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Dysfunctional Risks of the Internet and Their Overlap in the Different Stages of Adolescence

Adoración Díaz-López[1], Vanessa Caba-Machado[1], Juan Manuel Machimbarrena[2], Jessica Ortega-Barón[3], Priscila Pérez-Rodríguez[1], & Joaquín González-Cabrera[4]

[1] Faculty of Education, Universidad Internacional de La Rioja (UNIR), Logroño, Spain
[2] Faculty of Psychology, University of the Basque Country (UPV/EHU), Donostia, Spain
[3] Faculty of Psychology, University of Valencia, Valencia, Spain
[4] Instituto de Transferencia e Investigación (ITEI), Universidad Internacional de La Rioja (UNIR), Logroño, Spain

Abstract

The use of the internet is a normative phenomenon associated with problems for younger people. The dysfunctional risks are those in which there is a problematic use of technologies that generates negative consequences. General Problematic Internet Use (GPIU) is the most prevalent, while Internet Gaming Disorder (IGD) and Online Gambling Disorder (OGD) are less prevalent, perhaps because they are Clinical problems and notably more severe. They have been widely studied separately but have hardly been examined conjointly and overlappingly. This study employs a sample with a broad age range including participants across the three stages of adolescence (early, middle, and late) and emerging adulthood. The objectives are to analyze: 1) the overall prevalence of GPIU, IGD and OGD; 2) the prevalence of GPIU, IGD and OGD according to the degree of the reported problem; 3) overlap of GPIU, IGD and OGD. These objectives will be carried out according to the variable sex and stages of adolescence. Cross-sectional and analytical study with 7,295 participants aged between 11 and 22 years. Considering risk, 13.8% of the participants had one or more risks; 11.5% presented at least one risk, 9.6% presented GPIU; 2% presented GPIU and IGD together; in only 0.1% did all three risks overlap. Girls present higher prevalence of GPIU, and boys of IGD, OGD and in all the overlaps. There is a general upward trend in middle and late adolescence versus early adolescence in these risks, which decline in emerging adulthood. These data are discussed concerning their importance in psychoeducational prevention and intervention actions.

Keywords: internet; video games; gambling; overlaps; risks; adolescence

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Introduction

The internet has changed the way society lives and communicates. Its positive role is undeniable. However, using the internet, associated with other variables, also brings numerous challenges and potential risks (Fischer-Grote et al., 2019; Fumero et al., 2018; Núñez-Gómez et al., 2021).

Adolescence is a stage of high vulnerability in risk taking (Palacios, 2019), so concerning the online risks, Livingstone and Stoilova (2021) suggest a classification focuses on relational risks (cyberbullying, online grooming

or sexting). However, do not include the dysfunctional risks related to the problematic use of the internet, generating personal, social, relational, and academic/work consequences (González-Cabrera et al., 2023). These risks are: General Problematic Internet Use (GPIU; Caplan, 2010), general problematic use of Social Networks (Andreassen et al., 2016; Hussain & Griffiths, 2018), Internet Gaming Disorder (IGD; Bernaldo-de-Quirós et al., 2020), Online Gambling Disorder (OGD; Montiel et al., 2021), and problematic use of pornography (Fernandez & Griffiths, 2021), among others. This manuscript will focus in the most frequent, which is GPIU (Machimbarrena et al., 2018, 2019), and in the two more problematic, due to their clinical nature, IGD and OGD.

At the theoretical-conceptual level, General Problematic Use of the Internet (GPIU; Caplan, 2010) holds that the preference for online social interaction and mood regulation through the internet increases the likelihood of poor self-regulation, which has negative consequences in the person's life. Similarly, several authors (Kaess et al., 2021; Nogueira et al., 2023) point to a lack of a dividing line between what general problematic internet use is and what a disordered internet use would be. In fact, to date the only recognized internet related disorder is IGD, which is classified as a mental disorder in ICD-11. As well as that, other authors (Moretta et al., 2022) state that Problematic Internet Use (PUI) encompasses several other specific problems such as problematic use of social media. Within the specific problematic use of the internet, IGD, characterized by persistent and recurrent use of internet games (Petry et al., 2014), has been included in the DSM-5 (American Psychiatric Association [APA], 2013) within its III Section as a tentative disorder. However, the World Health Organization (WHO, 2019) recognizes it in the International Classification of Diseases-11 (ICD-11) as both online and offline (named gaming disorder). In the case of OGD, following the indications of ICD-11 and the components of the addiction model of Griffiths (2005), the conceptualization of the DSM-5 criteria for gambling disorder has been adapted to online context (González-Cabrera et al., 2020).

Concerning descriptive epidemiology, meta-analyses report a 17% of international prevalence of GPIU (Cha & Seo, 2018). Studies in the Spanish context indicate a prevalence close to 15% of GPIU in adolescence (Gómez et al., 2017; Machimbarrena et al., 2018; Muñoz-Miralles et al., 2016; Yudes-Gómez et al., 2018), and UNICEF (Andrade et al., 2021) reports that 33% of Spanish adolescents in secondary school may be developing GPIU. There is no consensus in the literature regarding differences in the prevalence of GPIU according to gender, as some studies find no differences (Gámez-Guadix, 2014; Gámez-Guadix et al., 2015), others find higher prevalence in boys (Durkee et al., 2012; Laconi et al., 2015; Munno et al., 2017), and others in girls (López-Fernández, 2018; Machimbarrena et al., 2018; Yudes-Gómez et al., 2018). This lack of consensus is also transferred to the variable age. Whereas some studies suggest that adolescents aged 16 to 18 have a higher level of problematic internet use than those aged 10 to 13 (Gómez et al., 2017; Machimbarrena et al., 2019), others find no differences in samples of preadolescents (10–14 years) and adolescents (15–18 years; Yudes-Gómez et al., 2018). As for IGD, internationally, a meta-analytic study found a 4,6% prevalence in adolescents (Fam, 2018). However, in Spain, this prevalence varies within a range of 1.9% (Beranuy et al., 2020) and 8.3% (Buiza-Aguado et al., 2018). Regarding gender, there is consensus in the literature, indicating a higher prevalence of IGD in boys (Fam, 2018). In addition, the prevalence of IGD appears to be higher at ages 15–21 years, but it decreases with advancing age (Fam, 2018; Mihara & Higuchi, 2017). Considering OGD, the international systematic review of Montiel et al. (2021) found prevalence in adolescents between 0.89% and 1%. In the Spanish context, 0.89% of a sample of adolescents between 11 and 19 years presented OGD (González-Cabrera et al., 2020). In terms of gender, there is a higher prevalence in males, but with regard to age, the data are contradictory (Montiel et al., 2021).

Even if adolescents are the most exposed to using the internet in such a way that causes problems in their lives (Anderson & Jiang, 2018; Instituto Nacional de Estadística, 2021), there is a lack of consensus regarding the age-related prevalence of the different risks (Wang et al., 2021). To our knowledge, such variable age ranges as those fluctuating between the lower limit of early adolescence to an almost upper limit of emerging adulthood have not been examined in the same study. In this sense, the WHO (2010) and the American Academic Pediatrics (AAP, 2021) identified adolescence by three age groups: early adolescence (10 to 13; 11 to 14 respectively), middle adolescence (14–16 years; 14–17 years respectively), and late adolescence (17–19 years; 18–21 years respectively). In addition, we note the proposed three-stage classification by Salmela-Aro (2011): early adolescence (11–13 years), characterized by the first biological changes typical of puberty; middle adolescence (14–17 years), characterized by changes in biological maturity and the importance of the peer group; late adolescence (17–19 years), stage of greater emotional stability, awareness of others, and reflection on life goals; emerging adulthood (19–25 years) characterized by the exploration of possibilities in a variety of areas, such as love and work Arnett (2000).

On the other hand, the importance of studying these three dysfunctional risks should be understood from the problem-behavior theory (Jessor & Jessor, 1977), which maintains that the presence of one behavioral problem increases the probability of another problem occurring. This has been applied to different types of online risks (Craig et al., 2020; Wachs et al., 2021). Regarding the risks of the present study, despite the scarce studies carried out, significant relationships have been found between IGD and OGD (Beranuy et al., 2020), between GPIU and IGD (Machimbarrena et al., 2023), and between all three constructs (González-Cabrera et al., 2020). However, their overlap and the adolescents' stage have not been analyzed. Previous studies have correlated total scores and have not classified them into problem/non-problem categories and the only study that provides data in this regard indicates that 2% of the participants who played video games conjointly presented GPIU and IGD and that 60.4% of the participants with IGD also had GPIU (Machimbarrena et al., 2023).

Consistent with these antecedents, the objectives of this study are: 1) to analyze the global prevalences according to the degree of GPIU, IGD, and OGD also as a function of sex; 2) to analyze the prevalences of GPIU, IGD, and OGD according to the degree of the problem reported for the stages of adolescence and sex in each one; 3) to analyze the overlap of GPIU, IGD, and OGD in the different stages of adolescence and according to sex. Due to the exploratory character of the study, and the lack of research on some key points, hypotheses are posed only for objectives 1 and 2. Nevertheless, for objectives 3 and 4 on account of the lack of previous evidence research questions are put forward.

Concerning the first objective and previous studies, we hypothesize that the prevalence of GPIU will be higher in girls (Gómez et al., 2017; López-Fernández, 2018; Machimbarrena et al., 2018; Yudes-Gómez et al., 2018), and the prevalences of IGD and OGD will be higher in boys (Fam, 2018; Montiel et al., 2021). Regarding the second objective, we formulated the following hypothesis: the highest risk and problem prevalences of GPIU, IGD, and OGD will be found in the stages of middle and late adolescence, and these prevalences will decrease as age increases (Fam, 2018; Gómez et al., 2017; Machimbarrena et al., 2019; Mihara & Higuchi, 2017). Regarding the third objective, we proposed the following research questions: How do the dysfunctional risks of the internet overlap with other? What is the prevalence according to the academic stage and sex?

Methods

Design and Participants

A cross-sectional and analytical study was conducted in the first quarter of 2021. The initial sample comprised 7,513 students, although finally, 7,295 participants responded (97.1% participation rate), aged between 11 and 22 years with an average age of 15.87±2.79. Of them, 61.3% were boys. Two percent of the invited sample did not attend the center on the day of the evaluation or could not participate with their class group, and 0.9% declined to participate.

Assessment Instruments

For the assessment process, we asked the participant some sociodemographic questions: sex, age, grade, school, and training itinerary (for vocational training students). The assessment instruments used are detailed below.

Spanish version of the Generalized and Problematic Internet Use Scale (GPIUS2 (Caplan, 2010; Gámez-Guadix et al., 2013). The test consists of 15 items divided into four factors: (1) Preference for online social interaction, (2) Mood regulation, (3) Negative consequences, (4) Cognitive preoccupation, and (5) Compulsive use. Agreement with the items is rated on a six-point Likert scale, from 1 (*strongly disagree*) to 6 (*strongly agree*). Scores range between 15 and 90 points. Participants were asked about their behavior in the past year. The GPIUS2 has adequate indicators of reliability and internal validity, obtaining for this sample a Cronbach's alpha of .90 for the total questionnaire and between .74 and .84, depending on the dimension.

Spanish version of the Internet Gaming Disorder Scale-Short-Form (IGDS9-SF; Beranuy et al., 2020; Pontes & Griffiths, 2015; Pontes et al., 2014). This scale consists of nine items based on the criteria of the DSM-5 for IGD (APA, 2013). The scale's response options range from 0 (*never*) to 4 (*very often*). The total score ranges between 0 and 36. Cronbach's alpha coefficient for this sample was .80.

Spanish version of the Online Gambling Disorder Questionnaire (OGD-Q; González-Cabrera et al., 2020). This scale presents 11 items that assess pathological online gambling by adapting the DSM-5 criteria for traditional gambling to the internet context (APA, 2013). The scale response options range from 0 (*never*) to 4 (*every day*). The total score ranges between 0 and 44. Cronbach's alpha coefficient for this sample was .93**.**

Table 1. *Distribution of the Sample as a Function of Sex for the Type of Study and Stage of Adolescence.*

	Total (*N* = 7,295)	Boys (*n* = 4,473)	Girls (*n* = 2,822)
Age	*M* = 15.87 (*SD* = 2.79)	*M* = 16.34 (*SD* = 2.77)	*M* = 15,11 (*SD* = 2.64)
Adolescence stage	*f* (%)	*f* (%)	*f* (%)
Early adolescence (11–13)	1,925 (26.4)	946 (21.1)	979 (34.7)
Middle adolescence (14–16)	2,258 (31.0)	1,251 (28)	1,007 (35.7)
Late adolescence (17–19)	2,297 (31.5)	1,662 (37.2)	635 (22.5)
Emerging adulthood (20–22)	815 (11.2)	614 (13.7)	201 (7.1)
Educational Stage			
6th Grade-Primary Education (*n* = 111)	111 (1.5)	51 (1.1)	60 (2.1)
Compulsory Secondary Education (*n* = 3,425)	2,471 (33.9)	1,701 (38)	1,724 (61.2)
High school (*n* = 656)	595 (8.2)	338 (7.6)	318 (11.3)
Basic Vocational Training (*n* = 757)	757 (10.4)	570 (12.7)	187 (6.6)
Intermediate Vocational Training (*n* = 1,416)	1,416 (19.4)	1,125 (25.2)	291 (10.3)
Higher Vocational Training (*n* = 930)	930 (12.7)	688 (15.4)	242 (8.5)

Note. M = means, *SD* = standard deviation, *f* = frequency, % = percentage.

The sample was obtained from 47 non-university schools in 34 locations from eight Spanish regions (Principality of Asturias, Castilla la Mancha, Castilla y León, Community of Madrid, Navarre, Basque Country, Cantabria, and Valencian Community). We conducted non-probabilistic, incidental sampling. The sample distribution according to the variables sex, educational stage, and stage of adolescence shown in Table 1.

Classification of Participants

The following criteria were applied to identify the different problem levels depending on each construct. Concerning GPIU, the criterion of Machimbarrena et al. (2019), classifying the points between 15–52 as no-problem, 53–74 as mild-problem, and between 75–90 as severe-problem, was followed throughout the total score of the GPIUS2. Regarding IGD, the scores assigned to each of the nine items were analyzed, and the

following process was carried out: a) any item with a score equal to or greater than 4 (*often* and *very often)* on the Likert scale was categorized as "problem." b) Items with scores below 4 (*never, rarely,* and *occasionally*) were categorized as "no-problem." c) A participant was considered to be "at risk" for IGD when their response options were *often* or *very often* in four of the nine items. d) If a problem (meeting the clinical diagnostic criteria for IGD) occurred in five or more items, the participant was classified as "problem" (Beranuy et al., 2020; Pontes & Griffiths, 2015; Pontes et al., 2014).

A similar procedure was followed to obtain the prevalence of OGD, although the criteria varied. First, each of the 11 items was dichotomized as follows: 1) participants whose direct score was equal to or greater than 3 (*frequently, very often,* and *every day*) on the Likert scale were classified as "problem." 2) participants whose items had score below 3 (*never* and *occasionally*) were categorized as "no-problem." After this process, the scores obtained in all the questionnaire items were added. Participants were considered to be at risk for OGD if they scored at least 4 points (four items with problems), and to meet a clinical diagnosis of OGD if they scored more than 4 points (four items with problems; González-Cabrera et al., 2020). In addition, people who met this criterion had to report these symptoms for at least the last 12 months. Concerning the stages of adolescence, the participants were classified according to the indications of Arnett (2000) and Salmela-Aro (2011). Thus, participants aged between 11–13 years were included in the "early adolescence" stage, students between 14–16 years made up the group of "middle adolescence," participants between 17–19 years were assigned to the stage of "late adolescence" and, finally, those between 20–22 years belonged to the group of "emerging adulthood."

Procedure

Through the Survey Monkey© online platform, participants answered the battery of questionnaires. This process was carried out in the computer rooms and the school classrooms through mobile devices in each school. The teachers, coordinated by the guidance departments of each school, participated in this process and were provided with specific instructions on the procedure. The time needed to complete the questionnaires varied between 5 and 12 minutes, depending on students' age and reading comprehension. Participation in the study was voluntary and anonymous.

Ethical Considerations

This study received the consent of the participants and the school directors. A passive consent form was sent to the families of underage students through an official communication channel to inform them of the following points: objectives, promoters, and characteristics of the study and their right to refuse to allow their wards to participate in the study. The legal guardians of minors who did not allow participation returned the signed consent. Less than 1% of the sample declined to participate in the study. The adult students were informed about the study and explicitly consented when answering the online batteries. All the students could decide whether to answer the questionnaire, as, after the presentation, they had to explicitly state that they agreed to participate (less than 0.2% responded negatively). This study was approved by the Research Ethics Committee of the Universidad Internacional de La Rioja (UNIR). There were no exclusion criteria for the sample.

Data Analysis

Statistical analyses were performed with the Statistical Package for the Social Sciences (SPSS) program, version 25 (IBM Corp, 2015).

First, we calculated the reliability of the instruments with Cronbach's alpha. We use frequencies to calculate the prevalence of GPIU, IGD and OGD. Chi-square tests were used to compare frequencies of GPIU, IGD and OGD risk categories between sexes, in different the stage of adolescence. This analysis were carried out to prove the following hypothesis: (H1) the prevalence of GPIU will be higher in girls and (H2) the highest risk and problem prevalence of GPIU, IGD, and OGD will be found in the stages of middle and late adolescence, and these prevalence will be lower for emerging adulthood. Furthermore, Games Howell post-hoc comparison and eta squared were calculated to answer a specific part of objective 2: to calculate the differences between all GPIU dimensions and the stages of adolescence. Finally, frequencies were used for calculating the overlap of dysfunctional risks so to answer the following research question: How do the dysfunctional risks of the internet overlap wit other? What is the prevalence according to the academic stage? Due to the large number of comparisons and to limit Type 1 errors, only values equal to or less than $p \leq .001$ were considered statistically significant.

Results

Global Prevalences of GPIU, IGD, and OGD in Adolescents by Sex

The global prevalence of GPIU, IGD, and OGD in the total sample as a function of sex was analyzed. In this sense, regarding GPIU (n = 6,986), an 11.3% prevalence of mild GPIU and a 0.8% prevalence of severe GPIU were found. Concerning IGD (n = 5,512), a 1.8% prevalence of risk and a 2.7% prevalence of clinical problems were found. Regarding OGD (n = 1,426), a 1.3% prevalence of risk and a 2.7% prevalence of clinical problems were observed.

Concerning gender, a significantly higher percentage of girls presented mild GPIU, $\chi^2(1) = 49{,}630$, $p < .001$, but no differences were found between boys and girls in severe problems of GPIU, $\chi^2(1) = 3{,}430$, $p = .064$. Regarding IGD, a significantly higher percentage of boys presented both risk, $\chi^2(1) = 11{,}927$, $p < .001$, and clinical problems of IGD, $\chi^2(1) = 27{,}110$, $p < .001$. Concerning OGD, no statistically significant differences were found in the percentages of risk, $\chi^2(1) = 0.210$, $p = .647$, or clinical problems, $\chi^2(1) = 0.647$, $p = .421$, as a function of sex.

Prevalences of GPIU as a Function of the Different Stages of Adolescence and Sex

Table 2 shows the differences in the prevalence of no-problem, mild, and severe GPIU depending on the stage of adolescence. In this sense, no statistically significant differences were found between mild GPIU and the stages of adolescence, $\chi^2(3) = 8{,}695$, $p = .034$. Despite no significance was found, an increase was observed in the frequency of mild GPIU from early to middle adolescence, reaching very similar values in late adolescence and subsequently decreasing in emerging adulthood, where it has the lowest prevalence. Regarding sex, statistically significant differences were observed between boys and girls at different stages of adolescence. Specifically, there was a higher prevalence of mild GPIU among girls in the stages of early and middle adolescence and among boys in the stages of late adolescence and emerging adulthood (see Table 2). In contrast, although no significant differences were found in the frequency of severe GPIU in the different stages of adolescence, $\chi^2(3) = 3{,}425$, $p = .331$, the same trend was observed as in mild GPIU. Regarding sex, and despite of the fact that no statistically significant differences were found, the prevalence of severe GPIU among boys was higher in all stages of adolescence except for middle adolescence (see Table 2).

Table 2. *GPIUS Prevalences According to the Stages of Adolescence and Sex.*

	Adolescence Stage	Total	Boys	Girls	χ^2 (p)
		f (%)	*f* (%)	*f* (%)	
No-problem (*n* = 6,143)	EA	1,640 (26.7)	826 (50.4)*	814 (49.6)**	53,964 (< .001)
		90.1%/total			
	MA	1,892 (30.8)	1,087 (57.5)*	805 (42.5)**	
		87.1%/total			
	LA	1,923 (31.3)	1,415 (73.6)*	508 (26.4)**	
		87.3%/total			
	A	688 (11.2)	519 (75.4)	169 (24,6)	
		87.3%/total			
Mild-problem (*n* = 786)	EA	171 (21.8)	60 (35.1)**	111 (64.9)*	49,093 (< .001)
		9.4%/total			
	MA	262 (33.3)	99 (37.8)**	163 (62.2)*	
		12.1%/total			
	LA	258 (32.8)	163 (63.2)*	95 (36.8)**	
		11.7%/total			
	A	95(12.1)	67 (70.5)	28 (29.5)	
		12.1%/total			
Severe-problem (*n* = 57)	EA	10 (17.5)	6 (60)	4 (40)	3,430 (.044)
		0.5%/total			
	MA	19 (33.3)	4 (21.1)	15 (78.9)	
		0.9%/total			

Note. EA = Early adolescence; MA = Middle adolescence; LA = Late adolescence; A = Emerging Adulthood; *f* = frequency; %/sample = percentage over the total sample; %/total = % over that given adolescence stage *Adjusted standardized residuals > 1.96; **Adjusted standardized residuals < −1.96; χ^2= Chi-square; *p* = significance.

Further, the differences between the GPIU dimensions and the stages of adolescence were analyzed. Statistically significant differences were found between all GPIU dimensions and the stages of adolescence. Thus, during the stages of middle and late adolescence, a greater Preference for Online Communication ($F = 5.659$, $p < .001$, $\eta^2 = .005$), higher Cognitive Preoccupation ($F = 19.274$, $p < .001$, $\eta^2 = .012$), and higher scores in Mood Regulation ($F = 12.232$, $p < .001$, $\eta^2 = .008$) and Compulsive use ($F = 17.099$, $p < .001$, $\eta^2 = .011$) were found. However, in the stages of late adolescence and emerging adulthood, as age increases, there is more concern about the Negative Consequences ($F = 37.364$, $p < .001$, $\eta^2 = .021$).

Prevalence of IGD in the Different Stages of Adolescence and Sex

Table 3 shows the differences in the prevalence of no-problem, risk, and clinical problems of IGD depending on the stage of adolescence. In this sense, although the differences were nonsignificant, an increasing trend in the frequency of risk of IGD was observed from early to late adolescence, where it reaches its highest values, subsequently decreasing in emerging adulthood, where it presents the lowest prevalence, $\chi^2(3) = 1.593$, $p = .661$. Regarding sex, there was a significantly higher prevalence of IGD risk among boys at all stages of adolescence.

On the other hand, concerning the prevalence of clinical IGD, although no statistically significant differences were found between the stages of adolescence, the same increasing trend from early to late adolescence was observed, $\chi^2(3) = 5.219$, $p = .156$. Regarding sex, statistically significant differences were found, with the group of boys presenting a higher prevalence of clinical IGD in all stages of adolescence.

Table 3. *IGD Prevalence in the Stages of Adolescence (No-Problem, At-Risk, and Clinical-Problem).*

	Adolescence Stage	Total	Boys	Girls	χ^2 *(p)*
		f (%)	*f* (%)	*f* (%)	
No-problem IGD (*n* = 5,264)	EA	1,072 (20.4) 96.1%/total	570 (53.3)	502 (46.8)	38,457 (< .001)
	MA	1,683 (32) 96%	989 (58.8)*	694 (41.2)**	
	LA	1,851 (35.2) 95%	1,411 (76.2)*	440 (23.8)**	
	A	658 (12.5) 94.8%	521 (79.2)*	137 (20.8)**	
At-risk IGD (*n* = 101)	EA	21 (20.8) 1.9%/total	12 (57.1)	9 (42.9)	11,927 (< .001)
	MA	28 (27.7) 1.6%/total	24 (85.7)*	4 (14.3)**	
	LA	41 (40.6) 2.1%/ total	37 (90.2)*	4 (9.8)**	
	A	11 (10.9) 1.6%/total	11 (100)	0 (0)	
Clinical Problem IGD (*n* = 147)	EA	22 (15) 2%/total	17 (77.3)*	5 (22.7)**	27,110 (< .001)
	MA	43 (29.3) 2.5% /total	36 (83.7)*	7 (16.3)**	
	LA	57 (38.8) 2.9%/total	51 (89.5)*	6 (10.5)**	
	A	25 (17) 3.6%/total	24 (96)*	1 (4)**	

Note. EA = Early adolescence; MA = Middle adolescence; LA = Late adolescence; A = Emerging Adulthood; *f* = frequency; % = percentage; *Adjusted standardized residuals > 1.96; **Adjusted standardized residuals < −1.96; χ^2 = Chi-square; *p* = significance.

Prevalence of OGD in the Different Stages of Adolescence and Sex

Table 4 shows the differences in the prevalence of no-problem, risk, and clinical problems of OGD depending on the stage of adolescence. No statistically significant differences were found between the stages of adolescence and risk of OGD, $\chi^2(3) = 3,245$, $p = 355$. Despite the lack of significance, it can be observed that the prevalence of OGD risk increases from early to late adolescence, reaching its highest values and subsequently decreasing in emerging adulthood, where the lowest prevalence is found.

As for sex differences, boys have a higher prevalence of risk of OGD in all stages of adolescence. On the other hand, no statistically significant differences were found in clinical OGD between the stages of adolescence, $\chi^2(3) = 6{,}62$, $p = .085$, and the same trend was found as in the prevalence of risk of problems. Although, no statistically significant differences were found based on sex, as displayed in Table 4, clinical OGD is more prevalent among boys at all stages of adolescence.

Table 4. *Prevalence of OGD in the Different Stages of Adolescence.*

	Adolescence Stage	Total	Boys	Girls	χ^2 *(p)*
		f (%)	*f* (%)	*f* (%)	
No-problem OGD (*n* = 1,370)	EA	319 (23.3) 98.2%	202 (63.3)	117 (36.7)	0,865 (.352)
	MA	337 (24.6) 96%	244 (72.4)	93 (27.6)	
	LA	512 (37.4) 95.9%	455 (89.9)	57 (11.1)	
	A	202 (14.7) 93.5%	178 (88.1)	24 (11.9)	
At-risk OGD (*n* = 18)	EA	1 (5.6) 0.3%	1 (100)	0 (0)	0,210 (.647)
	MA	5 (27.8) 1.4%	3 (60)	2 (40)	
	LA	9 (50) 1.7%	9 (100)	0 (0)	
	A	3 (16.7) 1.4%	2 (66.7)	1 (33.3)	
Clinical Problem OGD (*n* = 38)	EA	5 (13.2) 1.5%	5 (100)	0 (0)	0,647 (.421)
	MA	9 (23.7) 2.6%	6 (66.7)	3 (33.3)	
	LA	13 (34.2) 2.4%	12 (92.3)	1 (7.7)	
	A	11 (28.9) 5.1%	9 (81.8)	2 (18.2)	

Note. EA = Early adolescence, MA = Middle adolescence, LA = Late adolescence, A = Emerging Adulthood, *f* = frequency; % = percentage; *Adjusted standardized residuals > 1.96; **Adjusted standardized residuals < −1.96; χ^2 = Chi-square; *p* = significance.

Dysfunctional Risk Overlaps (GPIU, IGD, and OGD) as a Function of Adolescence Stage and Sex

Table 5 shows the percentage of overlap of GPIU, IGD, and OGD. Thus, 86.2% of the adolescents did not present any dysfunctional risk. On the contrary, 11.5% presented only one type of risk, the most frequent being GPIU (9.6%). Further, 2.2% presented an overlap of two risks, with the GPIU-IGD dyad being the most frequent at 2%. In only 0.1% did all three risks overlap simultaneously. On the one hand, in the group of participants who only presented one risk, there was a higher prevalence of GPIUS in middle adolescence and of IGD and OGD in emerging adulthood. On the other hand, among the young people who presented an overlap of two risks, higher prevalences of GPIU + IGD were found in late adolescence, of GPIU + OGD in middle and late adolescence, and of IGD + OGD in emerging adulthood. Thus, the overlap of the three types of dysfunctional risks is more prevalent in the stage of emerging adulthood. Regarding gender, a higher prevalence of GPIU among girls (as a single risk) and of only IGD and OGD among boys is noteworthy. However, boys have a higher overlap of risks than girls; of two risks in all their combinations, and of all three risks.

Table 5. *Overlap of Dysfunctional Risks in the Different Stages of Adolescence.*

	No Risk	One kind of online risk			Two kinds of online risk			Three kinds of online risk	χ^2 *(p)*
	f (%)	GPIUS	IGD	OGD	GPIUS+IGD	GPIUS+OGD	IGD+OGD	GPIUS+IGD+OGD	
Total (*n* = 7,116)	6,136 (86.2)	686 (9.6)	99 (1.4)	35 (0.5)	139 (2)	11 (0.2)	3 (0.0)	7 (0.1)	
EA (*n* = 1,858)	1,654 (89.0)	155 (8.3)	19 (1)	4 (0.2)	24 (1.3)	2 (0.1)	0 (0)	0 (0)	
MA (*n* = 2,212)	1,889 (85.4)	240 (10.6)	34 (1.5)	8 (0.4)	35 (1.6)	4 (0.2)	0 (0)	2 (0.1)	53,89 (< .001)
LA (*n* = 2,245)	1,916 (85.3)	212 (9.4)	32 (1.4)	15 (0.7)	63 (2.8)	4 (0.2)	1 (0)	2 (0.1)	
A (*n* = 801)	677 (84.5)	79 (9.9)	14 (1.7)	8 (1.0)	17 (2.1)	1 (0.1)	2 (0.2)	3 (0.4)	
Boys (*n* = 4,366)	3,825 (87.6)	292 (6.7)	90 (2.1)	31 (0.7)	112 (2.6)	6 (0.1)	3 (0.1)	7 (0.2)	180,21 (< .001)
Girls (*n* = 2,311)	2,311(84.0)	394 (14.3)	9 (0.3)	4 (0.1)	27 (1.0)	5 (0.2)	0 (0)	0 (0)	

Note. EA = Early adolescence; MA = Middle adolescence; LA = Late adolescence; A = Emerging Adulthood; *f* frequency; % = percentage. The percentages are calculated based on the total sample (*n* = 7,116).

Discussion

The study of some internet risks has gained prominence in the last decade, but its approach has been mainly independent (risk by risk) and in certain stages of adolescence. This exploratory research provides evidence of the overlap of different dysfunctional risks with a very broad age range, between early adolescence and emerging adulthood. This allows us to analyze how these risks function throughout an extended and changing stage in which, theoretically, up to two different sociological generations coexist (Generation Z and Alpha; McCrindle et al., 2021). This last result cannot be compared due to it is a different approach to this line of study and therefore there is a lack of articles of the same nature.

Next, we will discuss objectives 1 and 2 together because of their similarities. Concerning GPIU, an overall prevalence of 12.1% was found. These figures are slightly below those found in other studies in the Spanish context (with prevalence close to 15%; Gómez et al., 2017; Machimbarrena et al., 2018; Muñoz-Miralles et al., 2016; Yudes-Gómez et al., 2018). Concerning the international context, the meta-analysis of Cha and Seo (2018) shows a higher prevalence percentage (17%). A possible explanation for these data is the age ranges used. The present study adds emerging adulthood in a novel way to the set of stages of adolescence, finding that at this stage, the prevalence of this problem decreases considerably. This has led to a general decline in prevalence, but it remains in ranges close to 15% in previous stages of adolescence. In the Spanish context, it also differs from the results of the study by Andrade et al. (2021) due to the difference in the instrument and the cut-off points (stricter in this study for the problem range). According to gender, girls presented higher GPIU, coinciding with the results found in the studies of Gómez et al. (2017), López-Fernández (2018), Machimbarrena et al. (2018), and Yudes-Gómez et al. (2018) and contrary to those reported by Durkee et al. (2012); Laconi et al. (2015); Munno et al. (2017) who found a higher prevalence in boys. A possible explanation is that girls consume more internet in general, and social networks in particular (Andrade et al., 2021), linked to their need for acceptance by the peer group to obtain constant positive reinforcement (Wu et al., 2016). Other reasons could be related to the fact that more girls sleep with their mobile phone than do boys (Andrade et al., 2021) and present higher prevalence of Fear of Missing Out (FoMO; Stead & Bibby, 2017).

It should also be noted that the prevalence of GPIU as a function of the stage of adolescence aligns with the findings of the previous literature, which show that adolescents aged 16 to 18 years (middle and late adolescence) have a higher level of GPIU than those aged 10 to 13 years (early adolescence; Gómez et al., 2017; Machimbarrena et al., 2023). This can be explained because there is more parental mediation in the stage of early adolescence, which decreases as the youngsters grow older (Garmendia et al., 2022; Garmendia-Larrañaga et al., 2016). Regarding IGD, an overall prevalence of 3.8% was found. This falls within the range of percentages found in the Spanish literature, which vary between 1.9% (Beranuy et al., 2020) and 8.3% (Buiza-Aguado et al., 2018), and is very close to that found in international meta-analytic studies (Fam, 2018; Sugaya et al., 2019). Regarding gender, a significantly higher percentage of boys presenting risk and clinical problems of IGD was found. These results are like those reported by the meta-analysis of Fam (2018). Regarding the stages of adolescence, even if the differences between them are not significant, the prevalence of IGD is consistent with other studies (Fam, 2018;

Mihara & Higuchi, 2017), where the prevalence is higher between 15–21 years and decreases with advancing age. This may be related to a greater use of video games in these stages, together with the increased participation in competitive online games in these age brackets (Asociación Española de Videojuegos, 2022). These online games could increase the potential problems, such us the decrease of subjective happiness (Hew et al., 2023). Also, at these ages, there is a higher consumption of electronic sports, which predicted video game addiction (Yildiz-Durak et al., 2023).

Concerning OGD, a 4% prevalence was observed. These results are higher than those found in the Spanish context, which places the prevalence at 0.89% for a sample of adolescents between 11 and 19 (González-Cabrera et al., 2020), and the results reported by an international meta-analysis (Gioia & Boursier, 2019), where prevalences between 0.89% and 1% were reported. This dissonance could be justified because, unlike others, the present study also addressed the stage of emerging adulthood (where gambling is legal), in which the prevalence of OGD is higher, affecting the average prevalence. In the gambling context, being a minor should be a protective factor because it is forbidden, but the nature of online gambling implies that many minors can access and gamble (Observatorio Español de las Drogas y las Adicciones , 2022). Regarding sex, higher prevalences of OGD were found in boys, which is consistent with a systematic review study (Montiel et al., 2021). A possible explanation is that boys are the group that bets the most in online games (Andrade et al., 2021) and buys more loot boxes (González-Cabrera et al., 2022; Ide et al., 2021). Regarding the stages of adolescence, even if the differences between stages are not significant, the results are like those found in the review of Montiel et al. (2021), in which a higher percentage of OGD is observed among older adolescents (middle and late adolescence). A possible explanation for this fact is that online gambling is legal for adults (Observatorio Español de las Drogas y las Adicciones, 2022).

Therefore, even if the differences between stages were not significant, a similar trend was detected in the behavior of the different dysfunctional internet risks in the four stages of adolescence, with middle and late adolescence being the most problematic and emerging adulthood the least. This could be due to several factors, such us parents exercise greater online mediation in the stage of early adolescence, and schoolchildren between 15 and 17 years (middle and late adolescence) have more unlimited access to the internet (Díaz-López et al., 2020). On the other hand, in the stage of emerging adulthood, young people have greater impulse control (Nyongesa et al., 2019), can self-regulate their behavior (Van Tetering et al., 2020), and are more concerned about the negative consequences of their online actions.These results confirm the first and second hypotheses of this investigation (H1 and H2).

Regarding objective 3, when addressing the analysis of the overlap of the three dysfunctional risks, we found that 86.2% of the adolescents did not present any dysfunctional risk while the remain 13,8% of the students present at least one type of dysfunctional risk. In this sense, 11.5% presented only one type of risk, and 2.2% presented an overlap of two risks. This last fact is in line with the results reported in the study of Machimbarrena et al. (2023) in which 2% of the participants jointly presented two dysfunctional risks. Finally, 0.1% presented all three types of dysfunctional internet risk. This last result cannot be compared due to it is a different approach to this line of study and therefore there is a lack of articles of the same nature. However, in this line, in the previous literature, the relationships between the total scores of the GPIU2S, IGDS9-SF, and OGD-Q questionnaires were analyzed, although never from the combined analysis of the problems and their overlap. In this sense, previous studies found significant relationships between the specific IGD and OGD risks (Beranuy et al., 2020), between GPIUS and IGD (Machimbarrena et al., 2023), and between the total scores on the three constructs (González-Cabrera et al., 2020).

Despite being two clinical problems, the overlap of IGD and OGD should not be assumed, as they have a differentiated reality, although they are linked through the loot boxes, which are conceptualized as covert bets within video games (González-Cabrera et al., 2023; King et al., 2020). So, several studies highlight the relationship between the purchase of loot boxes and OGD (Brooks & Clark, 2019; González-Cabrera et al., 2022). In this sense, according to gender, boys present higher prevalence of the overlap of risks. This could be due to boys have a significant less online parental mediation than girls (Díaz-López et al., 2020). Likewise, a possible explanation for the low prevalence of overlap of the three risks could be the fact that GPIU is a problem of a general nature, whereas IGD and OGD are specific and clinical problems, therefore belonging to different realities, although they share common aspects. The prevalence of clinical problems is also expected to be low; and thus, the overlaps is less frequent. These results respond to the research question asked for objective 3.

This study also has some limitations: 1) different biases could be derived from the response process because we only used questionnaires. In the future, it would be interesting to triangulate with families or add objective

indicators of internet consumption, hours of video games, etc.; 2) the diagnosis of IGD and OGD was made using an assessment instrument, and this should have been confirmed by clinical interviews; 3) gambling is legal at the end of the late adolescence and in the emerging adulthood which could alter the result of the prevalence of OGD. So, result should be interpreted with caution; 4) This study is cross-sectional. It would be interesting using longitudinal designs for analyzing within-person changes overtime across different ages; 5) although the sample is very large, it is not representative of Spanish adolescents and young people, so caution should be exercised when generalizing these data; 6) the sample presents a larger number of males than females; 7) Besides according to Arnett (2000) and Salmela-Aro (2011), the emerging adulthood includes ages between 19 and 25 years, our sample only includes students up to 22 years due to the context we have taken it; 8) More robust analysis strategies such as latent class analysis were not possible, but it is a strategy for future research.

We think that the application of these results is especially relevant in the framework of internet risk prevention and intervention as confirm the need for prevention programs from a more holistic view of internet risks. Although there has been carry out initiatives to address specific risks (Bağatarhan & Siyez, 2022; Cañas & Estévez, 2021; Vondráčková & Gabrhelík, 2016), there does not seem to be any that combines these risks (at least, with evidence of their proper functioning). The only exception is the Safety.net Program (Ortega-Barón et al., 2021), but it presents a very broad risk approach, encompassing relational risks and nomophobia as the only specific dysfunctional risk. Additionally, the analysis carried out through the stages of adolescence suggests changes in the trend of these risks and inform us when it is necessary to carry out prevention or intervention programs. For example, it suggests the relevance of developing primary prevention actions in the last years of Primary Education (before the problems begin). In the case of early and middle adolescence, actions should pivot between secondary/tertiary prevention and intervention.

In conclusion, one in seven participants had one or more dysfunctional risks, the most frequent being GPIU (almost 1 in 10). There was also an overlap of several of these risks in a small percentage of the sample. Finally, there is a general upward trend in middle and late adolescence versus early adolescence in these risks, which subsequently decline in early adulthood.

Conflict of Interest

The authors have no conflicts of interest to declare.

Authors' Contribution

Adoración Díaz-López: conceptualization, formal analysis, investigation, resources, validation, visualization, writing—review & editing. **Vanessa Caba-Machado:** investigation, resources, validation, visualization, writing—original draft, writing—review & editing. **Juan Manuel Machimbarrena:** data curation, investigation, resources, validation, visualization, writing—review & editing. **Jéssica Ortega-Barón:** investigation, resources, validation, visualization, writing—review & editing. **Priscila Pérez-Rodríguez:** writing—review & editing. **Joaquín González-Cabrera:** conceptualization, data curation, investigation, methodology, project administration, resources, validation, visualization, writing—review & editing.

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The study was conducted with the authorization of all the participants in the investigation and with the consent of the school directors, students and families. Students and families' collaboration was voluntary, anonymous, and disinterested. The project was approved by the Research Ethics Committee of International University of La Rioja (Spain; PI007-2020 y PI001/2021) and the Juvenile Prosecutor's Office was informed.

References

American Academic Pediatrics (2021). *Stages of adolescent development.* https://www.healthychildren.org/English/ages-stages/teen/Pages/Stages-of-Adolescence.aspx

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC.

Anderson, M., & Jiang, J. (2018, May 31). *Teens, social media & technology 2018*. Pew Research Center. https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/

Andrade, B., Guadix, I., Rial, A., & Suarez, F. (2021). *Impacto de la Tecnología en la adolescencia: Relaciones, riesgos y oportunidades*. [Impact of technology on adolescence. Relationships, risks and opportunities]. UNICEF. https://www.unicef.es/sites/unicef.es/files/comunicacion/Informe%20Impacto%20de%20la%20tecnolog%C3%ADa%20en%20la%20adolescencia.pdf

Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors, 30*(2), 252–262. https://doi.org/10.1037/adb0000160

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469–480. https://doi.org/10.1037/0003-066X.55.5.469

Asociación Española de Videojuegos [Spanish Video Game Association]. (2022, July 9). *Anuario de la Industria del Videojuego* [Video Game Industry Yearbook]. http://www.aevi.org.es/documentacion/estudios-y-analisis/

Bağatarhan, T., & Siyez, D. M. (2022). The effectiveness of a cognitive-behavioral prevention program for internet addiction. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 40*(4), 767–792. https://doi.org/10.1007/s10942-021-00439-7

Beranuy, M., Machimbarrena, J. M., Vega-Osés, M. A., Carbonell, X., Griffiths, M. D., Pontes, H. M., & González-Cabrera, J. (2020). Spanish validation of the Internet Gaming Disorder Scale–Short Form (IGDS9-SF): Prevalence and relationship with online gambling and quality of life. *International Journal of Environmental Research and Public Health, 17*(5), Article 1562. https://doi.org/10.3390/ijerph17051562

Bernaldo-de-Quirós, M., Labrador-Méndez, M., Sánchez-Iglesias, I., & Labrador, F. J. (2020). Instrumentos de medida del trastorno de juego en internet en adolescentes y jóvenes según criterios DSM-5: Una revisión sistemática [Measurement instruments of internet gaming disorder in adolescents and young people according to DSM-5 criteria: A systematic review]. *Adicciones, 32*(4), 291–302. https://doi.org/10.20882/adicciones.1277

Brooks, G. A., & Clark, L. (2019). Associations between loot box use, problematic gaming and gambling, and gambling-related cognitions. *Addictive Behaviors, 96*, 26–34. https://doi.org/10.1016/j.addbeh.2019.04.009

Buiza-Aguado, C., Alonso-Canovas, A., Conde-Mateos, C., Buiza-Navarrete, J. J., & Gentile, D. (2018). Problematic video gaming in a young Spanish population: Association with psychosocial health. *Cyberpsychology, Behavior, and Social Networking, 21*(6), 388–394. https://doi.org/10.1089/cyber.2017.0599

Cañas, E., & Estévez, E. (2021). Intervention programs for the problematic use of the internet and technological devices: A systematic review. *Electronics, 10*(23), Article 2923. https://doi.org/10.3390/electronics10232923

Caplan, S. E. (2010). Theory and measurement of generalized problematic internet use: A two-step approach. *Computers in Human Behavior, 26*(5), 1089–1097. https://doi.org/10.1016/j.chb.2010.03.012

Cha, S.-S., & Seo, B.-K. (2018). Smartphone use and smartphone addiction in middle school students in Korea: Prevalence, social networking service, and game use. *Health Psychology Open, 5*(1), 1–15. https://doi.org/10.1177/2055102918755046

Craig, W., Boniel-Nissim, M., King, N., Walsh, S. D., Boer, M., Donnelly, P. D., Harel-Fisch, Y., Malinowska-Cieślik, M., Gaspar de Matos, M., Cosma, A., Van den Eijnden, R., Vieno, A., Elgar, F. J., Molcho, M., Bjereld, Y., & Pickett, W. (2020). Social media use and cyber-bullying: A cross-national analysis of young people in 42 countries. *Journal of Adolescent Health, 66*(6), S100–S108. https://doi.org/10.1016/j.jadohealth.2020.03.006

Díaz-López, A., Maquilón-Sánchez, J.-J., & Mirete-Ruiz, A.-B. (2020). Maladaptive use of ICT in adolescence: Profiles, supervision and technological stress. *Comunicar, 28*(64), 29–38. https://doi.org/10.3916/C64-2020-03

Durkee, T., Kaess, M., Carli, V., Parzer, P., Wasserman, C., Floderus, B., Apter, A., Balazs, J., Barzilay, S., Bobes, J., Brunner, R., Corcoran, P., Cosman, D., Cotter, P., Despalins, R., Graber, N., Guillemin, F., Haring, C., Kahn, J.-P., … Wasserman, D. (2012). Prevalence of pathological internet use among adolescents in Europe: Demographic and social factors. *Addiction, 107*(12), 2210–2222. https://doi.org/10.1111/j.1360-0443.2012.03946.x

Fam, J. Y. (2018). Prevalence of internet gaming disorder in adolescents: A meta-analysis across three decades. *Scandinavian Journal of Psychology, 59*(5), 524–531. https://doi.org/10.1111/sjop.12459

Fernandez, D. P., & Griffiths, M. D. (2021). Psychometric instruments for problematic pornography use: A systematic review. *Evaluation & the Health Professions, 44*(2), 111–141. https://doi.org/10.1177/0163278719861688

Fischer-Grote, L., Kothgassner, O. D., & Felnhofer, A. (2019). Risk factors for problematic smartphone use in children and adolescents: A review of existing literature. *Neuropsychiatrie, 33*(4), 179–190. https://doi.org/10.1007/s40211-019-00319-8

Fumero, A., Marrero, R. J., Voltes, D., & Peñate, W. (2018). Personal and social factors involved in internet addiction among adolescents: A meta-analysis. *Computers in Human Behavior, 86*, 387–400. https://doi.org/10.1016/j.chb.2018.05.005

Gámez-Guadix, M. (2014). Depressive symptoms and problematic internet use among adolescents: Analysis of the longitudinal relationships from the cognitive–behavioral model. *Cyberpsychology, Behavior, and Social Networking, 17*(11), 714–719. https://doi.org/10.1089/cyber.2014.0226

Gámez-Guadix, M., Calvete, E., Orue, I., & Las Hayas, C. (2015). Problematic internet use and problematic alcohol use from the cognitive–behavioral model: A longitudinal study among adolescents. *Addictive Behaviors, 40*, 109–114. https://doi.org/10.1016/j.addbeh.2014.09.009

Gámez-Guadix, M., Orue, I., & Calvete, E. (2013). Evaluation of the cognitive-behavioral model of generalized and problematic internet use in Spanish adolescents. *Psicothema, 25*(3), 299–306. https://doi.org/10.7334/psicothema2012.274

Garmendia, M., Martínez, G., & Garitaonandia, C. (2022). Sharenting, parental mediation and privacy among Spanish children. *European Journal of Communication, 37*(2), 145–160. https://doi.org/10.1177/02673231211012146

Garmendia-Larrañaga, M., Jiménez-Iglesias, E., Casado, M. Á., & Mascheroni, G. (2016). *Riesgos y oportunidades en internet y uso de dispositivos móviles entre menores españoles (2010-2015)* [Risks and opportunities on the internet and use of mobile devices among Spanish minors (2010-2015)]. https://addi.ehu.es/bitstream/handle/10810/21546/Informe%20NCGM%20España%202010-2015.pdf?sequence = 1

Gioia, F., & Boursier, V. (2019). Treatment of Internet addiction and Internet gaming disorder in adolescence: A systematic review. In B. Bozoglan (Ed.), *Multifaceted approach to digital addiction and its treatment* (pp. 157–176). Information Science Reference/IGI Global. https://doi.org/10.4018/978-1-5225-8449-0.ch008

Gómez, P., Rial, A., Braña, T., Golpe, S., & Varela, J. (2017). Screening of problematic internet use among Spanish adolescents: Prevalence and related variables. *Cyberpsychology, Behavior, and Social Networking, 20*(4), 259–267. https://doi.org/10.1089/cyber.2016.0262

González-Cabrera, J., Basterra-González, A., Montiel, I., Calvete, E., Pontes, H. M., & Machimbarrena, J. M. (2022). Loot boxes in Spanish adolescents and young adults: Relationship with internet gaming disorder and online gambling disorder. *Computers in Human Behavior, 126*, Article 107012. https://doi.org/10.1016/j.chb.2021.107012

González-Cabrera, J., Basterra-González, A., Ortega-Barón, J., Caba-Machado, V., Díaz-López, A., Pontes, H. M., & Machimbarrena, J. M. (2023). Loot box purchases and their relationship with internet gaming disorder and online gambling disorder in adolescents: A prospective study. *Computers in Human Behavior, 143*, Article 107685. https://doi.org/10.1016/j.chb.2023.107685

González-Cabrera, J., Machimbarrena, J. M., Beranuy, M., Pérez-Rodríguez, P., Fernández-González, L., & Calvete, E. (2020). Design and measurement properties of the Online Gambling Disorder Questionnaire (OGD-Q) in Spanish adolescents. *Journal of Clinical Medicine, 9*(1), Article 120. https://doi.org/10.3390/jcm9010120

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

Hew, J.-J., Lee, V.-H., T'ng, S.-T., Tan, G. W.-H., Ooi, K.-B., & Dwivedi, Y. K. (2023). Are online mobile gamers really happy? On the suppressor role of online game addiction. *Information Systems Frontiers*. https://doi.org/10.1007/s10796-023-10377-7

Hussain, Z., & Griffiths, M. D. (2018). Problematic social networking site use and comorbid psychiatric disorders: A systematic review of recent large-scale studies. *Frontiers in Psychiatry, 9*, Article 686. https://doi.org/10.3389/fpsyt.2018.00686

IBM Corp. (2015). *IBM SPSS Statistics for Windows (Versión 25.0)* [Software]. Armonk, NY: IBM Corp.

Ide, S., Nakanishi, M., Yamasaki, S., Ikeda, K., Ando, S., Hiraiwa-Hasegawa, M., Kasai, K., & Nishida, A. (2021). Adolescent problem gaming and loot box purchasing in video games: Cross-sectional observational study using population-based cohort data. *JMIR Serious Games, 9*(1), e23886. https://doi.org/10.2196/23886

Instituto Nacional de Estadística [Statistics National Institute]. (2021). *Instituto Nacional de Estadística* [Statistics National Institute]. https://www.ine.es/index.htm

Jessor, R., & Jessor, S. L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. Academic Press. https://lib.ugent.be/catalog/rug01:000002543

Kaess, M., Klar, J., Kindler, J., Parzer, P., Brunner, R., Carli, V., Sarchiapone, M., Hoven, C. W., Apter, A., Balazs, J., Barzilay, S., Bobes, J., Cozman, D., Gomboc, V., Haring, C., Kahn, J.-P., Keeley, H., Meszaros, G., Musa, G. J., … Wasserman, D. (2021). Excessive and pathological internet use–risk-behavior or psychopathology? *Addictive Behaviors, 123*, Article 107045. https://doi.org/10.1016/j.addbeh.2021.107045

King, A., Wong-Padoongpatt, G., Barrita, A., Phung, D. T., & Tong, T. (2020). Risk factors of problem gaming and gambling in us emerging adult non-students: The role of loot boxes, microtransactions, and risk-taking. *Issues in Mental Health Nursing, 41*(12), 1063–1075. https://doi.org/10.1080/01612840.2020.1803461

Laconi, S., Tricard, N., & Chabrol, H. (2015). Differences between specific and generalized problematic internet uses according to gender, age, time spent online and psychopathological symptoms. *Computers in Human Behavior, 48*, 236–244. https://doi.org/10.1016/j.chb.2015.02.006

Livingstone, S., & Stoilova, M. (2021). *The 4Cs: Classifying online risk to children.* CO:RE Short Report Series on Key Topics. https://doi.org/10.21241/SSOAR.71817

López-Fernández, O. (2018). Generalised versus specific internet use-related addiction problems: A mixed methods study on internet, gaming, and social networking behaviours. *International Journal of Environmental Research and Public Health, 15*(12), Article 2913. https://doi.org/10.3390/ijerph15122913

Machimbarrena, J. M., González-Cabrera, J., Ortega-Barón, J., Beranuy-Fargues, M., Álvarez-Bardón, A., & Tejero, B. (2019). Profiles of problematic internet use and its impact on adolescents' health-related quality of life. *International Journal of Environmental Research and Public Health, 16*(20), Article 3877. https://doi.org/10.3390/ijerph16203877

Machimbarrena, J. M., Beranuy, M., Vergara-Moragues, E., Fernández-González, L., Calvete, E., & González-Cabrera, J. (2023). Uso problemático de internet y trastorno de juego por internet: Solapamiento y relación con la calidad de vida relacionada con la salud en adolescentes [Problematic internet use and internet gaming disorder: Overlap and relationship with healthrelated quality of life in adolescents]. *Adicciones, 35*(2), 107–118. https://doi.org/10.20882/adicciones.1494

Machimbarrena, J. M., Calvete, E., Fernández-González, L., Álvarez-Bardón, A., Álvarez-Fernández, L., & González-Cabrera, J. (2018). Internet risks: An overview of victimization in cyberbullying, cyber dating abuse, sexting, online grooming and problematic internet use. *International Journal of Environmental Research and Public Health, 15*(11), Article 2471. https://doi.org/10.3390/ijerph15112471

Mihara, S., & Higuchi, S. (2017). Cross-sectional and longitudinal epidemiological studies of internet gaming disorder: A systematic review of the literature. *Psychiatry and Clinical Neurosciences, 71*(7), 425–444. https://doi.org/10.1111/pcn.12532

Montiel, I., Ortega-Barón, J., Basterra-González, A., González-Cabrera, J., & Machimbarrena, J. M. (2021). Problematic online gambling among adolescents: A systematic review about prevalence and related measurement issues. *Journal of Behavioral Addictions, 10*(3), 566–586. https://doi.org/10.1556/2006.2021.00055

Moretta, T., Buodo, G., Demetrovics, Z., & Potenza, M. N. (2022). Tracing 20 years of research on problematic use of the internet and social media: Theoretical models, assessment tools, and an agenda for future work. *Comprehensive Psychiatry, 112*, Article 152286. https://doi.org/10.1016/j.comppsych.2021.152286

Munno, D., Cappellin, F., Saroldi, M., Bechon, E., Guglielmucci, F., Passera, R., & Zullo, G. (2017). Internet addiction disorder: Personality characteristics and risk of pathological overuse in adolescents. *Psychiatry Research, 248*, 1–5. https://doi.org/10.1016/j.psychres.2016.11.008

Muñoz-Miralles, R., Ortega-González, R., López-Morón, M. R., Batalla-Martínez, C., Manresa, J. M., Montellà-Jordana, N., Chamarro, A., Carbonell, X., & Torán-Monserrat, P. (2016). The problematic use of information and communication technologies (ICT) in adolescents by the cross sectional JOITIC study. *BMC Pediatrics, 16*, Article 140. https://doi.org/10.1186/s12887-016-0674-y

Nogueira-López, A., Rial-Boubeta, A., Guadix-García, I., Villanueva-Blasco, V. J., & Billieux, J. (2023). Prevalence of problematic internet use and problematic gaming in Spanish adolescents. *Psychiatry Research, 326*, Article 115317. https://doi.org/10.1016/j.psychres.2023.115317

Núñez-Gómez, P., Larrañaga, K. P., Rangel, C., & Ortega-Mohedano, F. (2021). Critical analysis of the risks in the use of the internet and social networks in childhood and adolescence. *Frontiers in Psychology, 12*, Article 683384. https://doi.org/10.3389/fpsyg.2021.683384

Nyongesa, M. K., Ssewanyana, D., Mutua, A. M., Chongwo, E., Scerif, G., Newton, C. R. J. C., & Abubakar, A. (2019). Assessing executive function in adolescence: A scoping review of existing measures and their psychometric robustness. *Frontiers in Psychology, 10*, Article 311. https://doi.org/10.3389/fpsyg.2019.00311

Observatorio Español de las Drogas y las Adicciones [Spanish Observatory on Drugs and Addictions]. (2022). *Informe 2021: Alcohol, tabaco y drogas ilegales en España* [Report 2021: Alcohol, tobacco and illegal drugs in Spain]. https://pnsd.sanidad.gob.es/profesionales/sistemasInformacion/informesEstadisticas/pdf/2021OEDA-INFORME.pdf

Ortega-Barón, J., González-Cabrera, J., Machimbarrena, J. M., & Montiel, I. (2021). Safety.Net: A pilot study on a multi-risk internet prevention program. *International Journal of Environmental Research and Public Health, 18*(8), Article 4249. https://doi.org/10.3390/ijerph18084249

Palacios, X. (2019). Adolescencia: ¿Una etapa problemática del desarrollo humano? [Adolescence: A problematic stage of human development?]. *Revista Ciencias de la Salud, 17*(1), 5–7. https://doi.org/10.12804/revistas.urosario.edu.co/revsalud/a.7587

Petry, N. M., Rehbein, F., Gentile, D. A., Lemmens, J. S., Rumpf, H.-J., Mößle, T., Bischof, G., Tao, R., Fung, D. S. S., Borges, G., Auriacombe, M., González Ibáñez, A., Tam, P., & O'Brien, C. P. (2014). An international consensus for assessing internet gaming disorder using the new DSM-5 approach: Internet gaming disorder. *Addiction, 109*(9), 1399–1406. https://doi.org/10.1111/add.12457

Pontes, H. M., & Griffiths, M. D. (2015). Measuring DSM-5 internet gaming disorder: Development and validation of a short psychometric scale. *Computers in Human Behavior, 45*, 137–143. https://doi.org/10.1016/j.chb.2014.12.006

Pontes, H. M., Király, O., Demetrovics, Z., & 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), Article e110137. https://doi.org/10.1371/journal.pone.0110137

Salmela-Aro, K. (2011). Stages of adolescence. In B. B. Brown & M. J. Prinstein (Eds.), *Encyclopedia of adolescence* (pp. 360–368). Elsevier. https://doi.org/10.1016/B978-0-12-373951-3.00043-0

Stead, H., & Bibby, P. A. (2017). Personality, fear of missing out and problematic internet use and their relationship to subjective well-being. *Computers in Human Behavior, 76*, 534–540. https://doi.org/10.1016/j.chb.2017.08.016

Sugaya, N., Shirasaka, T., Takahashi, K., & Kanda, H. (2019). Bio-psychosocial factors of children and adolescents with internet gaming disorder: A systematic review. *BioPsychoSocial Medicine, 13*(1), 1-16. https://doi.org/10.1186/s13030-019-0144-5

Van Tetering, M. A. J., van der Laan, A. M., de Kogel, C. H., de Groot, R. H. M., & Jolles, J. (2020). Sex differences in self-regulation in early, middle and late adolescence: A large-scale cross-sectional study. *PLoS ONE, 15*(1), Article e0227607. https://doi.org/10.1371/journal.pone.0227607

Vondráčková, P., & Gabrhelík, R. (2016). Prevention of internet addiction: A systematic review. *Journal of Behavioral Addictions, 5*(4), 568–579. https://doi.org/10.1556/2006.5.2016.085

Wachs, S., Mazzone, A., Milosevic, T., Wright, M. F., Blaya, C., Gámez-Guadix, M., & O'Higgins Norman, J. (2021). Online correlates of cyberhate involvement among young people from ten European countries: An application of the routine activity and problem behaviour theory. *Computers in Human Behavior, 123*, Article 106872. https://doi.org/10.1016/j.chb.2021.106872

Wang, R., Yang, S., Yan, Y., Tian, Y., & Wang, P. (2021). Internet gaming disorder in early adolescents: Gender and depression differences in a latent growth model. *Healthcare, 9*(9), Article 1188. https://doi.org/10.3390/healthcare9091188

World Health Organization. (2010). *Orientation programme on adolescent health for health-care providers.* https://www.who.int/maternal_child_adolescent/documents/pdfs/9241591269_op_hand out.pdf

World Health Organization. (2019). *International Statistical Classification of Diseases and Related Health Problems* (11th ed.). https://n9.cl/dm7c1

Wu, Y.-J., Outley, C., Matarrita-Cascante, D., & Murphrey, T. P. (2016). A systematic review of recent research on adolescent social connectedness and mental health with internet technology use. *Adolescent Research Review, 1*(2), 153–162. https://doi.org/10.1007/s40894-015-0013-9

Yildiz Durak, H., Haktanir, A., & Saritepeci, M. (2023). Examining the predictors of video game addiction according to expertise levels of the players: the role of time spent on video gaming, engagement, positive gaming perception, social support and relational health indices. *International Journal of Mental Health and Addiction*. Advance online publication. https://doi.org/10.1007/s11469-023-01073-3

Yudes-Gómez, C., Baridon-Chauvie, D., & González-Cabrera, J.-M. (2018). Cyberbullying and problematic internet use in Colombia, Uruguay and Spain: Cross-cultural study. *Comunicar, 26*(56), 49–58. https://doi.org/10.3916/C56-2018-05

About Authors

Adoración Díaz-Lopez is a postdoctoral researcher in the Cyberpsychology research group at Universidad Internacional de la Rioja (UNIR), Spain. Her main research interests focus on cybervictimization and internet risks.

https://orcid.org/0000-0002-8841-3701

Vanessa Caba Machado is a postdoctoral researcher of the Cyberpsychology research group at Universidad Internacional de la Rioja (UNIR), Spain. Her research interests focus on internet risks.

https://orcid.org/0000-0002-1673-5998

Juan Manuel Machimbarrena, PhD, is an assistant professor of psychology at the University of the Basque Country UPV/EHU. His research interests focus on the use of new technologies by adolescents and their effect on health and health-related quality of life.

https://orcid.org/0000-0002-5506-3661

Jessica Ortega Barón, PhD, is an assistant professor and researcher in the Cyberpsychology group at Universidad Internacional de la Rioja (UNIR), Spain. Her research interest is mainly focused on the analysis and prevention of internet risks among adolescents.

https://orcid.org/0000-0001-8822-5906

Priscila Pérez-Rodríguez is a pre-doctoral researcher doing her thesis in Universidad Internacional de la Rioja (UNIR) on the overlapping risks of the internet and its relationship to the stages of adolescence.

Joaquín González-Cabrera, PhD, is a professor and the director of the Cyberpsychology research group at Universidad Internacional de la Rioja (UNIR), Spain. His research interests focus on school violence and internet risks.

Correspondence to
Dr. Joaquín González-Cabrera. Address: Centro de Investigación, Transferencia e Innovación (CITEI). Universidad Internacional de la Rioja (UNIR). Avd. de la Paz, 147. 26.006. Logroño (La Rioja), Spain, joaquin.gonzalez@unir.net