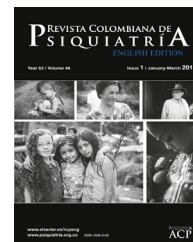




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Review Article

Individual factors associated with the consumption of illicit substances: a review of reviews



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ABSTRACT

Introduction: According to national studies, the use of illicit drugs is growing in Colombia. With this, the prevalence of substance use disorders and the set of health effects related to this practice also increases. Knowledge of the factors associated with the use of illicit drugs is necessary to guide the comprehensive care of the phenomenon.

Methods: This is a systematic review of reviews on factors associated with the consumption of illicit drugs with seven databases and evaluation of the quality of the manuscripts according to AMSTAR.

Results: Information was extracted from 38 reviews on individual factors associated with the use of illicit drugs. Demographic factors are associated with consumption through other factors. There is evidence of the association between mental and behavioural disorders and personality disorders.

Conclusions: The likelihood of consumption of illicit substances and disorders due to their use is affected by a set of personal factors including sociodemographic characteristics, mental health conditions, sexual behaviour, legal drug use, age of onset and risk perception.

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Factores Individuales Asociados al Consumo de Sustancias Ilícitas: Una Revisión de Revisiones

RESUMEN

Introducción: El consumo de drogas ilícitas está creciendo en Colombia según los estudios nacionales. Con ello también incrementa la prevalencia de los trastornos por uso de sustancias y del conjunto de afectaciones a la salud relacionadas con esta práctica. El conocimiento de los factores asociados al consumo de drogas ilícitas es necesario para orientar la atención integral del fenómeno.

Palabras clave:

Revisión sistemática

Modelos ecológicos

Consumo de drogas

Drogas ilícitas

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Métodos: Se trata de una revisión sistemática de revisiones sobre factores asociados al consumo de drogas ilícitas con siete bases de datos y evaluación de la calidad de los manuscritos de acuerdo con AMSTAR.

Resultados: Se extrajo información de 38 revisiones sobre factores individuales asociados al consumo de drogas ilícitas. Los factores demográficos se asocian con el consumo con mediación de otros factores. Hay evidencia de la asociación entre trastornos mentales y del comportamiento y los trastornos de personalidad.

Conclusiones: La probabilidad de consumo de sustancias ilícitas y de trastornos por su uso, se ve afectada por un conjunto de factores personales que incluyen características sociodemográficas, condiciones de salud mental, comportamiento sexual, el consumo de drogas legales, la edad de inicio y la percepción de riesgo.

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Introduction

Drug use is one of the most significant social determinants of health inequities in contemporary society.¹ In Colombia, drug use is a factor for vulnerability in nearly all forms of violence, including homicide, interpersonal aggression, partner violence and disappearances.²

Illegal drug use has been rising in the general population and in schools and universities in Colombia at a sustained rate since the early 1990s.^{3–6} Hence, research on this event is very important in establishing evidence-based policy and programmes that represent comprehensive interventions in the matter.⁷

Drug use in itself is an event of complex determination; therefore, it is a good idea to turn to ecological perspectives for the purpose of explaining it. Ecological approaches have a long-standing tradition in behaviour research; ideas put forward by Kurt Lewin and others were later adopted by Urie Bronfenbrenner and incorporated more systematically into his models of human development.^{8–10}

Within ecological perspectives, individual factors carry significant weight, although the importance of social factors is acknowledged.^{11,12} In illicit drug use, it is understood that variables in one's social environment have substantial influences and that, at the same time, factors such as age,^{4,13} sex,¹⁴ and mental and behavioural disorders^{15,16} also factor heavily in the likelihood of drug use.

At one time, personal beliefs, attitudes and self-esteem were ascribed a great deal of value in accounting for drug use.¹⁷ Today, thanks to research, more solid evidence is available that better accounts for drug use.

Due to the complex nature of illicit drug use, research on this phenomenon references a wide variety of factors; hence, the evidence is of a very mixed nature. With the goal of determining which factors are associated with psychoactive substance use, taking into account the diversity of factors that may influence the onset and maintenance thereof, a systematic review of reviews was carried out. From this was extracted, for the purpose of this article, matters of individual factors due to the wide-ranging set of factors addressed in the full study.

Method

Study type

A review of reviews was conducted. Reviews of reviews help to solve the difficulties of doing reviews of primary articles when these are highly abundant (7782 documents were retrieved using this very review's search criteria for primary articles). According to Smith, Devane, Begley and Clarke (2011), the methods for a review of reviews are similar to those used in a review of individual articles. In this case, the recommendations of Hunt and Aromataris were followed to conduct a review of reviews to a high standard of quality.^{19,20}

Procedure

Search strategy

The search strategy included checking PubMed, the Cochrane Library (including the Database of Abstracts of Reviews of Effects), ProQuest, ScienceDirect, Google Scholar, Redalyc and Scielo.

A combination of controlled vocabularies (MeSH and DeCS) and free-text terms (to take into account variant spellings, synonyms, acronyms and truncations) were used for "street drugs", "illicit drugs", "drug abuse", "substance-related disorders", "substance abuse", "drug consumption", "illicit drugs", "drug abuse", "factors", "factors associated", "factors related", "review", "systematic review" and "meta-analysis", with their Spanish equivalents, with field labels (title and abstract), proximity operators (adj) and Boolean operators (OR/AND), in the keywords of the publications and titles. A manual search of reviews cited in the manuscripts mentioned was conducted as well.

Searches were limited to a time frame of 2000 to March 2018 and to English, Spanish and Portuguese. The manuscripts identified that reported observational studies on factors associated with substance use or substance use disorders were included regardless of publication status.

Articles on genetic research, articles in animals and manuscripts that were not true reviews were excluded.

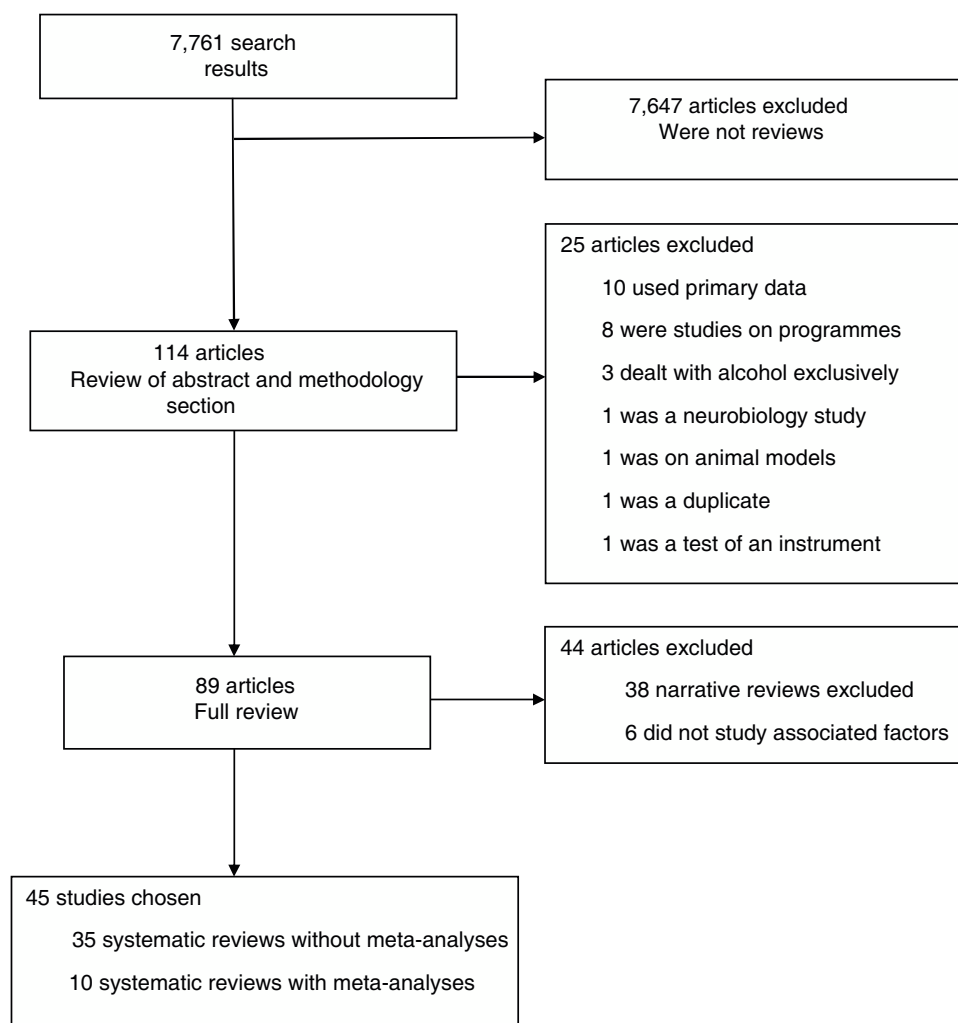


Fig. 1 – Article selection tree.

Data extraction

Data extraction was done according to the guidelines of Aromataris et al.¹⁹ and Hunt.²⁰ Information from reviews that included meta-analyses was separated from information from reviews that did not. Three investigators took part in data extraction: each article was read by two investigators who took the data independently. In case of discrepancies, the third investigator's opinion was requested.

Analysis of review quality

A measurement tool for the 'assessment of multiple systematic reviews' (AMSTAR) was used to assess the quality of the reviews.^{18,21,22} Quality was scored according to the following ranges: high (9–11), medium (5–8) or low (0–4). The AMSTAR instrument can be leveraged using full scores or scores for just some items.²³ In the case of the reviews, for meta-analyses, item 9, which refers to the methods used to combine the findings of primary studies, was omitted. The guidelines were also applied by two independent reviewers; the opinion of a third reviewer was requested in the event of a discrepancy.

Synthesis

The information synthesis was presented in a qualitative manner, since a good number of the original articles were based on surveys or other observational studies and there was a high degree of heterogeneity which precluded meta-analyses. Moreover, it is not advisable to perform meta-analyses based on meta-analyses.²⁰

Results

A total of 45 systematic reviews were included in the analysis: 35 reviews without a meta-analysis and 10 with a meta-analysis. Fig. 1 illustrates the different stages of article selection.

Twenty-eight reviews without a meta-analysis and the 10 with a meta-analysis addressed factors of an individual nature. The information extraction tables are available (see Tables 1 and 2), as are the quality scoring tables.

The quality of the reviews selected was scored as follows: high (four reviews without a meta-analysis and two with a meta-analysis), medium (18 reviews without a meta-analysis and seven with a meta-analysis) or low (four without

Table 1 – Qualitative extraction.

Factors	Main findings	Authors and year
Age	There was greater vulnerability to peer influence in early and mid-adolescence than late adolescence.	Marschall-Lévesque, Castellanos-Ryan, Vitaro, & Séguin, 2015
Age	Age was not significantly associated with methamphetamine use in a population that had not tried illicit substances.	Russell et al., 2008
Age and polysubstance use	The older the age, the higher the likelihood of polysubstance use in adolescents.	Tomczyk, Isensee, & Hanewinkel, 2015
Age and mental disorders	The younger the age of presentation of a depressive or behavioural disorder, the higher the likelihood of substance use, and those who had used substances in their youth were more likely to have affective disorders.	Saban & Flisher, 2010
Sex/gender	There was a higher likelihood of drug use in men.	Guxens, Nebot, Ariza, & Ochoa, 2007 Russell et al., 2008 Stone, Becker, Huber, & Catalano, 2012
Sex/gender	There was mixed and inconsistent evidence on peer influence in relation to gender.	Jacobs, Goodson, Barry, & McLeroy, 2016 Marschall-Lévesque, Castellanos-Ryan, Vitaro, & Séguin, 2014 Stone, Becker, Huber, & Catalano, 2012
Sex/gender	Female adolescents tended to be in the group of occasional polysubstance users, and there was no gender-based association with heavy use.	Tomczyk, Isensee, & Hanewinkel, 2015
Sex/gender	There was a certain degree of evidence on the protective role of female sex against substance use.	Brady, Iwamoto, Grivel, Kaya, & Clinton, 2016
Sex/gender	There was little evidence on the role of gender as a mediator of the effects of child abuse on drug use.	Kristman-Valente & Wells, 2013
Ethnicity	There was no clearly established association between polysubstance use and ethnicity.	Tomczyk, Isensee, & Hanewinkel, 2015
Ethnicity	Hispanic, Native American and Caucasian youths were at higher risk of methamphetamine use.	Russell et al., 2008
Socioeconomic status	Drug use did not change based on socioeconomic status, family income or parental occupational status.	Henkel & Zemlin, 2016 Stone, Becker, Huber, & Catalano, 2012
Socioeconomic status	Low socioeconomic status was associated with illicit drug use.	Daniel et al., 2009 Guxens, Nebot, Ariza, & Ochoa, 2007 Henkel & Zemlin, 2016
Socioeconomic status	Socioeconomic vulnerability increased the risk of use under conditions of conflict.	Jack, Reese Masterson, & Khoshnood, 2014 Daniel et al., 2009
Marginalisation	There were lower rates of use of inhalants in populations marginalised due to poverty or mental illness and those who had been involved with juvenile justice systems.	Nguyen, O'Brien, & Schapp, 2016
Unemployment	There was a higher risk of illicit drug use and of disorders among unemployed versus employed persons. Unemployed persons were less likely to be represented in surveys.	Henkel, 2011 Henkel & Zemlin, 2016
Religiosity/spirituality	There was an inverse relationship between religiosity and spirituality and substance use, although these terms were not adequately differentiated or standardised.	Guxens, Nebot, Ariza, & Ochoa, 2007 Kub & Solari-Twadell, 2013 Nargiso, Ballard, & Skeer, 2015
Marriage or cohabitation	Marriage and cohabitation acted as protective factors against substance use in young adults.	Stone, Becker, Huber, & Catalano, 2012
Sexual behaviour	The risk was higher among youths who had become sexually active and among those who engaged in unsafe sexual practices.	Edwards, Giroux, & Okamoto, 2010 Russell et al., 2008
Sexual behaviour	Being homosexual or bisexual was associated with methamphetamine use in the population that had not tried illicit substances.	Russell et al., 2008
Pregnancy	Female youths who became pregnant tended to decrease their marijuana use, but their use could increase after childbirth.	Stone, Becker, Huber, & Catalano, 2012
History of child abuse	There was no clearly established association between methamphetamine use and a history of child abuse in the population that had used illicit substances.	Russell et al., 2008
History of sexual abuse	There was evidence of an association between having been sexually abused and substance use.	Maniglio, 2011 Nguyen, O'Brien, & Schapp, 2016
Legal drug use	There was a higher likelihood of illegal drug use among those who used alcohol and tobacco.	Guxens, Nebot, Ariza, & Ochoa, 2007 Nargiso, Ballard, & Skeer, 2015 Russell et al., 2008
Perceived risk/danger	The greater the perceived risk, the lower the non-medical use of prescription drugs.	Nargiso, Ballard, & Skeer, 2015
Conformity with moral order	A lack of social conformity in adolescence could increase the risk of drug use in early adulthood.	Stone, Becker, Huber, & Catalano, 2012

Table 1 (Continued)

Factors	Main findings	Authors and year
Personality	Certain personality traits, such as a risk orientation, an unconventional personality, thrill-seeking behaviour and social anxiety, created a predisposition to illicit drug use.	Guxens, Nebot, Ariza, & Ochoa, 2007 Kirst, Mecredy, Borland, & Chaiton, 2014 Marschall-Lévesque, Castellanos-Ryan, Vitaro, & Séguin, 2014 Nargiso, Ballard, & Skeer, 2015 Nguyen, O'Brien, & Schapp, 2016
Mental disorder	There was a link between psychiatric illness and illegal drug use (including depression and anxiety). Dual diagnoses such as smoking and using cocaine had a worse prognosis and were unreceptive to typical treatments.	Edwards, Giroux, & Okamoto, 2010 Jack, Reese Masterson, & Khoshnood, 2014 Najt, Fusar-Poli, & Brambilla, 2011 Nguyen, O'Brien, & Schapp, 2016 Saban & Flisher, 2010 Sarvet & Hasin, 2016 Russell et al., 2008
Depression	There was an association between depression and substance use, largely in men, that was neither confirmed nor clear.	Vorspan, Mehtelli, Dupuy, Bloch, & Lépine, 2015 Hussong, Ennett, Cox, & Haroon, 2017
Objective and subjective deficits	Ecstasy, cannabis and polysubstance users showed more objective, subjective and memory deficits than non-users.	Carrigan & Barkus, 2016
Maladaptive stress and poor self-control	Tendencies towards avoidance, rage-based responses and maladaptive coping methods in general were associated with cannabis use.	Hyman & Sinha, 2009
Stressful events	There was a higher likelihood of substance use among those who had lived through larger numbers of stressful events during adolescence.	Stone, Becker, Huber, & Catalano, 2012
Trauma	One study showed that trauma and post-traumatic stress disorder were associated with illicit substance use.	Kirst, Mecredy, Borland, & Chaiton, 2014
Health insurance	There was mixed evidence on the association between type of health insurance and non-medical prescription drug use.	Nargiso, Ballard, & Skeer, 2015
Insecure attachment	This was a risk factor for drug use.	Becoña, Fernández del Río, Calafat, & Fernandez-Hermida, 2014 Schindler & Bröning, 2015
Academic performance	There was contradictory evidence on the association between academic performance and non-medical drug use.	Nargiso, Ballard, & Skeer, 2015
Educational performance	Poor school behaviour and poor academic performance were associated with illegal drug use.	Edwards, Giroux, & Okamoto, 2010 Paiva & Ronzani, 2009 Russell et al., 2008 Stone, Becker, Huber, & Catalano, 2012
Level of education	The highest rates of prevalence of non-cannabis illegal drug use were seen among students with a low level of education.	Henkel & Zemlin, 2016

a meta-analysis and one with a meta-analysis). According to the AMSTAR quality instructions, the analysis and discussion were based on studies of high or medium quality (see [Tables 3 and 4](#)).

Sociodemographic factors

A person's age was a factor associated with illicit drug use, particularly with a greater vulnerability in childhood and adolescence in view of other variables that increased the likelihood of use, such as peer influence, precocious puberty²⁴ and mental disorders.²⁵ This varies depending on type of substance; for example, at a later age, the risk of polysubstance use would increase in people who are already users,²⁶ while one review found that methamphetamine use in people not having used illicit substances was not associated with age.²⁹

For other authors, more than age per se, the relationship to drug use depended on the incidence of traumatic events or how early use started. A review by Maniglio et al. highlighted the importance of a history of sexual abuse, particularly in childhood.²⁷ The importance of life transitions tied to advancement through the educational system has also been proposed as something that could have an impact on a higher risk of drug use and disorders due to substance use at later ages.^{28,29}

With respect to sex, the reviews indicated variable associations, depending on the substance. Thus, there would be a higher likelihood of illicit substance use in men,^{28,30} but in relation to methamphetamine and polysubstance use, there would be no clear association between sex and illicit drug use.^{26,31} On the other hand, being female could play a protective role against substance use.³² Nevertheless, there is not enough evidence on the mediating role of this variable in the relationship between drug use and social media or in the relationship between child abuse and drug use.^{15,33}

In any case, one review showed that the male-to-female ratio in the use of cannabis decreased, in the world, from 2.0 between 1941 and 1945 (CI 1.8–2.3) to 1.3 between 1991 and 1995 (CI 1.2–1.4), indicating a relative increase in numbers of women who used cannabis.³⁴

Level of education was also a personal factor referenced in the studies. Among young people, those with less education were more likely to use illicit substances,^{31,35} while academic achievement would decrease that risk.²⁸ However, in the case of prescription drug abuse, there was no clear association with academic performance.³⁶

With respect to socioeconomic status, the evidence was mixed. On the one hand, two reviews found that there was no clear association between drug use and socioeconomic status and parental income.^{28,35} However, three reviews showed the importance of personal economic vulnerability as a factor

Table 2 – Quantitative extraction.

Factors	Main findings	Authors and year
Sex/gender	The male-to-female ratio in the use of cannabis decreased from 2.0 between 1941 and 1945 (CI 1.8–2.3) to 1.3 between 1991 and 1995 (CI 1.2–1.4), indicating a relative increase in numbers of women who used cannabis.	Chapman et al., 2017
[6,0]Attention deficit/hyperactivity disorder in childhood	The risk of cannabis use disorders in adolescence increased (OR = 1.51; CI 1.02–2.24), as did the risk of substance use disorders (OR = 3.48 CI 1.80–6.73).	Charach, Yeung, Climans, & Lillie, 2011
	The risk of disorders increased with drug use (OR = 1.52; CI 1.52–5.27).	Groenman, Janssen, & Oosterlaan, 2017
	There was a slight association with cannabis use (OR = 1.24, CI 1.06–1.45), with cannabis use disorder (OR = 1.68, CI 1.23–2.31) and between comorbidity between anxiety and depression and cannabis use (OR = 1.68, CI 1.17–2.40).	Kedzior & Laeber, 2014
	It was associated with marijuana use (OR = 2.78; CI 1.64–4.74) and with marijuana use disorder (OR = 2.29, CI 1.32–3.99).	Lee, Humphreys, Flory, Liu, & Glass, 2011
	It was associated with cocaine abuse or dependency (OR = 2.05; CI 1.38–3.04).	Lee, Humphreys, Flory, Liu, & Glass, 2012
	It was associated with illicit drug abuse or dependency (OR = 2.64; CI 1.77–3.94).	Lee, Humphreys, Flory, Liu, & Glass, 2013
	There was no association between attention deficit/hyperactivity disorder when controlling for behavioural disorder and oppositional defiant disorder (OR = 1.35 CI 0.90–2.03).	Serra-Pinheiro et al., 2013
	The risk of disorders increased with drug use (OR = 4.24; CI 1.32–5.59).	Groenman, Janssen, & Oosterlaan, 2017
Oppositional defiant disorder or behavioural disorder in childhood		
Depression in childhood	There were not enough studies to determine an association	Groenman, Janssen, & Oosterlaan, 2017
Anxiety disorders in childhood	The risk of disorders increased with drug use (OR = 1.60; CI 1.12–2.29).	Groenman, Janssen, & Oosterlaan, 2017
Implicit cognition	The weighted average correlation between implicit cognition and illicit substance use was 0.31	Rooke, Hine, & Thorsteinsson, 2008
Externalising pathology and five-factor model	Antisocial personality disorder co-occurred with substance use disorders; no specific indicator was presented for this finding.	Ruiz, Pincus, & Schinka, 2008
Attachment	There was a slight but significant association between attachment and substance use (meta-regression = 0.16).	Fairbairn et al., 2018

that increases illicit drug use,^{35,37,38} two showed an association between being unemployed and a higher risk of both drug use and drug use disorders,^{35,39} and one review highlighted the effects of this vulnerability on conditions of violent social conflict.⁴⁰

On the other hand, three reviews addressed matters of ethnicity: one of them found a higher risk of amphetamine use among Hispanic, Native American and Caucasian youths.³¹ Another review reported risks of drug use associated with ethnicity in Hawaiian youths.⁴¹ However, other authors found no clear link between polysubstance use and ethnicity.²⁶

Another couple of factors studied were religiosity and spirituality, which were included in four reviews that determined that these represented a factor inversely associated with drug use.^{28,36,38,42} In addition, a lack of conformity with moral order could increase the risk of drug use.²⁸

Mental and behavioural disorders

A significant set of reviews addressed the relationship between drug use and mental disorders, finding that use may precede disorders and vice versa.²⁵ With respect to anxiety, two reviews pointed to the presence of a link between anxiety and illicit substance use, with an OR of 1.60⁴³ and 1.24,⁴⁴ whereas in the case of depression the same reviews differed

in their conclusions, since in two cases, there was not enough evidence to affirm the presence of this association,^{31,43} and in another review, such an association was indeed present under conditions of comorbidity with anxiety (OR 2.31).⁴⁴ Altogether, four reviews presented evidence on the relationship between some sort of mental disorder and illicit drug use, indicating furthermore that this relationship rendered substance use disorders more likely and worsened prognoses.^{25,31,40,41}

In any case, one more recent review disputed these findings, stating that although there was evidence of the association between mental illnesses, particularly depression and drug use, this was not clearly established.⁴⁵ The importance of mental factors with respect to drug use under altered social circumstances, such as violent conflicts, has also been cited.⁴⁰

Attention deficit/hyperactivity disorder was found to be associated with illicit substance use, with estimated ORs between 1.52 and 3.48^{43,46,47}; however, according to Serra-Pinheiro et al.,⁴⁸ the association between attention deficit/hyperactivity disorder and drug use was not seen when controlling for behaviour disorder and oppositional defiant disorder (OR CI 0.90–2.03). Specifically, Groenman et al.⁴³ indicated that oppositional defiant disorder and behavioural disorders increased the risk of drug use (OR 4.24), as well as anxiety disorders in childhood (OR 1.60). Thrill-seeking personalities,^{24,29,36} behavioural problems³¹ and tendencies

Table 3 – Application of AMSTAR to qualitative reviews.

Author and year	Was an 'a priori' design provided?	Was there duplicate study selection and data extraction?	Was a comprehensive literature search performed?	Was the status of publication (e.g. grey literature) used as an inclusion criterion?	Was a list of studies provided?	Were the characteristics of the included studies provided?	Was the scientific quality of included studies assessed and documented?	Was the scientific quality of the included studies used appropriately in formulating conclusions?	Was the likelihood of publication bias assessed?	Was the conflict of interest stated?	Total
Becona, Fernández del Río, Calafat, & Fernandez-Hermida, 2014	Yes	No	Yes	Yes	No	No	Yes	Yes	No	Yes	6
Brady, Iwamoto, Grivel, Kaya & Clinton (2016)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Carrigan & Barkus, 2016	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	8
Daniel et al., 2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	9
Edwards, Giroux, & Okamoto, 2010	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No	5
Guxens, Nebot, Ariza, & Ochoa, 2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	8
Henkel & Zemlin, 2016	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	7
Henkel, 2011	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	7
Hussong, Ennett, Cox, & Haroon, 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	8
Hyman & Sinha, 2009	Yes	No	Yes	Yes	No	No	No	No	No	No	3
Jack, Reese Masterson, & Khoshnood, 2014	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	9
Jacobs, Goodson, Barry, & McLeroy, 2016	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	7
Kirst, Mecredy, Borland, & Chaiton, 2014	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	8

– Table 3 (Continued)

Author and year	Was an 'a priori' design provided?	Was there duplicate study selection and data extraction?	Was a comprehensive literature search performed?	Was the status of publication (e.g. grey literature) used as an inclusion criterion?	Was a list of studies provided?	Were the characteristics of the included studies provided?	Was the scientific quality of included studies assessed and documented?	Was the scientific quality of the included studies used appropriately in formulating conclusions?	Was the likelihood of publication bias assessed?	Was the conflict of interest stated?	Total
Kristman-Valente & Wells, 2013	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	8
Kub & Solari-Twadell, 2013	Yes	No	Yes	Yes	Yes	Yes	Yes	I cannot answer	No	Yes	7
Maniglio, 2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	8
Marschall-Lévesque, Castellanos-Ryan, Vitaro, & Séguin, 2014	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	8
Najt, Fusar-Poli, & Brambilla, 2011	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No	5
Nargiso, Ballard, & Skeer, 2015	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No	5
Nguyen, O'Brien, & Schapp, 2016	Yes	No	No	No	No	No	No	No	No	No	1
Paiva & Ronzani, 2009	Yes	No	Yes	Yes	No	No	No	No	No	No	3
Russell et al., 2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	8
Saban & Flisher, 2010	Yes	No	Yes	Yes	No	No	Yes	No	No	No	4
Sarvet & Hasin, 2016	No	No	No	No	Yes	Yes	No	No	No	Yes	3
Schindler & Bröning, 2015	Yes	No	Yes	No	Yes	Yes	No	I cannot answer	No	Yes	5
Stone, Becker, Huber, & Catalano, 2012	Yes	No	Yes	I cannot answer	Yes	Yes	No	No	No	Yes	5
Tomczyk, Isensee, & Hanewinkel, 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
Vorspan, Mehtelli, Dupuy, Bloch, & Lépine, 2015	No	No	No	Yes	No	No	No	No	No	Yes	2

Table 4 – Application of AMSTAR to quantitative reviews.

Author/year	Was an 'a priori' design provided?	Was there duplicate study selection and data extraction?	Was a comprehensive literature search performed?	Was the status of publication (e.g. grey literature) used as an inclusion criterion?	Was a list of studies provided?	Were the characteristics of the included studies provided?	Was the scientific quality of included studies assessed and documented?	Was the scientific quality of the included studies used appropriately in formulating conclusions?	Was the likelihood of publication bias assessed?	Were the methods used to combine the findings of studies appropriate?	Was the conflict of interest stated?	Total
Groenman, Janssen, & Oosterlaan, 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	11
Fairbairn et al., 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	11
Kedzior & Laeber, 2014	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	9
Charach, Yeung, Climans, & Lillie, 2011	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No	8
Lee, Humphreys, Flory, Liu, & Glass, 2011	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	8
Elliott, Carey, & Bonafide, 2012	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	8
Serra-Pinheiro et al., 2013	Yes	Yes	No	Yes	Yes	Yes	No	No	No	Yes	Yes	7
Rooke, Hine, & Thorsteinsson, 2008	Yes	No	Yes	Yes	Yes	Yes	No	No	No	Yes	No	6
Chapman et al., 2017	Yes	Yes	No	No	Yes	Yes	No	No	No	Yes	No	5
Ruiz, Pincus, & Schinka, 2008	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No	4

towards violent behaviour or delinquency were also associated with use.³⁶

Other factors

One review that dealt with the association between illicit substance use and implicit cognition found a weighted average correlation of 0.31.⁴⁹ Another manuscript reported evidence of greater cognitive deficits in cannabis, ecstasy and polysubstance users.⁵⁰

In addition, sexual behaviour would be linked to illicit substance use, in the sense that adolescents who initiated sexual relationships, engaged in risky sexual behaviours or were homosexual or bisexual had a higher likelihood of use.^{31,41}

Various reviews referred to the use of licit substances (alcohol and tobacco) as an antecedent to illicit substance use,^{29,36} although the use of licit substances such as marijuana in childhood and adolescence could also be a predictor of subsequent use of other types of substances.²⁸ Just one review noted that lesser perception of risks of drug use would be associated with a higher likelihood of illicit substance use.³⁶

Attachment would be a personal condition, though also a relational one, associated with illicit substance use. Two studies agreed that insecure attachment was associated with a higher likelihood of drug use, although it would be complicated to isolate the effects of parental attachment, school and other factors in drug use.^{51,52}

Discussion

This review found a wide array of factors referring to persons themselves — i.e. individuals as systems in interaction with surrounding systems, according to ecological approaches.^{9,10}

Among factors with the most evidence, factors of a demographic nature — and, within them, age and sex/gender, which seem to have an impact on use, in relation to other factors such as type of drug and stage of life — would be useful in guiding public-policy efforts and evidence-based intervention.^{15,26,28,30,31,33} Risk of psychoactive substance use, for its part, appeared to be linked to level of education and academic achievement,^{28,35} as well as conditions of socioeconomic disadvantage.^{35,37–39}

Prior use of licit substances also surfaced as a factor associated with illicit substance use.^{28,29,31,36} This constitutes an important key to strengthening measures tending to reduce the risk of escalation of use, especially in young people.⁵³

Mental, cognitive and personality disorders were linked to drug use.^{24,25,29,36,45,50} Advances in the study and treatment of dual disease and complex interactions between co-occurring nosological entities could also lead to more effective interventions in both prevention and treatment.⁵⁴

It is important to bear in mind that each of the factors mentioned herein could be the subject of a specific review, and that this could yield more definitive results if application of meta-analysis methods is achieved. In any case, several of the reviews included featured reviews with a meta-analysis, without conclusively resolving unknowns around the set of factors accounting for substance use. This led to stressing the

importance of ecological approaches, which, as they do not assume a deterministic stance, allow for integration of factors in specific contexts. However, they also run certain risks, as they transfer findings from units of population analysis to individuals. Such bias, known as ecological fallacy, consists of directly leveraging population results to explain individual characteristics. To avoid this fallacy, it should be understood that causal implications without sufficient support should be avoided.^{55–57}

Finally, the limitations of this review must be acknowledged. First, there was obviously a great deal of heterogeneity across the reviews as well as the articles on which said reviews were based. Such heterogeneity made it difficult to analyse the reviews, compare the results obtained and draw conclusions on the studies, though the result of the study design itself was largely what drove a very broad search of factors associated with illicit substance use. For this very reason, it was impractical to estimate publication bias. A search of reviews on a more narrowly delimited topic could be more precise, though it would carry the risk of finding little literature in that regard.

Another important set of limitations had to do with evaluation of review quality. The use of a standardised methodology helped to lay a solid foundation for such evaluation; however, evaluation is essentially subjective, though this limitation was offset by having multiple evaluators provide their opinion. There was also the fact that a low-quality review, according to the criteria of the AMSTAR guidelines, could be based on high-quality primary studies. This would lead to underestimation of valuable evidence. A low score on the AMSTAR scale may be due to reporting deficiencies, such as a lack of publication of lists of studies, more than methodological weaknesses.⁵⁸ To compensate for this potential deficiency, the findings of this review were based on reviews with high or medium scores, not just high-quality reviews.

This type of review has important implications for drug policy. Clearly, illicit substance use depends on factors that go well beyond the individual: they are found in families, neighbourhoods, communities and social contexts. Therefore, prevention of substance use should be based on a more comprehensive understanding of living conditions, social and economic contexts, and personal development, collected in evidence-based policies with a focus on human rights and public health.⁷

Factors associated with drug use

Article based on the doctoral dissertation in psychology *Factores Asociados al Consumo de Drogas Ilícitas en Estudiantes de Secundaria, Universitarios y Población General en Colombia* [Factors Associated with Illicit Drug Use in Secondary Students, University Students and the General Population in Colombia], Universidad Católica de Colombia [Universidad Católica de Colombia], 2019.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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