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Original Research

Emotional dependence as a predictor of emotional symptoms and substance abuse in individuals with gambling disorder: differential analysis by sex

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ABSTRACT

Introduction: Emotional dependence, anxious-depressive symptoms and substance use have been associated with gambling disorder (GD). Although anxiety and depression have been predominantly related to female gamblers and substance abuse to male gamblers, the role of emotional dependence in GD is unknown. Moreover, sex differences remain underexplored.
Objectives: First, to explore possible differences in emotional dependence, anxious-depressive symptoms and substance abuse by group (GD and non-GD) and sex (women vs men). Second, to analyse the predictive role of emotional dependence in alcohol and drug abuse and anxious-depressive symptoms in patients with GD as a function of sex.
Methods: Instruments to measure gambling (SOGS), emotional dependence (CDE), anxious-depressive symptoms (SCL-90-R) and substance abuse (MULTICAGE CAD-4) were administered to 108 people with GD diagnosis (60 women and 48 men) and 429 without GD (342 women and 87 men).
Study design: The research is an analytical cross-sectional study.
Results: The results showed that the group with GD scored significantly higher than the non-GD group on alcohol abuse, symptoms of depression and anxiety, and emotional dependence, but not on drug abuse. In the group with GD, emotional dependence predicted alcohol and drug abuse in women, and emotional dependence predicted anxiety and depressive symptoms in men.
Conclusion: The findings suggest that women with GD who consume alcohol or drugs would benefit from therapies addressing loneliness, borderline expression, attention-seeking and affective expression. Men with GD who report anxious-depressive symptomatology would benefit from therapeutic strategies to deal with separation anxiety and attention-seeking.

Gambling Disorder (GD) is the diagnostic category used in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* [DSM-5][1] to define a persistent and recurrent pattern of gambling associated with significant distress and impairment in the person's life. In European countries, problem gambling reaches three percent, while in some non-European countries, the rate rises to six percent.[2,3]

Apart from the general diagnostic criteria, it has been observed that the clinical picture of patients with GD may vary considerably according to sex. As a result, even though studies point to a higher prevalence in men,[4,5] being female is associated with an added social stigma when suffering from an addictive behaviour.[6] Hence, females' increasing participation in gambling activities has been explored in recent years.[7,8]

Considering the sex differences in GD profiles, it has been argued that motivations for gambling differ according to sex,[9–11] with women being more likely to gamble to escape from loneliness, boredom or to cope with everyday life difficulties.[12,13] In contrast, men enter gambling-related treatment at a younger age than women and are involved in more illegal conflicts.[14,15] In the case of females, the telescoping effect has been suggested, referring to a later age of onset but with a faster progression to GD than males.[16] However, some findings sharply contrast with this phenomenon, arguing that the convergence of the age of onset in gambling activities of both sexes diminishes any telescoping

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effect.[17] The literature shows a lack of sex-specific research on gambling in women.

The comorbidity of substance use disorders (SUDs) and emotional disorders has been extensively studied concerning GD. A systematic review of sex differences in GD found that male problem gambling was related to substance and alcohol use, whereas females suffering from GD were more likely to have comorbid psychiatric diagnoses, especially depression and anxiety.[18,19,29] SUDs are a mental health condition defined by the problematic use of a substance such as alcohol, drugs, or prescription medications. Similar to GD, the individual consumes heavily and despite harmful consequences, affecting their ability to function in daily life. The available studies of SUDs have indicated that although a higher proportion of male adults tend to show problematic alcohol and drug use than females, recent data indicate that this sex difference does not occur among adolescents.[21–23] More specifically, it has been suggested that this sex parity among young people is driven by prescription drug use, with girls reporting higher rates than boys, as well as a similar pattern of current alcohol use and binge drinking.[24]

Concerning comorbid emotional disorders, results are still inconsistent and mixed.[20,25,26] However, an investigation conducted by Andronicos et al. (2015)[18] found that the significance of psychopathology was similar for men and women with GD, especially in terms of the presence of affective disorders and SUDs, but the reported precipitating risk factors are likely to differ.[27,28]

Emotional dependence has been studied for its relationship with addictive disorders and maladaptive psychological symptomatology.[29–31] Emotional dependence is defined as an extreme affective need that a person feels towards another person, habitually the partner, in the course of their different relationships.[32] Some professionals have even argued for including emotional dependence as a diagnostic category within non-substance-related addictions.[33] This approach is based on the fact that addictive behaviour involves an object of obsession, either a substance or a person.[34] In addition, it has been observed that brain reward pathways are similar for substance and non-substance addictions and relationship addiction.[35] In the same vein, similar clinical characteristics have been suggested for GD and emotional dependence, such as craving, the activation of the brain reward and dopaminergic system, tolerance, abstinence syndrome, the loss of control or severe disruption of daily life.[36,37] Furthermore, Echeburúa et al. (2014)[38] suggested that GD also involves emotional dependence. In fact, the results obtained by Estévez et al. (2018)[39] found a positive relationship between emotional dependence and impulsive behaviours, as well as with psychological symptomatology, including depression, anxiety, hostility or somatisation.[31] Sex differences in emotional dependence remain incongruent. While some studies have found higher emotional dependence scores in men,[30,39,40] other studies have found it in women,[41] and still others have found no significant differences.[42]

However, to our knowledge, no studies have explored the role of emotional dependence in comorbid substance use and psychological symptoms in patients suffering from GD. Additionally, the scarcity of existing studies on the predictive role of emotional dependence for addictive behaviours and associated symptomatology sheds no light on whether the manifestation might differ between women and men suffering from GD. Therefore, the objectives of this study were, firstly, to explore the existence of sex differences in alcohol and drug abuse, symptoms of anxiety and depression, and emotional dependence in a group of people with and without GD. Secondly, we wished to examine the differences in the relationship between age, emotional dependence, alcohol and drug abuse, and symptoms of anxiety and depression in the group of women and men with GD. Thirdly, we analysed the association and predictive role of emotional dependence in alcohol and drug abuse and symptoms of anxiety and depression in the clinical sample with GD as a function of sex.

Hypothesis

Based on the objectives stated above, we hypothesise that emotional dependence will predict symptoms of anxiety and depression in women with GD. In men with GD, we hypothesise that emotional dependence will predict alcohol and drug abuse.

Method

Study design

The research is an analytical cross-sectional study.

Participants

The sample comprised 60 women and 48 men with GD and 342 women and 87 men without GD as a control group. Table 1 shows the sociodemographic characteristics of the four groups. All participants were over 18 years old. Significant differences among the four groups were found in age, $F(3, 533) = 81.46$, $P < 0.05$, SOGS scores (Lesieur & Blume, 1987), $F(3, 533) = 1752.273$, $P < 0.05$, marital status, $\chi^2(1, 18) = 141.619$, $P < 0.05$, employment status, $\chi^2(1, 27) = 254.466$, $P < 0.05$, and educational level, $\chi^2(1, 18) = 275.185$, $P < 0.05$.

The clinical sample, that is, women and men with GD diagnosis, was recruited through GD treatment associations belonging to the FEJAR (Spanish Federation of Rehabilitated Gamblers). Inclusion criteria for this group were attending treatment at a GD treatment centre and scoring as a gambler on the South Oaks Gambling Screen questionnaire [SOGS].[43] In the case of the sample without GD (general sample), the exclusion criterion was to score as a gambler on the SOGS (for more information, see the description of the SOGS in the instruments section).

Procedure and sampling

The present study used a non-probability sampling method. Concretely, this type of sampling has been selected due to the problematic sample localisation, as it is a population of men and women with GD diagnosis.

On the one hand, clinical participants with a GD diagnosis were outpatients recruited through GD treatment associations belonging to the FEJAR. FEJAR is a Spanish organisation aimed at rehabilitating GD, which comprises multiple associations throughout the country with the same purpose.

On the other hand, the non-clinical sample (i.e., without GD) was recruited from the general population. The questionnaire was diffused on social networks (e.g., WhatsApp, Instagram, e-mail, Facebook, or LinkedIn), university bulletin boards, journals of divulgative scientific articles and informative websites.

The sample recruitment time was approximately one year (i.e., from the summer of 2021 to the summer of 2022). The questionnaire was the same for both samples, the group of people with GD (clinical sample) and those without GD (general sample). The sample without GD completed the survey via an online link to the questionnaire or a QR code that accessed the same questionnaire. The GD clinical sample completed the questionnaires either online or offline (pencil and paper). According to Herrero-Fernández (2015),[44] a questionnaire's application method (pencil and paper vs online) does not affect the results obtained.

Table 1
Sociodemographic data of the sample.

	Male gambler	Female gambler	Male non-gambler	Female non-gambler
Age (M, DT)	41.33 (12.32)	49.07 (12.70)	27.48 (10.22)	26.80 (11.32)
Gambling – SOGS (M, DT)	9.42 (2.30)	9.13 (2.17)	0.64 (0.89)	0.23 (0.55)
Employment status				
Working	68.8%	45%	40.2%	23%
Unemployed	4.2%	23.3%	2.3%	2.7%
Student	6.3%	1.7%	34.5%	49.6%
Retired	8.3%	15%	1.1%	0.9%
Student and worker	0%	1.7%	21.8%	21.8%
Jobless	2.1%	3.3%	–	0.6%
Other	10.4%	10%	–	1.5%
Marital status				
Single	35.4%	41.7%	66.7%	48%
Married	33.3%	31.7%	9.2%	8.2%
Partner in law	12.5%	0%	2.3%	2.6%
Separated or divorced	14.6%	16.7%	–	3.2%
Widowed	2.1%	6,7%	–	0.9%
Other	2.1%	3.3%	21.8%	37.2%
Educational level				
Without education	8.3%	3.3%	–	–
Primary	8.3%	33.3%	1.1%	0.3%
High school	8.3%	6.7%	–	0.6%
Secondary school	6.3%	10%	13.8%	16.2%
Professional training	47.9%	30%	19.5%	8.8%
University studies	18.8%	16.7%	65.5%	74%
Other	2.1%	–	–	–

To access the questionnaire, participants had to read the study information and provide informed consent. The duration of the application was about 30 minutes. The questionnaire included general information about the main goals of the study. We ensured participants of their response confidentiality and anonymity and their voluntary participation. No compensation was provided for participation in this study.

Instruments

Gambling disorder

GD was assessed with the SOGS.[43] The Spanish version was adapted by Echeburúa et al. (1994).[45] It is a 20-item screening questionnaire. The scale contains items related to gambling activity patterns, debts, sources of money to gamble and emotions involved in gambling. The response format is a dichotomous scale with *Yes/No* response options. According to this tool, scores between 0 and one indicate no gambling risk, scores between two and three indicate gambling risk, and scores of four or more suggest the potential presence of GD. Therefore, to belong to the non-GD group of the present study (general sample), the participants had to score between 0 and one point; otherwise, they were excluded from the general sample. The instrument presents good psychometric properties, showing appropriate internal consistency for the original scale ($\alpha = 0.94$), and the convergent validity with DSM-IV criteria was 0.94. In the present study, Cronbach's alpha for the SOGS was 0.63.

Emotional dependence

We used the Emotional Dependence Questionnaire[46] ('Cuestionario de Dependencia Emocional' – CDE, in Spanish), which consists of 23 items. Each item is scored on a six point Likert response format ranging from 0 (*completely false*) to five (*it describes me perfectly*). The CDE assesses emotional dependence as a global construct through the sum of its items. It presents six subscales: (1) separation anxiety, (2) affective expression of the partner, (3) plan modification, (4) fear of loneliness, (5) borderline expression, and (6) attention-seeking. The original scale shows structural validity for both sexes and the presence or absence of a partner. Cronbach's alpha for the total original scale was 0.93. In the present study, Cronbach's alpha for the CDE was 0.92.

Alcohol and drug abuse

MULTICAGE CAD-4.[47] This questionnaire consists of 32 items that assess eight impulse-control disorders and addictions. In this study, we used two of the eight factors (i.e., Alcohol and Drug Abuse). Each factor contains four items, providing a total of eight items. Each factor is evaluated by reproducing the CAGE schema[48]: Self-Perception of the problem, Perception by Cohabitants, associated feelings of Guilt, and signs of Abstinence. The response format consists of a dichotomous scale *Yes/No*. According to the tool, scores between 0 and one indicate '*no problem*', two affirmative answers indicate the '*possible existence of the problem*', three affirmative answers indicate '*very probable existence of the problem*' and four affirmative answers indicate '*certain existence of the problem*'. The cut-off point was set by the authors at two affirmative responses to indicate problem behaviour and/or the presence of addiction. Cronbach's alpha for the total original scale was 0.86. Each subscale has an alpha above 0.70. For the present study, Cronbach's alpha was 0.82 for Alcohol and 0.92 for Drug Abuse.

Symptoms of depression and anxiety

We used the *Symptom Checklist-90-Revised* (SCL-90-R)[49], adapted to Spanish by González de Rivera et al. (1989).[50] The SCL-90-R is a self-administered questionnaire that assesses 90 psychological symptoms. It is divided into nine dimensions related to psychopathological symptoms and three global distress indices. In this study, two psychological symptoms were used: (1) Depression, composed of 13 items that tap signs related to depressive disorder (e.g., despondency, anhedonia, self-destructive thoughts, etc.) and (2) Anxiety, composed of 10 items that refer to clinical manifestations of both acute and generalised anxiety, as well as signs of emotional stress or psychosomatic manifestations. The level of distress caused by each symptom is assessed on a 5-point Likert scale ranging from 0 (*no symptom-related distress*) to 4 (*maximum distress*). Internal consistency is very good for the overall scale, and higher than 0.70 for all subscales. In the current study, Cronbach's alpha was 0.92 for the dimension of Depression and 0.94 for Anxiety.

Ethics

The research obtained the ethics committee's approval from the first author's university (ref: ETK-17/20-21). This study was performed following the principles of the Declaration of Helsinki.

Statistical analyses

First, mean differences for alcohol, drugs, anxiety, depression and emotional dependence were calculated with the analysis of variance (*ANOVA*) among four groups (male gamblers, female gamblers, male non-gamblers and female non-gamblers). Post-hoc analyses were carried out for intergroup comparisons using Scheffe's test. The effect size of mean differences was calculated with eta squared (η^2) values.

Second, the correlation between alcohol, drugs, anxiety, depression, emotional dependence and age was analysed in the clinical sample of female and male gamblers. The analyses were carried out separately in both groups: female gamblers and male gamblers. Fisher's *z*-test was carried out to determine the significance of the differences of correlations between both groups.

Third, hierarchical regression analyses were conducted to assess the predictive role of emotional dependence in substance abuse and emotional symptoms, controlling for the effect of age, employment and marital status, and educational level. The analyses were again carried out separately in both groups. In the case of female gamblers, the predictive role of emotional dependence on alcohol, drug abuse, anxiety and depression was calculated based on the correlational results. In the case of male gamblers, the predictive role of emotional dependence was analysed for anxiety and depression also based on the correlational results.

Additionally, baseline data on the SOGS scores[43] and age of the four sample groups were compared through *ANOVA*, while chi-square analyses were used to compare marital status, employment status and educational level.

Results

First, mean differences between male gamblers, female gamblers, male non-gamblers and female non-gamblers were analysed for alcohol, drugs, anxiety, depression and emotional dependence (Table 2). Results indicated that differences were significant for all variables except for drug abuse. The eta squared (η^2) values showed that the effect size was small ($\leq$0.03) for alcohol; moderate (0.03–0.06) for emotional dependence—affective expression and attention-seeking; and large (>0.06) for symptoms of anxiety, depression, total emotional dependence and emotional dependence—separation anxiety, plan modification, fear of loneliness and borderline expression.

A post-hoc analysis using Scheffe's test was then performed for intergroup comparisons. Post-hoc analyses showed that, in the case of alcohol abuse, female gamblers scored significantly lower than male and female non-gamblers. Regarding emotional dependence, both male and female gamblers scored higher than male and female non-gamblers on anxiety, depression, total emotional dependence, separation anxiety, affective expression, fear of loneliness, plan modification and borderline expression. In the case of plan modification, male non-gamblers also scored higher than female non-gamblers, and in the case of attention-seeking, all males (gamblers and non-gamblers) scored higher than female non-gamblers. In anxiety and depression, female non-gamblers scored higher than male non-gamblers. There were no significant differences between male and female gamblers in any of the study variables.

Secondly, the correlation between alcohol, drugs, anxiety, depression, emotional dependence and age was analysed in the clinical sample of female and male gamblers (Tables 3 and 4). In the case of female gamblers, alcohol and drug abuse correlated significantly with total emotional dependence and with emotional dependence—separation anxiety, affective expression, fear of loneliness and attention-seeking. Anxiety correlated significantly with total emotional dependence and with emotional dependence—separation anxiety, affective expression, fear of loneliness, borderline expression and attention-seeking. Depression correlated significantly with total emotional dependence and with emotional dependence—separation anxiety, fear of loneliness, borderline expression and attention-seeking. In turn, alcohol and drug abuse correlated with each other; anxiety and depression correlated with each other; and anxiety and alcohol abuse correlated with each other.

In the case of male gamblers, alcohol and drug abuse correlated significantly with each other but not with emotional dependence. Anxiety and depression correlated significantly with all variables of emotional dependence except for attention-seeking, and they correlated significantly with each other. Concerning age, no significant relationships were found with the study variables in the sample of male gamblers, except for the relationship between age and anxiety, which was negative. In contrast, significant relationships were found in the sample of female gamblers, where age correlated negatively with alcohol abuse, anxiety, total emotional dependence and emotional dependence—separation anxiety, affective expression and attention-seeking. Additionally, Fisher's *z*-test was carried out to determine the significance of differences of the correlations between both groups. Significant differences were found in the relationships among total emotional dependence, fear of loneliness, attention-seeking and alcohol; affective expression and drugs; total emotional dependence and separation anxiety, and depression; and attention-seeking and all the emotional dependence scales except for separation anxiety.

Thirdly, hierarchical regression analyses were conducted to assess the predictive role of emotional dependence in alcohol and drug abuse, anxiety and depression, controlling for the effect of age, employment and marital status, and educational level in the group of female gamblers (Table 5). The results showed that emotional dependence was a predictor of alcohol abuse for women gamblers; more specifically, the predictor variables were borderline expression and attention-seeking. The effect of sociodemographic data was non-significant. Emotional dependence was not a predictor of anxiety, depression or drug abuse in female gamblers.

In the group of male gamblers, the predictive role of emotional dependence was analysed for anxiety and depression, controlling for the effect of age (Table 6). The results showed that emotional dependence was a predictor of depression in men; more specifically, the predictor variable was separation anxiety. When controlling for the effect of sociodemographic data, it was a non-

Table 2
Comparison between male and female gamblers and non-gamblers on alcohol, drugs, anxiety, depression and emotional dependence.

	Male gamblers (n = 48)	Female gamblers (n = 60)	Male non-gamblers (n = 87)	Female non-gamblers (n = 342)	
	M (DT)	M (DT)	M (DT)	M (DT)	F (df)
1. Alcohol	1.56 (1.50)	0.85 (1.37)a,b	2.05 (2.12)a	1.89 (2.43)b	4.01 (3507)*
2. Drugs	1.79 (1.77)	0.52 (1.18)	1.40 (2.12)	1.39 (2.43)	2.55 (3490)
3. Emotional dependence	66.15 (21.39)a,b	61.83 (23.15)c,d	47.63 (14.96)a,c	47.03 (15.77)b,d	24.01 (3474)*
4. Emotional dependence – Separation anxiety	20.07 (8.56)a,b	18.70 (8.84)c,d	14.54 (5.64)a,c	14.79 (6.18)b,d	12.36 (3489)*
5. Emotional dependence – Affective expression	13.70 (4.77)a,b	13.45 (5.39)c,d	9.74 (4.21)a,c	11.07 (4.61)b,d	10.74 (3496)
6. Emotional dependence – Plan modification	10.65 (4.57)a,b	10.08 (4.83)c,d	7.79 (3.52)a,c,e	6.45 (2.75)b,d,e	33.97 (3487)*
7. Emotional dependence – Fear of loneliness	8.56 (4.52)a,b	8.92 (4.43)c,d	5.30 (2.48)a,c	6.29 (3.37)b,d	16.73 (3488)*
8. Emotional dependence – Borderline expression	6.28 (3.50)a,b	5.74 (2.92)c,d	4.32 (1.68)a,c	4.11 (1.35)b,d	24.88 (3488)*
9. D Emotional dependence – Attention-seeking	6.00 (2.73)a	4.94 (2.83)	5.58 (2.37)b	4.52 (2.10)a,b	8.59 (3498)*
10, Anxiety	22.23 (10.10)a,b	22.66 (11.46)c,d	10.34 (8.32)a,c,e	14.11 (10.89)b,d,e	22.39 (3498)*
11. Depression	31.88 (13.16)a,b	32.55 (14.19)c,d	15.05 (10.13)a,c,e	20.52 (12.34)b,d,e	32.86 (3492)*

* = p<.05 / a,b,c,d * Scheffe's test results.

Table 3
Correlation of alcohol, drugs, anxiety, depression and emotional dependence in female gamblers.

	1	2	3	4	5	6	7	8	9	10	11
1. Alcohol	–										
2. Drugs	0.56**	–									
3. Emotional dependence	0.49**/a	0.46**	–								
4. Emotional dependence – Separation anxiety	0.43**	0.37*	0.92**	–							
5. Emotional dependence – Affective expression	0.34*	0.50**/a	0.83**	0.71**	–						
6. Emotional dependence – Plan modification	0.22	0.28	0.59**	0.39**	0.34*	–					
7. Emotional dependence – Fear of loneliness	0.48**/a	0.35*	0.76**	0.63**	0.56**	0.28*	–				
8. Emotional dependence – Borderline expression	0.19	0.20	0.79**	0.70**	0.56**	0.37**	0.61**	–			
9. Emotional dependence – Attention-seeking	0.60**/a	0.30*	0.75**/a	0.64**	0.60**/a	0.38**/a	0.49**/a	0.56**/a	–		
10. Anxiety	0.31*	0.17	0.48**	0.48**	0.39**	0.21	0.43**	0.44**	0.24*	–	
11. Depression	0.11	0.05	0.32*/a	0.33*/a	0.22	0.02a	0.43**	0.37**	0.10*	0.65*	–
12. Age	−0.32*	−0.21	−0.31*	−0.35*	−0.30*	0.01	−0.25	−0.15	−0.32*	−0.28*	−0.26

* = $P < 0.05$, ** = $P < 0.01$, /a = $P < 0.05$ in Fisher's test.

significant predictor. Emotional dependence did not predict anxiety in men. As emotional dependence was not correlated with alcohol and drug abuse in male gamblers, regression analyses were not performed in this group.

Discussion

Existing research has identified many psychological variables that influence the onset, maintenance or relapse of GD. However, to our knowledge, no studies have explored the predictive role of emotional dependence in patients with GD, and even fewer have analysed sex differences. In fact, most studies on emotional dependence have focused on its relationship with violence or emotional symptoms and have been conducted in general population samples,[51,52] but almost nothing is known about the relationship of emotional dependence with addictions, and there are no explorations in samples with GD.

To this end, the present study first examined sex differences in alcohol and drug abuse, symptoms of anxiety and depression, and emotional dependence in groups with and without GD. The results showed that the group with GD scored significantly higher than the non-GD group on these variables (i.e., alcohol abuse, symptoms of depression and anxiety, and emotional dependence), except for drug abuse. However, even if the differences in drug abuse between the group of people with GD and those without GD were not significant, men with GD obtained the highest scores on drug abuse, followed by men and women without GD, respectively. Regarding sex differences, female gamblers were found to have lower scores on alcohol and drug abuse than both female and male non-gamblers. Concerning the other study variables (i.e., symptoms of depression and anxiety and emotional dependence), both females and males with GD scored higher than non-gamblers. These results align with previous findings indicating that women suffering from GD tend to exhibit less substance abuse comorbidity than men with GD.[20,53] That is, the manifestation of multiple addictions is not as common in the case of women when they already suffer from an addictive disorder such as GD. Alcohol is one of the most widely consumed substances in young people of the general population, in both females and males.[24,54,55] This might explain why the group of women and men from the general population of the study—who were younger than the group with GD— scored higher than the group of women with GD in alcohol abuse. Regarding symptoms of anxiety, depression, and emotional dependence, previous evidence supports our results showing that people with GD are more likely to obtain higher scores than those not at risk of gambling.[11,56,57]

Secondly, differences in the relationship between age, emotional dependence, alcohol and drug abuse, and symptoms of anxiety and depression were analysed in the group of women and men with GD. There were no significant differences between males and females with GD, but the variables were related differently. Alcohol and drug abuse, symptoms of anxiety and depression, and emotional dependence were positively related in women with GD. Moreover, significant negative relationships were found with age, indicating that the older the person, the less alcohol abuse and emotional dependence. These findings may also corroborate to some extent the previous hypothesis about alcohol consumption being related to the non-GD sample because of their younger age (and not to women with GD, who are older). Concerning men with GD, alcohol and drug abuse were significantly associated with each other but not with emotional dependence. In contrast, anxiety, depression and emotional dependence did show significant relationships with each other. No significant differences were found

Table 4
Correlation of alcohol, drugs, anxiety, depression and emotional dependence in male gamblers.

	1	2	3	4	5	6	7	8	9	10	11
1. Alcohol	–										
2. Drugs	0.45**	–									
3. Emotional dependence	0.19a	0.21	–								
4. Emotional dependence - Separation anxiety	0.19	0.23	0.90**	–							
5. Emotional dependence - Affective expression	0.14	−0.01a	0.76**	0.59**	–						
6. Emotional dependence - Plan modification	0.16	0.13	0.73**	0.58**	0.55**	–					
7. Emotional dependence - Fear of loneliness	0.11a	0.29	0.68**	0.49**	0.33*	0.51**	–				
8. Emotional dependence - Borderline expression	0.09	0.24	0.72**	0.57**	0.50**	0.38*	0.56**	–			
9. Emotional dependence – Attention-seeking	0.24a	0.09	0.44**/a	0.45**	0.33*/a	0.06a	0.05a	0.20a	–		
10. Anxiety	0.17	0.26	0.45**	0.46**	0.32*	0.33*	0.43**	0.34*	−0.07	–	
11. Depression	0.08	0.23	0.63**/a	0.64**/a	0.45**	0.42**/a	0.58**	0.51**	0.04	. 75**	–
12. Age	−0.05	−0.15	−0.30	−0.30	−0.19	0.01	−0.23	−0.29	−0.22	−0.31*	−0.19

* = $P < 0.05$, ** = $P < 0.01$, /a = $P < 0.05$ in Fisher's test.

Table 5
Regression analysis of emotional dependence as a predictor of alcohol in female gamblers controlling for the effect of age, employment and marital status, and educational level.

	t	*B*	*SE B*	*β*	*F (df)*	R	R^2	Adjust.R^2	R^2 change
Alcohol									
Step 1					3.552 (4,44)*	0.49	0.24	0.18	0.24*
Age	−0.95	−0.02	0.02	−0.15					
Employment status	−1.73	−0.15	0.09	−0.23					
Educational level	0.88	0.11	0.12	0.13					
Marital status	−1.60	−0.23	0.14	−0.25					
Step 2					4.395 (10,38)*	0.73	0.54	0.41	0.29*
Age	−0.43	−0.01	0.02	−0.06					
Employment status	−1.15	−0.09	0.08	−0.14					
Educational level	−0.14	−0.02	0.11	−0.02					
Marital status	−1.14	−0.15	0.13	−0.16					
ED − Separation anxiety	0.51	0.02	0.03	−10					
ED − Affective expression	−0.37	−0.02	0.04	−0.06					
ED − Plan modification	0.67	0.02	0.04	−08					
ED − Fear of loneliness	1.87	0.10	0.06	0.33					
ED − Borderline expression	−2.06*	−0.18	0.09	−0.35					
ED − Attention-seeking	3.19*	0.24	0.08	0.48					

* = $P < 0.05$. ED = emotional dependence.

in age in men with GD. This finding suggests, as the existing evidence has also shown, that women and men suffering from GD may manifest similarities in their apparent symptomatology, but the relationship of the psychological variables may not be the same for both sexes.[11,58]

Thirdly, the predictive role of emotional dependence on alcohol and drug abuse and anxious-depressive symptoms was explored for women and men with GD, controlling for the effect of age. In the case of women with GD, emotional dependence was found to predict alcohol and drug abuse but not symptoms of depression and anxiety. Concretely, fear of loneliness, borderline expression and attention-seeking predicted alcohol abuse, whereas affective expression of the partner predicted drug abuse. For men with GD, emotional dependence predicted anxiety and depressive symptoms but not alcohol and drug abuse. Specifically, attention-seeking predicted anxiety and depression, whereas separation anxiety only predicted depression. These findings are groundbreaking, as we have not found previous studies examining the differential predictive role of emotional dependence in comorbid alcohol and drug abuse and psychological symptomatology in female and male patients with GD.

In line with our results, other studies indicate that dependent personality traits are associated with an increased risk of engaging in health-damaging behaviours.[30] We found no specific studies about the relationship between GD and emotional dependence on the partner, but in substance addictions, there is ample evidence suggesting the relationship between emotional dependence and consumption.[59,60] In fact, psychodynamic theories suggest that emotional dependence may be rooted in fixations from the oral stage, and this may explain the subsequent search for addictive substances (i.e., oral stimulation[61,62]). Moreover, emotional dependence has been shown to predict addictive behaviours and to be related to symptoms of anxiety and depression.[11,63]

The literature does not agree on whether emotional dependence is more prevalent in men or women. Some research has found a greater tendency among men,[30,40,64] while other studies have found emotional dependence to be more prevalent among women.[65] However, the results of this study do not indicate whether one sex (women vs men) is more emotionally dependent than the other, but rather that in the case of people with GD, emotional dependence predicts one or another type of comorbid symptomatology depending on their sex. That is, emotional dependence is related to alcohol and drug abuse in the case of women with GD and to symptoms of anxiety and depression in the case of men with GD.

Table 6
Regression analysis of emotional dependence as a predictor of depression in male gamblers controlling for the effect of age, employment and marital status, and educational level.

	t	*B*	SE B	β	*F (df)*	R	R^2	Adjust.R^2	R^2 change
Depression									
Step 1					1.228 (4,35)	0.35	0.12	0.02	0.12
Age	−1.87	−0.36	0.19	−0.32					
Employment status	0.68	0.56	0.83	0.11					
Educational level	−0.05	−0.08	1.51	−0.01					
Marital status	1.65	3.08	1.86	0.30					
Step 2					4.379 (10,29)*	0.78	0.60	0.46	0.48*
Age	−0.04	0.16	−0.04	−0.27					
Employment status	−0.48	0.72	−0.10	−0.66					
Educational level	0.35	1.15	0.04	0.30					
Marital status	2.39	1.45	0.23	1.65					
ED − Separation anxiety	0.88	0.32	0.56	2.76*					
ED − Affective expression	0.41	0.46	0.15	0.88					
ED − Plan modification	−0.44	0.52	−0.15	−0.84					
ED − Fear of loneliness	0.79	0.47	0.28	1.70					
ED − Borderline expression	0.44	0.61	0.12	0.71					
ED − Attention-seeking	−0.94	0.73	−0.20	−1.30					

* = $P < 0.05$. ED = emotional dependence.

In sum, the findings of the present study highlight that emotional dependence plays a specific role in GD, which differs from other clinical and community samples. In addition, these results add to the evidence that there are sex differences in the manifestation and psychological vulnerability factors of GD that must be considered when preventing, assessing, diagnosing or treating this disorder. More specifically, this study provides insights for establishing intervention strategies according to sex and people's particular needs. In this sense, the results suggest that working on loneliness, borderline expression and attention-seeking would benefit women with GD who consume alcohol, whereas addressing affective expression would be recommended for women with GD who consume drugs. Regarding men with GD, we suggest therapeutic strategies to address attention-seeking and separation anxiety if anxious-depressive symptomatology is detected.

Limitations and contributions

This study presents some limitations. Firstly, it is a cross-sectional study, so we cannot establish causal relationships. In future studies, it would be advisable to explore the directionality of the relationships through longitudinal research methodologies. Moreover, screening instruments were used for anxiety, depression, alcohol and drug abuse. Therefore, we recommend administering other complementary tests or qualitative methodologies to confirm the specificity of the diagnosis and control for the effect of social desirability. The findings obtained in this study are based on sex differences, so it would be appropriate to carry out studies based on gender differences in the future. Nonetheless, we have attempted to interpret the results from a gender perspective. There are also sociodemographic differences between the clinical and non-clinical samples that may have influenced the results. For example, the size of the non-clinical sample is larger, and their age is younger. Therefore, the results should be interpreted cautiously. Future studies are recommended to collect a larger clinical sample size to develop cohort analyses that provide a more complete profile of the differences found.

However, it is important to note that the present study allows us to extend our knowledge about GD in relation to some psychological variables that are frequently present in clinical practice. Despite this, to our knowledge, the relationship of emotional dependence, GD and comorbid psychopathology has not been explored in previous scientific literature. In addition, this study provides further evidence on the clinical profile of women with GD, which has been underexplored.

Conclusion

In light of the results, we can conclude that the associated risk factors and difficulties that trigger women and men to engage in gambling are different, even if the symptomatic expression seems to be the same (e.g., GD or emotional dependence). Moreover, empirical studies on women with GD remain very scarce and contradictory, leading to the assumption of parameters and therapeutic strategies based on research on men with GD. Hence, the findings of this research provide new empirical evidence suggesting that the complex underlying links of psychological factors predisposing to GD are closely related to the patient's sex.

Author statements

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Ethical approval

The Institutional Review Board of the first author's university approved the study (ETK-17/20-21). This study was performed following the principles of the Declaration of Helsinki. Informed consent was obtained from all the participants included in the study.

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Competing interests

All authors declare no conflicts of interest or financial interest.

Consent

Informed consent was obtained from all individual participants included in the study.

Data availability

The data sets generated during and/or analysed during the current study are not publicly available due to confidentially.

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