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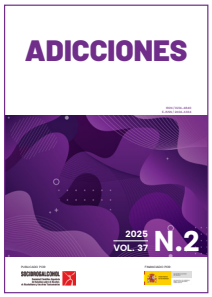

ORIGINAL

School prevention programs for problematic Internet use, problematic gambling and video game addiction in Spain: A systematic review

Programas de prevención escolar del uso problemático de Internet, juego problemático y adicción a videojuegos en España: Una revisión sistemática

Víctor José Villanueva-Blasco *, **, ***; Dalila Eslava **, ***, ****; Eduardo Ibor Bernalte ***, ****; Manuel Isorna ***, *****; Antonio Rial-Boubeta ******.

* Facultad de Ciencias de la Salud, Universidad Internacional de Valencia, Valencia, España.

** Grupo de Investigación en Salud y Ajuste Psico-Social (GI-SAPS), Universidad Internacional de Valencia.

*** Red de Investigación en Atención Primaria de Adicciones (RIAPAd), España.

**** Facultad CC Humanas y de la Educación, Universidad de Zaragoza, Huesca, España.

***** Facultad de Educación y Trabajo Social. Campus As Lagoas, Universidad de Vigo, Ourense, España.

****** Facultad de Psicología, Universidad de Santiago de Compostela, Santiago de Compostela, España.

Abstract

The present work aims to identify the school prevention programs for problematic Internet use, problematic gambling and video game addiction existing in Spain, reporting on their characteristics and effectiveness, establishing different degrees of recommendation. A systematic review was carried out with two complementary strategies: a) a search in the Xchange, Good Practices in Addictions (PPBB), Evidence-Based Prevention and EDDRA portals; b) a search of Web of Science, PudMed/MEDLINE, APA PsycInfo, Scopus or Cochrane Library. The search included the keywords "Spain", "gambling", "videogames", "Internet", "social network", "school prevention" and synonyms. Six programs were identified, of which five had empirical studies to evaluate their effectiveness. All were based on theoretical models related to the etiology of the problem, used an active and interactive methodology and were implemented by professionals with specific training. The programs ¿Qué te juegas?, Ludens and Safety.net achieved a higher degree of recommendation. For the Cubilete and PrevTec 3.1 programs, additional studies of its effectiveness are suggested. Regarding good practice portals, it is suggested that evidence be prioritized over accessibility and that the specific problem for which each program has been proven effective be clearly indicated. Based on these findings, we insist on the need to provide empirical evidence regarding any prevention strategy or program. Finally, some questions of interest are raised, such as the convenience of considering the prevention of these new problems jointly or separately.

Keywords: school prevention, problematic Internet use, problematic gambling, addiction, systematic review

Resumen

Con el presente trabajo se pretende identificar los programas de prevención escolar del Uso Problemático de Internet, Juego Problemático y Adicción a Videojuegos existentes en España, informando de sus características y de su eficacia, estableciendo diferentes grados de recomendación. Se llevó a cabo una revisión sistemática con dos estrategias complementarias: a) una búsqueda en los portales de Xchange, Buenas Prácticas en Adicciones (PPBB), Prevención Basada en la Evidencia y EDDRA; b) una búsqueda en Web of Science, PudMed/MEDLINE, APA PsycInfo, Scopus o Cochrane Library. La búsqueda incluyó las palabras clave "Spain", "Gambling", "Videogames", "Internet", "Social Network", "School Prevention" y sinónimos. Se identificaron seis programas, de los cuales cinco disponían de estudios empíricos para evaluar su eficacia. Todos se fundamentaban en modelos teóricos relacionados con la etiología del problema, utilizaban una metodología activa e interactiva y eran implementados por profesionales con formación específica. Los programas *¿Qué te juegas?*, *Ludens* y *Safety.net* alcanzaron un mayor grado de recomendación. Para los programas *Cubilete* y *PrevTec 3.1.* se sugieren estudios adicionales de su eficacia. Respecto a los portales de buenas prácticas, se sugiere priorizar la evidencia frente a la accesibilidad y señalar con claridad para qué problemática específica se ha demostrado eficaz cada programa. A partir de estos hallazgos se insiste en la necesidad de aportar evidencia empírica respecto a cualquier estrategia o programa de prevención. Se plantean finalmente algunas cuestiones de interés, como la conveniencia de contemplar la prevención de estas nuevas problemáticas de forma conjunta o por separado.

Palabras clave: prevención escolar, uso problemático de Internet, juego problemático, adicción, revisión sistemática

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■ **Send correspondence to:**
Víctor J. Villanueva-Blasco. Universidad Internacional de Valencia, C/ Pintor Sorolla, 21, 46002. Valencia, España. Tel: +34-961.924.993
Email: vjvillanueva@universidadviu.com

Parallel to the development of Information, Communication and Media Technologies [ICMT] (Gabelas & Marta, 2020), we have seen a rise in scientific and social interest in the Internet, its problematic use and its role as a catalyst for different problematic and/or risk behaviours (Fontana et al., 2022), including gambling and betting or video game addiction (Bjørseth et al., 2021; Cañas & Estévez, 2021; Cudo et al., 2018). This has been reflected in a significant proliferation of scientific publications and, at the same time, in an intense and persistent debate around clinical considerations, especially with regard to the use of the Internet and social networks. The terms *problematic use*, *abusive use*, *compulsive use*, *maladaptive use*, *pathological use* or even *Internet addiction* have often been used indiscriminately, without a clear definition of terms. This has led some authors to consider this area of research as a real 'minefield' (Ryding & Kaye, 2018). The lack of consensus and clinical evidence coincides with the fact that Internet use has not yet been considered an addiction by either the World Health Organization (WHO) or the American Psychiatric Association (APA), and the controversy between clinicians and researchers continues to be fierce (Kaess et al., 2021; Rumpf et al., 2019; Starcevic & Aboujaoud, 2017). Only gambling disorder (APA, 2013; WHO, 2019) and more recently gaming disorder (WHO, 2022) have been recognized by the scientific community as behavioural (or non-substance) addictions in their own right.

Taking the concept of problematic Internet use (PIU) as a reference, this could be considered, as proposed by Baggio et al. (2018) or Starcevic and Aboujaoude (2017), as an "umbrella construct" covering different behaviours associated with a certain loss of control and usually causing deterioration and distress, potentially leading to psychological, social, academic and/or professional issues (Baloğlu et al., 2020; Caplan, 2002; Fineberg et al., 2018; Gómez et al., 2014; Laconi et al., 2019). The increasing prevalence figures, especially among the adolescent population, indicate that it represents a public health problem (WHO, 2014). The UNICEF-Spain study, with a sample of more than 50,000 Spanish students in compulsory secondary education, revealed a PIU rate of 33% (Andrade et al., 2021). However, authors such as Nogueira-López et al. (2023) have not hesitated to question the criteria used, placing this prevalence instead at a mere 2.98% and at the same time warning of a serious risk of over-pathologization.

Regarding gambling disorder, this was classified by the World Health Organization (WHO) in the International Classification of Diseases [ICD-10] (WHO, 1992). It was initially considered to be an impulse control disorder, with levels and stages that reflect the degree of involvement in gambling, and later included in the Diagnostic and Statistical Manual of Mental Disorders [DSM-5] (APA, 2013) in the chapter on "substance-related and addictive disorders". The DSM-5 uses different terms to classify people based on their gambling patterns thus: a) problem gambling, when it involves excessive gambling behaviour causing some problems but without a very significant impact; and, b) gambling disorder, which can be differentiated as mild, moderate or severe. In Spain, 17.7% of adolescents aged between 14 and 18 years gambled for money in person in the last year, and 10.7% did so online, with 20.5% and 23.5% of these players respectively reporting possible problem gambling (Observatorio Español de las Drogas y las Adicciones [OEDA], 2023). It is estimated that the prevalence of possible problem gambling in Spain could be almost three times higher in the 14- to 18-year-old population (4.7%) than among those aged 15 to 64 (1.7%) (OEDA, 2023). Moreover, this is a particularly relevant problem since an earlier age of onset is normally associated with a greater likelihood of developing an addiction and that this will be of greater severity (Monreal-Bartolomé et al., 2023).

As for video games, these constitute an increasingly common leisure alternative in childhood and adolescence, with 79% of children aged between 6 and 10 years and 84% of those aged between 11 and 14 years regularly playing video games (AEVI, 2023), potentially leading to a new form of addiction some cases. In the last decade, the literature has been responsible for highlighting the addictive potential of certain video games, which has led to the inclusion in Section III of the DSM-5 (APA, 2013) of the so-called Internet gaming disorder. The essential characteristic of this disorder is the persistent playing of video games over many hours, usually in the company of other players, resulting in clinically significant deterioration or discomfort. The WHO incorporated gaming disorder into the ICD-11 (2022), but in contrast to the APA proposal, this disorder may be caused by both offline and online gaming behaviours. At the epidemiological level, it is noted that in Spain between 3% (Andrade et al., 2021) and 5.1% (OEDA, 2023) of adolescents between 14 and 18 years of age may present a gaming disorder.

The social and health repercussions of these three problems justify the social concern raised and, consequently, their specific consideration in the design of public policies, for example, the *National Strategy on Addictions* 2017-2024 (Ministry of Health, Social Services and Equality, 2017). They have become more prominent among the actions to be developed within the area of prevention in the last decade, a priority line of action being prevention in the adolescent population. This is usually focused on the school context, which enables access to a large number of adolescents in an optimal environment (Fonseca-Pedrero et al., 2023a), offering effective results (Throuvala et al., 2019) and high cost-effectiveness (Deogan et al., 2015). However, it is a reality that interventions differ in terms of organization, methodology, duration and effectiveness,

and this has led to a growing interest in promoting as good practice only those programs that have proven evidence of their effectiveness.

Evidence on school-based prevention programs aimed at preventing problematic Internet use, gaming, and gambling indicates that their effectiveness must be supported by an adequate theoretical conceptualization (Keen et al., 2016), the use of booster sessions (Ren et al., 2019), community involvement (Cañas & Estévez, 2021), assessment with behavioural measures (Keen et al., 2016), and designs with six-month follow-up measures (Monreal-Bartolomé et al., 2023). Various universal prevention programs address these problems by promoting psychosocial skills and risk awareness, and reducing associated symptoms (Fumero et al., 2021; Throuvala et al., 2019). At a global level, some of the school-based programs with empirical evidence are: the PROTECT program (Lindenberg et al., 2017), the PATHS project (Shek et al., 2011), the BEST Teen Program (Shek et al., 2016) and the Cyberhero Mobile Safety educational platform (Hswen et al., 2014). These programs, unlike those addressing substance addictions, work primarily on the basis of education and harm reduction (Fumero et al., 2021).

Although there are reviews analyzing the situation regarding prevention of non-substance addictions in adolescence worldwide (Cañas & Estévez, 2021; Giménez & Morales, 2022; Melodia et al., 2020), to our knowledge, this situation has not been analyzed in Spain. The following research questions are therefore raised: How many school programs for the prevention of PIU, problematic gambling, and gaming addiction are indexed on good practice portals? What levels of effectiveness do they demonstrate individually? Consequently, the present study pursued the following specific objectives: 1) to identify the prevention programs for PIU, problematic gambling, and gaming addiction available on good practice portals; 2) to report the level of effectiveness demonstrated by each program; 3) to compare the characteristics of the programs that include an assessment of their effectiveness with those that, despite being on good practice portals, do not include any assessment; and, 4) establish degrees of recommendation based on the suitability of each program and the available evidence.

Method

This systematic review followed the PRISMA guidelines for preparing systematic reviews and meta-analyses (Page et al., 2021). It was also registered in the PROSPERO database (CRD42023440613).

Search strategy and information sources

Regarding the first objective, a search was carried out in the portals that cover addiction prevention programs: Xchange (EMCDDA, n.d.), Portal de Buenas Prácticas en Adicciones (good practices in addictions portal, (PPBB), DGPNSD, n.d.), Prevención Basada en la Evidencia (evidence-based prevention, Socidrogalcohol, n.d.) and EDDRA (OEDT, n.d.). The search set Spain as the country limit and schools as the prevention area. The keywords used were: betting – gambling – video games – social networks – internet – ICT. The search was carried out from April 2023 to February 2024.

For the second objective, a search was conducted in scientific article databases. The search was conducted from April 2023 to February 2024. The following databases were used: Web of Science, PudMed/MEDLINE, APA PsycInfo, Scopus and Cochrane Library, with no date limitation. The search included the keywords "Spain", "gambling", "videogames", "internet", "social network", "school prevention" and synonyms. These terms were combined following this search strategy: "Spain" AND ("school prevention" OR "school intervention" OR "preventive program" OR "prevention program" OR "school-based" OR "school environment" OR "family prevention" OR "community prevention" OR "addiction prevention") AND ("gambling" OR "videogames" OR "internet" OR "problematic internet use" OR "compulsive internet use" OR "internet addiction" OR "internet use disorder" OR "online" OR "offline" OR "gamming" OR "gaming" OR "social network").

Inclusion criteria

Studies were included if they a) included prevention programs in schools; b) were conducted in Spain; and c) addressed Internet use, gambling, or video game addiction. In addition, for the second objective, the following criteria were also applied: d) published in peer-reviewed scientific journals; and e) written in English or Spanish.

The following studies were excluded: a) articles addressing substance addictions; b) bibliographic and systematic reviews, meta-analyses, books, book chapters, and conference papers; c) studies focused on interventions without published results; d) preventive interventions not protocolized as a program; and, e) studies that did not assess program results.

Selection process

Two authors (DE and VJVB) independently assessed the titles and abstracts of each study to decide whether they met the inclusion criteria. To reduce bias, the researchers reviewed the programs independently, without having contacted the authors nor participated in their development. Discrepancies were resolved in critical discussion with the other authors until consensus was reached. Each author then individually assessed the full text of the articles, and studies not meeting the inclusion criteria were excluded. In addition, a reverse search was performed on the reviewed publications for eligibility in order to identify articles not indexed in these databases (Figure 1).

In the scientific databases, the present review generated a total of 313 records after eliminating duplicates. On review of the titles and abstracts, 301 studies were excluded. This high number of excluded records included descriptive and exploratory studies on ICMT and publications that addressed other problems using technology as a medium. The full text of the remaining 12 articles was reviewed, and following a reverse search, four more studies were obtained. Of these 16, ten were excluded because they were: a) systematic reviews (n = 6), b) preventive interventions not protocolized as a program (n = 1) and c) studies that did not carry out an evaluation of the results of the program (n = 3). Thus, a total of six studies were included in the review: four on different programs evaluated (*¿Qué te juegas?*, *Ludens*, *Cubilete* and *PrevTec 3.1*) and two on the same program (*Safety.net*). The good practice portals yielded three programs (*¿Qué te juegas?*, *Ludens* and *Tú decides*), so, with two of them found in both sources, our systematic review covered a total of six programs.

Data extraction

Two authors (DE and VJVB) independently extracted data from each program into customized tables, covering the following data: a) name of the program; b) authorship; c) year; d) problem addressed; e) target population; f) level of prevention; g) theoretical model; h) implementation methodology; i) number of sessions; j) profile of the implementers; k) main components; and l) publications regarding its effectiveness.

Methodological quality assessment

The Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018) was used to assess the methodological quality of the articles. This is a critical appraisal tool designed for systematic reviews that include quantitative, qualitative and mixed empirical studies. For randomized controlled trials, the scale for RCTs was used, while the scale for non-randomized quantitative studies was used with quasi-experimental studies.

Figure 1
Flow chart

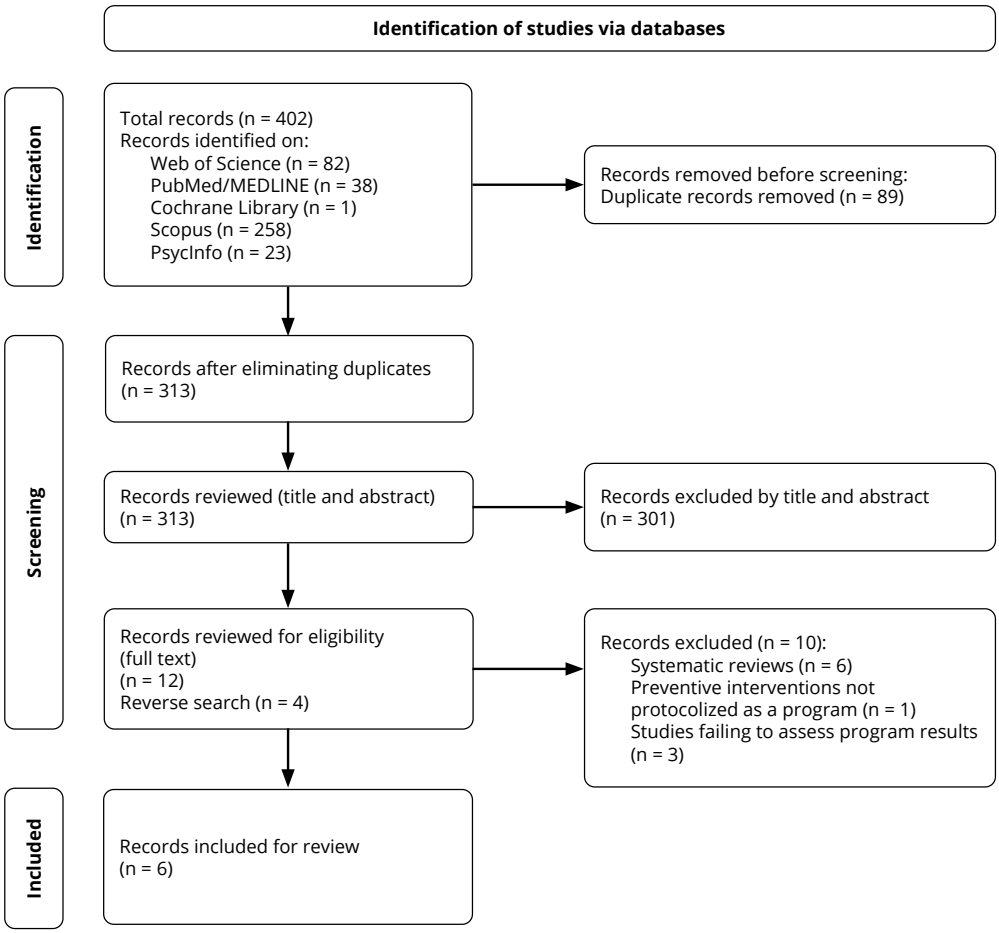

Table 1
Evaluating methodological quality for RCTs

Reference	Q1	Q2	Q3	Q4	Q5	% compliance
Lloret-Irles and Cabrera-Perona (2019)	Yes	Yes	Yes	No	Sí	80
Marco and Chóliz (2017)	Yes	Yes	Yes	No	Sí	80

Note. Q1: Is randomization performed correctly? Q2: Are the groups comparable at baseline? Q3: Are there complete outcome data? Q4: Are outcome assessors blinded to the intervention provided? Q5: Did participants adhere to the assigned intervention?

Table 2
Assessment of methodological quality for quasi-experimental studies

Reference	Q1	Q2	Q3	Q4	Q5	% compliance
Berrios et al. (2020)	Yes	Yes	Yes	No	Yes	80
Chóliz et al. (2022)	No	Yes	Yes	Yes	Yes	80
Ortega-Barón et al. (2021)	No	Yes	Yes	Yes	No	60
Ortega-Barón et al. (2024)	Yes	Yes	Yes	Yes	No	80

Note. Are participants representative of the target population? Q2: Are measurements appropriate for both the outcome and the intervention (or exposure)? Q3: Are outcome data complete? Q4: Are confounders accounted for in the design and analysis? Q5: During the study period, was the intervention (or exposure) administered as intended?

The assessment of each study's methodological quality is presented in Tables 1 and 2. All studies met a minimum of 60% of the criteria, and the average percentage of criteria met was 76.67%.

Assessing the quality of preventive programs

To judge the quality of preventive programs, the assessment established in the good practice portals in which they were indexed was reported. The assessment criteria are public and can be consulted at: Xchange (https://www.emcdda.europa.eu/best-practice/xchange/about#section6), Portal BBPP Adicciones (http://www.buenaspracticasadicciones.es/bbpp/queesbuenapractica.jsf) and Prevención Basada en la Evidencia (http://www.prevencionbasadaenlaevidencia.net/index.php?page=Criterios).

For preventive programs not indexed in good practice portals, the following quality classification criteria were applied: a) *Very low or no evidence*, when evidence of effectiveness was lacking; b) *Low*, in the case of an evaluation that demonstrated effectiveness, but with methodological quality below 60%; c) *Moderate*, if there was an evaluation demonstrating effectiveness with methodological quality equal to or greater than 60%; and d) *High*, if several evaluations demonstrated its effectiveness with methodological quality equal to or greater than 60%.

Regarding the programs' degrees of recommendation, the following classification criteria were applied: a) *Not recommended*, if the quality of evidence was non-existent, very low, or low, or if the methodological quality score was below or equal to 40%; b) *Recommended with further study*, if the quality was moderate, and c) *Recommended*, if the quality was high.

Results

Table 3 presents the prevention programs identified through good practice portals and by searching for studies evaluating their effectiveness. Table 4 contains information on the evidence of their effectiveness and includes a recommendation.

Prevention programs with efficacy assessment studies for PIU, gambling and video game addiction

Our study found a total of six universal prevention programs aimed at adolescents for PIU, gambling, and video game addiction. Of these, five present one or two assessments of their effectiveness, while the *Tú Decides* program does not contain an assessment, at least not published in peer-reviewed journals. The main findings are shown below.

¿QTJ? - ¿Qué te juegas?

In a study with a sample of 415 adolescents (15 – 17 years), Llorent-Irles et al. (2019) assessed the *¿QTJ? - ¿Qué te juegas?* program. A randomized design with a control group was used, with pretest and posttest measures one week after implementation. The results obtained were significant with a small-moderate effect. The group receiving the

Table 3
Prevention programs identified and their main characteristics

Program	Authors and year	Problem area	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Implementer profile	Principal components
¿QTJ? - ¿Qué te juegas?	Lloret-Irles, Cabrera & Castaños (2021)	Problematic gambling	Adolescents (14-17 years)	Universal	- Theory of Planned Action - Cognitive models - Social learning models	50-minute sessions with information, debate, group dynamics, watching video and case comments	4 sessions	Psychologists specialized in addictions	- Reduce pro-gambling beliefs and attitudes - Understand the consequences of gambling disorder - Identify cognitive biases related to the illusion of control, probability and expectations of success in gambling - Promote a critical stance and response to gambling advertising - Promote reflective thinking and self-efficacy in the face of peer pressure
Ludens	Chóliz (2022)	Problematic gambling	Adolescence, young people, adult population, over 65s (14-over 65 years)	Universal and selective	- Biopsycho-social approach involving psychological, sociological and cultural factors - Principles of ethical gambling	Sessions developed through audiovisual content: diagrams, news, testimonials, techniques used in advertising	2 sessions	Prevention technicians (psychologists) and counsellors	- Information about gambling, types of gamblers and mental health consequences - Awareness-raising about the economic interests of the sector in promoting gambling in society and about mental health consequences (addiction) - Guidelines for action to avoid exposure to gambling and to avoid risky gambling behaviour
Cubilete	Berrios, Pérez, Sánchez & Pantoja (2020)	Internet, mobile phone, Problematic online gambling	Adolescents	Universal	n.s.	Information sessions, real case videos and participatory activities	4 sessions	Psychologist specialized in addictions and compulsive disorders	- Risks and consequences of misuse and abuse of ICT - Terminological information on offline and online problem gambling - Symptoms derived from offline and online problem gambling - Recommendations for the prevention of gambling, the proper use of new technologies and the Internet, alternatives and amount dedicated to free time
Safety.net	Ortega-Barón, González-Cabrera, Machimbarrena & Montiel (2021)	Internet, mobile phone, gaming, Problematic online gambling	Adolescents (11-14 years)	Universal	- Theory of Planned Action - Social co-construction model - Cumulative risk model - Empowerment theory	Information sessions, group activities, reflections and recommend-dations	16 sessions	Teachers after 30 hours' training	- Digital skills: raising risk awareness and providing skills to prevent digital victimisation and dysfunctional Internet use - Relational risks: raising awareness of the seriousness of risks arising from relationships with other people through the Internet - Dysfunctional risks: raising awareness of the seriousness of the risks arising from dysfunctional use of the Internet - Changing attitudes and cognitions: promoting skills, competencies and abilities to better deal with internet risks
PrevTec 3.1: Gaming module	Marco & Chóliz (2017)	Gaming	Students (9-16 años)	Universal	n.s.	Audiovisual resources and doing group and individual tasks	3 sessions	Psychologists and 4th year students on Psychology Degree	- Schedule for video game use - Alternative free time activities - Show video games to parents and avoid online multiplayer video games - Techniques to control impulsiveness
Tú decides	Calafat & Amengual (2008) Calafat & Amengual (2019) Calafat & Amengual (2021)	Alcohol, smoking and illegal drugs Internet and social networks	Adolescents (11–19 years)	Universal	- Health Belief Model - Decision making - Escalation of use - Active role of peers - Alternatives to use	Pamphlets, stories, group dynamics	6 sessions (only 1 session on Internet and social networks) and 4 sessions for parents	Trained teachers (14 hours)	Social influences: peer pressure and affective and cognitive factors intervene when making health-related decisions

Note. n.s. = not specified.

Table 4
Evidence of the effectiveness of the prevention programs identified

Program	Authors and year	Indexing in good practices portal	Publications on effectiveness	Quality assessment* (Recommendation)**
¿QTJ? - ¿Qué te juegas?	Lloret-Irles et al. (2021)	Portal BBPP Adicciones	Lloret-Irles & Cabrera-Perona (2019)	Good practice[2] (Recommended)
Ludens	Chóliz (2022)	Portal BBPP Adicciones	Chóliz et al. (2022)	Good practice[2] (Recommended)
Cubilete	Berrios et al. (2020)	Not included	Berrios Aguayo et al. (2020)	Moderate[4] (Recommended with additional studies)
Safety.net	Ortega-Barón et al. (2021)	Not included	Ortega-Barón et al. (2021) Ortega-Barón et al. (2024)	High[4] (Recommended)
PrevTec 3.1: Gaming module	Marco & Chóliz (2017)	Not included	Marco & Chóliz (2017)	Moderate[4] (Recommended with additional studies)
Tú decides	Calafat & Amengual (2008) Calafat & Amengual (2019) Calafat & Amengual (2021)	Prevención Basada en la Evidencia Xchange Portal BBPP Adicciones	n.s.	Additional studies recommended [1,2] Moderate quality[3] (Recommended with additional studies)

Note. * = Quality assessment according to the indexing portal; ** = Degree of recommendation of the programs; 1 = Xchange; 2 = Portal BBPP Adicciones (best practice in addictions portal); 3 = Prevención Basada en la Evidencia (evidence-based prevention); 4 = Assessment established in the present study; n.s. = not specified.

intervention presented higher risk perception (d = 0.21) and self-efficacy to avoid gambling (d = 0.24), lower intention to gamble (d = 0.16), lower illusion of control and lack of knowledge of probability (d = 0.49), and more negative attitude towards advertising (d = 0.33) than before the intervention. In contrast, the control group showed changes in risk perception (d = 0.24) and the illusion of control and lack of knowledge of probability (d = 0.17), both decreasing. Regarding intergroup differences in the posttest, the experimental group presented a higher perception of risk (d = 0.30) and a lower illusion of control and lack of knowledge of probability (d = 0.43) than the control group.

Ludens

Chóliz et al. (2022) assessed the *Ludens* program with a sample of 2372 adolescents (14-19 years). They used pretest and posttest measures one month after its implementation. The results of the program assessment were significant with a small effect. After the intervention, the percentage of adolescents who participated monthly in traditional gambling (lottery, casinos, slot machines, etc.) and online gambling (betting, slot machines, roulette, etc.) decreased compared to the pretest measure (X^2= 99.23, *Phi* = .15; X^2= 39.93, *Phi* = .10, respectively). The risk of participating in gambling decreased (X^2 = 41.43, *Phi* = .10), as did the probability of presenting gambling disorder (X^2 = 6.17, *Phi* = .04). These results were similar when the sex and age of the participants were considered, with the exception of the probability of presenting gaming disorder, which was not statistically significant for girls and adolescents aged 18 to 19 years.

Cubilete

Berrios et al. (2020) evaluated the *Cubilete* program through a study with 637 high school and college students, with pretest and posttest measures after its implementation. The results were statistically significant. After the program, participants spent less money on computer-linked items, online games, mobile phones, applications and games of chance (X^2 = 333.23). They showed less monthly spending on the mobile phone (X^2 = 116.57) and lower use of gambling on this device (X^2 = 80.96). They also showed a lower frequency in the use of the computer ($X2$ = 289.77), but greater use of it to search for information in schoolwork (X^2 = 45.34). Finally, after the intervention, participants were more aware of the dependence they felt on technologies with an internet connection ($X2$ = 16.23) and that they spent too much time on the mobile phone (X^2 = 35.88). The influence of being convinced by third parties was also reduced (X^2 =37.13).

Safety.net

The *Safety.net* program was evaluated through two studies. In the first, Ortega-Barón et al. (2021) assessed the effectiveness through a study with a sample of 165 students (11-14 years old). A design with pretest and posttest measures after implementation and a control group was used. The program presented statistically significant results with a small-moderate effect. In PIU, nomophobia and online gaming disorder, the *time x group* interaction was statistically significant (η^2 = 0.05, η^2 = 0.12 and η^2 = 0.03, respectively), with the experimental group presenting lower scores. However, the program had no effect on the presence of gambling disorder. On the other hand, in the

relational aspect, a positive effect was also found in the *time x group* interaction in grooming (η^2 = 0.12), with the experimental group showing a lower score. No significant results were found in this interaction in cybervictimization, sexting and cyber violence in couples. However, in the case of cybervictimization, significant results were found in time and in the group in isolation (η^2 = 0.08 and η^2 = 0.01, respectively).

The second study, by Ortega-Barón et al. (2024), evaluated the effectiveness with a sample of 726 students (11-14 years) from five Autonomous Communities. A control group design was used, with pretest and posttest measurements between 20 and 30 days after implementation. The program presented statistically significant results with a small effect size. In PIU and nomophobia, the *time x group* interaction was statistically significant (η^2 = 0.03 and η^2 = 0.03, respectively), with the experimental group yielding lower scores, while no significant effect on internet gaming disorder and online gambling disorder was found. In the relational aspect, in cybervictimization, grooming and victimization of partner abuse, the *time x group* interaction was also significant (η^2 = 0.02, η^2 = 0.01 and η^2 = 0.05, respectively). In the first two, the experimental group scores were lower, while in the case of victimization in partner abuse, the score increased in both conditions, although less in the experimental group. No significant results were found in this interaction in sexting and in cyberbullying between peers and intimate partners.

PrevTec 3.1. – video game module

Marco and Chóliz (2017) used a sample of 1110 adolescents to study the effectiveness of impulsivity control techniques in the video game module of the PrevTec 3.1 program. To do so, they used a randomized design, gathered a control group with pretest - posttest (final session) measures and two experimental conditions with these measures pretest - posttest (final session) - follow-up (at three months): (1) a group receiving the prevention program in the traditional condition and (2) a group receiving the prevention program with additional impulsivity control techniques. After the assessment, the authors found statistically significant results with a small effect size. In the control group, no differences were found between pretest and posttest. Meanwhile, in the two experimental groups, a lower frequency of video game use was found in the two measures, as well as fewer hours of play and perceived dependence. However, while there were no statistically significant differences between post-test and follow-up in the traditional program group, such differences were found in the group using additional techniques. That is, once the intervention was carried out, the score on the variables continued to decrease in that group.

In the case of video game dependency, where only pretest-follow-up measurements were taken, a lower score was found at follow-up in both groups, with the magnitude of change being greater in the group with additional techniques. Both modalities therefore present a certain degree of effectiveness, with the long-term effect being greater when impulsivity control techniques are included.

Tú decides

The assessment studies of the *Tú decides* program were focused on substance use, not PIU. Therefore, there is no evidence of its effectiveness for this issue.

Comparison of the characteristics of the evaluated and non-evaluated preventive programs

Table 5 compares the main characteristics of the preventive programs found in the present study, depending on whether or not they had studies evaluating their effectiveness.

Discussion

The aim of this systematic review was to analyze the situation of school prevention of PIU, problematic gambling and video game addiction in Spain. While there are a multitude of programs for substance use prevention, although not all of them have been able to demonstrate their effectiveness (Medina-Martínez & Villanueva-Blasco, 2023; Villanueva-Blasco et al., 2025), only very few programs exist for the prevention of PIU, problematic gambling and gaming addiction. This is not essentially a problem, as it is not so much a question of quantity but rather of quality. Nevertheless, it shows an imbalance between the size of the problem evidenced by the epidemiological data, the social and health concerns raised and the few prevention programs that exist. Although various authors warn of the risk of over-pathologizing normal behaviours in the use of the Internet and screens (Billieux et al., 2015; Nogueira-López et al., 2023; Stein et al., 2018), prevention is the best strategy to avoid escalation in the continuum from use to problematic use to addiction.

First, there is a noteworthy difference between the number of publications found (n = 315) and the number of articles finally included in the review (n = 6). This difference may be due to the lack of conceptualization of ICMT and publications on approaches to prevention, a fact that may be an important limitation in clarifying what is being done and how its effectiveness is measured.

The present review found that five of the six programs analyzed (83%) have had their effectiveness assessed. In comparative terms, this percentage is higher than that of school prevention programs for drug use that have been evaluated, since according to Medina-Martínez and Villanueva-Blasco (2023) and Villanueva-Blasco et al. (2025), these represent only 37.5%. It would therefore be a reasonable assumption that efforts should not be directed

Table 5
Comparison of characteristics between assessed and non-assessed prevention programs

	Programs with effectiveness assessment (5 programs)	**Programs without effectiveness assessment (1 program)**
Problem area	Internet (40%), mobile phone (40%), gambling (60%), gaming (40%)	Alcohol, smoking, cannabis, Internet and social networks
Target population	Adolescents (9-17 years)	Adolescents (11-19 years)
Level	Universal (100%)	Universal (100%)
Theoretical model	- Theory of Planned Action (40%) - Cognitive models (20%) - Social learning models (20%) - Biopsychosocial approach (20%) - Principles of ethical gambling (20%) - Social co-construction model (20%) - Cumulative risk model (20%) - Empowerment theory (20%) - Not specified (40%)	- Health Belief Model - Decision-making - Escalation of use - Active role of peers - Alternatives to use
Application methodology	Information (60%), debate (20%), group dynamics (60%), watching videos (80%), testimonies and cases (60%), news and advertising (20%), reflections (20%)	Pamphlets, stories, group dynamics
Nº sessions (nº booster sessions)	2-16 sessions	1 session
Implementer profile	Psychologists (80%) or trained teachers (20%)	Trained teachers
Principal components	Raise awareness of risks and consequences; identify and reduce cognitive biases; promote skills and competencies; set a schedule and propose alternative leisure time options; raise awareness of economic interests and how advertising works; involve parents	Peer pressure and factors that influence decision making

towards the creation of new programs, but rather towards the improvement, assessment and dissemination of those that already exist and have proven effective. Of the programs evaluated, those with the highest recommendation are *¿QTJ?*, *Ludens*, and *Safety.net*. The *Cubilete* and *PrevTec 3.1* programs would be recommended when more studies are done to confirm their effectiveness.

The effectiveness of programs is directly related to their design. It is essential that prevention programs are designed on the basis of scientific evidence (Fonseca-Pedrero et al., 2023b; Throuvala et al., 2019; Villanueva-Blasco et al., 2025). For the prevention of PIU, problematic gambling, and gaming addiction, there are currently no international standards guiding the design of prevention programs as there are for the prevention of substance use. The United Nations Office on Drugs and Crime [UNODC] (2018) establishes that the most effective school-based drug prevention programs feature the following characteristics: a) they are based on models of competence and social influence; b) they use interactive methods; c) they have 10-15 structured sessions, with booster sessions; d) they are implemented by trained experts. Progress must be made in the assessment of prevention programs addressing behavioural addictions in order to achieve the quality standards that guide their design. Given that the availability and accessibility offered by the Internet is a serious risk factor for the development of the three problems of interest, this challenge is a priority, and in response to this, it is necessary to have better and more effective preventive tools.

With this issue in mind, it is essential for all interventions to be based on theoretical postulates (Vadrucci et al., 2016). Programs with designs evidencing a mature theoretical conceptualization are more likely to produce behavioural changes (Keen et al., 2016). At the etiological level of the problems addressed in this review, Espada and Gonzálvez (2021) focused on three theoretical models of reference: (1) Social Learning Theory (Bandura, 1986); (2) the Theory of Reasoned Action (Fishbein & Ajzen, 1975); and (3) the Theory of Planned Action (Ajzen, 1985). In the present review, the programs that have been shown to be effective in changing beliefs (*¿QTJ?* and *Safety.net*) are based on the Theory of Planned Action and Social Learning Theory. Other models on which they are based are the Social Co-construction Model (Subrahmanyam & Smahel, 2011), the Cumulative Risk Model (Evans et al., 2013) or Empowerment Theory (Rappaport, 1987). On the other hand, the *Ludens* program, which was shown to be effective for behavioural change, is based on an ethical gambling

model (Chóliz et al., 2018) which considers gambling from a socioeconomic and psychological perspective. Other programs (*Cubilete* and *PrevTec 3.1*) did not specify the theoretical model on which they were based, which is a limitation for understanding the approach that guides these interventions.

Cañas and Estévez (2021) point out that the effective components used in PIU prevention are raising awareness about negative consequences, providing self-regulation skills and time control. In the present review, the *Cubilete* and *Safety.net* programs incorporated among their components raising awareness of the risks and consequences of misuse and abuse of technologies and the Internet, promoting skills and competencies to guard against these risks, and providing recommendations for good use and alternatives for free time. Both programs managed to reduce the time spent using devices connected to the Internet in the short term.

In the prevention of problem gambling, the literature points out that reducing false beliefs and promoting awareness of the risks of this practice are effective components (Giménez & Morales, 2022). Emotional regulation is another important component, necessary in response to the relationship between gambling and emotional instability (Jara-Rizzo et al., 2019). In the present review, the *Cubilete*, *¿Qué te juegas?* and *Ludens* programs included components along these lines: identifying and reducing cognitive biases, raising awareness about economic interests of the industry and how advertising works, and promoting skills to avoid exposing oneself to these behaviours, and avoiding risky behaviours. The *Cubilete* program managed to reduce mobile spending and use in gambling in the short term. The *¿Qué te juegas?* program led to cognitive changes resulting in higher risk perception and lower intention to gamble, less ignorance about probability and less illusion of control, as well as a more negative attitude towards advertising. Participants in the *Ludens* program noted behavioural changes, reducing the prevalence of online and offline gambling, as well as the risk of gambling and of presenting a gambling disorder. Finally, the *Safety.net* program, within its approach to dysfunctional Internet use, also included problematic gambling in one of its sessions, but no significant changes in either of its two assessment studies were found.

Regarding the prevention of video game addiction, Király et al. (2017) noted that effective components included controlling game time, encouraging other types of leisure activities, addressing their addictive characteristics, and working with families. In line with the literature, the two programs that address the use of video games (*Safety.net* and *PrevTec 3.1*) worked on the above-mentioned component types, specifically, knowing the risks of gaming abuse, setting an alternative schedule and leisure time, involving parents and working on impulse control techniques. Both programs managed to reduce the time spent using online video games.

In terms of the level of prevention, all the programs are universal in nature. This fact highlights a significant insufficiency because what is actually needed is the design and assessment of selective and indicated prevention programs aimed at PIU, problematic gambling, and gaming addiction. Efforts designing new programs or adapting existing ones should point in this direction. There is evidence indicating that adolescents with certain characteristics and profiles, such as depressive symptoms, anxiety, ADHD, or impulsive traits, are at greater risk of developing these problems (Restrepo et al., 2020; Walther et al., 2012). An example of the possible direction in which to go is the PiensaTIC program (Díaz-Salabert & Gómez-Torres, 2019), which was excluded from the present review because it did not include results assessment. It presents an interesting proposal for selective prevention based on the SBIRT model, the methodology of which involves adapting the contents to the person's level of risk and their motivation for change.

Regarding methodology, all programs used an informative, dynamic strategy, with case work and examples, trying to encourage student participation. In addition, in all cases, the program was delivered by specialised technicians or teachers who had received specific training. The *Ludens* and *¿Qué te juegas?* programs consist of only two and four sessions, respectively, implemented by psychologists or prevention technicians specialising in addictions. The low number of sessions makes them of considerable interest at a practical level; however, doubts may be raised as to their long-term effectiveness and the maintenance of benefits over time. For its part, the *Safety.net* program consists of 16 sessions and can be implemented by the teachers themselves at the educational centres, once they have received the appropriate training. It would be interesting to determine through longitudinal studies the maintenance of the effects of these three programs, with an analysis of the relative importance that both the number of sessions and the profile of the implementers may have.

In terms of the measures assessed to establish the effectiveness of the programs, *Ludens*, *Cubilete* and *PrevTec 3.1.* considered behavioural measures, while *¿Qué te juega?* and *Safety.net* were limited to cognitive variables. Keen et al. (2016) have pointed out that, although the relationship between motivations and behaviour is close, it does not mean that they will lead to changes in behaviour, and it is necessary to use behavioural measures to really judge effectiveness. The level of effectiveness of the programs assessed was small to moderate, an effect level that could be enhanced by considering adjustments in program design along the lines of what Tani et al. (2021) and Williams et al. (2010) pointed out in programs on gambling in Italy and Canada, respectively. These featured similar components

to the programs found in Spain, while also involving the educational community with training for teachers and transversal school activities. Cañas and Estévez (2021) have pointed out that programs considering the peer group, teachers and family in the intervention achieve greater effectiveness and long-term maintenance of benefits.

The main differences between prevention programs with published assessments of their effectiveness (*¿QTJ?*, *Ludens?*, *Safety.net*, *PrevTec 3.1.* and *Cubilete*) and the one that has not been evaluated (*Tú decides*) can be found in the theoretical framework, the number of sessions and main components. Focusing on the limitations of the assessed programs, although they are shown to be effective in the short term, none of them report effectiveness more than six months after implementation, which would be recommendable (Giménez & Morales, 2022; Monreal-Bartolomé, 2023). This means that the long-term impact of these interventions cannot be determined. Immediate assessment after implementation of the program is by no means sufficient since the changes achieved tend to decrease once the program has concluded and can fade very quickly over time (Skara & Sussman, 2003). Moreover, none of the programs have booster sessions. In a gambling prevention program in the United States, Ren et al. (2019) observed the best results precisely when booster sessions were applied. Finally, the assessment of program effectiveness was carried out by the authors themselves, and additional evaluation studies, preferably carried out by external and independent assessors are recommended.

Additionally, it is important to point out some additional issues in relation to the programs evaluated in this review. According to the *Buenas Prácticas en Adicciones* portal, the program *¿Qué te juegas?* consists of four sessions, one more than the number stated in the assessment study, which suggests that the program has since been expanded without subsequent evaluation. Regarding the *Ludens* program, the *Buenas Prácticas en Adicciones* portal indicates that it is also a selective prevention program. However, it is not known that this program has been assessed in these terms, and a justification of its suitability and effectiveness is necessary to sustain such a category. On the other hand, *PrevTec 3.1.* is a program that consists of three modules, which address the use of mobile phones, the Internet, and video games. However, only one scientific article was found that assessed its effectiveness, and that only on video games, so it can only be classified as an effective program at that level. There are three conference papers presenting assessment related to the use of mobile phones and the Internet, reporting promising results (Marco et al., 2010; Villanueva et al., 2010a, 2010b), but they have not been endorsed in studies published in peer-reviewed journals.

The *Tú decides* program had historically focussed on preventing substance use. In 2008, it included a session that addressed the use of the Internet and social networks, but no modification of the theoretical framework was found in line with these new specificities. Although this program has three effectiveness assessments related to substance use, no studies have been found measuring the effectiveness of this new session. In this regard, it would be advisable for portals indexing good practices to specify clearly and prominently on which problems the program has been proven effective, also explaining the lack of evidence regarding those sessions that have not yet been assessed.

Meanwhile, three of the six programs analyzed in this review with an effectiveness assessment do not appear indexed in the good practice portals. Nevertheless, there is evidence of the existence of other prevention programs that address these problem behaviours and that are not registered in good practice portals, nor have their effectiveness assessed through peer review, but have instead carried out an assessment and published it in other dissemination formats. An example is the DIP TIC program (Sanz et al., n.d.), which addresses the use of the Internet, mobile phones, social networks and video games. Its results reported evidence of its effectiveness, but despite being manualized, it is not indexed in any portal, nor is its effectiveness study published in a peer-reviewed journal. This suggests that the process of including the preventive programs assessed in these portals should be more proactive. Perhaps funding initiatives for those programs that are assessed and indexed, and a restriction on public funding for those that are not assessed or indexed could be an alternative that would allow progress in the dissemination of best practices in the prevention of non-substance addictions.

Finally, it is worth asking whether these problems occur in a dissociated manner or if they tend to manifest together. Digital immersion causes these three problems to permute in hybrid models where it is difficult to differentiate them and, consequently, to intervene on them. For example, social media activity or gambling is present in video game contexts through the elements of interactivity or betting components (King et al., 2010; Kuss & Griffiths, 2012; Throuvala et al., 2019). This can also be seen between video games and games of chance, for example, through loot boxes, representing greater exposure to gambling opportunities and behaviours indirectly, while playing video games (Kim & King, 2020). The question arises whether these three behaviours form a problem behaviour syndrome in behavioural addictions, similar to that described by Donovan et al. (1988) regarding substance use, and whether these behaviours are linked to other behaviours of social concern. In this respect, the Internet is a window of access to all kinds of content (pornographic, violent, racist, sexist), as well as to sextortion, cyberbullying and grooming. In addition, there is a clear need for more in-depth research into the common and specific risk and protection factors for each of these problems, the results

of which will have to be transferred to the design of new preventive programs.

In this respect, with the exception of *¿QTJ?* and *Ludens*, the prevention programs analyzed focus on several of the problems raised. However, it is not reasoned whether this decision is due to an attempt to provide a joint approach from within a behavioural addiction prevention framework, or whether it is an attempt to address several problems within the same program. This should trigger a debate on the theoretical postulates and components that have to be considered in the design of preventive programs, as well as in the assessment of their effectiveness. Should joint prevention of these problems be a goal, or should they be addressed separately? On the other hand, given the terminological heterogeneity in relation to inappropriate Internet use, how can we know that preventive programs are really effective if it is not clearly explained whether the target behaviour to be prevented is abusive use, compulsive use, problematic use or addiction, and what instrument should be used? Can a program be considered effective for problematic gambling or gaming addiction without considering its effectiveness in the two possible modalities, offline and online? Should it be specified for which modality it has been shown to be effective? To answer these and other questions, it is necessary to generate more evidence, which is key to the design and evaluation of preventive programs, their being credited as good practice and their dissemination through the local and regional health service plans, which enables their real transfer to preventive praxis.

Similarly, it must be remembered that school prevention programs are part of a larger set of preventive actions. The family, for example, plays a fundamental role in educating about the healthy use of technology (Lukavská et al., 2022), acting as regulators and supervisors of screen use (Gentile et al., 2017) and shaping self-regulation behaviours (Altamimi et al., 2015). Parallel promotion of good family prevention is thus essential. Likewise, environmental prevention has proven to be particularly effective in relation to various problems. With reference to gambling and betting, despite being a regulated activity not permitted to minors, this has become normalized due to its easy accessibility and the increase in advertising in recent years, mostly focused on adolescents and young adults and its link to sport (Monreal-Bartolomé et al., 2023; Pitt et al., 2016). Adolescents are particularly exposed to gambling opportunities in sports betting, increasing the risk of developing problematic gambling (Barrera-Algarín & Vázquez-Fernández, 2021). In response to this, environmental prevention can act effectively. For example, Regan et al. (2022) considered the following as effective environmental prevention actions to reduce pathological gambling: increasing prices and taxes, reducing availability and accessibility, or regulating marketing, advertising, promotion and sponsorship.

This systematic review is not without limitations. First, although a rigorous search procedure was followed, including all relevant programs found, there is a possibility that some may have been missed. Second, because there are programs that are not indexed in best practice portals or peer-reviewed journals, programs used in schools in Spain may have been left out. And third, due to the lack of generalisation of the conceptualisation and the variety of measures used, it has not been possible to carry out a meta-analysis, which would have provided a richer and more thorough review.

Nevertheless, we believe that the review carried out has certain strengths. In addition to taking into account scientific article databases, we also explored good practice portals, providing relevant data for understanding the situation regarding prevention in Spain. Unlike other reviews, the convergence between the three problems addressed has also been considered, thus approaching the reality that several authors have been highlighting for years (King et al., 2010; Kuss & Griffiths, 2012; Throuvala et al., 2019).

In terms of recommendations for future studies, it would be advisable to consider adolescents who already exhibit risk behaviour and to collect information on the preventive practices currently being carried out in Spain at a selective and indicated level. It would also be interesting to assess whether the effectiveness of the programs depends on the people who carry them out or on the number of sessions. Finally, this review has been limited to adolescence, and it would also be interesting to focus on childhood or even young adults (Goldstein et al., 2016; Nannatt et., 2022).

Conclusions

Of the programs assessed, those receiving the best recommendation are *¿QTJ?*, *Ludens* and *Safety.net*. The *Cubilete* and *PrevTec 3.1.* programs would be recommended with additional studies to confirm their effectiveness. Likewise, it would be advisable to evaluate the effectiveness of the Internet and social network use module of the *Tú decides* program. In relation to their indexing in good practice portals, evidence should be prioritized over accessibility, clearly indicating for which specific problems each of them has been shown to be effective and for which there is no evidence. This also reinforces the need to clarify terms, components incorporated into preventive programs that are appropriate for problematic uses or behavioural addictions, and which instruments would be suitable for assessing them. Likewise, it is necessary to disseminate the existence of good practice portals widely among the different social agents involved in prevention so that evidence is reflected in preventive practice by promoting good practices.

Finally, based on this review, it is possible to conclude that the development of school-based prevention programs for PIU, problematic gambling and gaming addiction in Spain can be considered to a large extent as incipient, insufficient and with ample room for improvement. An imbalance has been highlighted between the social concern raised and its consideration from the scientific field, compared to the planning of public policies and preventive practice. This represents a challenge, as well as an enormous opportunity to avoid repeating the mistakes made in the past in terms of drug addiction prevention, a field in which, at the time, we were able to observe a great development of preventive actions and programs, yet often with very little empirical support to endorse their effectiveness.

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Conflict of interests

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