ARTICLE/ARTÍCULO

Video Game Addiction among the Adolescent Population of Andalusia

Adicción a los videojuegos entre la población adolescente de Andalucía

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ABSTRACT

The aim of this study was to assess the video game habits of adolescents in Andalusia, determining the extent of addiction and examining its relationship with socioemotional competence, particularly in the domain of self-control. Data on video game activity and socioemotional competence were collected from a non-probabilistic sample of 3,579 secondary school students in Andalusia. Results indicate that, overall and across different provinces, the most common profile is that of occasional gamers with low addiction levels. However, adolescents at risk of addiction exhibit lower socioemotional competence, particularly in terms of self-control. These findings underscore the importance of implementing interventions to enhance socioemotional skills among adolescents, thereby mitigating potential risks associated with excessive video game use.

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RESUMEN

El objetivo de este estudio fue conocer y analizar la actividad con videojuegos de la población adolescente andaluza con el propósito de establecer su grado de adicción, así como la relación de esta actividad con el nivel de competencia socioemocional, sobre todo con el área de autocontrol. Para ello se han tomado medidas de la actividad con videojuegos y la competencia socioemocional a una muestra no probabilística de 3.579 estudiantes de educación secundaria obligatoria de la comunidad autónoma de Andalucía. Los resultados revelan que tanto en términos generales como por provincias, el perfil de jugador ocasional de videojuegos, con un bajo nivel de adicción a esta actividad, es el que predomina en mayor medida, sin apreciarse diferencias entre los participantes en función de las provincias de procedencia. Sin embargo, los adolescentes que se encuentran en una situación de riesgo de adicción a esta actividad manifiestan poseer un menor nivel de competencia socioemocional, sobre todo en el autocontrol. Por tanto, la necesidad de diseñar, aplicar y evaluar medidas de intervención dirigidas a mejorar la competencia socioemocional entre los adolescentes, y así prevenir este tipo de problemas, parece estar más que justificada.

PALABRAS CLAVE: trastornos comportamentales; adicción; videojuegos; aprendizaje social y emocional; autocontrol; adolescentes.

1. Introduction

In contemporary society, technology plays an increasingly crucial role in people's lives (Spanish Ministry of Health, Social Services and Equality, 2018). The development of the internet, computers, smartphones and other electronic devices has resulted in a significant increase in the hours individuals spend in front of screens in Spain (Spanish Observatory on Drugs and Addictions, 2023). This rise has generated growing concern over excessive technology use over the past decade (Spanish Ministry of Health, Social Services and Equality, 2018).

The abusive use of technology has substantial implications across various aspects of life, including personal areas such as health, leisure and socialisation (López-Gómez *et al.*, 2022). These negative effects primarily impact new generations, who have been exposed to technology from birth, influencing the construction of their identity, social interactions and emotional well-being (López-Gómez *et al.*, 2022). Excessive consumption of electronic devices and drug addiction exhibit a similar pattern characterised by loss of control (Marco and Chóliz, 2017). Thus, problematic and continued technology use can lead to the development of recognised addictions, including behavioural addictions, substance-free addictions and technological addictions (Spanish Ministry of Health, Social Services and Equality, 2018).

According to the Spanish Video Game Association (2022), video games have established themselves as the primary choice for audiovisual entertainment, with over 18 million people—approximately 50% of the Spanish population aged 6 to 64—participating in gaming last year. Furthermore, Spaniards dedicated an average of 7.42 hours per week to playing video games, with the 6-to-24 age group spending the most time on this activity (Spanish Video Game Association, 2022). In Andalusia,

10.2% of individuals report playing daily. The data reveal a striking consumption pattern during adolescence, as 42.6% of children aged 12 to 13 report doing so daily. However, among girls, this percentage drops significantly to 13.9% (Social Services and Dependency Agency of Andalusia, 2019).

It is undeniable that play takes on a fundamental role in the early stages of human development. Through play, young people have the opportunity to explore, experiment and construct their understanding of their environment. This process enables them to acquire knowledge, develop key skills such as creativity and problem-solving, assimilate social norms that contribute to their moral development and values, incorporate gender roles and experience significant emotional growth. Thus, play is not only a recreational activity but also an essential component of the holistic development of individuals in their early life stages (López-Gómez *et al.*, 2022). Video games are regarded as highly beneficial tools for enhancing declarative and procedural knowledge, as well as information retention (Riopel *et al.*, 2020). Therefore, in the educational context, they can provide significant advantages across nearly all academic disciplines, with particular emphasis on areas such as foreign languages and sciences (Martinez *et al.*, 2022). Specifically, among video games, there are those known as "serious games", whose primary objective is learning rather than entertainment (Riopel *et al.*, 2020).

However, video games also have disadvantages due to their intrinsic characteristics, such as the sense of mastery and self-determination, appealing aesthetics, performance feedback and immersion in reality, among other aspects. The design structure can affect one's control ability, facilitating abusive and inappropriate use that may lead to addictive behaviour (Marco and Chóliz, 2017).

Addiction is a behaviour over which the individual has limited control, leading to harmful consequences (West, 2001). This ongoing behaviour can result in the development of non-substance-related disorders, defined as addictive disorders that do not involve the ingestion of a psychoactive substance (Kardefelt-Winther *et al.*, 2017). Consequently, internet gaming disorder is included in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) (American Psychiatric Association, 2013). This disorder is characterised by recurrent use of the internet to engage in gaming, resulting in clinically significant impairment or distress manifested by the following symptoms (American Psychiatric Association, 2013): (1) preoccupation with gaming; (2) withdrawal symptoms when gaming is taken away or not possible; (3) the need to spend increasing amounts of time on internet games; (4) unsuccessful attempts to control gaming; (5) loss of interest in other hobbies and leisure activities due to gaming; (6) excessive and continued gaming despite the development of psychosocial problems; (7) deception of others regarding consumption; (8) use of gaming to relieve negative moods; (9) jeopardising important relationships or educational or career opportunities due to gaming. Similarly, gaming disorder was included in the eleventh revision of the International Classification of Diseases (ICD-

11) (World Health Organization, 2024). Unlike internet gaming disorder, it is triggered by gaming behaviours both offline and online, and is characterised by the presence of the following elements (World Health Organization, 2024): (a) loss of control; (b) prioritisation of gaming over other aspects of life; and (c) continued gaming despite negative consequences, persisting for at least 12 months.

Among the variables shown to be related to video game addiction are: (a) age (Social Services and Dependency Agency of Andalusia, 2019; Spanish Observatory on Drugs and Addictions, 2023); (b) gender (Social Services and Dependency Agency of Andalusia, 2019; Spanish Observatory on Drugs and Addictions, 2023); (c) characteristics of the video game (e.g., preferred genre, type of gaming device) (Darvesh *et al.*, 2020); (d) other leisure activities (e.g., reading habits, attending exhibitions, museums, concerts, cinema, theatre and engaging in outdoor activities) (Social Services and Dependency Agency of Andalusia, 2019); (e) dysfunctional family relationships (Torres-Rodríguez *et al.*, 2018); (f) psychological or health issues (e.g., depression, anxiety, attention deficit hyperactivity disorder) (Social Services and Dependency Agency of Andalusia, 2019; Darvesh *et al.*, 2020); (g) social problems (Torres-Rodríguez *et al.*, 2018); (h) academic performance (Social Services and Dependency Agency of Andalusia, 2019; Darvesh *et al.*, 2020); (i) personality traits (Torres-Rodríguez *et al.*, 2018); (j) personal skills (e.g., decision-making, reaction time) (Darvesh *et al.*, 2020); (k) emotional intelligence (Torres-Rodríguez *et al.*, 2018); (l) life satisfaction (Social Services and Dependency Agency of Andalusia, 2019); and (m) self-control (Social Services and Dependency Agency of Andalusia, 2019; Kim *et al.*, 2007; Quancai *et al.*, 2023).

Specifically, self-control is closely linked to addictive behaviours, particularly in the context of video game addiction (Quancai *et al.*, 2023). It is considered a key component of socio-emotional competencies and is defined as the ability to regulate emotions, manage stress, self-motivate, exercise self-control, set goals and develop organisational skills (Clarke *et al.*, 2021). Thus, it plays a crucial psychological role by enabling individuals to actively manage their thoughts, emotions and behaviours, thereby suppressing negative behavioural responses (Quancai *et al.*, 2023). Therefore, the weaker an individual's self-control, the more likely they are to develop a video game addiction (Social Services and Dependency Agency of Andalusia, 2019; Kim *et al.*, 2007; Quancai *et al.*, 2023).

Although problematic video game use has been extensively studied, some authors argue that it is a particularly controversial and challenging topic to assess, underscoring the need for further rigorous investigations in this area (López-Gómez *et al.*, 2022; Kardefelt-Winther *et al.*, 2017; Rosendo-Ríos *et al.*, 2022). Furthermore, there is a clear need for additional studies that explore the relationship between socio-emotional competencies and video game addiction, extending beyond self-control alone. This will facilitate the design and implementation of more effective intervention programmes aimed at preventing and mitigating video game-related addictions.

Therefore, the overall aim of this study was to understand and analyse the video game activity of the adolescent population in Andalusia to determine their level of addiction, as well as the relationship between this activity and their level of socio-emotional competence, particularly with regard to self-control. In this context, the following specific objectives were set: (1) to describe the video game activity of Andalusian adolescents, identifying different types or profiles of players to determine overall and provincial levels of addiction; (2) to examine whether there are differences in video game activity and socio-emotional competence among participants based on their province of origin; (3) to determine the relationship between the video game activity of Andalusian adolescents and their level of socio-emotional competence, with particular attention to self-control; and (4) to investigate whether there are differences in socio-emotional competence, especially in self-control, among the different types or profiles of players identified.

2. Method

2.1. Sample

The sample comprised 3,579 students in compulsory secondary education, including 994 in the first year (27.77%), 924 in the second year (25.82%), 890 in the third year (24.87%) and 771 in the fourth year (21.54%), from 22 secondary schools in the eight provinces of Andalusia (two from Almería = 412, three from Cádiz = 466, two from Córdoba = 408, three from Granada = 454, two from Huelva = 388, two from Jaén = 395, four from Málaga = 521 and four from Seville = 535). The mean age of participants was 13.46 years (SD = 1.34), with an age range of 11 to 17 years. The gender distribution included 1,668 males (46.61%) and 1,911 females (53.39%).

The sample selection procedure was non-probabilistic and based on convenience (Vehovar *et al.*, 2016). The sample size was determined according to the study's objectives, taking into account the number of students enrolled in compulsory secondary education in Andalusia as a whole and in each of its provinces: Almería (36,477), Cádiz (61,672), Córdoba (33,952), Granada (42,309), Huelva (25,770), Jaén (27,286), Málaga (79,440) and Seville (100,365) (Andalusian Regional Government Department of Educational Development and Professional Training, 2023). In this context, using the target population data, with a confidence level of 95% and a margin of error of 5%, the minimum sample size was determined for each province (n = 384). However, the sample size exceeds the minimum established in various simulation studies for structural models similar to those proposed in this study (Tomarken and Waller, 2005). Additionally, the minimum sample size required for the specified model with greater structural complexity was also calculated (n = 200) for further assurance.

2.2. Instruments

The *Spanish version of the Internet Gaming Disorder Test* (Fuster *et al.*, 2016), aligned with the original version (Pontes *et al.*, 2014), is a Likert scale comprising 20 items rated from one to five points (e.g., 1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; and 5 = Strongly agree). These items are organised into six dimensions: (a) Salience: concern about the time spent gaming; (b) Mood modification: dedicating time to play to escape or alleviate negative mood states; (c) Tolerance: devoting excessive time to gaming despite awareness of the associated problems; (d) Withdrawal symptoms: irritability, nervousness, anxiety, sadness, etc., when reducing or withdrawing from gaming; (e) Conflict: loss of interest in other activities, lying to others about gaming time and jeopardising or losing a significant relationship, job or educational opportunity due to gaming; and (f) Relapse: unsuccessful attempts to control gaming time. The scores on this test range from 20 to 100 points, categorising players into five types or subgroups: (a) Casual players (score below 45); (b) Regular players (score between 45 and 54); (c) Low-risk players (score between 55 and 64); (d) High-risk players (score between 65 and 74); and (e) Players with disorder (score above 75). This test assesses gaming activity among Spanish adolescents and young adults, both online and offline, over the past 12 months. It incorporates the diagnostic criteria for Internet Gaming Disorder from the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) (American Psychiatric Association, 2013) and the six dimensions of Griffiths' (2005) addiction model. It demonstrates adequate internal consistency (Cronbach's alpha of 0.87) and validity, evidenced by tests with excellent goodness-of-fit indices confirming its internal structure (Fuster *et al.*, 2016). In this study, it yielded an α of 0.89 and a McDonald's omega (ω) of 0.92, while the confirmatory factor analysis (CFA) showed adequate indices and goodness-of-fit statistics: Chi-square (χ^2) (98; $n = 3{,}579$) = 464.41; $p < 0.00$; χ^2/degrees of freedom (df) = 4.73; comparative fit index (CFI) = 0.91; goodness-of-fit index (GFI) = 0.96; standardised root mean square residual (SRMR) = 0.77; root mean square error of approximation (RMSEA) = 0.07 (90% confidence interval [CI] = 0.06−0.07).

The Social and Emotional Learning Scale (Fernández *et al.*, 2022) is a Likert-type measure consisting of 30 items rated on a four-point scale (1 = Never or rarely; 2 = Occasionally; 3 = Often; and 4 = Almost always or always), grouped into five areas of socio-emotional competence: (a) Self-awareness: skills to accurately recognise one's own emotions, thoughts and values and how they influence behaviour, including the ability to assess one's strengths and limitations with confidence, optimism and a growth mindset; (b) Social awareness: skills to empathise with and understand the perspectives of others from diverse contexts and cultures, including the ability to advocate for one's ideas without belittling others; (c) Self-management: skills to effectively regulate one's own emotions, thoughts and behaviours in different situations, including the ability to set academic goals and work towards achieving them with self-discipline and self-motivation, using

planning and organisational strategies; (d) Relationship skills: skills to establish and maintain healthy and enriching relationships with diverse individuals and groups, including the ability to communicate clearly and effectively, listen actively and cooperate with others; and (e) Responsible decision-making: skills to make constructive decisions about personal behaviour and social interactions based on ethical standards, safety and social norms, including the realistic evaluation of the consequences of various actions and consideration of the well-being of oneself and others, as well as identifying problems, proposing solutions and taking actions that contribute to improving the immediate environment. The scores for each of the five areas range from one to five points, with a higher score indicating a higher level of socio-emotional competence. This scale is one of the few instruments available to measure socio-emotional competencies in Spanish adolescents and young people. Its psychometric properties are adequate, demonstrating reliability (α ranging from 0.70 to 0.84, and ω ranging from 0.71 to 0.84, with composite reliability and extracted variance indices exceeding 0.77 and 0.67, respectively, in the different areas of socio-emotional competence) and validity (tests with excellent goodness-of-fit indices confirming its internal structure and predictive validity for academic performance and life satisfaction) (Fernández *et al.*, 2022). In the sample used for this study, the scale yielded α values ranging from 0.75 to 0.84 and ω values from 0.76 to 0.85. The CFA showed adequate indices and goodness-of-fit statistics: $\chi2$ (395; *n* = 3,579) = 808.08; *p* < 0.05; $\chi2/df$ = 2.04; CFI = 0.92; GFI = 0.95; SRMR = 0.08; RMSEA = 0.07 (90% CI = 0.07−0.07).

The Socio-Demographic, Academic and Gaming Data Questionnaire is a self-report developed *ad hoc*, consisting of seven items with various response options. It is designed to gather relevant socio-demographic (i.e., age and gender), academic (i.e., secondary school and year) and gaming information (i.e., number of hours of gaming per week, platforms used for gaming and favourite game types or genres) from the participants.

2.3. Design and procedure

This research adopted a cross-sectional predictive methodological design (Ato *et al.*, 2013).

Regarding the procedure, once the necessary institutional permissions were requested and granted by the Research Ethics Committee of the University of Granada (3494/CEIH/2023), telephone contact was made with a member of the management team of 22 secondary schools in the eight provinces of Andalusia (two in Almería, three in Cádiz, two in Córdoba, three in Granada, two in Huelva, two in Jaén, four in Málaga and four in Seville) to request their voluntary participation in the research and to obtain a sample of adolescents from Andalusia. The purpose and procedure of the study were explained to them, and they were then sent an email containing the following documentation: (a) an introduction letter detailing the objectives and procedures of the research,

as well as the anonymous and voluntary nature of their participation; (b) an information document for participants, providing basic information about the project, participation in the research and data processing for participating students; (c) an informed consent form for the participants; and (d) a digital copy of the measurement instruments.

Subsequently, once the participation of the educational centres in the research was confirmed, the instruments were administered to the participating students using the computer-assisted web interviewing technique (Couper and Bosnjak, 2010). However, prior to this, the information document for participants and the informed consent forms for participants' parents and guardians were distributed by the participating educational centres through the teachers-tutors of their class groups. The administration of the instruments to the participating students was conducted collectively during class time in each reference class group, with the presence of their respective teacher-tutor. This process was carried out by a member of the research team, who first informed the students of the study's objective, the voluntary nature of their participation and the confidentiality of their responses. Subsequently, the written instructions provided in the online form were supplemented with oral explanations from the researcher, and the queries raised by the participants were addressed. The participants completed the instruments within a timeframe of 35 to 40 minutes. The data were collected during October and November 2023.

2.4. Data analysis

Initially, a descriptive analysis of the collected data was conducted, assessing distribution, linearity, outliers, missing values and influential points (Tabachnick and Fidell, 2019). Prior to this, the minimum sample size required for the specified model with greater structural complexity was calculated, considering the number of observed variables (30) and latent variables (5), the expected effect size (0.10), the associated probability (0.05) and the desired levels of statistical power (0.80) (Soper, 2023).

Secondly, to examine the theoretical structure of the Spanish version of the Internet Gaming Disorder Test (Fuster *et al.*, 2016), a confirmatory factor analysis (CFA) of six first-order factors correlated with each other was performed. In the case of the Social and Emotional Learning Scale (Fernández *et al.*, 2022), a CFA of five first-order factors was executed. The CFAs were estimated using the weighted least squares (WLS) method, employing various indices to assess goodness of fit (Hu and Bentler, 1999; Kline, 2015): (a) χ^2, which should not be statistically significant; however, due to its sensitivity to sample size, the χ^2/df ratio, which should be below 5, is also considered; (b) CFI and GFI, which should yield values greater than 0.90; and (c) SRMR and RMSEA, which should yield values less than 0.08. Furthermore, to assess the internal consistency of both instruments, the α and ω were calculated, with values expected to exceed 0.70 (Hair *et al.*, 2014).

Subsequently, a Kruskal–Wallis H test for independent samples was conducted (e.g., gaming activity, hours of play and socio-emotional competence) alongside Pearson's chi-square (χ^2) (i.e., platforms, types of games and players) to identify differences in the study variables among participants by province. Following this, Spearman's rank correlation (*r*) was used to correlate the various variables associated with gaming activity, hours of play, socio-emotional competence and age.

Next, a second Kruskal–Wallis H test for independent samples was performed (i.e., age, gaming activity, hours of play and socio-emotional competence), along with χ^2 (i.e., gender, school year, platforms, types of games and players) to identify differences in the study variables based on player types.

Finally, the family-wise error rate resulting from the multiple comparisons problem was controlled using the Bonferroni correction.

Statistical analyses were conducted using Stata v17 (StataCorp, College Station, TX, USA).

3. Results

The descriptive statistics for the various variables considered in the study are shown in Table 1. The values of skewness and kurtosis, as well as the Kolmogorov-Smirnov statistic, reveal a univariate non-normal distribution in all variables, while Mardia's multivariate skewness (93.42; χ^2 = 55,776.80; *p* < 0.001) and kurtosis (1,116.22; χ^2 = 11,373.05; *p* < 0.001) coefficients indicate that the joint distribution of the variables does not fit the multivariate normal distribution. This justifies the choice of the WLS estimator for the CFA and non-parametric tests for hypothesis testing. No missing values were detected, and outliers identified through Mahalanobis distance were processed using robust estimators. The descriptive analysis of the variables reveals that most Andalusian adolescents, both overall (Table 1) and by province (Table 2), play video games occasionally, mainly strategy video games on tablets or smartphones. In general, the participants in this study score low on the different dimensions of video game addiction, although it should be noted that nearly 5% of them are at risk of addiction to this activity. Furthermore, regarding the level of socio-emotional competence shown by Andalusian adolescents, it should be highlighted that their relationship skills are at an adequate level, although self-control stands out as the most limited dimension. Finally, no statistically significant differences were identified in video game activity, hours of play, platforms, types of games, types of players and socio-emotional competence among participants based on their province of origin.

Table 1

Overall descriptive statistics (Autonomous Community of Andalusia)

Variables	M (SD)	N (%)	SK	KU	K-S
Video game activity					
Salience	1.52 (0.70)	-	1.44	1.64	0.27***
Mood modification	2.17 (1.02)	-	0.58	-0.51	0.14***
Tolerance	1.49 (0.67)	-	1.41	1.34	0.29***
Withdrawal symptoms	1.34 (0.57)	-	2.02	4.59	0.36***
Conflict	1.58 (0.54)	-	0.85	0.80	0.16***
Relapse	1.50 (0.54)	-	1.38	1.64	0.30***
IGD-20	31.90 (10.72)	-	1.18	1.03	0.17***
Number of hours of play per week	4.48 (6.03)	-	2.94	10.70	0.26***
Platforms					
None	-	121 (3.38)	-	-	-
Personal computer (desktop or laptop)	-	977 (27.30)	-	-	-
Console (desktop or laptop)	-	611 (17.07)	-	-	-
Other device (tablet, smartphone)	-	1,870 (52.25)	-	-	-
Types of games					
None	-	126 (3.52)	-	-	-
Action	-	692 (19.33)	-	-	-
Strategy	-	1,545 (43.17)	-	-	-
Role-playing games	-	252 (7.04)	-	-	-
Adventure	-	715 (19.98)	-	-	-
Sports	-	249 (6.96)	-	-	-
Types of players					
Occasional	-	3,069 (85.75)	-	-	-
Regular	-	350 (9.78)	-	-	-
Low risk	-	134 (3.75)	-	-	-
High risk	-	22 (0.61)	-	-	-
Disordered	-	4 (0.11)	-	-	-
Socio-emotional competence					
Self-awareness	3.09 (0.56)	-	-0.38	-0.38	0.10***
Social awareness	3.18 (0.48)	-	-0.24	-0.34	0.09***
Self-control	2.94 (0.53)	-	-0.23	-0.25	0.07***
Relationship skills	3.55 (0.43)	-	-1.24	1.99	0.16***
Responsible decision-making	3.35 (0.51)	-	-0.54	-0.33	0.12***

N.B.: M: mean; SD: standard deviation; N: total number; %: percent; SK: skewness; KU: kurtosis; K-S: Kolmogorov-Smirnov; ***$p < 0.001$.

Table 2

Descriptive statistics and contrasts by provinces

Variables	1 M/N (SD)	2 M/N (SD)	3 M/N (SD)	4 M/N (SD)	5 M/N (SD)	6 M/N (SD)	7 M/N (SD)	8 M/N (SD)	H/χ2 (df)
Video game activity									
Salience	1.54 (0.71)	1.50 (0.70)	1.49 (0.66)	1.52 (0.69)	1.53 (0.72)	1.52 (0.72)	1.52 (0.69)	1.51 (0.71)	1.39 (7)
Mood modification	2.18 (1.01)	2.17 (1.02)	2.16 (1.00)	2.13 (1.00)	2.18 (1.04)	2.20 (1.03)	2.17 (1.02)	2.16 (1.02)	1.17 (7)
Tolerance	1.50 (0.67)	1.50 (0.68)	1.46 (0.64)	1.47 (0.64)	1.50 (0.70)	1.51 (0.69)	1.49 (0.68)	1.48 (0.68)	1.03 (7)
Withdrawal symptoms	1.34 (0.56)	1.35 (0.59)	1.34 (0.56)	1.32 (0.56)	1.34 (0.57)	1.34 (0.60)	1.34 (0.58)	1.33 (0.58)	0.89 (7)
Conflict	1.60 (0.54)	1.58 (0.56)	1.57 (0.52)	1.56 (0.51)	1.60 (0.55)	1.57 (0.56)	1.58 (0.54)	1.57 (0.55)	2.88 (7)
Relapse	1.54 (0.72)	1.49 (0.66)	1.48 (0.64)	1.49 (0.64)	1.52 (0.69)	1.49 (0.68)	1.49 (0.68)	1.49 (0.66)	1.19 (7)
IGD-20	32.29 (10.92)	31.95 (10.85)	31.67 (10.13)	31.55 (10.17)	32.20 (11.09)	31.99 (11.06)	31.91 (10.81)	31.77 (10.76)	0.92 (7)
Number of hours of play per week	4.33 (5.97)	4.53 (6.03)	4.24 (5.45)	4.40 (6.20)	4.90 (6.68)	4.59 (5.87)	4.23 (5.51)	4.64 (4.47)	3.62 (7)
Platforms									
None	12	14	18	15	12	12	19	19	
Personal computer (desktop or laptop)	110	133	105	126	107	112	147	137	18.25 (21)
Console (desktop or laptop)	64	94	59	70	71	81	78	94	
Other device (tablet, smartphone)	226	225	226	243	198	190	277	285	
Types of games									
None	12	14	19	16	13	12	20	20	
Action	90	97	81	84	77	64	95	104	
Strategy	172	185	175	205	169	180	225	234	16.99 (35)
Role-playing games	30	34	25	31	26	32	37	37	
Adventure	79	101	83	89	73	86	106	98	
Sports	29	35	25	29	30	21	38	42	
Types of players									
Occasional	350	399	352	396	332	336	441	463	
Regular	40	45	44	42	36	39	56	48	
Low risk	19	18	10	14	16	16	21	20	10.29 (28)
High risk	3	3	2	2	3	3	3	3	
Disordered	0	1	0	0	1	1	0	1	
Socio-emotional competence									
Self-awareness	3.08 (0.55)	3.08 (0.54)	3.09 (0.56)	3.11 (0.55)	3.10 (0.57)	3.08 (0.55)	3.09 (0.56)	3.10 (0.58)	2.20 (7)
Social awareness	3.19 (0.48)	3.16 (0.48)	3.18 (0.49)	3.20 (0.48)	3.17 (0.49)	3.16 (0.48)	3.18 (0.47)	3.17 (0.49)	2.22 (7)
Self-control	2.94 (0.52)	2.94 (0.54)	2.95 (0.54)	2.97 (0.53)	2.91 (0.53)	2.93 (0.54)	2.96 (0.53)	2.92 (0.53)	3.44 (7)
Relationship skills	3.56 (0.44)	3.53 (0.44)	3.55 (0.45)	3.56 (0.42)	3.56 (0.41)	3.54 (0.43)	3.56 (0.43)	3.56 (0.42)	3.12 (7)
Responsible decision-making	3.37 (0.51)	3.34 (0.51)	3.32 (0.53)	3.37 (0.51)	3.37 (0.50)	3.33 (0.52)	3.36 (0.52)	3.36 (0.51)	3.03 (7)

N.B.: M: mean; SD: standard deviation; N: total number; 1: Almería; 2: Cádiz; 3: Córdoba; 4: Granada; 5: Huelva; 6: Jaén; 7: Málaga; 8: Seville; H = Kruskal-Wallis H; χ2: Pearson's chi-square; df: degrees of freedom; *p < 0.007.

The correlations between the different variables associated with video game activity, socio-emotional competence and age ranged from 0.04 (age and withdrawal symptoms) to 0.80 (salience and IGD–20) (Table 3).

Table 3

Correlations between video game activity, socio-emotional competence and age

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	-													
2	0.54*	-												
3	0.71*	0.56*	-											
4	0.69*	0.51*	0.68*	-										
5	0.46*	0.31*	0.42*	0.54*	-									
6	0.70*	0.47*	0.64*	0.66*	0.48*	-								
7	0.80*	0.79*	0.78*	0.76*	0.68*	0.77*	-							
8	0.49*	0.41*	0.49*	0.37*	0.23*	0.42*	0.50*	-						
9	0.06*	0.08*	0.06*	0.04*	0.05*	0.03	0.07*	0.11*	-					
10	-0.18*	-0.14*	-0.15*	-0.17*	-0.12*	-0.17*	-0.19*	-0.10*	-0.01	-				
11	-0.12*	-0.11*	-0.16*	-0.14*	-0.10*	-0.13*	-0.17*	-0.08*	-0.04	0.44*	-			
12	-0.16*	-0.09*	-0.13*	-0.16*	-0.12*	-0.14*	-0.15*	-0.13*	-0.00	0.62*	0.41*	-		
13	-0.18*	-0.16*	-0.20*	-0.20*	-0.18*	-0.16*	-0.22*	-0.12*	-0.02	0.39*	0.43*	0.47*	-	
14	-0.12*	-0.06*	-0.12*	-0.10*	-0.05*	-0.10*	-0.11*	-0.06*	-0.03	0.42*	0.48*	0.48*	0.51*	-

N.B.: 1: Salience; 2: Mood modification; 3: Tolerance; 4: Withdrawal symptoms; 5: Conflict; 6: Relapse; 7: IGD-20; 8: Hours of play; 9: Age; 10: Self-awareness; 11: Social awareness; 12: Self-control; 13: Relationship skills; 14: Responsible decision-making; *$p < 0.001$.

For comparisons of video game activity, socio-emotional competence and age based on player types, the significance level for each multiple comparison test was adjusted using the Bonferroni correction, resulting in 0.007 for the different contrasts (0.05/7). In this context, the results of the comparisons according to player types reveal statistically significant differences in the variables associated with video game activity (e.g., dimensions of video game addiction, gaming platforms and types of games) and socio-emotional competence (Table 4).

Table 4

Comparisons of video game activity and socio-emotional competence with socio-demographic, academic and gaming variables based on player types

Variables	Occasional M/N (SD)	Regular M/N (SD)	Low risk M/N (SD)	High risk M/N (SD)	Disordered M/N (SD)	H/$\chi2$ (df)
Salience	1.32 (0.49)	2.42 (0.52)	3.06 (0.60)	3.73 (0.34)	4.33 (0.09)	1,172.88* (4)
Mood modification	1.95 (0.89)	3.32 (0.77)	3.57 (0.67)	4.50 (0.41)	4.67 (0.05)	823.99* (4)
Tolerance	1.30 (0.44)	2.54 (0.61)	2.77 (0.54)	3.50 (0.41)	3.67 (0.06)	1,253.86* (4)
Withdrawal symptoms	1.17 (0.33)	2.19 (0.52)	2.66 (0.79)	3.18 (0.52)	3.33 (0.07)	1,466.06* (4)
Conflict	1.46 (0.42)	2.10 (0.45)	2.73 (0.51)	2.86 (0.74)	3.80 (0.07)	849.30* (4)
Relapse	1.33 (0.50)	2.28 (0.56)	2.82 (0.60)	3.47 (0.49)	5.00 (0.08)	1,069.15* (4)
IGD-20	28.50 (6.71)	48.72 (3.01)	58.24 (2.78)	69.41 (3.58)	82.03 (0.05)	486.76* (4)
Hours of play	3.38 (4.43)	10.47 (8.77)	12.10 (10.49)	14.36 (10.39)	10.00 (0.06)	1,323.86* (4)
Age	13.45 (1.36)	13.53 (1.24)	13.42 (1.25)	13.27 (1.35)	13.75 (0.96)	2.91 (4)
Gender						
Male	1,429	155	69	13	2	3.42 (4)
Female	1,640	195	65	9	2	
Academic year						
First	871	79	37	7	0	11.06 (12)
Second	786	98	32	6	2	
Third	745	99	40	5	1	
Fourth	667	74	25	4	1	
Platforms						
None	121	0	0	0	0	225.01* (12)
Personal computer (desktop or laptop)	752	125	91	5	4	
Console (desktop or laptop)	481	98	24	8	0	
Other device (tablet, smartphone)	1,715	127	19	9	0	
Types of games						
None	126	0	0	0	0	130.76* (20)
Action	571	71	45	5	0	
Strategy	1,358	121	57	9	0	
Role-playing games	226	18	0	8	0	
Adventure	576	108	27	0	4	
Sports	212	32	5	0	0	
Self-awareness	3.12 (0.55)	3.00 (0.58)	2.87 (0.53)	2.61 (0.55)	2.20 (0.06)	59.61* (4)
Social awareness	3.20 (0.47)	3.09 (0.49)	2.99 (0.54)	2.77 (0.31)	1.80 (0.05)	58.74* (4)
Self-control	2.97 (0.52)	2.80 (0.54)	2.69 (0.46)	2.27 (0.95)	1.10 (0.05)	95.53* (4)

Variables Occasional M / N (SD)	Types of players					H / χ2 (df)
	Regular M / N (SD)	Low risk M / N (SD)	High risk M / N (SD)	Disor-dered M / N (SD)		
Relationship skills	3.58 (0.39)	3.34 (0.58)	3.42 (0.50)	2.98 (0.49)	3.40 (0.04)	94.06* (4)
Responsible decision-making	3.36 (0.51)	3.34 (0.52)	3.23 (0.47)	3.12 (0.65)	2.60 (0.02)	21.17* (4)

N.B.: M: mean; SD: standard deviation; N: total number; H = Kruskal-Wallis H; χ^2: Pearson's chi-square; df: degrees of freedom; * p < 0.007.

4. Discussion

The purpose of this research was to understand and analyse the video game activity of the adolescent population in Andalusia to determine their level of addiction, as well as the relationship between this activity and their level of socio-emotional competence, particularly with regard to self-control. Based on the results obtained, the following conclusions can be drawn: (1) the adolescent population in Andalusia generally exhibits a profile of an occasional video game player with a low level of addiction to this activity; (2) there are no differences in video game activity, hours of play, platforms, types of games, types of players or socio-emotional competence among participants based on their province of origin; (3) the variables associated with video game activity in Andalusian adolescents show an inverse relationship with their level of socio-emotional competence; and (4) adolescents at risk of addiction to this activity exhibit a lower level of socio-emotional competence, especially with regards self-control.

The results of this study stand in contrast to the findings of the specific literature previously published in Andalusia, which reports that between 20% and 30% of young people aged 12 to 20 play these types of games daily (Social Services and Dependency Agency of Andalusia, 2019). However, these differences could be attributed to the particular characteristics of the sample and the influence of other contextual variables, such as the location of schools or the socio-economic status of the families.

Although most Andalusian adolescents used tablets or smartphones to play video games, those at risk of developing an addiction tended to use personal computers more frequently. Additionally, it was observed that Andalusian adolescents predominantly preferred strategy, action and adventure games. Interestingly, participants with internet gaming disorder showed a specific preference for adventure games.

As expected, adolescents with lower levels of socio-emotional competence were the ones who spent more time playing video games. Specifically, students with lower self-awareness and relationship skills showed greater concern about the time spent on video games. Similarly, those with less developed relationship skills also spent more time playing video games, experienced withdrawal symptoms when

reducing their playing time and lost interest in other leisure activities. Additionally, regarding the differences in socio-emotional competence based on player profiles, the particularly low level of self-control exhibited by players with internet gaming disorder is noteworthy, aligning with findings from previous research (Social Services and Dependency Agency of Andalusia, 2019; Kim *et al.*, 2007; Quancai *et al.*, 2023).

The results of this study have significant implications. Adolescents with low levels of socio-emotional competence who play adventure games on personal computers are more susceptible to developing internet gaming disorder. Therefore, it is crucial to invest in intervention programmes that foster the development of socio-emotional competencies as a preventive measure against these disorders (Dieris-Hirche *et al.*, 2021). Such prevention should be implemented especially in schools, raising awareness about the risks associated with this behaviour and providing guidelines for its detection and treatment. Furthermore, it is essential to promote digital competence among students to ensure the safe, responsible, critical, healthy and sustainable use of technology (Spanish Video Game Association, 2022).

Despite the valuable insights provided by this study, it is essential to interpret the results with caution due to its limitations. On one hand, the cross-sectional predictive methodological design does not allow for the establishment of causal relationships. Therefore, future research should employ experimental or quasi-experimental designs and longitudinal research methods to enhance the study's findings and facilitate generalisation of the results. On the other hand, although the instruments used in this study have been widely employed in previous research, it is crucial to recognise that the use of self-reports may introduce biases. Additionally, future studies should consider variables such as academic performance and family context to gain a more comprehensive understanding of this issue.

5. Conclusions

In summary, video game addiction represents a growing problem that impacts the health of young people. Therefore, it is crucial to conduct research that analyses player profiles and the variables that may contribute to the development of internet gaming disorder. This will facilitate the design and implementation of effective interventions to prevent and address this phenomenon.

6. Funding

7. Bibliography

Agencia de Servicios Sociales y Dependencia de Andalucía (2019). *Las adicciones comportamentales en Andalucía.* Consejería de Igualdad, Políticas Sociales y Conciliación. Junta de Andalucía.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596

Asociación Española de Videojuegos (2022). *La industria del videojuego en España en 2022.* http://www.aevi.org.es/web/wp-content/uploads/2023/05/AEVI_Anuario-2022-DIGITAL.pdf

Ato, M., López, J. J. and Benavente, A. (2013). A classification system for research designs in Psychology. *Annals of Psychology*, *29*(3), 1038–1059. http://doi.org/10.6018/analesps.29.3.178511

Clarke, A., Sorgenfrei, M., Mulcahy, J., Davie, P., Friedrich, C. and McBride, T. (2021). *Adolescent mental health. A systematic review on the effectiveness of school–based interventions.* Early Intervention Fundation. https://www.eif.org.uk/report/adolescent-mental-health-a-systematic-review-on-the-effectiveness-of-school-based-interventions

Consejería de Desarrollo Educativo y Formación Profesional (2023). *Estadística sobre el alumnado escolarizado en el sistema educativo andaluz, a excepción del universitario.* Junta de Andalucía. https://www.juntadeandalucia.es/organismos/desarrolloeducativoyformacionprofesional/servicios/estadistica-cartografia/actividad/detalle/175110/175572.html

Couper, M. P. and Bosnjak, M. (2010). Internet surveys. In P. V. Mardsen and J. D. Wright (Eds.), *Handbook of survey research* (pp. 527–550). Emerald Group.

Darvesh, N., Radhakrishnan, A., Lachance, C. C., Nincic, V., Sharpe, J. P., Ghassemi, M., Straus, S. E. and Tricco, A. C. (2020). Exploring the prevalence of gaming disorder and Internet gaming disorder: a rapid scoping review. *Systematic Reviews, 9*(1). https://doi.org/10.1186/s13643-020-01329-2

Dieris–Hirche, J., Bottel, L., Pape, M., Te–Wildt, B. T., Wölfling, K., Henningsen, P.,Timmesfeld, N., Neumann, A., Neusser, S., Beckers, R. and Herpertz, S. (2021). Effects of an online–based motivational intervention to reduce problematic internet use and promote treatment motivation in internet gaming disorder and internet use disorder (OMPRIS): Study protocol for a randomised controlled trial. *BMJ Open*, *11*(83), e045840. https://doi.org/10.1136/bmjopen-2020-045840

Fernández, F. D., Moreno, A. J., Marín, J. A. and Romero, J. M. (2022). Adolescents' emotions in Spanish education: Development and validation of the social and emotional learning scale. *Sustainability*, *14*(7), 3755. https://doi.org/10.3390/su14073755

Fuster, H., Carbonell, X., Pontes, H. M. and Griffiths, M. D. (2016). Spanish validation of the Internet Gaming Disorder–20 (IGD–20) Test. *Computers in Human Behaviors*, *56*, 215–224. https://doi.org/10.1016/j.chb.2015.11.050

Griffiths, M. D. (2005). A "components" model of addiction within a biopsychosocial framework. *Journal of Substance Use*, *10*(4), 191–197. https://doi.org/10.1080/14659890500114359

Hair, J., Black, W., Babin, B. J., Anderson, R. and Tatham, R. (2014). *Multivariate data analysis* (6th ed.). Pearson International Edition.

Hu, L. and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Kardefelt–Winther, D., Heeren, A., Schimmenti, A., van Rooij, A., Maurage, P., Carras, M., Edman, J., Blaszczynski, A., Khazaal, Y. and Billieux, J. (2017). How can we conceptualize behavioural addiction without pathologizing common behaviours? *Addiction, 112*(10), 1709–1715. https://doi.org/10.1111/add.13763

Kim, E. J., Namkoong, K., Ku, T. and Kim, S. J. (2007). The relationship between online game addiction and aggression, self–control and narcissistic personality traits. *European Psychiatry, 23*(3), 212–218. https://doi.org/10.1016/j.eurpsy.2007.10.010

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford Publications.

López–Gómez, S., Rial–Boubeta, A., Marín–Suelves, D. and Rodríguez–Rodríguez, J. (2022). Videojuegos, salud, convivencia y adicción. ¿Qué dice la evidencia científica? *Psychology, Society & Education, 14*(1), 45–54. https://doi.org/10.21071/psye.v14i1.14178

Marco, C. and Chóliz, M. (2017). Eficacia de las técnicas de control de la impulsividad en la prevención de la adicción a videojuegos. *Terapia Psicológica, 35*(1), 57–69. https://doi.org/10.4067/s0718-48082017000100006

Martinez, L., Gimenes, M. and Lambert, E. (2022). Entertainment video games for academic learning: a systematic review. *Journal of Educational Computing Research, 60*(5), 1083–1109. https://doi.org/10.1177/07356331211053848

Ministerio de Sanidad, Servicios Sociales e Igualdad (2018). *Estrategia nacional sobre adicciones 2017–2024*. Secretaría General Técnica. Centro de Publicaciones Delegación del Gobierno para el Plan Nacional sobre Drogas. https://pnsd.sanidad.gob.es/pnsd/estrategiaNacional/docs/180209_ESTRATEGIA_N.ADICCIONES_2017-2024___aprobada_CM.pdf

Observatorio Español de las Drogas y las Adicciones (2023). *Informe sobre adicciones comportamentales y otros trastornos adictivos 2023: Indicador de admitidos a tratamiento por adicciones comportamentales: Juego con dinero, uso de videojuegos, uso problemático de internet y otros trastornos adictivos en las encuestas de drogas en*

España EDADES y ESTUDES. Ministerio de Sanidad. Delegación del Gobierno para el Plan Nacional sobre Drogas.

Pontes, H. M., Király, O., Demetrovics, Z. and Griffiths, M. D. (2014). The conceptualisation and measurement of DSM−5 Internet Gaming Disorder: the development of the IGD−20 Test. *PloS ONE*, *9*(10), e110137. https://doi.org/10.1371/journal.pone.0110137

Quancai, L., Meng, C. and Kunjie, C. (2023). Social control and self−control: factors linking exposure to domestic violence and adolescents' Internet gaming addiction. *Frontiers in Psychiatry, 14.* https://doi.org/10.3389/fpsyt.2023.1245563

Riopel, M., Nenciovici, L., Potvin, P., Chastenay, P., Charland, P., Sarrasin, J. B. and Masson, S. (2019). Impact of serious games on science learning achievement compared with more conventional instruction: An overview and a meta−analysis. *Studies in Science Education, 55*(2), 169−214. https://doi.org/10.1080/03057267.2019.1722420

Rosendo−Rios, V., Trott, S. and Shukla, P. (2022). Systematic literature review online gaming addiction among children and young adults: A framework and research agenda. *Addictive Behaviors, 129*, 107238. https://doi.org/10.1016/j.addbeh.2022.107238

Soper, D. S. (2023). *A−priori sample size calculator for structural equation models.* [Software] https://www.danielsoper.com/statcalc/calculator.aspx?id=89

Tabachnick, B. G. and Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.

Tomarken, A. J. and Waller, N. G. (2005). Structural equation modeling: Strengths, limitations, and misconceptions. *Annual Review of Clinical Psychology*, *1*, 31−65. https://doi.org/10.1146/annurev.clinpsy.1.102803.144239

Torres−Rodríguez, A., Griffiths, M. D., Carbonell, X. and Oberst, U. (2018). Internet gaming disorder in adolescence: Psychological characteristics of a clinical sample. *Journal of Behavioral Addictions, 7*(3), 707−718. https://doi.org/10.1556/2006.7.2018.75

Vehovar, V., Toepoel, V. and Steinmetz, S. (2016). Non−probability sampling. In C. Wolf (Ed.), *The Sage handbook of survey methods* (pp. 329−345). Sage. https://doi.org/10.4135/9781473957893.n22

West, R. (2001). Theories of addiction. *Addiction, 96*(1), 3−13. https://doi.org/10.1046/j.1360-0443.2001.96131.x

World Health Organization (2024). Gaming disorder. Retrieved on 3 January 2024 from https://www.who.int/standards/classifications/frequently-asked-questions/gaming-disorder

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