ผลของโปรแกรมสหปัจจัยต่อการลดพฤติกรรมการดื่มเครื่องดื่มแอลกอฮอล์ในวัยรุ่น
: การทบทวนวรรณกรรมอย่างเป็นระบบ
Effect of Multicomponent Interventions on Reducing
Alcohol Drinking Behavior Among Adolescents: A Systematic Review

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บทคัดย่อ

    การทบทวนวรรณกรรมอย่างเป็นระบบนี้ มีวัตถุประสงค์เพื่อศึกษาถึงผลของการใช้โปรแกรมสหปัจจัยเพื่อการลดพฤติกรรมการดื่มเครื่องดื่มแอลกอฮอล์ในวัยรุ่น อายุ 10-19 ปี การศึกษาครั้งนี้ได้สืบค้นงานวิจัย จากวารสารที่มีผู้เชี่ยวชาญตรวจสอบคุณภาพ ซึ่งตีพิมพ์เป็นภาษาอังกฤษในระหว่าง พ.ศ. 2553-2562 จากฐานข้อมูลอิเล็กทรอนิกส์ ได้แก่ CINAHL, PubMed, PsyInfo, และ Cochrane พบบทความวิจัย 19 ฉบับที่มีคุณภาพตามเกณฑ์การคัดเลือกที่กำหนด ซึ่งนำมาใช้สังเคราะห์องค์ความรู้ในการศึกษาครั้งนี้ ผลการวิจัยว่า

    โปรแกรมสหปัจจัยที่มีการดำเนินการในระดับโรงเรียน โดยใช้รูปแบบการให้ความรู้และการฝึกทักษะทางสังคมอย่างหลากหลาย ร่วมกับการเปิดโอกาสให้ผู้ปกครองเข้ามามีส่วนร่วมในโปรแกรมเป็นโปรแกรมที่มีประสิทธิภาพในการชะลอเวลาในการเริ่มดื่ม และลดพฤติกรรมการดื่มแอลกอฮอล์ของวัยรุ่นในระยะยาว ในขณะที่โปรแกรมสหปัจจัยที่มีดำเนินการป้องกันในหลายระดับทั้งในระดับโรงเรียน ครอบครัว และชุมชน ก็ถือเป็นเป็นอีกกลยุทธ์ที่มีประสิทธิภาพในการลดพฤติกรรมการดื่มของวัยรุ่นด้วยเช่นกัน

    ควรนำไปประยุกต์ใช้เป็นแนวทางในการพัฒนาโปรแกรมสหปัจจัยในการชะลอระยะเวลาในการเริ่มดื่มแอลกอฮอล์ และลดพฤติกรรมการดื่มแอลกอฮอล์ในกลุ่มวัยรุ่น ให้มีองค์ประกอบของโปรแกรมที่เหมาะสมและสอดคล้องกับความต้องการของวัยรุ่น ตลอดจนเปิดโอกาสให้ผู้ปกครองเข้ามามีส่วนร่วมในโปรแกรม อย่างไรก็ตามการออกแบบโปรแกรมสหปัจจัยเพื่อการป้องกันหรือลดพฤติกรรมการดื่มเครื่องดื่มแอลกอฮอล์ในวัยรุ่น ควรคำนึงถึงความเหมาะสมของโปรแกรมตามบริบทของชุมชนเป็นสำคัญ

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116

Abstract

This systematic review aims to examines the effect of multicomponent intervention on reducing alcohol drinking behaviors among adolescents age 10-19 years. Literature searching in CINAHL, PubMed, PsyInfo, and Cochrane Libraly was conducted to collect peer-reviewed articles published in English between 2010 and 2019. Nineteen articles met the inclusion criteria and were retained for evidence synthesis.

The main finding of this review found that school-based education in multiple life skills training with parental involvement were effective in delaying the onset of drinking and reducing adolescents' alcohol consumption in long-term. While most multicomponent interventions implementing in multi-level (i.e., school, family, and community) also provided the benefits on decreasing adolescents' alcohol consumption as well.

Therefore, the results of this study could be applied as a guideline in order to develop a multicomponent intervention for delaying drinking's onset and reducing drinking behavior among adolescent population. Intervention components for further studies should be designed based on adolescents needed. Moreover, parental involvement and culture appropriateness should be considered when designing a multicomponent alcohol prevention programs for adolescents.

Keywords: Multicomponent, Adolescent, Alcohol, Drinking Behavior

Introduction

The rising trends of underage drinking has become a serious public health issue worldwide including Thailand. Thailand ranked the third in early adolescent alcohol consumption compared to other Asian countries (World Health Organization [WHO], 2018). A Thai National survey reported more than half (54.8 %) of grade 7 - 12 students had taken their first alcohol at least once in their lifetime (Thailand Country Office, WHO, 2017). The impact of adolescents' drinking is a lot more severe as compared to adult drinking. In fact, underage drinking often results in unintentional injuries and death, suicide, aggression and victimization, risky sexual behaviors, and other social ailments (Center for Disease Control and Prevention [CDC], 2018; Kumsuk, 2020). Moreover, prolong and consistent alcohol usage during adolescence could affect functional and structural changes in the brain (Müller-Oehring, Kwon, Nagel, Sullivan, Chu, Rohlfing, et al., 2018). The National Institute on Alcohol Abuse and Alcoholism (2017) indicated that adolescents who start to drink alcohol before the age of 15 are four times more likely to become alcoholism in adulthood. Therefore, adolescence is a crucial period to intervene and interrupt trajectory towards long-term adverse health outcomes.

Multicomponent intervention appeared as a potential strategy to combat with a wide range of health risk behaviors among adolescents including alcohol and other substance use prevention (Filho, Bandeira, Minatto, Linard, da Silva, da Costa et al., 2019). Multicomponent interventions have begun to gain widespread popularity in the prevention of underage drinking. Multicomponent alcohol prevention interventions are the programs that include different approaches to delay the onset of alcohol initiation and/or reduce problematic drinking among adolescents (Chung, Creswell, Bachrach, Clark, & Martin, 2018; Foxcroft & Tsertsvadze, 2012).

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117

The programs with a parenting intervention were typically combine with classroom curricular. These programs were usually delivered in the school settings to whole populations at risk of alcohol drinking based on primary prevention approach.

Previous existing evidences claimed that school-based multicomponent interventions are more effective in decreasing adolescents' drinking behavior in terms of long-term effects than single component interventions focusing on education component alone (Das, Salam, Arshad, Finkelstein, & Bhutta, 2016). In addition, high intensively multicomponent intervention was the most successful for increasing knowledge regarding alcohol drinking and reducing hazardous drinking among adolescents (Thadani, Huchting, & LaBrie, 2009). Despite the importance of multi-component interventions, their effectiveness and details of interventions are remained unclear. Therefore, the purpose of this systematic review is to evaluate the evidence related to the effects of multicomponent interventions on reducing alcohol consumption among 10- to 19-year-old adolescents. This enhanced understanding about the effects of multicomponent intervention on adolescents' drinking behavior. Findings from this review would benefit for healthcare professionals to develop effective multicomponent interventions to postpone alcohol drinking initiation and/or to reduce alcohol consumption frequency among adolescents in the future.

Objectives

The purpose of this systematic review is to evaluate the evidence related to the effects of multicomponent interventions on reducing adolescents' alcohol drinking behavior.

Methods

Search Strategy

Articles were electrically searched from CINAHL, PubMed, PsyInfo, and Cochrane and restricted to peer-review articles published in English from 2010-2020. This time period was chosen to ensure that the literature being reviewed was contemporary and to avoid repeating findings from a study conducted in 2010 that already provided valuable information on the effectiveness of universal alcohol prevention programs in reducing alcohol drinking behavior among children and adolescents (Foxcroft & Tsertsvadze, 2012). Moreover, studies occurring before 2010 may not reflect current practices. The PICOT framework was used to identify the search terms in a way that addressed the purpose of this study

Study Eligibility Criteria

A two-stage process was used to select the studies for appraisal in this review. First, we independently screened the titles and abstracts identified from searching strategy based on the inclusion and exclusion criteria. Eligible studies were those that 1) primarily targeted adolescents age 10-19 years at baseline (Population); 2) published in the English language; 3) tested educational or psychosocial prevention interventions that focused on reducing the onset of alcohol initiation and/or reducing drinking behavior (Intervention); 4) compared the outcomes of the intervention group to those of the control group (Comparison); 5) measured adolescents' drinking behavior (Outcomes); and 6) were randomized controlled trials (RCTs) or quasi-experimental design with comparison group (Type of study). The studies were excluded from

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118

this review if they: 1) were opinion papers, reviews or meta-analyses, protocols, or policy reports; 2) secondary analyses; and 3) included an entire sample of people who had any level of alcohol addiction, and/or any alcohol-related psychiatric problems.

Study Selection

The study selection process was performed independently by the first and second authors. After screening all abstracts based on the inclusion and exclusion criteria and removing duplicates and articles that were clearly irrelevant based on the abstract screening, the remaining full text articles were retrieved and assessed for eligibility. In addition, the first author also hand-searched the reference lists of these full-text articles for any relevant reviews and original studies. We then resolved screening conflicts by consensus. The full search strategy is reported in a PRISMA flow chart (Figure 1).

Data Extraction

The first author extracted information on each study's characteristics based on The Consolidated Standards of Reporting Trials (CONSORT) checklist. Specifically, a data extraction table was used to collect information on author(s)/year of publication/country, study population, intervention objectives, outcomes measurement, design, intervention's components, duration/length of follow-up, and key findings. The second author independently verified the extracted data. Discrepancies were discussed until consensus was reached.

Quality Appraisal

The recommendations from the Cochrane Handbook for Systematic Review of Intervention (Higgins et al., 2019) were used to formulate criteria for evaluating risk of bias, which include the following indicators: 1) selection; 2) performance; 3) detection; 4) attrition; and (5) reporting biases. Risk of bias of the studies included were reported in three categories, which were low risk, high risk, and unclear. We independently appraised each potential study; mutual agreement was solved by discussion.
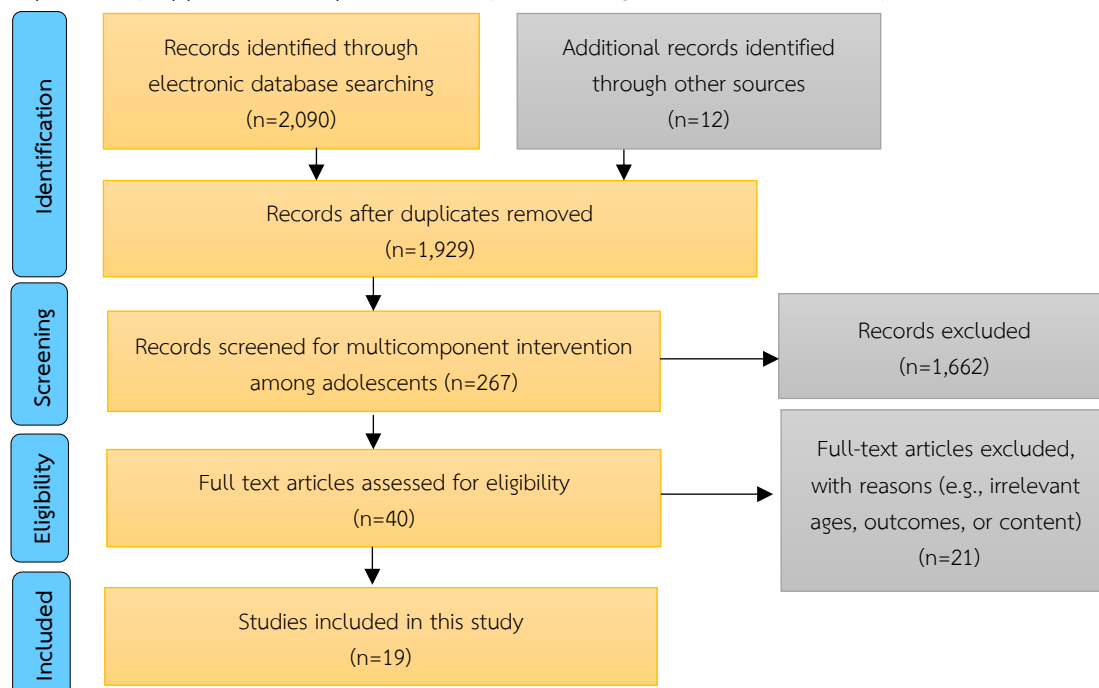

Figure 1 PRISMA Flow chart of article selection

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119

Results

Study Characteristics

A total of 2,102 studies were identified based on our initial electronic database search. After title and abstract screening, 40 studies were identified as potentially meeting inclusion and exclusion criteria. Full text articles were obtained and reviewed for eligibility by the first and second author. Finally, 19 articles met the eligibility criteria and were included in this systematic review (Figure 1). Of those nineteen studies, 11 studies were conducted in the U.S. (57.9%); two occurred in the Netherlands; one study was conducted in each of the following countries: Australia, Germany, Norway, Poland, Sweden, and Scotland. Thirteen studies (68.4%) were cluster RCTs; four studies used a RCT design (21.1%); and two studies were a quasi-experimental with comparison group design (10.5%).

Quality Assessment of the Article

More than half of the included studies (n=11; 57.9%) had a low risk of selection bias with all reporting randomization to each condition. Nine studies (47.3%) provided sufficient detail to assure that they allocated participants to experimental and control groups with concealment. Due to the nature of the interventions tested, 18 studies were rated as high-risk of performance bias, while all studies were rated as high-risk of detection bias because all of them were self-reported measurements. Only one study was rated as low-risk of performance bias because intervention was delivered to adolescent-parent dyads through online modules. Eight studies failed to report the attrition rate to allow assessment of the risk of bias for incomplete outcome data; seven studies were rated as low risk because they reported <20% loss of participants and indicated no differential attrition between group or condition. Lastly, all studies had low risk of reporting bias because pre-specified outcomes were reported.

Participants and Settings

The sample sizes of the 19 studies ranged from 188 to 11,960, and the intervention settings were classified as school-based, home-based, and community-based. Eight studies (42.1%) included school-based interventions; six (31.6%) were community-based; three (15.8%) were conducted in both school and community settings; and two (10.5%) were home-based with the intervention being delivered to adolescents and parents through computerized programs. The research participants' mean age at baseline in the included studies ranged from 10.8 to 17.9 years. The proportion of male participants ranged from 44.7% to 63.4%.

Intervention Duration and Delivery

The duration of the multicomponent interventions varied across studies. Thirteen effective interventions integrated adolescent and parent components and ranged from three weeks (Byrnes, Miller, Grube, Bourdeau, Buller, Wang-Schweig et al., 2019) to five academic years (Hawkins, Oesterle, Brown, Abbott, & Catalano, 2014). Only two of these 13 studies had booster sessions with one having five annual boosters (Schinke, Schwinn, & Fang, 2010), and the other including one booster session after 6 months post- intervention (Koning, Maric, MacKinnon, & Vollebergh, 2015). More than half of the interventions (n=7) were implemented between 3 and 10 weeks in duration. The number of sessions ranged from seven (Brody, Chen, Kogan, Murry, & Brown, 2010) to 20 (Strom, Adolfsen, Handegard, Natvig, Eisemann, Martinussen et al., 2015). The

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120

intervention time period ranged from 20 (Byrnes, Miller, Grube, Bourdeau, Buller, Wang-Schweig et al., 2019; Koning, Maric, MacKinnon, & Vollebergh, 2015) to 60 minutes (Brody, Chen, Kogan, Murry, & Brown, 2010; Marsiglia, Ayers, Baldwin-White, Booth, Marsiglia, & Ayers, 2016) with three interventions having sessions longer than 60 minutes in length (Gonzales, Jensen, Tein, Wong, Dumka, & Mauricio, 2018; Riesch, Brown, Anderson, Wang, Canty-Mitchell, & Johnson, 2012; Toumbourou, Douglas, Shortt, Hutchinson, & Slaviero, 2013). The majority of interventions were delivered one day a week, with three studies offering the intervention one day a month. Two studies did not clearly report the intervention frequency but indicated that it was delivered more than four times throughout one academic year (Table 1). Among four effective large-scale alcohol prevention programs, these interventions took place in community settings. The duration ranged from one to five years. The number of sessions/activities and intervention frequency were not exactly reported due to the heterogeneous setting and communities' needs.

Key Component of Successful Intervention

Eight successful educational intervention which targeted both adolescents and parents (Brody, Chen, Kogan, Murry, & Brown, 2010; Byrnes, Miller, Grube, Bourdeau, Buller, Wang-Schweig et al., 2019; Gonzales, Jensen, Tein, Wong, Dumka, & Mauricio, 2018; Koning, Maric, MacKinnon, & Vollebergh, 2015; Marsiglia, Ayers, Baldwin-White, Booth, Marsiglia, & Ayers, 2016; McKay et al., 2018; Schinke, Schwinn, & Fang, 2010; Toumbourou, Douglas, Shortt, Hutchinson, & Slaviero, 2013). All these parental involvement studies were face-to-face parent sessions delivered through interactive workshops, lecturing, skills training, role play, group discussion, or homework assignment. These studies reported a significant reduction of adolescents' alcohol drinking behavior in both short- and long-term follow-up. The majority of them focused on improving adolescents' knowledge and awareness regarding negative consequence of underage drinking; changing drinking attitude, enhancing self-esteem, increasing peer resistance; as well as the developing life skills such as problem solving, decision-making, communication, and/or refusal skill. Simultaneously, other features of the interventions focused on family rules, parental support, parent-child communication, conflict reduction, parental supervision, and/or parental monitoring.

Four of nineteen studies were the large scale environmentally focused interventions, which implemented in individual, family, schools, and community levels (Flewelling, Grube, Paschall, Biglan, Kraft, Black et al., 2013; Hawkins, Oesterle, Brown, Abbott, & Catalano, 2014; Jansen, Haveman-Nies, Bos-Oude, Izeboud, de Rover, & Veer, 2016; Komro, Livingston, Wagenaar, Kominsky, Pettigrew, & Garrett, 2017). These studies involved stakeholders in the communities to develop projects and implement interventions; they targeted environmental levels by foster anti-underage drinking norm and enforced local policy. Findings show a significant long-term effect on delaying onset of drinking, decreasing past month drinking behavior and binge drinking amongst intervention group.

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121

Table 1 Study characteristics and key finding (N=19)

Author (year)/ Country	Participant	Design/Intervention	Outcomes Measurement	Key Finding
Baldus et al (2016) Germany	N: I=153, C=149 Age: 10-14 M=59%	RCT I: A&P training C: No S: 7, 4 boosters. D: 50-60 mins	- Past 30 days alcohol use - % of new alcohol users - Lifetime alcohol use	- NS of past 30 days alcohol use and % of new user - ↓lifetime alcohol uses prevalence; NS
Brody et al (2010) USA	N: I=369, C=298 Mean age=10.8 M= NR	Cluster RCT I: A&P training, family practice C: Information flyers S: 7; D: 45-60 mins	- Past month drinking - Past month binge drinking - Alcohol Composite Index	- ↓past month drinking I>C - ↓Alcohol initiation rate I>C ($p< .05$) - ↓ binge drinking I>C ($p< .05$)
Byrnes et al (2019) USA	N: I=205, C=206 Mean age=16.4 M=44.7%	RCT I: Interactive online A&P C: No S: 6; D: 15-20 mins	- Past 30 days, 6 months alcohol use (frequency, quantity, drunkenness, and binge drinking)	- ↓33% past 30days drinking (p < .001) - ↓ rate of binge drinking and drunkenness I>C ($p<.05$) at 1-year f/u
Foxcroft et al (2016) Poland	N: I=247, C=367 Mean age=12.1 M=63.4%	Cluster RCT I: A&P training, family practice C: Information S: 7; D: 20 mins	- Past year drinking and drink without permission	- NS
Gonzales et al (2018) US	N: I=338, C=178 Mean age=17.9 M=48.8%	RCT I: A&P training, coping training, workshops C: meeting, information S: 9; D: 90 mins	- Past year frequency of alcohol use - Binge drinking and drunkenness	- ↓frequency drinking ($p< 0.05$; d=0.43) and drunkenness ($p<0.05$; d=0.41) - NS For binge drinking
Koning et al (2015) USA	N: I=874, C=883 Mean age=12.7 M=51%	Cluster RCT I: A&P training, group meeting, workshops C: No S: 12; D: 20 mins	- Drinking behavior - Drinking self-control	- ↓weekly drinking I>C ($p<.001$) - NS in drinking self-control

Table 1 (Continue)

Author (year)/ Country	Participant	Design/Intervention	Outcomes Measurement	Key Finding
Malmberg et al (2014) Netherland	N: I=1,195, C=1,259 Mean age=13.01 M=49.4%	RCT I: Online A&P training, online discussion C: No S=9; D=30 mins	- New incidences of alcohol (lifetime and 1-month prevalence)	- NS
Marsiglia et al (2016) USA	N: I=117, C=148 Age=11-13 years M=51.1%	Cluster RCT I: A&P training, workshops, group discussion C: No S=8; D=60 mins	- Alcohol use (amount and frequency) - Anti-drugs norms	- ↓alcohol use at 18 months f/u (I>C) - ↑anti-drug norms (I>C)
McKay et al (2018) Ireland and Scotland	N: I=5.749, C=5,567 Age=11-12 M=51%	Cluster RCT I: A&P training, parental rule training, school curriculum C: No S=10; D=40 mins	- Heavy episodic drinking (HED) - Alcohol-related harms (ARHs)	- ↓HED (I:17% vs C:26%; OR=0.60, 95% CI 0.49 - 0.73) - NS in ARHs
Riesch et al (2012) USA	N: I=150, C=83 Mean age=10.8 M=51%	Cluster RCT I: A&P training, Video tape, workshop, group discussion C: No S=7; D=2 hours	- Alcohol consumption rate without parents' permission	- NS
Schinke et al (2010) USA	N: I=162, C=163 Mean age=10.68 M=59%	RCT I: A&P interactive training, discussion, booklet C: No S=10; D=2 hours	- Past 30 days drinking, binge drinking - Alcohol refusal skills - Drinking Intentions	- ↓ past 30-days drinking, binge drinking, drinking intention ($p < .05$) - ↑refusal skills ($p < .05$)
Skarstrand et al (2013) Sweden	N: I=216, C=371 Mean age=12 M=50.9%	Cluster RCT I: A&P training, parent workshop, class discussion C: No S=10; D=40 mins	- Past month drinking - Past month binge drinking	- NS

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123

Table 1 (Continue)

Author (year)/ Country	Participant	Design/Intervention	Outcomes Measurement	Key Finding
Spoth et al (2011) US	N: I=6,059, C=5,901 Age=10-14 years M=NR	Cluster RCT I: school curriculum, parent training, parental support C: No S=15; D=40-50 mins	- Initiation rate (new user) - Past month drinking, drunkenness	- ↓ rate of new users, ↓drunkenness ($p<0.05$) - NS for past month alcohol use.
Strom et al (2015) Norway	N: I=1,007, C=567 Mean age=13.46 M=49.4%	Quasi-experimental I: school curriculum, school workshop, parent training, assignments C: No S=20; D=60 mins	- Monthly alcohol use - alcohol attitudes - Perceived behavioral control (PBC) - alcohol expectancy	- ↑Alcohol-related knowledge ($p< .005$) - NS in frequency of monthly alcohol use, alcohol attitudes, PBC or alcohol expectancy
Toumbourou et al (2013) Australia	N: I=1,218, C=1,110 Mean age=12.3 M=NR	Cluster RCT I: school curriculum, parent training, parent handbook C: No S=10; D= 1 hour	- Alcohol initiation - Alcohol drinking frequency - Heavy drinking	- ↓lifetime use (*OR*, 0.78; 95% CI, 0.62-0.97) - ↓heavy drinking (*OR*, 0.75; CI, 0.60-0.94)
Flewelling et al (2013) USA	N: I=7,229, C=7,108 Mean age=NR Age: 13-16 M=49%	Cluster RCT I: A&P training, community projects, law enforcement C: No D: 3 years	- Past month drinking - Past month binge drinking	- NS - ↓ rate of underage alcohol selling
Hawkins et al (2014) USA	N: I=2,410, C=2,010 Age=10-13 years M=sex balance	Cluster RCT I: Community projects, education, law enforcement C: Information D: 5 years	- Prevalence of alcohol use	- ↑ alcohol abstained rate (RR = 1.31; 95% CI, 1.09-1.58; $p<0.05$) - NS of past month alcohol use

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The Southern College Network Journal of Nursing and Public Health. **2020; 7(3), 115-129** Vol.7 No.3 September-December 2020
https://www.tci-thaijo.org/index.php/scnet/index

วารสารเครือข่ายวิทยาลัยพยาบาลและการสาธารณสุขภาคใต้
The Southern College Network Journal of Nursing and Public Health
ISSN 2408-1051 (Print), ISSN 2651-2270 (Online)

124

Table 1 (Continue)

Author (year)/ Country	Participant	Design/Intervention	Outcomes Measurement	Key Finding
Jansen et al (2016) Netherland	N: I=5,881, C=3,122 Mean age=14.4 M=49%	Quasi-experimental I: A&P training, community projects, law enforcement C: No D: 5 years	- Current alcohol use, and binge drinking	- ↓ 11% alcohol use ($P < 0.01$) in I group - ↓ 6% binge drinking ($P < 0.01$) in I group
Komro et al (2017) USA	N: I=224, C=588 Mean age=14.9 M=50.5%	Cluster RCT I: A&P training, community workshop, posters, law enforcement; C: No D:1 year	- Past month alcohol use - Past month heavy drinking	- ↓ 25% past month alcohol use - ↓ 24% heavy drinking over 2.5-year period - ($p<0.05$)

N = Number, I = Intervention group, C = Control group, M = Male, S = Sessions, D = Duration, ↓ = Decrease,
↑ = Increase, NS = No significant

Effect on Adolescent Alcohol Consumption

Twelve (63.15%) of 19 trials indicated statistically significant decreases in alcohol drinking behavior (e.g., weekly drinking, past month alcohol use, drinking frequency, binge drinking, heavy drinking, past month drunkenness) among adolescents participating in the interventions, compared to those in control conditions (e.g., no intervention, informational e-mail, educational booklets, parent postcards). Three studies also reported statistically significant improvements in other areas, including alcohol-related knowledge (Strom, Adolfsen, Handegard, Natvig, Eisemann, Martinussen et al., 2015), alcohol-refusal skills (Schinke, Schwinn, & Fang, 2010), anti-drinking norms (Marsiglia, Ayers, Baldwin-White, Booth, Marsiglia, & Ayers, 2016), and future drinking intention (Schinke, Schwinn, & Fang, 2010). Ten studies found a significant long-term effect (≥1 year) of the intervention on reducing adolescents' drinking behavior (Brody, Chen, Kogan, Murry, & Brown, 2010; Byrnes, Miller, Grube, Bourdeau, Buller, Wang-Schweig et al., 2019; Gonzales, Jensen, Tein, Wong, Dumka, & Mauricio, 2018; Hawkins, Oesterle, Brown, Abbott, & Catalano, 2014; Jansen, Haveman-Nies, Bos-Oude, Izeboud, de Rover, & Veer, 2016; Komro, Livingston, Wagenaar, Kominsky, Pettigrew, & Garrett, 2017; Marsiglia et al., 2016; McKay et al., 2018; Schinke, Schwinn, & Fang, 2010; Toumbourou, Douglas, Shortt, Hutchinson, & Slaviero, 2013), two studies (Byrnes, Miller, Grube, Bourdeau, Buller, Wang-Schweig et al., 2019; Komro, Livingston, Wagenaar, Kominsky, Pettigrew, & Garrett, 2017) found intermediate effect (≥ 6 months), and only one (Brody, Chen, Kogan, Murry, & Brown, 2010) found short-term effect (≤ 3 months).

Discussion

This systematic review summarized nineteen recently published articles of the effect of multicomponent interventions on reducing adolescents' drinking behavior. Overall, 12 out of 19 studies reported statistically significant effects of multicomponent alcohol prevention interventions across a broad-range of alcohol-related outcome measures. Based on our review, we found that interventions should be delivered on weekly basis, at least 6 consecutive weeks would therefore sufficient to change adolescents' belief regrading drinking and actual drinking behavior as well (Brody, Chen, Kogan, Murry, & Brown, 2010; Byrnes, Miller, Grube, Bourdeau, Buller, Wang-Schweig et al., 2019). Importantly, the components of the intervention is also an essential factor to consider when designing an alcohol prevention program for adolescents. Adolescent representatives should be involved in the development process of the program in order to develop the intervention that their needed, which will increase the effectiveness of the program (Jansen, Haveman-Nies, Bos-Oude, Izeboud, de Rover, & Veer, 2016; Komro, Livingston, Wagenaar, Kominsky, Pettigrew, & Garrett, 2017).

School-based multicomponent intervention with high-intensity face-to-face sessions which includes education, and refusal skills and multiple life skills training, with booster sessions appear to hold the most promise of long-term effect on postponing onset of drinking and reducing adolescents' drinking behavior (Brody, Chen, Kogan, Murry, & Brown, 2010; Spoth, Redmond, Clair, Shin, Greenberg, & Feinberg, 2011) when compared to those with no follow-up sessions. The Interventions that has the duration of study from four weeks onwards were more likely to be effective in reducing adolescents' drinking behaviors when comparing to those that less than a 4-week. . Furthermore, the finding supports the effectiveness of certain multicomponent interventions with parental involvement for the prevention of alcohol misuse amongst adolescents. In conclusion, we found that the effects of parental involvement interventions are small but generally consistent and also persistent into the medium to longer term especially among secondary school student population. These finding are consistent with prior study from Foxcroft, & Tsertsvadze (2012) which suggested that the combination of adolescent and parental training is more effective than those interventions which targeted adolescent alone. Nevertheless, the findings of this systematic review do have limitation due to some of the methodological issues. The first limitation was majority of the studies (n=11) included in this study were published in English language and were conducted in the United State. Secondly, the study sample sizes does varied, therefore it could be said that the generalization of this findings is limited.

The combination of school-based educational program and large-scale alcohol prevention intervention which targeted family and community levels also hold a promise for reducing quantity and frequency of drinking amongst intervention group versus control condition (Hawkins, Oesterle, Brown, Abbott, & Catalano, 2014 [$p<.05$]; Jansen, Haveman-Nies, Bos-Oude, Izeboud, de Rover, & Veer, 2016 [$p<.01$]; Komro, Livingston, Wagenaar, Kominsky, Pettigrew, & Garrett, 2017 [$p<.05$]. However, one multi-level intervention (Flewelling, Grube, Paschall, Biglan, Kraft, Black et al., 2013), which focused only strengthen community's law enforcement demonstrated no effect on reducing adolescents' binge drinking, even the selling rates of alcohol

วารสารฯผ่านการรับรองคุณภาพของ TCI และอยู่ในฐานข้อมูล TCI กลุ่มที่ 1   ปีที่ 7 ฉบับที่ 3 กันยายน-ธันวาคม 2563

The Southern College Network Journal of Nursing and Public Health. **2020; 7(3), 115-129** Vol.7 No.3 September-December 2020

https://www.tci-thaijo.org/index.php/scnet/index

วารสารเครือข่ายวิทยาลัยพยาบาลและการสาธารณสุขภาคใต้
The Southern College Network Journal of Nursing and Public Health
ISSN 2408-1051 (Print), ISSN 2651-2270 (Online)

126

for underage drinkers were significantly increased ($p<.05$). This may reflect the idea that implementation of underage drinking law enforcement alone may not an appropriate component for adolescent alcohol prevention intervention. However, better understanding about content and delivery context of effective multi-level interventions are needed.

Implication of the Results

1. Nursing and public health educators can utilize the finding from this review to educate nursing and public health students to develop the suitable strategies for prevention alcohol drinking and other substances use aiming to promote adolescent healthy behaviors.

2. Healthcare professionals should integrate alcohol prevention program as a part of school curriculum with parental involvement component and collaborate with community partners to implement the community projects to promote anti-underage drinking norms.

Recommendation for Future Study

Further studies of multicomponent intervention to deduce drinking behavior among adolescent population with proper research methodology are still needed to improve on the methodological rigor of the existing studies. Also, involving stakeholders in the community to implement multi-level (school, family, and community) alcohol drinking prevention would support the successful of the program. Furthermore, cultural appropriateness and parental involvement should not be neglected when design the intervention for adolescent.

Acknowledgement

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The Southern College Network Journal of Nursing and Public Health. **2020; 7(3), 115-129** *Vol.7 No.3 September-December 2020*

https://www.tci-thaijo.org/index.php/scnet/index

วารสารเครือข่ายวิทยาลัยพยาบาลและการสาธารณสุขภาคใต้
The Southern College Network Journal of Nursing and Public Health
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The Southern College Network Journal of Nursing and Public Health
ISSN 2408-1051 (Print), ISSN 2651-2270 (Online)

129

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*The Southern College Network Journal of Nursing and Public Health. **2020; 7(3), 115-129** Vol.7 No.3 September-December 2020*

https://www.tci-thaijo.org/index.php/scnet/index