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Sports betting around the world: A systematic review

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REVIEW ARTICLE



ABSTRACT

Background and aims: This systematic review examines whether sports betting behaviors differ among and between sports bettors in different countries, evaluates psychosocial problems related to sports betting behaviors and how problems may vary by country, and lastly, summarizes the current regulatory guidelines for sports betting. **Methods:** We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines and included peer-reviewed articles from PubMed, Web of Science, and PsycINFO. Studies on sports betting behavior were included if they were published in English or Chinese between January 1, 2010 and March 28th, 2022. We gathered regulatory information from peer-reviewed articles, legal acts, and relevant websites. Of 2,450 articles screened, 65 were included in the final review. **Results:** Marketing and promotion of sports betting were more prominent for sports betting in Australia and the United Kingdom. Interviews with sports bettors demonstrated that sports betting is persuasive and normalized. Psychosocial problems do not appear to differ greatly by country, and sports betting appears to be associated with elevated levels of problem gambling. Responsible gambling approaches have helped address risky sports betting behaviors. China and South Korea have imposed more strict regulations and restrictions on sports betting access in comparison to countries such as Australia or the United States. **Discussion and conclusions:** Currently, sports betting is easy to access, normalized, and contains many attractive features for sports bettors. Psychoeducation about potential risks of sports betting and encouragement of responsible gambling strategies could help lessen risky sports-betting behaviors, though cross-cultural adaptations should be explored.

KEYWORDS

sports betting, gambling disorder, addictive behaviors, cross-cultural, regulations, systematic review

INTRODUCTION

Sports betting is a rapidly growing industry that obtained a worldwide market size of over 200 billion United States (US) dollars in 2019 (Ibisworld, 2020). In total, there are over 30,000 sports-betting-related businesses globally (Ibisworld, 2020). Prior to the COVID-19 pandemic, the sports-betting industry in the regions of Asia, the Middle East, and South America had grown at above-average rates (Ibisworld, 2020), while in 2021 weekly sports betting in the United States doubled (Morning Consult, 2022). Although sports betting may be defined in different ways, the present study defines *sports betting* as placing a monetary

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wager on the outcome of one or multiple sporting events, occurrence/non-occurrence of an event within a sporting event, or betting on sports in a week-long or season-long competition. As sports betting continues to grow in the United States and elsewhere (American Gaming Association, 2022), recent research has focused on identifying possible risk factors associated with problematic sports-betting behaviors (e.g., chasing losses, distorted gambling cognitions, preoccupation with gambling, social or financial problems due to sports-betting behaviors) (Hing, Russell, Vitartas, & Lamont, 2016; Russell, Hing, & Browne, 2019). Research on this topic is of great importance, as problematic sports-betting behavior could eventually develop into a gambling disorder (GD). In the DSM-5, GD is an addictive disorder characterized by dysregulated and recurrent gambling behaviors that can generate clinically significant levels of distress and impairments in functioning (American Psychological Association, 2013). GD requires meeting at least 4 of 9 diagnostic criteria in the DSM-5, and some gambling behaviors that do not meet full diagnostic criteria for a GD (e.g., 2–3 inclusionary criteria for GD in DSM-5) have been linked to adverse measures of functioning (Loo, Kraus, & Potenza, 2019) and have been described as subthreshold GD or “problem gambling” or “at/risk gambling.”

The current systematic review examines the associations between sports-betting behaviors and psychosocial problems (e.g., erroneous sports-betting beliefs, mental health disorders, and family-related problems) and investigates whether sports-betting behaviors differ across Western and non-Western cultures. Furthermore, we also examine whether current regulations and policies for sports betting differ by Western and non-Western jurisdictions and cultures and make recommendations for future clinical and public health efforts aimed at reducing problematic sports betting.

Clinical correlates of problematic sports betting

For Australian sports bettors, greater engagement in gambling has been associated with the development of gambling problems (Russell, Hing, & Browne, 2019). In another Australian study, researchers found that sports betting may also include cultural elements relevant to gambling risk, with speaking an additional language other than English potentially increasing risk for problematic online gambling in ethnic minorities (Hing, Russell, & Browne, 2017). Similarly, Oei, Raylu, and Loo's (2019) review on culture's role in gambling and GD found support for cross-cultural differences more generally in GD, gambling behaviors, and gambling beliefs. Specifically, there were higher prevalence estimates of GD among culturally and linguistically diverse groups (e.g., ethnic minorities or Aboriginal groups within Western countries). Their review revealed cultural differences in gambling behaviors and beliefs, including stigma around gambling, motivations for gambling, willingness to seek out treatment for gambling, and gambling-related cognitions (Oei, Raylu, & Loo, 2019). Notably, cultural differences have been more often seen between collectivist (e.g., typical cultures within China, Taiwan, Macau, etc.) versus individualist cultures (e.g., typical cultures found within

Australia and Canada) (Dhillon, Horch, & Hodgins, 2011; Oei & Raylu, 2010; Oei et al., 2019; Po Oei, Lin, & Raylu, 2008). While Oei and colleagues' (2019) review provides a valuable foundation for cross-cultural research in gambling, the potential cultural differences specific to sports betting remain largely unexplored.

The extant sports-betting literature has produced few reviews to date. Previous reviews have focused on in-play sports betting (i.e., placing a bet on a sporting event that is in progress) in primarily Western countries (Killick & Griffiths, 2019) or examined general sports-betting behaviors and cognitions worldwide, rather than specific differences between countries (Mercier et al., 2018). As such, a review of jurisdictional and cultural differences in sports betting will provide a unique overview of the current findings in this area and suggest future directions for sports-betting cross-cultural research. Although some previous research has examined cultural differences within sports betting and general gambling, this research frequently involves comparisons between only two countries (e.g., one Western country, such as Canada, and one Eastern country, such as China) or ethnic groups (e.g., White/European compared to East Asian individuals). A review of sports betting across jurisdictions can examine comprehensively for potential cultural differences between several different countries and ethnic communities.

To address current gaps in the literature, our systematic review explored three study aims: (1) to assess whether sports-betting behaviors differ within and between different countries (e.g., United States, Australia, United Kingdom, China); (2) to evaluate psychosocial problems related to sports-betting behaviors and how problems may differ by country; and (3) to summarize the current regulatory guidelines for sports betting in different countries, for the purpose of making broad recommendations for reducing problematic sports betting across Western and non-Western countries. In the interest of brevity, we chose to focus on traditional forms of land-based/online sports betting for this current review, and do not include esports betting, or forms of gambling-related activities that occur within video games, such as microtransactions or loot boxes.

METHODS

Search strategy

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for this systematic review (Moher, Liberati, Tetzlaff, & Altman, 2009). This review only included peer-reviewed articles, which we collected from the databases PubMed, Web of Science, and PsycINFO. The search strategy included the following terms: (sport* AND gambl*) OR (sport* AND betting) OR (sport* AND bet) OR (sport* AND bettor*) OR (sport* AND wager*). In addition, we conducted searches of reference lists of included articles. To achieve the aims of this review, for the 65 articles included in the final review, we assessed the country of origin for each article and determined which (if



any) sports-betting behaviors/psychosocial problems differed by country. Figure 1 describes the selection and screening process of identified studies.

Selection criteria and review process

All studies were managed and organized through Rayyan (Ouzzani, Hammady, Fedorowicz, & Elmagarmid, 2016), a web-based application for systematic reviews. Two authors (RE, TX) screened each reference title and abstract independently for the full-text review and exchanged their decisions subsequently. When a selection could not be made, the authors discussed article inclusions as a group to reach a consensus. Studies were included in the initial pool of articles (after duplicates were eliminated) if they were: (1) published in English or Chinese as these languages were spoken by the researchers (the search criteria terms, however, were only in English) and (2) published between January 1, 2010, and March 28th, 2022, inclusively. This date range was chosen to focus on more recent studies and developments. We did not deliberately exclude any countries in the initial pool of articles. If a study met the following exclusionary/inclusionary criteria, it was included in this systematic review.

Exclusionary criteria. The following exclusion criteria were employed: (1) participants who were children, adolescents, college students, sports athletes, or treatment-seeking; (2) studies focused on esports, loot boxes/microtransactions,

horse racing, social media account analyses (i.e., Twitter account data), or predictions of the outcomes of sports events; (3) studies that were a review, a case report, a book chapter, a thesis or dissertation, secondary data, or a conference paper; (4) studies that focused on measure validation, illegal gambling, or testing gambling models; and (5) non-human subjects were used (e.g., mice, rats). The reasoning behind these exclusionary criteria is explained below.

This review focuses on adults participating in legal sports betting, and therefore, it does not examine issues of legality. This review examines sports betting generally, and as such does not examine specific populations, such as college students or treatment-seeking sports bettors. Furthermore, studies that focus on esports, loot boxes/microtransactions, horse racing, social media account analyses, or predicting the outcomes of sports events were not included in the review for reasons of parsimony, and because this review focuses on sports-betting behavior as related to traditional sporting events. Measure validation, and animal studies were also considered to fall outside of the scope of this review. Lastly, articles had to be original, peer-reviewed studies published in scholarly journals to be included in the review. We thus excluded reviews, case reports, book chapters, theses or dissertations, secondary data, or conference papers.

Inclusionary criteria. Included articles had the following characteristics: (1) they were published in English (the

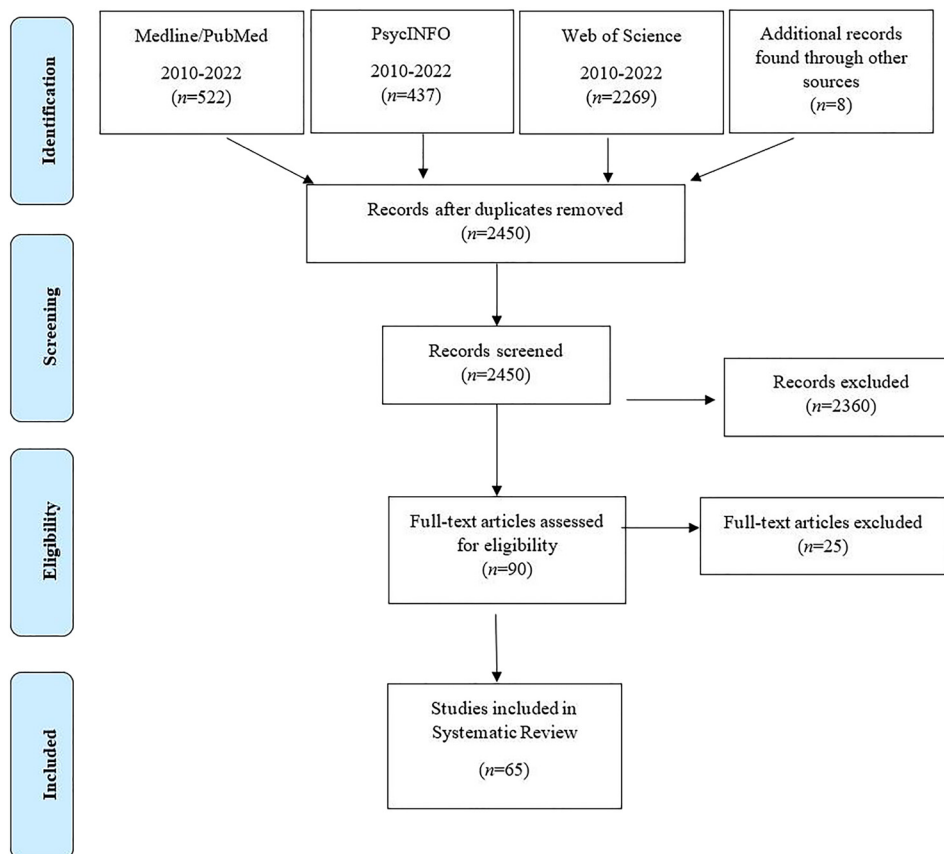


Fig. 1. PRISMA flow diagram of the systematic review phases

primary language of the authors); (2) had a major focus on sports betting or sports bettors; (3) were primary data sources (studies using original data); (4) had been published in peer-reviewed journals (to guarantee studies had been critically examined and approved by other researchers); and (5) did not contain any of the exclusionary criteria previously covered in the methods section. We found no relevant publications in Chinese to include in the final review.

Regulatory guidelines. PRISMA systematic review guidelines were not used to find regulatory information for sports betting. Instead, we examined peer-reviewed articles, legal acts, and relevant websites in order to evaluate current sports-betting regulations within individual jurisdictions. As it was not feasible to include sports-betting regulations for every country, Table 1 includes regulations for countries that were most strongly represented (i.e., at least 3 articles for each Western country and at least 1 article for each Eastern country) from the articles included in this review.

Article categorization. The authors determined article category by grouping articles with similar aims and topics. This categorization was based on natural groups that derived from the literature review. For articles that could be classified into multiple categories, the authors conferred on which category was the best fit for the article, until full consensus was reached. This review found six common domains explored in relation to sports betting. These domains were created by the authors after examining the themes covered in the included articles of this review. The six domains included: Marketing, Fantasy Sports (i.e., activities in which participants create virtual teams that consist of real sports players), Qualitative Studies, Responsible Gambling, Problem Gambling, and Psychosocial. Articles may share some overlap between domains but were placed in the “primary” and best-fitting domain. Studies that could not be grouped by these common themes were put into an “Uncategorized” domain.

RESULTS

Sixty-five articles were included in the present systematic review. The most heavily researched topics included the marketing of sports betting ($n = 13$) and fantasy sports betting ($n = 13$), followed by problem gambling in sports betting ($n = 12$), psychosocial aspects of sports betting ($n = 9$), qualitative interviews with sports bettors ($n = 7$), and responsible gambling initiatives ($n = 5$), with the remaining articles making up the uncategorized studies category ($n = 6$). Most studies were conducted in Australia, the United States, or the United Kingdom, while a limited number of articles examined sports betting in Asia.

For the countries in this review, their regulatory guidelines for sports betting included state or federal regulations and/or sanctions (see Table 1). Countries differed in the types of sports betting allowed (e.g., sports lotteries are the only legal form of sports betting within China and Taiwan, and all online sports betting is illegal in Iceland), and in their

sports-betting restrictions (e.g., in Australia, in-play betting is not allowed unless the bet is placed over the telephone or by using a machine at a licensed venue). Generally, Eastern countries tended to have more conservative and restrictive guidelines as compared to Western countries. For a full summary of sports-betting regulations for countries, see Table 1.

Domain 1: marketing and sports betting

Thirteen studies investigated marketing within sports betting, and several of these studies examined the content of advertisements. As concluded by Lopez-Gonzalez, Estévez, and Griffiths (2018), sports-betting advertisements aimed to reduce the perceived risk of gambling and to enhance the perceived control of bettors. Most characters in advertisements were male (Lopez-Gonzalez, Guerrero-Solé, & Griffiths, 2018), as likewise found by Roth-Cohen and Tamir (2017). Gender may play an important role in sports-betting promotions, as Hing, Vitartas, and Lamont (2017) found that attractive, non-expert, female presenters gained more attention from all gambling groups than other presenters.

In-play betting has been regularly marketed within sports-betting advertising, and overall seems to be quite persuasive to sports bettors (Thomas, Lewis, Duong, & McLeod, 2012). Consistent with the finding of Thomas et al. (2012), which found that in-play betting was one of the main themes of the advertisements, 46% of sports-betting television advertisements ($n = 135$) contained in-play betting (Lopez-Gonzalez, Guerrero-Solé, & Griffiths, 2018). Similarly, other research has suggested that advertising encouraged in-play betting and found that 39.1% of World Cup 2018 advertised bets could be determined before the match ended (Newall, Thobhani, Walasek, & Meyer, 2019). Another form of marketing that was commonly used involved inducements (refund/stake-back offers, followed by sign-up offers and promotional odds), which were typically subject to numerous, difficult-to-understand terms and conditions (Hing, Sproston, Brook, & Brading, 2017). Among them, bonus bets with play-through conditions, such as multi-bet offers, and refer-a-friend offers seemed particularly difficult to interpret for bettors, who frequently underestimated of the true costs of the inducements (Hing et al., 2019). Generally, individuals with problematic sports-betting behaviors showed high approval of gambling promotions (Hing, Lamont, Vitartas, & Fink, 2015). See Table 2 for a review of these articles.

Domain 2: fantasy sports and sports betting

Thirteen studies explored fantasy sports and sports betting. Fantasy sports have become increasingly popular, particularly in the United States (Fantasy Sports & Gaming Association). Betting on fantasy sports typically involves betting in two forms: (a) fantasy sports leagues and (b) daily fantasy sports (DFS). Betting in a fantasy sports league involves players creating a virtual team to compete against others for real money wagers. These competitions are generally longer-term and may run over an entire sports season. In contrast,



Table 1. Summary of sports betting regulations

Country/Region	Level of Regulatory Authority	Types of Betting	Description
Australia	National level; State Level	Single-game betting, parlays, teasers, parimutuel betting	Land-based sports betting is regulated individually by each state and territory, while online sports betting is regulated by the Interactive Gambling Act (2001) at the national level (Hartmann, Keen, Dawczyk, & Blaszczyński, 2016). A sporting event refers to a specific event that is determined by the Minister, such as a match, race, time trial, and tournament (Interactive Gambling Act, 2001). Sports betting includes betting on race events (e.g., horse race, harness race, or greyhound race) and sporting events. In-play betting is not permitted unless the bet is placed over the telephone or by using a machine at a licensed venue (Nettleton & Gauci, 2020).
Canada	Provincial level	Parlay wagering, single-game betting	Sports betting is overseen individually by each provincial or territorial government. Prior to June 22, 2021, both online and land-based sports betting companies could only offer parlay wagering, as single-event betting was illegal under the Criminal Code of Canada (Hartmann et al., 2016). That is, customers can only wager on the outcome of two or more sporting events. With the passing of a new bill (C-218), this restriction has been removed at the federal level (Safe and Regulated Sports Betting Act, 2021). Single-game sports betting is now available in several places such as British Columbia (Evans, 2021).
China	National level	Sports lottery	Based on the Criminal Law of the People's Republic of China, the only legal form of sports betting is sports lotteries, which are issued by the China Sports Lottery Administrative Center (CSLAC) (Wu & Lau, 2015 ; Hartmann et al., 2016). These lotteries include scratch-and-win lotteries, seven stars, listing 3/5, sports lotto, and football/basketball lottery (Huang, 2012).
France	National level	Fixed-odds betting, in-play betting	Under the Homeland Security Code, sports betting refers to “bets involving a monetary stake where the players’ potential winnings depend on the accuracy of their bets on the outcome of any real sports competition legally organized in France or abroad.” (Richard & Mullenex, 2020). Land-based sports betting is operated by Française des Jeux (FDJ Group, 2021), while online sports betting is open to all licensed operators (Valleur, 2015).
Germany	Federal level; State level	Fixed-odds betting, in-play betting	At the federal level in Germany, sports betting is regulated by the Interstate Treaty on Gambling 2012/2020 (Hofmann, Spitz, & Maier, 2020). States are assigned different duties to regulate the industry nationwide: North-Rhine Westphalia issues advertising permits; Hesse reviews/issues licenses; Lower Saxony blocks payment processors for illegal operators (Hofmann et al., 2020). Sports bets refer to “fixed odds bets on the outcome of a sports event or a part of a sports event.” (Interstate Treaty on Gambling, 2020). In-play betting is also permitted, but only on the results of a sports bet (e.g., no betting on the outcome of the coin flip). There is no limit on the number of sports betting licenses to the public (Hofmann et al., 2020).
Iceland	National level	Football pools, fixed-odds betting	Land-based sports betting is under the supervision of the Ministry of Justice (Hartmann et al., 2016). It only offers football pools and fixed-odds betting (Müller, 2014). Although online sports betting is considered illegal, people can still use unlicensed websites to bet on sporting events without breaking any laws (Hartmann et al., 2016).
Israel	National level	Sports lottery, single-game betting	Betting is defined as “any arrangement under which it is possible to win money, valuable consideration, or benefit, by guessing something, including lotteries based on the results of sports matches and contests.” (Penal Law 5737, 1977). The Penal Law prohibits gambling in Israel, but two activities including the sports betting service provided (which includes a sports betting website) by the Israel Sports Betting Board (ISBB) and lotteries offered by Mifal Hapayis, a national lottery organization, are legal (Barak, 2020).

(continued)



Table 1. Continued

Country/Region	Level of Regulatory Authority	Types of Betting	Description
South Korea	National level	Sports lottery	Sports are defined as “activities to cultivate a healthy mind and body through physical activities, such as sports events and outdoor sports, and to make good use of leisure time.” (National Sports Promotion Act, 2020). The business of sports betting is exclusively operated by the Sports Toto, a government-sanctioned company, which has 6,500 sports betting off-line shops and one sports betting website (Han, 2020). Only a few sporting events are offered, which include football, basketball, baseball, volleyball, and golf (Sports Toto, 2021). Sports betting refers to “the competition to predict the result of one or several sporting events, included in the programs previously established by the organizing body, or based on sporting facts or activities that form part or are carried out by the gaming operators within the framework of such events or competitions.” (The Spanish Gambling Act, 2011). Land-based sports betting is overseen by each regional authority, while online sports betting is under the supervision of the Directorate General for Regulation of Gambling (DGOJ) (Hartmann et al., 2016).
Spain	National level; Provincial level	Straight betting, parimutuel betting	Sports betting is regulated by the Ministry of Education’s Sports Administration and only sports lottery and pool betting are offered (Lee, Huang, Jiang, & Lee, 2012). The sports lottery refers to “any lottery in which the winners are determined based on the outcome of any professional or collegiate sporting event.” (Sports Lottery Issuance Act, 2020). Also, the lottery is the only legal form of online sports betting (Hartmann et al., 2016).
Taiwan	National level	Sports lottery, pool betting	The UK includes Great Britain (England, Scotland, and Wales) and Northern Ireland. In Great Britain, sports betting is regulated by the Gambling Commission under the Gambling Act of 2005 (Hartmann et al., 2016). Betting means “making or accepting a bet on the outcome of a race, competition or other event or process, the likelihood of anything occurring or not occurring, or whether anything is or is not true.” (Gambling Act, 2005). The types of betting include fixed odds betting, pool betting, spread betting, and betting exchanges, and fantasy sports (Barr-Smith, 2012). In Northern Ireland, sports betting is regulated under the Betting, Gaming, Lotteries and Amusement (NI) Order 1985 (Hartmann et al., 2016). The existing regulations in both two regions are being reviewed.
United Kingdom	State level	Fixed odds betting, pool betting, spread betting, betting exchanges, and fantasy sports	As of May 2021, legal sports betting is operational in 23 states and the District of Columbia (Legal Sports Report, 2021). The definitions of sports betting differ by state. For example, in Michigan, “sports betting” refers to operate, conduct, or offer for play wagering conducted on athletic events and other events approved by the board ...” (Lawful Sports Betting Act, 2019). While in Illinois, sports wagering means “accepting wagers on sports events or portions of sports events, or on the individual performance statistics of athletes in a sports event or combination of sports events, by any system or method of wagering ...” (Sports Wagering Act, 2020). Similarly, the available types of sports bets differ by state. In Illinois and Wyoming, they include single-game bets, teaser bets, parlays, over-under, money line, pools, exchange wagering, in-game wagering, in-play bets, proposition bets, straight bets, and fantasy sports (Sports Wagering Act, 2020 ; Online Sports Wagering Act, 2021). In contrast, fantasy sports is illegal in the state of Washington (Washington State Gambling Commission, 2021).
United States of America	State level	Types of betting vary by state	



Table 2. Summary of studies exploring marketing and sports betting

Article	Country and sample (n and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Hing et al. (2015)	Australia: n = 544 online and offline sports bettors. Included 242 regular sports bettors, 266 non-regular sports bettors, and 36 sports bettors with unspecified gambling frequency	No data on ethnicity 63.6% male 42.2±14.26 years	To investigate sports bettors' responses to gambling promotions, and whether their response varies with problem gambling severity	PGSI and behavioral measures of gambling; Participants classified as non-problem gamblers, low risk gamblers, moderate risk gamblers, and problem gamblers	Problem gamblers had the highest approval of gambling promotions. Problem gamblers also reported more encouragement and influence on gambling from these promotions as compared to all other groups.
Hing et al. (2016)	Australia: n = 639 online and offline sports bettors who had bet on sports in the last 12 months	None reported	To identify, behavioral, normative, and demographic risk factors for gambling problems amid sports bettors	PGSI evaluated gambling severity continuously	Vulnerable groups at higher risk to gamble included those who were young, educated, male, single, and employed full-time or a full-time student. Influences from significant others and from media advertising were associated with greater problem gambling risk.
Hing, Russell, Lamont, and Vitartas (2017)	Australia: n = 223 separate inducements which were categorized into 15 generic types. Inducements offered on the websites of 30 major race and sports betting brands	None reported	To investigate the range and structural features of racing and sports-betting inducements. It also aimed to examine the inducements alignment with the harm minimization and consumer protection goals of responsible gambling	None reported	All inducements were subject to numerous complex and difficult to understand terms and conditions. Website advertisements for inducements were noticeably promoted; yet few contained a responsible gambling message.
Hing, Sproston, et al. (2017)	Australia: n = 455 online and offline sports bettors. Included regular and non-regular sports bettors	No data on ethnicity or mean age 71.5% male	To determine whether responses to promotions for online sports betting varied with problem gambling severity	Attitude, approval, and subjective influence of gambling promotions, and the PGSI; Participants classified as non-problem gamblers, low risk gamblers, moderate risk gamblers, or problem gambler	Young male Internet sports bettors are especially vulnerable to gambling problems, particularly if they hold positive views toward gambling sponsors. As problem gambling severity increased, participants indicated that gambling promotions had a negative impact on their sports-betting behaviors.
Hing, Viartas, and Lamont (2017)	Australia: n = 611 online and offline bettors. Included 200 regular sports bettors, 207 non-regular sports bettors, and 204 non-sports bettors	No data on ethnicity or mean age 58.1% male	To examine which attributes of sports-betting advertisements most engaged interest, attention, and desire, as well as likelihood of betting when considering different severities of gambling	PGSI; Participants classified as non-problem gamblers, low risk gamblers, moderate risk gamblers, or problem gamblers	The attractive non-expert female presenter gained more attention from all gambler groups than other presenters. Among all gambler groups the most persuasive advertisement in converting attention into likely betting was type of bet (specifically the risk-free bet).

(continued)





Table 2. Continued

Article	Country and sample (n and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Hing, Russell, Li, and Vitartas (2018)	Australia: n = 1,813 online and offline sports bettors who had bet on sports during the last 12 months	No data on ethnicity or mean age 69% male	To determine whether wagering inducements predict impulse betting on sport	Sports betting behaviors and the PGSI; Participants classified as non-problem gamblers, low risk gamblers, moderate risk gamblers, or problem gamblers	Impulse betting was common and frequent users of wagering inducements had a greater propensity to place impulsive in-play bets. Impulsive sports bettors had higher trait impulsiveness, higher problem gambling severity, and more frequent sports betting.
Hing et al. (2019)	Australia: n = 299 online and offline sports bettors who had bet at least twice within the last 12 months on Australian Rules Football, cricket, or soccer	No data on ethnicity or mean age 96% male	To evaluate whether the attractiveness of gambling inducements with bonus bets varies based on the amount and type of information provided. And, to assess bettors' understanding of the true cost of the inducements and if this varies with problem gambling severity	Gambling frequency measure and PGSI; Participants classified as non-problem gamblers, low risk gamblers, moderate risk gamblers, or problem gamblers	Detailing key terms and conditions for an offer directly below the advertisement lessened its perceived attractiveness. Roughly three in five bettors underestimated the true cost of the inducements. No significant differences were found between gambler risk groups.
Lopez-Gonzalez, Estévez, and Griffiths (2018)	United Kingdom: n = 102 sports betting advertisements produced for television broadcast in the UK and uploaded on bookmakers' official British YouTube channels	None reported	To examine the sports-betting advertisements from the UK by using a grounded theory approach	None reported	Sports betting advertisements aimed to reduce the perceived risk of gambling and to enhance the perceived control of bettors. New technological features, such as in-play betting could lead to a greater sensation of control.
Lopez-Gonzalez, Guerrero-Solé, and Griffiths (2018)	United Kingdom: n = 135 sports betting adverts produced for British and Spanish television broadcast; mainly focused on soccer	None reported	To investigate how sports-betting adverts normalize betting behavior	None reported	Males and mobile betting were predominant in the sports-betting adverts. Almost half of the adverts included in-play betting. Potential large returns with small amounts of wagers were shown to imply great business opportunities.
Newall et al. (2019)	United Kingdom: n = 12 Live-odds adverts during the 2018 World Cup matches	None reported	To investigate the frequency and content of live-odds advertisements during the 2018 World Cup matches	None reported	39.1% of bets could be made before the end of the match, which might increase repeated in-play betting. 24.6% of bets had recently improved odds.

(continued)

Table 2. Continued

Article	Country and sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Rawat, Hing, and Russell (2020).	Australia: Overall <i>n</i> = 212; Sports bettors, <i>n</i> = 102; Race bettors, <i>n</i> = 110. All of whom gambled on sports and races at least fortnightly.	Sports bettors: 93.1% male 42±13.82 years Race bettors: 93.6% male 44±12.51 years Overall: 93.4% male 43±13.17 years No data on ethnicity	To examine the relationship between the content of direct messages and gambling behaviors among sports and race bettors	PGSI; Participants classified as non-problem gamblers, low risk gamblers, moderate risk gamblers, and problem gamblers	Sports and race bettors frequently received direct messages from gaming operators. This study found no significant relationship between the content of messages and the gambling risk status or betting frequency.
Roth-Cohen and Tamir (2017)	Israel: <i>n</i> = 211 sports betting adverts, <i>n</i> = 110 print adverts, and <i>n</i> = 111 television adverts	None reported	To interpret the meanings that can be inferred from sports betting adverts and to examine the history and creative appeals used in Israeli sports- betting adverts	None reported	Sports betting advertisements have been dominated by the presence of males as featured characters, and in addition, representations of militarism are quite prominent.
Thomas et al. (2012)	Australia: <i>n</i> = 12 sports betting marketing content during Australian Football League (AFL) matches	None reported	To investigate the frequency, length, and content of sports-betting marketing at stadiums during live matches and during the televised broadcasts of matches	None reported	A variety of marketing platforms were used to market sports betting during the matches and marketing strategies were integrated into the match. Meanwhile, people primarily received positive messages about sports betting.

Note. Problem Gambling Severity Index (PGSI).



DFS are an accelerated form of fantasy sports betting, wherein players create a virtual team, but participate in shorter-term competitions (usually with entry fees) that take place over a day or a week. Table 3 provides an overview of studies exploring fantasy sports betting.

The majority of articles in this domain investigated DFS betting. Nower, Caler, Pickering, and Blaszczynski (2018) found that when comparing DFS participants to non-DFS gamblers, DFS participants reported involvement in higher numbers of gambling activities, gambling more frequently, and having similar problematic behaviors to those found within online gambling. The level of involvement in DFS is also important to consider, as previous research suggests that heavily involved DFS participants often show increasing engagement (i.e., escalating entries, entry fees and participation) in DFS over time (Edson & LaPlante, 2020). Engagement in DFS could be also related to a big win, with a big win in DFS being associated with increased DFS engagement and losses, although this effect declined over time (Edson, Tom, Philander, Louderback, & LaPlante, 2021). DFS participants' motivations to play may influence their cognitions, behaviors, and engagement, as extrinsically motivated (by financial gain) DFS participants were found to have similar cognitions to people with gambling problems, while intrinsically motivated (by entertainment) DFS participants spent more time and money on DFS activities than extrinsically motivated DFS participants (Drayer, Dwyer, & Shapiro, 2019).

We found three studies that explicitly assessed DFS participation and traditional-only fantasy sports league betting. Dwyer and Weiner (2018) investigated similarities and differences in causality orientations of skill or chance (perceived beliefs that outcomes are determined by either skill or chance). Their results indicated similar relationships among causality orientations for both forms of fantasy sport involvement; however, no relationship was found between the Autonomy (skill) and Impersonal (chance) orientations. Although small differences have been found between DFS and traditional fantasy sports participants on impulsivity measures (Dwyer, Drayer, & Shapiro, 2019) and motivations to play (Weiner & Dwyer, 2017), overall, the two groups appear to present similarly. Broadly, the overall playing of pay to play fantasy sports is associated with higher levels of sports betting and online gambling (Houghton, Nowlin, & Walker, 2019).

Domain 3: qualitative studies of sports betting

Seven studies have explored sports-betting behaviors through qualitative interviews. Three studies used Australian sports-betting samples, three samples were from the United Kingdom, and one sample was based in Nigeria. Table 4 contains a summary of the qualitative sports-betting studies.

Interviews with sports bettors have been used to evaluate sports-betting behaviors and opinions on sports betting. Overall, sports betting is easy to access and can be very pervasive, especially when considering modern online sports-betting features (i.e., in-play betting) (Parke & Parke, 2019). For many sports bettors, sports betting is normative and

enjoyable (McGee, 2020). Although, many sports bettors were aware of the potentially addictive nature of sports betting, they saw mostly positives related to the activity, including beliefs that sports betting could alleviate their poverty or unemployment (Akanle & Fageyinbo, 2019).

Thematic analyses were often performed to analyze the qualitative interviews, and the “normality” of sports betting was again identified. Positive themes related to sports betting included perceiving sports betting as embedded within sporting rituals, having a sense of identity around sports betting, as well as having shared cultural values and desired acumen/skill related to sports betting (Deans, Thomas, Daube, & Derevensky, 2017; Gordon, Gurrieri, & Chapman, 2015). Relatedly, sports bettors may be motivated by fulfilling psychological needs of relatedness and competence (Lamont & Hing, 2020). Some of the riskier aspects of sports betting described themes of feeling social pressure to gamble and temptations to gamble; interviewees also mentioned they felt a lack of industry protection from gambling-related harms (Deans et al., 2017; Killick & Griffiths, 2020).

Domain 4: responsible gambling strategies and sports betting

Only five articles examined strategies for responsible gambling. Responsible gambling has been designed to minimize gambling-related harms among gamblers (Blaszczynski, Ladouceur, & Shaffer, 2004), yet a content analysis of sports-betting advertisements revealed that few responsible gambling messages were displayed (Thomas et al., 2012). These findings resonated with previous work which found that only 12% of sports-and race-betting inducements ($n = 223$) contained information on responsible gambling in website advertisements (Hing, Sproston, et al., 2017). These findings may be especially problematic when considering that gamblers tend to look more at information regarding inducement offers as compared to messages about responsible gambling (Lole et al., 2019).

Responsible gambling strategies (RGS) in sports bettors' decision-making processes have been defined as “diverse strategies or regulations that contribute to minimizing negative personal and social impacts such as problem gambling (Lee, Chen, Song, & Lee, 2014).” RGS may be divided into two types: supplementary RGS (e.g., voluntary treatment programs) and compulsory RGS (e.g., betting limits) (Lee, Chen, et al., 2014). Supplementary RGS have been positively related to both harmonious passion and obsessive passion for sports betting (Lee, Chung, & Bernhard, 2014). On the other hand, compulsory RGS have been negatively associated with obsessive passion (Lee, Chung, et al., 2014). Thus, implementing compulsory RGS has been suggested as being possibly effective in protecting sports bettors against problem gambling by reducing their obsessive passion for sports betting. Similar RGS involved sending sports bettors messages aimed at increasing deposit limit-setting and were effective as sports bettors frequently set limits as compared to controls (Heirene & Gainsbury, 2021). In other work, a consortium of gambling operators developed the Markers of Harm system



Table 3. Summary of studies investigating fantasy sports and sports betting

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [\pm SD])	Study Objective	Measure and severity of gambling problems	Findings
Drayer, Dwyer, and Shapiro (2013)	USA: Online sports bettors; <i>n</i> = 249 fantasy baseball league players	89.2% White 96.8% male 31.75 \pm 10.91 years	To examine the relationship between gambling and the attitudes and behaviors of fantasy players	A four-item gambling subscale of the MSFFP. Individuals separated into groups based on whether they played fantasy baseball for money	Individuals who played for money were not motivated by the opportunity to win money and were instead motivated by the social benefits associated with participation.
Drayer et al. (2019)	USA: DFS players; <i>n</i> = 521 players	79% White 73% male 36.42 years	To determine motivations of DFS players, explore differences in gambling related cognitions, and to examine gambling consumption and behaviors	Two motivational factors from the MSFFP, and the Gambling-Related Cognition Scale	Extrinsically motivated (by financial gain) DFS players were found to be similar to problem gamblers cognitively, while intrinsically motivated (by entertainment) DFS players spent more time and money on the activity than extrinsically motivated DFS players.
Dwyer and Weiner (2018)	USA: Online sports bettors; <i>n</i> = 535 DFS and traditional-only fantasy football participants	71.3% White 78.6% male 31.75 \pm 10.91 years	To explore differences and similarities in causality orientations (skill or chance). Anxiety and enjoyment were tested as mediators on causality orientations	None reported	Differences between the activities were not extreme. Although, differences were found in which emotions mediated relationships between perceived skill and consumption and in which causality orientations influenced enjoyment.
Dwyer, Shapiro, and Drayer (2018)	USA: Online sports bettors; <i>n</i> = 546 DFS players	80.5% White 91.3% male Mean age not reported	To examine problem gambling severity in conjunction with DFS participant motives, perceptions, and consumption behavior	Adapted PGSI for DFS, participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	The results found that problem gambling behaviors were similar to those found in other forms of online gaming. Motivations related to <i>Financial, Competition, and Social Interaction</i> were greater in the high-risk problem gambling group as compared to low and no risk groups.
Dwyer et al. (2019)	USA: Online sports bettors; <i>n</i> = 314 overall participants; <i>n</i> = 157 DFS only players and <i>n</i> = 157 traditional-only fantasy football players	69% White 66% male 34 \pm 10.18 years	To determine differences in consumption behavior and gambling-related dispositions between DFS only players and traditional fantasy-only fantasy football players	Gambling-Related Cognitions Scale	DFS participants had statistically significant higher scores for certain impulsivity (premeditation/seeking sensation) and gambling-related cognition (illusion of control) factors, but overall DFS involvement seems to closely resemble traditional fantasy sports participation.

(continued)





Table 3. Continued

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Edson and LaPlante (2020)	USA: Online sports bettors; <i>n</i> = 11,331 DFS players on DraftKings	No data on ethnicity or gender 33.50 years	To investigate how DFS is associated with excessive engagement (i.e., escalating entries, entry fees, and participation) over time	None reported	Results indicated increasing engagement over time among the most involved players. Less-involved players had high initial engagement followed by decreasing engagement over time.
Edson et al. (2021)	USA: Online sports bettors; <i>n</i> = 34,596 DFS players on DraftKings	None reported	To examine the effects of DFS big wins on subsequent play	None reported	A big win in DFS was associated with increased DFS engagement and losses. Though, the effect of a big win on engagement and losses declines over time.
Houghton et al. (2019)	USA: Online and offline sports bettors; <i>n</i> = 480 participants with a general interest in sports	80% White 64% male No data on age	To examine the relationship between sports fandom, sports betting and fantasy sports	None reported	Playing pay-to-play fantasy sports lead to higher levels of sports betting and online gambling. Materialism was associated with sports betting as people with high levels of materialism engaged directly in sports betting.
Nelson et al. (2019)	USA + Canada: Online sports bettors; <i>n</i> = 10,385 DFS players; who participated in at least one paid NFL contest.	No data on ethnicity or gender 34 years	To investigate actual play patterns of DFS players	None reported	Most DFS players exhibited moderate play patterns. Players' engagement and financial engagement were negatively associated with percent lost, while the frequency of play was not associated with the average bet size.
Nower et al. (2018)	USA: Online and offline sports bettors; DFS players; <i>n</i> = 299, who played DFS in the past year; Non-DFS gamblers, <i>n</i> = 1,847, who had gambled but not played DFS in the past year; Overall <i>n</i> = 2,146	DFS players: 80.3% male 42.8% White 35.4±11.20 years Non-DFS players: 45.9% male 65.0% White 47.3±16.20 years Overall: 50.7% male 61.9% White 45.6±16.20 years	To explore the gambling behaviors, problem gambling severity, and comorbid conditions among DFS players	PGSI, participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	DFS players were more likely to be male and to report suicidal thoughts. They participated in a higher number of gambling activities and gambled more frequently than non-DFS gamblers.
Ruibley, Billings, and Nick Buzzelli (2021)	USA: Online and offline sports bettors; <i>n</i> = 519 fantasy sport participants including <i>n</i> = 401 DFS players	87.7% White 96% male 33.08±10.60 years	To investigate participation and attitudes toward forms of fantasy sport and sports betting	None reported	Participants indicated a high familiarity, enjoyment, and participation in sports betting. As sports fandom increased, interest in future sports betting interest also increased.

(continued)

Table 3. Continued

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Tom et al. (2019)	USA: Online sports bettors; <i>n</i> = 11,130 DFS players; who had participated in at least one DraftKings contest	None reported	To examine relationships between social behaviors and DFS risk behaviors	None reported	DFS players who used referral programs were more likely to engage in risky DFS play. The number of friend referrals was positively associated with player risk scores.
Weiner and Dwyer (2017)	USA: <i>n</i> = 510 overall participants; <i>n</i> = 62 DFS only players, <i>n</i> = 255 traditional-only (season long) fantasy football players, and <i>n</i> = 193 hybrid players	71% White 68% male 34±10.18 years	To assess for motive and behavioral differences between DFS only, traditional-only and hybrid fantasy football players	MSFFP	There were significant differences in motive scores across the groups for the factors of gambling, social interaction, and competition. The groups showed no differences in entertainment and escape scores.

Note. Articles were listed as being in the USA due to the vast majority of these players being located in the USA. Problem Gambling Severity Index (PGSI), Motivational Scale for Fantasy Football Participation (MSFFP), Daily fantasy sports (DFS).

(i.e., an algorithm) to identify problematic sports-betting behaviors. Although some markers were positively associated with gambling engagement and proxies of problem gambling, researchers suggested that further adjustments should be made to improve the algorithm’s group classification and risk thresholds (McAuliffe, Louderback, Edson, LaPlante, & Nelson, 2022). Table 5 summarizes these studies.

Domain 5: problem gambling and sports betting

The twelve studies within this category primarily focused on associations between problem-gambling behaviors, problem gambling, and sports betting. Table 6 contains a synopsis of these studies. Overall, sports bettors tend to be young, impulsive, and engaged in sports betting, with those with problem and moderate-risk gambling being more likely to have greater levels of sports-betting involvement than those with non-problem and low-risk gambling (Russell, Hing, & Browne, 2019). Other factors associated with sports-betting problems included stronger gambling urges, more erroneous cognitions, overconfidence, poorer self-control, and problematic use of alcohol (Bum, Choi, & Lee, 2018; Russell, Hing, Li, & Vitartas, 2019). Comparably, for participants in sports lottery, level of sports-lottery consumption was associated with financial and social consequences and compulsive (disordered) gambling (Li et al., 2012). Sports bettors appear to be a high-risk group for developing problem gambling (Cooper, Olfert, & Marmurek, 2021; Lopez-Gonzalez, Russell, Hing, Estévez, & Griffiths, 2019).

Another problematic gambling behavior may be related to custom sports betting, in which gamblers create unique individualized bets. For example, one study found that custom sports betting was correlated with problem-gambling severity, gambling-related harms, and gambling consumption (Newall, Cassidy, Walasek, Ludvig, & Meyer, 2021). Lastly, a study investigating problem-gambling behaviors in online sports bettors found that the amount of money spent was the strongest statistical predictor of problem-gambling-related exclusion for sports bettors (Ukhov, Bjurgert, Auer, & Griffiths, 2020).

Domain 6: studies investigating psychosocial aspects of sports betting

Several articles investigated how psychosocial factors relate to sports-betting behaviors (see Table 7). Cognitive distortions have frequently been examined in GD, but these cognitions could also contribute to maintaining sports-betting behaviors. A recent study found that substance use mediated the relationship between cognitive distortions and suicidal ideation among sports bettors (Chukwuorji et al., 2020). Other studies have more specifically examined sports bettors’ cognitions (i.e., biases, illusion of control or decision-making). One study found similar levels of overconfidence bias for both sporadic and frequent gamblers (Erceg & Galić, 2014). With regard to illusion of control, there was no significant difference between the groups with and without problematic sports-betting behaviors (Huberfeld, Gersner, Rosenberg, Kotler, & Dannon, 2013).





Table 4. Summary of studies qualitatively examining sports betting

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Akanle and Fageyinbo (2019)	Nigeria: Online and/or offline sports bettors; <i>n</i> = 16 owners of football betting platforms or customers of football betting	No data on ethnicity or mean age 79% male	To contribute to the understanding of how European football identities are related to the increased popularity of betting associations	None reported	Many of the young sport bettors are aware of the addictive nature of this activity; however, they do not endorse negative aspects of sports betting. Many who bet believe that football betting cannot lead to social problems and will alleviate poverty and unemployment.
Deans et al. (2017)	Australia: Online and/or offline sports bettors; <i>n</i> = 50 men who were fans of, and had participated in gambling on either the National Rugby League (NRL), or Australian Football League (AFL)	No data on ethnicity 100% male 28±4 years	To qualitatively examine how peer group behaviors influence attitudes towards, and consumption of gambling products	PGSI; participants were classified into low, moderate, and high levels of gambling	Four thematic clusters emerged from the interviews. These included perceptions of sports betting as 'normal', sports betting becoming embedded within sporting rituals, a creation of a sense of identity around sports betting, and social pressure to gamble to 'fit in' with friends.
Gordon et al. (2015)	Australia: Online and/or offline sports bettors who reported sports betting at least once in the past 12 months; Ten friendships group interviews with <i>n</i> = 50 young adults between 18 and 30 years old	No data on ethnicity or mean age 66% male	To explore how consumers navigate, interpret, and participate in sports betting consumption communities	Brief Biosocial Gambling Screen (potential participants identified as pathological gamblers were excluded from the study)	Two key themes relating to how consumers interpret, navigate, and participate in sports betting lifestyle consumption communities were identified: <i>shared cultural values</i> and <i>desired acumen and skill</i> .
Killick and Griffiths (2020)	United Kingdom: Online sports bettors who placed at least one in-play sports bet online within 6 months prior to the interview taking place; <i>n</i> = 19	No data on ethnicity 89.5% male 25.5±3.5 years	To explore the attitudes and opinions of sports bettors in response to marketing strategies and to investigate the perceived impact of advertising on participant's sports-betting behaviors	PGSI; participants were classified into non-problem gambler, low-risk, moderate-risk, or problem gambling	Three main themes found were <i>temptation to gamble</i> , <i>promotion characteristics of gambling</i> , and <i>regulating gambling advertising</i> . Enhanced odds and "request-a-bet" promotions were perceived to increase feelings of control.
Lamont and Hing (2020)	Australia: Online and/or offline sports bettors who reported sports betting at least once in the past 12 months; <i>n</i> = 35 young adults between 18 and 34 years old	No data on ethnicity 100% male 27.6±4.80 years	To provide a deep and nuanced interpretation of young men's motivations for sports betting	None reported	Sports betting was driven by motives reflecting five SDT behavioral regulations, based around satisfying innate psychological needs of relatedness and competence.
McGee (2020)	United Kingdom: Online sports bettors; <i>n</i> = 32; who placed a minimum of one bet per week	100% White British or Irish 100% male No data on age	To qualitatively investigate gambling behaviors and risks associated with sports betting	None reported	Young men perceived gambling as a normalized and enjoyable part of sports. They were more likely to participate in sports betting because of

(continued)

Table 4. Continued

Article	Country and Sample (n and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Parke and Parke (2019)	United Kingdom: Online sports bettors who were problem gamblers; n = 19	No data on ethnicity 95% male 34.6±9 years	among young men in the United Kingdom To investigate disordered patterns of online sports betting behavior by using the grounded theory approach	PGSI; participants were classified into non-problem, low-risk moderate-risk and a problem gambler	the convenience of smartphone technologies and promotion incentives. Many individuals did not recognize the risks of online sports betting. Gamblers were motivated to re-engage in online sports betting because of modern online sports betting features, such as live betting. The ease of access and ubiquitous online sports betting and ubiquitous online sports betting marketing made it difficult to maintain self-control.

Note. Problem Gambling Severity Index (PGSI)

Personality features, such as aggression and neuroticism, may also influence sports-betting behaviors (Lin & Lu, 2015; Polat & Yildiz, 2021). In a study exploring the relationship between sport spectators’ gambling motivations and aggression propensities, greater propensities for violence were related to higher fandom levels among sports spectators who gambled (Polat & Yildiz, 2021). A separate study found that sports lottery bettors with neurotic tendencies had lower risk tolerance, while bettors with extroversion, openness, and agreeable tendencies had higher risk tolerance (Lin & Lu, 2015).

Domain 7: uncategorized studies examining sports betting

Six studies on sports betting that did not fit into the previous categories covered in this review were included in Table 8 as uncategorized. Overall, it remains unclear whether measuring gambling in a multidimensional measure is appropriate, as previous research did not find support for a taxonomic or dimensional model for extreme gambling behaviors among sports bettors (Braverman, LaBrie, & Shaffer, 2011). A separate study investigated relationships between sports-betting behaviors and various factors (e.g., hunger level, alcohol consumption, and recreational drug use), and found that these factors had both indirect and direct effects on impulsive bet size (Li, Hing, Russell, & Vitartas, 2020).

Several studies have analyzed sports bettors’ account data (generally for online betting). One study found that most bets were placed on races or sports, with 77.63% of bets resulting in player losses (Gainsbury & Russell, 2015). A different study investigating patterns of gambling behavior found higher losses for players, as subscribers to an online betting website lost 96% of the amounts they wagered (Gray, Jönsson, LaPlante, & Shaffer, 2015).

DISCUSSION

Sports betting has grown to become a profitable and widely accepted activity around the world. The current systematic review aimed to assess whether sports-betting behaviors differ among and between different countries. We evaluated psychosocial problems related to sports-betting behaviors and how problems may differ by country, and additionally summarized the current regulatory guidelines for sports betting across different countries.

Overall, we found that research on marketing and promotion of sports betting was most prevalent in Australia and the United Kingdom. This could possibly be due to these locations having an environment where marketing and promotion of sports betting is acceptable and common. Indeed, large number of studies in these regions suggest that sports-betting advertisements are influential, persuasive, and associated with higher sports-betting-related behaviors. Qualitative studies have also suggested that sports-betting advertising and promotions may motivate sports bettors to gamble. Furthermore, sports betting has been normalized

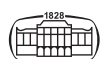




Table 5. Summary of studies exploring responsible gambling strategies and sports betting

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Heirene and Gainsbury (2021)	Australia: Online sports bettors; <i>n</i> = 26,560; who were account holders of Australian sports and race wagering websites.	No data on ethnicity 79% male 41.4±14.30 years	To test the effectiveness of three different messages designed to increase deposit limit-setting on gambling sites, sent through either e-mail or in-account notification. This study also examined how limit-setting impacted gambling behavior	None reported	One hundred and sixty-one bettors who were sent messages set limits compared to three controls. In-account messages showed no significant differences from e-mails. Bettors who set limits significantly decreased their average daily wager, and several other behaviors as compared to non-limit-setters.
Lee, Chung, and Bernhard (2014)	South Korea: Online sports bettors; <i>n</i> = 288	No data on ethnicity or mean age 76% male	To determine whether types of passion were related to types of motivation and consequences of gambling	Gambling Passion Scale, and questions on gambling motivation and gambling consequences. No specific problem-gambling severity	Intrinsic gambling motivations are related to harmonious passion, which in turn results in positive consequences. Whereas, extrinsic gambling motivations are related to obsessive passion, which in turn results in negative consequences.
Lee, Chen, et al. (2014)	South Korea: Online sports bettors; <i>n</i> = 587	No data on ethnicity or mean age 94.9% male	This study aimed to examine the effect of responsible gambling strategy on intentions to engage in online gambling by revising the theory of planned behavior	Questions related to gambling passion and questions on responsible gambling strategies	The inclusion of two types of gambling passion and two types of responsible gambling strategies explains online gambling intention well.
Lole et al. (2019)	Australia: Online and offline sports bettors; <i>n</i> = 59; who had bet on sports at least monthly in the last 12 months	No data on ethnicity 79.7% male 39.7±10.20 years	To examine how much responsible gambling messages were viewed, compared to other text-based messages, within the same sports-betting advertisement	PGSI; participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	Gamblers placed few fixations on responsible gambling messages, compared to inducement information. The number of fixations could be increased by presenting messages on a high-contrast/block-color background.
McAuliffe et al. (2022)	United Kingdom: Online sports bettors; <i>n</i> = 49,335	No data on ethnicity 92.0% male 30.59±10.22 years	To evaluate the Markers of Harm system. Also, this study aimed to examine the relationship between Markers of Harm and problem gambling severity.	None reported	Gaming operators developed the Makers of Harm system to detect at-risk gamblers. System scores were positively related to gambling engagement and proxies of problem gambling. Nevertheless, some limitations should be corrected to improve the system.

Note. Problem Gambling Severity Index (PGSI).

Table 6. Summary of studies examining problem gambling and sports betting

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [\pm SD])	Study Objective	Measure and severity of gambling problems	Findings
Brevers et al. (2021)	Europe: Online and offline sports bettors; <i>n</i> = 65 bettors	No data on ethnicity 93.8% male 26.04 \pm 5.63 No data on ethnicity	To investigate whether sports-betting cue reactivity is controlled by problem gambling severity, sports-betting passion, and trait-self-control	PGSI; Participants were classified into non-problem bettors and moderate to high-risk gamblers	Problematic sports bettors were sensitive when facing sports cues that were unavailable for betting. That is, the brain reactivity to unavailable gambling opportunities might be a marker of problem gambling.
Bum et al. (2018)	South Korea: online sports bettors; <i>n</i> = 291; bettors recruited at sports lottery stores	No data on ethnicity or mean age 78.4% male	To compare the differences in sports bettors' irrational beliefs and social adaptation based on their problem gambling severity	PGSI; Participants were classified into non-problem gamblers, low-risk gamblers, moderate-risk gamblers, and high-risk gamblers	As problem gambling severity increased, online sports bettors tended to have stronger irrational gambling beliefs, show more overconfidence, and overestimate their techniques.
Cooper et al. (2021)	Canada: Offline sports bettors; <i>n</i> = 1,280 participants overall, with <i>n</i> = 596 of whom had placed bets on a sporting event in the last 12 months	No data on ethnicity or mean age 44.6% male	To identify predictors of problem gambling severity by examining differences in the psychological characteristics and gambling behaviors of sports bettors and non-sports bettors	PGSI, Gamblers Belief Scale, Gambling Motivation Scale. Using the PGSI, participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	Sports bettors appear at higher risk of problem gambling compared to non-sports bettors, perhaps due to differences in attitudes towards gambling, thinking styles, gambling motivations, personality traits and erroneous cognitions.
Gainsbury, Abarbanel, and Blaszczynski (2020)	Australia: Online Sports bettors; <i>n</i> = 500; who indicated they had wagered on sports during the prior 4 weeks	71.8% European 67.8% male Age: males (45.5 \pm 14.8) and females (38.1 \pm 12.7)	To determine the relationship between in-play betting and gambling problems and to assess which online bettors are most likely to engage in in-play betting	PGSI, and behavioral measures, participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	Sports bettors placing in-play bets differed from those who had not in terms of employment status, education, ethnicity, age, and gambling involvement. In-play betting was significantly predicted by problem gambling severity, adjusting for other variables.
Lister, Wohl, and Davis (2015)	Canada: Online and offline sports bettors; <i>n</i> = 61; who had bet on sports in the last 12 months	No data on ethnicity 90.2% male 35.2 \pm 11.96 years	To examine whether feelings of authenticity and enhancement motives are associated with problematic gambling behaviors	A four-item measure of authenticity; the Gambling Motives Questionnaire; Betting frequency, biggest win and loss. No specific problem-gambling severity	Feelings of authenticity and enhancement motives were associated with problematic gambling behaviors; the combination of feelings of authenticity and enhancement motives is especially toxic.
Li et al. (2012)	China: Sports lottery players; <i>n</i> = 4,982; who had purchased sports lottery tickets in the last 12 months	No data on ethnicity or mean age 77.3% male	To examine the dimensions of problem gambling behaviors among sports lottery consumers in China	The Scale of Assessing Problem Gambling (SAPG). No specific problem-gambling severity	The level of sports lottery consumption was positively associated with measures of the SAPG termed financial consequence, social consequence, over-expectation, and compulsive disorder.

(continued)





Table 6. Continued

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Lopez-Gonzalez et al. (2019)	Australia + Spain: Online and offline sports bettors; <i>n</i> = 738 (Australian), <i>n</i> = 361 (Spanish); Overall <i>n</i> = 1,099 who had bet on sports at least once in the past 12 months	Australians: 79.3% male 35.7±12.25 years Spanish: 72% male 36.8±10.02 years Overall: 76.9% male 36.8±11.20 years No data on ethnicity	To compare Australian and Spanish sports bettors regarding the factors associated with problem gambling	PGSI; Participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	Sports bettors exhibited high problem gambling rates in both Australia and Spain. In-play betting, college education, female, and land-based betting were identified as risk factors associated with problem gambling in both countries.
Newall et al. (2021)	United Kingdom: Online sports bettors; <i>n</i> = 789; who placed a sports bet or a horse-racing bet online before; who were Premier League soccer fans	No data on ethnicity 67.3% male 35.4±10.86 years	To investigate problem gambling severity, illusion of control, gambling harms, and gambling consumption among the custom sports betting (CSB) users	PGSI; Participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	62.0% of participants used CSB products. CSB usage was positively correlated with problem gambling severity, gambling harms, and gambling consumption.
Russell, Hing, and Browne (2019)	Australia: Online and offline sport bettors; <i>n</i> = 1,147; who gambled on sports at least monthly	No data on ethnicity 66.5% male 41.2±14.50 years	To examine potential risk factors for gambling problems associated with sports betting	Sports Betting Problem Gambling Severity Index (PGSI-SB), participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	Gamblers were more likely to experience sports betting-related problems if they were younger people with some amount of disposable income, who gambled for money, had higher gambling urges and erroneous cognitions, had lower levels of self-control, and had alcohol problems.
Russell et al. (2019)	Australia: Online and offline sports bettors; <i>n</i> = 1813; who had gambled on sports in the past 12 months	No data on ethnicity 68.9% male 35.3±12.60 years	To examine potential risk factors for problem gambling among sports bettors in different gambling risk groups	PGSI; Participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	In all problem-gambling-severity groups, sports bettors who used more promotions and were heavily involved in in-play betting tended to be younger, male, more impulsive and more engaged. Problem gamblers and moderate-risk gamblers were more likely to have greater levels of sports betting involvement.
Ukhov et al. (2020)	USA: Online sports bettors, <i>n</i> = 5,000; Online casino players, <i>n</i> = 5,000; Overall, <i>n</i> = 10,000, who had positive approved deposits in the gaming operator LeoVegas	None reported	To investigate factors related to casino and sports problem gambling	None	For casino players, the number of cash wagers per active day was the most important predictor of problem gambling-related exclusion. For sports bettors, the volume of money was most associated with this exclusion.

(continued)

Table 6. Continued

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/(–SD)])	Study Objective	Measure and severity of gambling problems	Findings
Wardle et al. (2021)	United Kingdom: Online and offline sports bettors; <i>n</i> = 3,866 people who bet at least monthly on sports before COVID-19	No data on ethnicity or mean age 79.8% male	To understand changes that sports bettors reported in their gambling behaviors during the COVID-19 lockdown period and to explore whether these changes were related to experiences of gambling-related harms	Behavioral measures of gambling, and PGSI, participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	29.8% of male sports bettors and 33.4% of female sports bettors stopped gambling during the initial COVID-19 lockdown, but 17.3% of men and 16.5% of women started a new form of gambling during lockdown. Moreover, for men, there was a higher likelihood of problem gambling among those starting a new gambling activity during lockdown.

Note. Problem Gambling Severity Index (PGSI).

and is appealing for many sports bettors, perhaps especially due to the ease of access to participate in sports betting. Social factors such as perceived social pressure to bet on sports or camaraderie obtained through sports betting could be factors that maintain sports-betting behaviors. It should be noted that most of the marketing and qualitative articles in this review were from Western countries, and presently, it remains largely unclear how these domains of sports betting may present similarly or differently within Eastern countries.

This review found that RGS for sports betting have been researched in South Korea and Australia, and that messages promoting responsible sports betting have potential to help individuals who may be at risk of developing sports-betting-related problems. As expected, most research on fantasy sports betting has been conducted in the United States, which could be attributed in part to American football and fantasy sports in general being more popular within the United States than internationally. Most research of fantasy sports betting involved DFS participants, and results varied as most studies had unique aims. No major differences were noted between DFS and traditional fantasy sports bettors within studies that directly compared these two groups.

Psychosocial problems were related to sports betting, particularly among those reporting issues with problem gambling. Sports bettors in general tended to have high levels of problem gambling, and sports-betting involvement was frequently associated with greater problem-gambling severity. Psychosocial problems do not appear to differ greatly by country; however, certain countries are more restrictive (e.g., China, South Korea) with respect to which forms of sports betting are legal, which makes it more difficult to compare sports bettors as there may be vastly different sports-betting environments across countries. However, more strict restrictions on sports betting could limit the popularity and ease of access to these activities in some countries. While not as consistent as the relationship between sports betting and problem-gambling severity, several studies found that erroneous cognitions about gambling were associated with sports-betting-related problems. The relationship between erroneous gambling cognitions and problem-gambling severity has been reported in individuals seeking treatment for GD (Ledgerwood et al., 2020); however, it is unclear whether cognitive distortions present similarly or differently for sports bettors who seek treatment for GD. When considering that sports bettors often endorsed ease of access, normality, and persuasive qualities of sports betting, psychoeducation about the potential dangers of sports betting may help reduce risky sports-betting behaviors. Psychoeducation could also be used in addition to RGS (e.g., limit setting), which have shown potential to assist sports bettors in managing their betting behaviors (Heirene & Gainsbury, 2021).

Study limitations include a strict search criterion, which may have resulted in the potential loss of relevant articles, such as those published as grey literature. Relatedly, this review found relatively few studies from Eastern countries, which made cross-cultural comparisons difficult. This could





Table 7. Summary of studies investigating psychosocial aspects of sports betting

Article	Country and Sample (n and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Chukwuorji et al. (2020)	Nigeria: Online and offline sports bettors; n = 251 bettors recruited from sports betting cafes	No data on ethnicity 68.5% male 23.6±4.80 years	To test whether substance use mediates the relationship between cognitive distortions and suicidal ideation among gamblers	Gambling-Related Cognition Scale. No specific problem-gambling severity assessment	Substance use mediated the association between suicidal ideation and distorted cognitions. Furthermore, this indirect effect was moderated by gender. Difficulty stopping gambling was linked to higher suicidal ideation through substance use for men, but not for women.
Erceg and Galić (2014)	Croatia: Online and offline sports bettors; n = 130 male frequent or sporadic sports bettors	No data on ethnicity 100% male 40.5±14.23 years	To gain a better understanding of the overconfidence bias and conjunction fallacy	None reported	Both frequent and sporadic bettors were found to have similar levels of the overconfidence bias. Frequent versus sporadic betting was associated with conjunction fallacy.
Gassmann, Emrich, and Pierdzioch (2017)	Germany: Online and offline sports bettors: Used an online survey to collect data on attitudes towards risk, sports behavior, and media consumption of n = 634 individuals (included sports bettors and non-sports bettors)	No data on ethnicity 42% male 31±11 years	To examine what is known about the socioeconomic profile of bettors and to answer the question of “Who bets on sports?”	None	The typical sports-bettor in this study was 32 years old and male, was willing to take risks, had a low household income, and was extremely interested in sports.
Hu et al. (2017)	China: Online and offline sports bettors; n = 4,521 sport lottery players	No data on ethnicity and mean age 84.6% male	To develop a multidimensional measure of lottery playing health	The Gambling Urge Scale, and using the PGSI, participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	Multiple lottery player characteristics (i.e., age, perceived risk, and urge to play) were found to be significant predictors of players’ scores on this measure.
Huberfeld et al. (2013)	Israel: Online and offline sports bettors; n = 165 bettors	No data on ethnicity and mean age 72% male	To evaluate the illusion of control in three different groups	The SOGS; participants classified into pathological gamblers, an amateur group, or a layperson group	There was no significant difference between the pathological sports gambling group and the laypersons group.
Lin and Lu (2015)	Taiwan: On-site sports lottery players; n = 1,032; who had bet in at least one sports lottery in the last month	No data on ethnicity or mean age 83.6% male	To investigate the psychological and socio-demographic factors that are associated with risk tolerance and herding behavior of sports lottery bettors	None	This study found the existence of herding behaviors and a gender difference among sports lottery bettors. Bettors with neuroticism had a lower risk tolerance, while bettors with extroversion, openness, and agreeable tendencies had a higher risk tolerance.

(continued)

Table 7. Continued

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [\pm SD])	Study Objective	Measure and severity of gambling problems	Findings
Matama, Mbago, and Ngoboka (2021)	Uganda: <i>n</i> = 257 sports bettors in 26 betting firms	No data on ethnicity or mean age 96.7% male	To evaluate whether income level and employment explain instant gratification behavior among bettors in Uganda	None	Findings indicate that low-income earners are more likely to engage in sports betting and youth are the most frequent sport betting group. The lower the income, the higher the instant gratification behavior.
Polat and Yildiz (2021)	Turkey: Sport spectators; <i>n</i> = 539; who had gambled in the past year	No data on ethnicity 93.7% male 22.9 years	To examine the relationship between sport spectators' gambling motivation and aggression propensity	None	There was a relation between gambling motivation and aggression propensity. The increase in propensity for violence might result from the increase in the fandom level of sport spectators who gambled.
Torrance et al. (2022)	United Kingdom: Online and offline Sports bettors; <i>n</i> = 225; who had bet on sports in the last 6 months	81.8% White 79.1% male No data on age	To classify sports bettors according to their tilting occurrence and awareness of this phenomenon. To investigate the product preferences of the in-play bettors	PGSI, participants were classified into non-problem, low-risk, moderate-risk, and problem gamblers	There are at least three groups of sports bettors who differ in their reported tilting and awareness of this phenomenon, including conscious tilters, unconscious tilters, and non-tilters. Tilting may facilitate increased problem gambling severity.

Note. Problem Gambling Severity Index (PGSI), South Oaks Gambling Screen (SOGS).





Table 8. Summary of uncategorized studies examining sports betting

Article	Country and Sample (<i>n</i> and brief description)	Demographics (ethnicity, gender, mean age [+/-SD])	Study Objective	Measure and severity of gambling problems	Findings
Braverman et al. (2011)	85 different countries: Online sports bettors; <i>n</i> = 4,595; who engaged in online sports betting for more than 3 days	None reported	To determine whether characteristics of extreme gambling can be represented as qualitatively distinct or as a point along a dimension	Eight behavioral measures of gambling behaviors. No specific gambler severity	The study failed to find support for a taxonic or dimensional representation of gambling behaviors among people involved in Internet sports gambling.
Gainsbury and Russell (2015)	Australia: Online and telephone sports bettors; <i>n</i> = 12,099 different user accounts with 2,522,299 completed bets	Not measured for this analytic sample	To analyze player account data from an Australian corporate bookmaker, by providing a descriptive outline of the types of bets made and the outcomes of bets and compare wins and losses	None	Results found that most bets placed were for a win (45.31%) and were placed on races (86.74%) or sports (11.29%); 77.63% of bets were losses and there was large variation in bet size between types of bets and events on which bets were placed.
Gray et al. (2015)	Iceland: Online sports bettors; <i>n</i> = 520; who opened an account with the Internet betting service provider Íslensk Getspá sometime between January 1, 2010, and January 31, 2010	No data on ethnicity 68.5% male 40.5±14.23 years	To explore patterns of gambling behavior among a sample of Icelandic residents who subscribed to Íslensk Getspá during January 2010	Behavioral measures of gambling. No specific definition of problem-gambling severity	Subscribers lost 96% of the amount they wagered, for a mean total loss of approximately \$40. Expenditure per bet was usually lower for lottery games and their add-ons than sports betting games.
Li et al. (2020)	Australia: Online and offline sports bettors; <i>n</i> = 1,211; who had bet on sports in the last 12 months	No data on ethnicity or mean age 65.6% male	To investigate how hunger level, alcohol consumption, or recreational drug consumption could affect sports betting behavior	PGSI; No definition of problem-gambling severity	Hunger, alcohol/recreational drug consumption had both direct and indirect effects on impulsive bet size; PGSI score was positively associated with impulsive bet size.
Nabifo, Izudi, and Bajunirwe (2021)	Uganda: <i>n</i> = 401 motorcycle taxi “boda boda” riders overall. <i>N</i> = 74 sports bettors	No data on ethnicity 100% male 29.3 ± 5.9 years	To investigate the relationship between alcohol consumption, and other substance usage with sports betting	None	Alcohol use was significantly associated with sports betting, particularly for people with moderate alcohol use in comparison to low or no use. Furthermore, cigarette smoking was significantly associated with sports betting.
Nelson et al. (2021)	Many different countries: Online sports bettors; <i>n</i> = 32,262; who subscribed to an online gambling platform	No data on ethnicity 90.6% male 30.1 ± 10.3 years	To explore online sports-betting behaviors of a cohort of new subscribers to an Internet sports betting site across an 8-month time period.	Behavioral measures of gambling	Sports wagering behavior on the gambling platform remained relatively stable over time. There were a small handful of highly involved sports bettors whose betting was fundamentally different from the rest of the sample.

Note. Problem Gambling Severity Index (PGSI).

reflect our search restrictions, which included a limit to English or Chinese language, or a general lack of articles from Eastern regions. This review chose not to include esports betting, but future cross-cultural research should include esports, since this is a profitable and growing area for the sports-betting industry, with an estimated esports sports betting market size between 200 and 300 million US dollars (EsportsBettingTop, 2022). Additionally, studies that focused on horse racing were excluded from this review but could be examined in future studies. Strengths of the current review include its focus on recent sports-betting articles, which provides a wide-ranging review of the current sports-betting literature among different countries. Furthermore, the specificity of this study can be considered a strength as the findings of this review may be particularly helpful in explaining how the general population of sports bettors are affected by this activity. The findings of this review also provide a valuable overview of sports-betting behaviors internationally. Moreover, our review includes a detailed summary about the current sports-betting regulations around the world, offering a framework within which interpretation of research results from different jurisdictions may be considered for promoting healthy gambling behaviors.

CONCLUSIONS

This study examined differences in regulations, behaviors, and psychosocial problems related to sports betting. Among the included articles in this review, existing data suggest that cultural differences in sports betting may not differ greatly between Eastern and Western countries, with the biggest difference being a stronger emphasis of research on marketing and promotion of sports betting in specific Western countries (i.e., United Kingdom and Australia). Similarly, there were few differences between countries in types of psychosocial problems related to sports betting. Regulatory guidelines for sports betting had more prominent differences between countries as Eastern countries tended to be more restrictive in their sports-betting guidelines. As sports-betting restrictions varied by country, future cross-cultural research could explore how different elements of sports-betting regulations are related to problem gambling. If risk factors differ by country, then treatment for sports-betting-related problems may vary in focus for different countries and cultures.

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