



AKADÉMIAI KIADÓ

Journal of Behavioral Addictions

11 (2022) 2, 267-289

DOI:

10.1556/2006.2022.00019

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REVIEW ARTICLE



Differences in problem and pathological gambling: A narrative review considering sex and gender

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Received: December 14, 2021 • Revised manuscript received: February 11, 2022; March 15, 2022 • Accepted: March 22, 2022

Published online: May 2, 2022

ABSTRACT

Background and aim: A wide range of studies indicates that men and women with Problem (PrG) and Pathological Gambling (PG) differ in several clinical and sociodemographic characteristics. However, evidence for sex differences, such as the telescoping effect, is contradictory, and it is still unclear whether sex differences observed in offline gambling can also be found for online gambling. Furthermore, reviews have so far focused on binary sex differences but neglect gender aspects. In this study, an updated literature survey of sex- and gender-related differences in PrG and PG was conducted. *Methods:* We searched PsyInfo, Medline/Pubmed, and the Web of Science databases from 2005 to 2020 for studies investigating sex and gender differences in gambling. A total of 126 papers were included in the literature survey. *Results:* We are presenting our findings according to the categories ‘prevalence’ (offline, online, LGBTQI*), ‘sociodemographic factors’, ‘preferred gambling type’, ‘gambling motives’, ‘severity’, ‘progression of gambling problems’, ‘use of professional help/motivation for treatment’, ‘comorbidity’, ‘trauma’, ‘violence and criminality/delinquency’. The studies indicate that, despite some robust sex differences (e.g., concerning prevalence rates), results for most areas were mixed or suggest no sex differences (e.g., violence, gambling motives). *Discussion and conclusion:* To date, there is a lack of studies assessing gender, and not only sex, warranting further research in this area.

KEYWORDS

problem gambling, pathological gambling, sex and gender differences, review

INTRODUCTION

Problem gambling (PrG) and pathological gambling (PG) are well recognized societal and individual health issues (Marshall, 2009; The Lancet, 2017). PrG and PG are characterized by a strong urge to gamble with increasing amounts of money and loss of control. The gambling activities go along with significant financial losses and legal problems. Frequently, persons with PrG and PG risk their relationships and jobs and report severe psychosocial problems (American Psychiatric Association, 2013).

Aside from these general diagnostic criteria, the clinical picture may vary considerably by sex and gender. Whereas sex refers to the biological characteristics, gender focuses on societal and cultural norms, preferences as well as behaviors (WHO, 2019).

Regarding sex differences, some studies report that men are twice as likely to develop a gambling problem as women (Banz & Lang, 2017) and that men prefer skill-based games such as poker, whereas women prefer strictly chance-based games such as slot-machines or

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bingo (Bonnaire et al., 2017; Odlaug, Marsh, Kim, & Grant, 2011; Potenza, Maciejewski, & Mazure, 2006). Another frequently mentioned example is the telescoping effect (e.g., Blanco, Hasin, Petry, Stinson, & Grant, 2006; Grant, Odlaug, & Mooney, 2012; Tavares et al., 2003), suggesting that women start to gamble later in life but progress to pathological gambling behavior faster. It has also been hypothesized that women gamble for different motives (Echeburúa et al., 2011, 2013; Grant & Kim, 2002). Whereas men gamble to earn money easily or to seek excitement, women mainly want to escape boredom, loneliness and everyday problems. Men enter gambling-related treatment at a younger age than women, show more difficulties concerning their alcohol use and are more often in conflict with the law (Ladd & Petry, 2002; Potenza et al., 2001). Men and women also seem to differ in comorbidities. Some studies reported a higher probability of comorbid disorders in women (Blanco et al., 2006; Desai & Potenza, 2008; Díez, Aragay, Soms, Prat, & Casas, 2014). Elevated comorbidity rates have been found most often for affective and anxiety disorders. However, despite the wide variety of areas where sex differences between men and women have been observed in their gambling behavior and related problems, evidence so far has been mixed. Even for the often-cited telescoping effect, findings are contradictory (Slutske, Piasecki, Deutsch, Statham, & Martin, 2014). An additional issue is that existing reviews about gambling related problems have focused on binary sex differences between women and men and lack a gender dimension (e.g., McCarthy, Thomas, Bellringer, & Cassidy, 2019; Merkouris et al., 2016). As gambling is a phenomenon shaped by sociocultural factors (e.g., How socially accepted is it for different genders to gamble?), gender aspects should be considered. Despite some attempts to explore gender differences in gambling, a common problem is that even though only sex is being assessed, gender differences are implied. To avoid a confusion of concepts, Clayton and Tannenbaum (2016) suggest strictly differentiating between the two concepts. Due to the importance of the two concepts are more detailed definition will be given in the following.

Sex can be categorized as male, female or intersex and is indicated for example by one's sex chromosomes or reproductive organs. Whereas sex is a construct focusing on medical assumptions, gender highlights cultural and social aspects. Gender identity can be defined as a person's inner sense of being female, male or something else. It does not necessarily have to be congruent with a person's sex assigned at birth nor is it always visible to others. Gender includes the concept gender identity as well as gender expression. The external appearance of an individual (e.g., clothing, behavior, voice) is defined as gender expression and can be contrary to one's gender identity. In short gender identity is best captured as a continuum ranging from woman-ness to man-ness whereas gender-expression could be measured on a scale from femininity to masculinity. Another social construct, that is closely linked to gender, is sexual orientation, which refers to the sexual and emotional attraction to another person.

As the definitions illustrate, sex and gender comprise two distinct concepts. Even though they might influence or

complement each other, sex and gender focus on different aspects. Therefore, it is necessary to examine them separately. Differentiating between sex and gender aspects is not only of scientific interest. For example, it may help clarify reasons for differences in prevalence rates and treatment seeking behavior.

The aim of this study is to critically re-examine assumed sex and gender differences based on accumulated empirical evidence. A special focus is on identifying studies explicitly including gender aspects. The summary is intended to inform good clinical practice by providing a guideline about which differences between male, female, and gender diverse persons with PrG and PG should be considered in treatment.

METHODS

Selection criteria

To be included in the present narrative review, studies had to be peer-reviewed and available to the authors no later than November 2020. Only studies on predefined areas of interest were included. Overall, we defined 11 areas of interest: (1) prevalence rates (offline, online, LGBTGI* [Lesbian, Gay, Bisexual, Transgender, queer, intersex and others]); (2) sociodemographic factors (educational level, marital status, income, debts, children); (3) preferred gambling types; (4) gambling motives; (5) severity of gambling problems; (6) progression of gambling problems (age/telescoping effect); (7) use of help/motivation for treatment; (8) comorbidity; (9) trauma; (10) violence; (11) criminality and delinquency.

Procedure for identification of studies

We searched PsyInfo, Medline/Pubmed, and the Web of Science databases from 2005 to 2020 for clinical studies investigating sex and gender differences in gambling. We used the search term “(problem OR addict* OR pathological OR risk OR disorder) AND gambling AND (gender OR sex OR male OR female OR men OR women OR man OR woman)”. To search for specific sub-categories, further search terms were added (AND “prevalence”, “comorbidity” ...). All peer-reviewed papers published in German or English between 2005 and 2020 were scanned based on the title and information given in the abstract and keywords (full text available, specifically addressed gender differences). Additionally, we manually scanned the reference lists of relevant papers and included papers that were considered suitable. Pivotal gray literature (e.g., addiction surveys) was included as well. To be included in the review, studies had to have at least some focus on sex or gender differences. Studies in which this aspect was considered rather superficially, e.g., as a covariate in the analyses and only discussed in passing, were not included.

RESULTS

Overall, we identified 1970 articles. After removing duplicates and scanning the abstracts, 126 articles were included.



As some articles contained relevant information on more than one of the predefined areas, they will be cited separately in each category. 126 of the included articles examined sex. None provided information how the construct gender was assessed even if the title or abstract implied it. Therefore, we can't present any findings regarding gender differences in the results section.

Prevalence

Offline. Noting that partly different instruments were used to assess gambling-related problems among the different studies, the 26 included studies indicate a prevalence spectrum from 0.3% to 10.9% for at least problematic gambling (Abbott, Stone, Billi, & Yeung, 2016; Anagnostopoulos et al., 2017; Andrie et al., 2019; Assanangkornchai, McNeil, Tantirangsee, & Kittirattanapaiboon, 2016; Baggio et al., 2018; Castrén, Heiskanen, & Salonen, 2018; Blanco et al., 2006; Brodbeck, Duerrenberger, & Znoj, 2009; Castrén et al., 2013; Chiu & Woo, 2012; Economou et al., 2019; Fröberg et al., 2015; Giralt et al., 2018; Gori et al., 2015; Huang & Boyer, 2007; Lupu & Todirita, 2013; Melendez-Torres, Anthony, Hewitt, Murphy, & Moore, 2020; Mori & Goto, 2020; Nordmyr, Forsman, Wahlbeck, Björkqvist, & Österman, 2014; Petry & Steinberg, 2005; Petry, Stinson, & Grant, 2005; Svensson & Romild, 2014; van der Maas et al., 2018; Welte, Barnes, Tidwell, Hoffman, & Wiczorek, 2015; Williams, Lee, & Back, 2013; Wu, Lai, & Tong, 2014). Within this spectrum, men were usually more often affected by problematic and pathological gambling behavior than women. This general trend could be observed for adolescents and adults (Assanangkornchai et al., 2016; Blanco et al., 2006; Brodbeck et al., 2009; Castrén et al., 2013; Gori et al., 2015; Huang & Boyer, 2007; Mori & Goto, 2020). However, in one Swedish study (Svensson & Romild, 2014), there was a deviation from this pattern as females showed a higher prevalence after controlling for age and gambling type domains.

The extent of observed differences varied within different age groups. In studies addressing adolescent gambling, men exhibited higher ratios for PrG and PG compared with women (Anagnostopoulos et al., 2017; Andrie et al., 2019; Chiu & Woo, 2012; Gori et al., 2015; Huang & Boyer, 2007; Lupu & Todirita, 2013). According to a study by Blanco et al. (2006), men generally appeared to be affected by gambling problems at a younger age, whereas women appeared to be affected more often at an older age. In a study among the over 55-year-olds, differences could only be found with regard to general aspects of gambling (e.g., frequency, attitudes) and not with regard to the prevalence of PrG (van der Maas et al., 2018). The longitudinal comparison of two US surveys conducted in 1999–2000 and 2011–2013 found increasing PrG rates for men and decreasing rates for women (Welte et al., 2015), whereas a Finnish study by Castrén, Heiskanen, and Salonen (2018) observed the opposite with a decrease in men's PrG from 2007 to 2011, whereas women's at-risk gambling and problem gambling increased from 2011 to 2015 (see Table 1 at section 'prevalence of offline gambling').

Online. Overall, we found 11 studies investigating the prevalence of online gambling by sex (Chóliz, Marcos, & Lázaro-Mateo, 2019; Edgren, Castrén, Alho, & Salonen, 2017; Elton-Marshall, Leatherdale, & Turner, 2016; Floros, Siomos, Fisoun, & Geroukalis, 2013; Gainsbury et al., 2015; Gómez, Feijóo, Braña, Varela, & Rial, 2020; Griffiths, Wardle, Orford, Sproston, & Erens, 2009; Lelonek-Kuleta, Bartczuk, Wiechetek, Chwaszcz, & Niewiadomska, 2020; McCormack, Shorter, & Griffiths, 2014; Wu, Lai, & Tong, 2015; Yazdi & Katzian, 2017). The studies unanimously indicate that men are more likely to engage in online gambling. For example, Griffiths et al. (2009) and Chóliz et al. (2019) found that approximately 9% of men and only 3% of women had gambled online. Gómez et al. (2020) reported an even more pronounced sex difference of 11.5% vs. 1.4%. Griffiths et al. (2009) reported elevated prevalence rates of PG among persons who gamble online (5%). However, the group of people who gamble online was too small to be analyzed by sex. Data from Spain, where online gambling has been legalized since 2012, suggested that sex ratios for a mix of online and offline gambling are similar to previously reported sex ratios (Chóliz et al., 2019). See Table 1 at section 'prevalence of online gambling' for further information.

LGBTQI.* Overall, we found only three studies on the association between sexual orientation and the prevalence of pathological gambling. Two studies (Grant & Potenza, 2006; Richard et al., 2019) hinted at higher severity of gambling problems in the LGBTQI* community, whereas one study (Broman & Hakansson, 2018) found no evidence for elevated prevalence levels. As Richard et al. (2019) outlined, higher prevalence levels are in line with a generally higher risk for mental health and substance use problems in this group (see Table 1 at section 'prevalence of LGBTQI*').

Sociodemographic factors

We identified 11 studies providing information on sex differences for sociodemographic variables (Blanco et al., 2006; Bonnaire et al., 2016, 2017; Castrén, Kontto, Alho, & Salonen, 2018; Granero et al., 2009; Grant, Chamberlain, Schreiber, & Odlaug, 2012; Guillou-Landreat et al., 2016; Hing, Russell, Tolchard, & Nower, 2016; Jiménez-Murcia et al., 2020; Ronzitti, Lutri, Smith, Clerici, & Bowden-Jones, 2016; Vogelgesang, 2009). Education, income, employment status, and household composition were defined as variables of interest.

Two studies reported on education differences (Grant, Chamberlain, et al., 2012; Hing et al., 2016). Among a general population sample, Hing et al. (2016) found that men as well as women with PrG were more likely to have a lower education with less than 10 years of schooling, whereas Grant, Chamberlain, et al. (2012) found no educational differences among their clinical sample. Three studies included information on income differences (Blanco et al., 2006; Castrén, Kontto, et al., 2018; Granero et al., 2009). All showed that, on average, men with PrG had a higher monthly income than women with PrG. Concerning unemployment, two of three studies found women more



Table 1. 126 papers for the literature survey

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Prevalence of offline gambling						
Abbott et al. (2016)	Australia	23,479	Male: $n = 9,473$ Female: $n = 14,006$	Adults	General population	SOGS, CPGI, VGS
Anagnostopoulos et al. (2017)	Greece	2,141	Male: 45.4% Female: 54.6%	Adolescents	General population	DSM-IV
Andrie et al. (2019)	Spain, Greece, The Netherlands, Poland, Romania, Germany, Iceland	13,284	Male: $n = 6,284$ Female: $n = 7,000$	Adolescents	General population	SOGS
Assanangkornchai et al. (2016)	Thailand	4,727	Male: 36% Female: 64%	Adults	General population	DSM-IV
Baggio et al. (2018)	France	8,805	Male: 48.2% Female: 51.8%	Adolescents, Adults, Older Adults	General population	PGSI
Blanco et al. (2006)	USA	43,093	Only reported for participants with GD	Adults	General population	AUDADIS-IV
Brodbeck et al. (2009)	Switzerland	8,385	Male: 48% Female: 52%	Adults	General population	NODS
Castrén et al. (2013)	Finland	2,826	Male: $n = 1,243$ Female: $n = 1,583$	Adolescents, Adults	General population	PGSI
Castrén, Heiskanen, and Salonen (2018)	Finland	13,721	Male: $n = 6,785$ Female: $n = 6,936$	Adolescents, Adults, Older Adults	General population	SOGS
Chiu and Woo (2012)	Chinese in USA	192	Male: $n = 97$ Female: $n = 93$	Adolescents	General population	SOGS
Economou et al. (2019)	Greece	7,818	Male NPG: 46.7% Male PG: 67.1%	Adults	General and clinical sample	PGSI
Fröberg et al. (2015)	Sweden	4,358	Male: $n = 2,217$ Female: $n = 2,141$	Adolescents, Adults	General population	PGSI, SOGS
Giralt et al. (2018)	Germany	9,309	Male: $n = 4,600$ Female: $n = 4,709$	Adolescents	General population	DSM-IV
Gori et al. (2015)	Italy	5,920	Male: 62.3% Female: 37.7%	Adolescents	General population	SOGS
Huang and Boyer (2007)	Canada	5,666	N/A	Adolescents, Young Adults	General population	CPGI
Lupu and Todirita (2013)	Romania	1,032	Male: 65.57% Female: 34.43%	Adolescents	General population	20-GA
Melendez-Torres et al. (2020)	Wales	37,363	Male: $n = 18,663$ Female: $n = 17,959$	Adolescents	General population	N/A
Mori and Goto (2020)	Japan	6,576	Male: $n = 3,302$ Female: $n = 3,274$	Adults	General population	SOGS
Nordmyr et al. (2014)	Finland	2,984	Male: $n = 1,438$ Female: $n = 1,546$	Adults	General population	DSM-IV

(continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Petry and Steinberg (2005)	USA	149	Male: $n = 72$ Female: $n = 77$	Adults	Clinical sample (treatment seeking PGs)	SOGS
Petry et al. (2005)	USA	42,898	Male: 47.8% Female: 52.3%	Adults	General population	AUDADIS-IV
Svensson and Romild (2014)	Sweden	3,191	Male: $n = 2048$ Female: $n = 1,143$	Adolescents, Adults, Older Adults	General population	PGSI
van der Maas et al. (2018)	Canada	2,187	Male: $n = 1,011$ Female: $n = 1,176$	Older Adults	General population	CPGI
Welte et al. (2015)	USA	5,594	Male: $n = 2,703$ Female: $n = 2,891$	Adults	General population	SOGS
Williams et al. (2013)	South Korea	8,330	N/A	Adults	General population	CPGI, NODS, PPGM
Wu et al. (2014)	Macao	1,018	Male: $n = 454$ Female: $n = 564$	Adults	General population	DSM-IV
Prevalence of online gambling						
Chóliz et al. (2019)	Spain	6,816	Male: 48.4% Female: 51.6%	Adults, Older Adults	General population	NODS
Edgren et al. (2017)	Finland	3,555	Male: 53.8% Female: 46.2%	Adults, Older Adults	General population	PGSI
Elton-Marshall et al. (2016)	Canada	10,035	Male: $n = 4,937$ Female: $n = 5,098$	Adolescents	General population	GPSS of the CAGI
Floros et al. (2013)	Island of Kos	2017	Male: 51.8% Female: 48.2%	Adolescents	General population	DSM-IV
Gainsbury et al. (2015)	Australia	15,006	Male: 47.5% Female: 52.5%	Adults, Older Adults	General population	PGSI
Gómez et al. (2020)	Spain	3,772	Male: 49.8% Female: 50.2%	Adolescents	General population	N/A
Griffiths et al. (2009)	GB	9,003	N/A	Adolescents, Adults	General population	DSM-IV
Lelonek-Kuleta et al. (2020)	Poland	2000	Male: 48.2% Female: 51.8%	Adults	General population	BBGS
McCormack et al. (2014)	UK	975	Male: $n = 800$ Female: $n = 175$	Adults	General population	PGSI
Wu et al. (2015)	China	952 community sample (CS) 427 university student sample (US) ($N = 1,399$)	CS: Male: 42%, Female: 58% US: Male: 43.6%, Female: 56.4%	CS: Adults US: Young Adults	General population	DSM-IV
Yazdi and Katzian (2017)	Austria	3,043	Only reported for participants with GD	Only reported for participants with GD	General population	Johnson's Lie-and-Bet Questionnaire (Johnson et al., 1997) (continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Prevalence of LGBTQI*						
Broman and Hakansson (2018)	Italy	605	Male: 38% Female: 51% Non-sexual: 11%	Adolescents, Adults	General population	NODS, GAS
Grant and Potenza (2006)	USA	105	Only male	Adults	Clinical sample	DSM-IV
Richard et al. (2019)	Canada	19,299	Male: Hetero: $n = 10,305$ Gay: $n = 137$ Bi: $n = 65$ Female: Hetero: $n = 8,215$ Gay: $n = 274$ Bi: $n = 303$	Young Adults	General population	DSM-5
Sociodemographic factors						
Blanco et al. (2006)	USA	43,093	Only reported for participants with GD	Adults	General population	AUDADIS-IV
Bonnaire et al. (2016)	France	25,646	Male: $n = 12,504$ Female: $n = 13,142$	Adolescents, Adults, Older Adults	General population	CPGI
Bonnaire et al. (2017)	France	25,646	Male: $n = 12,504$ Female: $n = 13,142$	Adolescents, Adults, Older Adults	General population	CPGI
Castrén, Kontto, et al. (2018)	Finland	3,251	Male: $n = 1833$ Female: $n = 1,418$	Adolescents, Adults, Older Adults	General population	SOGS
Granero et al. (2009)	Spain	286	Male: 50% Female: 50%	Adults	Clinical sample	SOGS, DSM-IV
Grant, Chamberlain, et al. (2012)	USA	501	Male: $n = 227$ Female: $n = 274$	Adults	Clinical sample	SCI-PG, CGI, PG-YBOGS, GSAS
Guillo-Landreat et al. (2016)	France	194	Male: 82.47% Female: 17.53%	Adults	Clinical sample	DSM-IV, GRCS
Hing et al. (2016)	Australia	8,917	Male: $n = 3,783$ Female: $n = 3,903$	Adults	General population	PGSI
Jiménez-Murcia et al. (2020)	Spain	512	Male: $n = 473$ Female: $n = 39$	Adults	Clinical sample	DSM, GRSC
Ronzitti et al. (2016)	UK	1,178	Male: 92.5% Female: 7.5%	Adults	Clinical sample	PGSI
Vogelgesang (2009)	Germany	200	Male: 50% Female: 50%	Adults	Clinical sample	ICD-10
Preferred gambling type						
Bonnaire et al. (2017)	France	25,647	Male: $n = 12,504$ Female: $n = 13,142$	Adolescents, Adults, Older Adults	General population	CPGI
Leung and Tsang (2011)	Chinese in Hong Kong	4,480	Male: $n = 3,949$ Female: $n = 531$	Adults	Clinical sample	N/A

(continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Lopez-Gonzalez et al. (2020)	Australia/Spain	1,092	Australian Male: 79.3%, Female: 20.7% Spain Male: 72.0%, Female: 28.0%	Adults	General population	PGSI
Nong et al. (2020)	China	855	Male: 48.1% Female: 51.9%	Adults, Older Adults	latent class analysis	DSM-5
Nower and Blaszczynski (2006)	USA	2,670	Male: 51.1% Female: 48.4%	Adults, Older Adults	Clinical sample	N/A
Odlaug et al. (2011)	N/A	440	Male: 54.9% Female: 45.1%	Adults	Clinical sample	PG-YBOGS, CGI
Potenza et al. (2006)	US	2,417	Male: $n = 1,131$ Female: $n = 1,231$	Adults	General population	NODS
Ronzitti et al. (2016)	UK	1,178	Male: 92.5% Female: 7.5%	Adults	Clinical sample	PGSI
Stark et al. (2012)	Canada	3,604	N/A	Adults	General population	PGSI
Stevens and Young (2010)	Australia	1,172 people weighted to 97,525 to represent the resident Northern Territory adult population who had gambled in the previous 12 months	Male: 52.4% Female: 47.6%	Adults	General population	N/A
Svensson and Romild (2014)	Sweden	3,191	Male: $n = 2048$ Female: $n = 1,143$	Adolescents, Adults, Older Adults	General population	PGSI
Toneatto and Wang (2009)	Canada	60	Male: $n = 44$ Female: $n = 16$	Adults	Clinical sample	CPGI
van der Maas et al. (2018)	Canada	2,187	Male: $n = 1,011$ Female: $n = 1,176$	Older Adults	General population	CPGI
Williams et al. (2013)	South Korea	8,330	N/A	Adults	General population	CPGI, NODS, PPGM
Gambling motives						
Clarke and Clarkson (2008)	New Zealand	104	Male: $n = 41$ Female: $n = 63$	Older Adults	General population	N/A
Clarke et al. (2007)	New Zealand	209	Male: $n = 61$ Female: $n = 148$	Younger Adults, Older Adults	General population	DSM-IV
Echeburúa et al. (2011)	Spain	103	Male: $n = 52$ Female: $n = 51$	Adults	Clinical sample	DSM-IV
Flack and Stevens (2018)	Australia	4,945	N/A	Adults	General population	PGSI
Grant and Kim (2002)	N/A	131	Male: 40% Female: 60%	Adults, Older Adults	Clinical sample (treatment seeking PGs)	SOGS, GAF, CGI, DSM-IV
Hing et al. (2016)	Australia	8,917	Male: $n = 3,783$ Female: $n = 3,903$	Adults	General population	PGSI

(continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
McCormack et al. (2014)	UK	975	Male: $n = 800$ Female: $n = 175$	Adults	General population	PGSI
Sundqvist et al. (2016)	Sweden	257	Male: $n = 179$ Female: $n = 78$	Adults	General population	NODS-PERC, Johnson's Lie-and-Bet Questionnaire (Johnson et al., 1997)
Walker et al. (2005)	Canada	400	N/A	Adults	General population	N/A
Severity						
Granero et al. (2009)	Spain	286	Male: 50% Female: 50%	Adults	Clinical sample	SOGS, DSM-IV
Grant et al. (2017)	N/A	574	Male: 54% Female: 46%	Adults	Clinical sample	CGI, SCI-GD, PG-YBOGS, GSAS
Grant, Chamberlain, et al. (2012)	USA	501	Male: $n = 227$ Female: $n = 274$	Adults	Clinical sample	SCI-PG, CGI, PG-YBOGS, GSAS
Håkansson and Widinghoff (2020)	Sweden	327	Male: $n = 223$ Female: $n = 104$	Adults	Clinical sample	PGSI
Jiménez-Murcia et al. (2016)	Spain	1,632	Male: 91.5% Female: 8.5%	Adults	Clinical sample	SOGS
Jiménez-Murcia et al. (2020)	Spain	512	Male: $n = 473$ Female: $n = 39$	Adults	Clinical sample	DSM, GRSC
Kim et al. (2016)	New Zealand	150	Male: $n = 64$ Female: $n = 86$	Adults	Clinical sample	PGSI
Ronzitti et al. (2016)	UK	1,178	Male: 92.5% Female: 7.5%	Adults	Clinical sample	PGSI
Progression of gambling problems						
Carneiro et al. (2014)	Brazil	118	Only reported for subgroups	Adolescents, Adults	Clinical sample	NODS, DSM-IV
Edgerton et al. (2015)	Canada	679	Male: 48.2% Female: 51.8%	Young adults	General population	PGSI
Grant, Odlaug, and Mooney (2012)	N/A	71	Male: 52.1% Female: 47.9%	Adults	Clinical sample	SCI-PG
Haw and Holdsworth (2016)	Australia	267	Male: 54% Female: 46%	Adults	Clinical sample	PGSI
Nelson et al. (2006)	USA	2,256	Male: $n = 1,239$ – $1,258$ Female: $n = 921$ – 935	Adults	Clinical sample	DSM-IV
Slutske et al. (2014)	Australia	4,663	Male: $n = 2001$ Female: $n = 2,662$	Adults	General population	DSM-IV
Use of professional help/Motivation for treatment						
Aster et al. (2018)	Germany	773	Male: $n = 688$ Female: $n = 85$	Adolescents, Adults	Clinical sample (treatment seeking PGs, relatives)	N/A

(continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Braun et al. (2014)	Germany	7,718	Male: 83.9% Female: 16.1%	Adults	Clinical and general sample	DSM
Buchner et al. (2015)	Germany	N/A	N/A	N/A	Clinical sample	ICD-10
Echeburúa et al. (2011)	Spain	103	Male: $n = 52$ Female: $n = 51$	Adults	Clinical sample	DSM-IV
Harries et al. (2018)	USA	880	Only reported for subgroups	Adults	Clinical sample (treatment seeking PGs)	MIDI, SCI-PG, PG-YBOCS
Kim et al. (2016)	New Zealand	150	Male: $n = 64$ Female: $n = 86$	Adults	Clinical sample	PGSI
Kushnir et al. (2016)	Canada	207	Male: $n = 127$ Female: $n = 80$	Adults	Clinical sample	PGSI
Nelson et al. (2006)	USA	2,256	Male: $n = 1,239$ – $1,258$ Female: $n = 921$ – 935	Adults	Clinical sample	DSM-IV
Comorbidity						
Bischof et al. (2013)	Germany	164	Male: 74.4% Female: 25.6%	Adults	Clinical sample	CIDI
Bischof et al. (2015)	Germany	442	Male: 83.9% Female: 16.1%	Adults	Clinical sample	CIDI
Blanco et al. (2006)	USA	43,093	Only reported for participants with GD	Adults	General population	AUDADIS-IV
Bonnaire et al. (2017)	France	25,647	Male: $n = 12,504$ Female: $n = 13,142$	Adults, Older Adults	General population	CPGI
Boughton and Falenchuk (2007)	Canada	354	Only female	Adults	General population	SOGS
Brand et al. (2019)	USA	591	Male: $n = 404$ Female: $n = 187$	Adults	Clinical sample	ICD-9
Dannon et al. (2006)	Israel	78	Male: $n = 42$ Female: $n = 36$	Adults	Clinical sample	DSM-IV
Dash et al. (2019)	Australia	3,785	Male: $n = 1,365$ Female: $n = 2,420$	Adults	General population	NODS
Desai and Potenza (2008)	USA	43,039	Male: $n = 18,518$ Female: $n = 24,575$	Adults	General population	AUDADIS-IV
Díez et al. (2014)	Spain	96	Male: $n = 49$ Female: $n = 47$	Adults	Clinical sample	DSM-IV
Echeburúa et al. (2011)	Spain	103	Male: $n = 52$ Female: $n = 51$	Adults	Clinical sample	DSM-IV
Echeburúa et al. (2013)	Spain	206	Male: $n = 104$ Female: $n = 102$	Adults	Clinical and general population	SCI-PG, SCID-I
Ellenbogen et al. (2007)	Canada	5,313	Male: $n = 2,750$ Female: $n = 2,563$	Adolescents, Young Adults	General population	DSM-IV, GAQ

(continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Fröberg et al. (2013)	Sweden	19,016	Male: $n = 8,447$ Female: $n = 10,569$	Adolescents, Young Adults	General population	N/A
Håkansson and Widinghoff (2020)	Sweden	327	Male: $n = 223$ Female: $n = 104$	Adults	Clinical sample	PGSI
Håkansson et al. (2017)	Sweden	106	Male: $n = 85$ Female: $n = 21$	Adults	Clinical sample	DSM-5, ICD-10
Håkansson et al. (2018)	Sweden	2099	Male: 77% Female: 23%	Adults	Clinical sample	ICD-10
Jiménez-Murcia et al. (2009)	Spain	498	Male: $n = 439$ Female: $n = 59$	Adults	Clinical sample	SOGS, DSM-IV
Karlsson and Håkansson (2018)	Sweden	2099	Male: $n = 1,625$ Female: $n = 474$	Adults, Older Adults	Clinical sample	DSM-5, ICD-10
Lister et al. (2015)	Canada	150	Male: $n = 75$ Female: $n = 75$	Adults	Clinical sample	NODS
Luczak and Wall (2016)	USA	678	Male: 50% Female: 50%	Young Adults	General population	SOGS
Moodie and Finnigan (2006)	Scotland	1827	Male: $n = 739$ Female: $n = 1,037$	Young Adults	General population	SOGS
Ronzitti et al. (2016)	UK	1,178	Male: 92.5% Female: 7.5%	Adults	Clinical sample	PGSI
Sanscartier et al. (2019)	Canada	624	Male: 47.8% Female: 52.2%	Young Adults	General population	PGSI
Sundqvist and Rosendahl (2019)	Sweden	2010	Male: 66/65% Female: 34/35%	N/A	Clinical sample and general population	SOGS, PGSI
Suomi et al. (2014)	Australia	212	Male: $n = 105$ Female: $n = 107$	Adults	Clinical sample	PGSI
Vogelgesang (2010)	Germany	200	Male: $n = 100$ Female: $n = 100$	Adults	Clinical sample	ICD-10
Trauma						
Boughton and Falenchuk (2007)	Canada	354	Only female	Adults	General population	SOGS
Hodgins et al. (2010)	Canada	1,372	Male: $n = 602$ Female: $n = 770$	Adults, Older Adults	General population	PGSI, CIDI
Kausch et al. (2006)	USA	111	Male: 91.9% Female: 8.1%	Adults	Clinical sample	GSRI, ASI
Ledgerwood and Milosevic (2015)	Canada	150	Male: $n = 75$ Female: $n = 75$	Adults	General population (TN with PG background)	NODS, SOGS
Ledgerwood and Petry (2006)	North America	149	Male: $n = 72$ Female: $n = 77$	Adults	Clinical sample (treatment seeking PGs)	NODS
Petry and Steinberg (2005)	USA	149	Male: $n = 72$ Female: $n = 77$	Adults	Clinical sample (treatment seeking PGs)	SOGS

(continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Roberts et al. (2017)	UK	3,025	Only male	Adults	General population	SOGS
Scherrer et al. (2007)	USA	1,675	Only male	Adults, Older Adults	General population (twins)	DSM-IV
Shultz et al. (2016)	USA	Cases: 94 Controls: 91 (Relatives: 312)	Only reported for subgroups	Adults	General population	SOGS, NODS
Violence						
Affi et al. (2010)	USA	3,334	Only reported for subgroups	Adults	general population	DSM-IV
Andronicos et al. (2015)	N/A	86	Male: $n = 41$ Female: $n = 45$	Adults	Clinical sample	SCID-I, SCID-II, SOGS
Cunningham-Williams et al. (2007)	USA	926	Only female	Adults	General population	N/A
Dowling et al. (2014)	Australia	704	Male: $n = 364$ Female: $n = 320$ Unspecified: $n = 20$	Adults	Clinical sample (treatment seekingPG)	BBGS
Dowling et al. (2018)	Australia	4,153	Male: 48.7% Female: 51.3%	Adults	General population	PGSI
Dowling et al. (2019)	Australia	1,109	Male: 62.4% Female: 37.6%	Adults, Older Adults	General population	PGSI
Echeburúa et al. (2011)	Spain	103	Male: $n = 52$ Female: $n = 51$	Adults	Clinical sample	DSM-IV
Echeburúa et al. (2013)	Spain	206	Male: $n = 104$ Female: $n = 102$	Adults	Clinical and general population	SCI-PG, SCID-I
Fröberg et al. (2013)	Sweden	19,016	Male: $n = 8,447$ Female: $n = 10,569$	Adolescents, Young Adults	General population	N/A
Kausch et al. (2006)	USA	111	Male: 91.9% Female: 8.1%	Adults	Clinical sample	GSRI, ASI
Korman et al. (2008)	Canada	248	Male: 82.7% Female: 17.3%	Adults	General population	CPGI
Lee et al. (2012)	USA	515	Male: $n = 283$ Female: $n = 232$	Adolescents	General population	SOGS
Roberts et al. (2016)	UK	3,025	Only male	Adults	General population	SOGS
Suomi et al. (2019)	Australia	212	Male: 49% Female: 51%	Adults	Clinical sample with family members	N/A
Vogelgesang (2009)	Germany	200	Male: 50% Female: 50%	Adults	Clinical sample	ICD-10
Criminality/delinquency						
Abbott and McKenna (2005)	New Zealand	94	Only female	Adults	Prisoners	SOGS
Granero et al. (2014)	Spain	2,309	Male: 88.2% Female: 11.8%	Adults	Clinical sample	DSM-IV, SOGS

(continued)



Table 1. Continued

Study	Country	Sample Size	Sex (%)	Mean age (SD, age range)	Sample type	Problem gambling measures
Ledgerwood et al. (2007)	N/A	231	Male: $n = 127$ Female: $n = 104$	Adults	Clinical sample	SOGS, ASI-G
Mestre-Bach et al. (2018)	Spain	273	Only female	Adults	Clinical sample (treatment seeking PGs)	DSM-IV-TR, SOGS
Vogelgesang (2009)	Germany	200	Male: 50% Female: 50%	Adults	Clinical sample	ICD-10

Note.

20-GA The 20 questions of the Gamblers Anonymous American Association.

ASI Addiction Severity Index.

ASI-G Addiction Severity Index Gambling Scale.

AUDADIS-IV Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV version.

BBGS Brief Biosocial Gambling Screen.

CGI Clinical Global Impression-Severity scale.

CIDI Composite International Diagnostic Interview.

CPGI Canadian problem gambling index.

DSM-IV Pathological gambling diagnosed using the Diagnostic and Statistical Manual of Mental Disorders, 4th edition.

DSM-5 Pathological gambling diagnosed using the Diagnostic and Statistical Manual of Mental Disorders, 5th edition.

GAF Global Assessment of Functioning.

GAQ Gambling Activities Questionnaire.

GAS Gaming Addiction Scale.

GPSS of CAGI Gambling Problem Severity Subscale of the Canadian Adolescent Gambling Inventory.

GRSC Gambling Related Cognitions Scale.

GSAS Gambling Symptom Assessment Scale.

GSRI Gambler's Self-Report Inventory.

ICD-9 Pathological gambling diagnosed using the International Classification of Diseases and related Health Problems, 9th revision.

ICD-10 Pathological gambling diagnosed using the International Classification of Diseases and related Health Problems, 10th revision.

MIDI Minnesota Impulsive Disorders Interview.

NODS National Opinion Research Center (NORC) DSM Screen for Gambling Problems.

NODS-PERC National Opinion Research Center DSM-IV Screen for Gambling Problems - Preoccupation, Escape, Risked relationships and Chasing losses.

PGSI Problem Gambling Severity Index.

PG-YBOGS Pathological Gambling-Modification of the Yale-Brown Obsessive-Compulsive Scale.

PPGM problem and pathological gambling measure.

SCID-I Structured Clinical Interview for DSM IV Axis I Disorders.

SCID-II Structured Clinical Interview for DSM IV Axis II Personality Disorders.

SCI-GD Structured Clinical Interview for Gambling Disorder.

SCI-PG Structured Clinical Interview for Pathological Gambling.

SOGS South Oaks Gambling Screen.

VGS Victorian Gambling Screen.



likely to be unemployed (Granero et al., 2009; Ronzitti et al., 2016). Only Vogelgesang (2009) reported equivalent unemployment levels for men and women with PG, which, however, refer to a small sample size. Four studies on general population samples reported differences in household composition (Blanco et al., 2006; Bonnaire et al., 2016, 2017; Hing et al., 2016), whereas one study among a clinical sample found no differences (Grant, Chamberlain, et al., 2012). Men were more often found to be single and women to be widowed/divorced or separated. Furthermore, Hing et al. (2016) stated that women were more likely to be living in one-parent family households (see Table 1 at section ‘sociodemographic factors’).

Preferred gambling type

The 14 studies included indicate that women who gambled prefer non-strategic types of gambling (bingo, lottery, scratch cards), whereas men who gamble prefer more strategic games (casino games, horse race and sports betting) (Bonnaire et al., 2017; Leung & Tsang, 2011; Lopez-Gonzalez, Russell, Hing, Estévez, & Griffiths, 2020; Nong, Fong, Fong, & Lam, 2020; Nower & Blaszczynski, 2006; Odlaug et al., 2011; Potenza et al., 2006; Ronzitti et al., 2016; Stevens & Young, 2010; Svensson & Romild, 2014; Toneatto & Wang, 2009; van der Maas et al., 2018; Williams et al., 2013). However, age may be an important confounding factor as younger age is associated with a preference for strategic games and men who gamble tend to start gambling earlier (Bonnaire et al., 2017; Odlaug et al., 2011). Additionally, men who gamble were reportedly more likely to gamble on several games than women with PG (Stark, Zahlan, Albanese, & Tepperman, 2012). See Table 1 at section ‘preferred gambling type’ for further information.

Gambling motives

According to Flack and Stevens (2018), three main motives for gambling can be distinguished. People gamble for emotional (release of tension, stimulation, excitement), social (social recognition, “community” of gamblers), and monetary reasons (expectation to solve money problems). Of the nine studies identified (Clarke et al., 2007; Clarke & Clarkson, 2008; Echeburúa et al., 2011; Flack & Stevens, 2018; Grant & Kim, 2002; Hing et al., 2016; McCormack et al., 2014; Sundqvist, Jonsson, & Wennberg, 2016; Walker, Hinch, & Weighill, 2005), six found no statistically significant sex differences in any of these gambling motives. In contrast, three studies indicated sex differences (Echeburúa et al., 2011; McCormack et al., 2014; Walker et al., 2005). In a study on online gambling, female participants reported that they gambled significantly more often out of boredom, for free practice opportunities, and to spend less money compared with their male counterparts (McCormack et al., 2014). Walker et al. (2005) found that men who gamble in casinos endorsed risk-taking and cognitive self-classification more often than women as an important motive. Similar results are reported by Echeburúa et al. (2011), where men who gamble showed higher sensation seeking and

impulsiveness than women (see Table 1 at section ‘gambling motives’). Age specific differentiations were not available, as the studies mainly referred to adults.

Severity

Most of the eight included clinical studies showed higher levels of problem gambling severity for women than for men (Grant, Chamberlain, et al., 2012; Grant, Odlaug, & Chamberlain, 2017; Håkansson & Widinghoff, 2020; Jiménez-Murcia et al., 2020; Kim, Hodgins, Bellringer, & Abbott, 2016; Ronzitti et al., 2016). These higher levels of severity concerned the gambling disorder itself as well as accompanying burdens such as elevated anxiety or a more general psychopathology (Granero et al., 2009; Grant, Chamberlain, et al., 2012). However, there are also contradictory results. Another study stated an equal severity of PG for both sexes with no differences concerning SOGS total score and total DSM-IV reported criteria (Granero et al., 2009). Furthermore, Jiménez-Murcia et al. (2016) found higher severity scores for men in association with their early onset of PrG, suggesting that the onset of PrG mediates between sex and severity (Jiménez-Murcia et al., 2016). See Table 1 at section ‘severity’ for further information.

Progression of gambling problems

Six studies tackling the progression of gambling problems were included. Typical course-related factors such as age at gambling onset, first symptoms of PG, and onset of a PG diagnosis generally occurred earlier in men than in women (Carneiro et al., 2014; Grant, Odlaug, & Mooney, 2012; Slutske et al., 2014). This finding was also observed for a longitudinal study among young adults below the age of 25 by Edgerton, Melnyk, and Roberts (2015).

Two studies with treatment-seeking samples found a shorter time interval from the onset of gambling to the first occurrence of manifest problems with gambling for women compared with men who gamble (Grant, Odlaug, & Mooney, 2012; Nelson, LaPlante, Labrie, & Shaffer, 2006). However, Slutske et al. (2014) found no evidence for the telescoping effect in a general population sample.

One cross-sectional study found a temporal difference in the occurrence of comorbid disorders (Haw & Holdsworth, 2016). Women with PG retrospectively reported that they had experienced other disorders (e.g., mood and substance abuse disorders) before the first onset of PrG, whereas men indicated it to be the other way round. It should be noted that the PGSI was used here, which is usually recommended in a general population setting (Holtgraves, 2009) (see Table 1 at section ‘progression of gambling problems’).

Use of professional help/motivation for treatment

Sex differences in motivation for treatment and treatment seeking have hardly been examined so far. The existing evidence in the eight included studies is mixed. Echeburúa et al. (2011), Harries, Redden, and Grant (2018), and Kushnir, Godinho, Hodgins, Hendershot, and Cunningham



(2016) found no differences between men and women with PrG and PG regarding dropout rates and general rate of treatment seeking. In contrast to these studies, a German study on the outpatient sector by Braun, Ludwig, Slecza, Bühringer, and Kraus (2014) identified lower chances of being in treatment for women, which is consistent with another German study on inpatient treatment for gamblers (Buchner et al., 2015). Furthermore, studies that dealt with the use of telephone gambling hotlines reported significantly more use of subsequent treatment services among men than among women, which was also apparent for adolescents (Aster, Quack, Wejbera, & Beutel, 2018; Kim et al., 2016). However, women tend to seek therapeutic support sooner after recognizing their gambling problems than men. Usually, men start gambling earlier than women, but the time span between the occurrence of gambling problems and treatment seeking was longer. The authors also showed an interaction effect of initiation age and time to treatment. Earlier age of initiation was associated with a longer period from recognition of having a problem until treatment seeking. This relationship was stronger for men than for women (Nelson et al., 2006).

Regarding motivation for treatment, a study conducted by Kushnir et al. (2016) found that men exhibited higher trait detachment, whereas women tended to have higher scores on guilt proneness and shame, which is of interest as these factors can be relevant regarding the motivation for change. Despite these differences, the authors did not find sex effects concerning motivation for change (see Table 1 at section 'use of professional help/motivation for treatment').

Comorbidity

In general, PG was often accompanied by mental and substance-related comorbidities [e.g., 73% of persons with PG have a current other psychiatric diagnosis (Håkansson, Karlsson, & Widinghoff, 2018); the lifetime prevalence for any other psychiatric disorder for people with PG is 96.3% (Bischof et al., 2013)]. However, studies indicated that general comorbidity rates are higher for women (Brand, Rodriguez-Monguio, & Volber, 2019; Håkansson, Mårdhed, & Zaar, 2017, 2018; Suomi, Dowling, & Jackson, 2014).

Most evidence for higher comorbidity rates in women was found for affective disorders (Bischof et al., 2013; Blanco et al., 2006; Boughton & Falenchuk, 2007; Brand et al., 2019; Dannon et al., 2006; Desai & Potenza, 2008; Díez et al., 2014; Echeburúa et al., 2011; Erbas & Buchner, 2012; Håkansson et al., 2018; Jiménez-Murcia et al., 2009; Lister, Milosevic, & Ledgerwood, 2015; Moodie & Finnigan, 2006; Ronzitti et al., 2016; Sundqvist & Rosendahl, 2019; Vogelgesang, 2010). Only two studies reported no sex differences for affective disorders with these findings referring to young people and general population settings (Echeburúa et al., 2013; Ellenbogen, Derevensky, & Gupta, 2007). An equally strong sex difference as for affective disorders could be found for anxiety disorders (Blanco et al., 2006; Boughton & Falenchuk, 2007; Dannon et al., 2006; Echeburúa et al., 2011; Erbas & Buchner, 2012; Håkansson et al., 2018; Jiménez-

Murcia et al., 2009; Sundqvist & Rosendahl, 2019; Ronzitti et al., 2016; Vogelgesang, 2010). However, one general population study found no sex differences for anxiety disorders (Echeburúa et al., 2013). As it is typical for other psychological disorders, suicidality was found to be more prevalent in gambling women than in men (Bischof et al., 2015; Boughton & Falenchuk, 2007; Fröberg, Hallqvist, & Tengström, 2013; Sanscartier, Shen, & Edgerton, 2019; Sundqvist & Rosendahl, 2019). However, more committed suicides were reported for men (Karlsson & Håkansson, 2018).

The evidence for a correlation between PG and alcohol abuse/dependence was quite consistent for men but not for women (Blanco et al., 2006; Dannon et al., 2006; Dash et al., 2019; Echeburúa et al., 2011, 2013; Erbas & Buchner, 2012; Fröberg et al., 2013; Luczak & Wall, 2016; Ronzitti et al., 2016; Sanscartier et al., 2019; Suomi et al., 2014; Sundqvist & Rosendahl, 2019). Research concerning nicotine use or dependence and PG showed conflicting results, which seem to depend on the sample type. While general population studies indicated higher rates for gambling women (Bonnaire et al., 2017; Boughton & Falenchuk, 2007; Desai & Potenza, 2008), clinical studies reported no sex differences (Ronzitti et al., 2016; Vogelgesang, 2010).

Regarding other substance-related disorders, six studies showed a correlation with gambling for men but not for women (Brand et al., 2019; Dannon et al., 2006; Echeburúa et al., 2011; Erbas & Buchner, 2012; Jiménez-Murcia et al., 2009; Ronzitti et al., 2016). One study, addressing adolescents, contradicted this finding and found higher rates of using hard drugs for girls than for boys (Ellenbogen et al., 2007). No sex differences in substance use were found in three studies (Echeburúa et al., 2013; Håkansson et al., 2018; Håkansson & Widinghoff, 2020). See Table 1 at section 'comorbidity' for further information.

Trauma

Nine studies regarding trauma were included in this review. For men as well as women with PrG and PG, there was evidence for higher odds of traumatic life events than for people without gambling problems (Boughton & Falenchuk, 2007; Hodgins et al., 2010; Ledgerwood & Petry, 2006; Ledgerwood & Milosevic, 2015; Roberts et al., 2017; Scherrer et al., 2007; Shultz, Shaw, McCormick, Allen, & Black, 2016). These studies further observed that past experience of maltreatment was more frequent in women with PG. Similarly, most clinical studies showed that rates of physical, emotional, or sexual abuse in childhood as well as trauma in adulthood were considerably higher for women who gamble than for their male counterparts (Kausch, Ruge, & Rowland, 2006; Petry & Steinberg, 2005). In a general population study, people with gambling disorder and a comorbid post-traumatic stress disorder (PTSD) were less likely to be men than women (Ledgerwood & Milosevic, 2015). In contrast to clinical studies, the results of general population studies were less equivocal. With regard to the odds of maltreatment of men and women with PrG, general population studies



suggested that there is no difference (Hodgins et al., 2010). See Table 1 at section ‘trauma’ for further information.

Violence

We found 16 studies that explored the relationship between sex, gambling, and violence (Andronicos et al., 2015; Affi, Brownridge, MacMillan, & Sareen, 2010; Cunningham-Williams, Abdallah, Callahan, & Cottler, 2007; Dowling et al., 2014, 2016, 2018, 2019; Echeburúa et al., 2011; Fröberg et al., 2013; Kausch et al., 2006; Korman et al., 2008; Lee, Storr, Ialongo, & Martins, 2012; Roberts et al., 2016; Suomi et al., 2019; Vogelgesang, 2009, 2013). Pathological gambling was found to be associated with a higher likelihood of being the victim and the perpetrator of violence (psychological, physical, and sexual violence) (Affi et al., 2010; Roberts et al., 2016; Suomi et al., 2019). It is noteworthy that the prevalence of violence was unusually high among men and women with PrG and PG (compared with the general population). In their systematic review, Dowling et al. (2016) reported that around 38% were victims of violence and 37% perpetrators. In most cases, men and women who gambled were both victims and perpetrators, indicating reciprocal violence (Affi et al., 2010; Suomi et al., 2019). Suomi et al. (2019) and Korman et al. (2008) found that around 60% of people with gambling problems experienced violence during the past year. For women who gambled, Echeburúa et al. (2011) reported an even higher number of 68.6%, compared with only 9.8% in a non-gambling control group. Although there was robust evidence of the association between violence and gambling for men and women, the research findings on sex differences in scale were mixed. While Suomi et al. (2019) did not find differences between men and women, Dowling et al. (2014) found that women were more likely to be victims (2.1 times) than men and to report both victimization and perpetration (1.6 times) more often than men. Similar findings were reported by Kausch et al. (2006) and Andronicos et al. (2015). In a small clinical sample, Vogelgesang (2009) found higher rates of physical maltreatment and specifically sexual assaults for women (See Table 1 at section ‘violence’).

Criminality/delinquency

Overall, we found six studies exploring sex differences in criminality (Abbott & McKenna, 2005; Banks, Waters, Andersson, & Olive, 2020; Granero et al., 2014; Ledgerwood, Petry, Weinstock, & Morasco, 2007; Mestre-Bach et al., 2018; Vogelgesang, 2009). In relationship to gambling, mostly income-generating crimes were reported. These crimes included petty theft, fraud, and forgery (Laursen, Plauborg, Ekholm, Larsen, & Juel, 2016). Overall prevalence rates ranged from 14% to 30% (Granero et al., 2014; Ledgerwood et al., 2007). No sex differences were observed. Only in a very small clinical sample women who gambled reported criminal acts in 10% of the cases, whereas men who gambled had committed crimes in 30% of the cases (Vogelgesang, 2009).

Another topic of interest concerning criminality was the high prevalence of PG in forensic populations. In their

systematic review, Banks et al. (2020) found that 10.4–73% of imprisoned men met the criteria for PG, whereas only 5.9–45% of imprisoned women did so. These numbers show that prevalence rates among inmates were significantly higher than in the general population and higher for men than for women (see Table 1 at section ‘criminality/delinquency’).

DISCUSSION

Lack of gender sensitive research

The most important result of our extensive literature search was that studies measuring gender are still scarce. Our initial goal, to explicitly include gender differences and not only focus on sex differences could thus not be met. The studies on LGBTQI* were the only studies to include sexual orientation. In the other studies the terms sex and gender were used interchangeably without differentiating between the two concepts. As the studies failed to measure gender and only reported sex, the results of this review are limited to sex differences. This result was rather surprising as even more recent studies showed little awareness of the problem. An inconsistent use of the terms sex and gender, poor measuring of sex and gender, and a lack of gender- and sex-specific reporting can be considered as a major impediment concerning reviews on sex and gender differences (Blake-man, 2020). Future studies correctly assessing sex and gender are needed in order to highlight gender differences and not only sex differences (Clayton & Tannenbaum, 2016). As a generally accepted standard of measuring and reporting gender and related concepts is still missing, it will be a challenge to implement new ways of assessing gender and embrace the linked higher level of complexity when it comes to data analysis and interpretation of results (Blake-man, 2020).

The minimum standard should be, to separately assess and report both sex and gender (e.g., see most applied gender identity measurements in GenIUSS, 2013). As gender is a complex construct, it would be advisable to use multidimensional instruments [e.g., gender scale by Pelletier et al. (2015) or Lindqvist, Gustafsson Sendén, & Renström, 2021].

We are aware that including gender measures might be challenging, however we consider it to be necessary. As gambling is a phenomenon shaped by environmental and sociocultural factors and presumably not primarily by biological sex differences, investigating gender differences could yield new and surprising results.

One example is the preliminary result, that prevalence rates for PG might be elevated in the LGBTQI* community. Expanding research on differences by gender and sexual orientation might also yield new insights into the motives underlying observable differences. For instance, gambling is often used as a coping mechanism to deal with discrimination and victimization experiences linked to a non-hetero-normative sexual orientation (Richard et al., 2019).



Furthermore, existing data on substance use disorder (SUD) suggest that results for prevalence rates or comorbidities may differ depending on whether sex or gender is considered. Data from the World Health Organization indicate that prevalence differences for SUD narrow in societies with less gender role traditionality (Seedat et al., 2009). Given these findings it is reasonable to assume that including gender aspects in gambling research would add value to the current picture.

Sex differences

Despite not being able to report on gender differences, the review yielded some important results concerning sex differences, which will be discussed in the following.

Overall, most results on sex differences concerning persons with PrG and PG were mixed. However, the review could identify a few areas with rather robust evidence of sex differences. Compared to women, men generally showed higher prevalence rates, started gambling at an earlier age, reported a higher monthly income, played a larger variety of chance-based games, and showed a tendency toward strategic forms of gambling. These results are mostly in line with the review by Wenzel and Dahl (2009). Concerning prevalence rates there is even some evidence that the sex gap might be narrowing (Castrén, Heiskanen, & Salonen, 2018; McCarthy et al., 2018). Possible explanations are emerging games and gambling environments designed to appeal specifically to women.

For quite a few of the studied characteristics, the number and quality of studies were limited, indicating the need for further research. Especially in areas such as LGBTQI*, online gambling and the use of help/motives for help seeking, a shortage of studies was observed. Concerning sex differences, some further reasons for ambiguous results must be discussed. Contradictory findings in areas such as motives for gambling, severity, or comorbidity might be an artifact of varying study quality. Besides small sample sizes and heterogeneous definitions of PrG and PG (different diagnostic instruments), important confounding factors, such as progress of severity and sample age, were not considered in all studies. Previously claimed differences in gambling motives are an example. In this case, the assumption that women gamble to regulate emotions, whereas men gamble for economic reasons might result from a failure to account for the severity and progression of gambling problems. Rather than being a gender effect, monetary reasons and social recognition become less important and emotional regulation becomes the primary goal as the addiction progresses. Reports about differences in gambling motivations could thus be seen as artifacts of confounding factors such as the severity of problem gambling and addiction progress.

Even areas with apparently clear sex differences (prevalence rates) show a more nuanced picture when scrutinized in detail. The convergence of prevalence rates with increasing age is one example of the complex interplay of sex with further sociocultural factors (e.g., sample age, country

in which the study was conducted, sample type: general population vs. treatment-seeking population).

This finding is in line with the review by Merkouris et al. (2016), lending support to the gender as proxy theory (Nelson et al., 2006). Although sex is an important factor in explaining differences in gambling characteristics, the size of its contribution might sometimes be overestimated by a failure to account for further psychosocial characteristics. When factors such as age at initiation, socioeconomic status, cultural background, family history of addiction problems, etc. are considered, differences attributable to sex might diminish.

In line with the existing literature, we found mixed evidence for gambling-related sex differences in areas such as violence or acquisitive crime. Although women were more likely to be the victim and less likely to be the perpetrator in some of the studies, they were also generally found to have a higher proportion of delinquents or offenders among them. The ambiguous results are certainly caused by the very heterogeneous samples, survey settings and possibly biased by a failure to distinguish between minor violent acts and actual health-threatening assaults, but there is a need to expand research in this area. For clinicians, it might be important to keep in mind that a considerable number of men as well as women with PG are both perpetrators and victims of violence.

Concerning treatment, the review findings clearly indicate that factors such as trauma and violence should be actively queried for both sexes. Trauma appears to be a major risk factor for developing a gambling disorder and should therefore necessarily be considered in the development of prevention and treatment strategies. Especially women with more severe experiences of traumatic life events might be more likely to seek treatment than women with less severe histories (Hodgins et al., 2010).

Given the low utilization rates among women who gamble, it is important to elaborate and expand therapy services that are more suitable for women (Aster et al., 2018; Loy, Daniel, Bickl, Schwarzkopf, & Kraus, 2021; Kim et al., 2016). As prevention and therapy approaches are often geared towards a male clientele, it is necessary to expand the orientation of the offers in a more inclusive way, addressing feelings of shame and stigmatization among women.

CONCLUSIONS AND FURTHER RESEARCH

In conclusion, the review could identify a few areas with robust evidence of sex differences (e.g., men show higher prevalence rates, women start gambling later in life). Concerning treatment, PTSD and being the victim of violence should be checked for both sexes, but especially for women. Women's access to therapy services should be improved.

As studies on gender differences are currently scarce, future studies should focus on gender and report both sex and gender. Furthermore, relevant confounding factors such



as severity, sample age should be considered, and homogeneous and psychometric valid instruments used.

Funding sources: This study was conducted in the context of the Bavarian Coordination Centre for Gambling Issues (Bayerische Landesstelle Gluecksspielsucht (LSG)). The LSG is funded by the Bavarian State Ministry of Public Health and Care Services. The State of Bavaria provides gambling services (lotteries, sports betting and casino games) within the State gambling monopoly via the State Lottery Administration and provided funding for the Bavarian Coordination Centre for Gambling Issues as an unrestricted grant.

Authors' contribution: CG, AB, SH and JL designed the study. CG, AB, SH, JL and LH acquired the data to be reviewed. CG, AB, SH, JL and LH conducted the analysis and interpretation of the data. All authors critically contributed to earlier drafts of the manuscript. CG, AB, JL and LH approved the final version of the paper.

Conflict of interest: The authors report no financial or other relationship relevant to the subject of this article.

Acknowledgements: The authors express their heartfelt thanks to their colleagues Sonja Schröder, Pia Wullinger, Larissa Schwarzkopf, Norbert Wodarz, and Ludwig Kraus, who provided advice and support in conducting the study or drafting this paper.

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