

Beyond Time Spent Gaming: The Role of Binge Gaming and Monetization in Internet Gaming Disorder Symptoms Among Young Spanish Gamers

Más allá del tiempo de juego: el papel del binge gaming y la monetización en la sintomatología del trastorno por uso de videojuegos en jóvenes españoles

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Abstract

Internet Gaming Disorder (IGD) is an emerging public health concern associated with different gaming patterns and structural characteristics of video games. The present study aimed to examine the association between IGD symptom severity and different gaming habits, including gaming intensity, preferred video game genres, and monetization practices, as well as to determine the relative contribution of these factors to IGD symptom severity in a sample of young Spanish gamers.

A total of 682 young adults aged 18 to 24 years (59.5% women) participated in the study. Participants completed an online survey assessing sociodemographic characteristics, gaming habits, and the Internet Gaming Disorder Scale–Short Form (IGDS9-SF). Correlational analyses and hierarchical linear regression were conducted.

The results showed that greater gaming time during weekdays and weekends, as well as a higher frequency of *binge gaming*, were associated with higher levels of IGD symptomatology, with *binge gaming* emerging as the strongest predictor in the final model. Additionally, preference for MOBA and first-person shooter (FPS) games, along with greater engagement in video game monetization practices, was associated with increased IGD symptom severity. The hierarchical regression model indicated that gaming habits and monetization practices accounted for the largest proportion of explained variance in IGD symptomatology, whereas sociodemographic variables showed a limited contribution.

These findings highlight the importance of assessing not only the total amount of time spent gaming but also specific patterns of use, such as *binge gaming* and monetization practices. The results suggest that prevention strategies targeting young people should focus on identifying potentially maladaptive gaming patterns and promoting a more balanced and controlled use of video games.

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Keywords

Internet Gaming Disorder; problematic gaming; binge gaming; video game monetization; loot boxes; young adults.

Resumen

El trastorno por uso de videojuegos (*Internet Gaming Disorder, IGD*) constituye un problema emergente de salud pública cuya aparición se ha relacionado con diferentes patrones de uso y características estructurales de los videojuegos. El objetivo del presente estudio fue analizar la asociación entre la sintomatología de *IGD* y distintos hábitos de juego, incluyendo la intensidad de uso, el género de videojuego preferido y las prácticas de monetización, así como determinar la contribución relativa de estos factores sobre la severidad del trastorno en una muestra de jóvenes videojugadores españoles.

Participaron 682 jóvenes de entre 18 y 24 años (59,5 % mujeres), quienes completaron un cuestionario online que incluía variables sociodemográficas, hábitos de juego y la *Internet Gaming Disorder Scale–Short Form (IGDS9-SF)*. Se realizaron análisis correlacionales y una regresión lineal jerárquica para identificar los factores asociados a la sintomatología de *IGD*.

Los resultados mostraron que el mayor tiempo de juego en días laborables y fines de semana, así como una mayor frecuencia de *binge gaming*, se asociaron con niveles superiores de sintomatología de *IGD*, siendo este último el predictor de mayor peso en el modelo final. Asimismo, la preferencia por videojuegos *MOBA* y de acción en primera persona y una mayor implicación en conductas de monetización se relacionaron con una mayor sintomatología. El modelo de regresión indicó que los hábitos de juego y las prácticas de monetización explicaron la mayor proporción de la varianza del *IGD*, mientras que las variables sociodemográficas mostraron una contribución limitada.

Estos hallazgos destacan la importancia de evaluar no solo el tiempo total de juego, sino también patrones específicos como el *binge gaming* y las mecánicas de monetización, con implicaciones relevantes para el desarrollo de estrategias preventivas dirigidas a población joven.

Palabras clave

Trastorno por uso de videojuegos; uso problemático de videojuegos; juego en atracón; monetización; cajas botín; jóvenes adultos.

INTRODUCTION

Video gaming has become one of the most widespread and socially pervasive forms of digital leisure activity in recent decades, particularly among young people. Its sustained growth has been facilitated by the proliferation of access platforms, the diversification of gaming genres and formats, and the development of increasingly immersive and socially connected gaming experiences. According to the latest report from the Spanish Association of Video Games (AEVI),

22.1 million people played video games in Spain in 2024, devoting an average of eight hours per week to this activity. Although the gender distribution is virtually equal (50.45% women and 49.55% men), participation is particularly high among young people, reaching a prevalence of 96% among those aged 15–24 years (AEVI, 2025).

Although video gaming constitutes a recreational and adaptive activity for most users, the increased accessibility and frequency of use have raised growing concerns regard-



ing the potential negative effects associated with maladaptive or problematic gaming patterns, particularly during adolescence and emerging adulthood. In this context, scientific and clinical interest in problematic video game use has increased considerably in recent years, leading to the consolidation of specific diagnostic frameworks.

The American Psychiatric Association (APA, 2013) included Internet Gaming Disorder (IGD) in Section III of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a condition requiring further empirical investigation. Subsequently, the World Health Organization (WHO, 2018) formally included Gaming Disorder (GD) in the eleventh edition of the International Classification of Diseases (ICD-11). Both diagnostic systems define the disorder on the basis of three core characteristics: impaired control over gaming, increasing priority given to gaming over other significant activities, and continuation of gaming despite its negative consequences (APA, 2013; WHO, 2018).

Prevalence and Sociodemographic Vulnerability: Age and Gender

Estimating the prevalence of problematic video game use presents substantial methodological challenges arising from the conceptual heterogeneity and diversity of assessment instruments employed (Bernaldo-de-Quirós et al., 2020). Nevertheless, recent systematic reviews and meta-analyses estimate the global prevalence of IGD at approximately 3.05% (Stevens et al., 2021). In Spain, the most recent data from the Spanish Observatory on Drugs and Addictions (OEDA) indicate that 5.2% of the school population aged 14–18 years presents pos-

sible IGD, a percentage that rises to 8.6% among males. Although prevalence decreases at the onset of adulthood, reaching 3.6% at age 18, intensive gaming patterns remain common in this age group (OEDA, 2025).

Available evidence indicates that the disorder is more prevalent among men and that adolescence and emerging adulthood constitute periods of particular vulnerability (Gisbert-Pérez et al., 2024; Liao et al., 2025). However, beyond sociodemographic variables, specific patterns of gaming appear to play a key role in the development and maintenance of the problem.

Gaming Patterns and Intensity: From Gaming Time to Binge Gaming

Traditionally, time spent gaming has been considered one of the main indicators of risk, although there is currently debate as to whether the critical variable is the total number of hours played or the degree of functional interference associated with gaming (Pontes et al., 2022; Strojny et al., 2023). In this regard, recent research suggests that the temporal distribution of gaming is also relevant. Thus, young people tend to concentrate their gaming activity during the afternoon and evening hours, adapting it to their academic and social obligations (Gisbert-Pérez et al., 2024; Triberti et al., 2018).

Specifically, one of the gaming patterns of greatest clinical interest is the so-called binge gaming pattern, characterized by prolonged gaming sessions lasting five or more consecutive hours. This pattern tends to intensify during weekends and has been consistently associated with greater symptom severity and poorer psychosocial adjustment (Tse et al., 2025). Moreover, recent research sug-



gests that binge gaming may constitute a particularly relevant risk indicator for identifying problematic patterns of video game use. In a sample of young adults, Marmet et al. (2023) found that gaming sessions lasting five or more consecutive hours were associated not only with greater IGD symptomatology, but also with poorer sleep quality, lower life satisfaction, and higher levels of psychological distress. These findings suggest that the temporal distribution of gaming and the occurrence of intensive gaming episodes may provide additional clinical information beyond cumulative total gaming time.

Structural Features of Video Games: Genre and Monetization Mechanics

Similarly, the type or genre of video game played constitutes another relevant factor. Massively Multiplayer Online Role-Playing Games (MMORPGs), First-Person Shooter (FPS) games, and Multiplayer Online Battle Arena (MOBA) games show more robust associations with addiction symptoms, probably due to their mechanisms of continuous reinforcement, competitive components, and high levels of social interaction (Katz et al., 2024). In contrast, genres such as puzzle games or certain simulation games are generally associated with lower-risk profiles (Gisbert-Pérez et al., 2024; Katz et al., 2024).

Another emerging issue in the literature concerns the impact of monetization systems integrated into video games. In-game purchases, particularly those intended to improve performance, customize characters, or unlock content, have been associated with a greater likelihood of experiencing IGD symptoms (Gisbert-Pérez et al., 2024;

Oka et al., 2024). In Spain, approximately 11% of student gamers report having spent more than 50 euros on such purchases during the previous year (OEDA, 2025). Particular attention has been paid to loot boxes because their random reward mechanisms share structural similarities with gambling.

Several studies have found positive associations between loot box use and the severity of problematic video game use symptoms (Varchetta et al., 2024; Wardle & Zendle, 2021). Moreover, their prevalence is significantly higher among individuals who already present indicators of problematic gambling, suggesting a possible amplifying effect on behavioral loss of control (OEDA, 2025; Varchetta et al., 2024).

The Present Study: Objectives and Hypotheses

Despite the growing body of research, important gaps remain in the scientific literature, particularly regarding studies that comprehensively examine different gaming patterns—including use intensity, video game genre, monetization habits, and compulsive behaviors—in large samples of young Spanish adults.

Accordingly, the present study aimed to examine which gaming patterns and habits most accurately predict the severity of problematic video game use in a sample of Spanish gamers aged 18–24 years.

Specifically, the following objectives were pursued and their corresponding hypotheses were tested:

First, the study examined the relationship between gaming intensity, weekly gaming frequency, and the presence of prolonged gaming sessions (binge gaming) and disorder severity. A positive association was expected between



these indicators and higher levels of problematic gaming, as suggested by previous research (Pontes et al., 2022; Tse et al., 2025).

Second, the role of the type of video game played was examined. It was hypothesized that Massively Multiplayer Online Role-Playing (MMORPG) games, First-Person Shooter (FPS) games, and Multiplayer Online Battle Arena (MOBA) games would be associated with higher problematic gaming scores compared with less competitive or socially immersive genres (Gisbert-Pérez et al., 2024; Katz et al., 2024).

Third, the study aimed to explore the influence of in-game monetization practices, including in-game purchases and the use of loot boxes. Greater involvement in these mechanics was expected to be associated with greater severity of problematic video game use. This hypothesis was formulated in line with the available international and national evidence concerning the reinforcing potential of these reward systems, their association with increased addiction symptoms (Gisbert-Pérez et al., 2024; Katz et al., 2024), and their structural similarity to gambling dynamics (Varchetta et al., 2024).

Finally, the study aimed to determine the incremental predictive capacity of gaming patterns and habits for the severity of problematic video game use after controlling for the effect of relevant sociodemographic variables such as gender and age.

Specifically, gaming intensity, the presence of binge gaming, certain video game genres, and monetization practices were expected to account for a significant additional proportion of the variance in disorder severity beyond the effect attributable to these sociodemographic variables.

METHOD

Design

A cross-sectional, correlational observational study was conducted to examine the association between IGD-related symptomatology and different sociodemographic variables, gaming habits, video game genre preferences, and monetization behaviors in a sample of young gamers.

Participants

The sample consisted of 682 gamers aged between 18 and 24 years ($M = 21.29$; $SD = 2.02$). Of the total participants, 59.5% were women ($n = 406$) and 40.5% were men ($n = 276$).

The inclusion criteria were: (a) being between 18 and 24 years of age, (b) having played video games during the previous 12 months, and (c) voluntarily agreeing to participate in the study. Participants who did not complete the entire questionnaire or who did not provide informed consent were excluded.

Regarding gaming habits, participants reported playing an average of 4.05 different video games ($SD = 2.15$; range = 1–12). Likewise, the mean gaming frequency was 4.27 days per week ($SD = 1.97$), with an average of 2.26 hours of gaming on weekdays ($SD = 1.46$) and 3.63 hours during weekends ($SD = 1.87$). Regarding binge gaming, 31.2% of the sample reported engaging in this behavior frequently, 40.3% occasionally, and 28.4% reported not having engaged in it. The sociodemographic characteristics and main gaming habits of the sample are presented in Table 1.



Table 1. Frequencies and descriptive statistics of sociodemographic variables and gaming habits

		N	%	M	SD
Age				21,29	2,02
Gender	Male	276	40,5		
	Female	406	59,5		
Number of VG types played				4,05	2,15
Preferred VG played	Action and adventure	117	17,2		
	Racing	39	5,7		
	Sport	64	9,4		
	Strategy	27	4		
	Fighting	2	0,3		
	MOBA	34	5		
	Music rhythm	7	1		
	Platafors	31	4,5		
	Puzzles and board games	39	5,7		
	MMORPG	22	3,2		
	FPS	158	23,3		
	Simulation	131	19,2		
	Unclassifiable	11	1,6		
Days/ week				4,27	1,97
Hours/ weekdays				2,26	1,46
Hours/ weekends				3,63	1,87
Binge gaming	Yes, frequently	213	31,2		
	Yes, occasionally	275	40,3		
	No	194	28,4		

Note. M = mean; SD = Standard Deviation; VG = videojuegos

Variables and instruments

Sociodemographic variables and gaming habits

Information on participants' age and gender was collected. In addition, different indicators related to gaming habits were assessed, including preferred video game genres, the

number of types of video games played, weekly gaming frequency, hours devoted to gaming on weekdays and during weekends, the occurrence of binge gaming episodes, and different in-game monetization behaviors, such as purchasing upgrades, skins, or boosts, and obtaining or purchasing loot boxes using real money or other means.



Problematic videogame use

IGD-related symptomatology was assessed using the Internet Gaming Disorder Scale–Short Form (IGDS9-SF; Pontes & Griffiths, 2015), using the Spanish adaptation and validation by Sánchez-Iglesias et al. (2020). This instrument consists of nine items with a five-point Likert-type response format and was designed to assess the nine diagnostic criteria for Internet Gaming Disorder described in the DSM-5. The scale has a unidimensional structure and is one of the most widely used measures internationally to assess IGD severity and the negative consequences associated with this behavior during the previous 12 months. Higher scores on the scale indicate greater symptom severity. The Spanish version showed adequate internal consistency ($\alpha = .84$), while reliability in the present sample was excellent ($\alpha = .88$). The mean IGDS9-SF score was 19.23 points ($SD = 7.30$), with scores ranging from 9 to 45. According to the diagnostic criterion proposed for the scale (a score of 5 or higher on at least five items), six participants (0.9%) presented symptomatology compatible with possible IGD.

Procedure

Data collection was conducted between December 2025 and January 2026 through an online survey administered via a consumer panel managed by a company specializing in market research. The company recruited participants who met the established inclusion criteria and invited them to participate in the study. Participation was voluntary and anonymous. Before accessing the questionnaire, all participants received detailed information about the study objectives, the con-

ditions of participation, and the confidential treatment of the data, and subsequently provided electronic informed consent.

The questionnaire could be completed using different electronic devices and included sociodemographic questions, variables related to gaming habits, and the IGDS9-SF. The study was approved by the corresponding Research Ethics Committee and was conducted in accordance with the ethical principles established in the Declaration of Helsinki.

Data Analysis

Statistical analyses were conducted using IBM SPSS Statistics. First, descriptive statistics (means, standard deviations, frequencies, and percentages) were calculated to characterize the sample and the main study variables.

Subsequently, associations between total IGDS9-SF scores and sociodemographic variables, gaming habits, preferences for different video game genres, and in-game monetization behaviors were examined using correlational analyses. Pearson correlation coefficients were calculated, and the magnitude of the associations was interpreted according to the criteria proposed by Cohen (1988), considering values of r around .10 as small associations, around .30 as moderate associations, and above .50 as large associations.

Finally, a hierarchical linear regression analysis was conducted to determine the relative contribution of sociodemographic variables, gaming preferences, gaming habits, and monetization behaviors to the prediction of IGD symptomatology. Statistical significance was set at $p < .05$.



RESULTS

Table 2 presents the correlations between total IGDS9-SF scores and sociodemographic variables, characteristics related to gaming habits, preferences for different video game genres, and in-game monetization behaviors.

Associations Between IGD Symptomatology and Gaming Time

Total IGDS9-SF scores showed positive and statistically significant associations with all indicators of temporal involvement in video gaming. The association with the number of gaming days per week was small ($r = .140$; $p < .01$), whereas the associations with hours of gaming on weekdays ($r = .325$; $p < .01$), hours of gaming during weekends ($r = .338$; $p < .01$), and binge gaming frequency ($r = .353$; $p < .01$) were moderate. Of all the variables examined, binge gaming frequency showed the strongest association with IGD symptomatology.

Associations Between IGD Symptomatology and Video Game Types

The number of video game types played showed a small positive association with IGDS9-SF scores ($r = .085$; $p < .05$). Likewise, preference for MOBA games ($r = .107$; $p < .01$) and first-person action games ($r = .110$; $p < .01$) showed small positive associations with IGD symptomatology (see Table 3). No statistically significant associations were observed for the remaining video game genres assessed.

Associations Between IGD Symptomatology and Monetization Behaviors

Monetization behaviors showed positive and statistically significant associations with total IGDS9-SF scores (see Table 2). All observed associations were small in magnitude. The strongest associations were found for purchasing loot boxes with money ($r = .287$; $p < .01$) and acquiring upgrades, skins, or boosts through other means ($r = .280$; $p < .01$), followed by purchasing upgrades, skins, or boosts with real money ($r = .267$; $p < .01$) and obtaining loot boxes through other means ($r = .228$; $p < .01$). Overall, these results indicate that greater involvement in monetization behaviors was associated with higher levels of IGD symptomatology.

Factors Associated with IGD Symptomatology

Prior to estimating the model, the assumptions of linear regression were assessed. Inspection of the histogram of standardized residuals and the normal P-P plot indicated an approximately normal distribution of the residuals. Likewise, the graphical representation of standardized residuals against standardized predicted values showed no systematic patterns, supporting the assumption of homoscedasticity. Independence of errors was confirmed by a Durbin-Watson statistic of 2.03. Finally, no multicollinearity problems were detected, with tolerance values ranging from .51 to .98 and variance inflation factors (VIFs) ranging from 1.03 to 1.96.

**Table 2.** Correlations Between Sociodemographic Variables, IGDS9-SF Scores, Gaming Time, Video Game Types, and Monetization

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1											
2. Age	0,029	1										
3. IGDS9-SF score	-,091*	0,047	1									
4. Number of VG played	-,051	,117**	,085*	1								
5. days/ week	-,217**	0,029	,140**	,199**	1							
6. hours/ weekday	-,088*	0,045	,325**	,153**	,411**	1						
7. hours/ weekend	-,161**	0,027	,338**	,205**	,392**	,651**	1					
8. Binge gaming	-,149**	0,040	,353**	,281**	,262**	,343**	,425**	1				
9. Upgrades or skins purchases with money	-,206**	0,045	,267**	,183**	,280**	,275**	,296**	,249**	1			
10. Upgrades or skins purchases through other means	-,167**	-,037	,280**	,152**	,174**	,196**	,241**	,187**	,364**	1		
11. loot boxes purchases with money	0,02	0,045	,287**	,128**	,152**	,254**	,190**	,182**	,351**	,219**	1	
12. loot boxes purchases through other means	-,06	-,007	,228**	,188**	,137**	,146**	,176**	,118**	,218**	,410**	,363**	1

Note. IGDS9-SF = Internet Gaming Disorder Scale–Short Form; VG = video games. $p < .05$ (*); $p < .01$ (**).



Table 3. Correlations Between IGD Symptomatology and Preferred Video Game Genre

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. IGDS9-SF score	1												
2. Action and adventure	-,111**	1											
3. Racing	,079*	-,112**	1										
4. Sport	-0,068	-,146**	-,079*	1									
5. Fighting	0,065	-0,025	-0,013	-0,017	1								
6. MOBA	,107**	-,104**	-0,056	-0,074	-0,012	1							
7. Music and rhythm	-0,029	-0,046	-0,025	-0,033	-0,006	-0,023	1						
8. Platforms	0,001	-,099**	-0,054	-0,070	-0,012	-0,050	-0,022	1					
9. Puzzle and board games	-0,054	-,079*	-0,043	-0,056	-0,009	-0,040	-0,018	-0,038	1				
10. MMORPG	-0,020	-,083*	-0,045	-0,059	-0,010	-0,042	-0,019	-0,040	-0,032	1			
11. FPS	,110**	,250**	,135**	,177**	0,030	,126**	0,056	,120**	,096*	,100**	1		
12. Simulation	0,024	-,222**	-,120**	-,157**	-0,026	-,112**	-0,050	-,106**	-,085*	-,089*	-,268**	1	
13. Strategy	-0,062	-,092*	-0,050	-0,065	-0,011	-0,047	-0,021	-0,044	-0,035	-0,037	-,111**	-,099**	1

Note. IGD = Internet Gaming Disorder; VG = video games. $p < ,05$ (*); $p < ,01$ (**).

To identify factors associated with IGD symptomatology, a hierarchical linear regression analysis was conducted using total IGDS9-SF score as the dependent variable. The results of the model are presented in Tables 4 and 5.

In the first block, sociodemographic variables (gender and age) were entered, explaining 1.1% of the variance in IGD symptomatology ($R^2 = .011$; $F(2, 679) = 3.72$; $p = .025$). In the second block, variables related to the type of game played (number of video game types played and preferences for action and adventure, MOBA, and first-person action video games) were added, resulting in a significant increase in explained variance ($\Delta R^2 = .033$; $p < .001$), with a cumulative explained variance of 4.4%.

The inclusion of variables related to gaming habits (days of gaming per week, hours of gaming on weekdays, hours of gaming during weekends, and binge gaming frequency) produced the largest increase in the model's explanatory capacity ($\Delta R^2 = .161$; $p < .001$), increasing the explained variance to 20.5%.

Finally, the inclusion of monetization variables (acquisition of upgrades, skins, or boosts with money or through other means, and acquisi-

tion of loot boxes with money or through other means) added an additional 5.6% of explained variance ($\Delta R^2 = .056$; $p < .001$). The final model was statistically significant ($F(14, 667) = 16.87$; $p < .001$) and explained 26.1% of the variance in IGD symptomatology ($R^2 = .261$; adjusted $R^2 = .246$).

In the final model, greater binge gaming frequency ($\beta = .220$; $p < .001$), a greater number of hours of gaming on weekdays ($\beta = .105$; $p = .021$), greater gaming time during weekends ($\beta = .106$; $p = .023$), the number of video game types played ($\beta = .072$; $p = .045$), acquisition of upgrades, skins, or boosts through other means ($\beta = .123$; $p = .002$), and purchasing loot boxes with money ($\beta = .128$; $p = .001$) were significantly associated with higher levels of IGD symptomatology.

Conversely, preference for action and adventure video games ($\beta = -.102$; $p = .004$) also showed a significant association with IGD symptomatology in the adjusted model, although in the opposite direction. No statistically significant associations were observed for gender, age, preference for MOBA or first-person action video games, number of gaming days per week, purchasing upgrades, skins, or boosts with real money, or acquiring

Table 4. Hierarchical Linear Regression Model of Factors Associated with IGD Symptomatology

Model	Introduced predictors	R^2	ΔR^2	ΔF	P
1	Gender, age	.011	.011	3,72	.025
2	Number of video game types played, preference for action and adventure video games, preference for MOBA video games, preference for FPS video games	.044	.033	5,87	< .001
3	Number of days /week, hours/ weekdays, hours/ weekends, binge gaming	.205	.161	33,99	< .001
4	Skins purchased with money, skins obtained through other means, loot boxes purchased with money, loot boxes obtained through other means	.261	.056	12,70	< .001

Note. Dependent variable: total IGDS9-SF score. R^2 = coefficient of determination; ΔR^2 = increase in explained variance between models; ΔF = change in the F statistic. Final model: $R^2 = .261$; adjusted $R^2 = .246$; $F(14, 667) = 16.87$; $p < .001$; Durbin-Watson statistic = 2.03.



Table 5. Coefficients of the Final Model

Predictor	B	SE	β	t	P
Gender	-0,136	0,532	-,009	-0,256	,798
Age	0,121	0,122	,034	0,994	,320
Number of videogames played	0,245	0,122	,072	2,010	,045
Preference for action and adventure VG	-1,972	0,682	-,102	-2,891	,004
Preference for MOBA VG	0,950	1,165	,028	0,815	,415
Preference for FPS VG	0,139	0,665	,008	0,209	,834
Number of days/ week	0,064	0,061	,036	1,039	,299
Hours of play/ weekday	0,522	0,226	,105	2,317	,021
Hours of play/ weekend	0,416	0,183	,106	2,277	,023
Binge gaming	3,558	0,620	,220	5,736	< ,001
Skins purchased with money	0,685	0,616	,045	1,113	,266
Skins purchased through other means	1,903	0,602	,123	3,159	,002
Loot boxes purchased with money	2,739	0,823	,128	3,328	,001
Loot boxes purchased through other means	1,272	0,719	,069	1,769	,077

Note. Dependent variable: total IGDS9-SF score. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; t = t statistic.

loot boxes through other means.

DISCUSSION

The aim of the present study was to examine the relationship between different gaming patterns and habits and the severity of problematic video game use in a sample of young Spanish gamers. Overall, the findings support the relevance of behavioral factors associated with gaming over sociodemographic characteristics, showing that gaming intensity, certain consumption patterns, and some monetization behaviors constitute the main factors associated with greater IGD symptomatology.

Regarding the first objective, the results confirm that greater temporal involvement in video gaming is associated with higher levels of IGD symptomatology. Although weekly gaming frequency showed a significant association of smaller magnitude, the number of hours devoted to gaming on weekdays and during weekends showed more consistent relationships with problem severity. These findings are consistent with previous research indicating that gaming time, particularly when it involves sustained high levels of engagement, may constitute a risk indicator for the development of maladaptive use patterns (Pontes et al., 2022). Nevertheless, the re-



sults also support the notion that not all dimensions of gaming intensity carry the same weight, suggesting that the distribution and organization of time devoted to video gaming may be more relevant than the mere weekly frequency of use (Strojny et al., 2023).

Notably, binge gaming was the variable showing the strongest bivariate association with IGD symptomatology and the strongest predictor in the final regression model. This finding is consistent with recent studies indicating that prolonged gaming sessions represent a pattern particularly associated with loss of control and functional impairment related to problematic video game use (Tse et al., 2025), suggesting that the temporal concentration of gaming activity may constitute a specific risk indicator (Marmet et al., 2023). From a clinical perspective, these findings suggest that identifying frequent episodes of continuous gaming may constitute a more sensitive indicator of vulnerability than other traditional markers, such as the number of days per week on which gaming occurs.

Regarding the role of video game genre, the results showed positive associations between IGD symptomatology and preference for MOBA and FPS video games, although the effect sizes were small. These findings are consistent with previous research suggesting that highly competitive video games, characterized by continuous progression systems, constant social interaction, and frequent rewards, may promote greater behavioral involvement (Gisbert-Pérez et al., 2024; Katz et al., 2024). However, the hypothesis concerning MMORPGs was not supported, as no significant association with IGD symptomatology was observed. This result may be attributable to the lower representation of this genre in the sample or

may reflect changes in the current preferences of young gamers, among whom other competitive and immediately accessible formats, such as MOBA and FPS video games, are more prevalent.

A particularly interesting finding was that, once the different variables in the model were considered simultaneously, preference for action and adventure video games was associated with lower IGD symptomatology. Although this result should be interpreted with caution, it may indicate that certain genres characterized by more structured progression, clearly defined objectives, and less reliance on competitive online interaction have lower potential to promote problematic gaming patterns. In any case, future studies should explore the specific characteristics of video games in greater depth beyond traditional genre categories, including elements such as reward systems, competitiveness, and the social demands of gaming.

Regarding monetization behaviors, the results showed that greater involvement in the acquisition of in-game content was associated with greater IGD symptomatology. In particular, purchasing loot boxes with real money and obtaining upgrades, skins, or boosts through other means remained significantly associated with IGD symptomatology even after controlling for the other variables examined. These findings support growing scientific concern regarding the role of certain monetization mechanics as potential risk factors, particularly those based on variable rewards and elements of uncertainty similar to those found in gambling (Oka et al., 2024; Varchetta et al., 2024; Wardle & Zendle, 2021). This finding is particularly relevant in the field of substance and behavioral addictions, as it points to possible shared



psychological mechanisms related to reward seeking and loss of behavioral control.

The hierarchical regression analysis showed that sociodemographic variables had very limited explanatory capacity for IGD symptomatology, whereas gaming habits were the block contributing the largest increase in explained variance, followed by monetization behaviors. These results suggest that the risk associated with problematic video game use depends to a greater extent on how individuals play and on the characteristics of their interaction with video games than on basic demographic variables such as age or gender. This finding is consistent with current models of IGD, which propose an interaction between individual factors, behavioral patterns, and the structural characteristics of the video game itself. Similarly, other studies suggest that specific patterns of interaction with video games and monetization behaviors have greater explanatory capacity for IGD symptomatology than sociodemographic variables (Oka et al., 2024).

The results of the present study should be interpreted in light of several limitations. First, the cross-sectional design prevents causal relationships from being established between the gaming patterns identified and IGD symptomatology; therefore, it cannot be determined whether certain behaviors, such as binge gaming or monetization practices, constitute risk factors or, conversely, are a consequence of greater problematic involvement in video gaming. Second, the information was obtained through self-report measures, which may be subject to recall or social desirability biases. Furthermore, although the sample was large and comprised young gamers with diverse profiles, recruitment through an online panel may limit the

generalizability of the findings to the general population. Finally, the low proportion of participants meeting the criteria for possible IGD suggests that the results should be interpreted primarily in terms of symptom severity rather than as a comparison between individuals with and without the disorder.

Despite these limitations, the study has several strengths. One of the main strengths is the simultaneous analysis of multiple dimensions of gaming behavior in a large sample of young Spanish adults, including indicators that have traditionally received less attention, such as binge gaming and different forms of in-game monetization. In addition, the use of a hierarchical regression model made it possible to estimate the relative contribution of each group of variables, providing a more precise understanding of the factors associated with problematic video game use.

In conclusion, the findings of the present study indicate that specific patterns of interaction with video games, particularly prolonged gaming sessions, high levels of gaming involvement, and certain monetization practices, are more relevant for explaining IGD symptomatology than sociodemographic variables. These findings highlight the need for prevention and intervention strategies targeting young people to focus not exclusively on reducing total gaming time, but also on identifying potentially maladaptive use patterns and promoting healthier and more controlled video gaming. In particular, the observed association between certain monetization practices, especially purchasing loot boxes with real money, and greater IGD symptomatology suggests the value of developing digital education strategies that promote critical engagement with these reward systems, as well as continuing to investigate their potential



role in the development and maintenance of addictive behaviors related to video gaming.

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