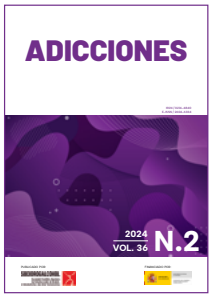
SOCIDROGALCOHOL
Sociedad Científica Española de Estudios sobre el Alcohol, el Alcoholismo y las otras Toxicomanías

ADICCIONES
2024 ■ VOL. 36 ■ N. 2 ■ PAGES 145–154
www.adicciones.es



ORIGINAL

Spanish validation of the Brief Problem Gambling Screen in patients with substance use disorders

Validación al castellano de la escala Brief Problem Gambling Screen en pacientes con Trastorno por Uso de Sustancias

Pedro Serrano-Pérez MD *,**,***,****, Jorge Lugo-Marin PhD *,**,***,****, Raúl Felipe Palma-Álvarez PhD *,**,***,****, Rachel Volberg PhD *****, Susana Jiménez-Murcia ******, Josep Antoni Ramos-Quiroga PhD *,**,***,****, Lara Grau-López, PhD*,**,***,****.

* Department of Psychiatry, Hospital Universitari Vall d'Hebron, Barcelona, España. ** Department of Psychiatry and Forensic Medicine, Universitat Autònoma de Barcelona, Bellaterra, España. *** Group of Psychiatry, Mental Health and Addiction, Vall d'Hebron Institut de Recerca (VHIR), Barcelona, España. **** Biomedical Network Research Centre on Mental Health (CIBERSAM), Madrid, España. ***** School of Public Health and Health Science, University of Massachussetts Amhest, USA. ****** Department of Psychiatry, Hospital Universitari Bellvitge, Barcelona, España. ******* Ciber Fisiopatología Obesidad y Nutrición (CIBERObn), Instituto de Salud Carlos III, Madrid, España.

Abstract

Problematic Gambling or Gambling Disorder (GD) can act by initiating and maintaining the problem of substance addiction. Despite this, there are no rapid screening tools validated in Spanish. The Brief Problem Gambling Screen (BPGS) has proven to be one of the most sensitive tools for detecting GD and populations at risk. This study aims to validate the Spanish version of the original five-item BPGS. A sample of 100 Spanish-speaking adults with substance use disorder were recruited from an addiction treatment center. The participants were administered the Spanish version of BPGS. It showed strong item reliability properties (Ω = 0.93). Sensitivity and specificity values were excellent (0.93 each), also positive (0.7) and negative (0.99) predictive values suggest high discriminant power when compared to non-GD subjects. Statistically significant strong correlation with a gold-standard measure (Problem Gambling Severity Index) was found (r = 0.8, p < 0.01). Similar psychometric properties were found in at-risk gambler patients. In conclusion, the BPGS seems to be an adequate screening instrument in Spanish-speaking clinical population, and also identifies at-risk of GD subjects.

Keywords: problem gambling, gambling disorder, validation, psychometrics, prevalence

Resumen

El juego patológico (JP) puede actuar iniciando y manteniendo el problema de la adicción a sustancias. A pesar de ello, no existen herramientas de cribado rápido validadas en español. La Breve evaluación del juego problemático (BPGS) ha demostrado ser una de las herramientas más sensibles para detectar JP y poblaciones en riesgo. Este estudio tiene como objetivo validar la versión en español de la BPGS original de cinco factores. Se reclutó una muestra de 100 adultos hispanohablantes con trastorno por uso de sustancias de un centro de tratamiento de adicciones. A los participantes se les administró la versión en español de la BPGS. El instrumento mostró propiedades de fiabilidad de los ítems evaluados (Ω = 0,93). Los valores de sensibilidad y especificidad fueron excelentes (0,93 cada uno), también los valores predictivos positivos (0,7) y negativos (0,99) sugieren un alto poder discriminante en comparación con los sujetos sin JP. Se encontró una fuerte correlación significativa con la medida gold-estándar (índice de severidad del juego problemático, PGSI) (r = 0,8, p < 0,01). Se encontraron propiedades psicométricas similares en pacientes en riesgo de JP. En conclusión, la BPGS parece un buen instrumento de cribado en la población clínica española, y también identifica a los sujetos en riesgo de desarrollar JP.

Palabras clave: juego problemático, juego patológico, validación, psicometría, prevalencia

■ *Received: October 2021; Accepted: June 2022.*

■ ISSN: 0214-4840 / E-ISSN: 2604-6334

■ **Send correspondence to:**
Pedro Serrano-Pérez. Department of Psychiatry, Hospital Universitari Vall d'Hebron, Barcelona, España. Passeig de la Vall d'Hebron, 119-129, 08035, Barcelona. Tel: +34 93 489 38 80. Fax: +34 93 489 45 87. E-mail: pedro.serrano@vhebron.net; pedrogserrano@gmail.com

Pathological Gambling or Gambling Disorder (GD) is so far the only behavioral addiction recognized in the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association or DSM-5 (American Psychiatric Association, 2013; Johansson, Grant, Kim, Odlaug & Götestam, 2009) and the ICD- 11 (World Health Organization, 2019). It refers to a condition characterized by a persistent and recurrent maladaptive game pattern that causes personal and social harm to the subject (Dirección General de Ordenación de Juego, 2017). Global prevalence is around 2.3% of the adult population (Parhami, Mojtabai, Rosenthal, Afifi & Fong, 2014). However, in Spain, the incidence is around 0.3-0.6%, with a lifetime prevalence of 0.9% (Dirección General de Ordenación de Juego, 2017; Observatorio Español de las Drogas y las Adicciones, 2020). In recent years, with the increase in online gambling, GD become an even more relevant problem from the social, educational and Public Health relevance point of view (Abbott, 2020).

The negative consequences of GD include the appearance of emotional problems, deterioration of general health, relational conflicts, economic problems, decreased work or academic performance and even the appearance of criminal acts (Langham et al., 2016). Different theoretical models have been described and demonstrate that GD is a heterogeneous and multidimensional disorder. The relationship between substance use and GD is close, causing a worsening of both psychiatric pathology and addiction. Both appear as a result of a complex interaction of genetic, biological, psychological and environmental elements. In all theoretical models, the importance of early identification and offering treatment alternatives to patients at risk or with GD has been highlighted (Blaszczynski & Nower, 2002). Longitudinal studies have even shown that GD predicts the development of alcohol consumption, anxiety or affectivity disorders (Parhami et al., 2014). The prevalence of this association varies greatly depending on the jurisdiction, the life span, the sample type and the instrument used. Systematic reviews, predominantly from the United States, report comorbidity of GD and substance use disorder (SUD) of 57.5% in the general population and up to 22.2% in patients treated in clinical units (Dowling et al., 2018). Various systematic reviews and meta-analyses indicate that gambling problems in patients with SUD are over-represented (10.0%–43.4%) (Cowlishaw, Merkouris, Chapman & Radermacher, 2014; Himelhoch et al., 2015; Lorains, Stout, Bradshaw, Dowling & Enticott, 2014; Manning et al., 2017). Despite this, even in stricter studies, there is evidence of prevalence rates of 14% in PG and 23% if we refer to the entire gambling spectrum (Cowlishaw et al., 2014). In Spain, there are few studies on the prevalence of gambling-related problems in SUD patients despite the fact it occupies one of the first positions of per capita spending in gambling (Becoña, 1996). The little research that exists in our environment, makes a detection instrument even more important to study the true magnitude of the problem. In a study carried out in an outpatient unit for addiction treatment, 20% of treated patients were also found to have a gambling disorder (Pérez, 2010).

In SUD, GD can play a role both in initiating and maintaining or hindering treatment of SUD (Grant & Chamberlain, 2015; Spunt, Lesieur, Liberty & Hunt, 1996). This is an especially vulnerable population due to the poor adherence and the low therapeutic compliance that these patients present (Steinkamp et al., 2019; Zhang, Friedmann & Gerstein, 2003), since the comorbidity of GD and SUD, is associated with an increased risk of presenting other psychiatric disorders when compared with patients without SUD (Abdollahnejad, Delfabbro & Denson, 2014; Cowlishaw & Hakes, 2015). Not correctly identifying GD in patients with SUD could have important consequences such as detriment to adherence, worse prognosis and non-achievement of therapeutic goals (Clausen, Anchersen & Waal, 2008; Zhang et al., 2003).

Outpatient drug addiction centers are an ideal place to identify and properly treat such patients and it is one of the places where the early detection of this pathology should be carried out. Despite this, there is data suggesting that the screening rates carried out by physicians in these services remain very low (Cowlishaw et al., 2014; Holtgraves, 2009). Different barriers have been identified to carry out screening and detection of GD in patients with SUD in these centers, including lack of time, lack of knowledge to carry it out, little information about its effectiveness, the perception that gambling-related problems are not a disease, lack of effective interventions, or limited access to specific treatment units (Dowling et al., 2019; Manning et al., 2017).

Therefore, when it comes to screening, the tool used must be easy and quick to apply since there are many aspects that must be assessed in a clinical interview. Screening instruments can increase clinical care by reducing healthcare costs (Tiet, Finney & Moos, 2008). In recent years, different short screening tools for PG have been developed, most of them derived from more complex measuring instruments (Dowling et al., 2019).

Currently, the Problem Gambling Severity Index (PGSI) is considered the international gold standard (Dellis et al., 2014) and has been replacing other tools that assess prevalence or perform GD screening tests (Calado & Griffiths, 2016; López-González, Estévez & Griffiths, 2018). This instrument has been compared and evaluated with various GD detection instruments (Calado & Griffiths, 2016). However, the PGSI extension can compromise its application for screening in routine clinical practice (Ferris,

Wynne, Ladouceur, Stinchfield & Turner, 2001; Lubman et al., 2017).

Therefore, new instruments have been developed that have the same or even better psychometric properties. There has been different research studying the sensitivity, specificity and overall diagnostic accuracy of different screening instruments with variable and sometimes contradictory results. One of the scales that has shown most interesting results is the Brief Problem Gambling Screen (BPGS) which can be used in 4 different versions including from 2 to 5 items. In a relational study with 837 participants, nine brief screening tools were compared with the PGSI as the reference standard (Calado & Griffiths, 2016), concluding that the only one that showed adequate sensitivity when detecting any level of problem game when compared to the other eight screening tools was the 5-item version of the BPGS (Dowling et al., 2018) also indicating that it could be an optimal tool for use in a clinical population (Lorains et al., 2014). In that study, the 5-item BPGS has shown a sensitivity of 100% and a specificity of 86% for patients with GD. In patients at risk of GD, both the sensitivity and the specificity were 94%. Also positive and negative predictive values showed excellent results (PPV = 70%; NPV = 99%), thus showing strong discriminant power when differentiating with non-GD subjects (Dowling et al., 2018). Its adequate capacity to detect the population at risk was also confirmed, which reinforces the idea that it is a useful tool for early screening in GD. In addition to great sensitivity, its positive predictive value suggested that it is an efficient instrument for detecting patients with any level of gambling disorder. It showed that 93% of the patients identified in the sample used had at least a low risk that was confirmed with the gold standard PGSI, although this decreased to 33% in patients with GD (Dowling et al., 2018). While in some studies the 5-item version appears as the best tool to detect any type of problem with gambling, in other studies its diagnostic accuracy is lower and yet the two-item version does show better results in both the risk population and patients with GD (Browne, Greer, Rawat & Rockloff, 2017). Along these lines, it has been seen that the proportion of gamblers at risk of developing GD is responsible for a large part of the problem, due to the high prevalence that exists. Identifying, therefore, not only the GD but also the populations at risk and being able to act early is another important characteristic of a screening tool (Volberg & Williams, 2011). Despite the ability to diagnose GD and to detect population at risk described, the variability obtained in different samples justifies re-evaluating the scale. Moreover, this is the first study to our knowledge that is carried out in a clinical population with SUD.

Despite having been evaluated as a valuable instrument for early screening in clinical populations, the BPGS has not been validated in Spanish. The fact that it is not validated in Spanish limits its use, the comparison between different studies and if used without adequate validation, can lead to biases (Browne et al., 2017). The main hypothesis of the study is that the Spanish validation of the scale can be successful and useful for its regular use in outpatient addiction centers.

For this reason, the stated objective is the cultural adaptation and validation of 5-item BPGS in Spanish in a population with SUD so that its use and promotion in Spanish-speaking countries or with high rates of Spanish-speaking population are favored.

Methods

Participants

The sample consisted of individuals undergoing treatment for SUD in an outpatient treatment unit in Barcelona. It is one of the reference centers in addiction treatment for years. A convenience sample was recruited by a consecutive sampling method. Thus, given that an objective was to study the prevalence of GD in SUD clinical population, patients were recruited consecutively if they agreed to participate and met the inclusion criteria. The inclusion criteria were 1) age between 18 and 65 years, 2) ability to understand and complete the research questionnaire and 3) willingness to sign the informed consent. The exclusion criteria were 1) presenting a state of intoxication at the time of the interview, 2) decompensation of the psychiatric disorder and 3) not understanding the Spanish language. Since the center belongs to a university hospital, and patients are used to participating in studies, only 15 patients refused to participate. The questionnaire was self-administered in an office where the patient's identity was safeguarded. The sociodemographic characteristics of the sample are represented in Table 1. The protocol was evaluated and accepted by the Ethics and Drug Research Committee of the Vall d´Hebron Hospital. All the participants signed informed consent prior to completing the questionnaires. There was no financial compensation for participation.

Measures

Sociodemographic and clinical variables

The information was obtained using a semi-structured face-to-face interview performed by trained psychologists and psychiatrists and a self-developed questionnaire in which the following sociodemographic variables were registered: age, gender, occupation, academic level, and current situation of coexistence (Table 1).

The *Brief Problem Gambling Screen (BPGS)* (Volberg & Williams, 2011) was developed to identify early gambling problems in the clinical population. It was created by combining certain parameters which were considered the best combination of elements with the power to identify pathological gamblers, problem gamblers and

those at risk of becoming so. It consists of five questions with pathological gambling-related issues in the last 12 months, although it is specified that the time frame may be earlier or even throughout life. An affirmative answer to one or more questions is indicative of a problem with gambling and therefore requires a more detailed assessment (Lubman et al., 2017).

In its elaboration, five items were chosen from a selection of 30 items, of which two items belonged to the Canadian Problem Gambling Index (CPGI) (Items 1 and 3) (Ferris et al., 2001), two belonged to the Problem and Pathological Gambling Measure (PPGM) (Items 8 and 10C) (Williams & Volberg, 2010), and one to the South Oaks Gambling Screen (SOGS) (Item 4) (Holtgraves, 2009; Lesieur & Blume, 1987). Four different versions have been evaluated separately (BPGS-5, BPGS-4, BPGS-3 and BPGS-2).

The *Problem Gambling Severity Index (PGSI)* was created by Ferris et al. (2001). The scale consists of nine items that assess the severity of the GD, five of which assess the negative consequences of the game and four focused on the problem behavior of the gambler (Holtgraves, 2009). Each item is scored on a four-point scale (0-never; 1- sometimes; 2-most of the time; 3- almost always). Scores obtained from the individual items are summed with scores ranging from 0 to 27 used to classify patients' risk levels (0 = non-problematic player with no negative consequences; 1–2 = low risk player. Player experiencing few problems and with few or no negative consequences; 3–7 = moderate risk player. Player experiencing moderate problems with some negative consequences; 8 or more = Problem player). For the present study, the version validated in Spanish was used, which has shown internal consistency above the reliability threshold (α = .97) (Grant & Chamberlain, 2015).

Procedure

The usual procedures to adapt the BPGS to Spanish were carried out. Two of the native Spanish authors of the manuscript independently translated and documented the original English version. The two versions were compared and each difference was discussed until a full agreement was reached. The consensus version in Spanish was sent to an external reviewer (native English) who had previous experience in validating scales. This individual back- translated the tool to identify words that had been translated incorrectly or possible inconsistencies. Necessary corrections were made until there was a full agreement with the external reviewer. This version was corrected by a Spanish gaming expert who runs a reference unit on pathological gambling in the city (Appendix 1).

After signing the informed consent by the participant, the assessment instruments were administered individually. The scale was administered after the visit. It was carried out by two of the researchers, both with previous experience in the use of scales in psychiatry.

Statistical analysis

All analyses were carried out with IBM SPSS 24 software. Item reliability analysis was carried out with an internal consistency analysis (McDonald's Omega). The predictive properties of the scale were determined by obtaining the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) for each category (GD and at risk of GD). Similarly, for each category, the analysis of convergence of the Spanish-language BPGS with the gold-standard instrument (PGSI) was carried out with Spearman's rank correlation coefficient. The level of statistical significance was set at 0.05. An exploratory factor analysis (EFA) was conducted to study the internal structure of the BPGS. Since the items of the BPGS are dichotomous scores, the factorial analysis was conducted with the tetrachoric correlation matrix, with the software FACTOR (Lorenzo-Seva & Ferrando, 2006). The model was estimated via robust unweighted least squares estimation, which is the recommended procedure in the case of dichotomous scores (Ferrando, Lorenzo, Hernández & Muñiz, 2022). Finally, mean differences analysis was conducted with non-parametric tests, U Mann-Whitney test (for comparison of two groups) and Kruskal-Wallis test (when comparing 3 or more groups).

Data regarding the scales was fully available. Although missing data was less than 5% for sociodemographic variables, a replacement for the average method was used. The level of statistical significance was 0.05.

Results

Table 1 shows the sociodemographic and clinical characteristics of the sample. The total number of participants was 100 Spanish-speaking adults diagnosed with SUD. The sample mean age was 45.83 years (SD= 11.287). Only a quarter of the sample was made up of women (27%). The most prevalent substances under treatment among the participants were alcohol (43%), cocaine (32%) and opiates (19%), with 63% of the participants presenting a second substance under treatment. 21% of the participants presented with psychiatric comorbidity, being depression (10%), anxiety (7%) and schizophrenia (5%) the most prevalent comorbid disorders.

Descriptive statistics and differences by SUD and Gender

Table 2 shows descriptive statistics for the BPGS. In relation to gender, male participants score statistically significant higher in the BPGS when compared with female participants (BPGS: z = -2.43, p = 0.02), with a low effect size (r = 0.24). The Kruskal-Wallis H test indicated that there was not a statistically significant difference in the dependent variable between the different groups ($\chi^2(6)$ = .74, p = .69).

Table 1
Sociodemographic and clinical characteristics of the participants

Participants (N)	100
Female	27
Male	73
Mean age (sd. Range)	45. 83 (11.287. 22-67)
Education level (%)	
Can't read/write	1
Primary	2
Secondary	59
Bachelor/Vocational training	35
University	3
Marital status (%)	
Single	47
Married/Partner	45
Separated/Divorced	8
Employment status (%)	
Active	34
Inactive	28
Sick leave	6
Pensioner/retired	31
Other	1
Main substance in treatment (%)	
Opiates	19
Cocaine	32
Alcohol	43
Cannabis	2
Benzodiazepines	2
Amphetamines	1
Analgesics	1
Second substance in treatment (%)	
Opiates	6
Cocaine	14
Alcohol	24
Cannabis	10
Benzodiazepines	3
Polyconsumption	6
None	37
Psychiatric comorbidity (%)	
Any psychiatric disorder	27
Schizophrenia	5
Schizoaffective disorder	1
Depressive disorder	10
Anxiety disorder	7
ADHD	1
Induced psychosis	3
None	73
Dual pathology (%)	
Yes	21
No	79

Table 2
Descriptive statistics and mean differences test results of the BPGS

	BPGS	**Intergroup differences**
Total Score (mean. sd)	7 (1.53)	
Gender (mean. sd)		
Male	.90 (1.69)	z = -2.43. p = 0.02. r =.24
Female	.15 (.77)	
SUD (mean. sd)		
Opiates	.42 (.96)	χ^2 = .74. p = .69
Cocaine	1.03 (1.91)	
Alcohol	.67 (1.51)	
Cannabis	0 (0)	
Benzodiazepines	0 (0)	
Amphetamines	0 (0)	
Analgesics	0 (0)	

Table 3
Results of the Exploratory Factor Analysis of the BPGS

	Factor 1	**Communality**
BPGS item 1	.99	.99
BPGS item 2	.96	.92
BPGS item 3	.93	.87
BPGS item 4	.97	.95
BPGS item 5	.95	.90

Internal structure of the BPGS

Table 3 shows the results of the EFA. In the final solution, eigenvalues greater than 1 showed the existence of a single factor. This solution explains 94% of the variance. The items present factor loadings greater than .50 and communalities greater than .35. Bartlett's sphericity test was significant (1111.0, df = 10, Sig. = .001) and the Kaiser-Meyer-Olkin sample size adequacy indicator was adequate (.86).

Item reliability analysis

The result obtained in the analysis was $\Omega = 0.93$ for the BPGS was considered to be in the acceptable range ($\Omega > 0.9$ and $\alpha > 0.80$). Likewise, the correlation of each individual item with the total BPGS score reported high values ($r_s = 0.83 - 0.91$), suggesting a relevant contribution of each of the items to the total score. All the items of the BPGS reached good discriminant values (D = .40) (item 1 D = .76; item 2 D = .90; item 3 D = 0; item 4 D = 0; item 5 D = .80).

Predictive value analysis

The Spanish version of the BPGS showed acceptable predictive values to detect GD, with a sensitivity of 0.93 and a specificity of 0.93 for a score equal to or greater than 1. PPV and NPV also showed acceptable values, with a PPV of 0.7 and a NPV of 0.99. The value of the area under the curve was 0.95 (95% CI, 0.87, 1). In at-risk GD, the predictive values were 0.94 and 0.96 for sensitivity and specificity, respectively. The PPV and NPV were 0.85 and 0.99, respectively. The value of the area under the curve was 0.97 (95% CI, 0.91, 1).

Correlation analysis with the PGSI

The BPGS in Spanish language showed a high correlation with the gold-standard assessment instrument (PGSI), with an association value of 0.8 ($p < 0.01$) for GD and 0.9 ($p < 0.01$) for at-risk GD.

Discussion

This is the first study where the BPGS has been tested in a clinical sample of patients with SUD. It is also one of the first studies to try to assess the prevalence of GD in this type of population in Spain. The results obtained in our analyses confirm those obtained in previous studies where the sensitivity and NPV of the test obtained great classifying power to correctly identify and classify both at-risk patients and those with a gambling disorder. Additionally, in our study, we obtain very high values also in specificity and PPV when compared to other similar studies (Manning et al., 2017). In a population with real GD (PGSI => 8), the sensitivity of 93% falls within the range described for the test with 95% confidence and which is between 0.91-0.99 (Volberg & Williams, 2011), although somewhat lower than that found in other studies where a sensitivity of 100% is indicated (Dowling et al., 2018).

When the accuracy of correctly diagnosing patients with GD has been studied, a sensitivity of 99% has been obtained (Dowling et al., 2019). The specificity found in our study (93%) is opposite to that observed in previous studies (Manning et al., 2017). Although it is within the range 0.61-0.99 (95%IC) obtained in the development of the scale, the value is above that obtained when compared with the PGSI (+8) in other studies (Dowling et al., 2018), when compared with other screening scales (Himelhoch et al., 2015) and when its diagnostic capacity obtaining a value of 69% (Dowling et al., 2019).

Although the NPV coincides with that obtained in previous studies, it is noteworthy the great difference found with the PPV in Dowling et al. (2017) of 33%, while in our study it has reached the 70%. Despite this data, when the sample contains the entire spectrum of risk for developing GD the PPV is 93% and is in line with the 85% obtained in our case (Dowling et al., 2018).

When analyzing the screening power in the population at risk of GD, an increase in all the parameters is observed, which coincides with the results indicated by other authors (Dowling et al., 2018; Manning et al., 2017), where a greater power to correctly identify and classify was already identified.

In a recent meta-analysis (Dowling et al., 2019) it is indicated how the BPGS presents greater diagnostic capacity in population at risk than in real GD. In previous studies where the ability to correctly classify patients was also analyzed, they also describe great sensitivity across the entire spectrum of problem gambling and highlight a higher PPV in patients at risk than when seeking to classify only those at high risk (Manning et al., 2017).

It is of great clinical utility to explore the presence of gambling problems from a dimensional perspective that includes from non-problematic gambling, to problematic and pathological gambling, to identify the different levels of severity of the behavior, and thus to be able to apply the programs of specific and personalized treatment to the symptoms of each patient (Himelhoch et al., 2015).

The main strength of this study is that it constitutes one of the first studies carried out in Spain on patients undergoing treatment for SUD on an outpatient basis. Compared to the only study found in a clinical population in our country, the prevalence would be somewhat lower, 15% vs. 20% (Pérez, 2010). In this sense, our results are in line with the stricter studies on prevalence in the general population and somewhat lower if we talk about the entire spectrum of problematic gambling (Himelhoch et al., 2015). As previously explained, although the prevalence in treatment units in countries such as the United States is higher, numerous studies indicate that it seems to be over-represented (Clausen et al., 2008). Promoting the use of screening tools could help provide reliable data about the prevalence of GD in our country.

As a main limitation of the study, it is worth noting that the clinical service where the data were collected has been treating GD for a relatively short time and that there is a reference GD unit in the city that attends patients from the entire territory. In this sense, the prevalence obtained could be lower than the real one. On the other hand, although the PGSI was used as the gold standard, some authors point out the clinical utility of directly comparing with the DSM-5 diagnostic criteria (Himelhoch et al., 2015). Furthermore, we used one of the methods for the back-translation, however, there are several ways to perform translations of health scales (more than 31 guidelines) (Muñiz, Elosua & Hambleton, 2013; Ortiz-Gutiérrez & Cruz-Avelar, 2018). Moreover, some bias may be present because of the self-assessments. Another limitation of the study is that the sample is mostly made up of men. Although this aspect describes the reality of addiction centers, it is a feature to point out. Finally, it should be noted that the instrument has been validated for the Spanish-speaking population

with SUD, so its use in other clinical populations remains to be evaluated.

Despite the limitations and based on what was previously stated, it can be concluded that the Spanish adaptation of the original five-item BPGS offers correct validity and item reliability in the Spanish-speaking population with SUD. Its great sensitivity in identifying, classifying and diagnosing both the population at risk of developing a GD problem, as well as those who already have it, makes it a very useful screening tool. The inclusion of this instrument in the usual welcome protocols in drug addiction care units could facilitate early detection and facilitate the correct clinical approach.

Conflict of interests

The authors have no conflict of interest to declare in relation to this paper. Dr. Palma-Álvarez has received fees to give talks for Lundbeck, MSD, Mundipharma and Exeltis. Dr. Ramos-Quiroga has received fees as speaker from Janssen-Cilag, Shire, Lilly, Ferrer, Medice and Rubió. He has received research funding from Janssen-Cilag, Lilly, Ferrer, Lundbeck and Rubió. Dr. Grau-López has received fees to give talks for Janssen-Cilag, Lundbeck, Servier, Otsuka, and Pfizer.

The other authors do not have any potential conflict of interest.

The material has not been published in whole or part elsewhere, the paper is not currently considered for publication elsewhere. We declare that all authors have been personally and actively involved in work on the report and will hold themselves jointly and individually responsible for its content.

References

Abbott, M. W. (2020). The changing epidemiology of gambling disorder and gambling-related harm: Public health implications. *Public Health, 184*, 41-45. doi:10.1016/j.puhe.2020.04.003.

Abdollahnejad, R., Delfabbro, P. & Denson, L. (2014). Psychiatric co-morbidity in problem and pathological gamblers: Investigating the confounding influence of alcohol use disorder. *Addictive Behaviors, 39*, 566–572. doi:10.1016/j.addbeh.2013.11.004.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders.* American Psychiatric Association. (trad. cast. en Barcelona: Masson, 2014). doi:10.1176/appi.books.9780890425596.

Becoña, E. (1996). The problem and pathological gambling in Europe: The cases of Germany, Holland and Spain. *Journal of Gambling Studies, 12*, 179-192. doi:10.1007/BF01539173.

Blaszczynski, A. & Nower, L. (2002). A pathway model of problem and pathological gambling. *Addiction, 7,* 487-499. doi:10.1046/j.1360-0443.2002.00015.x.

Browne, M., Greer, N., Rawat, V. & Rockloff, M. (2017). A population-level metric for gambling-related harm. *International Gambling Studies, 17*, 163–175. doi:10.1080/14459795.2017.1304973.

Calado, F. & Griffiths, M. D. (2016). Problem gambling worldwide: An update and systematic review of empirical research (2000–2015). *Journal of Behavioral Addictions, 5*, 592–613. doi:10.1556/2006.5.2016.073.

Clausen, T., Anchersen, K. & Waal, H. (2008). Mortality prior to, during and after opioid maintenance treatment (OMT): A national prospective cross-registry study. *Drug and Alcohol Dependence, 94*, 151–157. doi:10.1016/j.drugalcdep.2007.11.003.

Cowlishaw, S. & Hakes, J. K. (2015). Pathological and problem gambling in substance use treatment: Results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *American Journal on Addictions, 24*, 467–474. doi:10.1111/ajad.12242.

Cowlishaw, S., Merkouris, S., Chapman, A. & Radermacher, H. (2014). Pathological and problem gambling in substance use treatment: A systematic review and meta-analysis. *Journal of Substance Abuse Treatment, 46*, 98–105. doi:10.1016/j.jsat.2013.08.019.

Dellis, A., Sharp, C., Hofmeyr, A., Schwardmann, P. M., Spurrett, D., Rousseau, J. & Ross, D. (2014). Criterion-related and construct validity of the Problem Gambling Severity Index in a sample of South African gamblers. *South African Journal of Psychology, 44*, 243–257. doi:10.1177/0081246314522367.

Dirección General de Ordenación de Juego (2017). *Estudio y análisis de los factores de riesgo del trastorno de juego en población clínica española.* Ministerio de Hacienda y Función Pública.

Dowling, N. A., Merkouris, S. S., Dias, S., Rodda, S. N., Manning, V., Youssef, G. J.,… Volberg, R. A. (2019). The diagnostic accuracy of brief screening instruments for problem gambling: A systematic review and meta-analysis. *Clinical Psychology Review, 74,* 101784. doi:10.1016/j.cpr.2019.101784.

Dowling, N. A., Merkouris, S. S., Manning, V., Volberg, R., Lee, S. J., Rodda, S. N. & Lubman, D. I. (2018). Screening for problem gambling within mental health services: A comparison of the classification accuracy of brief instruments. *Addiction, 113*, 1088–1104. doi:10.1111/add.14150.

Ferrando, P. J., Lorenzo, U., Hernández, A. & Muñiz, J. (2022). Decálogo para el análisis factorial de los ítems de un test. *Psicothema, 34*, 7-17. doi:10.7334/psicothema2021.456.

Ferris, J., Wynne, H., Ladouceur, R., Stinchfield, R. & Turner, N. (2001). *The Canadian Problem Gambling Index: Final report.*

Grant, J. E. & Chamberlain, S. R. (2015). Gambling disorder and its relationship with substance use disorders: Implications for nosological revisions and treatment. The *American Journal on Addictions, 24*, 126–131. doi:10.1111/ajad.12112.

Himelhoch, S. S., Miles-Mclean, H., Medoff, D. R., Kreyenbuhl, J., Rugle, L., Bailey-Kloch, M.,… Brownley, J. (2015). Evaluation of brief screens for gambling disorder in the substance use treatment setting. *American Journal on Addictions, 24*, 460–466. doi:10.1111/ajad.12241.

Holtgraves, T. (2009). Evaluating the problem gambling severity index. *Journal of Gambling Studies, 25*, 105–120. doi:10.1007/s10899-008-9107-7.

Johansson, A., Grant, J. E., Kim, S. W., Odlaug, B. L. & Götestam, K. G. (2009). Risk factors for Problematic Gambling: A critical literature review. *Journal of Gambling Studies, 25*, 67–92. doi:10.1007/s10899-008-9088-6.

Langham, E., Thorne, H., Browne, M., Donaldson, P., Rose, J. & Rockloff, M. (2016). Understanding gambling related harm: A proposed definition, conceptual framework, and taxonomy of harms. *BMC Public Health, 16*, 80. doi:10.1186/s12889-016-2747-0.

Lesieur, H. R. & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of Pathological gamblers. *American Journal of Psychiatry, 144*, 1184–1188. doi:10.1176/ajp.144.9.1184.

López-González, H., Estévez, A. & Griffiths, M. D. (2018). Spanish validation of the Problem Gambling Severity Index: A confirmatory factor analysis with sports bettors. *Journal of Behavioral Addictions, 7*, 814–820. doi:10.1556/2006.7.2018.84.

Lorains, F. K., Stout, J. C., Bradshaw, J. L., Dowling, N. A. & Enticott, P. G. (2014). Self-reported impulsivity and inhibitory control in problem gamblers. *Journal of Clinical and Experimental Neuropsychology, 36*, 144–157. doi:10.1080/13803395.2013.873773.

Lorenzo-Seva, U. & Ferrando, P. J. (2006). FACTOR: A computer program to fit the exploratory factor analysis model. *Behavior research methods, 38*, 88-91.

Lubman, D., Manning, V., Dowling, N., Rodda, S., Lee, S. J., Garde, E. L.,… Volberg, R. (2017). *Problem Gambling in People Seeking Treatment for Mental Illness.* Victorian Responsible Gambling Foundation.

Manning, V., Dowling, N. A., Lee, S., Rodda, S., Garfield, J. B. B., Volberg, R.,… Lubman, D. I. (2017). Problem gambling and substance use in patients attending community mental health services. *Journal of Behavioral Addictions, 6*, 678–688. doi:10.1556/2006.6.2017.077.

Muñiz, J., Elosua, P. & Hambleton, R. K. (2013). Directrices para la traducción y adaptación de los tests: Segunda edición. *Psicothema, 25*, 151–157. doi:10.7334/psicothema2013.24.

Observatorio Español de las Drogas y las Adicciones (2020). *Adicciones comportamentales. Juego con dinero, uso de videojuegos y uso compulsivo de internet en las encuestas de drogas y otras adicciones en España EDADES y ESTUDES.* Ministerio de Sanidad.

Ortiz-Gutiérrez, S. & Cruz-Avelar, A. (2018). Translation and cross-cultural adaptation of health assessment tools. Proceso de traducción y adaptación cultural de instrumentos de medición en salud. *Actas dermo-sifiliograficas, 109*, 202–206. doi:10.1016/j.ad.2017.09.012.

Parhami, I., Mojtabai, R., Rosenthal, R. J., Afifi, T. O. & Fong, T. W. (2014). Gambling and the onset of comorbid mental disorders: A longitudinal study evaluating severity and specific symptoms. *Journal of Psychiatric Practice, 20*, 207–219. doi:10.1097/01.pra.0000450320.98988.7c.

Pérez, E. J. P. (2010). Detección de adicciones comportamentales en adictos a sustancias en tratamiento. *Trastornos Adictivos, 12*, 13–18. doi:10.1016/s1575-0973(10)70005-2.

Spunt, B., Lesieur, H., Liberty, H. J. & Hunt, D. (1996). Pathological gamblers in methadone treatment: A comparison between men and women. *Journal of Gambling Studies, 12*, 431–449. doi:10.1007/BF01539187.

Steinkamp, J. M., Goldblatt, N., Borodovsky, J. T., LaVertu, A., Kronish, I. M., Marsch, L. A. & Schuman-Olivier, Z. (2019). Technological interventions for medication adherence in adult mental health and substance use disorders: A systematic review. *JMIR Mental Health, 6*, e12493. doi:10.2196/12493.

Tiet, Q. Q., Finney, J. W. & Moos, R. H. (2008). Screening psychiatric patients for illicit drug use disorders and problems. *Clinical Psychology Review, 28*, 578–591. doi:10.1016/j.cpr.2007.08.002.

Volberg, R. A. & Williams, R. J. (2011). *Developing a brief problem gambling screen using clinically validated samples of at-risk, problem and pathological gamblers.* https://www.uleth.ca/dspace/handle/10133/2561.

Williams, R. J. & Volberg, R. A. (2010). *Best practices in the population assessment of problem gambling. Guelph: Ontario Problem Gambling Research Centre.* https://www.researchgate.net/publication/228420596_Best_Practices_in_the_Population_Assessment_of_Problem_Gambling.

World Health Organization (2019). *International Statistical Classification of Diseases and Related Health Problems (11th ed.; ICD-11).*

Zhang, Z., Friedmann, P. D. & Gerstein, D. R. (2003). Does retention matter? Treatment duration and improvement in drug use. *Addiction, 98*, 673–684. doi:10.1046/j.1360-0443.2003.00354.x.

Appendix 1. Spanish version of Brief Problem Gambling Screen.

Test	Preguntas	Sí	No
PPGM10	En los últimos 12 meses, ¿Dirías que has estado preocupado por el juego o las apuestas?		
CPGI3	En los últimos 12 meses, ¿Has necesitado apostar crecientes cantidades de dinero para obtener el mismo grado de emoción?		
SOGS4	En los últimos 12 meses, ¿Has apostado durante más tiempo, mayor cantidad de dinero o con mayor frecuencia de lo que pretendías inicialmente?		
PPGM8C	En los últimos 12 meses, ¿Has hecho intentos de reducir, controlar o detener las apuestas?		
CPGI5	En los últimos 12 meses, ¿Has pedido prestado dinero o vendido algo para obtener más dinero para jugar o apostar?		