

What Works to Prevent Adolescent Smoking? A Systematic Review of the National Cancer Institute's Research-Tested Intervention Programs

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ABSTRACT

BACKGROUND: Cigarette use remains the leading preventable cause of death in the United States. Although school is an ideal setting for antismoking interventions, school-based programs have not been successful in the long term. The purpose of this study was to explore characteristics of programs deemed to be successful short-term Research-Tested Intervention Programs (RTIPs) by the National Cancer Institute (NCI).

METHODS: To identify adolescent smoking prevention programs, 2 independently working researchers applied specified selection criteria to all programs in the NCI's RTIP database. Selected programs were abstracted using a structured form for general information, participants, interventions, outcomes, and quality. Extracted data were then assessed for common themes and contrasts in each category.

RESULTS: As of June 2008, 18 studies met the NCI's standards for RTIPs preventing smoking among adolescents. After selection criteria were applied, only 5 programs remained. Each independently working researcher arrived at the same pool of programs. In chronological order according to date of publication of outcomes evaluation, the 5 programs ultimately included were Project Towards No Tobacco Use, Pathways to Health, Native FACETS, Kentucky Adolescent Tobacco Prevention Project, and Sembrando Salud. The majority of these programs were targeted toward a particular sociodemographic group (eg, American Indians, Hispanic migrant communities).

CONCLUSIONS: New school-based programs are needed to address current issues in tobacco control. To improve chances of success, these programs may wish to target certain specific high-risk demographic groups, use professional health educators and/or trained community members, and build in methods of updating material.

Keywords: tobacco; smoking; school-based; adolescent; National Cancer Institute; Research-Tested Intervention Programs; prevention.

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INTRODUCTION

Cigarette use remains the leading preventable cause of death in the United States.¹ Despite decades of educational programming and policy changes, 54% of high school students have tried cigarette smoking and 16% of high school students have smoked a whole cigarette before the age of 13.² Those who try their first cigarette in adolescence are at greatest risk of becoming daily smokers by the age of 18³⁻⁵ and are less likely to quit smoking.^{6,7} This developmental period is crucial because of accelerated biological, cognitive, social, and emotional changes that influence behavioral choices.⁸

School would seem to be the ideal setting for antismoking interventions because it offers a captive audience of those at risk for smoking. Despite this, school-based programs generally have not been successful in the long term.³ Even a particularly comprehensive 10-year program—which randomized 40 school districts in Washington State to receive either 47 hours of state-of-the-art antitobacco programming or usual programming—had no effect on long-term smoking rates.⁹ A recent systematic review of school-based antismoking programs concurred that these programs have not been successful in the long term.¹⁰

It would be useful to reassess in depth the types of programs that have been effective in the short term. This type of analysis may provide information assisting development of novel, more effective programming. The National Cancer Institute (NCI) has developed a systematic method of determining successful anticancer programs, and it maintains a database of all programs that fulfill its rigorous criteria. They call these programs Research-Tested Intervention Programs (RTIPs).¹¹ Although RTIPs address multiple cancer-related subjects such as sun safety and colorectal cancer screening, they also

include tobacco control programs. To be included in this database as an RTIP, all programs are rated on 6 criteria by a panel of topic experts in the field (Table 1). Of these criteria, “Research integrity” is often the most difficult to satisfy, as the value of the program must have been established via funded research and publication in a peer-reviewed journal. This criterion is assessed with 16 subcriteria assessing constructs such as theoretical basis, reliability and validity of measures, intervention fidelity, comparison condition, selection bias, attrition, and handling of missing data. All RTIPs make available the research materials to the cancer control community.¹¹ Investigators submit potential RTIPs to the NCI. Additionally, however, RTIP staff members identify internally any programs that may potentially fulfill criteria.

The purpose of this study was to explore characteristics of successful school-based smoking prevention programs via systematically reviewing NCI’s RTIPs for tobacco control. Examination of characteristics of programs deemed successful by the NCI and identifying gaps in the literature may help school systems develop more effective programs targeted at adolescents to lower smoking rates.

METHODS

Research Question

What are characteristics of school-based antitobacco programs deemed to be successful by the NCI via its RTIP program?

Selection Criteria

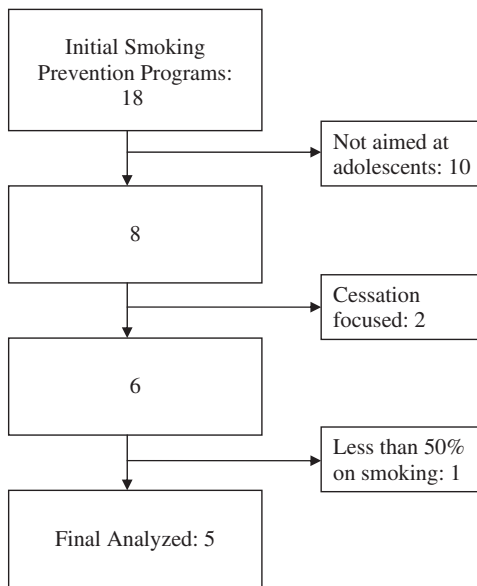
Three selection criteria were applied (Figure 1). First, RTIPs were included if they focused on adolescent

Table 1. Research-Tested Intervention Programs Program Review Ratings*

Criterion	Definition
Dissemination capability	The readiness of program materials for use by others as well as program’s capability to offer services/resources to facilitate dissemination. This is measured through (a) the quality of implementation materials; (b) training and technical assistance protocols; and (c) the availability of quality assurance materials to determine whether their implementation is done with high fidelity to the original model
Cultural appropriateness	This represents the extent to which the culture of the target audience is specified in the program; the extent to which the program has been evaluated with different cultural groups; and the extent to which materials incorporate salient cultural aspects relevant to the community of interest
Age appropriateness	This represents the extent to which the age of the target audience is specified; the extent to which the program has been evaluated with different age groups; and the extent to which materials reflect issues relevant to the age groups targeted
Gender appropriateness	This represents the extent to which the gender of the target audience is specified; the extent to which the program has been evaluated with different gender groups; and the extent to which materials reflect issues relevant to the gender group being addressed
Research integrity	Integrity reflects the overall confidence reviewers can place in the findings of a program’s evaluation based on its scientific rigor. The research integrity rating system comprises 16 criteria scored by external peer reviewers. Scores on each criterion range, on a 5-point scale, from low quality to high quality. The overall integrity score is a weighted average of the 16 criteria reflecting the merits of the science that went into the program evaluation
Intervention impact	The intervention impact describes whether, and to what degree, a program is usable and appropriate for widespread application and dissemination. The rating criteria consists of Population Reach and Intervention Effect Size that are rated separately on a 5-point scale from low to high and then combined into a single rating

*Reprinted from <http://rtips.cancer.gov/rtips/ratings.do>

Figure 1. Research-Tested Intervention Program Retention After Application of Selection Criteria



populations, as opposed to adults. “Adolescents” were defined a priori as persons between the ages of 10 and 18. Second, the program had to focus on smoking prevention, as opposed to cessation. Finally, the program had to focus on smoking (eg, as opposed to alcohol or illicit drug abuse). For a program to focus on smoking, it was determined a priori that at least 50% of the program had to be devoted to smoking to ensure that the program focused on the intended topic.

Search Strategy

The RTIP database was accessed via the World Wide Web¹¹ between January 2008 and June 2008. This database was searched using its own included tools by 2 researchers (E. S. & B. P.) working independently. Their selections were compared using percent agreement and Cohen’s kappa statistics.¹² After statistical comparison, any discrepancies were to be adjudicated by the researchers with consultation of a third party if necessary.

Data Abstraction and Synthesis

The independently working researchers abstracted all selected programs using a structured form for general information, participants, interventions, outcomes, and quality. General information abstracted consisted of the program title, funding source, focus, purpose, rationale, and target audience. Participants were detailed by gender, race, and age. Intervention-related information abstracted included

setting, format, instructor training, instructional methods, and supplements to lectures. Finally, outcomes were assessed, both positive and negative, and quality was assessed using the mean NCI quality score. This score averaged subscores related to the 6 categories described in Table 1. Each construct was assessed by NCI staff on a 5-point Likert scale, with 1 being poor and 5 being excellent.¹¹

Extracted data were assessed for common themes and contrasts in each category: general information, participants, interventions, and outcomes/quality. During the synthesis process, special attention was paid to the determination of overall characteristics of these programs deemed by the NCI as particularly successful.

RESULTS

As of June 2008, 18 studies met the NCI’s standards for Tobacco Control programs. After the 3 selection criteria were applied, only 5 programs remained (Figure 1). Each independently working researcher arrived at the same pool of programs. Thus, percent agreement was 100%, and Cohen’s kappa score was perfect at 1.0. In chronological order according to date of publication of outcomes evaluation, the 5 programs ultimately included were (1) Project Towards No Tobacco Use (TNT), (2) Pathways to Health, (3) Native FACETS, (4) Kentucky Adolescent Tobacco Prevention Project (KATPP), and (5) Sembrando Salud (Tables 2–4).

General Information

Table 2 outlines general characteristics of each of these programs. Outcome evaluations for Project TNT were published in 1993. The study was funded by the NCI and the National Institute on Drug Abuse. This school-based program focused on (1) delaying age of smoking initiation and (2) reducing overall use of tobacco products by middle school students. Evaluations for Pathways to Health, also funded by the NCI, were published in 1995. This program was aimed at nonsmoking fifth and seventh grade American Indian students, and it focused not only on cancer prevention but also on health promotion in general. Native FACETS, evaluated 1 year later in 1996, was similarly focused on American Indian student nonsmokers. It involved not only tobacco prevention but also dietary change. The KATPP was aimed at high-risk individuals living in high tobacco production areas. It was funded by the NCI and the outcomes evaluation was published in 1998. Finally, Sembrando Salud had its outcomes evaluation published in 2000 and was funded through a grant by NCI. Its purpose was to improve communication skills

Table 2. General Characteristics of Smoking Prevention Research-Tested Intervention Programs

Program	Year	Funding Source	Focus and Target Audience	Rationale
Project Towards No Tobacco Use (TNT)	1993	NCI, NIDA	Smoking prevention among adolescents aged 10–15 years	School-based programs are needed to counteract adolescent exposure to media and advertising that promotes the use of tobacco
Pathways to Health	1995	NCI	Smoking prevention among Native American adolescents in the fifth and seventh grades	Native Americans tend to adopt Western lifestyles that involve unhealthy habits leading to increase in cancer risk factors
Native FACETS	1996	NCI	Smoking prevention and dietary change among Native American youth in the northeastern United States	Culturally sensitive strategies to prevent cancer are needed to reduce the high prevalence of cancers associated with behavioral and lifestyle patterns among Native Americans
Kentucky Adolescent Tobacco Prevention Project (KATPP)	1998	NCI	Smoking prevention for middle school youth living in counties that produce 7.7 pounds of tobacco annually	Rural youth living in tobacco-raising households begin using tobacco early and have high usage rates
Sembrando Salud	2000	NCI	Smoking prevention for migrant adolescents aged 11–16 years	Migrant farm children are at high risk for health problems due to risk behaviors such as tobacco and alcohol use

Table 3. Program Evaluation Participants and Interventions

Program	N	Grade Level	% Female	Racial Breakdown	Setting	Format	Instructors
Project Towards No Tobacco Use (TNT)	6716	Sixth to eighth	50	60% white; 27% Hispanic; 7% black; 6% Asian/other	Classroom	Ten 40- to 50-minute lessons over 10 consecutive school days; 2 booster lessons	Trained health educators
Pathways to Health	714	Fifth & seventh	50	50% Navajo Native American 50% Pueblo Native American	Classroom	16-session program implemented over the course of 2 semesters	Classroom teachers
Native FACETS	86	Fifth to seventh	45.5	100% Native American	Community center	15 weekly 90-minute group sessions after the school days or on Saturdays	Community-based native Americans trained to deliver intervention
Kentucky Adolescent Tobacco Prevention Project (KATPP)	3072	Seventh to eighth	50	92% white; 5.6% black; 2.3% other	Classroom	Six 45- to 50-minute sessions in seventh grade; 3 booster sessions in eighth grade	Classroom teachers
Sembrando Salud	660	Sixth to tenth	49	100% Hispanic	School	8 weekly 2-hour sessions; parents attend 3 sessions jointly with their adolescents	Bilingual, bicultural Mexican Americans from local universities who attended 10 weekly training sessions and met a minimum competency

between parents and children in the Hispanic migrant community.

All 5 of the programs aimed to prevent smoking, but Native FACETS also addressed dietary change. All outcome evaluations for these programs were published before or in 2000. Of the 5 programs, 4 were designed for specific groups of adolescents that are typically at higher risk for using tobacco: Pathways to Health and Native FACETS focused on Native Americans, KATPP's focus was on youth living in tobacco producing counties, and Sembrando Salud focused on Hispanic migrant farm children. Only Project TNT had a wide intended audience of youth aged 10–15 years.

Participants

Project TNT and KATPP were evaluated with the largest samples (Table 3). Most programs focused on sixth to eighth grade students, although Sembrando Salud involved youth up to age 16. All evaluation samples were about 50% female. Of the 5 programs, 4 had an overwhelming majority of the participants of 1 particular race (92–100%). In KATPP, 92% of the participants were Caucasian; in Native FACETS and Pathways to Health, 100% were Native American; and for Sembrando Salud, 100% were Hispanic. When all participants from all 5 programs were pooled, 60% of participants were Caucasian, 22% were Hispanic, and 7% were Native American. Overall, blacks and Asians

Table 4. Instructional Methods, Outcomes, and Quality

Program	Instructional Methods	Positive Outcomes	Negative Outcomes	Mean NCI Quality Score
Project Towards No Tobacco Use (TNT)	Activities counteracting normative social influences to use tobacco and misperceptions regarding the physical consequences of tobacco use; role-playing	Initiation of cigarette use was reduced by 26%; initiation of smokeless tobacco use was reduced by approximately 30%. Weekly or more frequent cigarette smoking was reduced by 60%. Weekly or more frequent smokeless tobacco use was eliminated	Teaching refusal assertion skills and facts about classmate peer disapproval of tobacco use were ineffective	4.4
Pathways to Health	Teaching of dietary patterns consistent with NCI recommendations, avoidance of cigarette smoking and the use of smokeless tobacco, and adoption of behavioral skills and patterns conducive to a healthy lifestyle; Native American foods, games, and customs manual	Among those who were not current smokeless tobacco users, nearly 92% of intervention students remained nonusers at posttest. Few intervention seventh grade students consistently thought they would ever use smokeless tobacco	No statistically significant differences were found among fifth graders' self-reports of smoking/intention to smoke	3.6
Native FACETS	Students directed to healthy behavior with use of regional and tribal Native American cultural content included in every intervention; survival of Native American culture used as a way of combating negative peer and other social influences; films; activities; demonstrations	Knowledge of the negative effects of smoking and smokeless tobacco, and awareness of objectives and methods of tobacco advertising increased. Ability to resist peer pressure and their willingness to refuse offers from friends increased	Students in the tobacco-only group reported more instances of smoking than the mixed tobacco and diet group	4.7
Kentucky Adolescent Tobacco Prevention Project (KATPP)	Skills training, recognizing, and countering advertising appeals; trained peer leaders; student pledges not to use tobacco and negative consequences for using tobacco; videotapes	Significant effects were found for those involved in raising tobacco for eighth graders. In ninth grade students, significant effects were found for 30-day, 7-day, and 24-hour smoking for those involved in raising tobacco	No program effects were seen for smokeless tobacco	3.6
Sembrando Salud	Training regarding listening skills and communication skills; material on health effects of smoking, peer pressure, health effects of alcohol, decision making, societal influences, refusal skills, and media influences; role-playing; videotapes	Youth who attended more sessions were less susceptible to using tobacco and alcohol. Parents and youth who participated in the tobacco/alcohol intervention reported better communication in their family than did those in the control group. Thirty-day smoking and drinking rates remained at very low levels. The program appears to make short-term changes to smokers' perceived effects of tobacco use	Tended to be effective when there were fewer siblings and more attention is needed on larger families	4.2

NCI = National Cancer Institute.

were underrepresented, representing only 5% and 4% of the studied population, respectively.

Intervention Characteristics

Project TNT, Pathways to Health, KATPP, and Sembrando Salud were all school-based. Of those programs, only Sembrando Salud was not integrated into the standard school day. Native FACETS was designed to be implemented in a community-based center after the standard school day or on Saturdays.

Each of the 5 programs began with an initial group of sessions, and 2 programs (Project TNT and KATPP) featured additional sessions the following year (Table 3). Initial programming ranged from 6 (KATPP) to 16 sessions (Pathways to Health). Additional sessions were sparse; Project TNT and KATPP consisted

of 2 and 3 sessions, respectively. Program sessions also varied in length. Although most sessions were about the length of a class period (40–50 minutes), Native FACETS sessions lasted 90 minutes and Sembrando Salud sessions were 2 hours.

Pathways to Health and KATPP were designed to be implemented by regular classroom teachers. Project TNT, however, was implemented by trained health educators who were not students' regular teachers. Native FACETS and Sembrando Salud were implemented by trained community leaders: for Native FACETS, the instructors were specially trained community-based Native Americans, and for Sembrando Salud, the instructors were trained bilingual, bicultural Mexican American group leaders from local universities. Each of the programs

relied primarily on lectures; however, supplementary activities included videotapes, role-playing, and other interactive activities.

For Project TNT, instruction focused on counteracting normative social influences to use tobacco and misperceptions regarding the consequences of tobacco use. Students used role-playing to practice refusal skills. Pathways to Health taught dietary patterns along with avoidance of cigarette smoking and use of smokeless tobacco. Like Project TNT, this program also taught behavioral skills such as refusal skills. Unlike Project TNT, Pathways to Health had an important cultural component: it integrated American Indian foods, games, and traditional customs. Native FACETS similarly directed students to healthy behavior through the use of regional and tribal American Indian content. Films, activities, and demonstrations were used to help teach students how to combat negative peer and other social influences. The KATPP used skill training, including recognizing and countering advertising appeals. The students pledged not to use tobacco and were taught the negative consequences for using tobacco through resources such as videotapes. Finally, Sembrando Salud taught students about the health effects of smoking and alcohol and about the influence of peer pressure, society, and media on smoking. It also fostered listening and communication skills, and used role-playing and videotapes.

Outcomes and Quality

Evaluation of Project TNT found that the initiation of cigarette use was reduced by 26% and initiation of smokeless tobacco use was reduced by approximately 30% over the course of the study period.¹³ Weekly or more frequent cigarette smoking was reduced to 60% and weekly or more frequent smokeless tobacco use was eliminated.¹³ However, the teaching of refusal assertion skills and facts about classmate peer disapproval of tobacco use was not effective (Table 4).¹³

Evaluation of Pathways to Health found that among those students who were not current smokeless tobacco users at pretest, nearly 92% of intervention students remained nonusers at posttest, compared with 82% in the control group ($p = .001$).^{14,15} Few intervention students thought they would ever use smokeless tobacco, whereas a larger proportion of control students continued to think they would use it or were unsure at posttest.^{14,15} However, for Pathways to Health there was no statistically significant difference found among fifth graders' self-reports of smoking or intention to smoke.^{14,15}

Evaluation of Native FACETS showed that knowledge of negative effects of smoking, knowledge of effects of smokeless tobacco, and awareness of objectives and methods of tobacco advertising all significantly increased.¹⁶ Additionally, the researchers found

statistically significant increases in students' ability to resist peer pressure to use tobacco and their willingness to refuse offers from friends after the program. However, positive results were reported more often in the mixed tobacco and dietary change group rather than the tobacco-only group.¹⁶

Evaluation of KATPP found that 1 year after delivery of the additional sessions, youth in the intervention group had lower 24-hour, 7-day, and 30-day smoking compared with youth in the control group.¹⁷⁻¹⁹ However, there were no significant changes in use of smokeless tobacco in the intervention group.¹⁷⁻¹⁹

Students who attended more Sembrando Salud sessions were less susceptible to using tobacco and alcohol.²⁰ Additionally, those that took part in the program also reported better communication among family members.²⁰ Thirty-day smoking and drinking rates did not change significantly, but they remained at low levels. Overall, the program appeared to make a short-term change in smokers' perceived effects of tobacco use; however, it tended to be more effective when there were fewer siblings. Thus, the authors concluded that more attention is needed on larger families.²⁰

The NCI ranked all the programs on a scale from 1 to 5 based on dissemination capability, cultural appropriateness, age appropriateness, gender appropriateness (if applicable), research integrity, and intervention impact. Native FACETS received the highest overall rating of 4.7, followed by TNT with 4.4 and Sembrando Salud with 4.2. Pathways to Health and KATPP both received a score of 3.6. These latter 2 programs received somewhat lower mean scores because Pathways to Health received 2 in research integrity and 3 in dissemination capability and intervention impact. The KATPP received scores of 3 in dissemination capability and cultural appropriateness.

DISCUSSION

This systematic review finds that relatively few (5 of 18) RTIPs for tobacco control endorsed by the NCI focused on smoking prevention among youth. It was also found that the vast majority of these programs were targeted toward a particular sociodemographic group. Additionally, programs deemed as successful by the RTIPs program were relatively brief: no initial programming lasted longer than 1 year, and those programs that did contain longitudinal components (only 2 of 5 programs) contained only 2-3 additional sessions. Finally, all the included programs were developed and evaluated many years ago, with no program evaluated after 2000.

Studies have shown that antismoking programs should begin when students are young due to

the important social, cognitive, biological, and emotional changes that take place during this time.^{8,21} Furthermore, because empirical studies show that 90% of those who eventually die from smoking begin before age 18,²² it would seem that the majority of programs should focus on smoking prevention during adolescence. However, only 5 of the 18 tobacco control programs deemed successful by the NCI aimed to prevent smoking among adolescents. There are several reasons that might explain why adolescent smoking prevention programs are poorly represented among all tobacco control programs. First, it may be that fewer programs have been developed to prevent smoking. Indeed, funding is often difficult to obtain for prevention programs compared with cessation programs.⁷ However, it may also be that although many programs aim to prevent smoking, they may be less successful—proportionally—compared with cessation programs. Although smoking cessation programs are often established in medical clinics and hospitals, prevention programs are often established in schools, which can be challenging. It is known in order for programs to work best in schools they need to be marketable, easily and rapidly disseminated and implemented—all while being cost effective.⁷ This is difficult to achieve in the school setting. Whatever the underlying reason, our finding that only a minority of successful tobacco control programs aim to prevent adolescent smoking suggests that more emphasis should be placed on development and testing of smoking prevention programs.

It is also valuable to note that the majority of the successful programs were aimed at a certain demographic. This finding is consistent with the principles of social marketing, which suggest that it is valuable to identify a specific sociodemographic audience on which to target a health promotion campaign.²³ Commercial marketing, from which social marketing was derived, uses a similar technique. In fact, the tobacco industry relies heavily on promoting their various products to specific markets in terms of gender, age, race, socioeconomic status, and psychographic profile.²⁴ It is possible that programs such as that tested in the Hutchinson Smoking Prevention Project, and other large programs that were not successful, may have been too broad in their attempted appeal.^{9,10} Successes of programs such as *Sembrando Salud*, *Pathways to Health*, *Native FACETS*, and *KATPP* suggest that new tobacco prevention programs may have to be more specifically targeted at those of particular demographic or psychographic profiles.

African Americans and Asians were poorly represented in these evaluations. Although these demographic groups seem to smoke less than Caucasians and Hispanics,² African Americans currently bear the greatest burden of morbidity and mortality due to

smoking.²⁵ For example, total mortality from lung cancer is 21% higher among African Americans than among Caucasians, and African American mortality from stomach cancer is 127% higher than that of Caucasians.²⁶ Epidemiological analyses have suggested that tobacco-related disparities between African Americans and Caucasians are so profound that reversing them could help eliminate all cancer disparities between these racial groups.²⁷ Thus, there is a need for antitobacco programming specifically targeted at this demographic.²⁸

Although 2 of these programs (*Pathways to Health* and *KATPP*) used regular classroom teachers to implement the curricula, the majority used trained community-based educators. *Sembrando Salud* used bilingual, bicultural college students who attended a weekly training on facilitating the program. Similarly, *Native FACETS* used community-based Native Americans trained to lead the intervention. Using instructors with whom students can relate on multiple levels may be a powerful way to reach students. *Project Toward No Tobacco Use* used professional health educators. Such trained professionals may be more knowledgeable than the average classroom teacher, may represent a positive change for students, and may increase implementation fidelity. However, it can also be expensive and difficult to sustain.

It is also important to note that the programs assessed highly variable outcomes, such as tobacco knowledge, refusal efficacy, attitudes, normative beliefs, and behaviors. This variety of outcomes presents a challenge in determining overall efficacy. Thus, it may be valuable for future researchers and practitioners to invest resources into standardizing outcomes.²⁹

These programs were all relatively brief. Even those with sessions beyond the initial programming period contained sparse additional sessions. This may be because it is challenging to develop, fund, and sustain extensively longitudinal programs.^{9,10} Indeed, although additional sessions are known to improve smoking prevention programs, the minority of tobacco control programs provide them.³⁰ Future research should continue to assess the benefits of additional sessions and to ascertain why they are not more commonly provided in tobacco control programming.

It is noteworthy that each of these programs was evaluated nearly a decade or more ago. The *RTIPs* program receives continuous updates. At the time of this writing, the program has added programs dealing with breast cancer screening prevention care management and use of direct mail to increase screening mammography. Thus, it is notable that these programs are relatively old. This is problematic because tobacco use patterns and promotions change quickly.^{31–33} In fact, many of the programs assessed

here were developed before the Master Settlement Agreement, which changed drastically the ways that tobacco is marketed. These programs may refer to tobacco billboards, for instance, yet tobacco billboards are no longer legal. They may refer to brands of cigarettes that no longer exist. New challenges to public health involve other types of tobacco. The major tobacco companies are now test marketing forms of smokeless tobacco (ie, “snus”) that were not available at the time these programs were developed.^{34,35} Similarly, studies have demonstrated increases in the use of waterpipe (ie, “hookah”) smoking over the past several years.^{36–38} It will be a great challenge to future tobacco control programs to actively update their programming; use of the internet and similar technologies may assist with this process. Additionally, future researchers may wish to follow more closely the dissemination of these programs. Although this is out of the scope of the current study, it would be a valuable direction for future research.

Limitations

This analysis relied on the NCI’s RTIP tobacco control database; thus, it is possible that this may not be an accurate representation of all available adolescent smoking prevention programs. However, this is unlikely, because (1) the RTIP program is prestigious and well known to the cancer control community and (2) programs are identified both by RTIP staff internally and by program developers externally. It is also a limitation that programs such as Life Skills Training, which did not devote more than 50% of its programming to tobacco use, were not assessed. Although this criterion was developed to focus on tobacco control programs, it may be valuable to soften this criterion in future analyses. One particular reason for this is that one of the most successful programs, Native FACETS, was only 50% focused on tobacco use.

CONCLUSIONS

In summary, this systematic review of adolescent smoking prevention programs finds that only 5 such programs were deemed successful by the NCI and that these were evaluated, on average, about a decade ago. Programs that were successful were generally targeted toward specific demographic groups, were conducted in schools, and often used professional health educators and/or trained community members. The lessons that these successful programs have provided may assist in the development of urgently needed new programs addressing current tobacco control issues.

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