

Top Tier Evidence Initiative:
Evidence Summary for LifeSkills Training

HIGHLIGHTS:

- **Intervention:** Middle-school substance abuse prevention program.
- **Evaluation Methods:** Two well-conducted randomized controlled trials.
- **Key Findings:** Approximately a 20% reduction in smoking initiation, and 10-15% reduction in drunkenness, at 12th grade follow-up (i.e., 5-6 years after random assignment).
- **Other:** Strong evidence of effectiveness applies to rural or suburban public schools with a mostly white population. Evidence for urban, minority schools is promising but limited by lack of long-term follow-up. Program is low-cost.

I. The Top Tier initiative's Expert Panel has identified this intervention as *Top Tier*.

The Panel finds that this intervention meets the Congressional Top Tier Evidence standard, defined as: *Interventions shown in well-designed and implemented randomized controlled trials, preferably conducted in typical community settings, to produce sizable, sustained benefits to participants and/or society.*

II. Description of the Intervention:

LifeSkills Training is a middle school substance abuse prevention program that: (i) teaches students social and self-management skills, including skills in resisting peer and media pressure to smoke, drink, or use drugs; and (ii) informs students of the immediate consequences of substance abuse.

The program is delivered by regular classroom teachers who have received brief training from the LifeSkills Training organization. The teachers provide the program to students in 15 classroom sessions, each approximately 40-45 minutes in length, during students' first year of middle school (either 6th or 7th grade). Over the next two years, the teachers provide students with a total of 5-15 review sessions to reinforce what they have learned.

In the classroom sessions, the teachers first explain a variety of life skills (e.g. giving assertive responses in a social interaction) and demonstrate how to use it. Students then practice using these skills in role plays during class, and in behavioral homework assignments outside of school.

Curriculum materials cost approximately \$8 per student per year, and the teacher training workshops cost approximately \$235 per teacher (2014 dollars). [Click here to go to the program's website.](#)

III. Evidence of Effectiveness:

This summary of the evidence is based on a systematic search of the literature, and correspondence with leading researchers, to identify all well-conducted randomized controlled trials of LifeSkills Training that evaluated the program's effect over a sustained period of time. Our search identified two such studies, summarized below. Importantly, these trials evaluated the program as implemented in predominantly white, rural or suburban public schools. Thus their findings apply only to the program as implemented in such a population and setting, and cannot be presumed to apply, for

example, to urban schools with large minority populations. (The evidence of effects in such schools is promising but limited by lack of long-term follow-up.¹)

The specific effects that were replicated in both studies – and thus are most likely to be reproducible in a program replication – are reductions in smoking and drunkenness 5-6 years after random assignment.

The following summarizes the program's effects on the main outcomes measured in each study, including any such outcomes for which no or adverse effects were found.² All effects shown are statistically significant at the 0.05 level unless stated otherwise.

Study 1 (rural Iowa)

This was a randomized controlled trial of 24 middle schools in rural Iowa. Schools were matched on school-level risk of substance use, and then randomly assigned to either: (i) a group in which all 7th graders received LifeSkills Training, or (ii) a control group that did not receive the program.³ The schools had a total of approximately 1200 7th grade students. Over 95% were white, and approximately 23% were from low-income households.

Effects of LifeSkills Training approximately 5.5 years after random assignment – i.e., 12th grade:

Initiation of substance use. Compared to the control group, students in the LifeSkills Training group were:

- 21% less likely to have ever smoked cigarettes (53% of LifeSkills Training students reported ever smoking vs. 67% of control group students).
- 23% less likely to have ever used marijuana (29% vs. 38%).
- 11% less likely to have ever been drunk (61% vs. 68%). This finding was significant at the 0.10 level but not the 0.05 level.

There was no significant effect on the percent who had ever drunk alcohol (more than 90% of both groups had done so).

¹ See, for example, Botvin, G.J., Griffin, K.W., Diaz, T., & Ifill-Williams, M. “Drug abuse prevention among minority adolescents: One-year follow-up of a school-based preventive intervention.” *Prevention Science*, vol. 2, 2001, pp. 1-13.

² We do not summarize the effects that were estimated with methods that provide suggestive, but not strong, evidence – e.g., effects estimated for the subsample of students who received a relatively complete version of the program (the “high-fidelity” subsample).

³ The study also contained a second experimental condition, involving 12 additional schools. These schools received LifeSkills Training plus a family skills training program, in a combined intervention. We do not summarize the effects of this combined intervention because they were similar to those found for LifeSkills Training alone.

Frequency of substance use.

- For the full sample, the study found no statistically significant effects on the frequency (as opposed to initiation) of substance use.
- However, for the subgroup of students who already were using two or more substances at the start of the study (i.e., the “high-risk“ subgroup, comprising 20% of the sample), LifeSkills Training produced significant reductions in the frequency of alcohol, cigarette, and marijuana use, drunkenness, and monthly multi-substance use. The magnitude of these effects is unclear, because the study used an index to measure frequency that does not lend itself to ready interpretation.

Importantly, we believe these subgroup effects may be valid, but could also be a spurious finding resulting from the study’s analysis of various retrospectively-defined subgroups. Therefore, corroboration in additional studies is needed.

Discussion of study quality:

- This was a sizable study conducted in 24 schools across several Iowa counties, with a long-term follow-up (5.5 years after random assignment).
- At the start of the study, the LifeSkills Training and control group students were highly similar in their observable characteristics (e.g., levels of previous substance use, demographics).
- The study measured outcomes for all students assigned to the LifeSkills Training group, regardless of how much of the program they actually received (i.e., the study used an “intention-to-treat“ analysis).
- The study evaluated LifeSkills Training as implemented in typical classrooms by public school teachers, thus providing evidence of the program’s effectiveness in real-world conditions. One caveat is that university researchers partnered with participating schools in program delivery. This may limit the extent to which the study’s findings generalize to delivery systems without such university involvement (although the results of study 2, below, suggest the findings do generalize to other delivery systems).
- The study’s statistical analysis accounted for the fact that schools, rather than individual students, were randomly assigned to the LifeSkills Training and control groups.
- One limitation of this study is sample attrition. Although there was no attrition of *schools* from the sample, there was a moderate level of *student* attrition due to absenteeism, dropouts, and transfers: 30% at the 5.5-year follow-up. The attrition rates were similar for the LifeSkills Training versus control group (31% and 29% respectively), suggesting that attrition was not influenced by group assignment; and statistical tests show the attrition did not create differences between the two groups in their observable characteristics. It is conceivable, however, that attrition caused *unobservable* differences between the two groups, possibly leading to inaccurate estimates of LifeSkills Training’s effects.
- A second study limitation is that the study relied exclusively on self-reports to measure substance use outcomes, obtained through a confidential written questionnaire administered

in the classroom. Preferably, the study would have corroborated some self-reports with other measures (e.g., saliva tests for smoking).

Study 2 (New York State)

This was a randomized controlled trial of 57 middle schools in three rural or suburban areas in the state of New York. Schools were matched based on geographic location and smoking rates, and then randomly assigned either to a group that provided LifeSkills Training to its 7th grade students or to a control group that did not.⁴ The schools contained a total of approximately 6000 7th grade students, most of whom were white (91%) and from middle-income families.

Effects of LifeSkills Training 6 years after random assignment – i.e., end of 12th grade:

Compared to the control group, students in the LifeSkills Training group were:

- 19% less likely to smoke weekly (22% of LifeSkills Training students smoked weekly versus 27% of control group students).
- 21% less likely to smoke a pack-a-day (9.5% vs. 12%).
- 16% less likely to have gotten drunk in the last month (33.5% vs. 40%).

There was no significant effect on the percent of students who used alcohol occasionally (i.e., monthly or weekly), or on the percent who used marijuana.

Discussion of study quality:

- The study had a large, multi-site sample (57 schools) and a long-term follow-up (6 years).
- LifeSkills Training and control group students in the 6-year follow-up sample were highly similar in their pre-program characteristics (e.g., previous substance use, demographics).
- The study measured outcomes for all students assigned to the LifeSkills Training group, regardless of how much of the program they actually received (i.e., the study used an “intention-to-treat” analysis).
- The study evaluated LifeSkills Training as it is normally implemented in typical classrooms by public school teachers, thus providing evidence of its effectiveness in real-world conditions.
- Self-reported levels of tobacco use were corroborated with biochemical data (i.e., breath samples). Although the study relied exclusively on self-reports to measure alcohol and marijuana use, there is evidence that the collection of breath samples (for smoking) may increase the truthfulness of self-reports for other substances too. Self-reported substance use was measured through a confidential written questionnaire.
- The study's statistical analysis accounted for the fact that schools, rather than individual students, were randomly assigned to the LifeSkills Training and control groups.

⁴ The study actually had two experimental conditions – one in which teachers received in-person training in delivery of the program, and one in which they received training via videotape. The results for these two conditions were very similar, so this write-up summarizes the effects for the two groups combined (versus the control group).

- One limitation of this study is sample attrition. Although the study had low *school* attrition (only one school dropped out of the study after random assignment), it had a fairly high level of *student* attrition due to absenteeism, dropouts, and transfers: approximately 40% at the 6-year follow-up. Although the follow-up samples were still largely equivalent in their observable pre-program characteristics (including prior substance use), the attrition conceivably could have caused *unobservable* differences between the two groups, possibly leading to inaccurate estimates of LifeSkills Training's effects.

Other Studies:

12 other randomized controlled trials of LifeSkills Training have been conducted. Their results are generally consistent with the results of the two studies described above. However, these trials fall outside our initiative's inclusion criteria (e.g., due to lack of long-term follow-up), and so are not summarized here.

IV. Summary of the Intervention's Benefits and Costs:

If taxpayers fund the delivery of this intervention, what benefits to society can they expect to result, and what would be their net cost? The following table provides a summary. This is intended to be a general overview of social benefits in relation to taxpayer cost, rather than a comprehensive benefit-cost analysis. It assigns monetary value to particular benefits and costs only when doing so requires minimal assumptions. The monetary amounts shown are in 2014 dollars.

<p><u>Benefits To Society</u></p> <ul style="list-style-type: none"> ▪ Approximately a 20% reduction in smoking initiation, and 10-15% reduction in drunkenness, at 12th grade follow-up (i.e., 5-6 years after random assignment).
<p><u>Cost To Taxpayers</u></p> <ul style="list-style-type: none"> ▪ Curriculum materials cost approximately \$8 per student per year, and the teacher training workshops cost approximately \$235 per teacher.

V. References:

Study 1 – rural Iowa

- Spoth, Richard, G. Kevin Randall, Linda Trudeau, Chungyeol Shin, and Cleve Redmond. "Substance use outcomes 5 1/2 years past baseline for partnership-based, family-school preventive interventions." *Drug and Alcohol Dependence* 96 (2008) 57-68.
- Spoth, Richard, Linda Trudeau, and Chungyeol Shin. "Long-term effects of universal preventive interventions on prescription drug misuse." *Addiction*, 2008, vol. 103, no. 7, pp. 1160-1168.
- Spoth, R.L., S. Clair, C. Shin, and C. Redmond. "Long-term Effects of Universal Preventative Interventions on Methamphetamine Use Among Adolescents." *Archives of Pediatric & Adolescent Medicine*, 2006, vol. 160, pp.876-882.

- Trudeau, Linda, Richard Spoth, Catherine Lillehoj, Cleve Redmond, and K.A.S. Wickrama, "Effects of a Preventive Intervention on Adolescent Substance Use Initiation, Expectancies, and Refusal Intentions." *Prevention Science*, vol. 4, no. 2, June 2003, pp. 109-122.
- Spoth, Richard, Cleve Redmond, Linda Trudeau, and Chungyeol Shin, "Longitudinal Substance Initiation Outcomes for a Universal Preventive Intervention Combining Family and School Programs," *Psychology of Addictive Behaviors*, vol. 16, no. 2, 2002, pp. 129-134.

Study 2 – New York State

- Griffin, K.W., Botvin, G.J., and T.R. Nichols. "Effects of a school-based drug abuse prevention program for adolescents on HIV risk behaviors in young adulthood." *Prevention Science*, 2006, vol. 7, no. 2, pp. 103-112.
- Griffin, K.W., Botvin G.J., and Nichols, T.R. "Long-term follow-up effects of a school-based drug abuse prevention program on adolescent risky driving." *Prevention Science*, 2004, vol. 5, pp. 207-212.
- Botvin Gilbert J., Kenneth W. Griffin, Tracy Diaz, L.M. Scheier, C. Williams, and J.A. Epstein. "Preventing illicit drug use in adolescents: Long-term follow-up data from a randomized control trial of a school population." *Addictive Behaviors*, 2000, vol. 25, pp. 769-774.
- Botvin, Gilbert J., Sharon Mihalic, and Jennifer Grotmeter (1998). *Blueprints for Violence Prevention, Book Five: LifeSkills Training*. Boulder, CO: Center for the Study and Prevention of Violence. <http://www.colorado.edu/cspv/blueprints/modelprograms/LST.html>.
- Botvin, Gilbert J., Eli Baker, Linda Dusenbury, E.M. Botvin and Tracy Diaz. "Long-term Follow-up Results of a Randomized Drug Abuse Prevention Trial in a White Middle-class Population." *JAMA*, vol. 273, no. 1, April 12, 1995, pp. 1106-1112.
- Botvin, Gilbert J., Eli Baker, Linda Dusenbury, Stephanie Tortu, and E.M. Botvin. "Preventing Adolescent Drug Abuse Through a Multimodal Cognitive-Behavioral Approach: Results of a 3-Year Study." *Journal of Consulting and Clinical Psychology*, vol. 58, no. 4, 1990, pp. 437-446.