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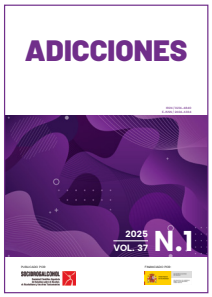

ORIGINAL

Systematic review on the characteristics and efficacy of school preventive programs for drug addiction in Spain

Revisión sistemática sobre características y eficacia de los programas preventivos escolares en drogodependencias en España

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Abstract

The school environment is of great relevance in the prevention of drug use in students because it is where they spend most of their time and, since education is compulsory until upper secondary school in Spain, interventions in this area can reach the majority of children up to that stage. The objective of this systematic review is to determine the level of efficacy of the school preventive programs that have been implemented in Spain. Following the PRISMA recommendations, a systematic literature search was carried out in the Web of Science, PubMed/MEDLINE, Embase, Scopus, and Cochrane Library databases. The search yielded 274 studies, of which 29 studies were selected. It was found that 48 drug addiction prevention programs have been implemented in Spanish school context, of which only 18 (37.5%) had an evaluation of their effectiveness following the criteria and standards of effective prevention. Conversely, the programs that were not evaluated are far from these standards in their design. It is concluded that there are two models of school prevention of drug addiction in Spain: a model that meets this description; and another model classified as "pseudo-prevention", since its design does not meet the standards of effective prevention nor has its preventive efficacy been demonstrated.

Keywords: preventive programs, school setting, intervention, efficacy evaluation, systematic review

Resumen

El ámbito escolar adquiere una gran relevancia en la prevención del consumo de drogas en estudiantes, ya que es donde pasan una mayor parte del tiempo y, puesto que en España la enseñanza es obligatoria hasta los 16 años, las intervenciones en este ámbito pueden alcanzar a la mayoría de niños en esa etapa. El objetivo de esta revisión sistemática fue determinar qué nivel de eficacia presentan los programas preventivos escolares que se han implementado en España. Siguiendo las recomendaciones PRISMA, se llevó a cabo una búsqueda bibliográfica sistemática en las bases de datos Web of Science, PubMed/MEDLINE, Embase, Scopus y Cochrane Library. La búsqueda arrojó 274 estudios, de los cuales fueron seleccionados 29 estudios. Se ha identificado que en España se han implementado 48 programas preventivos en drogodependencias en el contexto escolar, de los cuales tan solo 18 (37,5%) cuentan con evaluación de su eficacia siguiendo los criterios y estándares de una prevención eficaz. Por el contrario, los programas que no han sido evaluados distan en su diseño de estos estándares. Se concluye que en España conviven dos modelos de prevención escolar de las drogodependencias: un modelo que responde a esta denominación; y otro modelo calificado como "pseudo-prevención", dado que su diseño no se ajusta a los estándares de la prevención eficaz ni su eficacia preventiva ha sido demostrada.

Palabras clave: programas preventivos, ámbito escolar, intervención, evaluación de eficacia, revisión sistemática

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School-based prevention is one of the most widely-used strategies for guaranteeing that the educational and socio-environmental conditions at school are the most conducive to the healthy development of students. Schools can provide an optimal, efficient and effective environment for intervention (Deogan et al., 2015; Lassi et al., 2015; Pereira & Sanchez, 2018). Universal prevention has a broader focus, according to the classification proposed by Gordon (1987), but one which is less intense than selective and indicated prevention, which target more specific populations with greater problems related to drug use, albeit at greater expense.

Over recent decades, drug addiction prevention programs have proliferated with different characteristics. One of the most widely-used criteria for their classification is the intervention strategy used. Authors such as Tobler (1986) and Tobler et al. (2000) categorised preventive programs into the following typologies: 1) focused on information; 2) focused on affective education; 3) combining information with emotional education; 4) psychosocial in nature; 5) focused on developing resilience skills; 6) focused on developing generic skills (social and life); and 7) focused on the promotion of alternatives (skills and/or activities).

According to international standards for drug use prevention (United Nations Office on Drugs and Crime [UNODC], 2018), the most effective school preventive programs have the following characteristics: they a) are based on models of competency and social influence; b) use interactive methods; c) have a duration of 10-15 structured sessions, with booster sessions; d) are implemented by trained experts; and e) train personal and social skills (such as coping skills, decision-making, and substance use resistance), address risk perceptions, and dispel misconceptions about the normative nature and expectations of substance use.

The set of characteristics of effective school preventive programs specified by Villanueva (2017) (Table 1) is based on various meta-analytic reviews (see Cuijpers, 2002a; Faggiano et al., 2008a; Hansen, 1992; Skara & Sussman, 2003; Thomas et al., 2013; Tobler et al., 2000; Tobler & Stratton, 1997; Winters et al., 2007).

Table 1
Characteristics of effective prevention programs in the school environment

Theoretical foundations	- Proven theoretical model with empirical evidence.
Program Orientation	- Social influence. - Life skills model. - Multicomponent model.
Level of education	- Age-appropriate program implementation. - Greater efficacy if applied between 11 and 14 years of age.
Target sustances	- By age and prevalence of use. - Preferably alcohol and tobacco, followed by cannabis.
Main components	- Negative consequences of short-term use. - Focus on subjective social norm: subjective perception of behaviour and attitudes in the environment regarding drug use. Correction of erroneous conceptions about the prevalence of drug use among peers. - Techniques to cope with indirect social influences and resist social pressure towards drug use. - Training in life skills and positive social interaction. - Reinforcement of attitudes against the use of drugs and personal commitment against drug use.
Methodology	- Active, participatory and interactive.
Sessions	- Minimum recommended number of 10 sessions. - Includes booster sessions once program is completed.
Administrators	- Professional experts. - Suitably trained teachers. - Participation of peers with prosocial profile and against drug use.
Application	- Sustainable in time, long-term. - Application of complete program. - Methodological rigour. - Application of necessary adjustments.
Assessment	- Rigorous assessment essential to reflect positive effects. - Information on missing data. - Behavioural change. - Control group without intervention.
Related aspects	- Gender perspective in design, implementation and assessment. - Consideration of interculturality.

In the Spanish context, a meta-analysis (Espada et al., 2015a) and an assessment of effectiveness based on a review of various meta-analyses (Fernández et al., 2002) identified that the school prevention programs showing greater effectiveness a) included models for education in health and social learning b) addressed the social influence involved in drug use, c) had an active methodology, d) used a combination of oral, written and audiovisual support, e) were implemented by professionals and teachers jointly, with the participation of peers, and f) had booster sessions.

Despite the availability of evidence on what works and what does not work in prevention, the transfer to practical application still seems be a work in progress, with preventive programs of different levels of effectiveness coexisting with programs yet to be assessed (Medina-Martínez & Villanueva-Blasco, 2023). This may be due to the lack of greater visibility and recognition of preventive programs that have been shown to be effective, given that, in the Spanish school context, awareness-raising or information interventions unsupported by empirical evidence continue to be carried out. The National Strategy on Addictions 2017-2024 (Delegación del Gobierno para el Plan Nacional sobre Drogas [DGPNSD], 2018) and the 2021-24 Addictions Action Plan (DGPNSD, 2022) state one of their priorities to be the improvement of the availability and effectiveness of prevention programs based on empirically verified data. These strategies at the national level indicate that the coverage of preventive programs has been decreasing and that they are rather focused on education. As improvements, they therefore propose a greater focus on the social conditions promoting drug use, and that universal coverage of evidence-based programs that meet quality criteria be guaranteed (DGPNSD, 2018).

The following research questions are thus posed: To what extent do preventive programs implemented in Spain show characteristics in line with the standards of effective school preventive programs? Furthermore, in the expectation of finding that some programs comply with the standards while others do not, is the fact of having their efficacy assessed an indicator that the program's design is in accordance with said effective prevention standards? Consequently, the general objective of this systematic review was to determine the level of efficacy of the school preventive programs that have been implemented in Spain. The specific objectives were: 1) to identify the characteristics of school preventive programs applied in Spain; 2) to recognize which ones have been assessed and how effective they are; and, finally, 3) to compare the characteristics of school preventive programs that include efficacy assessment to those that do not.

Method

Search strategy and information sources

For the first objective, a search was carried out in the Xchange portal and best practice databases (EMCDDA, n.d.), evidence-based prevention (Socidrogalcohol, n.d.) and the best practice for addictions portal (DGPNSD, n.d.). For this purpose, country and prevention scope limits were set to target programs carried out in Spain and in the school environment.

For the second objective, a systematic review was carried out on 01/14/2023, applying the criteria as stated in Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) (Page et al., 2021).

A structured electronic bibliographic search was conducted in five databases (Web of Science, PubMed/MEDLINE, Embase, Scopus, and Cochrane Library) to retrieve peer-reviewed articles published in English or Spanish, with no date limit. The search strategy combined multiple previously agreed keywords, which were developed by breaking down the objective. The Population, Intervention, Comparison and Outcomes (PICO) framework was followed in conducting the literature search. References extracted from each of the database searches were grouped and stored in a RefWorks library. Searches were performed and duplicates removed by the lead author of this manuscript.

The search strategy included the keywords "*Spain*", "*alcohol*", "*tobacco*", "*cannabis*", "*school prevention*" and synonyms. These terms were combined creating the following search strategy: "*Spain*" AND ("*school prevention*" OR "*school intervention*" OR "*preventive program*" OR "*school-based*" OR "*school environment*") AND ("*alcohol*" OR "*tobacco*" OR "*cannabis*" OR "*marijuana*"). Additionally, a reverse search was performed by reviewing the reference lists of the studies to identify articles not indexed in these databases.

Similarly, preventive programs with scientific publications on their efficacy but not indexed in good practice portals were also considered as part of the first objective.

Eligibility criteria

Regarding the second objective, two reviewers (M-M and V-B) evaluated the studies that met the following inclusion criteria in the initial search processes: studies that a) included preventive programs in the school environment; b) were carried out in Spain; c) addressed alcohol, tobacco and/or cannabis use; d) were published in peer-reviewed scientific journals; and e) were written in English or Spanish.

Exclusion criteria were: a) articles that addressed behavioural addictions; b) bibliographic and systematic reviews, meta-analyses, books, book chapters and conference communications; c) studies focusing on interventions to reduce drug use without published results; d) preventive interventions not protocolized as a program; and e) studies that did not assess program results.

Selection process

Two authors (M-M and V-B) identified the studies found in three steps following literature guidelines (Gunnell et al., 2020). First, article titles and abstracts obtained in the initial search were screened and selected on the basis of the above disaggregated eligibility criteria. Second, full-text articles were analyzed in detail and screened for eligibility. Third and finally, the bibliographic references of all selected articles were checked manually to identify relevant articles missed in the initial search strategy. The search process is summarized in Figure 1, created using the recently updated PRISMA tool for creating flowcharts (Haddaway & McGuinness, 2020).

The review of scientific articles reporting on studies assessing the efficacy of preventive programs in drug addiction in Spain yielded a total of 274 records. After removing duplicates, 173 studies were obtained for title and abstract review while 134 were excluded. The full text of 39 articles was thus reviewed. After 10 were excluded, the systematic review comprised 29 articles.

Data extraction

Two authors (M-M and V-B) independently and systematically extracted data from the final list of included studies. The following categories of manuscript features were identified and recorded: a) program name, b) authorship, c) year, d) substances, e) target population, f) level of prevention (i.e., universal, selective or indicated), g) theoretical model (e.g., Theory of Reasoned Action, Social Development Model, etc.), h) application methodology (e.g., audiovisual, interactive, etc.), i) number of sessions, j) administrator profile (i.e., faculty, external experts, etc.), k) main components, and l) publications of efficacy. Discrepancies between the authors were resolved by consensus decision. All extracted data were synthesized and grouped using tables created with Microsoft Excel.

Assessment of methodological quality

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

The assessment of each study's methodological quality is presented in Tables 2 and 3. All studies met a minimum of 40% of the criteria and the average percentage of criteria met was 67.6%.

Figure 1
Flow chart

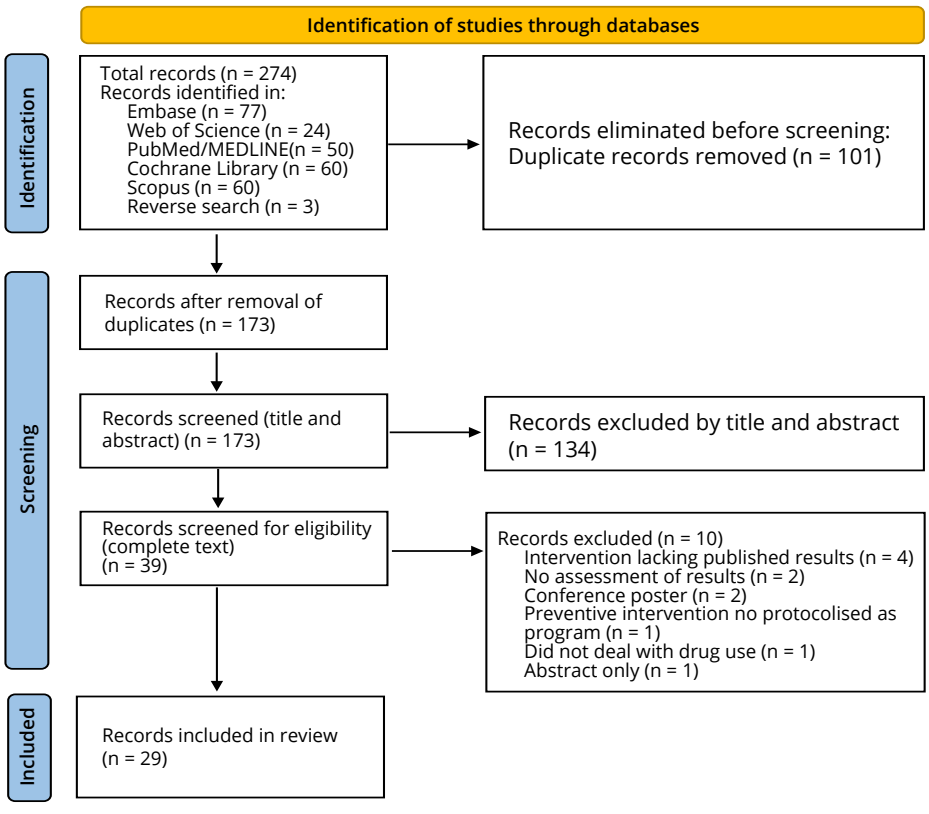

Table 2
Methodological quality assessment for ECA

Reference	P1	P2	P3	P4	P5	% compliance
Alarcó-Rosales et al. (2021)	Yes	Yes	Yes	No	Yes	80
Caria et al. (2011)	Yes	No	Yes	No	Yes	60
Cutrín et al. (2021)	Yes	Yes	Yes	No	Yes	80
Espada et al. (2014)	Yes	Yes	Yes	No	Yes	80
Espada et al. (2015b)	Yes	No	Yes	No	No	40
Faggiano et al. (2007)	Yes	No	Yes	No	Yes	60
Faggiano et al. (2008b)	Yes	No	Yes	No	Yes	60
Faggiano et al. (2010)	Yes	No	Yes	No	No	40
García et al. (2005)	Yes	No	Yes	No	Yes	60
Gonzálvez et al. (2015)	Yes	Yes	Yes	No	No	60
Gonzálvez et al. (2016)	Yes	Yes	Yes	No	No	60
Gonzálvez et al. (2018)	Yes	Yes	Yes	No	Yes	80
Leiva et al. (2018)	Yes	Yes	Yes	Yes	No	80
Luna-Adame et al. (2013)	Yes	No	Yes	No	Yes	60
Romero et al. (2017)	Yes	Yes	Yes	No	Yes	80
Valdivieso et al. (2015)	Yes	Yes	Yes	Yes	No	80
Vargas-Martínez et al. (2019)	Yes	No	Yes	No	No	40
De Vries et al. (2003)	Yes	Yes	Yes	No	Yes	80
De Vries et al. (2006)	Yes	Yes	Yes	No	No	60

Note. P1: Was randomization correctly done? P2: Were the groups comparable at the beginning? P3: Were there complete results data? P4: Were the results assessors blinded to the intervention provided? P5: Did the participants adhere to the assigned intervention?

Table 3
Methodological quality assessment for quasi-experimental studies

Reference	P1	P2	P3	P4	P5	% compliance
Ariza et al. (2008)	Yes	Yes	Yes	No	Yes	80
Ariza et al. (2013)	Yes	Yes	Yes	Yes	Yes	100
Barón-García et al. (2021)	No	No	Yes	No	Yes	40
Cabrera et al. (2022)	Yes	Yes	Yes	No	Yes	80
Calafat et al. (1995)	Yes	Yes	Yes	No	Yes	80
Espada et al. (2012)	No	Yes	Yes	No	Yes	60
Gómez-Fraguela et al. (2002)	Yes	Yes	Yes	No	Yes	80
Hernández et al. (2013)	No	Yes	Yes	No	Yes	60
Moral et al. (2009)	No	Yes	Yes	No	Yes	60
Villanueva et al. (2021)	Yes	Yes	Yes	No	Yes	80

Note. P1: Were participants representative of the target population? P2: Were the measurements suitable to both the result and the intervention (or exposure)? P3: Were there complete results data? P4: Were confounding factors taken into account in design and analysis? P5: During the study period, was the intervention administered (or did exposure occur) as planned?

Results

Table 4 lists the preventive programs identified through good practice portals and through the search for studies assessing their efficacy. Information is provided on authorship and year of publication, substances addressed, target population, level of prevention, underlying theoretical models, application methodology, number of sessions, administrator profiles, main components and the publications found regarding their efficacy.

As can be seen (Table 4), of the total 48 programs analyzed, 41 have a universal prevention frame (83.7%), of which 30 address drinking (73.17%), 29 smoking (70.73%), 16 cannabis (39.02%), and three drugs in general without specifying which (7.32%). Four selective prevention programs were analyzed (8.2%), of which three address drinking (75%), one cannabis use (25%), one general drug use without specifying which ones (25%) and none is focussed on smoking. For indicated prevention, two programs were detected (4.1%), of both of which address drinking (100%), and tobacco (100%), with one addressing cannabis (50%), and none drugs in general. Finally, two programs (4.1%) address various levels of prevention.

Table 4
Information on the preventive programs included in the review

Program	Substance	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Administrator profile	Main components	Publication of efficacy
A no fumar ¡me apunto!	Tobacco	Minors aged 12-16, teachers and family	Universal	n.s.	Interactive, participative	n.s.	Teachers	Risks, benefits of not smoking, beliefs, group and advertising pressure, interpersonal and cognitive skills, emotional control	-
ALCAZUL	Alcohol, tobacco, cannabis	Adolescents aged 12-18	Universal	Theory of reasoned action (Fishbein & Ajzen, 1975)	Community	n.s.	Experts and monitors	Healthy leisure, drug information, prosocial attitudes, sensation seeking	-
ALERTA ALCOHOL	Alcohol	Adolescents aged 16-18	Selective	I-change model (de Vries, 2017)	*Online*	6	n.s.	Benefits of not drinking, attitudes, social influences, self-efficacy, resistance skills	Vargas-Martínez et al. (2019)
Cine y Educación en Valores 2.0	Drugs in general (n.s.)	Minors aged 6-16 and their teachers	Universal	n.s.	Audiovisual	n.s.	n.s.	Cinema and values	-
Construyendo Salud	Alcohol, tobacco, cannabis, others	Minors aged 12-14	Universal	Theory of reasoned action (Fishbein The& Ajzen, 1975), Social development model (Hawkins et al., 1992), Theory of self-derogation (Kaplan, 1996), Multi-stage social learning model (Simons et al., 1988), Problem behaviour theory (Jessor & Jessor, 1977), Self-control theory (Hirschi & Gottfredson, 1988),	Interactive, participative	16 (9 booster)	Trained teachers	Information component, decision making, self-image and self-improvement, emotional control, social skills, tolerance and cooperation, leisure and free time	Gómez-Fraguela et al. (2002), Luna-Adame et al. (2013)
Construye tu Mundo	Alcohol, tobacco, cannabis	Minors aged 3-16	Universal	n.s.	Active learning, IVAC	n.s.	Teachers	Empathy, attitudes towards health protection, self-esteem, attitudes towards drugs, decision making, assertiveness	-
Déjame que te cuente algo sobre... Los Porros	Cannabis	Minors aged 13-16	Universal, selective	Theory of reasoned action (Fishbein & Ajzen, 1975)	Interactive	5	Educators/monitors	Informational, attitudinal, normative and affective components of the decision-making balance	-
DINO Educación Preventiva de Drogas para Preadolescentes	Alcohol, tobacco	Minors aged 10-12	Universal	Systemic model of guided intervention (Álvarez, 1987)	Interactive	n.s.	Teachers	Self-esteem, social skills, decision making, information about drugs, social influences, healthy habits	-

Program	Substance	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Administrator profile	Main components	Publication of efficacy
DISCOVER. Aprendiendo a vivir	Alcohol, tobacco, cannabis, others	Minors aged 10-16	Universal	n.s.	Interactive	9-13	Trained teachers	Self-esteem, conflict resolution, risks, relational skills, decision making	-
En la huerta con mis amig@s	Alcohol, others	Minors aged 5-10 their families and teachers	Universal	n.s.	Audiovisual	n.s.	Teachers	Healthy habits, psychoaffective and social development	-
En Plenas Facultades	Drugs in general (n.s.)	Young people aged 18-25	Universal	n.s.	Peer to peer	n.s.	Students	Awareness raising about drug abuse and addictions, risky sexual behaviours and sexually transmitted infections	Barón-García et al. (2021)
Entre Todos	Alcohol, tobacco, cannabis	Minors aged 10-16	Universal	n.s.	Cooperative learning	6-13	Experts and trained teachers	Information about drugs, attitudes, values, motivations, self-esteem, social skills, decision making, healthy habits, leisure and free time	-
EmPeCemos	Alcohol, tobacco, cannabis	Minors aged 5-10 and their families	Indicated	n.s.	Interactive	12 (3 booster)	Trained therapists	Emotion recognition, self-control, problem solving and decision making, social skills	Romero et al. (2017)
Galilei	Alcohol, cannabis, others	Adolescents aged 15-21 PCPI (Vocational training)	Selective	Theory of reasoned action (Fishbein & Ajzen, 1975), Problem behaviour theory (Jessor & Jessor, 1977), Social development model (Hawkins et al., 1992)	Interactive	14	Trained teachers	Intentions to use, attitudes to drugs, normative beliefs, effects of drugs, life skills, social and resistance skills, emotional management, impulse control, stress control	-
ITACA	Tobacco	Minors aged 12-16	Universal	Theory of triadic influence (Flay, 1999)	Participative	22	Teachers	Social and advertising influences, information about smoking, resistance skills, emotion management, interpersonal skills, self-esteem, critical thinking, problem solving	Leiva et al. (2018)
Juego de llaves	Alcohol, tobacco, cannabis	Minors aged 11-16	Universal	n.s.	*Online*	6-12	Trained teachers	Emotional management, cognitive strategies, social interaction, leisure and free time, information on drugs, values	-

Program	Substance	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Administrator profile	Main components	Publication of efficacy
KAMELAMOS GUINAR - Queremos Contar	Alcohol, others	Roma population: minors aged 6-12, adolescents aged 13-18, women aged 18-32	Selective	Competency model (Albee, 1980)	Interactive	n.s.	Professionals and volunteers	Information about drugs, group pressure resistance skills, leisure and free time	-
La Aventura de la Vida	Alcohol, tobacco, others	Minors aged 6-11	Universal	Life skills education model (WHO, 1994), Theory of reasoned action (Fishbein & Ajzen, 1975), Social development model (Hawkins et al., 1992), Developmental model (Kandel, 1980), Constructivist theory (Piaget, 1962; Vygotsky, 1962)	Audiovisual, interactive	n.s.	Teachers	Information and attitudes towards drugs, risk perception, normative perception, life skills	-
Mantente REAL (anteriormente keepin' it REAL)	Alcohol, tobacco, cannabis	Minors aged 11-15	Universal	n.s.	Participative	12	Teachers	Pressure resistance skills, personal and social skills, communication, assertiveness, problem solving	Cutrín et al. (2021)
Me llamo Marcos. Jóvenes y Estilos de Vida	Alcohol	Adolescents aged 15-18	Universal	n.s.	Audiovisual	n.s.	n.s.	n.s.	-
Nexus. Programa para la prevención del consumo de drogas	Alcohol, tobacco	Minors aged 10-13	Universal	Theory of reasoned action (Fishbein & Ajzen, 1975), Multi-stage social learning model (Simons et al., 1988), Social development model (Hawkins et al., 1992), Developmental model (Kandel, 1980), Problem behaviour theory (Jessor & Jessor, 1977), Theory of self-derogation (Kaplan, 1996), Sensation seeking theory (Zuckerman, 1979)	Interactive, participative	12	Trained instructors	Information on drugs, risk perception, normative beliefs, social influences, resilience skills, communication skills, emotional intelligence, self-esteem, leisure and free time, tolerance and cooperation	-
¡ÓRDAGO! Afrontar el desafío de las drogas	Alcohol, tobacco, cannabis	Minors aged 12-16	Universal	Theory of reasoned action (Fishbein & Ajzen, 1975), Social development model (Hawkins et al., 1992), Developmental model (Kandel, 1980), Constructivist theory (Piaget, 1962; Vygotsky, 1962), Social learning theory (Bandura, 1977a)	Participative	32	Trained teachers	Information on drugs, beliefs, attitudes, social influences, self-esteem, decision making, resistance to group pressure, leisure and free time	-

Program	Substance	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Administrator profile	Main components	Publication of efficacy
PASE.bcn (ESFA)	Alcohol, tobacco	Minors aged 12-13	Universal	ASE model (de Vries et al., 1995)	Interactive	7 (6-5 booster)	Trained teachers	Drug effects, group and advertising pressure, normative education, resistance skills, future planning	Ariza et al. (2008), de Vries et al. (2003), de Vries et al. (2006)
Prevención del consumo de drogas	Alcohol, tobacco, cannabis, others	Minors aged 12-17	Universal	Social learning theory (Bandura, 1977a), Developmental model (Kandel, 1980), Health Education Model	Participative	9	Teachers and external professionals (psychologists and pedagogues)	Knowledge about drugs, decision making, social and group pressure	-
Programa de intervención psicosocial	Alcohol	Adolescents aged 12-18	Universal	n.s.	Participative	8	External professionals and trained teachers	Information on drinking, myths, risk perception, social and resistance skills	Moral et al. (2009)
Programa de Prevención de Drogodependencias "CINENSINO"	Alcohol, tobacco	Minors aged 11-13 and their teachers	Universal	Theory of reasoned action (Fishbein & Ajzen, 1975), Susceptibility hypothesis (Mansilla & Vega, 1999)	Participative	12	Teachers	Knowledge about drugs, risks, critical thinking, self-esteem, decision making, assertiveness, resistance to group pressure, healthy leisure	-
Programa de prevención del IAMS	Alcohol, cannabis	Adolescents aged 13-18	Universal	Development theories, ecological perspective & predictive theories of drug use	Interactive, participative	3	External professionals	Information on drugs, social learning and social influences, risk perception	Cabrera et al. (2022)
Programa de promoción de la salud para la prevención del tabaquismo	Tobacco	Minors aged 12-14	Universal	n.s.	Participative	8	Teachers	Effects of smoking, assertiveness, resistance skills, critical thinking	García et al. (2005)
Programa Engoe	Drugs in general (n.s.)	Students aged over 12, teachers, families, young people with problematic use (aged 14-21)	Universal, selective, indicated	Comprehensive-sequential model, multisystemic theory	n.s.	n.s.	External professionals	Emotional and social skills, value education	-
Programa escalonado de prevención escolar - "Protegiéndote"	Alcohol, tobacco, cannabis	Minors aged 3-16, teachers and families	Universal	Biopsychosocial model	Interactive	10	Trained teachers	Information on drugs, emotional control, social skills, problem solving and decision making, habits in school learning	-
Programa de Prevención de Drogodependencias para educación primaria BRÚJULA/ BRÚIXOLA	Alcohol, tobacco, others	Minors aged 6-12 and their families	Universal	Theory of reasoned action (Fishbein & Ajzen, 1975), Theory of planned behaviour (Ajzen, 1985), Health Education Model	Participative	9	Teachers	Healthy habits, social skills, personal identity	-

Program	Substance	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Administrator profile	Main components	Publication of efficacy
Programa preventivo en Cataluña	Tobacco	Minors aged 11-15	Universal	n.s.	Participative	7	School nurses	Effects of smoking, social and advertising influence, critical thinking	Valdivieso et al. (2015)
Programa Rompecabezas	Drugs in general (n.s.)	Adolescents aged 16-21 in at-risk situations, teachers in non-formal education centres and vocational training	Selective	Problem behaviour theory (Jessor & Jessor, 1977), Developmental model (Kandel, 1980)	n.s.	n.s.	Teachers and external experts	Information on drugs, leisure and free time, personal development, social skills, responsibility at work	-
Programa Saluda	Alcohol, others	Minors aged 12-14	Universal	n.s.	Participative	10	Teachers, psychologists, social workers and educators, monitors, sociocultural animators	Problem solving and decision making, healthy leisure, social and resilience skills, information on drugs, public engagement, self-reinforcement	Espada et al. (2012), Hernández et al. (2013)
Project EX	Tobacco	Adolescents aged 14-19	Universal	Motivation model, Coping skills, Personal commitment	Participative	8	Teachers and health educators	Self-control, withdrawal control, emotion and stress management, goal setting, self-esteem	Espada et al. (2014), Espada et al. (2015b), Gonzálvez et al. (2015), Gonzálvez et al. (2016), Gonzálvez et al. (2018)
PPCDE	Alcohol, tobacco, others	Pre-school, primary, compulsory secondary, higher secondary students and their teachers	Universal	Theory of reasoned action (Fishbein & Ajzen, 1975), Developmental model (Kandel, 1980), Social learning theory (Bandura, 1977a), Self-efficacy theory (Bandura, 1977b), Lifestyle model and conditioning risk factors (Calafat et al., 1985)	Debate/ discussion, conversations	n.s.	Teachers and external experts	Information on drugs, self-esteem, social and resistance skills, healthy values, decision making, emotional control, healthy leisure	-
RyR2	Alcohol, tobacco, cannabis	Adolescents aged 18	Universal	Cognitive-behavioural and social learning theories	Participative	12-15	External professionals (psychologists and educators)	Problem solving, emotional competences, social influences, critical thinking, empathy, social and negotiation skills, values	Alarcó-Rosales et al. (2021)
Respir@ire	Tobacco	Minors aged 12-16	Universal	Health Education Model	Participative	16	Teachers	Knowledge about drugs, attitudes, social and resistance skills, decision making	-

Program	Substance	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Administrator profile	Main components	Publication of efficacy
Sé Tú Mismo/a	Alcohol, tobacco, cannabis	Minors aged 12-14	Universal	Models of social influence and competence	Interactive	10	Experts in drug addiction prevention	Communication skills, emotional education, empathy, assertiveness, normative education, drug information, resistance skills	Villanueva et al. (2021)
Sobre Canyes i Petes (anteriormente xkpts.com)	Alcohol, cannabis	Minors aged 14-16	Universal	ASE model (de Vries et al., 1995)	Interactive	5	Trained teachers	Knowledge about drugs, social and peer pressure, skills training, problem solving	Ariza et al. (2013)
SUSPERTU - Programa de Apoyo a Adolescentes	Alcohol, tobacco, others	Adolescents aged 13-20 in at-risk situations and their families	Indicated	Social learning theory (Bandura, 1977a), Biopsychosocial model	Participative and dynamic	25	External professionals	Knowledge about drugs, attitudes, self-esteem, emotional control, decision making, healthy leisure, social and resistance skills, school performance	-
¿Te apuntas?	Alcohol, others	Minors aged 9-11	Universal	Self-esteem improvement model (Kaplan et al., 1986), Theory of reasoned action (Fishbein & Ajzen, 1975), Developmental model (Kandel, 1980), Social learning theory (Bandura, 1977a), Problem behaviour theory (Jessor & Jessor, 1977)	Participative	5	n.s.	Decision making and problem solving, social and communication skills, critical thinking, leisure and free time	-
Tú decides	Alcohol, tobacco, others	Minors aged 12-16	Universal	Developmental model (Kandel, 1980)	Interactive	6	Trained teachers	Information on drugs, decision making, social and resilience skills	Calafat et al. (1995)
Unplugged	Alcohol, tobacco, cannabis	Minors aged 12-14	Universal	Social influence model (Sussman et al., 2004)	Interactive	12	Trained teachers	Knowledge about drugs, social and resilience skills, normative education, intrapersonal skills, assertiveness, critical thinking, coping strategies, decision making, problem solving, goal setting	Caria et al. (2011), Faggiano et al. (2007), Faggiano et al. (2008b), Faggiano et al. (2010)
¿Vivir el momento?	Alcohol, tobacco	Minors aged 12-14	Universal	n.s.	n.s.	5	n.s.	Problem solving, resilience skills, prosocial values, healthy leisure, critical thinking	-

Program	Substance	Target population	Level	Theoretical model	Application methodology	Nº sessions (nº booster sessions)	Administrator profile	Main components	Publication of efficacy
Y tú, ¿qué piensas?	Alcohol, tobacco, others	Adolescents aged 13-18	Universal	n.s.	Audiovisual, debate	n.s.	n.s.	Leisure and free time, analysis of advertising and fashion, interpersonal skills	-
Y tú, ¿qué sientes?	Drugs in general (n.s.)	Adolescents aged 13-18	Universal	n.s.	Audiovisual, reflection	n.s.	n.s.	Emotional component	-
5 top secrets sobre el cannabis	Cannabis	Adolescents aged 15-18	Universal	Theory of reasoned action (Fishbein & Ajzen, 1975)	Participative	7	Teachers/ educators/ monitors	Information on cannabis, consequences, effects, myths	-

Note. ASE: Attitudes-Social influences-Self-efficacy; ESFA: European Smoking Prevention Framework Approach; IAMS: Madrid Health Service Addiction Institute; IVAC: Research, vision, action and change; n.s.: not specified; PASE.bcn: Prevention of substance addictions at school; RyR2: Reasoning and Rehabilitation V2.

Preventive programs with effectiveness evaluation studies

ALERTA ALCOHOL (ALCOHOL ALERT)

Vargas-Martínez et al. (2019) noted that the program showed a statistically significant reduction in binge drinking after four months of follow-up. This effect was greater the greater the adherence to the program, that is, when a greater number of completed sessions were attended. The intervention did not show a significant increase in health-related quality of life; it was, however, shown that those who reduced the number of binge drinking occasions perceived higher health-related quality of life, as did those with greater adherence to the program.

Construyendo Salud (Building Health)

Gómez-Fraguela et al. (2002) reported that the program achieved a smaller increase in smoking and drinking in the intervention group (IG) compared to the control group (CG), with the effect maintained after 15 months. At follow-up, after 27 and 39 months, these differences seemed to diminish and were no longer significant. The three-year follow-up showed a significant reduction in the level of general use of cannabis, tranquilizers and amphetamines. However, Luna-Adame et al. (2013) reported that no preventive effects on smoking were found, neither immediately nor after a year, but that it could be effective in preventing an increase in the level of tobacco consumption.

EmPeCemos (Let's Get Started)

Romero et al. (2017) reported that participation in the program was associated with more unfavourable attitudes toward drugs and lower intention to use tobacco and alcohol. Significant effects were also observed in smoking prevention, with a lower frequency both in lifetime and last-month smoking in IG. While there were no significant differences in the frequency of alcohol or cannabis use, such differences were found in the amount of alcohol drunk, with a lower number of drinks and episodes of drunkenness in IG compared to CG.

En Plenas Facultades (Of Sound Mind)

Barón-García et al. (2021) reported that program users significantly improved their level of knowledge about drugs and sexuality by the end of the sessions. However, there is no evidence on the effects on drug use behaviour.

ITACA (ITHACA)

Leiva et al. (2018) reported that no statistically significant differences were found in the incidence of regular smoking or smoking initiation in IG and CG. Therefore, there is no evidence that the program is effective in preventing smoking in adolescents.

Mantente REAL (Stay REAL)

Cutrín et al. (2021) noted that relatively smaller increases in drinking were observed in IG compared to CG. There was a statistically significant reduction of binge drinking and episodes of drunkenness, as well as a marginally significant decrease in the frequency and quantity of alcohol drunk. This program was therefore shown to be effective in curbing the increase in drinking at the beginning of adolescence and preventing problematic use.

PASE.bcn (ESFA)

The IG in this program reported significantly less weekly smoking, more anti-tobacco attitudes, as well as significantly higher scores on social self-efficacy and negative intentions toward tobacco (de Vries et al., 2003). The significant effects

for beliefs about the benefits of not smoking continued at 24 and 30 months of follow-up, and were maintained after 30 months for social self-efficacy (de Vries et al., 2006). At 12, 24 and 36 months, the number of new regular smokers was significantly lower in IG (Ariza et al., 2008), although, according to another study (de Vries et al., 2006), this effect disappears in the long term.

Programa de intervención psicosocial (Psychosocial intervention program)

Moral et al. (2009) reported that the program showed a significant reduction in the amount of alcohol drunk weekly at two, seven and 12 months of follow-up. It also showed a strengthening of attitudes against drinking and greater resistance to group pressure. Likewise, in the 12-month follow-up, attitudinal strengthening was maintained in the Family IG and the Basic Awareness IG, showing greater efficacy of the empowerment and skills training programs compared to those that were merely informative.

Programa de prevención del Instituto de Adicciones de Madrid Salud (IAMS) (Prevention program of the Madrid Health Addictions Institute)

Cabrera et al. (2022) reported a significant decrease in IG compared to CG in the intention to drink alcohol and smoke cannabis, as well as in positive attitudes towards their use, and increased risk perception. Furthermore, it showed a significant reduction in drinking in the last month and a reduction in the perception of social pressure. However, regarding cannabis, the differences in its use were not significant and the intervention did not seem to produce changes in self-efficacy to resist consumption.

Programa de promoción de la salud para la prevención del tabaquismo (Health promotion program for smoking prevention)

García et al. (2005) pointed out that there was a smaller increase in smoking experimentation, as well as a lower percentage of daily smokers, in IG compared to CG. Similarly, more negative attitudes toward smoking developed. The program presented positive effects in the short term in modifying attitudes and use, but these decreased in the medium term (eight months of follow-up).

Programa preventivo en Cataluña (Preventive program in Catalonia)

Valdivieso et al. (2015) reported that this program reduced the prevalence and incidence of smoking by 25% and 26%, respectively, but did not find statistical significance. Thus, there is no clear efficacy evidence.

Programa Saluda (Healthy Greetings Program)

The program increased social and problem-solving skills, and reduced short-term substance use intentions (Espada et al., 2012; Hernández et al., 2013). At 12 months, there was a significant reduction in alcohol use (Espada et al., 2012). Hernández et al. (2013) reported that it reduced the percentage of drunken episodes, decreased the perception of social pressure, increased knowledge about alcohol and synthetic drugs, and resulted in a higher percentage of participants carrying out healthy leisure activities (reading and other outdoor activities).

Project EX

The program has been shown to have immediate effects by significantly reducing the intention to smoke, exhaled CO levels, and nicotine dependence (Espada et al., 2014, 2015b; Gonzálvez et al., 2015, 2016, 2018). Similarly, it caused marginal positive effects regarding knowledge about tobacco (Espada et al., 2014) and motivation to quit smoking (Espada et al., 2015b). These factors influenced IG participants to reduce smoking compared to CG (Espada et al., 2015b; Gonzálvez et al., 2015, 2016, 2018) and some to stop smoking (14.28%) (Espada et al., 2015b). These changes were maintained after six months (Espada et al., 2015b) and one year (Gonzálvez et al., 2015, 2016, 2018), which shows the efficacy of the program in reducing long-term tobacco use.

Reasoning and Rehabilitation V2 (RyR2)

Alarcó-Rosales et al. (2021) noted that, at six months, compared to CG, IG showed a significant reduction in daily smoking, drinking (including episodes of drunkenness), and frequency of cannabis use. These positive effects were maintained at 12-month follow-up, although the improvements in daily smoking and drunken episodes showed some reduction.

Sé Tú Mismo/a (Be Yourself)

Villanueva et al. (2021) found that the Be Yourself program was effective in moderating the increase in cannabis use in the last 12 months, so that IG participants were less likely to use than their CG counterparts. Furthermore, the probability of use in the last 30 days decreased in IG compared to previous consumption, while in CG consumption increased. Although the preventive effects decreased at six months of follow-up, IG was still less likely to use cannabis than CG.

Sobre Canyes i Petes (All about Pints and Joints)

Ariza et al. (2013) reported that at the 15-month follow-up, a significant reduction of 29% was observed in past-month cannabis users in IG. These reductions were 34% and 36% when the "acceptable IG" or "qualified IG" subgroups were considered, respectively. That is, greater adherence to program implementation was associated with greater reduction in cannabis use.

Tú Decides (You Decide)

Calafat et al. (1995) point out that there was evidence of a slowdown in the growth curves of alcohol and tobacco use in IG compared to CG, in addition to other positive effects (encouraging active attitudes against drug availability, greater responsibility and willingness to seek help for classmates with drug problems, and improved family communication). Positive effects were still maintained at the two-year follow-up, although moderate drinkers increased in IG. In GC, there was a progressive increase in consumption across the entire study.

Unplugged

This program significantly reduced alcohol-related problem behaviours and drunkenness (Caria et al., 2011; Faggiano et al., 2008b). Despite not showing an overall reduction in drinking, IG non-drinkers and occasional drinkers progressed towards frequent drinking less often than in CG (Caria et al., 2011). At 18 months, the reduced risk of drunken episodes continued to persist (Faggiano et al., 2010).

Regarding tobacco, smoking prevalence was lower in IG, which included activities with parents, compared to CG (Faggiano et al., 2007). Likewise, a reduction in the number of daily cigarettes was shown (Faggiano et al., 2008b). This effect disappeared at 18 months (Faggiano et al., 2010), although the intervention was effective in preventing non-smokers from starting to smoke, compared to CG (Faggiano et al., 2008b, 2010).

With cannabis, the prevalence of use was shown to be significantly lower in IG than in CG (Faggiano et al., 2007), an effect that persisted at 18 months (Faggiano et al., 2010). However, the effects on cannabis use were of marginal statistical significance (Faggiano et al., 2008b).

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

Table 5 presents the comparison of the main defining characteristics of the assessed preventive programs versus those that were not assessed.

Discussion

The present study attempted to discover the extent to which school-based preventive programs implemented in Spain have characteristics in line with the standards of effective school preventive programs, and which ones have been assessed.

In terms of the first objective, determining the characteristics of the school preventive programs applied, it is evident that universal prevention is the most

Table 5
Comparison of characteristics between preventive programs assessed and not assessed

	Programs with efficacy assessment	**Programs lacking efficacy assessment**
Substances	Alcohol (72.22%), tobacco (66.67%), cannabis (44.44%), other (16.67%), n.s. (5.56%)	Alcohol (73.33%), tobacco (63.33%), cannabis (36.67%), other (36.67%), n.s. (13.33%)
Target population	Adolescents aged 12-14	Adolescents aged 10-16, at-risk populations
Level	Universal (88.89%), selective (5.56%), indicated (5.56%)	Universal (80%), selective (10%), indicated (3.33%), various (6.67%)
Theoretical model	Comprehensive social influence models. n.s. (38.89%)	General health education or biopsychosocial models. Some social influence models. n.s. (36.67%)
Application methodology	Interactive (*role-playing*, gamification, debates, group discussions)	Audiovisual, Community, *onlin*e, participative
Nº sessions (nº booster sessions)	8-12 (3-9 booster sessions). n.s. (5.56%)	5-12 (no booster sessions). n.s. (40%)
Administrator profiles	Teachers (61.11%), external professionals (38,89%), school nurses (5.56%), students (5.56%)	Teachers (60%), external professionals (36.67%), volunteers (3.33%), n.s. (20%)
Main components	Information on drugs alongside general life skills training, social and personal skills, emotional control, healthy leisure alternatives, resistance to social and advertising pressure, and normative education	Only emotional component. Only informative component. Only healthy leisure alternatives. Some include general life skills training.

Note. n.s.: not specified.

implemented in Spain, while selective and indicated prevention is in the minority. Nevertheless, according to Offord (2000), selective and indicated prevention programs have some advantages over universal prevention programs, such as the possibility of treating problems earlier and potentially being more efficient; Furthermore, effects have been documented which are up to nine times greater than with universal prevention programs (Bröning et al., 2012). Regardless of the level of prevention, and congruent with Kandel's Stage Theory (1980), it is observed that alcohol is the most frequently addressed substance, followed by tobacco and, lastly, cannabis. School-based preventive programs thus focus mainly on the use of legal drugs and, much less so, on illegal ones.

Regarding the age ranges of the target population, considerable variability was observed. While some programs reported a range of 2-3 years, which would be equivalent to application across two school years, other programs had a higher range, rising to 13 years. This suggests a need to reflect on the suitability of programs and their components for specific ages, as advised by scientific evidence and quality standards (EMCDDA, 2011; Robertson et al., 2004). The application of a preventive program across a broad age range does not seem appropriate since the needs related to substance use are different, as indicated by a variety of theories and authors (i.e., Jessor & Jessor, 1977; Kandel, 1980; Simons et al., 1988). It is also known that risk and protective factors vary with age. (Salvador & de Silva, 2010; U.S. Department of Health and Human Services, 2016). The effectiveness of the different components may therefore be different when working with wide age ranges, complicating the real assessment of their efficacy.

With regard to the theoretical model that these 48 programs use as a reference, which also determines the components involved, wide variability is observed. Most notably, 37.5% did not report a theoretical reference. This fact represents a limitation in compliance with quality standards since the importance of starting from a theoretical model for the design of preventive programs has been indicated (Becoña, 2001). As stated by Vadrucci et al. (2016), any prevention intervention must be based on recognized theories since all hypotheses must be based on theoretical postulates.

Among those studies using a reference model, there is great variability, with some programs focusing more on life skills and social influence components, while others are more focused on informational, emotional and healthy leisure components. In this regard, as pointed out by UNODC (2018) and Villanueva (2017), the evidence indicates that competency and social influence models are the most effective.

In relation to application methodologies, although all programs generated significant changes in knowledge about drugs, non-interactive programs did not have positive effects on attitudes or drug-use behaviour (Fernández et al., 2002). For interactive programs, however, several studies (Cuijpers, 2002b; Fernández et al., 2002; Porath-Waller et al., 2010; Roona et al., 2000; Tobler et al., 2000) have established their efficacy in: a) reducing smoking; b) reducing drinking; c) reducing driving under the influence of alcohol; d) reducing the use of cannabis and other illicit drugs; and e) delaying the age of substance use onset. Therefore, merely informative programs tend to be less effective than those based on social learning theory and having an active methodology (Moral et al., 2005), which is why international prevention standards (UNODC, 2018) recommend adopting interactive methods in preventive programs.

The application intensity of the program or number of sessions, including booster sessions, also varied, as did the application methodologies and the administrator profiles. In relation to the number of sessions, UNODC (2018) and Villanueva (2017) indicate a recommended minimum of 10 structured sessions, with booster sessions. Indeed, programs involving a greater number of sessions have been shown to have a positive impact on the use of both legal and illegal drugs (Soole et al., 2008). However, simply having a greater number of sessions or booster sessions did not mean that a program was necessarily more effective, since efficacy depends largely on the orientation of the program and the methodology used. For its part, given that the positive effects achieved in the short term by preventive interventions usually fade over time, subsequent consolidation or booster sessions are recommended (Fernández et al., 2002; McGrath et al., 2006; Ramos et al., 2010; Robertson et al., 2004).

Regarding administrator profiles, the empirical evidence does not seem to provide a clear answer. Gázquez et al. (2011) did not find significant differences in smoking reduction when the preventive intervention was carried out by teachers as compared to psychologists. Moral et al. (2005) and Espada et al. (2002), however, found greater efficacy when programs were carried out by experts. Likewise, students who have been trained in the prevention of drug use have also been described as a good option (Klepp et al., 1986). Various authors (Espada et al., 2015a; Fernández et al., 2002; Villanueva, 2017) recommended that they be implemented by professionals and teachers together, with the participation of peers. International standards (UNODC, 2018), meanwhile, recommend is that preventive programs should be carried out by a person trained in the field of drug addiction prevention.

In short, the analysis of the characteristics of the school-based preventive programs being applied in Spain leads us to report a wide heterogeneity which, in many cases, does not correspond to the standards of effective school preventive programs.

This finding is linked to the other two study objectives, namely, analysing which preventive programs have been assessed and what their efficacy is, and whether they presented characteristics in line with the evidence on effective preventive programs, as opposed to those programs that were not assessed.

Of the 48 school preventive programs analyzed, only 18 (37.5%) had publications in scientific journals in which their results were assessed. The programs with efficacy evaluations were: Project EX, Unplugged, PASE. bcn, Construyendo Salud, Programa Saluda, ALERTA ALCOHOL, En Plenas Facultades, EmPeCemos, ITACA, Mantente REAL, Programa de intervención psicosocial, Programa de prevención del IAMS, Programa de promoción de la salud para la prevención del tabaquismo, Programa preventivo en Cataluña, RyR2, Sé Tú Mismo/a, Sobre Canyes i Petes, and Tú Decides.

Of these efficacy assessed programs, those shown to be most effective had the following characteristics: a) they are consistent regarding the age of the target population and the components they incorporate, adjusted to the 12-14 year range, where the highest prevalence of use is found for alcohol, tobacco and cannabis, and focusing on these substances; b) they are based on comprehensive social influence models; c) they offer from 7 to 16 sessions and have booster sessions; d) they incorporate components focusing on knowledge and information, social and personal skills (decision making, empathy, effective communication, control of emotions and stress, assertiveness, self-esteem, motivation, problem solving), healthy leisure, resistance to social and advertising pressure, critical thinking, general life skills training and normative education; and e) they are applied using interactive methodologies, including activities such as role-playing and gamification. That is to say, the characteristics of these programs are in line with international standards and previous scientific evidence on effective school preventive programs.

In sum, although there are several considerations to take into account when choosing a preventive program to be implemented in a school, based on the findings of this study, the two programs that were shown to be most effective are Project EX and Unplugged. Their efficacy was consistently supported by several studies, which makes them the best choice for application in the school context. In addition, Unplugged has the advantage that it addresses both alcohol, tobacco and cannabis use, while Project EX focuses exclusively on smoking.

Conversely, preventive programs lacking assessment of their efficacy, or with such assessment limited to the information component, without referring to behavioural change in substance use, have characteristics which are far from congruent with the evidence on effective school-based prevention. Regarding age, their ranges are wide, implying a mismatch between age and the components addressed, given that these programs do not include sessions staggered by age, but rather apply the same program at different ages. They are based mostly on general health education or biopsychosocial models, only occasionally incorporating aspects of social influence models. The number of sessions to be implemented is usually lower than the recommended 10 and booster sessions are generally not contemplated. In this sense, it is also notable that four out of ten programs did not report the number of sessions, which is indicative of a lack of protocolization and planning. The components incorporated were mostly informative, emotional or focused on healthy leisure alternatives; this contrasts with scientific evidence, which has shown that these components offer the lowest level of efficacy or can even be iatrogenic if the information provided is not age-adjusted (Becoña, 2001; Moral et al., 2004). Regarding the application methodology, it is noted that it was usually audiovisual, at community level, online or participatory, none of which allow the level of interaction to be clearly established, which is what has been determined to be most effective.

This study is not without limitations. Firstly, in the majority of cases, the assessment of drug use was carried out using self-completed questionnaires, which may therefore present memory or social desirability biases; however, there are some articles that controlled for the latter bias with the bogus pipeline technique (Luna-Adame et al., 2013). Secondly, some studies had a very small sample (Alarcó-Rosales et al., 2021; Hernández et al., 2013; Romero et al., 2017), so it may not be representative of the target population and the results are difficult to generalize. Thirdly, it is worth highlighting the attrition bias due to participant drop-out in longitudinal studies that were extended over time.

Conclusions

The findings of this study clearly indicate that two school-based drug addiction prevention models coexist in Spain. On the one hand, there is a model based on the design of programs applying the principles and standards of effective prevention, which have also made efforts to demonstrate their efficacy through scientific studies. On the other hand, we have a model that can be described as "pseudo-prevention" (Medina-Martínez & Villanueva-Blasco, 2023), if we understand that addiction prevention is a science and that, consequently, both its design and practice must be based on scientific evidence and the demonstration that it really offers preventive results.

The findings of this study therefore converge with the priority of the Action Plan on Addictions 2021-24 (DGPNSD, 2022), stating the interest in improving the availability and efficacy of prevention programs based on empirically verified data, as well as with the program accreditation process through the best practice for

addictions portal (DGPNSD, n.d.). Socidrogalcohol (n.d.) was a pioneer in Spain in its page on Evidence-Based Prevention, which established categories for programs based on whether or not they had been correctly assessed and whether they showed positive results. These initiatives have guided the way forward to greater awareness of prevention practice within a framework of scientific evidence and best practice. Other complementary initiatives could be to limit public financing only to the implementation of those programs with demonstrated efficacy, and to those whose design is aligned with the principles of effective prevention and are committed to carrying out an assessment of their efficacy. Likewise, it is known that having effective preventive programs is not enough if they are not implemented rigorously or, if adjustments are necessary, that these are informed through a process assessment. Therefore, there is an evident need for the professionalization of prevention through the accreditation of professionals under standardized criteria, or the requirement of university degree qualifications to work in the professional field.

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Conflict of interests

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References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In *Action control* (pp. 11-39). Springer Berlin Heidelberg.

Alarcó-Rosales, R., Sánchez-SanSegundo, M., Ferrer-Cascales, R., Albaladejo-Blazquez, N., Lordan, O. & Zaragoza-Martí, A. (2021). Effects of a school-based intervention for preventing substance use among adolescents at risk of academic failure: A pilot study of the Reasoning and Rehabilitation V2 program. *Healthcare (Basel, Switzerland), 9*(11), 1488. https://doi.org/10.3390/healthcare9111488

Albee, G. W. (1980). A competency model to replace the defect model. In M. Gibbs, J. Lachenmayer & J. Sigal (Eds.), *Community psychology: Theoretical and empirical approaches* (pp. 117-139). Gardner Press.

Álvarez, V. (1987). *Metodología de la orientación educativa* [Methodology of educational guidance]. Alfar.

Ariza, C., Nebot, M., Tomás, Z., Giménez, E., Valmayor, S., Tarilonte, V. & de Vries, H. (2008). Longitudinal effects of the European smoking prevention framework approach (ESFA) project in Spanish adolescents. *European Journal of Public Health, 18*(5), 491-497. https://doi.org/10.1093/eurpub/ckn050

Ariza, C., Pérez, A., Sánchez-Martínez, F., Diéguez, M., Espelt, A., Pasarín, M. I., Suelves, J. M., De La Torre, R. & Nebot, M. (2013). Evaluation of the effectiveness of a school-based cannabis prevention program. *Drug and Alcohol Dependence, 132*(1-2), 257-264. https://doi.org/10.1016/j.drugalcdep.2013.02.012

Bandura, A. (1977a). *Social learning theory*. General Learning Press.

Bandura, A (1977b). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. https://educational-innovation.sydney.edu.au/news/pdfs/Bandura%201977.pdf

Barón-Garcia, T., Gómez, S., Amatller, O., Bosque-Prous, M. & Espelt, A. (2021). Evaluación del programa de prevención universal de consumo de sustancias y prácticas sexuales de riesgo en población universitaria "En plenas facultades": Estudio cuasiexperimental [Evaluation of the universal prevention program for substance use and risky sexual practices in the university population "In full faculties": A quasi-experimental study]. *Revista Española de Salud Pública, 95*, e202106082. https://www.sanidad.gob.es/biblioPublic/publicaciones/recursos_propios/resp/revista_cdrom/VOL95/ORIGINALES/RS95C_202106082.pdf

Becoña, E. (2001). *Bases teóricas que sustentan los programas de prevención de drogas* [Theoretical bases that support drug prevention programs]. Ministerio del Interior, Delegación del Gobierno para el Plan Nacional sobre Drogas. https://pnsd.sanidad.gob.es/profesionales/publicaciones/catalogo/catalogoPNSD/publicaciones/pdf/bases.pdf

Bröning, S., Kumpfer, K., Kruse, K., Sack, P.-M., Schaunig-Busch, I., Ruths, S., Moesgen, D., Pflug, E., Klein, M. & Thomasius, R. (2012). Selective prevention programs for children from substance-affected families: A comprehensive systematic review. *Substance Abuse Treatment, Prevention, and Policy*, *7*(23). https://doi.org/10.1186/1747-597X-7-23

Cabrera, V., Ordoñez, A., González, I., Civantos, V., Moriano, J. A. & Lloret, D. (2022). Evaluación de la eficacia de un programa de prevención escolar del consumo de alcohol y cannabis entre adolescentes [Evaluation of the effectiveness of a school prevention program for alcohol and cannabis use among adolescents]. *Revista Española de Salud Pública, 96*, e202201004. https://www.sanidad.gob.es/biblioPublic/publicaciones/recursos_propios/resp/revista_cdrom/VOL96/ORIGINALES/RS96C_202201004.pdf

Calafat, A., Amengual, M., Farres, C. & Palmer, A. (1985). Life-style and drug use habits among secondary school students. *Bulletin on Narcotics*, *37*(2-3), 113-123. https://europepmc.org/article/MED/4074998

Calafat, A., Amengual, M., Guimerans, C., Rodríguez-Martos, A. & Ruiz, R. (1995). "Tú decides": 10 años de un programa de prevención escolar ["You decide": 10 years of a school prevention program]. *Adicciones, 7*(4), 509-526. http://www.irefrea.eu/uploads/PDF/Calafat%20et%20al_1995_Tu%20Decides_10%20a%C3%B1os.pdf

Caria, M. P., Faggiano, F., Bellocco, R. & Galanti, M. R. (2011). Effects of a school-based prevention program on European adolescents' patterns of alcohol use. *Journal of Adolescent Health, 48*(2), 182-188. https://doi.org/10.1016/j.jadohealth.2010.06.003

Cuijpers, P. (2002a). Effective ingredients of school-based drug prevention programs: A systematic review. *Addictive Behaviors*, *27*(6), 1009-1023. https://doi.org/10.1016/s0306-4603(02)00295-2

Cuijpers, P. (2002b). Peer-led and adult-led school drug prevention: A meta-analytic comparison. *Journal of Drug Education*, *32*(2), 107-119. https://doi.org/10.2190/LPN9-KBDC-HPVB-JPTM

Cutrín, O., Kulis, S., Maneiro, L., MacFadden, I., Navas, M. P., Alarcón, D., Gómez-Fraguela, J. A., Villalba, C. & Marsiglia, F. F. (2021). Effectiveness of the Mantente REAL program for preventing alcohol use in Spanish adolescents. *Psychosocial Intervention, 30*(3), 113-122. https://doi.org/10.5093/pi2020a19

Delegación del Gobierno para el Plan Nacional sobre Drogas, DGPNSD. (s.f.). *Portal de buenas prácticas en reducción de la demanda de drogas y otras adicciones* [Portal of good practices in reducing the demand for drugs and other addictions]. http://www.buenaspracticasadicciones.es/

Delegación del Gobierno para el Plan Nacional sobre Drogas, DGPNSD. (2018). *Estrategia nacional sobre adicciones 2017-2024* [National strategy on addictions 2017-2024]. DGPNSD. https://pnsd.sanidad.gob.es/pnsd/estrategiaNacional/docs/180209_ESTRATEGIA_N.ADICCIONES_2017-2024__aprobada_CM.pdf

Delegación del Gobierno para el Plan Nacional sobre Drogas, DGPNSD. (2022). *Plan de acción sobre adicciones 2021-24* [Addiction action plan 2021-24]. DGPNSD. https://pnsd.sanidad.gob.es/pnsd/planAccion/docs/PlanASA_2021-24_aprobado.pdf

Deogan, C., Zarabi, N., Stenström, N., Högberg, P., Skärstrand, E., Manrique-Garcia, E., Neovius, K. & Månsdotter, A. (2015). Cost-effectiveness of school-based prevention of cannabis use. *Applied Health Economics Health Policy*, *13*(5), 525-542. https://doi.org/10.1007/s40258-015-0175-4

Espada, J. P., Gonzálvez, M. T., Guillén-Riquelme, A., Sun, P. & Sussman, S. (2014). Immediate effects of Project EX in Spain: A classroom-based smoking prevention and cessation intervention program. *Journal of Drug Education, 44*(1), 3-18. https://doi.org/10.1177/0047237915573523

Espada, J. P., Gonzálvez, M. T., Orgilés, M., Lloret, D. & Guillén-Riquelme, A. (2015a). Meta-analysis of the effectiveness of school substance abuse prevention programs in Spain. *Psicothema*, *27*(1), 5-12. https://doi.org/10.7334/psicothema2014.106

Espada, J. P., Gonzálvez, M. T., Orgilés, M., Guillén-Riquelme, A., Soto, D. & Sussman, S. (2015b). Pilot clinic study of Project EX for smoking cessation with Spanish adolescents. *Addictive Behaviors, 45*, 226-231. https://doi.org/10.1016/j.addbeh.2015.02.009

Espada, J. P., Griffin, K. W., Pereira, J. R., Orgilés, M. & García-Fernández, J. M. (2012). Component analysis of a school-based substance use prevention program in Spain: Contributions of problem solving and social skills training content. *Prevention Science: The Official Journal of the Society for Prevention Research, 13*(1), 86-95. https://doi.org/10.1007/s11121-011-0249-y

Espada, J. P., Méndez, F. X., Botvin, G. J., Griffin, K., Orgilés, M. & Rosa, A. I. (2002). ¿Éxito o fracaso de la prevención del abuso de drogas en el contexto escolar? Un meta-análisis de los programas en España [Success or failure of drug abuse prevention in the school context? A meta-analysis of programs in Spain]. *Psicología Conductual*, *10*(3), 581-602. https://www.behavioralpsycho.com/wp-content/uploads/2020/04/08.Espada_10-3oa.pdf

Espada, J. P., Méndez, F. X. & Hidalgo, M. D. (2003). Cuestionario de consumo [Consumption questionnaire]. In J. P. Espada & F. X. Méndez (Eds.), *Programa Saluda: Prevención del abuso de alcohol y del consumo de drogas de síntesis* [Saluda Program: Prevention of alcohol abuse and synthetic drug use] (pp. 167-168). Pirámide.

European Monitoring Centre for Drugs and Drug Addiction, EMCDDA. (s.f.). *Xchange prevention registry*. https://www.emcdda.europa.eu/best-practice/xchange

European Monitoring Centre for Drugs and Drug Addiction, EMCDDA. (2011). *European drug prevention quality standards: A manual for prevention professionals, EMCDDA manuals 7*. Publications Office of the European Union. www.emcdda.europa.eu/publications/manuals/prevention-standards

Faggiano, F., Galanti, M. R., Bohrn, K., Burkhart, G., Vigna-Taglianti, F., Cuomo, L., Fabiani, L., Panella, M., Perez, T., Siliquini, R, van der Kreeft, P., Vassara, M., Wiborg, G. & the EU-Dap Study Group. (2008b). The effectiveness of a school-based substance abuse prevention program: EU-dap cluster randomised controlled trial. *Preventive Medicine, 47*(5), 537-543. https://doi.org/10.1016/j.ypmed.2008.06.018

Faggiano, F., Richardson, C., Bohrn, K., Galanti, M. R. & EU-Dap Study Group. (2007). A cluster randomized

controlled trial of school-based prevention of tobacco, alcohol and drug use: The EU-dap design and study population. *Preventive Medicine, 44*(2), 170-173. https://doi.org/10.1016/j.ypmed.2006.09.010

Faggiano, F., Vigna-Taglianti, F., Burkhart, G., Bohrn, K., Cuomo, L., Gregori, D., Panella, M., Scatigna, M., Siliquini, R., Varona, L., van der Kreeft, P., Vassara, M., Wiborg, G., Galanti, M. R. & the EU-Dap Study Group. (2010). The effectiveness of a school-based substance abuse prevention program: 18-month follow-up of the EU-Dap cluster randomized controlled trial. *Drug and Alcohol Dependence, 108*(1-2), 56-64. https://doi.org/10.1016/j.drugalcdep.2009.11.018

Faggiano, F., Vigna-Taglianti, F. D., Versino, E., Zambon, A., Borraccino, A. & Lemma, P. (2008a). School-based prevention for illicit drugs use: A systematic review. *Preventive Medicine*, *46*(5), 385-396. https://doi.org/10.1016/j.ypmed.2007.11.012

Fernández, S., Nebot, M. & Jané, M. (2002). Evaluación de la efectividad de los programas escolares de prevención del consumo de tabaco, alcohol y cannabis: ¿Qué nos dicen los meta-análisis? [Evaluation of the effectiveness of school programs for the prevention of tobacco, alcohol and cannabis use: What do the meta-analyses tell us?]. *Revista Española de Salud Pública*, *76*(3), 175-187. http://scielo.isciii.es/scielo.php?script=sci_arttextypid=S1135-57272002000300002ylng=esytlng=es

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Addison-Wesley.

Flay, B. R. (1999). Understanding environmental, situational and intrapersonal risk and protective factors for youth tobacco use: The Theory of Triadic Influence. *Nicotine and Tobacco Research*, *1*(2), S111-S114. https://doi.org/10.1080/14622299050011911

García, P., Fernández, A., Sánchez, J. M., Carrillo, A., Alcaraz, J. & Abad, E. (2005). Ensayo controlado aleatorizado de un programa de promoción de la salud para la prevención del tabaquismo en un grupo de escolares [Randomized controlled trial of a health promotion program for the prevention of smoking in a group of schoolchildren]. *Revista de Calidad Asistencial, 20*(1), 4-13. https://doi.org/10.1016/s1134-282x(08)74711-0

Gázquez, M., García del Castillo, J. A. & Espada, J. P. (2011). Eficacia diferencial de dos programas de prevención escolar sobre el consumo de tabaco, según el tipo de aplicador [Differential efficacy of two school prevention programs on tobacco consumption, according to the type of applicator]. *Psicothema*, *23*(4), 537-543. http://www.psicothema.es/pdf/3919.pdf

Gómez-Fraguela, J. A., Luengo, Á. & Romero, E. (2002). Prevención del consumo de drogas en la escuela: Cuatro años de seguimiento de un programa [Prevention of drug use at school: Four years of follow-up of a program]. *Psicothema, 14*(4), 685-692. https://www.psicothema.com/pdf/785.pdf

Gonzálvez, M. T., Espada, J. P., Orgilés, M., Soto, D. & Sussman, S. (2015). One-year effects of Project EX in Spain: A classroom-based smoking prevention and cessation intervention program. *PloS One, 10*(6), e0130595. https://doi.org/10.1371/journal.pone.0130595

Gonzálvez, M. T., Espada, J. P., Orgilés, M., Morales, A. & Sussman, S. (2016). Nicotine dependence as a mediator of Project EX's effects to reduce tobacco use in scholars. *Frontiers in Psychology, 7*, 1207. https://doi.org/10.3389/fpsyg.2016.01207

Gonzálvez, M. T., Morales, A., Orgilés, M., Sussman, S. & Espada, J. P. (2018). Role of smoking intention in tobacco use reduction: A mediation analysis of an effective classroom-based prevention/cessation intervention for adolescents. *Addictive Behaviors, 84*, 186-192. https://doi.org/10.1016/j.addbeh.2018.04.013

Gordon, R. (1987). An operational classification of disease prevention. In J. A. Steinberg & M. M. Silverman (Eds.), *Preventing mental disorders* (pp. 20-26). Department of Health and Human Services.

Gunnell, K., Poitras, V. J. & Tod, D. (2020). Questions and answers about conducting systematic reviews in sport and exercise psychology. *International Review of Sport and Exercise Psychology*, *13*(1), 297-318. https://doi.org/10.1080/1750984X.2019.1695141

Haddaway, N. R. & McGuinness, L. (2020). *PRISMA2020: R package and ShinyApp for producing PRISMA 2020 compliant flow diagrams*. https://doi.org/10.5281/ZENODO.4287835

Hansen, W. B. (1992). School-based substance abuse prevention: A review of the state of the art in curriculum, 1980–1990. *Health Education Research*, *7*(3), 403-430. https://doi.org/10.1093/her/7.3.403

Hawkins, J. D., Catalano, R. F. & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, *112*(1), 64-105. https://doi.org/10.1037/0033-2909.112.1.64

Hernández, O., Espada, J. P., Piqueras, J. A., Orgilés, M. & García, J. M. (2013). Programa de prevención del consumo de drogas Saluda: Evaluación de una nueva versión en adolescentes españoles [Saluda drug use prevention program: Evaluation of a new version in Spanish adolescents]. *Health and Addictions / Salud Y Drogas, 13*(2), 135-144. https://doi.org/10.21134/haaj.v13i2.210

Hirschi, T. & Gottfredson, M. R. (1988). Towards a general theory of crime. In W. Buikhuisen & S. A. Mednick (Eds.), *Explaining criminal behaviour. Interdisciplinary approaches* (pp. 88-97). Brill.

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C. & Vedel, I. (2018). *Mixed Methods Appraisal Tool (MMAT). Version*

2018. McGill University. http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/fetch/127916259/MMAT_2018_criteria-manual_2018-08-01_ENG.pdf

Jessor, R. & Jessor, S. L. (1977). *Problem behaviour and psychosocial development: a longitudinal study of youth*. Academic Press.

Kandel, D. B. (1980). Developmental stages in adolescent drug involvement. *NIDA Research Monograph*, *30*, 120-127.

Kaplan, H. B. (1996). Empirical validation of the applicability of an integrative theory of deviant behavior to the study of drug use. *Journal of Drug Issues*, *292*, 345-377.

Kaplan, H. B., Johnson, R. J. & Bailey, C. A. (1986). Self-rejection and the explanation of deviance: Refinement and elaboration of a latent structure. *Social Psychology Quarterly*, *49*(2), 110-128. https://doi.org/10.2307/2786723

Klepp, K. I., Halper, A. & Perry, C. L. (1986). The efficacy of peer leaders in drug abuse prevention. *Journal of School Health*, *56*(9), 407-411. https://doi.org/10.1111/j.1746-1561.1986.tb05783.x

Lassi, Z. S., Salam, R. A., Das, J. K., Wazny, M. K. & Bhutta, Z. A. (2015). An unfinished agenda on adolescent health: Opportunities for interventions. *Seminars in Perinatology*, *39*(5), 353-360. https://doi.org/10.1053/j.semperi.2015.06.005

Leiva, A., Estela, A., Bennasar-Veny, M., Aguiló, A., Llobera, J. & Yáñez, A. M. (2018). Effectiveness of a complex intervention on smoking in adolescents: A cluster-randomized controlled trial. *Preventive Medicine*, *114*, 88-94. https://doi.org/10.1016/j.ypmed.2018.06.009

Luna-Adame, M., Carrasco-Giménez, T. J. & Rueda-García M. M. (2013). Evaluation of the effectiveness of a smoking prevention program based on the 'Life Skills Training' approach. *Health Education Research*, *28*(4), 673-682. https://doi.org/10.1093/her/cyt061

Mansilla, F. & Vega, P. (1999). Hipótesis de la susceptibilidad en drogodependencia: Reflexiones para un modelo etiológico [Hypothesis of susceptibility in drug dependence: reflections for an etiological model]. *Revista Española de Drogodependencias*, *24*(1), 17-30. https://www.aesed.com/descargas/revistas/v24n1_2.pdf

McGrath, Y., Sumnall, H., McVeigh, J. & Bellis, M. (2006). Drug use prevention among young people: A review of reviews. Evidence briefing update. *National Institute for Health and clinical excellence*. http://www.cph.org.uk/showPublication.aspx?pubid=216

Medina-Martínez, J. & Villanueva-Blasco, V.J. (2023). Prevention versus pseudo-prevention: A systematic review of school drug prevention and its indexing in best practice portals. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469-023-01122-x

Moral, M. V., Ovejero, A., Sirvent, C. & Rodríguez, F. J. (2005). Prevención e intervención psicosocial sobre el consumo juvenil de sustancias psicoactivas: Comparación de la eficacia preventiva de cuatro programas [Prevention and psychosocial intervention on the young psychoactive substances constumption: Comparision of four programs preventive efficacy]. *Psychosocial Intervention*, *14*(2), 189-208. http://www.copmadrid.org/webcopm/publicaciones/social/99051.pdf

Moral, M. V., Rodríguez, F. J., Ovejero, A. & Sirvent, C. (2009). Cambios actitudinales y reducción del consumo de alcohol en adolescentes a partir de un programa de intervención psicosocial [Attitudinal changes and reduction of alcohol consumption in adolescents from a psychosocial intervention program]. *Adicciones, 21*(3), 207-219. https://doi.org/10.20882/adicciones.231

Moral, M. V., Sirvent, C., Ovejero, A. & Rodríguez, F. J. (2004). Comparación de la eficacia preventiva de programas de intervención psicosocial sobre las actitudes hacia el consumo juvenil de sustancias psicoactivas [Comparison of the preventive efficacy of psychosocial intervention programs on attitudes towards youth consumption of psychoactive substances]. *Trastornos Adictivos*, *6*(4), 248-261. https://www.elsevier.es/es-revista-trastornos-adictivos-182-pdf-13069836

Offord, D. R. (2000). Selection of levels of prevention. *Addictive Behaviors*, *25*(6), 833-842. https://doi.org/10.1016/s0306-4603(00)00132-5

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S.,... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, *372*(71), 1-9. https://doi.org/10.1136/bmj.n71

Pereira, A. P. D. & Sanchez, Z. M. (2018). Drug use prevention: Factors associated with program implementation in Brazilian urban schools. *BMC Public Health*, *18*, 334. https://doi.org/10.1186/s12889-018-5242-y

Piaget, J. (1962). *Play, dreams, and imitation in childhood*. Norton.

Porath-Waller, A. J., Beasley, E. & Beirness, D. J. (2010). A meta-analytic review of school-based prevention for cannabis use. *Health Education and Behavior*, *37*(5), 709-723. https://doi.org/10.1177/1090198110361315

Ramos, P., Oliva, A., Moreno, C., Lorence, B., Jiménez, A. M., Jiménez, L., Hidalgo, M. V. & Antolín, L. (2010). *Los programas escolares para la prevención del consumo de sustancias. Análisis de las claves que determinan su eficacia* [School programs for the prevention of substance use. Analysis of the keys that determine its effectiveness]. Universidad de Sevilla, Departamento de Psicología Evolutiva y de la Educación. https://personal.us.es/oliva/Libro_drogas.pdf

Roona, M., Streke, A., Ochshorn, P., Marshall, D. & Palmer, A. (2000). Identifying effective school-based substance abuse prevention interventions. In *Background Paper for Prevention 2000 Summit.* Social Capital Development Corporation.

Robertson, E., David, S. & Rao, S. (2004). *Cómo prevenir el uso de drogas en los niños y los adolescentes. Una guía con base*

científica para padres, educadores y líderes de la comunidad [How to prevent drug use in children and adolescents. A science-based guide for parents, educators, and community leaders]. NIDA. https://nida.nih.gov/sites/default/files/redbook_spanish.pdf

Romero, E., Rodríguez, C., Villar, P. & Gómez-Fraguela, X. A. (2017). Intervención sobre problemas de conducta tempranos como prevención indicada del consumo de drogas: Siete años de seguimiento [Intervention for early conduct problems as an indicated prevention of drug use: Seven years of follow-up]. *Adicciones, 29*(3), 150-162. https://doi.org/10.20882/adicciones.722

Salvador, T. & de Silva, A. (2010). *Guía de buenas prácticas y calidad en la prevención de drogodependencias en la comunidad autónoma de la Región de Murcia* [Guide to good practices and quality in the prevention of drug addiction in the autonomous community of the Region of Murcia]. Plan Regional sobre Drogas. http://www.prevencionbasadaenlaevidencia.net/uploads/PDF/EG_Buenaspracticasprevencion_Murcia.pdf

Simons, R. L., Conger, R. D. & Whitbeck, L. B. (1988). A multistage social learning model of the influences of family and peers upon adolescent substance abuse. *Journal of Drug Issues*, *18*(3), 293-315. https://doi.org/10.1177/002204268801800301

Skara, S. & Sussman, S. (2003). A review of 25 long-term adolescent tobacco and other drug use prevention program evaluations. *Preventive Medicine*, *37*(5), 451-474. https://doi.org/10.1016/s0091-7435(03)00166-x

Socidrogalcohol. (s.f.). *Prevención basada en la evidencia. Intervenciones evaluadas* [Evidence-based prevention. Interventions evaluated]. http://www.prevencionbasadaenlaevidencia.net/index.php?page=intervenciones-evaluadas.

Soole, D. W., Mazerolle, L. & Rombouts, S. (2008). School-based drug prevention programs: A review of what works. *Australian and New Zealand Journal of Criminology*, *41*(2), 259–286. https://doi.org/10.1375/acri.41.2.259

Sussman, S., Earleywine, M., Wills, T., Cody, C., Biglan, T., Dent, C. W. & Newcomb, M. D. (2004). The motivation, skills, and decision-making model of "drug abuse" prevention. *Substance Use & Misuse*, *39*(10-12), 1971-2016. https://doi.org/10.1081/ja-200034769

Thomas, R., McLellan, J. & Perera, R. (2013). Programas escolares para la prevención del hábito de fumar [School programs for the prevention of smoking]. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.CD001293.pub3

Tobler, N. S. (1986). Meta-analysis of 143 adolescent drug prevention programs: Quantitative outcome results of program participants compared to a control or comparison group. *Journal of Drug Issues*, *16*(4), 537-567. https://doi.org/10.1177/002204268601600405

Tobler, N. S., Roona, M. R., Ochshorn, P., Marshall, D. G., Streke, A. V. & Stackpole, K. M. (2000). School-based adolescent drug prevention programs: 1998 meta-analysis. *The Journal of Primary Prevention*, *20*(4), 275-336. https://doi.org/10.1023/A:1021314704811

Tobler, N. S. & Stratton, H. H. (1997). Effectiveness of school-based drug prevention programs: A meta-analysis of the research. *Journal of Primary Prevention*, *18*(1), 71-128. https://doi.org/10.1023/A:1024630205999

United Nations Office on Drugs and Crime, UNODC. (2018). *International Standard on Drug Use Prevention. Second updated edition*. UNODC. https://www.unodc.org/documents/prevention/UNODC-WHO_2018_prevention_standards_E.pdf

U.S. Department of Health and Human Services, HHS. (2016). Prevention programs and policies. En *Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs, and Health*. HHS. https://www.ncbi.nlm.nih.gov/books/NBK424850/

Vadrucci, S., Vigna-Taglianti, F. D., van der Kreeft, P., Vassara, M., Scatigna, M., Faggiano, F., Burkhart, G. & EU-Dap Study Group. (2016). The theoretical model of the school-based prevention programme Unplugged. *Global Health Promotion*, *23*(4), 49-58. https://doi.org/10.1177/1757975915579800

Valdivieso, E., Rey-Reñones, C., Rodriguez-Blanco, T., Ferre, C., Arija, V., Barrera, M. L., Granado-Font, E., Flores-Mateo, G. & the TAB_ES Study Group. (2015). Efficacy of a smoking prevention programme in Catalan secondary schools: A cluster-randomized controlled trial in Spain. *Addiction, 110*(5), 852-860. https://doi.org/10.1111/add.12833

Vargas-Martínez, A. M., Trapero-Bertran, M., Lima-Serrano, M., Anokye, N., Pokhrel, S. & Mora, T. (2019). Measuring the effects on quality of life and alcohol consumption of a program to reduce binge drinking in Spanish adolescents. *Drug and Alcohol Dependence, 205*, 107597. https://doi.org/10.1016/j.drugalcdep.2019.107597

Villanueva, V. J. (2017). Diseño y evaluación de la eficacia de un programa de habilidades para la vida en la prevención del consumo de sustancias en adolescentes [Tesis doctoral] [Design and evaluation of the effectiveness of a life skills program in the prevention of substance use in adolescents [Doctoral thesis]]. Universidad de Santiago de Compostela.

Villanueva, V. J., Puig-Perez, S. & Becoña, E. (2021). Efficacy of the "Sé tú Mismo" (Be Yourself) program in prevention of cannabis use in adolescents. *International Journal of Mental Health and Addiction*, *19*, 1214-1226. https://doi.org/10.1007/s11469-019-00219-6

de Vries, H. (2017). An integrated approach for understanding health behavior; The I-change model as an example. *Psychology and Behavioral Science International Journal*, *2*(2), 1-6. https://doi.org/10.19080/PBSIJ.2017.02.555585

de Vries, H., Backvier, E., Kok, G. & Dijkstra, M. (1995). The impact of social influences in the con-

text of attitude, self-efficacy, intention and previous behavior as predictors of smoking onset. *Journal of Applied Social Psychology*, *25*(3), 237-257. https://doi.org/10.1111/j.1559-1816.1995.tb01593.x

de Vries, H., Dijk, F., Wetzels, J., Mudde, A., Kremers, S., Ariza, C., Duarte, P., Fielder, A., Holm, K., Janssen, K., Lehtovuori, R. & Candel, M. (2006). The European smoking prevention framework approach (ESFA): Effects after 24 and 30 months. Health Education Research, *21*(1), 116-132. https://doi.org/10.1093/her/cyh048

de Vries, H., Mudde, A., Kremers, S., Wetzels, J., Uiters, E., Ariza, C., Duarte, P., Fielder, A., Holm, K., Janssen, K., Lehtovuori, R. & Candel, M. (2003). The European smoking prevention framework approach (ESFA): Short-term effects. *Health Education Research, 18*(6), 649-663. https://doi.org/10.1093/her/cyg033

Vygotsky, L. (1962). *Thought and language.* MIT Press. https://doi.org/10.1037/11193-000

Winters, K. C., Fawkes, T., Fahnhorst, T., Botzet, A. & August, G. (2007). A synthesis review of exemplary drug abuse prevention programs in the United States. *Journal of Substance Abuse Treatment*, *32*(4), 371-380. https://doi.org/10.1016/j.jsat.2006.10.002

World Health Organization, WHO. (1994). *Life skills education for children and adolescents in schools*. WHO. https://apps.who.int/iris/handle/10665/63552

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Erlbaum.