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Research Article

Examining the Effectiveness of School-Based Interventions Developed to cope with and Prevent Substance Use: A Systematic Literature Review

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Abstract

In this research, between January 2012 and December 2022, four databases, Eric, Science Direct, Web of Science and Scopus, were searched for studies written in English and 7 studies were found to meet the necessary conditions for review. The findings show that the most frequently used substances by adolescents are cigarettes, alcohol, opium, nass, cannabis, and methamphetamine. Also, it was concluded that group intervention shave an effect on perceived parent involvement in adolescents, prevent and decrease adolescent substance use, resist peer pressure, help in being able to say no, and increaseparents' relationship satisfaction with their adolescents. These findings suggest that school-based group interventions that involved adolescents and parents together are functional in preventing and reducing adolescent substance use. However, the fact that half of the risk of bias assessment is ambiguous suggests that research that integrates experimental studies with low risk of bias is needed.

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Introduction

Adolescence, which is one of the developmental periods shaping personality, is a period when the probability of encountering risky behaviors increases. Adolescence is also a risky period for starting behaviors such as dangerous alcohol consumption, tobacco use, antisocial behaviors, substance use, and unprotected sexual intercourse (Patton et al., 2016). Illegal drug use is among the most important problems during adolescence (Gore et al., 2011) because the desire to seek excitement increases risk-taking behaviors (Steinberg, 2008). In the study by Currie et al. (2012), when the data obtained from many countries included in their project are analyzed, it is seen that there is a significant increase in the number of adolescents using substances between the ages of 11 and 15. High consumption of alcohol can cause

serious problems such as harming oneself or another person, vandalism, injuries, and accidents (Kuntsche & Gmel, 2013), cigarettes started early in life can lead to increased consumption and continuous smoking later in life (Kuper, Adami & Boffetta, 2002). It was found that marijuana use is attributed to problems such as increased risk of motor vehicle accidents, impaired respiratory function, cardiovascular disease, and addiction in adolescents (Hall & Degenhardt, 2009). It was detected that methamphetamine is attributed to increased risky sexual behaviors and psychiatric problems (Buck & Siegel, 2015) and opium is attributed to the risk of using heroin in adolescents in the future (Mokri, 2002).

Since substance use has increased among adolescents aged 12-18 years (Patton et al., 2016), it is said that interventions for substance and alcohol use should be carried out immediately (Leal-Lopez, Sánchez-Queija, Rivera, & Moreno, 2020). It was observed that adolescents who spend most of their time at school benefit from school-based interventions to avert and decrease substance use (Stewart, Siebert, Arlt, Moise-Campbell & Lehinger, 2016). Studies are reporting that school-based interventions were used for smoking cessation (Haug, Castro, Kowatsch, Filler & Schaub, 2017), decreasing alcohol and cannabis use in adolescents (Midford et al., 2012), and in preventing drug use (Schwinn, Schinke, Keller & Hopkins, 2019). However, findings are showing that it is not effective in measurements after substance use interventions with adolescents (Marsiglia, Peña, Nieri & Nagoshi, 2010). But, there is more evidence in the literature reporting that it is effective (Midford et al., 2012; Stewart et al., 2016).

It seems that school-based studies are mostly implemented as group interventions (Bahramnejad, Iranpour, Karamoozian & Nakhaee, 2020; Koning van den Eijnden, Verdurmen, Engels & Vollebergh, 2013; Marsiglia, Wu, Ayers & Weide, 2019). School-based group interventions involve adolescents (Haug et al., 2017), adolescent and family members (Beeres, Arnö, Pulkki-Brännström, Nilsson & Galanti, 2022), parents and adolescents (Marsiglia, Wu, Ayers & Weide, 2019) and the participation of different groups. In a workshop report by the United Nations Office on Drugs and Crime and the World Health Organization, it was emphasized that it is important to involve family members in preventing substance use in adolescents (Milano et al., 2017). Although adolescents who interact less with their parents during adolescence seem to focus their attention on their peer groups, parents continue to be important for adolescents (Steinberg, 2001). It has been found that in families where parental monitoring and parental communication are high,

adolescents' desire to use substances and engage in risky behavior is less (Patel et al., 2021). Considering that adolescents and their families are the most affected by this situation (Katrancı Bingöl, 2022), evidence-based options are few (Austin, Macgowan & Wagner, 2005), or interventions are only psycho-educational for adolescents,and studies offer limited awareness projects (Erbaş & Kağnıcı, 2017), it can be said that there is a need for further studies at school.

Along with the studies conducted at school on the effects of substance use on adolescents, meta-analyses and systematic literature reviews compiling these studies are also found (Bo, Hai & Jaccard, 2018; Champion, Newton, Barrett & Teesson, 2013; de Kleijen et al., 2015; Karki et al., 2012; MacArthur, Harrison, Caldwell, Hickman & Campbell, 2016; Sandra & Emmanuel, 2016; Strom, Adolfsen, Fossum, Kaiser & Martinussen, 2014). In these studies, school-based alcohol, smoking, and cannabis prevention programs (de Kleijen et al., 2015; Karki et al., 2012; Strom et al., 2014), peer-led interventions (MacArthur et al., 2016), online interventions (Champion et al., 2013), and parent-based interventions (Bo, Hai & Jaccard, 2018; Sandra & Emmanuel, 2016) were used for adolescents. Although there are studies synthesizing the effectiveness of interventions that involved the participation of only parents (Bo, Hai & Jaccard, 2018; Sandra and Emmanuel, 2016), or adolescents (de Kleijen et al., 2015; Strom et al., 2014), no analysis or systematic literature review was found testing the effectiveness of the interventions that involved both groups.

Systematic literature searches aim to bring together studies that meet predetermined criteria to answer a specific research question using systematic methods to decrease bias and help to report the interventions achieved transparently (Liberati et al., 2009). Considering that group interventions that involved adolescents and parents together for school-based substance use increased recently (Bahramnejad et al., 2020; Chang et al., 2015; Marsiglia et al., 2019; Williams, Ayers, Baldwin & Marsiglia, 2016), a systematic literature review that helps to bring these studies together and examine their effectiveness is considered to contribute to filling the gap in the literature. This study aims to bring together empirical studies to identify the advantages and disadvantages of school-based interventions for adolescents involving parents in the prevention and reduction of substance use. This is the first time that the efficiency of school-based group interventions involving parents and adolescents in adolescent substance use has been systematically examined in this study. The sub-objectives of the study were i) To identify the school-based group interventions with parent-adolescent

participation developed to prevent and cope with substance use in adolescents found in the literature, ii) Review the existing literature as a whole by examining the detailed information and components of programmes involving parent-adolescent involvement, iii) explain how the involvement of parents in school interventions can influence the outcome of the intervention.

Method

The systematic literature review method was used in the present study. The Narrative Synthesis Method was used in this study because it helps to report interventions in a transparent and detailed way and to explore relationships between studies (Rodgers et al., 2009). In this context, PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which is designed to examine the effectiveness of studies in the health sector, to collect and report studies in the field, was utilized (Liberati et al., 2009).

The PICOS (Participants, Interventions, Comparisons, Results, and Study Design) is frequently used in systematic literature reviews to identify study questions and describe studies (Liberati et al., 2009). Participants are defined according to age, gender, developmental level, psychiatric diagnosis, etc.; interventions are defined according to the problem under consideration, type and content of the intervention. Comparisons are clearly defined according to the comparison with groups other than the intervention under consideration and concrete findings obtained as a result of the intervention. For this purpose, firstly, it is necessary to determine the criteria for inclusion and exclusion from the study (Perestelo-Pérez, 2013). The inclusion and exclusion criteria for this study and the rationale for these criteria are presented in Table 1.

In the present study, Web of Science, Science Direct, Scopus, and Eric databases, which show comprehensive results in the field of social sciences, were searched between April-May 2023. To access relevant studies that meet the inclusion criteria, search databases

Table 1. Inclusion and exclusion criteria for the study selection process

Inclusion criteria	**Justification**
The age of the adolescents who participated in the study must be between 12-18.	Increasing substance use between the ages of 12-18 (Patton et al., 2016)
School-based group interventions must include studies on reducing or avoiding smoking, alcohol, and drug use.	Evidence that school-based interventions are effective in reducing or preventing substance use (Stewart et al., 2016; Stormshak & Dishion, 2009)
Studies that involved parent and adolescent involvement.	The fact that the participation of parents and adolescents together in drug abuse studies increases the positive effect of the application (Marsiglia et al., 2019)
Examining the results by using a psychometric measurement tool.	Experimental intervention based on quantitative data.
The study must be written in English.	The most common language in scientific studies is English and it can be translated.
Study designs must be in an experimental pattern (including semi-experimental designs).	Experimental design is strong and is the strongest pattern showing effectiveness.
The study must be published in a peer-reviewed journal.	Inclusion of qualification studies.
The study must be published between 2012-2022.	The increased school-based and group interventions that involved parents in reducing or preventing adolescent substance use in the last 10 years (Bahramnejad et al., 2020; Chang et al., 2015; Marsiglia et al., 2019; Midford et al., 2014)
Exclusion Criteria	**Justification**
Works published outside the scope of this study: Books, Theses, Films, Magazines, Newspapers, Bulletins.	Less scientific details.
School-based non-intervention studies.	The necessity of applying studies whose effectiveness was researched at school.
Studies without group intervention.	A group setting offers the adolescent and parent the opportunity to experience and develop the skills acquired (Yalom & Leszcz, 2018).
Studies that do not involve family and adolescent involvement.	The necessity of group interventions whose effectiveness was investigated must include family and adolescent involvement.
Studies that involve psychological discomfort as well as substance use.	Insufficient school-based interventions in curing psychological disorders.

("school-based interventions" OR "adolescent drug use OR "parental involvement") AND ("school-based group interventions" OR "adolescent alcohol use" Experimental studies written in English using the keywords OR "family" were analyzed. Figure 1 shows the prisma diagram explaining the selection process of the studies.

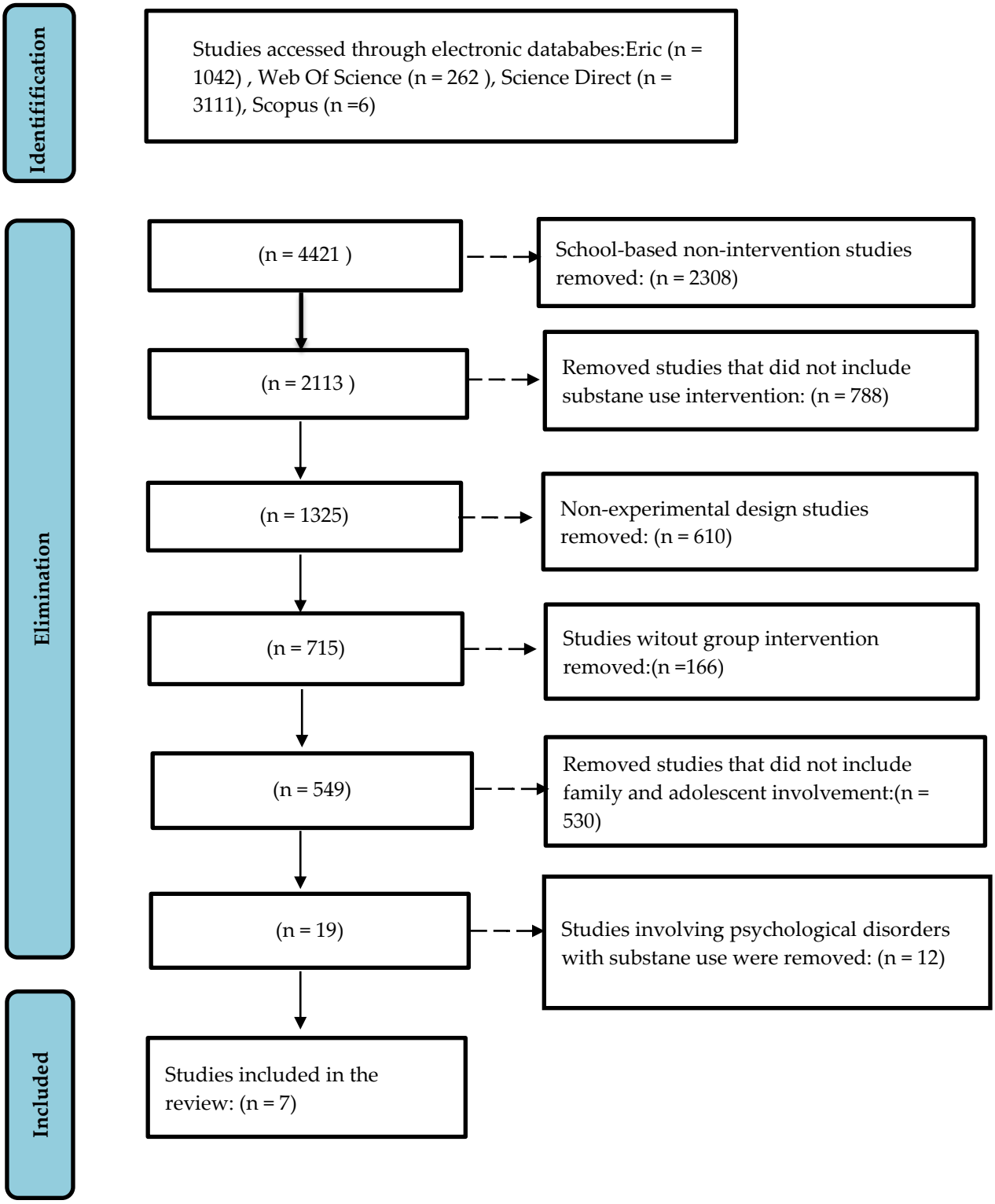


Figure 1. PRISMA diagram showing the study selection process

In the screening process of the articles included in the study, the abstracts were read first; when detailed information could not be obtained from the abstracts, the full text was reviewed. The researchers came together frequently to discuss whether the full-text articles met all the inclusion criteria and reached a final decision.

Coding of Studies

The included studies were grouped according to the inclusion criterion: a) resarch and year of the study b) experimental design model c) country d) age range e) the intervention program f) item considered g) intervention and control group process h) evaluation i) effect size i) psychological measurement outcome.

Assessment of Risk of Bias

The risk of bias is used to express that methodological drawbacks of a study mightcause bias. Risk of bias assessments isalso used to evaluate the quality of studies and how far they are free from bias by focusing on risk areas of the study in systematic literature reviews (Munder & Barth, 2018). The Cochrane bias assessment tool was developed to determine the distance of research from risk areas by focusing on seven different dimensions. The tool has three ratings: low, uncertain and high (Higgins et al., 2011).

Murder and Barth's (2018) recommendations for evaluating psychotherapy work were taken into account instead of this tool to identify the effectiveness of the health sector. These domains, consisting of seven categories in total, are as follows: Randomization of allocation to groups, whether participants and implementers had knowledge of allocation to groups, blinding of participants and implementers, treatment implementation, identification, attrition and reporting bias.

These seven dimensions were evaluated by two researchers for each study that was included in the study, and the risk of bias was decided in line with a common decision. One of the dimensions, selection bias, involves random allocation of groups and concealment of randomization information. Another dimension (allocation concealment) involves the information of hiding the participant assignment and practitioners and treatment. Providing detailed information on the intervention process and the competence of the practitioner constitutes the treatment implementation dimension. Another dimension (the detection bias) refers to the detection bias that occurs because of the knowledge of the interventions applied by the evaluators. Another dimension (attrition bias) describes

whether missing outcome data exists or how missing data are handled. The final dimension (reporting bias) involves whether the study has an from the staff. Another dimension (performance bias risk)involves blinding of participants intervention protocol and reporting the results regarding the variables determined before the experimental intervention (Murder & Barth, 2018).

Results

In the present study, as a result of the review made with the mentioned keywords about school-based interventions, 4421 studies were evaluated. In the first step, the articles that did not include school-based interventions (n=2308) were eliminated. The articles without substance use intervention (n = 788) and qualitative studies without experimental design (n = 610) were excluded in the second step. The studies without group intervention (case studies) (n=166) and the studies that did not involve parents-adolescents (n=530) were excluded in the third step. Finally, after excluding studies that included psychological disorders in addition to substance use (n = 12), it was determined that seven studies were eligible for this review. The process of accessing these included articles is summarized in Table 2.

Characteristics of the Selected Studies

The ages of the adolescents in the studies analyzed in this review are between 12-18. One of these studies was conducted in Iran (Bahramnejad et al., 2020), one in the USA (Marsiglia et al., 2019), one in Taiwan (Chang et al., 2015), one in the Netherlands (Koning et al., 2013), one in Mexico (Williams et al., 2016), the last two studies were both in Australia (Midford et al., 2014). Three studies (Chang et al., 2015; Marsiglia et al., 2019; Williams et al., 2016) were programs aimed at preventing substance use, and four of them (Bahramnejad et al., 2020; Koning et al., 2013; Midford et al., 2014) were programs for coping with substance use. In preventive intervention programs (Chang et al., 2015; Marsiglia et al., 2019; Williams et al., 2016), it is not clear whether the sample group is a substance user or not, and it is aimed to increase the personal characteristics of adolescents in the prevention process; ıt was stated in the coping intervention programs (Bahramnejad et al., 2020; Koning et al., 2013; Midford et al., 2014) that all of them were substance users and aimed to decrease or quit substance use. In one of the coping intervention programs (Bahramnejad et al., 2020), participants used alcohol, cigarettes, opium, nass, cannabis, and methamphetamine, and in

three of them (Koning et al., 2013; Midford et al., 2014), school-based group interventions were used for adolescents who used alcohol only. Although one of the prevention intervention programs (Williams et al., 2016) included the information that alcohol and cigarettes were taken into consideration as substances, the information for which school-based group intervention was applied was not included in two studies (Chang et al., 2015; Marsiglia et al., 2019).

Methodological Characteristics of Studies

Many studies included in this study had experimental and control groups and experimental designs in which subjects were randomly assigned (Koning et al., 2013; Marsiglia et al., 2019; Midford et al., 2014; Williams et al., 2016). Only two of them (Bahramnejad et al., 2020; Chang et al., 2015) had a quasi-experimental design. In three of these studies, pretest, last test, and monitoring test were used (Marsiglia et al., 2019; Williams et al., 2016), in four (Bahramnejad et al., 2020; Chang et al., 2015; Koning et al., 2013; Midford et al., 2014) pretest-lasttest measurements were used.

In most of the studies (Bahramnejad et al., 2020; Chang et al., 2015; Midford et al., 2014), there was only one experimental group; in one study (Williams et al., 2016), in the last two remaining studies (Koning et al., 2013; Marsiglia et al., 2019). In the study of Williams et al. (2016), which consisted of two experimental and control groups, an 8-week FPNG (Families Preparing the New Generation) program was used for the parents in the experimental group and a 10-week kiR (keepin' it REAL) program was used for the adolescents. Although the kiR program was used for the adolescents in the Experimental 2 group, control group adolescents and their parents did not receive any intervention. In a study in which three different experiments were conducted (Marsiglia et al., 2019), the FPNG program was applied to parents and the kiR program was applied to adolescents in Experiment 1 group. Parents in the second experimental group received the FPNG program and adolescents received the school's standard substance use prevention program; a training program on the importance of school participation was used for the parents in the Experimental 3 group, and the standard substance use prevention program of the school was used for the adolescents.

In another study with three different experimental groups (Koning et al., 2013), Experimental Group 1 consisted of only adolescents, and a four-class alcohol coping

program was applied.Experimental Group 2 consisted of parents only and a three-lesson training was provided to help their children establish rules for alcohol use. The Experiment 3 group consisted of both parents and adolescents and the two treatments in the other groups were applied together. The control group received no intervention. In 5 studies (Bahramnejad et al., 2020; Koning et al., 2013; Marsiglia et al., 2019; Williams et al., 2016), parent and adolescent interventions were used as consecutive sessions at school. In two studies (Chang et al., 2015; Midford et al., 2014), interventions were in the form of consecutive sessions with adolescents at school. In the studies included, at least four sessions (Koning et al., 2013) and at most eleven sessions (Bahramnejad et al., 2020) were used for adolescents, and at least 3 sessions were used (Koning et al., 2013) and a maximum of 8 sessions were used for parents (Marsiglia et al., 2019; Williams et al., 2016).

Intervention Results

Effectiveness. In the studies included here, school-based group interventions that involved adolescents and parents used to prevent substance use were found to be effective (Chang et al., 2015; Marsiglia et al., 2019; Williams et al., 2016) and coping (Bahramnejad et al., 2020; Koning et al., 2013; Midford et al., 2014). In one study (Williams et al., 2016), no significant differences were detected between pretest-lasttest measurements, but it was found that Experimental Group 1 was less likely to try alcohol and cigarettes when compared to Experimental Group 2 in the monitoring test. Since no study's effect size was explicitly given, the researchers were able to calculate the effect size of 3 included studies by utilising the website https://lbecker.uccs.edu (Bahramnejad et al., 2020; Chang et al., 2015; Midford et al., 2014).The values of the remaining studies could not be calculated because they could not be reached. In Bahramnejad et al. (2020) study, effect size values of the intervention applied to the experimental group were calculated for substance use tendency (d = 0.15), resilience (d = 0.145), and drug use tendency (d = 0.57). In Chang et al. (2015) study, effect size values were calculated for drug-related knowledge (d=0.235), drug prevention attitude (d=0.101), life skills (d=0.013), drug use intentions (d=0.042), parental involvement (d=0.02). In Midford et al. (2014) study, effect size values of the intervention applied to the experimental group were calculated for risky alcohol consumption (d=0.33), harms of alcohol (d=0.01), alcohol consumption (d=0.11).

In two of the studies that involved more than one experimental group (Koning et al., 2013; Marsiglia et al., 2019), it was found that adolescents achieved more effective results in

reducing the amount of excessive drinking and alcohol use at the weekend and having anti-drug norms in the lasttest and monitoring test of the groups, which included adolescent and parent interventions, compared to the other experimental groups. In a single study (Williams et al., 2016), there was no significant difference in the pre-test and lastt-test measurements of the groups, but in monitoring test, the experimental group, which included both adolescent and parent interventions, was found to be less likely to try alcohol and cigarettes than the group intervention for adolescents only. In two studies (Chang et al., 2015; Midford et al., 2014), which consisted of home activities and homework assignments that parents should do with their children at home, an increase was found in perceived parental involvement and significant changes in the level of communication with parents about alcohol. In Table 3 and Table 4, descriptive information on the year of publication, author information, country of affiliation, research design, age of adolescents, intervention program, item considered in the study, detailed information on the groups, evaluation, effect size and results of the included studies are given. Table 4 is given at the end of the bibliography.

Assessment Results Regarding Risk of Bias

In three studies, the randomization of groups was ambiguous (Bahramnejad et al., 2020; Chang et al., 2015; Marsiglia et al., 2019), while in the rest (Koning et al., 2013; Midford et al., 2014; Williams et al., 2016) it was low. No studies were evaluated in the high-risk category. In the size of allocation concealment, one study was included in the high-risk category, and one study (Bahramnejad et al., 2020) was included in the low-risk category. All remaining studies were evaluated in the uncertain risk category. Blinding of participants and practitioners, which is one of the dimensions of performance bias, was determined that most of the studies (Koning et al., 2013; Marsiglia et al., 2019; Midford et al., 2014) fell into the uncertain risk category and the remaining studies (Bahramnejad et al., 2020; Chang et al., 2015; Williams et al., 2016) fell into the high risk category. It was found that the risk was low in all studies in reporting the qualifications and treatment content of intervention practitioners in detail, which is another dimension of performance bias.

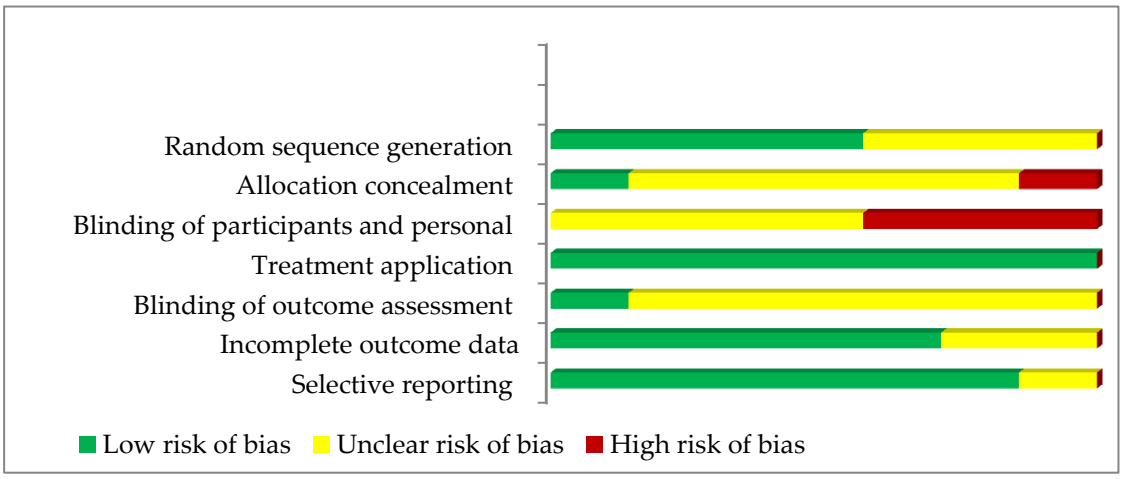
Table 3. Bibliometric informantion of retrieved studies

Study	Research Design	Country	Age range	Intervention program	Taken into account substane
Bahramnejad et al. (2020)	Semi-Experimentel	Iranian	15-16	Coping	Alcohol, cigarettes, opium, nass, marijuana, methamphetamine
Marsiglia et al. (2019)	Experimentel	America	12-14	Prevention	Unspecified
Chang et al. (2015)	Semi-Experimentel	Taiwan	7th grade students	Prevention	Unspecified
Toumbourou et al. (2013)	Experimentel	Ausralia	The average age: 12.3	Coping	Alcohol
Koning et al. (2013)	Experimentel	Holland	12-16	Coping	Alcohol
Midford et al. (2014)	Experimentel	Ausralia	13-14	Coping	Alcohol
Williams et al. (2016)	Experimentel	Mexican	The average age: 12	Prevention	Alcohol and cigarettes

In terms of detection bias, many studies (Bahramnejad et al., 2020; Chang et al., 2015; Koning et al., 2013; Marsiglia et al., 2019; Williams et al., 2016) were included in the uncertain risk category because of the lack of sufficient information on the measures taken to decrease the bias based on the intervention knowledge of the people who evaluated the intervention (Higgins et al., 2011; Munder & Barth, 2018). One study (Midford et al., 2014) was included in the low-risk category because it included the information that the outcome assessment was performed by a different expert. In the attrition bias dimension,many studies (Koning et al., 2013; Marsiglia et al., 2019; Midford et al., 2014; Williams et al., 2016) were included in the low-risk category because they had insufficientinformation on missing result data and how they were handled,two studies were included in the uncertain risk category (Bahramnejad et al., 2020; Chang et al., 2015). No study was included in the high-risk category in terms of detection bias.

In terms of reporting bias, one study (Bahramnejad et al., 2020) was included in the uncertain risk category because it did not include reports on all the results before the experimental procedure. All remaining studies were in the low-risk category because a pre-intervention study protocol was available and included information on all outcomes determined before the experimental study. The results of the risk of bias assessment of each study are shown in Table 5.

Table 5. Risk of bias grapy



Discussion

In the present study, the purpose was to review the literature systematically on the effectiveness of school-based group interventionsthat involved parents for adolescent substance use prevention/coping. As a result of the search, 7 studies written in English between 2012 and 2022 were eligible for this review. This is the first systematic literature review on the evaluation of school-based group interventions involving parents in adolescent substance use.

When we look at the countries where the studies examined in this study were conducted, it is seen that the studies were conducted in 6 different countries: Iran (Bahramnejad et al., 2020); USA (Marsiglia et al., 2019); Taiwan (Chang et al., 2015); Australia (Midford et al., 2014); Netherlands (Koning et al., 2013); Mexico (Williams et al., 2016). This provides important evidence that adolescent substance use coping/prevention is a common intervention and that school-based group interventions, that involve parents, can be applied in many cultures.

The findings show that school-based group interventions that involved parents were effective in preventing and reducing the use of alcohol, cigarettes, opium, nass, cannabis, and methamphetamine in adolescents. The variety of substances considered in the interventions in the study confirms the information that adolescents are at risk of many stimulants in substance use (Gore et al., 2011; Hall & Degenhardt, 2009; Kuntsche & Gmel, 2013; Kuper, Adami & Boffetta 2002; Patton et al., 2016).

Regarding the methodological characteristics of the studies, most of them had experimental and control groups (Koning et al., 2013; Midford et al., 2014; Williams et al., 2016), but one study (Marsiglia et al., 2019) consisted of only three experimental groups and they were experimental studies with random sampling. Both of them (Bahramnejad et al., 2020; Chang et al., 2015) have a quasi-experimental design. Randomization is effective in showing that the outcome is due to the intervention rather than confounding variables (Field & Hole, 2019). The consideration of randomization shows that school-based group interventions involving adolescents and their parents make a great contribution to the outcomes of adolescents on preventing and reducing substance use. However, the different number of participants in the studies considered was a weakness. Because the fact that the groups (experimental, control, and placebo) were different from each other before the experimental procedure indicates that the intervention effect might have occurredbecause of another confounding variable.It must be examined whether the groups had similar characteristics to each other because this may decrease the internal validity of the experimental design (Field & Hole, 2019).

Three studies (Marsiglia et al., 2019; Williams et al., 2016) had pre-test, last-test and monitoring test; four (Bahramnejad et al., 2020; Chang et al., 2015; Koning et al., 2013; Midford et al., 2014) had pre-test-last-test measurements. Repeated measurements make it easier to argue that the difference in the determined variable occurs because of the experimental procedure (Field & Hole, 2019). In two of the studies with more than one experimental group (Koning et al., 2013; Williams et al., 2016), it was observed that the experimental groups that included adolescents and parents in the same group achieved more effective results in reducing the amount of binge drinking and alcohol use of adolescents on weekends and decreasing the likelihood of alcohol and cigarette trials compared to the other experimental groups. This finding confirms the literature datathat show that involving adolescents and parents together in the intervention is more successful (Mendez Ogg, Loker & Fefer, 2013). In the remaining studies (Bahramnejad et al., 2020; Chang et al., 2015; Midford et al., 2014), it was observed that the experimental group gave more significant results. It was seen that the interventions had effects on preventing and reducing adolescent substance use, resisting peer pressure, being able to say no, increasing perceived parental involvementin adolescents, significant changes in communication levels with parents about alcohol use, and a statistically significant difference in parents' relationship satisfaction with adolescents.

Although these findings support the previous findings showing that perceived parental support, monitoring test, and control are effective in preventing and reducing adolescent substance use (Currie et al., 2012) although adolescents try to distance themselves from their parents during adolescence (Steinberg, 2001). For this reason, it can be argued that school-based group interventions that involve adolescents and their parents are effective both in reducing and preventing substance use.

The fact that some studies (Chang et al., 2015; Midford et al., 2014) consisted of activities and homework assignments that adolescents would do at home with their parents, that the interventions were not mandatory to be applied at school, and that studies using different channels could also be effective (Haug et al., 2017) support the studies in the literature reporting that the activities using different interventions may be effective. Homework assignments are considered to be a flexible method because they help to perform the intervention from home in situations where it is difficult and costly for parents to come to school.

Effect size provides information about the magnitude of the difference resulting from the intervention (Can, 2022). There are three studies (Bahramnejad et al., 2020; Chang et al., 2015; Midford et al., 2014), for which an effect size was calculated. It is seen that this effect size varies between low and medium level. Moderate effect size shows that the intervention is important in preventing and coping with substance use in adolescents. Because the effect size reveals the power of the experimental process (Field & Hole, 2019). The low effect level indicates that different variables may have been involved in the intervention. Therefore, care should be taken when interpreting the findings.

The risk of bias assessment of the studies included in the review was conducted jointly by two researchers, and the studies were evaluated for randomization of allocation to groups, whether participants and practitioners had knowledge of allocation to groups, blinding of participants and practitioners, treatment administration, identification, attrition and reporting bias. The selection bias of three of the studies included was uncertain (Bahramnejad et al., 2020; Chang et al., 2015; Marsiglia et al., 2019), and the remaining studies (Koning et al., 2013; Midford et al., 2014; Williams et al., 2016) was in the low category. Assigning participants to the intervention by using the random assignment method indicates a low risk of selection bias, which may allow the conclusion reached to be attributed to the intervention applied (Higgins et al., 2011; Munder & Barth, 2018). Three of

the studies included in this research (Bahramnejad et al., 2020; Chang et al., 2015; Marsiglia et al., 2019) were included in the uncertain risk category because the groups were randomly assigned but there was no information on how this assignment was made. It was stated in some of these studies (Koning et al., 2013; Midford et al., 2014; Williams et al., 2016) that they created groups by using the random assignment method on the computer. These studies fall into the category of low selection bias because the methods of dividing participants into groups are unlikely to affect the results (Murder & Barth, 2018). A previous study in the dimension of allocation concealment was included in the high-risk dimension, and one study (Bahramnejad et al., 2020) was included in the low-risk dimension. All the remaining studies were evaluated in the uncertain risk category. The fact that selection bias is mostly ambiguous does not fully show that the results occurredbecause of the intervention.

The risk of blinding participants and practitioners was mostly uncertain (Koning et al., 2013; Marsiglia et al., 2019; Midford et al., 2014) and some were high (Bahramnejad et al., 2020; Chang et al., 2015; Williams et al., 2016). No studies were included in the low-risk category. Blinding of the participants and staff (i.e., the clients and therapists) is a condition used to avoid the influence of expectations and motivations on the intervention and to give the impression that the outcome occurs onlybecause of the intervention. However, applying this condition in psychotherapeutic interventions is difficult because therapists know which intervention they are applying and clients have knowledge about this. For this reason, the implementation of the intervention and the assessment of the effects on outcomes are not clear (Orkibi & Feniger-Schaal, 2019).

All studies were characterized as low risk because treatment content and practitioner qualifications were detailed. Giving detailed content on the proficiency, qualifications, and treatment program of the intervention practitioners indicates that treatment implementation, which is among the dimensions of performance bias, is at low risk (Munder & Barth, 2018). No studies were included in the uncertain and high-risk category. In terms of detection bias, many studies (Bahramnejad et al., 2020; Chang et al., 2015; Koning et al., 2013; Marsiglia et al., 2019; Williams et al., 2016) conducted on the intervention knowledge of the people who evaluated the intervention were included in the uncertain risk category because of the lack of sufficientin formation on the measures taken to decrease the detection bias (Higgins et al., 2011; Munder & Barth, 2018). A previous study (Midford et al., 2014) was included in the low-risk category because it informed that the outcome assessment was performed by a

different expert. Failure to inform or inadequate information about whether those evaluating the outcome of the intervention are independent of the implementers may lead to a bias in the evaluation. Many studies were classified as low risk because they included incomplete outcome data and how it was handled (Koning et al., 2013; Marsiglia et al., 2019; Midford et al., 2014; Williams et al., 2016), and two of them were (Bahramnejad et al., 2020; Chang et al., 2015) are included in the uncertain risk category. Low attrition means that information was provided about whether there were missing outcome data and how these missing data were handled, and ambiguous means that insufficient information was provided about participants who dropped out during the intervention and how missing outcome data were included in the analysis process (Higgins et al., 2011; Munder and Barth, 2018).

One of the studies included in this study (Bahramnejad et al., 2020) was evaluated in the uncertain risk category in terms of reporting bias because the reports on all the results determined before the current experimental procedure were not sufficient. All the other studies were evaluated in the low-risk category for reporting bias. Selective reporting bias refers to situations where results are not reported according to a predetermined study protocol and registry and bring risks in terms of bias (Higgins et al., 2011; Munder & Barth, 2018).

Considering the cross-cultural diversity in substance use interventions, recent studies have shown that the substance use of adolescents of Iranian origin is alarming (Pourramazani, Sharifi, & Iranpour, 2018), and it has been observed that the studies on prevention interventions have reduced the substance use tendencies of adolescents but have no effect on their resilience. In the study of Bahramnejad et al. (2020), it is thought that the majority of adolescents of Afghan origin have been in contact with the substance, so interventions for prevention are considered to be late (Bahramnejad et al., 2020). As a result of the intervention with Latino youth, it was found that the intervention was effective in making adolescents have anti-drug norms (Marsiglia et al., 2019). The fact that the FPNG programme is sensitive to cultural norms may play a role in this effect (Parsai et al., 2011). It is thought that the effect of the less individualistic and collectivist social structure identified with Latino communities is important (Arevalo, So, & McNaughto-Cassill, 2016). The study conducted in Taiwan was effective on adolescents' life skills and perceived parental involvement (Chang et al., 2015). The DEVS programme developed by the Victorian government in Australia was developed specifically to reduce the prevalence of binge

drinking among adolescents in the country. As a result of the intervention, a significant decrease was observed in the binge drinking rates of adolescents (Midford et al., 2014). In line with the finding that adolescent-parent communication is effective in reducing alcohol-related harms (Miller-Day, 2008), it may be important for Australian youth to talk more with their families about alcohol. The resilient families programme implemented in Toumbouro et al. (2013) study is a special programme developed to reduce the drinking frequency of adolescents who consume high amounts of alcohol (Short et al., 2006). The fact that the intervention was a 3-year longitudinal study contributed to the decrease in the amount of alcohol consumption in adolescents (Toumbourou et al., 2013). However, it was not found to be effective on parents' communication levels due to low parental participation (Short et al., 2006). Koning et al. (2013) found that the intervention delayed adolescents' alcohol initiation and reduced alcohol-related harms. Previous interventions were found to help Dutch adolescents to start using alcohol later (Koning et al., 2009). Therefore, it is stated that it is important to delay the age of alcohol initiation until the age of 15 (McGue & Iacono, 2008). In the study of Williams et al. (2016), it was found that the culturally sensitive intervention programme delayed the initiation of smoking and alcohol in adolescents. In this effect, it is thought that parents have an important effect on the welfare of adolescents of Latin origin, especially Mexican origin (Rosa et al., 2010).

In conclusion, there are several reasons why parent and adolescent involvement in school-based group interventions in reducing/preventing substance use was effective in reducing and preventing adolescent substance use. Schools facilitate the formation and development of communities along with the socialization of families and their involvement in interventions to protect young people from risky situations (Dishion & Kavanagh, 2000). Parent education programs that aim to improvethe health of young people are difficult to implement because they are costly and time-consuming (Stormshak, Kaminski & Goodman, 2002). However, school-based interventions involving parents can decrease the initiation of substance useamong adolescents who are at risk, increase their commitment to school, and assist in the placement of family interventions in public schools (Stormshak, Fosco & Dishion, 2010). In other words, parent involvement plays important roles in the success of interventions.

These findings suggest that school-based group interventions involving adolescents and parents are effective in lowering and preventing substance use among adolescents. The findings suggest that parent-based interventions can be generalised in the prevention or reduction of substance abuse. It may be functional to develop policies in this direction in the future. The systematic review of Sandra and Emmanuel (2016) on parent-based interventions and Karki et al. (2012) found similar results in a systematic review of substance use interventions with adolescents. The effect of school-based interventions on improvement in perceived parental involvement, reduction in alcohol consumption, having anti-drug norms, and reduction in drug use tendencies is significant; it shows that there is a strong scientific evidence as it was tested in more than one group. The included studies tested the effectiveness of the interventions in preventing and reducing alcohol, cigarette, opium, nass, cannabis, methamphetamine use in adolescents. In other words, variables show heterogeneity. For this reason, although the target group of the interventions is similar, since the measured variables differ; the effect of the same intervention on different themes may vary. Also, the low performance, attrition, and reporting bias in the studies indicate that our findings are strong. However, the studies included were often not clear in terms of identification, blinding of participants and practitioners, and selection bias, necessitating careful interpretation of the results. In other words, factors other than school-based group interventions including parents (the fact that the interventions are performed by school teachers can create an expectation situation, the feelings towards the school may affect the intervention, knowing the practitioner before, etc.) may have roles in substance use interventions for adolescents. However, considering that most school-based interventions were conducted with large sample groups and it was not always possible to take perform for these risk areas, it did not mean that school-based substance use group interventions that involved parentswere not successful in preventing and coping with adolescent substance use. The absence of effect sizes is another issue that must be considered when interpreting the results of the studies. The p-valuein the studies showed whether there was a difference as a result of the interventions, but did not provide information on the size of this difference. Since effect size helps to comment on the size of the change in the intervention (Can, 2022), it is considered that including studies that examine the effect size of future studies will help increase the power of the experimental process. Implementation of the study results at schools may show the possibility of students in the experimental and control groups to be

aware of each other and influence each other about the content of the intervention, which may cause the conclusion that there is no difference between the measurements of the experimental and control groups. For this reason, future experimental studies with increased performance against bias risks and including effect sizes will provide stronger evidence in showing the effect of group interventions that involve parents in coping with and preventing adolescent substance use. Also, the inadequacy of meta-analysis and systematic literature reviews shows the fact that systematic and consistent findings on the effectiveness of these interventions are increased. However, the present study had some limitations.

The first limitation is the exclusion of articles written in a different language than English, found in databases other than Science Direct, Eric, Scopus and Web of Science, and published before 2012. It is recommended to conduct systematic literature reviews on articles and theses on the results of school-based group interventions involving parents for adolescent substance use in other databases (other than Science Direct, Eric, Scopus and Web of Science) where English language is not used. The second limitation of this study was that it focused on the effectiveness of school-based group interventions that involveparents and adolescents in substance use. The effect of the present study on other problems (conflict resolution, aggression) experienced by adolescents was not examined. For this reason, systematic literature reviews indicating the effectiveness of school-based adolescent and parent-group interventions on these problems are recommended for future studies. The fact that school-based interventions often cover a long period also increases the cost of implementation, which may cause other countries, which are not economically strong, to be unable to benefit from the work in which many schools are involved in the intervention. The fact that almost all of the interventions in this study were conducted in developed countries confirms this. However, the involvement of parents in the intervention through home activities and homework assignments in some studies shows that similar practices can be used in developing countries. The third limitation of this study was the inclusion of studies that involved parents in school-based interventions aimed at reducing/preventing substance use. For this reason, systematic literature searches can be planned in the future to show the effectiveness of school-based interventions, including friends, siblings, or teachers, aimed at reducing/preventing substance use.

School-based interventions that involve adolescents and parents are not limited to substance use. There is evidence that it is effective in a wide range of problems such as problematic behavior, school engagement, self-regulation skills, depressive symptoms, academic achievement, and antisocial behaviors (Stormshak, Fosco & Dishion, 2010). Although there is a large body of systematic literature evaluating school-based interventions (Bo, Hai & Jaccard, 2018; Champion et al., 2013; Cuijpers, 2003; de Kleijen et al., 2015; Karki et al., 2012; Lemstra et al., 2010; MacArthur et al., 2016; Sandra & Emmanuel, 2016; Strom et al., 2014), there is a paucity of studies synthesizing evidence on the effectiveness of studies in which parents and adolescents are involved in the intervention together. The pooling of empirical evidence from the past 10 years of this study provides promising findings that school-based parent- and adolescent-basedgroup interventions are effective in preventing and reducing adolescent substance use. Adolescents and their families are the most affected parties by substance use (Katrancı-Bingöl, 2022), there are few evidence-based options reported in studies (Austin, Macgowan & Wagner, 2005), or that interventions are psycho-based only for students. Considering the limited number of trainingactivities and awareness projects (Erbaş & Kağnıcı, 2017), it is clear that school-based interventions are needed in this respect. For this reason, the findings obtained in this study will provide important information to fill the gap in the literature.

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Due to the scope and method of the study, ethics committee permission was not required.

Author Contribution Statement

***Feride ÇELİK**: Literature review, collecting data, data analysis and discussion*

***Yağmur ULUSOY**: Methodology, reporting, translation, editing.*

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Table 4. Bibliometric Informantion of Retrieved Studies 2

Study	Intervention and control group				Evaluation				Effect size	Results
	Experiment 1	Experiment 2	Experiment 3	Control	Pre-test	Last-test	Monitoring test 1	Monitoring test 2		
Bahramnejad et al. (2020)	11 sessions for 310 student and 5 sessions for their parents	-	-	298 student no transaction	✓	✓	-	-	Tendency to use substances: .15 Resilience: .14 Tendency to use drugs: .57	As a result of the intervention, the substance orientation of the experimental group decreased, but there was no effect on their stability.
Chang et al. (2015)	327 students received a 10-lesson drug program and 4 homework to do with their parents	-	-	314 students in the control group received a curriculum that included health course information	✓	✓	-	-	Information about the medicine: .23 Drug prevention attitude: .11 Life skills: .01 Intentions to use drugs: .04 Parental involvement: .03	The intervention helped adolescents to develop stable attitudes towards drug use and increased perceived parental support.

Table 4 (continued)

Study	Intervention and control group				Evaluation				Effect size	Results
	Experiment 1	Experiment 2	Experiment 3	Control	Pre-test	Last-test	Monitoring test 1	Monitoring test 2		
Koning et al. (2013)	Student intervention: 942 students recieved a 4-session training on developing healthy attitudes against alcohol use.	Parent (n=801) intervention: It is a 3-session program consisting of an explanation of the limits that parents can draw against alcohol use by adolescents.	812 students and parents received both interventions in Experiment 1 and Experiment 2	No treatment for the control group (n= 935).	✓	✓	-	-	-	It was found that the Experiment 3 group reduced the rate and frequency of alcohol consumption during vacations.
Marsiglia et al. (2019)	Youth (n=188) receive kiR (10 week) and parents receive FPNG (8 week)	Parents (n=160) were given the FPNG program and adolescents were given the school's	Education for parents (n=184) on the importance of collaborating with the school and adolescents were given the	-	✓	✓	✓	✓	-	When comparing the experiment groups, the Experiment 1 group is most effective in having adolescents anti-drug norms.

Note: kiR (keepin' it REAL): is a substance use prevention program for adolescents. FPNG (Families Preparing the New Generation) It is a program consisting of 8 lessons for parents developed to increase the effectiveness of the kiR program.

Table 4 (continued)

Study	Intervention and control group				Evaluation				Effect size	Results
	Experiment 1	Experiment 2	Experiment 3	Control	Pre-test	Last-test	Monitoring test 1	Monitoring test 2		
Midford et al. (2014)	1161 students in 14 schools were given the DEVS program and home aktivities to do at home with their parents.	-	-	Control group adolescents (n=585) received the substance use program given by the school	✓	✓	-	-	Risky drinking consumption : .33 The harms of alcohol : .01 Alcohol consumption :.11	There was a significant difference in parent-adolescent communication in the experimental group. Alcohol consumption increased less; and alcohol-related harms are reduced.
Toumbou rou et al. (2013)	Experimental group (n=2416) students and their parents received the Resilient Families program	-	-	No treatment for the control group (n=1988)	✓	✓	✓	-	-	As a result of the intervention, the frequency of alcohol use among adolescents decreased and parents set stricter rules to discourage adolescents from drinking alcohol.

Note: DEVS (Drug Educations in Victorial Schools), is a substance abuse program consisting of 18 lessons given to adolescents. Resilient Families; it is a 5-compenent program consisting of parent and adolescent content.

Table 4 (continued)

Study	Intervention and control group				Evaluation				Effect size	Results
	Experiment 1	Experiment 2	Experiment 3	Control	Pre-test	Last-test	Monitoring test 1	Monitoring test 2		
Williams et al. (2016)	Youth (n=268) receive kiR (10 week) and their parents receive FPNG (8 week)	Only the students (n=321) received kiR program.	-	No treatment for the control group (275).	✓	✓	✓	-	-	There was no significant difference between the experiment groups and the control group in terms of pre test-last test meaurements. According to monitoring test, between Experiement 1 and Experiement 2, Experiement 1group was found to be less likely to try alcohol and cigarettes.