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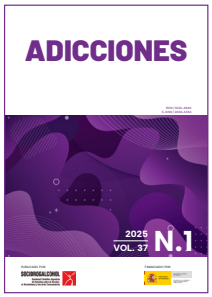

ORIGINAL

Factors associated with video game abuse among adolescent women

Factores asociados al abuso de videojuegos en mujeres adolescentes

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Abstract

Playing video games can become a problem behavior. The factors associated with this transition have been widely studied in males, while among females it is a field that has not yet been sufficiently addressed. The objective of this study was to determine the prevalence of problematic video game use in adolescent females and the associated risk factors. Specifically, to analyze the predictive potential of videogaming habits, psychopathological symptomatology and maladaptive gaming cognitions. A sample of 536 females (12-17 years old) (*M*= 13.91; *SD*= 1.57) was obtained by stratified random sampling from educational centers in the Community of Madrid, to whom the *Gamertest*, an online expert system to assess problematic video game use, was administered. 2.8% of the adolescent girls had a problematic video game use, and only 0.7% had an Internet Gaming Disorder. The main predictive variables identified were: cognitions related to compulsion and preoccupation, average number of gaming days per week and anxious symptomatology. The results obtained are in addition to the few studies carried out in women and highlight the need to pay special attention to the maladaptive gaming cognitions in the prevention and treatment of these problems.

Keywords: video games, Internet Gaming Disorder, risk factors, females, adolescent

Resumen

Jugar a videojuegos puede convertirse en una conducta problemática. Los factores asociados a esta transición han sido ampliamente estudiados en varones, mientras que entre las mujeres es un campo aún no suficientemente abordado. El objetivo de este trabajo fue identificar qué factores de riesgo pueden estar asociados al uso problemático de videojuegos en mujeres adolescentes. En concreto, analizar el potencial predictivo de los hábitos de juego, la sintomatología psicopatológica y las cogniciones desadaptativas relacionadas con los videojuegos. Mediante muestreo aleatorio estratificado de los centros educativos de la Comunidad de Madrid se obtuvo una muestra de 536 mujeres (12-17 años) (*M*= 13,91; *DT*= 1,57), a las que se aplicó el *Gamertest*, un sistema experto *online* para evaluar el uso problemático de videojuegos. Un 2,8% de las adolescentes presentaban un uso problemático de videojuegos, y tan sólo un 0,7% un Trastorno por Juego en Internet. Las principales variables predictoras identificadas fueron: las cogniciones relacionadas con compulsión y preocupación, el promedio de días de juego a la semana y la sintomatología ansiosa. Los resultados obtenidos se suman a los escasos estudios realizados en mujeres y ponen de manifiesto la necesidad de prestar atención, especialmente, a las cogniciones desadaptativas relacionadas con los videojuegos en la prevención y tratamiento de estos problemas.

Palabras clave: videojuegos, Trastorno de Juego en Internet, factores de riesgo, mujeres, adolescentes

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Playing video games (PVG) has become an increasingly popular leisure activity, especially among teenagers. Its rapid increase has been facilitated by the availability of an ever-growing variety of more attractive video games (VG), by their greater accessibility from different devices, as well as by widespread social acceptance. The survey by the Spanish Video Game Association (AEVI, 2021) shows that 18.1 million Spaniards spent an average of eight hours a week during 2021 playing video games. Of these, 74% were aged between 15 and 24 years. According to the latest ESTUDES survey (on drug use in Spanish secondary schools), 70% of students who have played VG have done so without spending money on improving their skills or game characters, although 20.1% acknowledge having spent €50, 5% between €50 and €100, and 4.4% more than €100 on such enhancements (Observatorio Español de las Drogas y las Adicciones [OEDA], 2023). The majority of players use VG responsibly, but more and more studies report that an inappropriate pattern of PVG is becoming apparent in a certain percentage of players (Paulus et al., 2018). This has generated considerable social alarm, since it has been confirmed that inappropriate or problematic use of PVG affects adolescents in particular (Mihara & Higuchi, 2017). In addition to the danger of problematic VG use itself, it has been associated in numerous studies with the presence of psychopathological, family and social problems. This is reflected in the inclusion of Internet Gaming Disorder (IGD) in DSM-5 (APA, 2013), as a research category in Section III. The WHO has likewise included Gaming Disorder (GD) in the eleventh revision of the International Classification of Diseases (ICD-11) (OMS, 2018).

How do women play?

It is a fact that the percentage of men is higher than that of women among the video gamer community (AEVI, 2021; Entertainment Software Association [ESA], 2022), but it is also true that the number of women participating in this hobby is rising (OEDA, 2022). Surveys show that, both in the Spanish population (AEVI, 2021) and in the American population (ESA, 2022), almost half (48%) of video gamers of all ages are women. Moreover, among adolescents, 73% of Spaniards who played video games during 2021 were women; 4% more than in 2019 (OEDA, 2022).

A more careful look at the habits of women when playing video games reveals that there are differences with respect to men in terms of playing time, preferred game genre, and the device preferred for playing. Firstly, gaming in women is characterized by sporadic and short periods of gaming, in contrast to men. According to various studies on adolescents, women not only play on fewer days per week, but also for fewer hours per day than their male counterparts (Fumero et al., 2020; Gómez-Gonzalvo et al., 2020; Leonhardt & Overå, 2021; OEDA, 2022). Furthermore, population studies have shown that the video game genres chosen by women tend to be different from those chosen by adolescent men (Gómez-Gonzalvo et al., 2020; Leonhardt & Overå, 2021; López-Fernández et al., 2021). Women tend to prefer cooperative games over competitive games, and social, card, puzzle, educational or skill games are preferred over role-playing, action, fighting, sports or shooting games (Labrador et al., 2022). Regarding the device used for playing, it seems that adolescent girls use mobile phones more than games consoles (Gómez-Gonzalvo et al., 2020; Ricoy & Ameneiros, 2016).

Problematic video game use among women

Although it is true that problematic video game use is more prevalent among men (Castro-Sánchez et al., 2019; Fumero et al., 2020; Wang et al., 2018; Warburton et al., 2022), the percentage of women who also suffer from it should not be ignored. Thus, results in the meta-analysis by Stevens et al. (2021) on the global prevalence of IGD indicated an average of 2.54% with this pathology were women. The authors themselves concluded that, although lower than for men (6.31%), the rate seems to be increasing, since in 2009 it was 1.75%. Regarding prevalence in Spain, it has been observed that, among students aged 14 to 18 years, 2.7% of those who presented possible IGD were women (OEDA, 2022).

However, less has been published about the factors which raise the risk of such behaviour in this population (López-Fernández et al., 2019; Marraudino et al., 2022). Most studies have been carried out with predominantly male samples or have not taken into account differences and similarities regarding gender. Among the risk factors associated with problematic use are: *age*, although it is true that excessive video gaming is more frequent in adolescence, some studies suggest that in women it is more likely to occur with increasing age (López-Fernández, 2018; Marraudino et al., 2022); *time spent playing* (Fumero et al., 2020); and *game genre*, with *Multiplayer Online Battle Arenas* (MOBA), *First Person Shooters* (FPS) and *Massively Multiplayer Online Role-Playing Games* (MMORPG) the games more likely to lead to more problematic use (López-Fernández et al., 2019).

Furthermore, women report different motivations than men, with the most common being socializing with others, physically or online (McLean & Griffiths, 2013). López-Fernández et al. (2019) found that, among women, it was not only social motivation that acted as a predictor of excessive video game use, but also primarily achievement motivation. In addition, Laconi et al. (2017) found the competition factor to be a predictor, exclusively in women, as well as the escape factor in both sexes. That is to say, playing for the pleasure of beating the other players was found as a predictor only in women, while playing to avoid thinking about real-life problems acted as a predictor in both women and men.

Furthermore, certain pathologies have been shown to be linked to video game abuse. Among them, anxiety and depression show contradictory results, however. In relation to anxiety, Fumero et al. (2020) found results, in a sample of Spanish adolescents, which suggested that anxiety could be a predisposing factor. Meanwhile, Cudo et al. (2022) found the opposite, since they obtained a negative correlation between anxiety and problematic use of video games. Regarding depression, this has been positively associated with abusive use of video games (Bonnaire & Baptista, 2019), and it has been indicated that it could be a predictor of the future development of this problem among women (Marraudino et al., 2022). Nevertheless, in the study by López-Fernández et al. (2019), depression did not emerge as a predictor among gamers in the sample, while other psychopathologies did.

As for the role of maladaptive cognitions, while less studied, they have also been shown to be relevant among women. Yu et al. (2021) confirmed a significant association between adolescent girls and problematic gaming, although this was weaker than among their male peers.

The general objective of the present study was to determine the risk factors for problematic video game use in a sample of adolescent women from the city of Madrid. Specifically, the risk factors assessed were: hours and days per week dedicated to playing, preferred game genre, motivation for playing, psychopathological symptoms and maladaptive cognitions linked to video games. Based on the literature review carried out, it was expected that adolescents with higher scores in problematic video game use: play for more hours and/or days per week; report socializing, feeling of winning and/or getting distracted from problems as motivation for playing; and prefer shooter and/or massively multiplayer online (MMO) games and lower preference for puzzle games. They were also expected to score higher in psychopathological symptoms, specifically anxiety and/or social dysfunction, as well as in maladaptive cognitions related to video games, specifically, preoccupation with the game, self-esteem based on the game and/or compulsion.

Method

Participants

This study is part of a larger project funded by the Spanish Ministry of Economy and Competitiveness. Sample selection was carried out through stratified random sampling of schools in the city of Madrid. To do this, the population of students from the city's 21 districts, their age, school, school year and school type (public, state subsidized or private) were recovered from the statistical services website of the Autonomous Community of Madrid City Council (2017). From there, a stratified random sample was obtained, equating the distribution of students from the different districts, school type and school year from the first year of compulsory secondary education (ESO) to the second year of baccalaureate or vocational training (VT) equivalent. The total sample comprised 2,887 participants, of which 2,173 had played video games.

The inclusion criteria in the present study were: a) being a woman; b) aged between 12 and 17 years; and c) having played video games. Participants who had any condition that could interfere with the assessment process (e.g., cognitive deficit, sensory deficit, etc.) or whose parents or guardians were against their participation in the study were excluded.

Of the 2,173 participants who had played video games, 1,547 male participants were discarded. Of the 626 remaining women participants, 89 between the ages of 18 and 22 were excluded. Finally, one participant was eliminated due to missing data. Thus, the present sample consisted of 536 women, with an average age of 13.91 years (SD = 1.57; max.: 17, min.: 12). Among the adolescents, 438 (81.7%) were in ESO, 79 (14.7%) were studying for the baccalaureate and 19 (3.5%) were in vocational training.

Variables and instruments

This information was collected through the Gamertest (Labrador et al., 2019), an online expert system which detects the problematic use of video games and is available on http://www.gamertest.es/. The assessment protocol is available at osf.io/nrv45. The variables used in the present study are described in more detail below.

Problematic Use of Video Games

The *IGDS9-SF* (Pontes & Griffiths, 2015) was used in its Spanish validation (Sánchez-Iglesias et al., 2020) to assess gaming problems. This is a brief instrument of nine items assessing the nine diagnostic criteria of DSM-5. It measures the severity of IGD and its negative consequences by assessing the gaming activities carried out in the last 12 months, online and offline. It consists of a five-point Likert-type scale ranging from: (1) *never* to (5) *very often*. In its original validation, it showed an internal consistency of 0.87, good criterion validity and good convergent validity with other instruments measuring problematic video games or Internet use. The Spanish validation (Sánchez-Iglesias et al., 2020) indicates an internal consistency of 0.84, and recommends a cut-off point of 36, or meeting five criteria with a score of 5 to signal probable IGD, and a cut-off point of 27 or meeting three criteria with a score of 3 to indicate probable problematic use.

Gaming habits

Weekly hours of gaming (dichotomized into two categories: less than 30 hours per week and 30 hours per week or more), average number of days per week played, preferred game genre (dichotomized into three categories: preference for MMO games, preference for shooter and preference for puzzle games) and main motivation for playing (dichotomized into three categories: feeling of winning, distraction from problems, and socializing).

Psychopathological Symptoms

The *General Health Questionnaire* (*GHQ-12*; Goldberg & Williams, 1988) was used. The Spanish validation *GHQ* (60, 30 and 12 items) was carried out in the city of Tres Cantos, Madrid, but one of the main limitations of this validation is that it has not been published in any scientific journal, which makes access to this material difficult (Rocha et al., 2011). The *GHQ-12* is a brief general mental health questionnaire, with only 12 items in four-point format, which can be interpreted as a Likert format (0 to 4 points) or dichotomously (0-0-1-1). It is useful in detecting possible cases of mental disorder in the general population or in primary care. The questionnaire items measure two different factors, anxiety and social dysfunction, thus forming two subscales within the test itself. It is a widely used questionnaire, with translations into 11 languages, and adequate psychometric properties: reliability due to internal consistency is a = 0.86, and there is abundant evidence of its validity in the general and other specific populations.

Maladaptive Cognitions

The *Dysfunctional Cognitions in Gaming Scale (DCG Scale)* (Sánchez-Iglesias et al., 2022) was used, comprising 16 items with a five-point Likert-type response format (0 = *Never*; 1 = *Rarely*; 2 = *Sometimes*; 3 = *Many times*; 4 = *Always*), with a scoring range from 0 to 64. There is evidence of excellent internal consistency, $\alpha = 0.91$, as well as adequate indications of validity based on its correlation with the *IGDS9-SF* ($r = .73$; $p < .001$). Its factor structure fits three factors corresponding to: (1) self-esteem, (2) concern about gaming, and (3) compulsion. A higher total score implies more problematic cognitions about video games, and there are no recommended cut-off points.

Procedure

Data were collected by five independent psychology graduate student assessors who were trained to collect assessments through *Gamertest*. Once a school agreed to participate in the study, the assessors distributed the informed consents to the children's parents/guardians, and a date was set on which the assessor would come to carry out the assessment in the classes of the schools that had been selected by stratified random sampling. After collecting informed consent from parents/guardians, the assessment was administered by group on the computers in each school's computer room, with students spending approximately 30-40 minutes completing it. The participants' responses were collected and coded anonymously directly into the computerized database.

Ethical questions arising in this study were favourably assessed in a report from the Deontological Commission of the Faculty of Psychology of the Complutense University of Madrid.

Data analysis

Statistical analyses were carried out using IBM SPSS statistical software version 21 for Windows (IBM Corp. Released, 2012). Descriptive analyses were performed to describe the sample. Different coefficients were also used to analyse simple correlations between problematic video game use (*IGDS9-SF*) and the other variables. On the one hand, for the analysis of the correlation between *IGDS9-SF*, average weekly days of play, psychopathological symptoms and maladaptive cognitions, the Pearson correlation coefficient was used due to the quantitative nature of the variables. On the other hand, to analyse the correlation between *IGDS9-SF*, weekly hours of play, preferred game genre, and motivation for playing, the point-biserial correlation coefficient was used since the relationship of a quantitative variable with variables of a dichotomous nature was being tested. Finally, a stepwise multiple linear regression was performed to determine the statistical usefulness of the predictor variables in predicting problematic video game use. Only variables showing a significant bivariate correlation with *IGDS9-SF* were included in this final analysis.

Results

Of all participants, 15 (2.8%) met criteria for problematic video game use. Regarding IGD, 4 (0.7%) of the adolescents met the relevant criteria. As for gaming habits (see Table 1), the majority of participants: played less than thirty hours a week, chose action and adventure as their preferred genre, chose mobile phones as their preferred device for playing, and preferred to play at home and without company, both online and offline.

Table 1
Gaming habits: Descriptive statistics

		n	%	M	DT
Preferred genre	Action and adventure	121	22.6		
	Gambling	22	4.1		
	Driving	28	5.2		
	Sports	39	7.3		
	Strategy	12	2.2		
	Shooter	22	4.1		
	MMO	46	8.6		
	Music and rhythm	35	6.5		
	Platforms	51	9.5		
	Puzzles and board	77	14.4		
	Roleplay	4	.7		
	Simulators	79	14.7		
Hours/week	≥ 30	5	.9		
	< 30	531	99.1		
Average days/week				2.56	1.74
Preferred place	At home	445	83		
	At friends' home	29	5.4		
	School	20	3.7		
	Gaming centres	15	2.8		
	Outdoors / public transport	27	5		
Preferred company	Alone	321	59.9		
	With someone (physically)	118	22		
	With someone (online)	52	9.7		
	In a group (physically)	24	4.5		
	In a group (online)	21	3.9		
Online/offline preference	Online	115	21.5		
	Offline	147	27.4		
	Both	274	51.1		
Preferred device	Desktop/laptop computer	71	13.2		
	Console	85	15.9		
	Smartphone	277	51.7		
	Tablet	54	10.1		
	Television	49	9.1		
Motivation for playing	Having fun/passing the time	492	91.8		
	Socialising	16	3		
	Feeling of winning	1	.2		
	Testing my skills	10	1.9		
	Distraction from my problems	17	3.2		

Note. N = 536; MMO = massively multiplayer online; Shooter = first person shooter and other shooter games; Socialising = meeting people and being with my friends.

Correlation between playing time, genre, motivation for playing and IGDS9-SF

Of the variables analysed, these showed significant correlations with *IGDS9-SF* scores: weekly hours and average days of gaming per week, preference for MMO games, and playing to distract oneself from problems. The direction of these relationships was positive (Table 2). The average number of weekly days of gaming was the variable that shared the greatest variance with the dependent variable (r = .43), explaining 18.5% of the variance in *IGDS9-SF* (r^2 = .185). Other variables explaining the variance, albeit to a lesser extent, were the preference for MMO games and weekly hours of gaming (r^2 = .036 and r^2 = .020, respectively). Being distracted from problems was the variable that presented the least variance (r = .12), explaining only 1.4% of the variance (r^2 = .014).

Correlation between the DCG Scale factors, the GHQ-12 subscales and IGDS9-SF

All the variables analysed, except social dysfunction on the *GHQ-12*, showed significant correlations with the *IGDS9-SF* scores. For all of them, the direction of the relationship was positive (Table 3). The three factors of the *DCG Scale* were the variables that explained a greater proportion of variance in the *IGDS9-SF* scores. First, compulsion (r^2 = .504), followed by worry (r^2 = .462), and self-esteem (r^2 = .336). Anxiety was the variable that showed the least variance (r = .30), explaining 9% of the variance (r^2 = .09).

Table 2
Correlation between game time, game genre, motivation for playing and IGDS9-SF

Variable	M	DT	1	2	3	4	5	6	7	8
1. IGDS9-SF	13.64	5.35								
2. Hours weekly	.01	.10	.14**							
3. Average days weekly	2.56	1.74	.43**	.14**						
4. MMO	.09	.28	.19**	.11*	.17**					
5. Shooter	.04	.20	.04	-.02	-.02	-.05				
6. Puzzles	.14	.35	-.08	-.04	-.01	-.13**	-.07			
7. Feeling of winning	.002	.04	.03	-.004	.11*	-.01	-.01	-.02		
8. Distraction from one's problems	.03	.18	.12**	.09*	.05	.06	-.03	-.01	-.01	
9. Socialising	.03	.17	.08	-.02	-.03	.03	-.03	-.04	-.01	-.03

Note. MMO = massively multiplayer online; Shooter = first person shooter and other shooter games; Socialising = meeting people and being with my friends; *p < .05; ** p < .01.

Table 3
Correlation between factors of the DCG Scale, the subscales of the GHQ-12 and IGDS9-SF

Variable	*M*	*DT*	1	2	3	4	5
1. IGDS9-SF	13.64	5.35					
2. Self-esteem	6.64	4.89	.58**				
3. Worry	2.16	2.67	.68**	.57**			
4. Compulsion	3.27	3.76	.71**	.73**	.66**		
5. Anxiety	7.89	4.89	.30**	.29**	.15**	.31**	
6. Social dysfunction	5.82	3.25	.04	-.11*	-.03	.04	.34**

Note. *p< .05; ** p< .01.

Table 4
Stepwise multiple regression model of game time, MMO gaming, anxiety, distraction from problems and DCG Scale factors on IGDS9-SF score

	Variable	B	*SE B*	*B*	R^2	ΔR^2
Step 1	Constant	10.36**	.22		.496	.497**
	Worry	1**	.04	.71**		
Step 2	Constant	9.89**	.21		.576	.080**
	Compulsion	.65**	.05	.46**		
	Worry	.76**	.08	.38**		
Step 3	Constant	8.89**	.27		.599	.024**
	Compulsion	.62**	.05	.43**		
	Worry	.66**	.08	.33**		
	Average days weekly	.51**	.09	.17**		
Step 4	Constant	8.09**	.33		.609	.011**
	Compulsion	.56**	.05	.39**		
	Worry	.69**	.07	.34**		
	Average days weekly	.50**	.09	.16**		
	Anxiety	.12**	.03	.11**		

Note. ** $p < .01$.

Risk factors for Problematic Video Game Use

Those variables showing significant bivariate relationships with the *IGDS9-SF* scores were entered into a stepwise multiple linear regression; the results are presented in Table 4. In the first step, the compulsion variable was entered, representing 49.6%. of the variance in the *IGDS9-SF* scores ($R^2 = .496$). In the second step, worry was added to the model, explaining an additional 8% of variance ($\Delta R^2 = .080$). In the third step, the variable entered was the average number of days per week ($\Delta R^2 = .024$) and, in the fourth step, anxiety ($\Delta R^2 = .011$); As a result, the explained variance increased to 60.9% ($R^2 = .609$). The variables excluded from the model were weekly hours of gaming, preference for MMO games, self-esteem, and distraction from problems.

Discussion

The general purpose of the present study was to establish the prevalence and risk factors involved in problematic video game use in a sample of adolescent women from the city of Madrid. More specifically, the objective was to analyse the predictive potential of the following factors: hours and days per week spent playing, preferred game genre, motivation for playing, psychopathological symptoms and maladaptive cognitions related to video games.

The results indicate that the prevalence of problematic video game use was 2.8% and the prevalence of IGD was 0.7%. Other studies have reported higher prevalences for IGD in women, such as 2.7% among Spanish students aged 14 to 18 (OEDA, 2022) or an average rate of 2.54%, according to the review and meta-analysis by Stevens et al. (2021). It is common for IGD prevalence rates to vary across studies given regional differences, different ways of defining the disorder, and methodologies used (Paulus et al., 2018).

In a previous study in which differences in relation to gender were analysed (Labrador et al., 2023), it was found that playing time was greater in men, who spent an average of one day a week more than women, as well as more time in terms of weekly hours spent playing, which was also in line with other studies (Fumero et al., 2020; Gómez-Gonzalvo et al., 2020; Király et al. 2017; Leonhardt & Overå, 2021; Mérelle et al, 2017). Differences were also found in the devices used for playing, as in other studies, (with smartphones preferred by women compared to men, who preferred consoles) (Gómez-Gonzalvo et al., 2020; Ricoy & Ameneiros, 2016), as well as with regard to company (with a greater percentage of women preferring to play alone compared to men, and a greater percentage of men preferring to play in an online group compared to women). Both men and women coincided in game genre preferences, except for simulators, puzzles and music, which were preferred by women. No differences were found between the two in relation to the place from which the game was played.

Cognitive factors are those that have shown greater explanatory power for problematic video game use. Among them, thoughts related to the compulsion factor, which assessed the difficulty of stopping playing once the action had started, are those that contributed the most. These findings are similar to those of Yu et al. (2021), who found that perceived lack of willpower in playing was significantly associated with problematic use in both women and men. Secondly, cognitions related to worry, which assessed the difficulty in concentrating on other activities not related to video game use, is the next most explanatory factor. Again, these results agree with those of Yu et al. (2021), who obtained a significant association between the perceived urge to play and problematic use in both women and men. Thoughts related to the self-esteem factor, which assessed the use of video games as a way of achieving social acceptance, was the only maladaptive cognition which, despite showing a high correlation with problematic use, did not contribute to it. These results do not coincide with those of King and Delfabbro (2016), although the items in their study referred to the individual's self-esteem when comparing their game skills to those in the real world (e.g., "*I can achieve more in a game than anywhere else*"), while those used in the present study include social acceptance and one's own ability with respect to others (e.g., *"I am better than others"*).

Regarding gaming habits, the average number of days per week that adolescents spend playing was also shown to explain problematic use, consistent with a previous study (Jo et al., 2022). However, weekly hours of gaming, although showing a positive correlation with problematic use, did not explain part of its variability. It seems that the amount of time played per day may be more relevant (Karaca et al., 2020; Yesilyurt, 2020). Specifically, Macur and Pontes (2021) found that high-risk players, compared to low-risk players, played three hours more per day on weekdays and up to four and a half more hours at weekends.

In relation to psychopathological symptoms, anxiety has also been a factor contributing, although to a lesser extent, to explaining problematic use of video games. These results coincide with those found in adolescent women (Fumero et al., 2020) and in male and female high school students (Faulkner et al., 2015), but go against those of Cudo et al. (2022), who found a negative correlation between anxiety and problematic use. These differences could reflect a mediating effect of game type and motivation for playing. On the one hand, Cudo et al. (2022) suggest that the harassment women often suffer in online games could be generating a refusal to play among players with greater anxiety, which would protect them from excessive use of video games. Adopting this reasoning, anxiety was perhaps predictive in this study because the offline gaming percentage was higher than online, which would mean fewer adolescents exposed to online harassment who, consequently, would not stop playing for this reason, and would thus still be vulnerable to developing problematic use. On the other hand, Cudo et al. (2022) did not assess the participants' motivation for playing, while in the present study a positive correlation was found between problematic use and playing to distract oneself from problems, which may reflect the use of video games as a strategy to regulate emotions.

Other factors, such as a preference for MMO games and gaming to distract oneself from problems, were not predictors of increased risk despite showing significant correlations with problematic VG use.

Implications for clinical practice

From a practical point of view, knowing which factors increase the risk of developing problematic video game use in a given population can provide a guide for designing prevention programs. Given that there is no clear definition of what type of video game use is harmful and that this activity is not classified as harmful per se, even being potentially beneficial for some users, prevention would be based on promoting adaptive use of video games. Taking into account the differences regarding gaming habits in relation to gender, it is also necessary to consider the relevant factors in the adolescent female population, which has been neglected in most studies, focused more on men. The results of this study highlight the relevance of modifying maladaptive cognitions related to video games in adolescent women, for which techniques, already indicated in the literature, could be included, such as self-recording, Socratic questioning and behavioural experiments (King & Delfabbro, 2020).

Limitations

First, since this is a cross-sectional study, causal inferences cannot be made. Longitudinal studies are needed to determine the direction of causality, that is, whether the associated variables preceded higher levels of problematic video game use, or vice versa. In relation to the assessment of some variables, it was sometimes difficult for players to choose their preferred genre, given that there are some games that belong to several categories, while new genres are continually entering the market. Furthermore, the wide variety of game genres gives rise to different classifications within the literature, making it difficult to compare results between studies. It is also worth noting that, to assess the motivation for playing, none of the instruments developed for this purpose were used, but rather a choice was made between the motivations most frequently found in the literature, so this variable has not been studied rigorously. Furthermore, the self-report technique itself means that the responses may be subject to errors such as social desirability bias, simulation, poor introspection capacity or lack of motivation. Finally, only a small percentage of women met criteria for problematic video game use or IGD, limiting data manipulation and processing.

Future lines of research

Two directions are proposed om which future lines of research can contribute to this area. On the one hand, since the majority of participants did not meet criteria for problematic gaming or a disorder, using a clinical sample with which to carry out comparative studies would be valuable. On the other hand, it would be advisable to assess some factors of interest that were not analysed in the present study, such as perceived harassment in online video games, the assessment of gender stereotypes in video games, or emotional regulation strategies.

Conclusions

The results of this study confirm that there is a prevalence, albeit low, of adolescent women with problematic video game use, and even disorder. These results also suggest that the factors contributing most to explaining problematic use, in this population, are cognitions related to video games, mainly the compulsion to play, followed by the worry about playing. At the same time, the average number of days played per week and a higher anxiety score have been shown to be relevant, although to a lesser extent. In summary, behavioural, physiological and, above all, cognitive aspects seem to be contributing to a greater risk of developing a problem with video games. Despite the limitations, this research is useful given the scarcity of similar studies in the literature, added to the context of the continually rising number of women who practise this leisure activity and could develop problematic behaviour in the future.

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Conflict of interests

The authors declare no conflicts of interest in relation to the study, its authorship, and/or the publication of this manuscript.

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