

Moon et al., 2016

Volume 2 Issue 1, pp. 555-576

Date of Publication: 13th December, 2016

DOI- <https://dx.doi.org/10.20319/pijss.2016.s21.555576>

This paper can be cited as: Moon, S. S., Kim, Y. J., Jang, S. M., Yoon, S., & Kim, J., (2016). Preventing Substance Abuse among Adolescents: Evaluation of an Integrated Model Combining Life Skills Training and Parent Training. *PEOPLE: International Journal of Social Sciences*, 2(1), 555-576.

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PREVENTING SUBSTANCE ABUSE AMONG ADOLESCENTS: EVALUATION OF AN INTEGRATED MODEL COMBINING LIFE SKILLS TRAINING AND PARENT TRAINING

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Abstract

This study examines the effectiveness of an integrated model combining Life Skills Training (LST) for students and Love and Logic Training (LLT) for parents. 310 middle school students and 49 parents were participated in the study. A paired sample t-test was computed to compare pre and post-test scores for each participant. An independent sample t-test was used to determine if statistical differences exist between the treatment and control groups. Alcohol use and resistance to alcohol use among both treatment and control groups were significantly changed after the intervention in a positive way. No significant change in substance use was found in both groups. When it comes to comparison between treatment and control groups, a significant difference was found only in resistance to alcohol use, meaning participants in treatment group showed significantly higher level of resistance to alcohol use than control group after the intervention. Implications of these results for practice and training were discussed.

Keywords

Life Skills Training, Love and Logic, Substance Abuse, Prevention, Adolescent

1. Introduction

Adolescent substance use continues to be a significant public health concern. Nationwide, epidemiological statistics from the Center for Disease Control (CDC, 2010) suggest that youth continue to exhibit an alarmingly high prevalence of substance use behaviors. According to the 2013 Youth Risk Behavior Surveillance Survey in United States, 41.1% of high school students have tried cigarette smoking at some point; 22.4% of students reported current cigarette use, current smokeless tobacco use, or current cigar use; 66.2% of students have drunk alcohol at some point; 34.9% reported current alcohol use; 40.7% of students have used marijuana at some point; 23.4% of students reported current marijuana use; 5.5% of students had used cocaine at some point; 8.9% have used inhalants at some point; 6.6% have used ecstasy at some point; 2.2% of students have used heroin at some point; and 3.2% of students have used methamphetamines at some point (CDC, 2014).

Substance use behaviors are linked to several negative outcomes, including criminal involvement (Boyd, Fast, & Small, 2016; Collette, Pakzad, & Bergheul, 2015), lowered school achievement (Arthur et al., 2015), unintended pregnancy (Connery, Albright, & Rodolico, 2014), and HIV (U.S. Department of Health and Human Services, 2010), which are the leading causes of youth morbidity and mortality.

There is growing recognition and evidence that parenting and family interventions may play a critical role in reducing substance use among adolescents (Kuntsche & Kuntsche, 2016; Marsiglia et al., 2016; Pantin et al., 2009). Adolescents may benefit from a multi-component program given that the family serves as the principal influence of social adjustment (Parcel & Dufur, 2001).

Cross-sectional correlational studies have found that family factors are associated with decreased odds of substance use (Crawford & Novak, 2002; Hadley et al., 2016; Kuendig & Kuntsche, 2006). Literature suggests that adolescents who spend more time with their parents, have more conversations with their parents, perceive greater family support, and feel more connected to their families are less likely to use alcohol and other substances (Curran, 2007; Hadley et al., 2016; Mc Laughlin, Campbell, & Mc Colgan, 2016).

Service providers have strongly agreed on the need for developing and implementing a multi-component model including parents. However, few trials of multi-component models have been undertaken. Scholars and practitioners continue to have little idea of the effects of multi-component substance use prevention program. To fill this gap, this article examines the effectiveness of a multi-component model combining Life Skills Training (LST) for students and Love and Logic training for their parents. It is hypothesized that adolescents participating in the multi-component model including parent training will report significantly lower levels of substance use (at post-test) compared to adolescents who receive the substance abuse curriculum without their parents' involvement.

2. Literature Review

2.1 Risk Factors as Intervention Targets

Risks for substance abuse often involve individual and eco developmental factors. At the individual level, poor life skills and decision making of youth are widely supported explanations for substance use (Botvin & Griffin, 2014; Sussman et al., 2004; Sussman, Rohrbach, & Mihalic, 2004). At the eco developmental level, youth substance abuse can be seen as the result of an impoverished opportunity structure where families, schools, and other institutions fail to provide opportunities, skills, and reinforcements for prosocial involvement (Botvin & Griffin, 2014; Hadley et al., 2016). In the next section, we selectively review risk factors for youth substance use focusing on risk factors that are malleable and inform the design of LST and Love and Logic.

2.2 Life Skills and Substance Use

One of the crucial parts of drug abuse prevention programs is teaching life skills to help youth cope with their drug use. Life skills were defined by the World Health Organization as skills and competencies that enable individuals to deal adequately with their daily challenges and their developmental tasks such as communication skills, problem solving, and assertiveness (1997). Research has found that adolescents who joined life skills training programs were more likely to reduce their drug use than those who did not (Botvin & Griffin, 2014; Spaeth, Weichold, Silbereisen, & Wiesner, 2010; Wenzel, Weichold, & Silbereisen, 2009). Several researches have also indicated that adolescents who use drugs have poor life skills, which put them at greater risk of becoming users and decreasing their chances of abstaining from using substances (Botvin, Baker, Dusenbury, Botvin, & Diaz 1995; Weichold & Blumenthal, 2016).

2.3 Decision-Making and Substance Use

Decision-making skills are active strategies to collect information, solve problems, weigh pros and cons, and choose proper actions (Byrnes, 1998). Decision-making has consistently been regarded as a protective factor in substance use research (Hawkins, Catalano, & Miller, 1992; Paglia & Room, 1999; Trudeau, Lillehoj, Spoth, & Redmond, 2003). For example, poor decision-making skills are significantly associated with substance use among

adolescents (Epstein et al., 1999; Scheier & Botvin, 1998). Thus, decision-making skills are continually included in substance prevention programs for youth (Tobler et al., 2000).

2.4 Eco developmental Influences on Substance Use

Eco developmental models of health posit that the health of an individual is determined not only by individual genetic factors and behaviors, but also by environmental and social influences at family, community, and society levels (Edberg, 2007). A large body of research has been conducted on eco developmental influences on adolescent substance. Generally speaking, various problem behaviors in adolescence are highly correlated with one another, such that eco developmental mechanisms that predict one problem behavior (e.g., substance abuse) also predict other problem behaviors (e.g., violence) (Telleen, Kim, & Pesce, 2009). Important eco developmental predictors of substance use emerge from a number of social levels and systems. For example, processes occurring within the family, such as communication (Noyori-Corbett & Moon, 2010), support (Guerrero et al., 2010), and positive parental involvement (Moon, Patton, & Rao, 2010) are negatively predictive of adolescent substance use and violence. Moreover, a number of studies have indicated that provision of parental warmth and support is associated with less adolescent substance use (Cleveland, Feinberg, & Greenber, 2010). Furthermore, adolescents who had more time to spend with their parents had a tendency to show lower rates of alcohol and other substance use (Crawford & Novak, 2002; Hadley et al., 2016; Kuendig & Kuntsche, 2006). Similarly, processes occurring at school, such as school bonding and interest (Moon, Patton, & Rao, 2010), and processes occurring in the peer network, such as association with deviant or risk-taking peers (Casey & Beadnell, 2010), have been found to be strongly related to adolescent substance use. Processes that do not directly involve the adolescent are also predictive of adolescent substance use. Connections between the adolescent's contexts, such as parental involvement in school and parental monitoring of peers, are negatively predictive of substance use in adolescence (Moon, Patton, & Rao, 2010; Noyori-Corbett & Moon, 2010). Processes occurring in the parent's own ecosystem, such as social support for parents and parents' stressors, may affect adolescent risk-taking behaviors indirectly through their effects on parenting (Galambos, Sears, Almeida, & Kolaric, 1995).

2.5 Extant Prevention Programs: The Need to Include Parent Training

Most well-known substance abuse prevention programs are classified into two categories: 1) information provision models such as DARE (Singh et al., 2011) and Health Belief Models (Kim & Zane, 2016), and 2) social influence models including LST (Botvin et al., 1995), Social Competence Programs (Caplan, Choy, & Whitmore, 1992) and Resistance Strategies Trainings such as Project SMART (Hansen et al., 1988), Project ALERT (Ellickson & Bell, 1990; Ellikson, Bell, & McGuigan, 1993), and DRS (Marsiglia, Kulis, & Hecht, 2001). While the former has generally been found to be ineffective, social influence models have been identified as better practice prevention programs by the National Institute on Drug Abuse. A meta-analysis conducted on resistance skills training programs has established their effectiveness (Tobler, 1997).

We reviewed 20 prevention programs for adolescents and found that only two programs (Thriving Teens & Eu-Dap School Program) have a component for parents. However, only one of these programs (Thriving Teens) was based in the United States. Thriving Teens guides parents to: (1) build and maintain a positive relationship; (2) balance that positive relationship with the use of effective guidance and discipline for the teen years; (3) understand the developmental challenges teens face and help them identify pressures teens experience that may lead to substance use; (4) improve parental problem-solving skills; and, (5) teach their teens effective problem-solving and refusal skills (Gallagher & Bruzzese, 2004). The results of the initial investigation of Thriving Teens indicated that parents report feeling more confident in taking the necessary steps to prevent substance use in their children. Parents in the treatment group also report that they believe they can communicate more effectively, spell out rules about substances, and create more positive family activities compared to those in the control group (Gallagher & Bruzzese, 2004). The EU-Dap program, based on the comprehensive social influence approach (Sussman et al., 2004), incorporates life skill elements and is designed to prevent the use of tobacco, alcohol, and illegal drugs. The Eu-Dap includes two components: a peer-related curriculum and a parent-related curriculum. A large cluster randomized sample in seven European countries reported that 15 months after the completion of the program,

exposure to Eu-Dap was associated with a significantly lower prevalence of alcohol and marijuana use in the past 30 days (Faggiano et al., 2005).

3. Methods

3.1 Design

A non-equivalent comparison group quasi-experimental design was used. Students were purposively assigned to either the treatment or control group according to parents' willingness to take the training. In this study, the treatment group received the Life Skills curriculum for children and Love and Logic training for their parents, whereas in the control group, children received the Life Skills curriculum only. Children whose mothers agreed to take the Love and Logic training were assigned to the treatment group. The primary data collection method was written surveys. Surveys were administered at school to each of the participants in the treatment and control groups. Both treatment and control groups were assessed immediately prior to intervention. Six months after program conclusion, post-test data were collected.

3.2 Participants

Inclusion criteria for the current study were: 1) Be 12 years of age or be in the 6th or 7th grade; 2) be fluent in reading, writing, and understanding the English language; 3) have no cognitive limitations; and 4) not be institutionalized. Exclusion criteria: 1) meets DSM-IV criteria for dependence of illicit drugs; 2) has limited English proficiency; 3) has DSM-IV diagnosis of any psychiatric disorder; and 4) is receiving in-patient treatment. Inclusion criteria for parents were 1) be fluent in reading, writing, and understanding the English language, 2) have no cognitive limitations; and 3) not be institutionalized. Children whose parents were limited English proficient were excluded from the proposed study. Participants were recruited from two middle schools where Life Skills Training has been traditionally offered. Letters were sent to parents of all students in the two participating schools, inviting them to participate in the study in two ways: (1) child only (control group) and (2) child and parent together (treatment group). Of the 310 students whose parents returned the consent forms, 261 permitted kids to participate in the study (control group). 49 indicated both kids and parents would participate in the study (treatment group). The adolescent gender distribution in the two groups was not

statistically different ($p > .20$). The mean age of the adolescents was 12.52 years ($SD = 0.55$; range from 10.69 to 14.89 years). The largest percentage of participants were Caucasian (76 %), followed by African American (2.9%), Asian (2.6%), and other (18.5%).

Table 1: Descriptive Statistics of Students (N = 310)

Demographic Variables	<i>n (%) or M (SD)</i>	
	Control group <i>(n = 261)</i>	Treatment group <i>(n = 49)</i>
Age	12.49 (0.55)	12.55 (0.54)
Gender		
Male	116 (44.4%)	30 (61.2%)
Female	145 (55.6%)	19 (38.8%)
Race		
Caucasian	200 (76.6%)	37 (75.5%)
African American	10 (3.8%)	1 (2.0%)
Asian	8 (3.1%)	1 (2.0%)
Hispanic	6 (2.3%)	2 (4.1%)
American Indian	3 (1.1%)	0 (0.0%)
Native Hawaiian/Pacific Islander	1 (0.4%)	0 (0.0%)
More than one race	33 (12.6%)	8 (16.3%)

4. Intervention

4.1 Life Skills Training for children

In the proposed study, the treatment group received an integrated program which consisted of the Botvin Life Skills Training (LST) curriculum and Love and Logic for their

parents whereas the control group only received the Life Skills Training for the children. The LST high school program consists of 10 class sessions. Each session takes approximately 40-45 minutes. LST is comprised of two theory-based thematic content components, cognitive misperception correction and behavioral skills instruction. Cognitive perception information is offered to change adolescents' attitudes/beliefs regarding their substance use. For example, one program activity involves students examining "drug use myths," or questionable expectancies students may have regarding the effects of drugs. These misperceptions often lead students to justify their drug use. The behavioral skills material provides instruction in social skills and behavioral self-management, which can facilitate the ability of adolescents to bond flexibly with a variety of peer groups, to seek out social support when needed, and to minimize stressful, conflict-type interactions (Botvin, Griffin, Paul, & Macaulay, 2003).

4.2 Love and Logic for Parents

Love and Logic training was presented over a seven-week period, with one session conducted per week. Each session lasted approximately two hours. Love and Logic training is guided by five basic principles, each firmly grounded in research: (1) preserve and enhance the child's self-concept; (2) teach children how to own and solve the problems they create; (3) share the control and decision-making; (4) combine consequences with high levels of empathy and warmth; and (5) build the adult-child relationship (Fay, 2012). A key component of the training involves giving parents a firm rationale for each of the above principles, as well as practical tools for following them.

5. Measures

The outcome evaluation includes measures on alcohol and substance use and resistance to alcohol use.

5.1 Alcohol and Substance use

To measure the severity of alcohol and substance use, adolescents' self report of cigarette, alcohol, and illicit drug use were assessed using 20 items from the Monitoring the Future Survey (MTF) (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Our measure consists of the number of times each substance was used: "On how many occasions have you

had beer to drink?"; "How frequently have you smoked cigarettes?"; or "On how many occasions have you used marijuana?" Each item ranged from 0 (*0 times*) to 6 (*more than 40 times*).

5.2 Resistance to alcohol use

Participants were asked how sure they were that they could resist drinking alcohol in the given circumstances. The measure consists of 36 items that presented a list of situations in which adolescents may find themselves drinking alcohol: "How sure are you that you could resist drinking alcohol when you are angry?"; "When you are at a party?" or "When someone offers you alcohol?" These questions ranged from 1 (*I am very sure I would drink*) to 6 (*I am very sure I would not drink*).

6. Analysis

A number of statistical tests were used for the analysis. A paired sample *t*-test was computed to compare pre and post-test scores for each participant. An independent sample *t*-test was used to determine if statistical differences exist between the treatment and control groups. All hypotheses tests were conducted with 95% confidence level. Effect sizes were calculated for statistically significant differences found between the treatment and control group. All the numerical analyses were performed using the SPSS 22 statistical software.

7. Results

7.1 Comparison of Means of Pretest between Control and Treatment Groups

An independent sample *t*-test was conducted to compare levels of alcohol and substance use and resistance to alcohol use between control and treatment groups in pre-test. Mean and standard deviation of both groups have been depicted in Table 2. No significant differences were found between the two groups. This result suggests that there was not any significant difference between the control and treatment groups on the levels of alcohol and substance use, and resistance to alcohol use before the intervention. This result supports our first hypothesis that characteristics of participants in both groups would be similar in the baseline survey.

Table 2: Comparison of Pretest of Control & Treatment Groups (N = 310)

Measures	$M (SD)^{con}$	$M (SD)^{tre}$	$M (SD)^{dif}$	$t (df)$
Alcohol Use	11.01 (0.14)	11.57 (4.09)	- 0.56 (.58)	- 0.96 (48.02) ^{n.s.}
Substance Use	10.03 (0.24)	10.06 (0.43)	- 0.03 (.04)	- 0.62 (308) ^{n.s.}
Resistance to Alcohol Use	199.84 (0.87)	198.47 (20.11)	1.37 (2.87)	0.48 (48.03) ^{n.s.}

Note. $M (SD)^{con}$ = mean (standard deviation) control group, $M (SD)^{tre}$ = mean (standard deviation) treatment group, $M (SD)^{dif}$ = mean (standard deviation) difference between control and treatment group.
^{n.s.} = not significant.

7.2 Effectiveness of LST in Control Group

The adolescents who received LST and whose parents did not participate were considered the control group. A paired sample *t*-test was performed to verify changes between pre- and post-test of the control group. There was significant difference in the level of alcohol use ($M^{dif} = 0.34$, $SD = 2.22$, $t(260) = 2.51$, $p < .05$) and resistance to alcohol use ($M^{dif} = -0.57$, $SD = 4.22$, $t(260) = -2.19$, $p < .05$). No significant change was found in substance use. The results illustrated that LST significantly decreased alcohol use and significantly increased the level of resistance to alcohol use among adolescents. In addition, LST was not effective in reducing the level of substance use. Results are shown in Table 3.

Table 3: Analyses of Pre & Posttest of Control Group (N = 261)

Measures	$M (SD)^{pre}$	$M (SD)^{post}$	$M (SD)^{dif}$	$t (df)$
Alcohol Use	11.01 (0.14)	10.67 (2.23)	0.34 (2.22)	2.51 (260) [*]
Substance Use	10.03 (0.24)	10.02 (0.19)	0.01 (0.14)	1.34 (260) ^{n.s.}
Resistance to Alcohol Use	199.84 (0.87)	200.41 (4.21)	- 0.57 (4.22)	-2.19 (260) [*]

Note. $M (SD)^{pre}$ = mean (standard deviation) pretest, $M (SD)^{post}$ = mean (standard deviation) posttest, $M (SD)^{dif}$ = mean (standard deviation) difference between pre- and posttest, NA = not applicable.
^{n.s.} = not significant. ^{*} $p < .05$.

7.3 Effectiveness of the combination of LST for children and Love and Logic Training for parents

The students who received LST and whose parents participated in Love and Logic Training were categorized as the treatment group. A paired sample *t*-test was used to evaluate the effectiveness of the combination of LST for children and Love and Logic Training for parents on adolescents' alcohol and substance use and resistance. The results (see Table 4) showed significant change in alcohol use ($M^{dif} = 1.08, SD = 3.68, t(48) = 2.06, p < .05$) and resistance to alcohol use ($M^{dif} = -9.08, SD = 16.84, t(48) = -3.78, p < .001$) between pre- and post-test of treatment group. These results indicated that LST for children and Love and Logic Training for parents was significant in reducing children's alcohol use and increasing resistance to alcohol use. However, the combination of trainings did not make significant changes in the level of substance use among adolescents.

Table 4: Analyses of Pre & Posttest of Treatment Group ($N = 49$)

Measures	$M (SD)^{pre}$	$M (SD)^{post}$	$M (SD)^{dif}$	$t (df)$
Alcohol Use	11.57 (4.09)	10.49 (2.38)	1.08 (3.68)	2.06 (48) *
Substance Use	10.06 (0.43)	10.02 (0.14)	0.04 (0.29)	1.00 (48) ^{n.s.}
Resistance to Alcohol Use	198.47 (20.11)	207.55 (12.83)	- 9.08 (16.84)	- 3.78 (48) ***

Note. $M (SD)^{pre}$ = mean (standard deviation) pretest, $M (SD)^{post}$ = mean (standard deviation) posttest, $M (SD)^{dif}$ = mean (standard deviation) difference between pre- and posttest.

^{n.s.} = not significant. * $p < .05$. *** $p < .001$.

7.4 Comparison of Means of Posttest between Control and Treatment Groups

To compare the scores of each variable between treatment and control groups in post-test, an independent sample *t*-test was conducted. As depicted in Table 5, significant difference was found only in resistance to alcohol use between the two groups ($M^{dif} = -7.14, SD = 1.85, t(49.96) = -3.86, p < .001$). The results indicated that the treatment group showed higher increased resistance to alcohol use than the control group. In other words, the adolescents who received LST and whose parents participated in Love and Logic Training showed significantly higher levels of resistance to alcohol use than the adolescents who only received LST.

Differences in alcohol and substance use between the two groups were not significant. These results partially support the second hypothesis that the treatment group will show significantly lower rates of alcohol and substance use and higher levels of resistance to alcohol use in post-test compared to control group.

Table 5: Comparison of Posttest of Control & Treatment Groups (N = 310)

Measures	<i>M (SD)</i> ^{con}	<i>M (SD)</i> ^{tre}	<i>M (SD)</i> ^{dif}	<i>t (df)</i>
Alcohol Use	10.67 (2.23)	10.49 (2.38)	0.18 (0.35)	0.50 (308) ^{n.s.}
Substance Use	10.02 (0.19)	10.02 (0.14)	0.00 (0.03)	0.09 (308) ^{n.s.}
Resistance to Alcohol Use	200.41 (4.21)	207.55 (12.83)	- 7.14 (1.85)	- 3.86 (49.96) ^{***}

Note. *M (SD)*^{con} = mean (standard deviation) control group, *M (SD)*^{tre} = mean (standard deviation) treatment group, *M*^{dif} = mean difference. We also conducted an ANCOVA to control the pretest conditions of three variables but had the identical results.

^{n.s.} = not significant. ^{***} *p* < .001.

8. Discussion

Despite increasing evidence that parental support is essential for youth substance prevention programs, few existing interventions employ parenting training (Hadley et al., 2016; Crawford & Novak, 2002; Kuendig & Kuntsche, 2006). Previous findings indicated that teens are less likely to use alcohol and other substances when they have open communication with their parents and receive emotional support from their family members (Hadley et al., 2016; Crawford & Novak, 2002; Curran, 2007; Kuendig & Kuntsche, 2006). Following these recommendations, we developed an integrated program that combined the Life Skills curriculum for kids and Love and Logic training for their parents.

Our longitudinal analysis revealed both training conditions. The kids training only program and the kids and mothers training program were successful in reducing alcohol use and increasing resistance to alcohol. The results also demonstrated the importance of parenting programs, showing that school children tended to report higher levels of resistance to alcohol when a parent training component was added to the child training component of the prevention program, compared to when only the child training component was included. This study

provides initial evidence that school-based curriculum targeting parents can also increase children's resistance to alcohol. This finding extends previous work on the important role of family members in teens' normative behavior (Smith, Faulk, & Sizer, 2016) but additionally suggests that it is not enough to emphasize the importance of parenting. Instead, this result shows that these parents can be educated via an intervention program. The findings strongly suggest that systematic training programs should be developed and offered to parents.

Our results also suggest that the prevention program should be designed not only to provide educational information, but also to cultivate decision-making skills. Previously, the information provision model or literacy approach claimed that media and intervention programs should provide more facts and increase general knowledge about alcohol and substance abuse. The underlying assumption of this view is that if children have more information about alcohol and substance consumption and its consequences, they will reduce such consumption. However, this study supports alternative perspectives. Corroborating other efforts including social influence models and resistance strategies approaches, the findings indicate that the intervention program should incorporate decision-making skills training into the prevention program for kids and parents.

Although our findings clearly demonstrate the importance of parenting training and decision-making skills in intervention programs targeting youth's alcohol consumption, some limitations need to be addressed. First, the study established treatment and control groups to compare the effectiveness of intervention programs but did not involve random assignment across two groups. Thus, the interpretation of causal relationships between the program and outcome variables should be made with caution. For example, those who were willing to take the combined program in a treatment condition tend to maintain good mother-child relationships in the first place. However, as our results reflect long-term intervention effects instead of short-term effects that can be demonstrated via controlled experiments, the implications of the current findings should not be neglected. Additionally, this concern may be minimized given that our pre-test results show no difference in terms of alcohol and substance use between control and treatment groups. Future efforts may employ randomization to establish stronger causal inferences.

Another limitation stems from the fact that our pretest survey did not include many other control variables including socio-economic information. If we had more household-level data, those data could have served as control variables, which could also alleviate concerns regarding the lack of random assignment.

Finally, self-reports have many weaknesses. This concern is relevant because teenagers may not want to disclose their experiences about their alcohol and substance use. Especially considering that the intervention and survey tests were administered at the school level. It is likely that students may answer the questions in a socially desirable way. To reduce this concern, future research may need to measure implicit attitudes toward alcohol and other substances using implicit association tests.

9. Conclusion

Taken together, our findings are promising. The results demonstrated the importance of parenting programs suggesting that integrating life skills training for kids and Love and Logic for parents can be a successful strategy in terms of substance abuse prevention programming. The results corroborate previous evidence that incorporating parenting training could be an effective approach (Hadley et al., 2016; Crawford & Novak, 2002; Kuendig & Kuntsche, 2006). Based on our results, we suggest that systematic training programs should be developed and offered to parents along with life skills training for kids.

Acknowledgments

We gratefully acknowledge the financial support of the Amon G. Carter Foundation through the Innovative Community Academic Partnership Program at the University of Texas at Arlington School of Social Work. The statements and opinions expressed are solely the responsibility of the authors and do not represent the official views of the foundation

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