



JÖNKÖPING UNIVERSITY

*School of Education and  
Communication*

# **School-based Interventions or Prevention Programs regarding Alcohol, Smoking and Drug Use among Adolescents with Disabilities or Physical Impairments**

## **A Systematic Literature Review**

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Interventions in Childhood

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## ABSTRACT

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A Systematic Literature Review

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*Introduction* Substance use in adolescents with disabilities is rising, containing the prevalence of substance-related disorders (SRD) such as addiction, mental or health disorders, cancer, accidents and mortality. Yet, little is known about the existing substance use prevention programs among adolescents with disabilities or physical impairments. *The aim of this systematic review* was to investigate the effects of school-based interventions or prevention programs directed at the reduction of alcohol, tobacco and drug use in young adolescents with disabilities or physical impairments. *Method* Five scientific databases were explored mainly for school-based randomized controlled trials (RCTs) and prevention programs examining the effects of substance use interventions and prevention programs on adolescents with disabilities or physical impairments. Guided by the NICE guidelines, eligible articles were detected from which data were collected. A systematic literature review was performed for many diverse outcomes such as, substance use knowledge, substance use, modelling social environment, intention to quit smoking, peer pressure, etc. *Results* The primary literature search resulted in 821 articles. Five studies were included in the systematic literature review. Most of the collected studies were about adolescents with intellectual disabilities (MBID or MMID). The review's sample group ranged from 12-to 18-year-old adolescents. Included studies had a total sample of 981 out of which 13 were teachers. Studies measured both primary and secondary outcomes like modelling smoking, substance use and frequency of alcohol use. *Conclusion* This review summarized evidence about interventions and prevention programs aimed at decreasing or preventing substance use in adolescents with various types of disabilities or physical impairments. Substance use education increases knowledge about alcohol, tobacco and drug use and the health-related harms in teenagers with disabilities. Additional research is required, especially among teenagers with intellectual disabilities and other types of disabilities.

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*Keywords: school-based interventions, prevention programs, adolescents, alcohol consumption, smoking, drug use, physical impairments, disability*

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## I Introduction

Adolescence is a time period and the main kernel of young people's lives where they start to experiment and discover new behaviors, situations and perspectives (Murphy, Sahm, McCarthy, Lambert, & Byrne, 2013). Evidently, adolescence is the period when many teenagers begin alcohol (Smyth, Kelly, & Cox, 2011), tobacco and cannabis use (Vega et al., 2002). Substance abuse in adolescence can often be catastrophic for adolescents' future adulthood and natural development (Tucker, 2009; Gruber, Sagar, Dahlgren, Racine, & Lukas, 2011). Continual substance use within this period can cause many long-lasting health related issues (e.g., addiction) or even mortality at a young age (Schuppan, & Afdhal, 2008). Substance abuse interventions and prevention programs designed for adolescents with disabilities or physical impairments is a crucial public health issue, but it has not been methodically researched.

This denotes that people's knowledge about substance abuse regarding this population is limited, and as a result teachers and healthcare experts have an insufficient amount of empirical evidence to support their teaching methods and clinical practice. Hence, this population will be the target group of this review, since there is a substantial dearth of literature on substance abuse interventions/programs designed for them (McGillicuddy, 2006; Bickenbach, Cieza, & Sabariego, 2016).

### ***Adolescents with disabilities or impairments***

Universally, it is estimated that there are between 93 million to 150 million children and adolescents who have disabilities or physical impairments (WHO and World Bank, 2011). The notion of disability is exceedingly wide and includes a broad scope of mental, intellectual, sensory or physical impairments (UN, 2006). This population group has early 'experimentation' with cigarettes and elevated levels of smoking and alcohol addiction (Steele et al., 2004; Emerson & Turnbull, 2005).

Prevalence rates of current tobacco use are escalated in individuals with mental disorders (60%) and orthopaedic disabilities (26.9%), (Brawarsky et al., 2002). The most usual substance that individuals with intellectual disabilities are likely to use include alcohol, cannabis and cocaine (Chaplin, Gilvarry & Tsakanikos, 2011). Around 33% of individuals with visual impairments have substance abuse issues (Orange County Government, 2010). In fact, there are studies that propose that students with disabilities have increased rates of substance abuse (e.g., alcohol, drug use) compared to the general population (Demers, 2000; McMillen et al., 2002;

Simeonsson et al., 2002; Hollar, Weber & Moore, 2002), whereas other studies claim decreased rates (Yu, Huang & Newman, 2008).

### **Adverse consequences of substance misuse**

Adolescence is a period during which cognitive and physical growth takes place, along with minor modifications that can later affect an individual's lifespan. Therefore, substance use throughout this critical developmental stage may cause chronic health problems and adverse effects equally for the person and for the entire society (Murphy, Sahm, McCarthy, Lambert, & Byrne, 2013).

The use of alcohol, tobacco, or other drugs (ATOD) can be defined as substance use on a range of from nonproblematic societal and experimental *use* to *substance misuse* (e.g., use of pain medication for the purpose of becoming stimulated due to the substance effect) to *abuse*, which illustrates challenging use that influences people and their relations, and eventually, to *addiction* or *dependence*, which denotes obsessive use that might necessitate medically controlled detoxification and/or official treatment to refrain from it or inhibit its use (Straussner, 2004). For example, Alcohol dependence (AD) is a severe public health issue and adds to 1.8 million mortality cases, globally (WHO: Global Burden of Disease, 2009).

Reportedly, study results from school surveys have revealed that in several countries the inception of alcohol consumption begins prematurely and even before the age of 15. Heavy alcohol users have a high probability of being heavy tobacco and regular drug users as well (Global status report on alcohol and health WHO, 2018). In fact, alcohol and drug abuse have been indicated among the contributory causes of adolescent mortality rates. *Drug* and *alcohol use* are leading causes of violence (e.g., domestic violence, intimate partner violence), premature mortality, injuries (i.e., car accidents), unprotected sexual practices, heart diseases, mental disorders (e.g., psychosis, depression) and criminality (Foxcroft., & Tsertsvadze, 2012; WHO, 2016; WHO 2018; Babor et al., 2010). Aside from the immediate deprivation of health owing to alcohol dependence, *alcohol* is liable for deaths triggered by liver cirrhosis, liver cancer, epilepsy, oesophageal cancer and homicide (WHO, 2009).

*Illicit drug use* is among the most dangerous and risky adolescent behaviors, and especially cannabis is one of the most widespread illicit drugs that are used by teenagers (Murphey, Barry, Vaughn, Guzman, & Terzian, 2013). High- school students who use illicit drugs have a higher probability of encountering academic, social, physical and mental health problems (RWJ, 2001). Heroin users run the highest risk of contracting HIV/AIDS, committing suicide, dying

from overdose, or experiencing trauma (WHO, 2009). Chronic and excessive cannabis use prompts enduring cognitive malfunction and abnormalities (Solowij & Pesa, 2010). *Tobacco use* is a main risk factor for various cancers, cardiovascular disease (CVD) and chronic respiratory disease (CRD) and mortality (World health statistics, 2018).

### ***Interventions and prevention programs***

Adolescents are a varied group of individuals, where all youth encounter abundant life alterations (e.g., somatic, societal, psychological and mental) that will influence their overall well-being and health for their entire lives. Therefore, planned actions and support for teenagers' well-being and health are crucial interventions that can result in a substantial effect. However, even though there is tangible evidence about the advantages of interventions, teenagers' well-being and health continues to be ignored in many countries, and thus, adolescence is still a developmental period during which many people confront immense threats (WHO, 2018).

Interventions in someone's *primary life stages* that efficiently enhance healthy behaviors and attitudes could offer substantial lifelong benefits for both children and their families, and via the prevention of poor health could generate cost savings to health services and to society as a whole (Chilton, Pearson, & Anderson, 2015; Kolehmainen, et al., 2011). In fact, there is a substantial body of evidence that brief interventions (BI) are an efficient and cost-effective way to successfully target substance abuse among adolescents (Tanner-Smith & Lipsey, 2015).

The current review focuses mainly on school-based interventions and prevention programs for substance abuse among adolescents with disabilities, since the school context is the most common place where numerous substance use prevention and health programs take place. In school contexts, comprehensive prevention normally incorporates, *alcohol awareness prevention, social and peer resistance skills, positive peer relations, constructive feedback and promotion of behavioral norms*. Prevention programs may be either a precise *academic schedule* provided as school lectures or classroom *behavior* management programs (Foxcroft & Tsertsvadze, 2012). Indeed, it has been shown that *behavioral interventions* encompass assisting individuals to modify conduct utilizing practices that alter attitudes (e.g., expectations, opinions, perspectives, perceptions, etc.) or behavioral monitoring linked to that conduct. An example is employing self-regulation (a behavioral modification approach) to boost an adolescent's confidence (a personal opinion regarding capacity) in refraining from alcohol, tobacco or drug use (a conduct), (Kolehmainen, et al., 2011). Consequently, the school is a favourable setting

for fostering a healthy lifestyle, containing emotional, cultural, psychological, behavioral, mental and social health, decreasing the risk of substance abuse (Secretary of Public Education, 2002). Considering the fact that most school-based interventions or prevention programs to improve health can be viewed as “complex interventions”- usually “multi-component”, based on the specific setting, and greatly reliant on the actions of equally the students and health care professionals or teachers- reliable and with a generalizability of the efficiency of the results by a particular kind of intervention are scarce. A deeper knowledge of the efficacy of school health promotion additionally includes a comprehension of how the provision of these programs is somewhat maintainable and doable in various conditions or when applied in a different way (Chilton, Pearson, & Anderson, 2015).

### **Prevention**

In parallel with substance abuse interventions, this review also concentrates on prevention programs about alcohol, tobacco and drug use. *Prevention* is defined as a pre-emptive process that organizes and helps people and systems in the formation and strengthening of healthy conducts and lifestyles. Tobacco, alcohol and other drug issues’ prevention focuses on both *protective* and *risk factors* related to the use of these substances, focusing on areas in which practical experience and research recommend that attainment in lessening substance abuse and dependence is most probable (Center for Substance Abuse Prevention, 2007).

This description emphasizes efficacy and points out that prevention efforts are carried out in distinct settings and environments such as schools, social services, families and societies in general. In view of the fact that the majority of individuals who use tobacco, alcohol and other drugs begin prior the age of 20 (Skara & Sussman, 2003; SAMHSA, 2013), the largest part of prevention efforts occurs while children and adolescents are still in school. These endeavors are directed at tackling drug, tobacco and alcohol issues prior of their onset or as young people begin to experiment with substances, so as to prevent the inception of dependence and other adverse health effects. By postponing the beginning of substance use, substance use prevention is more cost- effective than the treatment of substance abuse or the detoxification once it has occurred (Marsiglia, Becerra, & Booth, 2013).

Prevention programs ought to enhance protective factors and counteract or minimize risk factors (Hawks et al., 2002). Prevention interventions are divided into three different types namely, primary, secondary and tertiary prevention interventions. *Primary prevention interven-*



*tions* are planned for the enrichment of protective factors of all students so as to avert problematic situations from surfacing. *Secondary prevention interventions* are aimed at the reverse of the harm that was caused by the exposure to recognized risk factors for a chosen group of students. *Tertiary prevention interventions* are directed at the decrease of harm rather than the reverse of harm among a specific high-risk group of individuals (Walker & Shinn, 2002).

Prevention programs must evaluate the strengths and the weaknesses of communities so as to create more constructive social contexts for youth (Marsiglia, Becerra, & Booth, 2013). The most effective prevention methods are inclined to offer knowledge about normative education, *peer pressure*, social impacts, to cultivate *social skills, learning of refusal skills or techniques*, to focus on protective factors and provide insight concerning perceived harm (Kulis et al., 2005).

### **Risk factors**

One of the most basic purposes of prevention programs is to address the identified risk factors that halt people's overall health development. Risk factors are personal and environmental vulnerabilities linked to a heightened probability that an adverse effect will occur. Chosen risk factors usually aimed at prevention interventions are the subsequent risk factors. *Communal risk factors* encompass effortless accessibility to tobacco, alcohol and illicit drugs, social disorder and decreased neighborhood connection. *Family risk factors* contain lack of communication or diminished communication, absence of parental control, biological addiction, lack of varying rules and expectations. Next, *school risk factors* involve declined or inconsistent educational standards and assistance, ambiguous policies concerning drugs and alcohol, shortage of discipline and disordered environment (Arthur, Hawkins, Pollard, Catalano & Baglioni, 2002; Hawkins, Catalano, & Arthur, 2002). Finally, *personal and peer risk factors* include; decreased academic success, vulnerability to peer pressure, peer and personal prior-drug norms, onset at an early age, antisocial conduct, assimilation of stress, and "sensation seeking" (Marsiglia, Nieri, & Stiffman, 2006).

### **Protective factors**

Prevention programs operate in order to reinforce protective factors and lessen or eradicate risk factors. *Protective factors* are personal or environmental advantages or safety measures that enhance or upgrade an individual's capacity to overcome stressful situations or hazardous

circumstances and assist them to adjust and be capable in opposing those risks (Marsiglia et al., 2012). *Communal protective factors* include national and cultural identity, supportive adults, social unity and common norms and values. *Family protective factors* include effective communication between the parent and the child, spirituality, religion, having mutual fun time among family members, well-defined rules and stable effects. *School protective factors* incorporate positive school atmosphere, distinct rules and expectations, academic success, warm and supportive environment. Ultimately, *personal and peer protective factors* contain increased academic achievement, norms against drugs, adult role models, participation in hobbies, critical thinking and problem-solving abilities (Hawkins, Catalano, & Arthur, 2002).

## **Theoretical background**

### *Resiliency theory*

Notwithstanding the conventional concentration on *risk factors*, researchers are gradually becoming informed about the significance of *positive factors* in young people's lives, and their impact on teenage drug, tobacco and alcohol use (Zimmerman, Salem, & Notaro, 2000; Bryant & Zimmerman, 2002; Fergus & Zimmerman, 2005). *Positive factors* are essential since they add to people's knowledge about developmental processes and offer cues for creating prevention strategies (Zimmerman & Arunkumar, 1994).

*Promotive factors* involve personal qualities and environmental resources that function in order to upgrade healthy development. They are complementary to risk factors and contribute to assisting young people to conquer the adverse effect risks that influence their development. These *promotive factors* are critical for *resiliency theory* since they help in balancing for or safeguarding against the effects of risks on healthy development. Fergus and Zimmerman (2005) illustrate protective and compensatory models in which *promotive factors* might function. *Protective factors* signify the interaction effects that help to elucidate and differentiate various methods, so that *promotive factors* might decrease the repercussions of *risk factors* (Fergus & Zimmerman, 2005).

Two *models of resiliency* contain: the *risk-protective model* (interaction impact) and the *compensatory model* (immediate impact). The risk-protective model presumes that promotive factors shield or regulate the adverse effect of risk exposure. Inside this model, promotive factors interact with risks and decrease or alter their adverse influence on teenage conduct. The *compensatory model* denotes that promotive factors (i.e., church attendance, parental assistance,

pro-social activities) can lessen the effects of risk factors. In specific, promotive factors might counterbalance the exposure to risk factors. Highlighting the environment is particularly vital for taking into account ostracized social groups, such as adolescents with disabilities or physical impairments and revealing probable underlying *types of resilience* (Zimmerman & Arunkumar, 1994).

## **Rationale**

Adolescence is a delicate developmental period that can trigger the inception of alcohol, tobacco or drug use and even current or future addiction. Over the years, numerous interventions and prevention programs directed at prevention of substance abuse, addiction and delay of the onset of addictive substances have been explored. Although there is ample scientific evidence about such interventions, the majority of these interventions has focused on the general and non-clinical population. Consequently, the understanding about the adaptation of these interventions or prevention programs and the related outcomes on addressing adolescents with disabilities or physical impairments is inadequate and scarce. Students with disabilities or impairments face depleted health, not only due to their health status and comorbidities, but also due to their social exclusion, deprivation of access to health and social services, impoverishment, and prejudice. Public health services should recognize and pay attention to these ecological variables (Bickenbach, Cieza, & Sabariego, 2016).

Thus, the information that will be gathered in this review will clarify the present condition of substance abuse education in the school environment for students with disabilities or physical impairments, with the purpose of encouraging teachers and healthcare professionals to introduce suitable substance abuse education programs where needed.

## **Aim**

The purpose of this systematic literature review was to investigate the effects of school-based interventions or prevention programs directed at the decrease of alcohol, tobacco and drug use among young adolescents with disabilities or physical impairments.

## **Research questions**

1). What types of substance use school-based interventions or prevention programs have been

developed for adolescents with disabilities or physical impairments?

- 2). What are the outcomes of the included school interventions or prevention programs for adolescents with disabilities or physical impairments?

## **Method**

### **Overview**

In this study, a systematic literature review will be conducted for the estimation of the effects of alcohol, tobacco and drug interventions or prevention programs and the types of interventions that are targeted towards the decrease of adolescents' alcohol, tobacco and drug use (e.g., adolescents with disabilities or physical impairments), administered in school settings, globally. Systematic reviews reporting the efficacy of interventions or prevention programs are conventionally comprised of research studies describing trial information and utilize precise repeatable methodologies including, quality assessment and data extraction of other studies (summary) based on prearranged eligibility criteria (McCormack et al., 2006). The current study synthesized an outline of school-based intervention or prevention studies of the existing research literature.

### **Search strategy**

The search strategy included the following databases: ERIC, PubMed, PsycINFO, Scopus and Cochrane Library throughout December 2018 until April 2019. A combination of MESH and/or free-text search terms along with the aid of the thesaurus were included into the electronic databases. The search techniques utilized expansive general search terms to secure that all literature studies regarding interventions, substance abuse education and prevention in the school context were detected. The search terms that were used in the databases are presented below in Table 1. The articles were examined by the researcher based on their titles and abstracts. English was used as the search language and merely articles from peer-reviewed journals were included. In the end of the data selection process, solely the full-text articles that fulfilled the eligibility criteria were chosen for the literature review. The search strategy was comprised of an initial electronic search in the selected databases followed by a manual search, so as to incorporate any additional articles that were relevant to this study's objective and answered the research questions that have not been found in the primary data search.

**Table 1.** *Search strategy**Search terms*

Category	Qualifying terms
Diagnostic Criteria	intellectual disabilities OR autism OR learning disabilities OR ADHD OR visual OR motor OR hearing OR physical impairments, etc.
	AND
Intervention or Prevention program	intervention OR prevention OR prevention program OR substance use education OR teaching practices OR school-based intervention OR randomized- controlled trials OR preventive strategies
Age group	adolescents OR high- school students OR junior high- school students OR youth OR teenagers

***Inclusion and exclusion criteria***

The *inclusion criteria* that were applied to this study on the abstract level and throughout the screening process of the full- text articles contained: a) adolescents between 12 to 18 years old, and b) school-based interventions and/or prevention programs for alcohol, tobacco (smoking) or drug use aimed at adolescents with disabilities or physical impairments. The *exclusion criteria* were as follows: a) non school-based interventions or prevention programs where participants did not have disabilities or physical impairments, and b) interventions for substance abuse designed for the general population, for adults and/or or children). The inclusion and exclusion criteria of this study were used for the abstract screening and then those articles that fulfilled the eligibility criteria were chosen for the final full- text screening. A more thorough illustration of these criteria is further provided in Table 2.

**Table 2.***Inclusion and exclusion criteria*

Inclusion criteria	Exclusion criteria
<b>Literature search criteria</b>	
Form of publication	
Articles	Literature reviews, theses, books, book chapters, newspaper articles, dissertations, conference papers, discussion papers, or other types of literature, qualitative studies.

Peer- reviewed journals

Non-peer-reviewed journals

Included abstract

Missing abstract

English language

Written in other languages

Full-text articles

Incomplete or missing parts of the articles

**Accessibility**

Publication date from 2000 until 2019

Older article publications

**Abstract criteria**

Study sample

Adolescents between 12 till 18 years old

Studies about children and adults

Teenagers with disabilities or physical impairments

Studies that do not include teenagers with disabilities or physical impairments

Cognitive disabilities (borderline, mild or severe

Intellectual disabilities, neurodevelopmental disorders

Studies about the general non-clinical population

Learning disability disorders (LDS), autism spectrum

Studies that included merely alternative/supplementary medicine

disorders (ASD), attention- deficit/ hyperactivity

(i.e., acupuncture, biofeedback, relaxation training), prescribed

disorder (ADHD), Asperger's, syndrome, physical

medications, or specific diets (i.e., vitamins), dietary/nutritional

impairments (visual and hearing impairments, blindness,

supplements were omitted from the review.

deafness, speech difficulties, motor dysfunctions, emotional

Studies that only stated physical health-related outcomes.

or behavioral disorders, (anxiety, depression)

Studies addressing equally medical and/or health,

behavioral and mental health outcomes about adolescents.

**Study design**

Randomized- controlled trials, non- randomized

Observational studies

controlled trials, pilot studies, intervention studies

Studies that did not investigate substance abuse

School- based interventions or prevention programs

Studies about substance abuse (alcohol, smoking, drugs)

Case studies, literature review studies, Studies that

Classroom setting or treatment centers (for adolescents

were not school- based interventions or prevention

who cannot be enrolled in special education schools).

Programs

**Participants**

This literature review's study sample included adolescents with either disabilities or physical impairments with an age range between 12 to 18 years who had cognitive, or other disabilities.

This review's sample size will include 14-to 18 year- old teenagers, since in most European countries this is the defined age range for adolescents. In addition, studies that contained adolescents with physical or sensory impairments were also encompassed in the current study.

*Comparisons* among students with disabilities or physical impairments who received the inter-

vention or the substance use prevention program (experimental group) and students with disabilities or physical impairments who did not receive any intervention, or a different intervention condition was put into effect (control group). The chosen *intervention or prevention program techniques* were aimed at evaluating behavioral, cognitive or educational outcomes. Some of the expected *outcomes* included; i) prevention of alcohol, tobacco and drug use among teenagers with disabilities or physical impairments, ii) increased knowledge in parents and adolescents about substance use, iii) heightened awareness among teachers.

### **Title and Abstract screening process**

All the articles that were gathered through the databases PsycINFO, Cochrane library, Scopus, ERIC and PubMed were later contained in separate word documents created by the researcher in order to keep track of all the identified articles. The abstracts were also read from each database. Duplicate articles were omitted and then 821 studies were included in the ‘title and abstract screening process’. From these 821 articles, 792 studies were excluded from ‘full-text screening’, since they did not meet the inclusion criteria of the review (e.g., reviews, interventions for the general population, study design, etc.). As a result, 29 studies were contained in the ‘full-text screening’ process. Through a final manual search 3 more articles were detected and they were then included in the ‘full-text process’, thereby 32 articles were encompassed in the full-text process.

### **Full- text screening process**

After the title and abstract screening of the previous articles, the inclusion and the exclusion criteria were also used for the 32 articles that have been selected for the full-text screening process. In this stage, the researcher read the intervention description, content, measurement tools, outcomes, setting and the methodology of every study. Next, from all these 32 articles, one was a literature review study for school-based substance abuse prevention programs (  $n = 1$ ), a relevant intervention was found but not in full-text (  $n = 1$ ), another community intervention study was about adults with intellectual disabilities [ID (  $n = 1$ )], another was a qualitative study for students with disabilities (  $n = 1$ ), many interventions were found but they were designed for adolescents or children (general population, non-clinical samples,  $n = 20$ ), 1 study had a mixed sample of students (  $n = 1$ ), another study was a review for students with learning disabilities (  $n = 1$ ), and another one was an intervention for general health education (hygiene) for ID adolescents (  $n = 1$ ). In the end, 27 articles were excluded and solely 5 studies met the

eligibility criteria and were further thoroughly analyzed and incorporated in the final data extraction process. The flowchart of the literature search strategy is depicted in *Appendix A*.

### **Quality appraisal**

Quality criteria of the articles referred to their enduring outcomes, the study types, and the various behavioral, health-related and/or social consequences detected through the studies. The suitability of the articles was based on their titles, the abstracts, the sample sizes and the age groups. More specifically, the quality assessment of the articles was determined based on the content of the articles (e.g., full-text articles) along with the guidelines of the data extraction protocol (i.e., *Appendix B*). The chosen studies were evaluated in view of the NICE quality criteria checklist for interventions (quantitative studies), (NICE, 2012). The quality assessment protocol is based on the '*Graphical appraisal tool for epidemiological studies (GATE)*', designed by (Jackson et al., 2006; NICE, 2012). Those studies that were characterized as having 'high' quality needed to fulfill at least four of the quality criteria without having 'low' ratings. Also, studies that were rated as 'medium', it was due to having a 'high' quality rating in one category and 'low' in another classification. A detailed description of the quality assessment of the chosen studies is provided in *Appendix C*. All the included studies had 'high' quality apart from one study that had a 'medium' quality appraisal (Demers et al., 2000).

### **Ethical considerations**

The present systematic literature review did not necessitate a formal ethical approval by the University of Jönköping and the responsible Research Ethics Committee from Jönköping University in Sweden, since in this review secondary data from previous research studies were analysed.

### **Data analysis**

Data was collected from all the selected five articles grounded in interventions or prevention programs, titles, abstracts and finally the comprehensive reading of the articles (e.g., full-text) via the support of the data extraction protocol (*Appendix B*). The data extraction protocol (abstract and full-text level) for the data gathering was used both before and after the data analysis for the identification of any supplementary information. Specifically, the full-text data extraction protocol was employed in order to collect important information about the content of the selected studies, study design and for the quality appraisal (*Appendix C*). The main goal was to investigate existing substance use interventions or prevention programs about adolescents with



disabilities or physical impairments. The evaluation and the data collection of the results incorporated: a) the results, b) setting, c) type of disability or impairment, d) description of interventions or prevention programs, e) implementation and measures, along with f) intervention outcomes and effect sizes.

## **Results**

### **Overview of results**

The findings will offer valuable knowledge about the effects of specific interventions aimed at decreasing or preventing substance use in adolescents with disabilities or physical impairments. In summary, from the five selected studies, one was a study protocol (Turhan et al., 2016), which has not been implemented yet, and the other studies were interventions or prevention programs for adolescents with disabilities. Since one of the studies was a study protocol, no results were evaluated but valuable knowledge was gained about the importance of taking into account people's personality traits and their relation to specific types of substance use. The other three interventions were proved to be effective, yet, with small significant results. Evidently, the HSD-SE prevention program was ineffective for adolescents with emotional and behavioral problems from SEB schools (Turhan et al., 2016). Even though the above interventions did not manage to change substantially adolescents' motives or attitudes to use substances or to decrease their current substance use, they enhanced students' knowledge about the risks and health harms of alcohol, tobacco and drug usage.

More specifically, Demers et al. (2000) discovered that students in the PALS group, were negatively influenced by peer pressure to use substances and they had higher odds of starting substance use in the future compared to their peers (T3) at the end of the school year (high school). Kiewik et al. (2016) detected comparable findings with the above study (Demers et al., 2000). Students at T2 had lower scores on the tests, did not change their attitudes or intentions about quitting or starting smoking and/or alcohol. However, at T2 their attitudes concerning smoking were slightly more positive than before, which denotes that they had favorable attitudes towards smoking after the delivery of the intervention. Yet, their alcohol knowledge and modelling of smoking were improved (Kiewik et al., 2016). In a subsequent study, Kiewik et al. (2017) indicated that those who received the intervention had a significantly reduced effect of classmates and direct social environment in terms of modelling alcohol. This means that

these adolescents were less influenced about adopting alcohol-related behaviors observed among their peers, friends and their families. However, their attitudes, modelling of smoking, knowledge, intention, subjected norms, and social pressure remained unchanged (Kiewik et al., 2017). The study conducted by Turhan et al. (2016) had the most negative effects compared to the other studies. HSD-SE produced adverse effects in students from SEB schools (students with emotional and behavioral problems). In fact, SEB students had negative behavioral changes regarding ‘life-time frequency of alcohol use’ and ‘intention to drink alcohol’. This implies that their willingness to use alcohol and the frequency of their alcohol intake deteriorated over time after the implementation of HSD-SE program (Turhan et al. 2016).

## Participants

**Table 3.**

*Demographic characteristics of participants*

Author and year	Description of disability or physical impairment	Age range	N (girls, boys)	Country	Setting
Kiewik, M., (2017) VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A.	Mild to Moderate Intellectual Disabilities (MMID) (IQ between 35 – 70).	12- 16 years	Male students (62.3%)	The Netherlands	Special-needs schools.
Turhan, A. et al., (2016)	Secondary SE schools: • SEL schools (learning disabilities and developmental disorders), • SEB schools (emotional and behavioural disorders or intellectual and physical disabilities (SEI schools).	12- 16 years	Males (68.1%)	The Netherlands	Special education schools (SE).
Schijven, E. P. et al., (2015)	Mild to borderline ID and severe behavioral problems: internalizing (anxiety, depression) and externalizing (aggression, antisocial behavior) • Behavioral problems or • Psychiatric diagnoses.	14- 21 years	Males and females	The Netherlands	Treatment centers.
Kiewik, M. et al., (2016)	• Borderline or Mild ID	12- 15	Males	The Netherlands	Special-needs

	(IQ between 50 and 85), and • Sufficient communication skills.	years	(57.6%) (n = 121)		schools.
Demers, J. et al., (2000)	• Developmental disabilities, • Physical disabilities, • Learning disabilities	9 <sup>th</sup> grade till 12 <sup>th</sup> grade	Males (58.8%) (n = 100)	U.S.A.	Special education schools (SE).

Most of the studies, examined substance abuse interventions or prevention programs among students with intellectual disabilities (ID), (Kiewik et al., 2017; Turhan et al., 2016; Schijven, et al., 2015; Kiewik et al., 2016). In the study carried out by Demers et al. (2000), the study sample was comprised of a special education population with physical, developmental and learning disabilities. Turhan et al. (2016) had the most diverse study sample (i.e., emotional disorders, learning disabilities, etc.). In the study carried out by Kiewik et al. (2017), participants had mild to moderate intellectual disabilities (MMID). In line with that, Kiewik et al. (2016) solely included students with borderline or mild intellectual disabilities (BMID). Four out of the five included studies were conducted in The Netherlands (Kiewik et al., 2017; Turhan et al., 2016; Schijven, et al., 2015; Kiewik et al., 2016). The only exception was the study carried out by Demers et al. (2000), which was performed in U.S.A. The age range of participants in these studies was between 12 to 17 years. This additionally justified the selection of the focused target group of this review (12- 18 y.o.). Only one study's sample encompassed somewhat older late adolescents/ early adults (Schijven et al., 2015). The majority of study participants was comprised of males, apart from the study protocol that did not have results (Schijven et al., 2015). All of the studies were delivered in special- needs schools, aside from one study that was designed for treatment centers (Schijven et al., 2015), (Table 3). Additional information about participants' demographic characteristics and the interventions or prevention programs can be found in *Appendix D* (Tables 1, 2, & 3).

### ***Types of Interventions or Prevention Programs and their Implementation***

**Table 4.**

*Description of setting and professionals delivering the intervention*

Study	Interventions and	Setting	Instructor
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Prevention programs			
S1	<i>'Prepared on time'</i> ("Op tijd voorbereid")	Classroom setting (e-learning program)	<ul style="list-style-type: none"> <li>• Interviewer: a master psychology student &amp;</li> <li>• A digital Professor Professor 'Profitacto'.</li> </ul>
S2	'Healthy School and Drugs (HSD)': HSD-SE (Special Education).	Classroom setting	<ul style="list-style-type: none"> <li>• Researchers from Health Services and Care Centers &amp;</li> <li>• SE teachers with special training.</li> </ul>
S3	<i>'Take it personal!'</i>	Treatment centers	<ul style="list-style-type: none"> <li>• A team of therapists: • 2 qualified trainers, • 1 psychomotor therapist, and</li> <li>• 1 behavioral scientist.</li> </ul>
S4	<i>'Prepared on time'</i> ("Op tijd voorbereid")	Classroom setting (e-learning program)	<ul style="list-style-type: none"> <li>• Interviewer: the researcher.</li> <li>• A digital Professor 'Profitacto' (avatar).</li> </ul>
S5	<i>PALS</i> program	Classroom setting	<ul style="list-style-type: none"> <li>• Teachers with special training for PALS program for ATOD use prevention.</li> </ul>

Note. S1: (Study 1, Kiewik, M., VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A., 2017).

S2: (Study 2, Turhan, A., et al., 2016).

S3: (Study 3, Schijven, E. P., et al., 2015).

S4: (Study 4, Kiewik, M., et al., 2016).

S5: (Study 5, Demers, J., et al., 2000).

Prevention programs, such as the e-learning *'Prepared on Time'* ("Op tijd voorbereid") program, are effective although their effectiveness has not been investigated among students with intellectual disabilities (ID). Researchers examined for the first time the effectiveness of this program among adolescents with mild to borderline intellectual disabilities (ID) in special needs schools (S4). In addition, the efficacy of *'Prepared on Time'* program was later tested among adolescents with mild to moderate intellectual disabilities (MMID), (S1). The program *'Take it personal!'* is grounded in a present program for other teenagers from the general population, which has been found to be efficacious. The intervention for teenagers with mild to borderline ID was created in line with the instructions for effective interventions for individuals with mild ID (S3). The program *'Prepared on time'* was initially applied in typical primary schools (Ter Huurne, 2006) and it has been recently utilized in a study for teenagers with ID (S1). Also, the program *'Take it personal!'* was initially created for students in regular schools, and it was modified for teenagers with mild ID (S3). In addition, the *HSD- SE*-aimed prevention program is an adjustment of the *'Healthy School and Drugs (HSD)'* program for mainstream

secondary educational institutions, which is modified especially for special education (HSD-SE), (S2). Only the *PALS* program was originally designed for students with disabilities and was not an adaptation from a regular substance use program (S5).

Thus, the objective of the *'Prepared on time'* program is to postpone the inception of drinking and smoking behaviors ('first experiences') and to train students about the time when they will confront alcohol consumption and tobacco use among their classmates and friends (Simpson, 2012), (S1, S4). On the other hand, *'Take it personal!'* is a unique prevention program directed at decreasing substance use in teenagers with mild to borderline ID. The program is a selective intervention particularly designed for adolescents with mild to borderline ID who are treated for supplementary behavioral problems and who have a personality risk factor for certain substances (S3). Four personality profiles are acknowledged to be linked to substance use including, *Impulsivity* (IMP), *Negative Thinking* (NT), *Sensation Seeking* (SS), and *Anxiety Sensitivity* (AS). Every personality profile is related to specific forms of substance use, comorbid psychopathology, and 'maladaptive motives' for substance use (S3). All of the studies were aimed at increasing students' substance use knowledge (S1, S2, S3, S4, S5) and health risks (S2, S5, S1, S4), while others concentrated on addressing adolescents' special educational needs (S5) or personality traits (S3).

All of the interventions/prevention programs were carried out in special education schools inside the classrooms (S1, S4, S5, S2), except for one study that was created for treatment facilities, where adolescents received additional treatment for other personal issues (S3). Two of the e-learning programs were taught by an "avatar" a digital figure named 'professor Profitacto', who read the written documents from the computer screen and provided clarifications to students, constructive feedback, clues and support to students (S1, S4). Additional help was provided by a master psychology student (S1) and the researchers (S4, S2). In the *'Take it personal!'* intervention, a team of professional therapists administered the program (S3). On the contrary, only two of the studies were provided by special education teachers who received special training (S2, S5), (Table 4).

## **Content of Interventions and Prevention Programs**

### **Table 5.**

*Content of Interventions and Prevention Programs*

Content	S1	S2	S3	S4	S5
•Games	X			X	
•Videos	X			X	
•Quizzes	X			X	
•Tests (substance use knowledge: smoking, alcohol)	X			X	
•Refusal skills	X			X	
•Empowerment of students to make their own choices	X			X	
•Resistance of peer pressure for tobacco and alcohol use	X			X	X
• resistance of peer pressure for drug use					X
•Classroom health education (including substance use)		X			
•Social skills training		X			
•Parental involvement in the intervention		X			X
• Written information about parental skills knowledge for alcohol and tobacco use prevention.		X			
•Learning of school policy implications		X			
•Methods to detect and refer high-risk students to school authorities		X			
•Psycho-education			X		
•Behavioral coping skills			X		
•Cognitive coping skills			X		
•Substance use education based on each participant's:			X		
• personality traits, • behaviors, and • attitudes					
•Substance use knowledge (alcohol, smoking, and other drugs)					X
•General skill building					X
•Stress management/coping					X
•Learning to avoid drug use environments					X
•Teacher education for educating students about substance use knowledge and prevention					X

*Note.* S1: (Study 1, Kiewik, M., VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A., 2017).

S2: (Study 2, Turhan, A., et al., 2016).

S3: (Study 3, Schijven, E. P., et al., 2015).

S4: (Study 4, Kiewik, M., et al., 2016).

S5: (Study 5, Demers, J., et al., 2000).

Two of the included studies that were conducted in The Netherlands used the same e-learning '*Prepared on time*' prevention program, but they had different study samples (S1, S4). Thus, all the exercises, the theories, the program content and the learning skills were identical in these two studies (S1, S2). Three of the studies based their programs on the *ASE theoretical model* ("*Attitude, Social influence, Self-efficacy*"), (S1, S4, S2). However, in two studies researchers utilized one more theory, the '*Theory of Planned Behavior*' (*TPB*), (S1, S4). '*Prepared on time*' program is founded on the supposition that 'attitude', 'self-efficacy' and 'social influence' have an impact on someone's choice to initiate alcohol and tobacco use (De Vries et al., 2003; S1, S4, S2). Although it was not explicitly mentioned, in one more of the studies researchers had seemingly used the ASE theoretical model, since they covered comparable aspects in their program (S5). By contrast, the 'Take it personal!' intervention was grounded in the *theoretical* background of '*Cognitive Behavioral Therapy*' (*CBT*), (S3).

The '*Prepared on time*' intervention program encouraged students to contemplate the constellation of the physical, health and social repercussions of alcohol and smoking (S1, S4).

Two of the programs contained videos, tests, games and quizzes to improve adolescents' substance use knowledge and understanding, to offer paradigms of proper *refusal skills* and to empower students' *decision-making skills* and to oppose *peer pressure* when they are exposed to smoking and drinking behaviors among their peers (S1, S4). Similarly, the PALS program focused on teaching students about '*resistance skills*', '*opposition of peer pressure*' and general drug and substance use knowledge (S5).

The *HSD-SE* revised prevention program's fundamental theoretical basis of the lectures that is written in the books. In this prevention program the concepts of 'self-efficacy', 'attitude', and 'sensed social influence' concerning substance use are all emphasized. The books focused upon knowledge and perception about smoking and alcohol. Followed by a review of the benefits and drawbacks of drinking and smoking, by cultivating favorable '*attitudes*', tackled '*self-efficacy*' and '*social influence*' directed at opposing peer pressure and independent *decision-making skills*. Eventually, there was an examination of the motives to engage in or sustain these conducts, and chances to test objectives for attaining these motives were offered. 'Behavioral change' methods employed involved skills training in a) 'refusal self-efficacy', b) 'setting goals', c) 'decision-making', and d) 'action planning'. Exercises about gained knowledge and critical thinking questions regarding positive or negative motives for tobacco and alcohol use. The last component of the *HSD-SE* program included a parental meeting offering *parenting skills* applicable to alcohol and tobacco use prevention. Parents were given advice and booklets with relevant information on how to safeguard their children from smoking and alcohol with

parenting techniques, setting boundaries, having sincere conversations and reaching an agreement about avoidance of substance use (S2). This HSD program included a multifaceted technique, parental participation, social skills training, school policy consequences, health education lessons, and methods to recognize and turn over to school authorities ‘high-risk’ groups of adolescents. The HSD program is modified especially for special education (HSD-SE) encompasses a sequence of eight classroom lectures, aided by an educator’s guidance with books for adolescents with different linguistic abilities altered based on those students’ reading skills. Parental participation is achieved with a meeting with students’ parents (S2).

Adolescents will take part in one of the four types of the intervention that focus on each high-risk personality trait. *‘Take it personal!’* consists of three basic components: a) psycho-education, b) behavioral coping skills, and c) cognitive coping skills. *Psycho-education* concerning the teenagers’ personality profile and comprehensive problematic coping behavior. Adolescents are encouraged to be accustomed to their personality profile and learn to cope with their personality via assignments. Everyday life experiences and comprehensive *cognitive, physical* and *behavioral reactions* will be examined. Adolescents will determine personal objectives, which they will attempt to accomplish throughout the training. The *coping skills training* will involve teenagers in *activities* targeted at detecting instant thoughts. Participants will recognize personality-related thoughts that result in problematic behavior. Adolescents will create an individualized ‘changing plan’ to cope in a different way with their risky and challenging behavior. Researchers employed clear and plain information, utilized many visual tools (e.g., photos), several repetitive lectures, short sessions, and provided games and precise assignments. The program also offered psychomotor therapeutic methods that are beneficial for teenagers with ID (S3).

The exercises that were given to teenagers in the *PALS* (*‘Prevention Works! All of us together! Learning to care! Special modifications!’*) program were specifically created for youth with disabilities (S5). Although the specific assignments and course material that were provided to both teachers and students were described briefly (S5) and not as extensively as in the other included studies (S1, S2, S3, S4). Solely one of the programs used *motivational interviewing (MI)* for data gathering (S3). The PALS Program highlights education in fundamental drug use risks along with learning and *identifying and escaping social events and settings* where drug use is present, *managing efficiently stress*, and learning the way and the context where to convey in a non-intimidating manner about drug use inquiries. PALS also offers ‘substance use prevention’ education for teachers and parents who cope with children who have disabilities and different learning styles (S5).



### **Outcomes of interventions and prevention programs**

The outcomes of the interventions and prevention programs were assessed with different statistical analyses by the researchers in every study. Effects and outcomes were described based on the identified alterations across time periods (e.g., baseline, post-test, follow-up) along with comparisons between groups. Further statistical analyses revealed the effect sizes of the interventions or prevention programs. A thorough illustration of all the outcomes is provided below (Table 6). In addition, the outcome measurement scales that were used in these studies are demonstrated in *Appendix D* (Table, 5).

**Table 6.**

<i>Outcomes of the included studies</i>					
Outcomes	S1	S2	S3	S4	S5
Smoking (lifetime use)	X	X		X	
Daily smoking		X			
Frequency of alcohol use (lifetime)		X			
Frequency of binge drinking		X			
Alcohol use (lifetime)	X			X	
Alcohol: percentage of decrease in binge drinking, weekly use, and problematic use.			X		
Hard drug use: percentage of decrease (lifetime use)			X		
Cannabis use: percentage of decrease (lifetime use and weekly use)			X		
ATOD (lifetime use)					X
ATOD use within the last 30 days					X
Knowledge of smoking	X			X	
Knowledge of alcohol	X			X	
Attitudes about smoking	X			X	
Attitudes about alcohol	X			X	
Subjective norms about smoking	X			X	
Subjective norms about alcohol	X			X	
Modelling direct environment smoking,	X				
Modelling direct environment alcohol	X				

Modelling classmates (smoking)	X											
Modelling classmates (alcohol)	X											
Modelling smoking								X				
Modelling alcohol								X				
Social pressure (smoking)	X											
Social pressure (alcohol)	X											
Peer pressure for ATOD use											X	
Intention to stop or intention not to start (smoking)	X							X				
Intention to stop or intention not to start (alcohol)	X							X				
Intention to use alcohol				X								
Intention to smoke				X								
Intention to use less alcohol and or drugs in the future						X						
Intention to use ATOD use in the future											X	
Motives for alcohol and/or drug use						X						
Self-efficacy (smoking)				X				X				
Self-efficacy (alcohol)				X				X				
Social norm (alcohol)				X								
Social norm regarding smoking				X								
Perception of harm from ATOD											X	
Self-image and getting along with others											X	
Portrayal of best friends' ATOD use											X	

Note. S1: (Study 1, Kiewik, M., VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A., 2017).

S2: (Study 2, Turhan, A., et al., 2016).

S3: (Study 3, Schijven, E. P., et al., 2015).

S4: (Study 4, Kiewik, M., et al., 2016).

S5: (Study 5, Demers, J., et al., 2000). *ATOD*: Alcohol, Tobacco, and Other Drugs use

## Table 7.

### *Effects of Interventions*

Author and year	Type of Analysis	Mod. envir.	Mod. class alc.	Frequency lifetime use	Intention alcohol use	Alc. knowl.	Mod. Smok.	Intention Smok.	Int. Alc.	Intent. fut. ATOD use	Peer pres. ATOD use
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(S1) Kiewik, M., (2017)	$p$	0.006*	0.006*				
VanDerNagel, J. E. L.,	$\eta^2$	0.109*	0.194*				
Engels, R. C. M. E.,							
& DeJong, C. A.							
<hr/>							
(S2) Turhan, A., et al.,	$p$		0.002*	0.023*			
2016).							
<hr/>							
(S4) Kiewik, M.,	$p$			0.01*	0.01*	0.607	0.413
et al., 2016	$\eta^2$			0.034*	0.073*	0.002*	0.007*
<hr/>							
(S5) Demers, J.,							
et al., 2000	$p$					$p = .08^*$	$p = .08^*$

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Note. (S5) Demers, J., et al., 2000: Mann-Whitney test.  
 $p < 0.05$ .

Statistical analyses demonstrated that there were significant mixed between-within group effects regarding *modelling* from someone's *immediate social environment* ( $F(1,65) = 7.919, p = 0.006, \eta^2 = 0.109$ ) and *classmates* ( $F(1,36) = 8.669, p = 0.006, \eta^2 = 0.194$ ) about *alcohol consumption*, both in support of the e-learning prevention program. Those adolescents who participated in the experimental group were subjected to a significantly decreased effect of classmates/friends by modelling alcohol-related conducts and their immediate social environment in comparison with adolescents in the control group. By contrast, '*Prepared on time*' program did not appear to have altered students' attitudes, modelling of smoking, knowledge, intention, subjected norms, and social pressure, still adolescents were adequately able to use the e-learning prevention program (Kiewik, VanDerNagel, Engels and DeJong, 2017, S1, Table 7).

In the study performed by Turhan et al. (2016), it was revealed that there were no statistically significant differences between the experimental and the control groups after the follow-up process on any of the outcome variables, implying that the *HSD-SE* substance use prevention program was ineffective. Table 7 illustrates the interaction effects (moderation effects) between groups and school types. *HSD-SE* program had a probability of generating adverse outcomes repeatedly in SEB schools (Table 7). Evidently, significant negative program effects were detected in SEB schools in the follow-up process. Adolescents in SEB schools who were assigned to the intervention group stated negative change in the two items about '*life-time frequency of alcohol use*' ( $p = 0.002$ ) and the '*intention for alcohol use*' ( $p = 0.023$ ) in comparison with SEB teenagers in the control group (Turhan, Onrust, ten Klooster & Pieterse, 2016, S2), (Table 7).

Furthermore, students in both the experimental and the control group had a lower probability to ‘*intend to stop tobacco use*’ at T2 (*or to refrain from it*) with small to average effect sizes ( $F_{1,123} = 12.72, P = 0.001, \eta^2 = 0.0914$ ) or ‘*drinking (or remain abstinent)*’ ( $F_{1,102} = 10.26, P = 0.002, \eta^2 = 0.091$ ) in comparison with T1. Also, students’ *attitudes* regarding *smoking* were marginally more positive at T2 ( $F_{1,197} = 4.96, P = 0.027, \eta^2 = 0.025$ ) in comparison with T1. Yet, the two groups (experimental and control groups) did not vary significantly concerning these attitudes. Conversely, students in the experimental condition had lower scores when they completed the follow-up questionnaire in comparison with the baseline. Additionally, the results revealed between-group effects for *modelling smoking* ( $F_{1,88} = 6.88, P = 0.01, \eta^2 = 0.073$ ) and *alcohol knowledge* ( $F_{1,180} = 6.31, P = 0.01, \eta^2 = 0.034$ ), which proved that even though it was a small effect, it was still a significant effect concerning the intervention. Additionally, results revealed that students started drinking (15%) and smoking (6%) for the first time prior to the age of 10 years or at a younger age. This showed that this intervention program was effective. Nevertheless, the intervention program did not appear to have altered students’ ‘attitude’ about or their ‘intention to initiate tobacco and/or alcohol use (Kiewik, VanDerNagel, Kemna, Engels & DeJong, 2016, S4, Table 7).

Statistical analyses about the differences between the two groups (attitude and behavior assessments) are described in Table 7. The results from the Mann-Whitney test indicated that on all seven criteria of students’ in the experimental (PALS) group scores after the end of the academic year were greater and more positive in comparison with students’ scores in the control group. The sole two criteria that proved to have an effect on students in the PALS group are “*Peer pressure: ATOD Use*” ( $p = .08$ ) and the “*Intend to Use ATOD in the Future?*” ( $p = .08$ ) measures (Table 7), (Demers, French & Moore, 2000, S5). A more detailed description of the above results is provided in *Appendix D, Table 6*.

## **Discussion**

This review investigated peer-reviewed research studies on evidence-based substance use interventions and prevention programs in the school environment in adolescents with disabilities or physical impairments, since 2000. This review encompassed a small but comprehensive collection of international studies that varied from RCTs to prevention programs. In detail, the aim of this systematic review was to integrate different studies that examined the types of existing prevention interventions and the effects of substance use interventions in teenagers with

disabilities, physical impairments or other disorders. In total, five studies were incorporated in the present review. Across the studies, some similarities were noticed concerning the results and patterns of behaviors. Equally as it happens in all reviews, it was necessary to describe the methodological issues and limitations that were recognized, the discussion of study results of this review, as well as future research recommendations.

From the five selected studies, one was a study protocol and the other studies were interventions/prevention programs for adolescents with disabilities. Since one of the studies was a study protocol, no results were evaluated. Even though three of the interventions/prevention programs indicated small significant effects, they were proved to be effective except for the HSD-SE program, which was both ineffective and counterproductive for students with emotional and behavioral problems (SEB schools), (Turhan et al., 2016, S2).

### **Reflections on findings**

Even though the above interventions did not manage to change substantially adolescents' motives to use substances or to decrease their current substance use, they enhanced students' knowledge about the risks of alcohol, tobacco and drug usage.

Despite the fact that students' knowledge and understanding about alcohol increased significantly after the implementation of the 'Prepared on time' program, it did not affect the behavioral factors, apart from *modelling*. This denotes that students experienced a minimal impact of adverse modelling derived from their social context. In addition, their '*intention to quit smoking or drinking*' (or not to initiate smoking or drinking behaviors) deteriorated with the passage of time for both groups. Since '*intention*' has a prognostic value of teenage smoking conduct, this study's findings emphasize that preventive efforts ought to inform adolescents with intellectual disabilities in advance, prior to the inception of tobacco and alcohol use (Kiewik et al., 2016).

Kiewik et al. (2016) emphasized that prevention efforts should start at a younger age (before 12 y.o.), since 6% of the participants had smoked for the first time and 15% of them had consumed alcohol when they were 10 years old or even at a younger age. Characteristically, the age of initiation of alcohol use among these study participants was more than 2 years beneath that of the Dutch population of 14.6 years (Monshouwer, et al., 2007). Comparable findings have been found by McMillen et al. (2002) and Simeonsson et al. (2002), where teenagers with disabilities reported significantly greater cannabis and alcohol use before 11 years in comparison to their peers who did not have disabilities.

Demers et al. (2000) discovered that students in the PALS group were negatively influenced by peer pressure to use substances and they had higher odds of starting substance use in the future compared to their peers (T3) when they finished high- school. This is line with past study findings. *Peer influence* is a crucial factor in children's and adolescents' decision-making processes and choices regarding smoking (Wang et al., 1997; Demers et al., 2000). Nowadays, students with disabilities attend mainstream schools instead of special education schools. Despite being beneficial for them to socialize with other peers without disabilities, this can also have catastrophic effects on their exposure to risky behaviors. Students might want to imitate these harmful behaviors when they are around their other peers, so as to become socially acceptable by them or to have a sense of belongingness inside their peer group. Prevention programs that are designed for the general population usually do not produce the same results. This happens because people with disabilities and particularly intellectual disabilities are a heterogeneous group with different needs and levels of disability. Therefore, interventions should be created based on an 'individualized changing plan' that will help adequately these teenagers (Schijven et al., 2015).

Among the limitations of all the included studies was the fact that the sample sizes of their studies were relatively small, as it was mentioned by the researchers themselves. For example, Kiewik et al. (2016) claimed that they had a rather small sample size, thereby, their sample was not typical of all teenagers with ID. This was also the case in a subsequent study by Kiewik et al. (2017), since it was a pilot study with a small sample size as well (low transferability of the results). Despite being a regular phenomenon in interventions, RCTs and pilot studies, the results should be interpreted with attentiveness when trying to generalize them to all youth with intellectual disabilities. Nevertheless, most of the interventions/prevention programs proved to be effective except for one study (Turhan et al., 2016). The studies were analytical in the methodology and statistical analyses with adequate quality, therefore, all of them were described in this review (results) apart from one study that was a study protocol and mostly its method was explained (Schijven et al., 2015). The age range of students in the reviewed articles was from 12 to 18 years. One of the included studies had a sample with 14- 21 year- old- adolescents and adults (Schijven et al., 2015), yet, it was contained in the review since the target group of the current review was within that age range. This provides substantial knowledge for intervention preventions and educators about adolescents who attend school. These prevention strategies also have implications for adults with disabilities, however, this review was restricted to detect interventions or academic programs for adolescents with various disabilities.

Among the most alarming, adverse and significant findings were detected in the study carried out by Turhan et al. (2016). Students with emotional and behavioral problems from SEB schools adopted even more deleterious '*alcohol-related behaviors*' and '*intentions for drinking*' than before the implementation of the HSD-SE program. These negative effects might have been influenced by 'iatrogenic effects', since these students additionally received specific medication for their personal problems related to their type of disability. Another potential explanation might be that these adolescents were considered as 'high-risk' individuals who had started substance use many years ago. Therefore, the intervention did not manage to decrease or to change their attitudes and harmful behaviors.

### **Resiliency theory**

There is a considerable amount of attention on how to empower adolescents to enhance their personal resilience that can assist them in dealing daily and effectively with their steady transition to a healthy adulthood devoid of substance addiction. In accordance with Belcher & Shinitzky (1998) and Fuller (1998), protective factors including *resilience*, having a close connection with a parent or a caregiver, being brought up in a warm family environment with stable disciplinary methods and academic success are commonly considered to provide security versus the damaging effects of drugs and other substances. These factors should be strengthened among high-risk youth. Support for this theory has been observed in the study that was carried out by Kiewik et al. (2017), where they discovered that their prevention program diminished the 'risk factor' of '*modelling alcohol behaviors*' from their peers, friends and families. This indicates that by empowering students through education, they can subsequently resist peer pressure and the adoption of catastrophic behaviors.

Several factors are implicated in a teenager's choice to drink alcohol for the first time along with binge drinking, like *peer relations* and *parental styles* (McDonough, Jose & Stuart, 2016; Van der Vorst, Engels, Meeus & Dekovic, 2006). This finding has also been corroborated in the present review by Demers et al. (2000) who discovered that '*peer pressure*' and the '*intention for ATOD use in the future*' were both increased ('risk factors') among adolescents in the PALS group.

Moreover, adolescents with intellectual disabilities are at a high risk of suffering from substance-related issues due to social factors (peer pressure, need for social approval, deviant

friends, social isolation, hyperactivity, etc.) (Demers et al., 2000) and their personal characteristics (i.e., being male, young age, spontaneity), (Taggart et al., 2008; Barrett & Paschos, 2006). However, the present review did not describe age and gender differences among teenagers, since the studies did not proceed with further statistical analyses regarding these variables.

### **Prevention programs**

As it was already mentioned before, the most effective prevention techniques are focused on providing knowledge about *normative education, peer pressure, social impacts*, to develop *social skills, learning of refusal skills or strategies*, and are concentrated on protective factors, while they simultaneously offer insight regarding perceived harm of certain behaviors and attitudes (Kulis et al., 2005). All of the reviewed studies were directed at substance use education among teenagers, and especially four of the studies addressed specifically ‘peer pressure’, ‘social effects and skills’, ‘harmful consequences’, ‘perceptions’, ‘attitudes’, ‘self-efficacy’, and ‘learning of refusal skills’ (Demers et al., 2000; Kiewik et al., 2016; Kiewik et al., 2017; Turhan et al., 2016). Therefore, the above interventions were expected to be as effective in special-needs schools as they were in mainstream schools.

### **Methodological issues**

As with all reviews, the current review had both advantages and drawbacks. Namely, among the strengths of the study was that all the steps of the data search strategy were sufficiently described, meaning that the literature search in the databases was replicable for future verification. Another main advantage was that all the studies included a description of participants’ demographic characteristics on ethnicity, race, gender, age and type of disability. This information is a helpful and valuable element of this review. An additional strength in the current review, was that the research focus was not only on the effective substance abuse intervention programs, but also on other interventions with unfavorable effects (Turhan et al., 2016). This information offered knowledge about what kind of prevention interventions are efficacious or ineffective, which ones have harmful effects, and what are the high-risk groups with certain types of disabilities. In terms of the shortcomings of the method was that there was solely one reviewer responsible for the selection of the studies, the title, abstract and full-text screening, since the time frame for the review was rather narrow. Hence, there was no peer-review for the



inclusion of the studies. This might have resulted in selection bias of some excluded studies from the review. Finally, one more drawback of this review might be that only five database search engines were encompassed, which may have led to the omission of some useful studies.

### **Limitations**

Noticeably, there were some limitations present in this review. A limitation to this systematic review is that the conclusions drawn from the articles were dependent upon the quality and the precision of the included studies. Yet, this is a limitation that exists in all literature and systematic reviews. To eliminate the effect of ‘low’ quality studies in this review, the quality appraisal of the studies was supported by the NICE public health guidance tool for interventions (2012). Then, it could be argued that since the quality assessment tool and the data extraction protocol were created by the author, they were not that accurate. Even though they were not pilot tested, they were guided by the NICE criteria with considerable caution. Besides that, as it has been previously commented upon, the author was the sole reviewer of the articles due to the limited time period. Another shortcoming is that in this review only articles that were published since 2000 till 2019 were examined. This means that past intervention studies are missing, however, effective interventions are usually replicated in future published studies.

There was a limited number of articles identified during the literature search process that investigated school-based substance use prevention programs or interventions for youth with disabilities. An extensive search of five databases and an additional hand search of studies could solely result in five final articles. Although the main goal of the study was to encompass interventions for various types of disabilities, this was not accomplished because most of the studies focused on adolescents with intellectual disabilities. This might imply that students with mild disabilities (i.e., ADHD, dyslexia) are enrolled in mainstream schools and receive general prevention programs. Thus, it was challenging to have a complete insight of substance use and prevention programs from these studies. It is critical to explore in the future meticulously similar patterns of behaviors, risks, attitudes and prevalence rates in this target group, and then tackle substance abuse. Also, there is a group of individuals that is overlooked in this review. As it was mentioned above, students with diverse types of disabilities may be registered at regular schools and not at special education schools. This omission is an important gap in every review that examines prevention programs. In fact, students with disabilities in mainstream schools are usually exposed to many more risky behaviors like substance use than their peers

in special schools (Alfaro et al., 2017). By excluding this target group might eventuate in underreporting of the magnitude of the effects of these interventions in youth with disabilities in mainstream schools.

### **Future research**

Aside from their families, educators are the adults who devote a considerable amount of time with students and they have a vast knowledge of the psychological and cognitive developmental difficulties that several students encounter as they attend various school grades (Briggs & Hawkins, 1997). Research has indicated that educators are, usually, the most proper professionals for substance abuse education (Gottfredson & Wilson, 2003; McNeal, Hansen, Harrington, & Giles, 2004). School employees (e.g., teachers, school psychologists) ought to be given constant training, ideally by health care experts experienced in detecting risk factors for substance abuse (SA), so that school personnel will be capable of guiding staff members, families, parents, as well as students (American Academy of Pediatrics, Committee on Substance Abuse, 2007).

Inclusive education is acknowledged generally as a principle for fostering equal opportunities for individuals with disabilities in academic contexts and more widely in the entire society (UNICEF, 2012; World Health Organization, 2011). Inclusive policies functioning globally, promote registration of an expanding percentage of students with numerous types of disabilities in mainstream schools and, preferably, inside mainstream classrooms (Blanc, Bondonneau & Choisnard, 2011; McLeskey, Landers, Williamson & Hoppey, 2010). Thus, researchers and school authorities should investigate what kind of prevention programs are effective for youth with disabilities in mainstream and special education schools after careful examination.

Although tobacco and alcohol levels in individuals with intellectual disabilities, in general, are more decreased than in the general population, prevalence rates in individuals with mild or moderate intellectual disabilities are considered to be reaching that of the general population (Emerson & Turnbull 2005; McGillicuddy 2006; Taggart et al. 2008).

Research about the similarities and differences between adolescents with disabilities and the general population ought to be highly assisted, as a method of creating a comprehensive notion of substance use depicting youth. Precise epidemiological and empirical findings on this population group, when compared to those gathered from other students without disabilities, are vital to adapt prevention policies and, thus, to rise the opportunities and prospects of teenagers with disabilities for their adulthood (Alfaro et al., 2017). The most suitable intervention program

would seem to be collaborative/united service delivery. It is critical that health promotion interventions are based on theories and created to attend to language, communication, memory, cognitive and perceptive needs of this target group (Kerr, Lawrence, Middleton, Fitzsimmons & Darbyshire, 2017). Future research is needed to establish the contribution of these intervention programs to the preservation of gained knowledge and positive skills (e.g., refusal skills, social skills).

## **Conclusion**

Data about early exposure to alcohol, tobacco and drugs and a high risk of future illicit and licit substance use emphasizes the need for prevention programs which can be delivered in schools aimed at very young children. This claim is further supported by one of the reviewed studies, where results indicated that adolescents already initiated tobacco (6%) and alcohol (15%) use when they were still children around 10 years old or even younger (Kiewik et al., 2016).

In addition, the data expresses the necessity of implementing substance use programs that can and will be employed by schools, since schools are among the few settings where the majority of children and teenagers can be approached (Burd et al., 2006; Kiewik et al., 2016; Demers et al., 2000). Cooperation between teachers, education authorities and public health professionals can foster the process of offering health promotion school activities and lessons for teenagers with numerous types of disabilities (Hollar, 2005). In addition, it is important to involve adolescents' parents in prevention programs, since it has been proved that parents influence the development of '*resistance skills*' in their children, which is achieved by altering parental practices before modifying teenagers' '*self-control*' (Maat et al., 2010). The importance of parental involvement in substance use interventions/prevention programs was pinpointed in two of the previous studies (Turhan et al., 2016; Demers et al., 2000). Indeed, in HSD-SE program, the role of parents was emphasized and addressed directly by providing effective '*parenting skills*' training and substance use knowledge to adolescents' parents (Turhan et al., 2016). Useful strategies to help the effective inclusion of adolescents with disabilities in the design of interventions can be enhanced by listening to students' opinions and needs.

The increase in certain substances among teenagers with disabilities is unclear, and endeavors should be enhanced to notify parents, youth and the society about the risks and health consequences of substance use. Future research should rectify the disparity in substance use re-

search that places most of the researchers examining school substance use prevention interventions or programs for the general population, whereas little research has been done on such interventions aimed at adolescents with disabilities or impairments. Nevertheless, knowledge gained from these studies should lead future research towards the advancement of specialized substance use prevention programs that are intended for special needs schools or for students with disabilities who attend mainstream schools.

## References

- American Academy of Pediatrics, Committee on Substance Abuse (2007). The role of schools in combating illicit substance abuse., *Pediatrics*, 120, 784.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4<sup>th</sup> ed.). Washington, DC: American Psychiatric Association.
- Alfaro, D. L. P., Ehlinger, V., Spilka, S., Ross, J., Sentenac, M., & Godeau, E. (2017). Alcohol, tobacco and cannabis use: Do students with mild-intellectual disability mimic students in the general population?. *Research in developmental disabilities*, 63, 118-131.
- Arthur, M., Hawkins, J. D., Pollard, J., Catalano, R., & Baglioni, A. J. (2002). Measuring risk and protective factors for substance use, delinquency, and other adolescent problem behaviors: The communities that care youth survey. *Evaluation Review*, 26(6), 575–601.
- Babor TF, Babor T, Caetano R, Casswell S, Edwards G, Giesbrecht N et al. (2010). *Alcohol: no ordinary commodity: research and public policy* (2). New York (NY): Oxford University Press.
- Blanc, P., Bondonneau, N., & Choisnard, M. (2011). *La scolarisation des enfants handicapés*. Paris, France: Présidence de la République.
- Babor, T., Babor, T. F., Caulkins, J. P., Edwards, G., Fischer, B., Foxcroft, D. R., ... & Reuter, P. (2010). *Drug policy and the public good*. Oxford university press.
- Brawarsky, P., Brooks, D. R., Wilber, N., Gertz, Jr. R. E., & Klein, W. D. (2002). Tobacco use among adults with disabilities in Massachusetts. *Tob. Control*. 11(Suppl., 2), 29–33.
- Bickenbach, J., Cieza, A., & Sabariego, C. (2016). Disability and public health. *International Journal of Environmental Research and Public Health*, 13, 123.
- Briggs, F., & Hawkins, R. (1997). *Child protection: A guide for teachers and childcare professionals*. St. Leonards, Sydney, NSW, USA: Allen & Unwin.
- Barrett, N., & Paschos, D. (2006). Alcohol-related problems in adolescents and adults with intellectual disabilities. *Curr. Opin. Psychiatry*, 19, 481-485.
- Belcher, H.M.E., & Shinitzky, H.E. (1998). Substance abuse in children. prediction, protection, and prevention. *Archives of Paediatric and Adolescent Medicine*, 152, 952-60.
- Bryant, A. L., & Zimmerman, M. A. (2002). Examining the effects of academic beliefs and behaviors on changes in substance use among urban adolescents. *Journal of Educational Psychology*, 94, 621–637.
- Chaplin, E., Gilvarry, C., & Tsakanikos, E. (2011). Recreational substance use patterns and comorbid psychopathology in adults with intellectual disability. *Res. Dev. Disabil.*, 32, 2981-

2986.

- Chilton, R., Pearson, M., & Anderson, R. (2015). Health promotion in schools: a scoping review of systematic reviews. *Health Education, 115*(3/4), 357-376.
- Center for Substance Abuse Prevention. (2007). *Prevention pathways*. Online manual. <http://pathwayscourses.samhsa.gov>
- Demers, J. C. (2000). *Adapting Prevention Messages for Youth with Disabilities*. Dayton, OH: SARDI Program, Department of Community Health, Wright State University.
- Demers, J., French, D. C., & Moore, D. (2000). The preliminary evaluation of a program to help educators address the substance use/prevention needs of special students. *Journal of Alcohol and Drug Education, 46*(1), 14.
- Emerson E., & Turnbull L. (2005). Self-reported smoking and alcohol use amongst adolescents with intellectual disabilities. *Journal of Intellectual Disabilities 9*, 58 –69.
- Fuller, A. (1998). *From Surviving to Thriving. Promoting mental health in young people*. Melbourne: ACER Press.
- Foxcroft, D. R., & Tsertsvadze, A. (2012). Universal alcohol misuse prevention programmes for children and adolescents: Cochrane systematic reviews. *Perspectives in Public Health, 132*(3), 128-134.
- Fergus, S., & Zimmerman, M. A. (2005). Adolescent resilience: A framework for understanding healthy development in the face of risk. *Annual Review of Public Health, 26*, 399–419.
- Gruber, S. A., Sagar, K. A., Dahlgren, M. K., Racine, M., & Lukas, S. E. (2011). Age of onset of marijuana use and executive function. *Psychology of Addictive Behaviors, 26*(3), 496.
- Gottfredson, D. C., & Wilson, D. B. (2003). Characteristics of effective school-based substance abuse prevention. *Prevention Science, 4*(1), 27–38.
- Hollar, D. (2005). Risk behaviors for varying categories of disability in NELS: 88. *Journal of School Health, 75*(9), 350-358.
- Hawkins, J. D., Catalano, R., & Arthur, M. (2002). Promoting science-based prevention in communities. *Addictive Behaviors, 27*, 951–976.
- Hawks, D., Scott, K., & McBride, M. (2002). *Prevention of psychoactive substance use: A selected review of what works in the area of prevention*. Geneva, Switzerland: World Health Organization.
- Hollar, D., Weber, J., & Moore, D. (2002). *Educational and employment outcomes for youth with disabilities who use alcohol and drugs: analysis of NELS: 88 longitudinal data*. In Proceedings of the 130th Annual meeting of the American Public Health Association, Philadelphia, PA.

- Jackson, R., Ameratunga, S., ... & Broad, J. (2006). The GATE frame: critical appraisal with pictures. *Evidence based Medicine*, *11*, 35–8.
- Kolehmainen, N., Francis, J. J., Ramsay, C. R., Owen, C., McKee, L., Ketelaar, M., & Rosenbaum, P. (2011). Participation in physical play and leisure: developing a theory-and evidence-based intervention for children with motor impairments. *BMC pediatrics*, *11*(1), 100.
- Kerr, S., Lawrence, M., Middleton, A. R., Fitzsimmons, L., & Darbyshire, C. (2017). Tobacco and alcohol use in people with mild/moderate intellectual disabilities: giving voice to their health promotion needs. *Journal of Applied Research in Intellectual Disabilities*, *30*(4), 612-626.
- Kulis, S., Marsiglia, F., Elek, E., Dustman, P., Wagstaff, D., & Heck, M. (2005). Mexican/Mexican American adolescents and keepin' it REAL: An evidenced based substance use prevention program. *Children and Schools*, *27*(3), 133–145.
- Kiewik, M., VanDerNagel, J. L., Kemna, L. M., Engels, R. M., & DeJong, C. J. (2016). Substance use prevention program for adolescents with intellectual disabilities on special education schools: a cluster randomised control trial. *Journal of intellectual disability research*, *60*(3), 191- 200.
- Kiewik, M., VanDerNagel, J. E., Engels, R. C., & DeJong, C. A. (2017). The efficacy of an e-learning prevention program for substance use among adolescents with intellectual disabilities: A pilot study. *Research in developmental disabilities*, *63*, 160-166.
- McGillicuddy, N. B. (2006). A review of substance use research among those with mental retardation. *Mental Retardation and Developmental Disabilities Research Reviews*, *12*(1), 41-47.
- Marsiglia, F. F., Ayers, S., Gance-Cleveland, B., Mettler, K., & Booth, J. (2012). Beyond primary prevention of alcohol use: A culturally specific secondary prevention program for Mexican heritage adolescents. *Prevention Science*, *13*(3), 241–251.
- Marsiglia, F. F., Becerra, D., & Booth, J. M. (2013). *Alcohol and Drug Problems: Prevention*. In Encyclopedia of Social Work.
- Murphey, D., Barry, M., Vaughn, B., Guzman, L., & Terzian, M. (2013). Adolescent health highlight: use of illicit drugs. *Child Trends*, September.
- McCormack, B., Dewar, B., Wright, J., Garbett, R., Harvey, G., & Ballantine, K. (2006). *A realist synthesis of evidence relating to practice development: final report to NHS education for Scotland and NHS quality improvement Scotland*. Edinburgh: NHS Quality Improvement Scotland.
- McNeal, R. B., Jr., Hansen, W. B., Harrington, N. G., & Giles, S. M. (2004). How All Stars

- works: An examination of program effects on mediating variables. *Health Education and Behaviour*, 31(2), 165–178.
- McDonough, M. H., Jose, P. E., & Stuart, J. (2016). Bi-directional effects of peer relationships and adolescent substance use: A longitudinal study. *Journal of youth and adolescence*, 45(8), 1652-1663.
- Maat M. J., Koning I. M., & Lammers J. (2010). Alcoholpreventie bij jongeren: ouders en school maken het verschil [Alcohol prevention among youth: parents and school make the difference]. *Praktijk*, 88, 418–21.
- McLeskey, J., Landers, E., Williamson, P., & Hoppey, D. (2012). Are we moving toward educating students with disabilities in less restrictive settings?. *The Journal of Special Education*, 46(3), 131-140.
- McMillen, J. S., McMillen, B. J., & Simeonsson, R. J. (2002). *Risk behaviors among students with and without disabilities: the North Carolina high school YRBS*. In: Proceedings of the First CDC Conference on Birth Defects, Developmental Disabilities, and Disability and Health. Atlanta, GA, (pp. 17–19). Atlanta, GA: Centers for Disease Control and Prevention.
- Marsiglia, F. F., Nieri, T., & Stiffman, A. (2006). HIV/AIDS protective factors among urban American Indian youth. *Journal of Health Care for the Poor and Underserved*, 17(4), 745–758.
- Murphy, K., Sahm, L., McCarthy, S., Lambert, S., & Byrne, S. (2013). Substance use in young persons in Ireland, a systematic review. *Addictive behaviors*, 38(8), 2392- 2401.
- Monshouwer, K., Verdurmen, J., Van Dorsselaer, S., Smit, E., Gorter, A., & Vollebergh, W. (2007). *Jeugd en riskant gedrag, kerngegevens uit het peilstationsonderzoek scholieren, roken, drinken, drugsgebruik en gokken* [Youth and Risk Behavior, Data from Research Among Students Regarding Smoking, Drinking, Drug Use and Gambling]. Trimbosinstituut, Utrecht.
- National Institute for Health and Care Excellence (2012). *Methods for the Development of NICE Public Health Guidance*. (3<sup>rd</sup> ed., pp. 179 -186). NICE: London.
- Orange County Government (2010). *Addictions and disabilities*. Orange County Government.
- Robert Wood Johnson Foundation (RWJ) (2001). *Substance abuse: The nation's number one health problem*. Princeton, NJ: The Robert Wood Johnson Foundation. Substance Abuse Resource Center.
- Rehm, J., Dawson, D., Frick, U., Gmel, G., Roerecke, M., Shield, K. D., & Grant, B. (2014). Burden of disease associated with alcohol use disorders in the United States. *Alcoholism:*



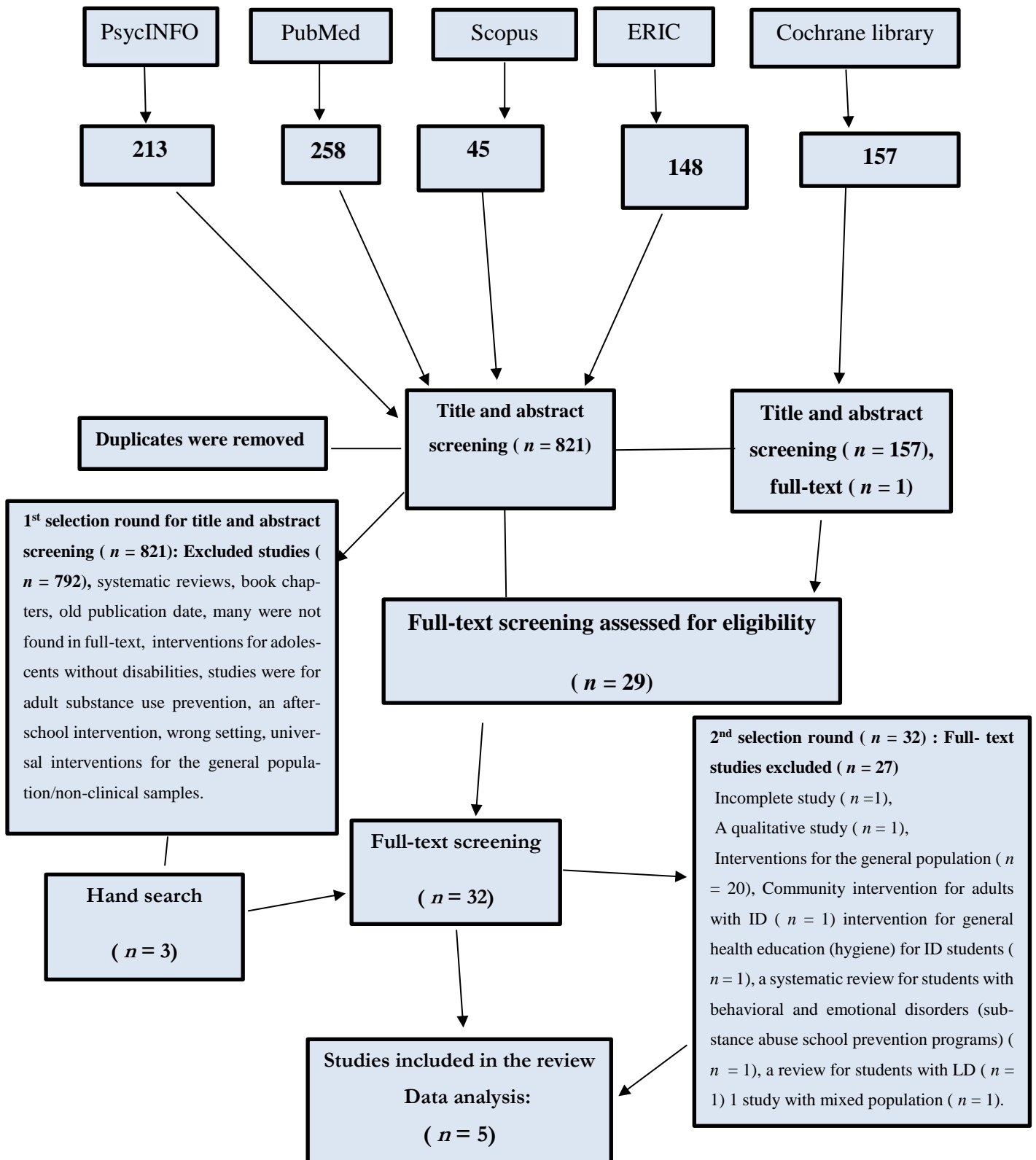
- Clinical and Experimental Research*, 38(4), 1068-1077.
- Simpson, M. (2012). Alcohol and intellectual disability: Personal problem or cultural exclusion? *Journal of Intellectual Disability Research*, 16, 183-192.
- Straussner, S. L. A. (2004). *Assessment and treatment of clients with alcohol and other drug abuse problems: An overview*. In S. L. A. Straussner (Ed.), *Clinical work with substance abusing clients* (2<sup>nd</sup> ed., pp. 3–35). New York: Guilford.
- Schuppan, D., & Afdhal, N. H. (2008). Liver cirrhosis. *The Lancet*, 371(9615), 838-851.
- Schijven, E. P., Engels, R. C., Kleinjan, M., & Poelen, E. A. (2015). Evaluating a selective prevention program for substance use and comorbid behavioral problems in adolescents with mild to borderline intellectual disabilities: Study protocol of a randomized controlled trial. *BMC psychiatry*, 15(1), 167.
- Smyth, B. P., Kelly, A., & Cox, G. (2011). Decline in age of drinking onset in Ireland, gender and per capita alcohol consumption. *Alcohol and alcoholism*, 46(4), 478- 484.
- Steele, C. A., Kalnins, I. V., Rossen, B. E., Biggar, D. W., Bortolussi, J. A., & Jutai, J. W. (2004). Age-related health risk behaviors of adolescents with physical disabilities. *Soz. Praventivmed*, 49, 132–141.
- Simeonsson, R. J., McMillen, B. J., McMillen, J. S., & Lollar, D. (2002). *Risk behaviors among middle school students with and without disabilities: the North Carolina middle school YRBS*. In Proceedings of the 130th Annual meeting of the American Public Health Association. Philadelphia, PA, (pp. 9–13). Washington, DC: American Public Health Association.
- Solowij, N., & Pesa, N. (2010). Cognitive abnormalities and cannabis use. *Revista brasileira de psiquiatria*, 32, 531-540.
- Skara, S., & Sussman, S. (2003). A review of 25 long-term adolescent tobacco and other drug use prevention program evaluations. *Preventative Medicine*, 37,451–474.
- Substance Abuse and Mental Health Services Administration (SAMHSA) (2013). *The CBHSQ Report: A day in the life of American adolescents: Substance use facts update*. Rockville, MD: Center for Behavioral Health Statistics and Quality.
- Secretary of Public Education (2002). *Program inter healthy education: Healthy school and safe, smoke-free snuff*. Mexico City: Secretary of Public Education.
- Tucker, P. (2009). Substance misuse and early psychosis. *Australasian Psychiatry*, 17(4), 291-294.
- Ter Huurne, E. (2006). *Op tijd voorbereid, een onderzoek naar het gebruik van e-learning bij genotmiddelenpreventie voor het basisonderwijs* [PREPARED ON TIME, a study to the use

- of an e-learning program for alcohol and tobacco use in primary schools]. Universiteit Twente.
- Taggart, L., Huxley, A. & Baker, G. (2008). Alcohol and illicit drug misuse in people with learning disabilities: implications for research and service development. *Advances in Mental Health and Learning Disabilities*, 2, 11–21.
- Tanner-Smith, E. E., & Lipsey, M. W. (2015). Brief alcohol interventions for adolescents and young adults: A systematic review and meta analysis. *Journal of Substance Abuse Treatment*, 51, 1–18.
- Taggart, L., McLaughlin, D., Quinn, B. & Milligan, V. (2006). An exploration of substance misuse in people with learning disabilities. *Journal of Intellectual Disability Research*, 50, 588–97.
- Turhan, A., Onrust, S. A., Ten Klooster, P. M., & Pieterse, M. E. (2017). A school-based programme for tobacco and alcohol prevention in special education: effectiveness of the modified 'healthy school and drugs' intervention and moderation by school subtype. *Addiction*, 112(3), 533-543.
- Vega, W. A., Aguilar-Gaxiola, S., Andrade, L., Bijl, R., Borges, G., Caraveo-Anduaga, J. J., ... & Merikangas, K. R. (2002). Prevalence and age of onset for drug use in seven international sites: results from the international consortium of psychiatric epidemiology. *Drug and alcohol dependence*, 68(3), 285-297.
- Van Der Vorst, H., Engels, R. C., Meeus, W., & Deković, M. (2006). The impact of alcohol-specific rules, parental norms about early drinking and parental alcohol use on adolescents' drinking behavior. *Journal of Child Psychology and Psychiatry*, 47(12), 1299-1306.
- Verdurmen J., Monshouwer, K., van Dorsselaer S., Lokman, S., Vermeulen-Smit E., Vollebergh W. (2012). *Jeugd en riskant gedrag 2011: kerngegevens uit het peilstation-sonderzoek scholieren [Youth and risk behavior 2011: Data from research among students]*. Utrecht: Trimbos-instituut.
- De Vries, H., Mudde, A., Leijds, I., Charlton, A., Vartiainen, E., .... & Buijs, G. (2003). The European Smoking prevention Framework Approach (EFSA): an example of integral prevention. *Health Education Research* 18, 611–26.
- UNICEF Regional Office for Central and Eastern Europe and the Commonwealth of Independent States (CEECIS) (2012). *The right of children with disabilities to education: A rights-based approach to Inclusive Education*. Geneva, Switzerland: UNICEF.
- UN (2006). 'Convention on the Rights of Persons with Disabilities and Optional Protocol'. ([www.un.org/disabilities/documents/convention/convoptprot-e.pdf](http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf)).

- Wang, M., Fitzhugh, E., Eddy, J., Fu, Q., & Turner, L. (1997). Social influences on adolescents' smoking progress: A longitudinal analysis. *Am. J. Health Behav*, 21(2), 111–117.
- Walker, H. M., & Shinn, M. R. (2002). *Structuring school-based interventions to achieve integrated primary, secondary, and tertiary prevention goals for safe and effective schools*. In M. R. Shinn, H. M. Walker, & G. Stoner (Eds.), *Interventions for academic behavior problems: Vol. 2: Preventive and remedial approaches* (pp. 1–25). Bethesda, MD: National Association of School Psychologists.
- World Health Organization (2018). *Global status report on alcohol and health 2018*. Geneva: WHO.
- World Health Organization (2018). *Advocating for Change for Adolescents! A Practical Toolkit for Young People to Advocate for Improved Adolescent Health and Well-being*. Geneva: WHO.
- World health statistics (2018). *Monitoring health for the SDGs, sustainable development goals*. Geneva: WHO.
- World Health Organization (2016). *Adolescents: health risks and solutions*. Geneva: WHO.
- WHO and World Bank (2011). *World report on disability*. Geneva: WHO.
- World Health Organization (2011). *World report on disability*. Geneva, Switzerland: WHO.
- World Health Organization (2009). *Global Burden of Disease attributable to alcohol*. WHO.
- World Health Organization (2009). *Global health risks: Mortality and burden of disease attributable to selected major risks*. Geneva: WHO.
- Yu, J., Huang, T., & Newman, L. (2008). *Substance use among young adults with disabilities: Facts from National Longitudinal Transition Study 2*. Washington, DC: Department of Education Institute of Education Science.
- Zimmerman, M. A. (2005). *Youth violence: Application of empowerment theory & adolescent resilience*. Columbia University, New York, NY.
- Zimmerman, M. A., & Arunkumar, R. (1994). Resiliency research: Implications for schools and policy. Social Policy Report. *Society for Research in Child Development*, 8(4), 1–18.
- Zimmerman, M. A., Salem, D. A., & Notaro, P. C. (2000). *Make room for daddy II: The positive effects of fathers' role in adolescent development*. In R. D. Taylor & M. C. Wang (Eds.), *Resilience across contexts: Family, work, culture, and community* (pp. 233–253). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

APPENDIX A

Appendix A: Flowchart of the literature search strategy followed in this systematic review



## APPENDIX B

## Thesis Data Extraction Protocol

<i>Thesis Protocol – Abstract Level and Full-Text level Screening</i>		
A b s t r a c t	<b>General information</b>	Title: Authors: Year of publication: - What was the year during which the study was conducted? Country: (country/town/school/setting) - What was the setting of the study? Journal: - Was it a peer-reviewed journal? (yes/no)
	<b>Definition</b>	- How did the authors define disability or impairment in the article? - Were disability or impairment stated in the title or in the abstract of the article?
	<b>Setting</b>	- In which country was the study performed?
	<b>Age range</b>	- What was the age range of the participants?
	<b>Type of Intervention or prevention program</b>	- What was the type of the intervention or the prevention program used in the study? - Did they include substance use knowledge? - What was the content of the intervention/prevention program? - What were the activities related to substance use in the interventions/prevention programs for adolescents? - What was the setting of the intervention/prevention program? - What was the specified duration of the intervention/prevention program?
L e v e l	<b>Type of disability or impairment</b>	- Did the article especially focused on disability or impairment?
S c r e e n i n g		

<i>Thesis Protocol - Full-text screening and data extraction</i>		
F u l l  T e x t  S c r e e n i n g	<b>Background information</b> <b>Purpose</b> <b>Research questions</b>	Description of the aim of the study: - What was the aim of the study? Study rationale: - What was the rationale of the study? Research question (s): - What were the research questions of the study? Target group: - What was the sample of the study? Theory - Was there a theoretical background included in the study? Definition of disability or impairment: - Was the disability definition adequately described?
	<b>Method</b>	Type of study: - What was the type of the study? (quantitative/qualitative and/or mixed methods). Study design: - What was the study design? - Did the researchers provide an informed consent? - Was the participation in the study voluntary or mandatory (part of the curriculum)?
	<b>Study sample:</b> <b>Student sample</b> <b>Teacher sample</b>	Sample size - How many participants were recruited for the study? Sampling - What was the sampling strategy? (e.g., random selection) Description of the sample - What were the demographic characteristics of participants? (ethnicity, type of disability, special education teachers, type of school, etc.) - Did the study encompass a control group? - Was the study focused on adolescents with disabilities or physical impairments?
	<b>Interventions or prevention programs</b>	- What was the type of substance use intervention or prevention program used in the study? - What was the setting of the intervention/prevention pro-

	<p>gram?</p> <ul style="list-style-type: none"> <li>- Did the study have a particular aim except for the general aim of the study? Explanation (yes/no)</li> <li>- Was the intervention/prevention program obligatory or elective (curriculum)? (elective/mandatory)</li> <li>- What was the duration of the intervention/prevention program? (months, years, days)</li> <li>- Was the intervention/prevention program carried out in person or through the internet (online) or both?</li> <li>- Did they encompass any fieldwork in the study? Explanation (yes/no)</li> </ul> <p>Content of the intervention/prevention program</p> <ul style="list-style-type: none"> <li>- Were there any given assignments to study participants during the intervention? (yes/no)</li> <li>- If yes, what were these assignments?</li> <li>- Did they contain any teaching techniques in the intervention/prevention program? Explanation (yes/no)</li> <li>- If yes, what were these teaching methods?</li> <li>- What was the content of the interventions/prevention programs? Explanation (course content).</li> <li>- What kind of substance use knowledge did the teachers share with their students (school context) or the researchers with the participants (treatment center)?</li> </ul>
<b>Measures used</b>	<ul style="list-style-type: none"> <li>- What were the measurement scales in the study?</li> <li>- Were they specified? (yes/no)</li> <li>- Were they pilot tested? (yes/no)</li> <li>- Were the measurement scales adapted? (yes/no)</li> <li>- If yes, what were the adaptations?</li> <li>- What was the reliability of the scale used?</li> </ul>
<b>Results</b>	<ul style="list-style-type: none"> <li>- Did the authors explain the statistical analyses used in the study?</li> <li>- What were the statistical methods used in the study?</li> <li>- How did they describe the statistical analyses?</li> <li>- Did they include means and standard deviations? (yes/no)</li> <li>- Did the researchers calculate the effect sizes of their interventions?</li> </ul>
<b>Outcomes of the interventions/prevention programs</b>	<p>Data analysis</p> <p>Overview of results</p> <ul style="list-style-type: none"> <li>- What were the outcome measurement scales?</li> </ul>

	<ul style="list-style-type: none"> <li>- How many measurements were reported across different time periods? (T1, T2, T3- follow-up).</li> <li>- Did researchers report from the statistical analyses participants' attitude changes regarding alcohol, smoking and drugs? (yes/no)</li> <li>- Was participants' substance use knowledge improved after the implementation of the intervention?</li> <li>- Did teachers receive a special training about the intervention/prevention program?</li> <li>- Were the teachers qualified enough in order to deliver the interventions adequately?</li> <li>- Did they report gender and age differences among participants? (yes/no)</li> </ul>
<b>Conclusions</b> <b>Future recommendations</b>	<ul style="list-style-type: none"> <li>- What were the conclusions of the study?</li> <li>- Were future research suggestions described in the discussion section?</li> </ul>
<b>Discussion</b> <b>Implications</b> <b>Limitations and Methodological issues</b>	<ul style="list-style-type: none"> <li>- Were practical implications described?</li> <li>- Did they describe the study findings properly?</li> <li>- Were the study limitations, methodological issues or possible bias explained in the discussion section?</li> </ul>
<b>Quality assessment</b>	<ul style="list-style-type: none"> <li>- What was the quality of the study?</li> </ul>



## APPENDIX C

*Quality Assessment Protocol*

Q u a l i t y  A s s e s s m e n t	<i>Quality Assessment Protocol</i>	
	<b>Study full citation information (identification)</b> <b>Peer-reviewed journal</b> <b>Aim and Research questions</b>	- Was the study published in a peer-reviewed journal? - Were the research questions and the aim of the study properly defined? - Was it published in a peer-reviewed journal?
	<b>Study design</b>	- Was it a randomized controlled trial (RCT)? - Or was it a quasi- experimental study design? - Was there a control group? - Was there a follow-up after the completion of the post-test to detect any alterations due to the intervention?
	<b>Population</b>	- What was the study's sampling strategy? (purposive/random/convenient)? - Was the drop- out percentage of participants mentioned? - Was the loss of study participants due to follow- up process discussed?
	<b>Comparisons among groups in the studies</b>	- Was there a randomization of participants in the study? (yes/no) - Were participants in the control group treated in an equal way except for the experimental group (intervention)? (yes/no) - If participants had differences, how did the researchers manipulate those differences?
	<b>Comparisons among groups before and after the interventions/prevention programs</b> <b>- Before-and-after studies (BA) studies (pre-post studies)</b>	- Did they evaluate participants' substance use knowledge, attitudinal and behavioral changes with the same measurement scales across different time periods?
	<b>Ethical considerations</b>	- Did they provide an informed consent to adolescents and/or to teachers? - Did they ask for parental permission prior the recruitment of participants? - Did they discuss ethical considerations in their study?

	<ul style="list-style-type: none"> <li>- Did they mention any possible ‘conflict of interest’ at the end of their study that might have affected their findings? (yes/no)</li> </ul>
<b>Intervention description</b>	<ul style="list-style-type: none"> <li>- Was the intervention or prevention program adequately explained?</li> </ul>
<b>Method</b>	<ul style="list-style-type: none"> <li>- Was the methodology of the study clarified enough?</li> </ul>
<b>Outcome measures</b>	<ul style="list-style-type: none"> <li>- Did they use already validated and reliable outcome measurement scales?</li> <li>- If not, did the researchers measure the scales before (pilot- testing) or during the study (Cronbach’s alpha)? (yes/no)</li> <li>- Did they conduct a follow-up evaluation process?</li> </ul>
<b>Statistical analyses</b>	<ul style="list-style-type: none"> <li>- Did the researchers observe any similarities between the experimental and the control groups at the baseline level? If yes, were these similarities controlled?</li> <li>- Did they identify any differences between the two groups in major confounders at baseline?</li> <li>- If yes, did they control these confounders in the analyses? (stratification, multivariate analysis)</li> <li>- Were all participants included in the analysis from the groups where they were initially assigned (and those who dropped out or did not complete the intervention)?</li> <li>- Was the interpretation of the findings clear and sufficient?</li> <li>- Did they adequately give ‘power’ to the study to notice an intervention effect? (if there was an effect)</li> <li>- Did they report a ‘power’ estimation? If not, what was the expected effect size? Was the sample size sufficient?</li> <li>- Did they measure the effect sizes?</li> <li>- Were the effect estimates reported or could they be calculated? (relative/absolute risks)</li> <li>- Were the statistical analyses suitable for the study?</li> <li>- Were major differences in the follow- up process and potential confounders controlled for?</li> </ul>

	<ul style="list-style-type: none"> <li>- If it was a cluster study design, were analyses of effect sizes, sample size (and power) calculated on clusters? (instead of individuals separately)</li> <li>- Were sub-group analyses predetermined?</li> <li>- Did they provide or measure the precision of the intervention effects?</li> <li>- Were p-values or confidence intervals (CI) for effect estimates provided or probable to assess?</li> <li>- Were CI's broad or adequately precise to support decisions? If there was no precision, does it mean that the study had 'low statistical power'?</li> </ul>
<b>Summary</b>	<ul style="list-style-type: none"> <li>- Did the results have internal validity? (unbiased)</li> <li>- Were the findings generalizable to the general population? (external validity)</li> <li>- Did the researchers eliminate sufficiently potential sources of bias? (adjustment of confounders)</li> <li>- Did the study design have significant errors or drawbacks?</li> <li>- Did researchers describe adequately the study so as to decide if the results were generalizable to the general population?</li> <li>- Did they discuss the limitations (methodological issues) in the discussion section?</li> </ul>
<b>Total score of the quality appraisal</b>	Score on the quality assessment protocol (high/medium/low quality appraisal).
<p><i>Note.</i> The critical criteria for the appraisal checklist were based on the National Institute for Health and Clinical Excellence (NICE, 2012; Jackson et al., 2006).</p>	

## APPENDIX D

**Table 1.**

Overview of all the included articles

Author, Year and Title	Purpose	Description of Disability or Impairment	Findings: outcomes of the interventions
Kiewik, M., (2017) VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A. : The efficacy of an e-learning prevention program for substance use among adolescents with intellectual disabilities: A pilot study.	<p>“The goals of this study were:</p> <p>1) to examine the lifetime use of tobacco and alcohol among this target group and</p> <p>2) to gain a first impression of the efficacy of ‘Prepared on time’ among 12-16 -year old students with moderate or mild intellectual disability (ID) (MMID)”.</p>	Special Education Schools: adolescents with Mild to Moderate Intellectual Disabilities (MMID, IQ between 35 and 70).	<p>“The lifetime tobacco use and alcohol consumption rates in our sample were 25% and 59%, respectively. The e-learning program had a positive effect on the influence of modelling of classmates and friends. No significant effects were found on other behavioral determinants and knowledge”.</p> <p><i>Conclusions:</i> This study showed that an e-learning prevention program can be feasible for adolescents with MMID”.</p>
Turhan, A., (2016) Onrust, S. A., ten Klooster, P. M., & Pieterse, M. E. : A school-based programme for tobacco and alcohol prevention in special education: effectiveness of the modified ‘healthy school and drugs’ intervention and moderation by school subtype.	<p>1) “To test the effectiveness of the Healthy School and Drugs (HSD) programme on tobacco and alcohol use in Dutch secondary special education (SE) schools, and</p> <p>2) Whether this depends upon subtypes of SE schools and the level of implementation”.</p>	SE (Special Education Schools): students with emotional and behavioral disorders (SEB), students with learning disabilities and developmental disorders (SEL), and students with intellectual and physical disabilities (SEI).	<p>“No significant differences were found at follow-up in life-time smoking and drinking frequency. Interaction analyses revealed adverse effects in SEB students for alcohol use. Effect on tobacco refusal self-efficacy was moderated positively by implementation fidelity”.</p> <p><i>“Conclusion:</i> The Healthy School and Drugs programme</p>

			<p>adapted for secondary special education in the Netherlands lacked clear evidence for effects on all outcomes. This pilot study suggests further that within special education, substance use interventions may need to be targeted at school subtypes, as these may have harmful effects among students with behavioral difficulties”.</p>
<p>Schijven, E. P., (2015) Engels, R. C.M.E., Kleinjan, M., &amp; Poelen, E. A.P. Evaluating a selective prevention program for substance use and comorbid behavioral problems in adolescents with mild to borderline intellectual disabilities: Study protocol of a randomized controlled trial.</p>	<p>“The study described in this protocol tested the effectiveness of a selective intervention aimed at reducing substance use in adolescents with mild to borderline ID and behavioral problems. In the intervention, participants acquire competences to deal with their high-risk personality traits”.</p>	<p>Adolescents with mild to borderline ID and behavioral problems who are admitted to treatment facilities in The Netherlands.</p>	<p>“This study protocol describes the design of an effectiveness study of a selective prevention program for substance use in adolescents with mild to borderline ID and behavioral problems. This prevention program is expected to have a significant reduction in alcohol, cannabis and hard drug use among adolescents in the intervention group compared with the control group”.</p>
<p>Kiewik, M., (2016) VanDerNagel, J. E.L., Kemna, L. E.M., Engels, R. C.M.E., &amp; DeJong, C. A.J. Substance use prevention program for adolescents with intellectual disabilities on special education</p>	<p>“The objectives of this study were: 1) to undertake a cluster randomized control trial to test the efficacy of the e-learning program among 12- to 15- year old students with mild and borderline ID</p>	<p>Special needs schools: students in the first or second grade with borderline or mild intellectual disabilities (ID).</p>	<p>“Baseline findings showed that a large proportion of all respondents had initiated smoking (49%) and drinking (75%), well above the</p>

schools: a cluster randomised control trial.

in secondary special-needs schools and  
2) to examine the tobacco and alcohol use for this population”.

expected numbers based on national figures. ‘PREPARED ON TIME’ did not affect the behavioral determinants (i.e. attitude, subjective norm and self-efficacy), except modelling on smoking. Additionally, alcohol-related knowledge of students in the experimental group increased after the completion of the program.

Demers, J., (2000)  
French, D. C.,  
& Moore, D.  
The preliminary evaluation of a program to help educators address the substance use/prevention needs of special students.

“The purpose of the pilot study was to test a substance abuse prevention education program targeted toward addressing the needs of students in special education and to assess the effects of the program on participating students’ related attitudes, understanding, and behavior”.

Special needs high-schools: Students with special needs.

“Pilot students noted an increase in their teachers’ emphasis on substance abuse prevention in their classes and their criterion-related attitudes/behaviors were somewhat higher than those observed for a group of control students the differences between that two groups’ criterion scores did not differ significantly”.

**Table 2.**

## Study design and number of participants

Author and Year of publication	Study design	Country	Number of participants
Kiewik, M., (2017) VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A. : The efficacy of an e-learning prevention program for substance use among adolescents with intellectual disabilities: A pilot study.	A pre-/post intervention pilot study with two com- parison groups (intervention and control group).	The Netherlands	<i>Experimental group:</i> 37 students (n = 37) with Mild to Moderate Intellectual Disabilities (MMID).  <i>Control group:</i> 36 students (n = 36) at baseline with Mild to Moderate Intellectual Disabilities (MMID).
Turhan, A., (2016) Onrust, S. A., ten Klooster, P. M., & Pieterse, M. E. : A school-based programme for tobacco and alcohol prevention in special education: effectiveness of the modified 'healthy school and drugs' intervention and moderation by school subtype.	Quasi-experimental design with two comparison groups (intervention group and control group): A pilot study.	The Netherlands	<i>Intervention condition</i> (n = 205): (20 classes, one SEI with intellectual and physical disabilities, 10 SEB with emotional and behavioral disorders and 9 SEL with learning disabilities and developmental disorders).  <i>Control condition</i> (n = 158): (15 classes, 7 SEB with emotional and behavioral disorders and 8 SEL with learning disabilities and developmental disorders).
Schijven, E. P., (2015) Engels, R. C.M.E., Kleinjan, M., & Poelen, E. A.P. Evaluating a selective prevention program for substance use and comorbid behavioral problems in	A Randomized Controlled Trial (RCT) with two comparison groups (an intervention group and a con- trol group).	The Netherlands	<i>Intervention condition:</i> (Take it personal!; n = 70) with mild to borderline ID and behavioral problems.  <i>Control condition:</i> (care as usual; n = 70) with mild to

adolescents with mild to borderline intellectual disabilities:  
Study protocol of a randomized controlled trial.

borderline ID and behavioral problems.

<p>Kiewik, M., (2016) VanDerNagel, J. E.L., Kemna, L. E.M., Engels, R. C.M.E., &amp; DeJong, C. A.J.</p> <p>Substance use prevention program for adolescents with intellectual disabilities on special education schools: a cluster randomised control trial.</p>	<p>A cluster randomized controlled trial (RCT) with two comparison group (an intervention and a control group).</p>	<p>The Netherlands</p>	<p><i>Experimental condition:</i> 111 students (<math>n = 111</math>) with mild or borderline intellectual disabilities (ID).</p> <p><i>Control condition:</i> 143 students (<math>n = 143</math>) with mild or borderline intellectual disabilities (ID).</p>
<p>Demers, J., (2000) French, D. C., &amp; Moore, D.</p> <p>The preliminary evaluation of a program to help educators address the substance use/prevention needs of special students.</p>	<p>“A quasi- experimental design procedure: the sample of schools divided into two groups (experimental group and control group), with all students in each school receiving the same ‘treatment’”.</p>	<p>Dayton, Ohio: U.S.A.</p>	<p>Student sample: <i>Experimental group:</i> 65 students (<math>n = 65</math>) with special needs.</p> <p><i>Control group:</i> 73 students (<math>n = 73</math>) with special needs.</p> <p>Teacher sample: <i>Experimental schools:</i> 6 teachers in the training session (<math>n = 6</math>)</p> <p><i>Control schools:</i> 7 teachers in the training session (<math>n = 7</math>).</p>



**Table 3.***Author, year of publication, titles of all the included articles*

Author	Year	Title
Kiewik, M., VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A.	(2017)	The efficacy of an e-learning prevention program for substance use among adolescents with intellectual disabilities: A pilot study.
Turhan, A., Onrust, S. A., ten Klooster, P. M., & Pieterse, M. E.	(2016)	A school-based programme for tobacco and alcohol prevention in special education: effectiveness of the modified 'healthy school and drugs' intervention and moderation by school subtype.
Schijven, E. P., Engels, R. C.M.E., Kleinjan, M., & Poelen, E. A.P.	(2015)	Evaluating a selective prevention program for substance use and comorbid behavioral problems in adolescents with mild to borderline intellectual disabilities: Study protocol of a randomized controlled trial.
Kiewik, M., VanDerNagel, J. E.L., Kemna, L. E.M., Engels, R. C.M.E., & DeJong, C. A.J.	(2016)	Substance use prevention program for adolescents with intellectual disabilities on special education schools: a cluster randomised control trial.
Demers, J., French, D. C., & Moore, D.	(2000)	The preliminary evaluation of a program to help educators address the substance use/prevention needs of special students.

**Table 4.***Quality Assessment of the Included Articles*

Author	Peer-reviewed journal	Study design	Sample size	Informed consent	Description of disability or impairment	Method analysis and effect sizes	Ranking of the study
Kiewik, M., (2017) VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A.	High	Medium	Medium	High	High	High	High
Turhan, A. et al., (2016).	High	High	Medium	High	High	High	High
Schijven, E. P. et al., (2015)	High	High	Medium	High	High	High	High
Kiewik, M., et al., (2016)	High	High	Medium	High	High	High	High

Demers, J., et al., (2000)	High	Medium	Medium	Low	Medium	Medium	Medium
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**Table 5.***Outcome measures of the included studies*

Outcome measures	
S1	A Dutch self-report questionnaire based on the ASE theoretical model with ID students (Ter Huurne, 2006).
S2	A Dutch questionnaire designed by Trimbos Institute (Verdurmen et al., 2012).
S3	Substance Use and Misuse among Intellectually Disabled Persons Questionnaire (SumID-Q), Drinking Motives Questionnaire-Revised- Short Form (DMQ-R-SF), and internalizing and externalizing behavioural problems measured by YSR and a Substance Use Risk Profile Scale (SURPS).
S4	A Dutch self-report questionnaire based on the ASE theoretical model, pilot tested with ID students (Ter Huurne, 2006).
S5	The questionnaire was developed by PALS staff.

*Note.* S1: (Study 1, Kiewik, M., VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A., 2017).

S2: (Study 2, Turhan, A., et al., 2016).

S3: (Study 3, Schijven, E. P., et al., 2015).

S4: (Study 4, Kiewik, M., et al., 2016).

S5: (Study 5, Demers, J., et al., 2000).

*Outcome measures*

Measurements of the effects and outcomes were calculated grounded in students' answers or scores in questionnaires. The measurement scales that were utilized in these studies to evaluate the outcomes of the interventions were as follows: a self-report questionnaire based on the ASE theoretical model with ID students (Ter Huurne, 2006; S1, S4), a questionnaire designed by Trimbos Institute (Verdurmen et al., 2012; S2) and the PALS questionnaire (S5). In study 3, researchers used a Substance Use and Misuse for ID individuals Questionnaire (SumID-Q), a Drinking Motives Questionnaire-Revised- Short Form (DMQ-R-SF), a Substance Use Risk Profile Scale (SURPS) for the four high-risk personality scales, while adolescents' internalizing and externalizing behavioural problems were measured by the Youth Self-Report scale (YSR), (S3). Solely the effect sizes and the significant results from the statistical analyses were explained in the paragraphs below.

**Table 6.***Effects of Interventions and Prevention Programs*

S1	<i>Behavioral determinants and knowledge</i>	<i>F (df)</i>	<i>p</i>	<i>η<sup>2</sup></i>
S1.	Modelling direct environment	<i>F (1,65) = 7.919</i>	0.006	0.109
	Modelling classmates alcohol	<i>F (1,36) = 8.669</i>	0.006	0.194
S2	<i>SEB schools</i>	<i>Cohen's d (95% CI)</i>		<i>P</i>
S2.	Frequency of lifetime alcohol use	0.43 (0.16–0.69)	0.002	
	Intention to use alcohol	0.44 (0.06–0.82)	0.023	
	Smoking (life-time)	2.21 (0.58–8.42)	(NA)	0.245
	Frequency of alcohol use (life-time)	(NA)	0.48 (0.14–0.83)	0.006
	Daily smoking	3.74 (0.83–16.82)	(NA)	0.085
	Intention to smoke	(NA)	0.06 (-0.38 to 0.49)	0.799
	Social norm regarding smoking	(NA)	0.18 (-0.28 to 0.64)	0.435
	Self-efficacy to refuse smoking	(NA)	-0.12 (-0.55 to 0.32)	0.603
	Frequency of binge drinking	(NA)	0.17 (-0.29 to 0.64)	0.461
	Intention to use alcohol	(NA)	0.53 (0.08 to 0.99)	0.022
	Social norm regarding alcohol use	(NA)	0.40 (-0.06 to 0.86)	0.087
	Self-efficacy to refuse alcohol	(NA)	-0.28 (-0.71 to 0.16)	0.216
S4	<i>Behavioral determinants and knowledge</i>	<i>F (df)</i>	<i>p</i>	<i>η<sup>2</sup></i>
S4.	Alcohol knowledge	<i>F 1,180 = 6.31</i>	0.01	0.034
	Modelling smoking	<i>F 1,88 = 6.879</i>	0.01	0.073
	Intention to stop or intention not to start			
	Smoking	<i>F 1,123 = 0.265</i>	0.607	0.002
	Alcohol	<i>F 1,102 = 0.675</i>	0.413	0.007
S5		<i>Z</i>	<i>p- value</i>	
S5.	Intend to use ATOD in the future?	<i>Z = -1.75</i>	<i>(p = .08)*</i>	
	Peer pressure regarding ATOD use	<i>Z = -1.72</i>	<i>(p = .08)*</i>	

Note. S1: (Study 1, Kiewik, M., VanDerNagel, J. E. L., Engels, R. C. M. E., & DeJong, C. A., 2017).

S2: (Study 2, Turhan, A., et al., 2016).

S3: (Study 3, Schijven, E. P., et al., 2015).

S4: (Study 4, Kiewik, M., et al., 2016).

S5: (Study 5, Demers, J., et al., 2000). ATOD: Alcohol, Tobacco, and Other Drugs use