



## Women and gambling disorder: Assessing dropouts and relapses in cognitive behavioral group therapy

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### ARTICLE INFO

#### Keywords:

Gambling disorder  
Women  
Cognitive-behavioral therapy  
Relapse  
Dropout

### ABSTRACT

**Background:** Gender-specific literature focused on gambling disorder (GD) is scarce, and women with GD have been understudied. Therefore, the aim of this study was to estimate the short-term effectiveness in women with GD ( $n = 214$ ) of a group standardized cognitive-behavioral therapy (CBT) and to identify the most relevant predictors of the primary therapy outcomes (dropout and relapse). **Methods:** The manualized CBT consisted of 16 weekly outpatient group sessions. Women were provided with resources to obtain a better understanding of the GD, to improve self-control and to manage risk situations. **Results:** The dropout risk was higher for women with lower GD severity and higher psychopathological distress. Among other factors, lower education levels were a significant predictor of the relapse risk and the frequency of relapses was higher for divorced women with a preference for non-strategic gambling and with substances consumption. **Conclusions:** Our findings evidence women-specific predictors of the primary therapy outcomes. The results highlight the need to design psychological interventions that address dropout and relapse risk factors in women.

## 1. Introduction

### 1.1. Gambling disorder and gender

Gambling disorder (GD) is considered a psychiatric condition characterized by recurrent, maladaptive gambling behavior that leads to clinically significant distress (American Psychiatric Association, 2013). It is a mental health problem less prevalent in women, and a male–female ratio of 2.8:1.0 has been identified (Merkouris et al., 2016;

Blanco et al., 2006). Nevertheless, some authors suggest that GD may have been under-diagnosed in women mainly because only a small percentage of women who develop gambling problems seek treatment (Braun et al., 2014).

Numerous gender-related differences have been reported, especially focusing on gambling behavior patterns, GD pathogenesis, and socio-demographic and psychopathological profiles (Gavriel-Fried et al., 2019; Grant and Kim, 2002; Jiménez-Murcia et al., 2014; Slutske et al., 2015; Wong et al., 2013; Jiménez-Murcia et al., 2020). Whereas women

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<https://doi.org/10.1016/j.addbeh.2021.107085>

Received 21 April 2021; Received in revised form 2 July 2021; Accepted 11 August 2021

Available online 13 August 2021

0306-4603/© 2021 The Authors.

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usually start to gamble at a later age than men, the time between the onset of gambling and the development of problems appears to be shorter in women than in men (Blanco et al., 2006; Slutske et al., 2015; Potenza et al., 2001; Grant et al., 2012; Richmond-Rakerd et al., 2013). This phenomenon has been labeled as the “telescoping effect” and has been widely evidenced (Grant et al., 2012; Tavares et al., 2001; Khanbhai et al., 2017). In addition, women generally seek treatment when they are older, and they commonly show higher levels of associated psychopathology, especially depression and anxiety, in comparison with men (Tavares et al., 2001; Khanbhai et al., 2017). Regarding motives and preferences for gambling, women may use gambling, especially non-strategic forms, to escape the discomfort of experiencing negative emotions (Grant et al., 2012; Holdsworth et al., 2012). Accordingly, Sundqvist & Rosendahl (McCarthy et al., 2019) observed that in the case of women, GD appeared after psychopathology such as anxiety or depression, while men initiated gambling before any psychiatric condition appeared (Jiménez-Murcia et al., 2020; Sundqvist and Rosendahl, 2019).

### 1.2. Gambling disorder, treatment outcome and gender

Behavioral treatments are one of the main therapeutic options for GD due to its association with significant improvements in these gambling behaviors (Jiménez-Murcia et al., 2020; Yau and Potenza, 2015). Although different psychological approaches have been used, cognitive behavioral therapy (CBT) has the strongest empirical evidence in GD (Potenza et al., 2019; Tolchard, 2017; Mallorquí-Bagué et al., 2018; Mestre-Bach et al., 2016). Previous studies have stressed the need of including cognitive restructuring and motivational components in CBT protocols in order to facilitate the approach of cognitive distortions related to gambling behavior, and to interrupt irrational thought processes, magical thinking and perseveration patterns associated with GD (Mestre-Bach et al., 2019; Menchon et al., 2018; Di Nicola et al., 2020; Jiménez-Murcia et al., 2019).

Regarding the type of treatment, it is worth mentioning that CBT reduces gambling behavior and the problems related to it, regardless of its modality, without observing significant differences in relation to the efficacy of the treatment, whether the CBT is administered individually or in group modality (Ginley et al., 2019; Cowlshaw et al., 2012; Pickering et al., 2018).

To the best of our knowledge, treatment outcomes for GD have been poorly operationalized and inconsistently studied (Granero et al., 2020). The most explored factors associated with treatment responses have been relapse and dropout (Oei et al., 2010; Ginley et al., 2019; Cowlshaw et al., 2012; Pickering et al., 2018). Regarding relapse, although there is no consensus to operationalize this complex construct, different predictive factors have been identified, such as gambling related cognitions and urge, high gambling exposure and social/economic deprivation (Oei et al., 2010; Ginley et al., 2019). However, there is also a combination of factors that might protect the gambler from eventually carrying out the gambling episode, such as personality traits, coping skills, gambling cognitions and biological factors (Smith et al., 2015). More specifically, some relapse protective factors identified are: distraction techniques to avoid thinking about the urge to gamble, vigilance, motivation to change, cognitive strategies such as remembering the negative consequences of past gambling episodes, and positive social support (Ronzitti et al., 2017). With respect to dropout in treatments for GD, some of the associated predictors have been younger age, a lower GD severity, affect-driven impulsivity traits, use of drugs, and family history of GD (Cowlshaw et al., 2012; Pickering et al., 2018). The dropout rate in GD is around 30–45% (Cowlshaw et al., 2012; Pickering et al., 2018; Abbott, 2020; Rizzo et al., 2019). One of the difficulties associated with GD that can significantly impede adherence to treatment is a high rate of psychiatric comorbidities, which is mostly associated with increased GD severity (Ronzitti et al., 2017; Oakes et al., 2019). Other factors that have been associated with a worse treatment outcome

are pre-treatment gambling behavior, GD severity, craving states, gambling cognitive distortions, coping with negative emotions, debt and gambling preferences (Granero et al., 2020; Ronzitti et al., 2017; Oakes et al., 2012; Aragay et al., 2015). On the other hand, factors such as lower sensation seeking, stronger awareness of the consequences related to gambling behavior and the involvement of a concerned significant other in the therapeutic process have been associated with greater adherence to treatment (Jiménez-Murcia et al., 2015; Ronzitti et al., 2018). Women are less likely to seek treatment for GD due to multiple barriers: cultural reasons, social stigma, practical concerns and caretaking issues, and financial and travel limitations (Jiménez-Murcia et al., 2017; Jara-Rizzo et al., 2019; Boughton and Brewster, 2002). However, it has been suggested that women would have a higher probability of recovery in comparison with men (56% vs 36%), showing different obstacles and strengths to overcome GD, making the gender perspective essential to study treatment outcome (Gavriel-Fried et al., 2019; Melville et al., 2007). However, the gender-specific literature focused on GD is scarce, and women have been neglected in gambling research (Grant et al., 2012; Merkouris et al., 2016; Karlsson and Håkansson, 2018).

In-depth study of women and their gambling behavior may improve prevention and treatment plans for GD (Jiménez-Murcia et al., 2015; Ronzitti et al., 2018). Therefore, the aim of the current study was to estimate the short-term effectiveness in women with GD ( $n = 214$ ) of a standardized group CBT program executed over 16 weekly sessions and to identify the most relevant predictors of the primary therapy outcomes.

## 2. Material and Methods

### 2.1. Participants and procedure

Participants measured for the study were recruited women at the Pathological Gambling and Behavioral Addictions Unit at our hospital, who voluntarily sought treatment for GD ( $n = 214$ ). The recruitment took place between January 2005 and January 2019. These participants were allocated to a manualized CBT group program. The treatment groups were of the closed type (all patients started and ended at the same time) and consisted of 14 consecutive patients who met the inclusion criteria. Neither gender nor age was taken into account when setting up the therapy groups, because it is considered that the heterogeneity of clinical profiles can be enriching for patients. Exclusion criteria were having an intellectual disability, an organic mental disorder or an active psychotic disorder.

### 2.2. Instruments

#### 2.2.1. DSM-5 criteria [APA, 2013]

Patients meeting DSM-IV-TR criteria were diagnosed with pathological gambling (Jiménez-Murcia et al., 2017). It is worth mentioning that the appearance of the DSM-5, the concept of pathological gambling was changed to GD. All patient diagnosis were reevaluated and recodified post hoc and only patients who met DSM-5 criteria for GD (American Psychiatric Association, 2013) were involved in our study.

#### 2.2.2. Symptom Checklist-Revised (SCL-90-R) (Jara-Rizzo et al., 2019)

This is a 90-item questionnaire measuring symptoms of psychopathology in general and psychological distress. The items measure nine symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. Intensity is determined by a scale that goes from total absence (score 0) to maximum intensity (score 4). The (Global Severity Index [GSI]) is a direct indicator of the level of severity of symptoms, also called the index of psychopathological distress and is widely used. The Spanish adapted version was used in this study (Boughton and Brewster, 2002).

### 2.2.3. Other clinical and sociodemographic variables

Relevant sociodemographic and clinical variables related to gambling were considered using a semi-structured face-to-face clinical interview described in another section (Gainsbury et al., 2014).

## 2.3. Treatment

CBT group-based program consisted of 16 weekly outpatient sessions of 90 min each at a public hospital. The CBT groups were managed by a qualified clinical psychologist and a licensed co-therapist. To guarantee the reliability of our results, treatment providers received training on how to strictly follow the program and adhere to the treatment manual (Gainsbury et al., 2014). Throughout the years of collection of the sample, the team of psychologists has remained stable. If there have been variations in relation to the figure of the co-therapist, in itself, this fact is not a problem. On the other hand, training has been provided to the entire therapeutic team, continuously over time on how to strictly follow the program and adhere to the standardized CBT treatment manual, guaranteeing the minimum influence of individual variables that may influence the outcome of the treatment, offering methodological rigor, so that the results can be replicated as observed in subsequent studies (Jara-Rizzo et al., 2019; Jimenez-Murcia et al., 2008; Singer and Willett, 2003). The aim of this treatment was to provide patients with CBT resources and strategies for coping with their desire to gamble and, ultimately, to obtain a complete and definitive abstinence from any type of gambling behavior. The matters included in the treatment plan were: psychoeducation on gambling disorder (vulnerability factors, their evolution, diagnostic criteria, etc.), contingency control (supervision and control of money, self-exclusion programs, avoidance of potential triggers, etc.), response prevention (compensatory and alternative behaviors), cognitive restructuring to modify the player's own cognitive distortions, focused on magical thinking and illusions of control over the game and, training in emotional regulation skills and other practices of relapse prevention. The treatment program has previously been defined in another article (Gainsbury et al., 2014) and its short and middle-term efficacy has been described in other studies (Granero et al., 2020; Nelson et al., 2006; Slutske et al., 2009). During the entire treatment, presence to treatment sessions, control of spending and the incidence of relapses were noted weekly on a record sheet. A relapse was defined as the presence of a gambling episode once treatment had been started. Relapses are common among gambling disorder patients. (Mestre-Bach et al., 2016; Slutske et al., 2009). Not attending three consecutive sessions of CBT therapy was considered a dropping out criterion.

### 2.4. Statistical analysis

Stata16 for Windows was used for the statistical analyses. The rate of dropout and relapse was modeled with survival analysis curves, using Kaplan-Meier (product-limit) estimator. Survival function constitutes a procedure accustomed to measure the probability of patients' "living-survive" for a certain amount of time (Grant and Potenza, 2004). In this study, surviving is considered by the absence of dropout and the absence of relapse after the beginning of the CBT.

Regression models identified the variables with significant capacity on the risk of dropout and relapse during the CBT, as well as on the number of sessions attended during the therapy and the number of relapses also registered during the intervention. Logistic regression was used for the binary criteria [dropout (yes/no) and relapse (yes/no)] and negative binomial regression was used for the count criteria (number of sessions and relapses). Negative binomial is a type of generalized linear model useful for dependent variables measured with a count scale, which offers better properties than the Poisson regression for overdispersed outcomes (Dowling et al., 2009). The regressions were adjusted through stepwise procedures, which automatically selected the significant predictors for each criterion within the list of independent

variables registered at baseline: sociodemographics, gambling profile [duration of the problematic gambling, preferred form of gambling (non-strategic, strategic or both) and GD severity], global psychopathological distress (SCL-90-R GSI), and substances use-abuse (alcohol, tobacco and other drugs).

### 2.5. Ethics

The current study was accepted in accordance with the latest version of the Declaration of Helsinki. The University Hospital Clinical Research Ethics Committee approved the study, and signed informed consent and agreement was obtained from all participants.

## 3. Results

### 3.1. Characteristics of the sample

Most women in the study achieved primary or less education levels (62.1%), were single (42.5%) or married (37.9%) and belonged to mean-low or low social position indexes (83.1%). Mean age was 49.2 years (SD = 12.3), mean age of onset of the problematic gambling was 37.7 years (SD = 12.2) and mean duration of the disorder 5.7 years (SD = 5.7). The most preferred form of gambling was non-strategic (87.9%), and 43.9% of the women reported debts due to the gambling activity. Table 1 includes the frequency distribution for the sociodemographics and gambling related variables in the samples.

### 3.2. Treatment outcomes

The quantity of women who dropped out during the CBT treatment was  $n = 90$  [the risk estimate was  $R = 42.1\%$ , 95% confidence interval (95%CI): 35.4% to 48.7%], and  $n = 77$  women reported at least one relapse during the treatment ( $R = 36.0\%$ , 95%CI: 29.6% to 42.4%).

Fig. 1 shows the survival functions for dropout time and the moment of first relapse during the CBT. Dropouts appeared during the first two months of treatment: 7.5% had dropout at week 2, 14.5% at week 3, 24.3% at week 4, and the remaining 17.8% were registered during the weeks 5 to 7. The presence of relapses was observed during the whole intervention, with a higher rate during the first month (14.5% had occurred at week 4, while 8.4% occurred during the second month, 6.5% during the third month and the remaining 6.5% during the last fourth month).

### 3.3. Predictive models of the treatment outcomes

Table S1 (supplementary material) shows the distribution of all the variables analyzed in the study for patients grouped by the risk of dropout (yes-no) and relapse (yes-no).

Table 2 includes the final predictive models for CBT outcomes. The first model indicates dropout risk is higher for women with lower GD severity and higher psychopathological distress. A fewer number of sessions attended during the treatment was related to younger age, lower number of DSM-5 criteria for GD and worse psychopathological state. Regarding the risk of relapse during the CBT, it appears to be higher for women with lower education levels and those without debts due to the gambling activity. Finally, the relapse rate registered during the CBT was higher for divorced women, those within lower social position indexes, preference for non-strategic gambling, reporting maximum bets per gambling-episode, and absence of smoking use but use of other illegal drugs.

As a summary of the results, Fig. 2 contains the radar-chart with the main variables related to the risk of dropout and relapse.

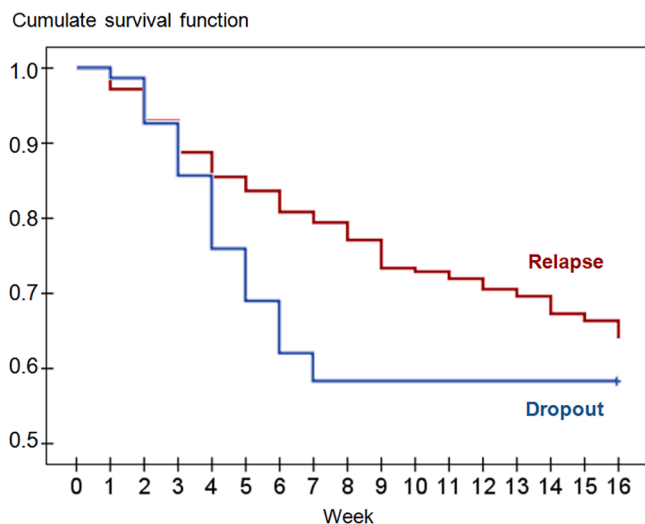
## 4. Discussion

The main purpose of the present study was to estimate the short-term

**Table 1**  
Characteristics of the patients in the study (n = 214).

Sociodemographics	n	%	GD: age, onset and duration	Mean	SD
Education			Chronological age (yrs-old)	49.20	12.34
Primary or less	133	62.1%	Onset of the addiction (yrs-old)	37.67	12.19
Secondary	69	32.2%	Duration of the addiction (yrs)	5.72	5.67
University	12	5.6%	<i>GD severity</i>	<i>Mean</i>	<i>SD</i>
Marital status			DSM-5 total criteria	6.96	1.65
Single	91	42.5%	Bets (euros/episode, maximum)	531	646
Married-couple	81	37.9%	Bets (euros/episode, mean)	70	110
Divorced-Separated	42	19.6%	Debts due to gambling; n - %	94	43.9%
Employment			*Debts (euros); mean - SD	7,531	7,510
Unemployed	104	48.6%	Gambling type	188	87.9%
Employed	110	51.4%	Non-strategic	10	4.7%
Social status			Strategic	16	7.5%
Mean-high or high	9	4.2%	Both (non-strategic and strategic)		
Mean	25	11.7%			
Mean-low	34	15.9%			
Low	146	68.2%			

Note. SD: standard deviation. \*Calculated for patients who reported bets due to the gambling behavior.



**Fig. 1.** Survival functions for the dropout and relapse during the CBT (n = 214).

effectiveness of a standardized CBT group program in women with GD, and to identify the most relevant predictors of the primary therapy outcomes.

The sociodemographic and clinical profile of the women included in this study was characterized by primary education levels or less, a mean age of 49.2 years, mean age of GD onset of 37.7 years and a mean duration of the disorder of 5.7 years. This supports previous findings in the literature suggesting that women usually start to gamble at a higher age than men (Blanco et al., 2006; Slutske et al., 2015; Richmond-Rakerd et al., 2013). Moreover, it also confirms what has been called the “telescoping effect”, which shows that the period between the initial participation in gambling and the development of GD is shorter in women. (Potenza et al., 2001; Grant et al., 2012; Association et al., 2000). It has been suggested that women start to present problems with the gambling behavior at an older age than men (Blanco et al., 2006; Slutske et al., 2015; Richmond-Rakerd et al., 2013).

Regarding gambling preferences, the most preferred form of gambling was non-strategic. Our finding dovetails with the results of previous studies demonstrating that women choose chance-based forms of gambling (such as lotteries and bingo) (Grant et al., 2012; Derogatis, 1994). Some authors have suggested that this form of gambling provides an escape from negative emotions as a form of emotion-based coping (Grant et al., 2012). However, recent studies have indicated that younger women’s gambling preferences may be changing towards more

**Table 2**  
Predictive models of the CBT outcomes in the study.

<sup>1</sup> Criterion: dropout	B	SE	Wald	p	OR	95%CI	OR
DSM-5 total criteria	-0.308	0.096	10.32	0.001	0.735	0.609	0.887
SCL-90R GSI	0.483	0.210	5.28	0.022	1.620	1.074	2.446
<sup>2</sup> Criterion: number of sessions	B	SE	Wald	p	95%CI	B	
Age (years-old)	0.004	0.002	4.880	0.027	0.001	0.008	
DSM-5 total criteria	0.085	0.015	30.615	<0.001	0.055	0.116	
SCL-90R GSI	-0.152	0.034	20.089	<0.001	-0.218	-0.086	
<sup>1</sup> Criterion: relapses	B	SE	Wald	p	OR	95%CI	OR
Education			6.020	0.049			
Secondary versus primary	-0.800	0.333	5.765	0.016	0.449	0.234	0.863
University versus primary	0.089	0.618	0.021	0.885	1.093	0.325	3.673
Secondary versus university	-0.889	0.658	1.830	0.176	0.411	0.113	1.491
Debts due to gambling activity	-0.538	0.298	3.257	0.048	0.589	0.326	0.999
<sup>2</sup> Criterion: number of relapses	B	SE	Wald	p	95%CI	B	
Civil status			4.098	0.043	-0.752	-0.012	
Single versus divorced	-0.382	0.189	11.809	0.001	-1.121	-0.307	
Married versus divorced	-0.714	0.208	3.313	0.069	-0.690	0.025	
Single versus Married	-0.332	0.182	6.071	0.014	0.053	0.462	
Social position index (lower levels)	0.257	0.104	4.405	0.036	0.055	1.608	
Gambling			0.002	0.968	-1.196	1.148	
Non-strat. versus both	0.831	0.396	3.192	0.074	-1.793	0.083	
Strategic versus both	-0.024	0.598	12.427	0.001	0.000	0.000	
Non-strategic versus strategic	-0.855	0.479	9.283	0.002	-0.793	-0.172	
Bets (episode/euros; maximum)	0.001	0.001	8.115	0.004	0.265	1.436	
Tobacco use	-0.483	0.158					
Other illegal drugs use	0.851	0.299					

Note. <sup>1</sup>Logistic regression model. <sup>2</sup>Negative binomial regression model. SE: standard error. OR: odds ratio. Sample size: n = 214.



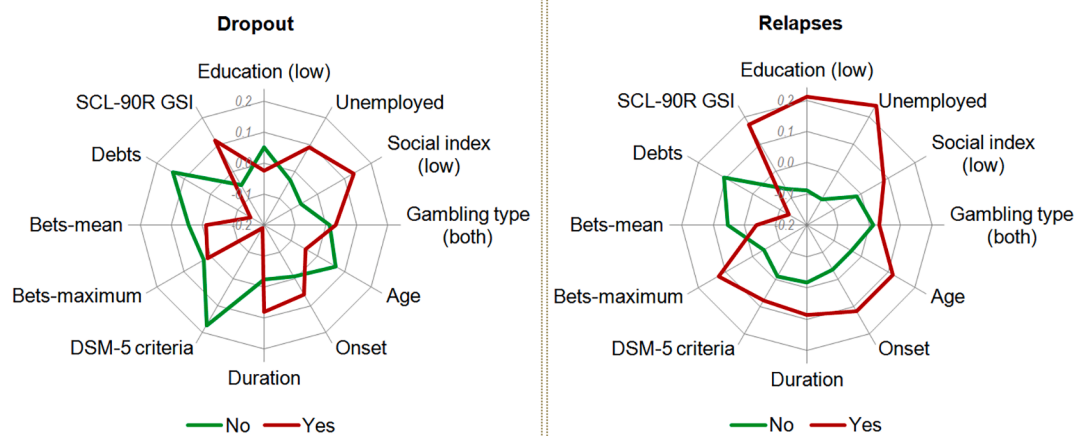


Fig. 2. Radar-chart (n = 214).

competitive types of gambling, especially skill-based forms of gambling such as wagering (Derogatis, 2002), the most common preference of men (Grant et al., 2012; Jiménez-Murcia et al., 2006). In addition, an evolution towards online gambling is also being observed among women, given that they perceive it as anonymous, less intimidating and safer (Jiménez-Murcia et al., 2006; Jimenez-Murcia et al., 2012).

The finding that dropouts occurred within the first two months of the treatment and relapses were registered throughout the treatment, with a higher rate during the first month, corroborate previous studies which reported first relapses during the first month of treatment (Abbott, 2020). It has also been described that relapse rate decreases slowly and consistently from therapy initiation (Tolchard, 2017; Abbott, 2020). In addition, some authors have suggested that dropout and relapse rates may be modified if some factors are controlled in therapy, such as the presence of a concerned significant other (Slutske et al., 2009). Specifically, Jiménez-Murcia et al. (Slutske et al., 2009) observed that those patients whose partners had been involved throughout treatment showed a lower likelihood of relapse and lower dropout rates.

Regarding dropouts, it could be hypothesized that those patients with greater GD severity may have to work harder in treatment to evidence a change in symptomatology, may have been part of a greater number of treatments in the past, and may have greater associated comorbidity, which would explain a higher difficulty in adhering to the treatment (Rizzo et al., 2019). However, previous studies have not been able to demonstrate a clear association between GD severity and dropout (Jimenez-Murcia et al., 2008; Singer and Willett, 2003; Dupont, 2009). In the present study, lower GD severity was related with higher risk of dropout. We postulate that this association could be due to the fact that those women with less GD severity may experience less interference arising from the GD and perceive the disorder as more egosyntonic, so they might not clearly identify the need for psychological treatment (Castrén et al., 2013). Moreover, according to Mestre-Bach et al. (McCormack et al., 2014), it is essential to complement dimensional severity measures with categorical ones derived from the DSM-5, in order to determine how to best identify predictors of treatment response.

On the other hand, higher psychopathological distress (SCL-90-R GSI) was related with a higher risk of dropout. Psychopathology has been linked to the treatment outcome of individuals with GD in previous studies (Oakes et al., 2012; McCarthy et al., 2018). Comorbid psychopathology in GD has been described to be related with higher GD severity, greater impulsivity levels and gambling urges and cognitions, and psychosocial difficulties (Ronzitti et al., 2017; Wenzel and Dahl, 2009; Griffiths, 2001), clinical aspects that may promote therapeutic abandonment.

Therefore, from a clinical perspective, one of the findings of this study in relation to predictors of treatment drop-out in women is the

presence of high psychopathology. This could be related to the lack of emotional regulation skills, commonly present in GD and conceptualized as a transdiagnostic characteristic (Echeburúa et al., 1996; Munguía et al., 2021) and specifically women, unlike men, use gambling in a functional and regulatory way to escape the discomfort of experiencing negative emotions and as a maladaptive mechanism of emotion regulation (Jiménez-Murcia et al., 2020; Griffiths, 2001; Echeburúa et al., 2001). Including therapeutic support through individual sessions in parallel to group therapy that contains and helps to manage the high levels of psychological distress could be a specific contribution to CBT in women which could contribute to reducing the rate of dropout of the therapy in this group. In turn, and as another effective therapeutic alternative, it would be to use new technologies such as serious games designed to intervene on emotional regulation as complementary therapeutic strategies to standard CBT, in order to enhance its results (Mena-Moreno et al., 2021; Steward et al., 2017; Johansson et al., 2009; Guerrero-Vaca et al., 2021).

Our findings also showed that older age was related to higher mean number of CBT sessions attended. Although previous literature examining the link between age and dropout in individuals with GD seems to be controversial, with some authors suggesting an association between older age and increased risk of dropout (Rizzo et al., 2019; Mallorquí-Bagué et al., 2017), others pointing to a link between younger age and dropout (Abbott, 2020), and others supporting that any association can be found (Robson et al., 2002; Jimenez-Murcia et al., 2008; Singer and Willett, 2003; Dupont, 2009). In this context, our results could be associated with the fact that at younger ages the levels of impulsivity are higher (Leblond et al., 2003), which may be limiting adherence to treatment. Nevertheless, more empirical evidence is required in order to reach a sound conclusion.

If now we turn to the risk of relapse, it was higher for women with lower education levels. Other studies have also highlighted an association between poor treatment outcomes and a low education level (Oakes et al., 2012; Hodgins et al., 2004; El-Guebaly et al., 2012; Spritzer et al., 2011). This finding could be attributed, at least partially, to the cognitive skills that are required to modify cognitive and behavioral patterns associated with gambling. Other studies in this area suggest that this type of therapy, especially in a group format, would require some intellectual ability and could be challenging for those individuals with a lower education level (Oakes et al., 2012; Jiménez-Murcia et al., 2016; Fenger et al., 2011).

Furthermore, the risk of relapse during the CBT was also higher for those women without debts due to the gambling behavior. Previous studies that performed similar analyses did not find a similar association in males (McCarthy et al., 2018). However, we hypothesize that not having gambling-related debts may be associated to low levels of

interference in a patient's life and, consequently, to underestimate the adverse impact of relapse. That is, debts and the negative consequences associated with the disorder could be acting as an external control factor for these patients.

Although previous research reported no differences in relapse rate regarding the marital status (Rizzo et al., 2019; Singer and Willett, 2003), our findings showed that the number of relapses registered during the CBT was higher for divorced women. Some authors have proposed that the involvement of a family member to rely on may increase the likelihood of remaining in therapy and lead to better treatment outcomes (Slutske et al., 2009; Moore and Grubbs, 2021; Flórez et al., 2016). However, in the case of women, it should be taken into account that they are more likely than men to have suffered physical and sexual abuse in their childhood and to have endured violent behavior by their partners when they are adults (Neale et al., 2014). This would imply carrying out a precise analysis and evaluation to determine the validity of the co-therapist's support figure, ruling out those couples who present substance use or have engaged in any type of violent behavior towards them. Finally, drug use was also associated with the frequency of relapses. This result lends support to previous studies finding that individuals with GD who also report alcohol or drug abuse have an increased probability of experiencing gambling relapses (Mestre-Bach et al., 2020; Davis and Avery, 2004; Hodgins & El-Guebaly, 2010).

#### 4.1. Strengths, clinical implications and limitations

To the best of our knowledge, this is the first study focused exclusively on treatment outcome in women with GD. Because women with GD remain an understudied group, this empirical contribution is essential to promote lines of research on GD and women, which may help to design more effective intervention programs for this understudied population.

However, the present study has some limitations. First, the non-randomized design of the present study is a main limitation. Future studies should, therefore, employ a stricter, randomized controlled trial design to examine the validity of our results. Second, our study only tested the effectiveness of the CBT and it would be positive to know if comparable results are present using a multiple-arm study design. Our sample comprised only women, which limits the generalizability of the results to other samples with GD.

Initially, we could dare to hypothesize that there are certain variables associated with greater adherence to treatment. For example, in relation to psychological variables, according to our results, a lower presence of psychopathology in general and a lower perception of psychological distress could be related to greater adherence to treatment, since high comorbidity and high levels of psychological distress tend to be associated with high dropout rates in the literature (Karlsson and Håkansson, 2018). In relation to sociodemographic variables, having a high educational level and high social status could be related to greater therapeutic success. Likewise, and in relation to gambling behavior, it could be postulated that a greater severity of the disorder would be associated with the achievement and completion of treatment.

Following the methodological recommendations of The Banff Alberta Consensus, a second related study could propose the identification of predictive factors for the effectiveness of CBT therapy in women, including follow-up evaluations (Karlsson and Håkansson, 2018; Oakes et al., 2012). The proposed follow-ups are: one just at the end of treatment, short-term follow-up (3–6 months after treatment), medium-term follow-up (approximately 12 months after treatment) and long-term follow-up (24 months or longer after treatment). Therefore, these associations would not be conclusive, but they would serve as previous hypotheses in future longitudinal studies of the efficacy of the treatment that did include periods of post-treatment, short, medium and long-term follow-up (Walker et al., 2006).

#### 4.2. Conclusions

It is important to emphasize one of the more significant findings that appear from this study is the identification of women-specific predictors of the primary therapy outcomes. The current data highlight the need to design gender specific psychological interventions that will better address dropout and relapse risk.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.addbeh.2021.107085>.

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