boolean matrix multiplication in Microsoft Excel until the matrix stabilized (i.e., no further changes occurred).

For level partitioning, the reachability set (factors that a given factor can reach) and the antecedent set (factors that can reach the given factor) were identified from the final reachability matrix. Factors where the reachability set and the intersection set were equal were assigned the highest level in the partitioning process (which corresponds to the lowest level in the final hierarchical diagram). These factors were then removed, and the process was repeated until all factors were assigned to levels.

7. MICMAC Analysis

The driving power and dependence of each factor were analyzed using MICMAC (Matrice d'Impacts Croisés Multiplication Appliquée à un Classement) to classify the factors into four clusters: autonomous, dependent, linkage, and independent. This analysis helps to identify which factors are most influential in the system.

Results

This section presents the results of processing the research data and the opinions of participants based on the steps of the ISM method.

The thematic analysis of the interview transcripts revealed 13 sub-factors influencing online sports betting among physical education students. These sub-factors were classified into three main categories: cultural, economic, and social factors. Table 1 below presents the full list of sub-factors along with their corresponding categories.

Table 2. Categories and sub-factors of online sports betting among physical education students

Themes	Sub-themes
Cultural Factors	Controversial advertisements
	Attractiveness and enjoyment
	Entertainment and lack of leisure
	Risk-taking and skill in football prediction

Economic Factors	Quick and easy way to get rich
	Unemployment and poor economic conditions
	Winning and excitement of the game
Social Factors	Addiction to betting
	Peer pressure or attention
	Sense of competition
	Availability of smartphones
	Availability of predictive websites
	Interest in betting

The cultural, economic, and social dimensions identified in this study underscore the need for multi-level interventions that address not only individual vulnerabilities but also the broader environmental and technological drivers of online betting among students.

Structural Self Interaction Matrix (SSIM)

As mentioned, this study utilized the perspectives of the same 16 participants (described in the Methods section) to determine the relationships among the factors. All participants reported having between 1 to 3 years of experience in betting sites. Ten were undergraduate students, and six were master's students. For each pair of criteria, participants were asked to provide their opinions on the existence of a relationship between the two criteria. Four indicators were used to show how the relationships between two criteria, i and j, exist:

V: Factor in row i facilitates the realization of factor in column j.

A: Factor in column j facilitates the realization of factor in row i.

X: Both factors in row and column mutually facilitate each other (factors i and j have a bidirectional relationship).

O: There is no relationship between the factor in row and the factor in column.

The final results of the participants' opinions are presented in the matrix in the table below.

Table 3. Structural Self-Interaction Matrix

	Criteria	13	12	11	10	9	8	7	6	5	4	3	2	1
1	Addiction to Betting	O	V	O	O	V	O	O	O	O	O	A	A	
2	Peer Pressure or Attention	O	O	O	O	O	O	O	O	O	O	O		
3	Sense of Competition	V	V	O	O	A	O	O	O	A	O			
4	Entertainment and Lack of Leisure	O	O	O	A	O	O	O	O	O				
5	Controversial Advertisements	O	O	O	O	O	V	V	X					
6	Availability of Smartphones	O	O	O	O	O	X	O						
7	Attractiveness and Enjoyment	O	O	O	O	O	O							
8	Availability of Predictive Websites	O	V	O	O	O								
9	Interest in Betting	V	V	V	O									
10	Winning and Excitement of the Game	O	A	O										
11	Quick and Easy Way to Get Rich	O	V											
12	Unemployment and Poor Economic Conditions	O												
13	Risk-Taking and Skill in Football Prediction													

Initial Reachability Matrix (3)

The reachibility matrix is prepared using the structural self-interaction matrix (SSIM), meaning that it is transformed into a zero-one matrix using the substitution rule of zeros and ones. The resulting matrix is presented in the table below.

Table 4. Initial Reachibility Matrix

	Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Addiction to Betting	1	0	0	0	0	0	0	0	1	0	0	1	0
2	Peer Pressure or Attention	1	1	0	0	0	0	0	0	1	0	0	1	0
3	Sense of Competition	1	0	1	0	0	0	0	0	0	0	0	1	1
4	Entertainment and Lack of Leisure	0	0	0	1	0	0	0	0	0	0	0	0	0
5	Controversial Advertisements	0	0	1	0	1	1	1	1	0	0	0	0	0
6	Availability of Smartphones	0	0	0	0	1	0	1	0	0	0	0	0	0
7	Attractiveness and Enjoyment	0	0	0	0	0	0	1	0	0	0	0	0	0
8	Availability of Predictive Websites	0	0	0	0	0	1	0	1	0	0	0	1	0
9	Interest in Betting	0	0	1	0	0	0	0	0	1	0	1	1	1
10	Winning and Excitement of the Game	0	0	0	1	0	0	0	0	0	1	0	0	0
11	Quick and Easy Way to Get Rich	0	0	0	0	0	0	0	0	0	0	1	1	0
12	Unemployment and Poor Economic Conditions	0	0	0	0	0	0	0	0	0	1	0	1	0
13	Risk-Taking and Skill in Football Prediction	0	0	0	0	0	0	0	0	0	0	0	0	1

Final Reachibility Matrix and Leveling

The final reachibility matrix is obtained by considering the transferability relationship, meaning that the initial reachibility matrix is adjusted. To derive this matrix (using Euler's theory), the initial matrix is first added to the identity matrix, and then the resulting matrix is raised to the power of n. The exponentiation operation must be performed based on Boolean rules. The results obtained are presented in the table below.

Table 5. Final Reachibility Matrix

Criteria		1	2	3	4	5	6	7	8	9	10	11	12	13	Influence
1	Addiction to Betting	1	0	1	1	0	0	0	0	1	1	1	1	1	8
2	Peer Pressure or Attention	1	1	1	1	0	0	0	0	1	1	1	1	1	9
3	Sense of Competition	1	0	1	1	0	0	0	0	1	1	1	1	1	8
4	Entertainment and Lack of Leisure	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5	Controversial Advertisements	1	0	1	1	1	1	1	1	1	1	1	1	1	12
6	Availability of Smartphones	1	0	1	1	1	1	1	1	1	1	1	1	1	12
7	Attractiveness and	0	0	0	0	0	0	1	0	0	0	0	0	0	1

	Enjoyment														
8	Availability of Predictive Websites	1	0	1	1	1	1	1	1	1	1	1	1	1	12
9	Interest in Betting	1	0	1	1	0	0	0	0	1	1	1	1	1	8
10	Winning and Excitement of the Game	0	0	0	1	0	0	0	0	0	1	0	0	0	2
11	Quick and Easy Way to Get Rich	0	0	0	1	0	0	0	0	0	1	1	1	0	4
12	Unemployment and Poor Economic Conditions	0	0	0	1	0	0	0	0	0	1	0	1	0	3
13	Risk-Taking and Skill in Football Prediction	0	0	0	0	0	0	0	0	0	0	0	0	1	1

At this stage, with the final accessibility matrix obtained, two sets are defined to determine the levels of the criteria: the reachable set and the prerequisite (antecedent) set. The first row where the intersection of the two sets is equal to the reachable set will be assigned the highest priority level. After determining the level, the criteria that have been assigned a specific level are removed from the table, and this process is repeated until all remaining variables are leveled. Subsequently, based on the determined levels and the final matrix, the ISM network structure is drawn. Therefore, all criteria are ranked according to their influence power and dependence power, as presented in the table below.

Table 6. Ranking of Factors based on Influence and Dependence Power

Criterion	Reachable Set	Precedent Set	Intersection	Level
1. Addiction to Betting	1-3-4-9-10-11-12-13	1-2-3-5-6-8-9	1-3-9	5
2. Peer Pressure or Attention	1-2-3-4-9-10-11-12-13	2	2	6
3. Sense of Competition	1-3-4-9-10-11-12-13	1-2-3-5-6-8-9	1-3-9	5
4. Entertainment and Lack of Leisure	4	1-2-3-4-5-6-8-9-10-11-12	4	1
5. Controversial Advertisements	1-3-4-5-6-7-8-9-10-11-12-13	5-6-8	5-6-8	7
6. Availability of Smartphones	1-3-4-5-6-7-8-9-10-11-12-13	5-6-8	5-6-8	7
7. Attractiveness and Enjoyment	7	5-6-7-8	7	1
8. Availability of Predictive Websites	1-3-4-5-6-7-8-9-10-11-12-13	5-6-8	5-6-8	7
9. Interest in Betting	1-3-4-9-10-11-12-13	1-2-3-5-6-8-9	1-3-9	5
10. Winning and Excitement of the Game	4-10	1-2-3-5-6-8-9-10-11-12	10	2
11. Quick and Easy Way to Get Rich	4-10-11-12	1-2-3-5-6-8-9-11	11	4
12. Unemployment and Poor Economic Conditions	4-10-12	1-2-3-5-6-8-9-11-12	12	3
13. Risk-Taking and Skill in Football Prediction	13	1-2-3-5-6-8-9-13	13	1

Afterwards, based on the established ranking and the final accessibility matrix, an initial model is drawn. By removing the transfer abilities in the initial model, the final model titled "Causes of Online Sports Betting Among Youth in Iran" is obtained. As mentioned, the final model derived from this research consists of 7 levels (Figure 1). In this hierarchical model, factors at higher levels (levels 5-7) are perceived as having greater driving power within the participants' judgment. This seven-level hierarchy reflects the perceived structural relationships among factors. Specifically, environmental and technological factors at the highest level are positioned as primary drivers that, in the participants' view, influence other factors through mediating levels. It is important to note that this represents a perceived structural model based on expert judgment, not an empirical causal mechanism.

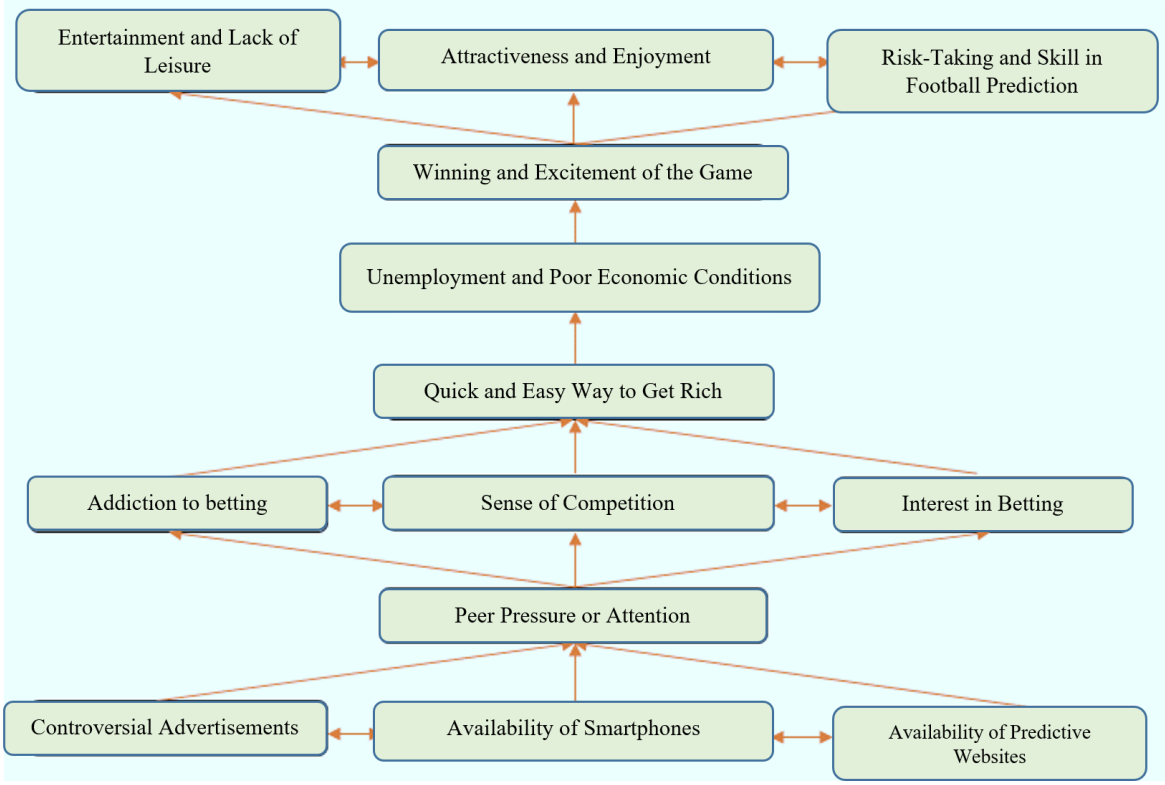

Figure 1. Hierarchical model of factors influencing online sports betting among physical education students

The MICMAC clusters align systematically with the ISM hierarchy (Figure 1):

Driving (independent) factors in MICMAC (peer pressure, controversial advertisements, availability of smartphones, availability of predictive websites) are positioned at the highest levels (levels 5-7) of the ISM model, indicating their perceived primacy.

Linkage factors (addiction to betting, sense of competition, interest in betting) are located at intermediate levels (levels 4-5), having both high driving power and high dependence.

Dependent factors (entertainment and lack of leisure, winning and excitement, quick way to get rich, unemployment, risk-taking and skill in football prediction, attractiveness and enjoyment) are found at the lowest levels (levels 1-3), indicating they are more influenced by other factors.

This alignment confirms the consistency of the ISM and MICMAC analyses in representing the perceived structural relationships among factors influencing online sports betting.

Table 7. Summary of ISM levels and MICMAC clusters for each factor

Factor	ISM Level	MICMAC Cluster
Peer pressure or attention	6	Driving
Controversial advertisements	7	Driving
Availability of smartphones	7	Driving
Availability of predictive websites	7	Driving
Addiction to betting	5	Linkage
Sense of competition	5	Linkage
Interest in betting	5	Linkage
Quick and easy way to get rich	4	Dependent
Unemployment and poor economic conditions	3	Dependent
Winning and excitement of the game	2	Dependent
Entertainment and lack of leisure	1	Dependent
Attractiveness and enjoyment	1	Autonomous
Risk-taking and skill in football prediction	1	Dependent

MICMAC Analysis

The purpose of the MICMAC analysis is to categorize the criteria based on their driving power and dependence into four clusters. In this method, all the criteria can be placed in one of the four clusters. On the MICMAC matrix, the boundary points are usually one unit larger than the average number of factors. In this research, with 13 criteria, the average is 6.5, so the boundary point was set at 7. However, depending on the research conditions, different boundary points can be considered. The boundary points should be set in a way that they can effectively differentiate the various factors into the desired clusters.

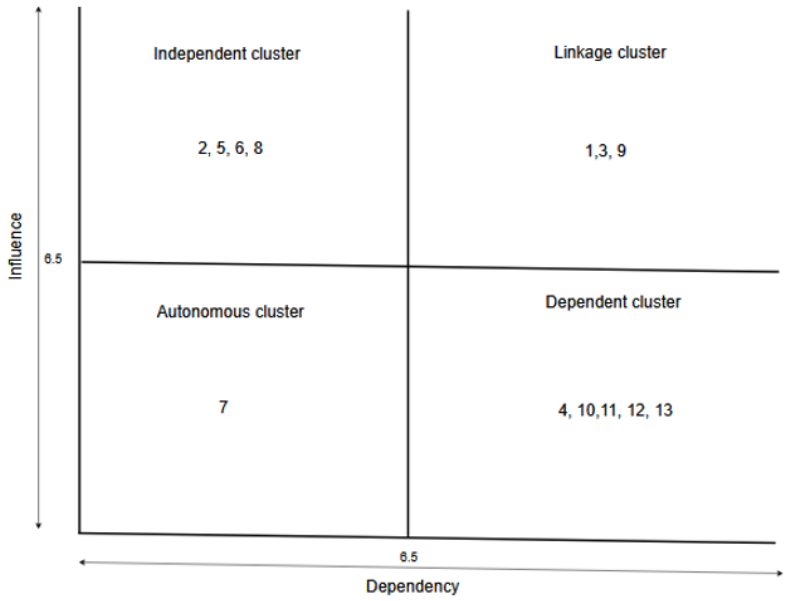

Figure 2. MICMAC clustering of factors influencing online sports betting

As shown in Figure 2, factor 7 is the only one in the autonomous cluster, meaning it has the least driving power and dependence and operates independently. Factors 4, 10, 11, 12, and 13 are more influenced by other factors and are considered dependent elements from a

systemic perspective. Factors 1, 3, and 9 are in the linkage cluster, indicating they have high dependence on other factors and also high driving power. Finally, factors 2, 5, 6, and 8 are in the driving or influential cluster, meaning they have a very high impact on online betting among youth.

Discussion

The three categories identified through thematic analysis reflect the multi-dimensional nature of online sports betting behavior among students. Cultural factors, including sensational advertisements and the normalization of betting through media, align with previous findings on the role of marketing in shaping gambling attitudes (McGrane et al., 2025; Di Censo et al., 2025). Economic factors, such as unemployment and the appeal of quick wealth, are consistent with studies emphasizing financial pressures as key drivers of betting participation (Balsdon et al., 2007; Yimer, 2025). Social factors, particularly peer pressure and technological accessibility, resonate with the social ecological model of problem gambling (Oksanen et al., 2021) and highlight the importance of relational and environmental contexts in sustaining betting behavior.

The lack of clear legal frameworks for online betting in Iran has created an environment where illegal gambling activities can flourish among young people, including students (Pirani, Abbasi, & Ghorbani, 2023; Yaraghi Esfahani & Hajian, 2024). Recent analysis of Iranian legislation reveals that existing laws, including the 2009 Computer Crimes Law, lack specific mechanisms to regulate digital gambling and targeted advertising. This legal ambiguity, combined with easy access to betting websites and smartphones, has increased the vulnerability of physical education students to online sports betting. Empirical evidence indicates that students are especially vulnerable to betting involvement due to social influences from peers, financial constraints, and the perception of gambling as a fast route to financial gain (Kitole, Kihwele, Kalimasi, Ojo & Elhindi, 2025). Therefore, understanding the factors influencing this phenomenon is essential for developing effective preventive measures. The following discussion interprets the hierarchical relationships among these factors based on the ISM model, progressing from the lowest level (foundational factors) to the highest level (driving factors).

1. Thematic Analysis Findings

The thematic analysis (Table 2) identified three overarching themes—cultural, economic, and social—each comprising multiple sub-themes. These themes reflect the multi-dimensional nature of betting behavior, encompassing media influences (McGrane et al., 2025; Di Censo et al., 2025), financial pressures (Yimer, 2025; Kitole et al., 2025; Balsdon et al., 2007), peer dynamics and social learning (Oksanen et al., 2021; Bandura, 1977; Aliverdinia et al., 2016), and technological accessibility (Torrance et al., 2024; Hing et al., 2024). Theoretically, the coexistence of these themes underscores the need for an integrated framework that considers individual, relational, and environmental factors as interacting layers of influence rather than isolated drivers.

2. ISM Results

The ISM hierarchy (Table 6; Figure 1) reveals a clear progression from individual-level factors at the base (e.g., entertainment, risk-taking) to environmental and technological drivers at the apex (e.g., advertisements, smartphone availability, predictive websites). Theoretically, this structure suggests that distal environmental factors operate as primary drivers that shape more proximal individual and social influences. In other words, access to technology and exposure to betting advertisements create the conditions under which individual vulnerabilities (e.g., risk-taking, excitement-seeking) and social pressures (e.g., peer influence) translate into sustained betting

behavior. This layered arrangement is consistent with socio-ecological models, which posit that behavior is shaped by multiple interacting levels of influence, with environmental factors often serving as the most fundamental drivers (Oksanen et al., 2021). The positioning of peer pressure at Level 6, just below environmental factors, further highlights its mediating role, suggesting that social influences amplify the effects of technological and cultural drivers (Bandura, 1977; Aliverdinia et al., 2016). The presence of addiction, sense of competition, and interest in betting at intermediate levels (Level 5) reflects their dual role as both outcomes of lower-level factors and drivers of higher-level engagement (Wirkus et al., 2024; Helfrich, 2025; Song et al., 2024), while economic factors at Levels 3 and 4 (Balsdon et al., 2007; Yimer, 2025; Kitole et al., 2025) and foundational factors at Levels 1 and 2 (Raylu & Oei, 2004; Burge et al., 2004; Griffiths, 2003; Gainsbury, 2015; Mohan, 2025) represent the individual and financial motivations that are activated by environmental drivers.

3. MICMAC Analysis

The ISM hierarchy and MICMAC classification complement each other in understanding the perceived structural system. Factors identified as driving (independent) in MICMAC (peer pressure, controversial advertisements, availability of smartphones, availability of predictive websites) consistently appear at the highest levels (levels 6-7) of the ISM model. This alignment indicates that from the participants' perspective, these factors serve as foundational drivers within the system.

Conversely, dependent factors in MICMAC (entertainment and lack of leisure, winning and excitement, quick way to get rich, unemployment, risk-taking and skill in football prediction) , are located at the lowest levels (levels 1-4) of the ISM hierarchy.

Linkage factors (addiction to betting, sense of competition, interest in betting) occupy intermediate level (levels 5), reflecting their dual role as both influencing and being influenced by other factors. The autonomous factor (attractiveness and enjoyment) appears at the lowest ISM level (level 1), confirming its relative independence from the system. This convergence is expected, as both analyses are derived from the same Final Reachability Matrix, and therefore reflects the internal consistency of the model rather than serving as independent validation.

Conclusion

This study provided a structured model of the factors influencing online sports betting among physical education students. Based on the participants' perspectives, the findings suggest that sensational advertisements, availability of smartphones, and access to predictive websites are perceived as the most influential factors at the highest level, while individual factors such as entertainment, risk-taking, and enjoyment were positioned at the lowest level. The MICMAC analysis classified the factors into four clusters: autonomous (attractiveness and enjoyment), dependent (entertainment, winning, risk-taking, unemployment, quick wealth), linkage (interest in betting, sense of competition, addiction), and driving (peer pressure, advertisements, smartphone availability, predictive websites). This classification highlights the critical role of environmental and technological factors as driving forces that shape the entire system of online betting behavior. These results underscore the complexity of online betting behavior and the need for multi-level interventions targeting both environmental and individual factors.

The hierarchical model developed in this study provides a clear framework for understanding the complex interactions among factors influencing online sports betting among physical education students. By identifying the driving factors (e.g., advertisements, peer

pressure, and access to technology) and dependent factors (e.g., entertainment and risk-taking), this model can guide policymakers and educators in designing targeted interventions. The results emphasize the need for proper planning to meet recreational needs, media awareness campaigns about the harms of betting, and cultural development to direct young people toward valuable and beneficial activities. Furthermore, authorities should pay closer attention to illegal betting platforms and provide students with accurate information about the risks associated with such organizations

Practical implications: The findings of this study offer several actionable insights for policymakers, educators, and university administrators. First, given the perceived driving role of sensational advertisements and easy access to betting platforms, regulating gambling-related advertisements on social media and sports broadcasts could reduce students' exposure to betting promotions. Second, universities should consider implementing digital literacy programs that raise awareness about the psychological and financial risks associated with online betting. Third, providing alternative recreational and leisure activities on campus may help divert students' attention from betting toward healthier forms of entertainment. Fourth, peer-led awareness campaigns and counseling services can be effective in addressing social pressures and promoting responsible decision-making among students. These strategies, if implemented collaboratively, could mitigate the harms of online sports betting in academic settings.

The most important limitation of this study is the small sample size (n=16). This prevents any generalization of the findings to the broader population of students or young people in Iran.

Other limitations include:

1) Difficulty in identifying participants due to the illegality of betting in Iran, which made access to individuals with betting experience challenging.

2) Narrow age range – only participants aged 19–27 years were included, and the researchers did not have access to individuals from higher age groups.

3) Lack of financial data – the researchers were not aware of the financial status of the interviewees.

4) Cross-sectional design – the lack of facilities (including financial and social constraints) prevented a longitudinal study in this field.

5) Methodological limitation – using students with betting experience as the primary source for ISM modeling, while valuable, may not represent the full spectrum of expertise in this domain. Future research could benefit from incorporating perspectives from other stakeholders, such as psychologists, sociologists, and law enforcement officials, to enhance the robustness and generalizability of the model.

For suggestions for future research, considering the Islamic nature of the country, it is suggested that other researchers examine this finding from the perspective of cultural compatibility and compare their results. Given the importance of leisure time among young people, it is suggested that a qualitative study be conducted from the perspective of young people to identify and extract their needs. Other researchers interested in studying betting websites should consider the income variable as an intervening variable to develop and expand the present results. Finally, it is suggested that if the necessary facilities for a comprehensive study are provided, other researchers conduct a longitudinal study to reveal more gaps in this phenomenon.

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