

Teacher Perceptions of a Curriculum-Infused Tobacco Prevention Program for Grades 4 Through 6

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Abstract

This project assessed 1,336 Grade 4 - 6 teachers who attended a brief tobacco prevention workshop and received accompanying lesson plans and activities. Four weeks later, 889 answered follow-up questions. At follow-up they continued to rate tobacco prevention as very important, were significantly more likely to have taught a tobacco prevention lesson, and had more favorable attitudes about their preparation than at the initial workshop. Teachers who attended a tobacco prevention workshop were open to age-appropriate materials that are infused into existing curricula.

Tobacco use is the leading cause of preventable death in the United States (Surgeon General, 1994). The majority (82%) of daily smokers began smoking before the age of 18 (Centers for Disease Control and Prevention [CDC], 1994). Therefore, schools appear to be the ideal settings in which to provide tobacco-prevention programs to ensure that they reach the largest possible numbers of children and adolescents (CDC, 1994). The present study describes an initiative in a southern, rural state to infuse tobacco prevention materials into the standard curriculum of Grades 4 through 6 in a manner that was convenient for teachers and required no additional preparation time for them.

Several school-based tobacco-prevention programs have demonstrated positive results. Some of the successful programs involve teaching students about the role of social influence factors such as discussion of peer pressure and refusal skill training (e.g., Ary et al., 1990; Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995; Botvin, Baker, Filazzola, & Botvin, 1990; Elder et al., 1993). This model includes increasing students' awareness of social pressures to smoke, demonstrating specific assertiveness techniques, and helping to correct students' understanding of normative expectations about smoking (Botvin et al., 1990).

Other successful programs involve a combination of school programs and media involvement. Such programs have been successful with girls in Grade 8 (Worden et al., 1996), African-American students in Grades 6-7 (Kaufman, Jason, Sawlski, & Halpert, 1994), and northeastern and northwestern United States

students in Grades 5-10 (Flynn et al., 1992). Media components typically are designed to enhance the information presented in the school materials.

These programs, however, often focus on young adolescents, including students in Grade 7 (Botvin et al., 1995), Grade 8 (Botvin et al., 1990), Grades 6 through 9 (Ary et al., 1990), Grades 6 through 8 (Shope, Copeland, Marcoux, & Kamp, 1996), and Grades 7 through 9 (Elder et al., 1993). Only a few successful school-based tobacco-prevention programs target children younger than adolescence, even though the CDC guidelines specifically state that tobacco prevention education programs should be appropriately designed and implemented in grades Kindergarten through 12 (CDC, 1994). One time-intensive behavior management program targeted disruptive and aggressive behaviors in urban early elementary classrooms. Interventions involved 10-minute class programs at least three times per week for two years. In an overall analysis of the students' behaviors at age 14, boys (but not girls) who participated were less likely to have initiated smoking than those in a comparison classroom, which the authors believe was a byproduct of the behavioral management (Kellam & Anthony, 1998). Although successful, this program is probably unrealistic for the average school district with limited resources.

Additionally, these programs are time-intensive both in terms of the classroom time required and in terms of training leaders to facilitate the activities. They may require as many as 10 (Ary et al., 1990; Elder et al., 1993), 15 (Botvin et al., 1995) or even 20 (Botvin

et al., 1990) classroom sessions devoted to tobacco/drug use. For example, one program involved middle school and junior high students and their parents attending 6 evening sessions that lasted 2.5 hours each (Pilgrim, Abbey, Hendrickson, & Lorenz, 1998). Further, teachers may be required to give up their own time for extensive training sessions that last as long as a full day (Basen-Engquist et al., 1994; Botvin et al., 1995; Flynn et al., 1992; Shope et al., 1996). Alternatively, outside staff may be required to lead the tobacco-prevention lessons (Elder et al., 1993; Price, Beach, Everett, Telljohann, & Lewis, 1998) or observe/supervise some of the teacher-led sessions (Ary et al., 1990). Thus, successful tobacco-prevention programs seldom are focused on children in elementary school, and are typically time-intensive.

Additionally, health is not usually part of elementary teacher preparation (Mississippi Department of Education, 1996), nor is it generally a specific formal course taught to students at the elementary level. Therefore, an age-appropriate curriculum-infused model where the materials are based on state standards in social studies, language arts, arts, and mathematics could be a time-efficient and effective method of introducing tobacco prevention.

At the Kindergarten through Grade 3 level, the present authors initiated one such program that offered teachers a one-hour workshop and provided them with lesson plans and activity materials. To increase exposure and presumably effectiveness, the materials contained mascots and themes commensurate with media advertisement being shown throughout the state. Four weeks after training, teachers were more likely to report that they actually taught a tobacco-prevention lesson than they had been prior to the workshop. Further, their assessment of their own skills and knowledge to deliver such lessons was more positive than it had been four weeks earlier (Carver, Reinert, Range, & Campbell, 2000b).

To address students in Grades 4 through 6, a similar program (Students Working Against Tobacco [SWAT]) was developed that was age-appropriate, fit the late elementary curriculum, and was consistent with the local anti-tobacco media campaign. The purpose of the present study was to evaluate teachers' responses to this program.

The attitudes and perceptions of teachers are important for several reasons. First, school-based tobacco prevention efforts cannot be implemented without teacher cooperation. Second, teacher commitment and self-efficacy are related to initiation

and maintenance of tobacco prevention programs. In particular, teachers' level of personal involvement (defined as willingness to attend training sessions and become active in tobacco prevention efforts) predicted their willingness to continue implementing the program (Gingiss, Gottlieb, & Brink, 1994). Third, educational curricula are already full. Therefore, a successful program would be one that involved only a limited time commitment on the part of the teachers.

The present school-based intervention was one component of a statewide tobacco-prevention effort in a largely rural state. The Partnership for a Healthy Mississippi, a nonprofit organization formed with the assistance of tobacco settlement funds, funded the development of lesson plans and activities specifically for children in Grades 4 through 6. Therefore, the tobacco-prevention materials could be infused into the teachers' existing curricula rather than being added as a separate program. The present goal was to assess teachers' beliefs about tobacco prevention for their classroom, their actual practice with the provided tobacco prevention lessons, and their experience with other school-related tobacco prevention efforts.

Method

Participants

Participants initially were 1,336 teachers of children in Grades 4 through 6 in one southeastern state who attended a tobacco prevention workshop (all who attended completed the initial questionnaire). Most were women (1,260, 94.3%); and, a substantial minority were African American (387, 29.0%), though most were Caucasian American (925, 69.2%). These proportions are similar to those in the entire state (Mississippi Department of Education, 1996).

On average, present teachers ranged from 11 to 15 years of teaching experience. A few (64, 4.8%) reported that they currently use tobacco. Note, a few teachers did not answer all questions, so that total percentages are slightly less than 100%. A Follow-up Questionnaire was mailed to the teachers four weeks after the workshop. A total of 889 of these teachers completed the Follow-up Questionnaire, yielding a return rate of 66.5%.

Materials

Teachers completed a demographic information sheet that was used for reimbursement. Demographic information was kept separate from the Initial and Follow-up Questionnaires to preserve anonymity.

An *Initial Questionnaire* (Carver et al., 2000b) included the teacher's school, school district, county,

grade, years of teaching experience, gender, ethnicity, and, eight items about the teacher's present tobacco curriculum. These items asked, in a Yes-No format, whether teachers (a) thought it was important to teach anti-tobacco lessons in grades 4-6, (b) had taught any lessons in 1999 in tobacco prevention, and (c) felt that they had the appropriate knowledge base to teach tobacco prevention. Other items asked whether the school had any special tobacco prevention activities in 1999, had an existing tobacco free policy; and, whether a school nurse had conducted any tobacco prevention activities during 1999. Open-ended questions asked for clarification of the Yes/No answers, and, what would be the best way to develop teachers' knowledge base, what types of additional information they would need for tobacco prevention, and if their school or class had any tobacco prevention activities during 1999 that involved parents and families. This questionnaire has been used in other investigations of the impact of tobacco prevention (Carver et al, 2000a; Carver et al., 2000b).

The *Follow-up Questionnaire* (Carver et al., 2000b) contained the same items, as well as additional items about the impact, if any, of the tobacco-prevention workshop.

In terms of the *Workshop Agenda*, workshop leaders introduced themselves, described the statewide nonprofit tobacco-prevention organization, and briefly explained why teachers are essential to this statewide effort. After that, teachers completed the demographic questionnaire. Next, the workshop leader gave each teacher a notebook containing 12 lesson plans, and learning materials sufficient for 30 students. Then, for the bulk of the workshop, the leader guided the teachers through one of the lesson plans using an interactive format. Next, the leader provided a toll-free number for teachers to call if they had any questions or requests, and explained where they might get additional tobacco facts. Finally, teachers anonymously completed the *Initial Questionnaire*.

Lesson Plans provided the grade level, subject areas, theme, objectives, materials, a one- or two-sentence introduction, and a one-paragraph description of the activity. They were specifically designed to be appropriate for Grades 4 through 6 and to be consistent with state education requirements in language arts, reading, science, math, health, social studies, or some combination of these areas. Further, they were consistent with CDC Guidelines that programs to prevent tobacco use and addiction provide instruction about (a) the short- and long term negative physiological and social consequences of tobacco use,

(b) social influences on tobacco use, (c) peer norms regarding tobacco use, and (d) development of refusal skills (CDC, 1994). Activities included 10 worksheets, often combined with small group discussions, and two additional small-group activities that did not involve worksheets, one involving a tobacco-prevention play and another involving role-playing refusal skills.

For example, Activity #3 was appropriate for Grades 4 through 6 in the language arts and science subject area, and had a theme based on the physical effects of tobacco. Materials needed for the activity included a chalkboard or overhead projector and a crossword puzzle worksheet. The teachers wrote this phrase on the overhead: "Smoking is bad for me because ___," then asked students to complete the phrase in their notebook and share their answers. Next, the teacher distributed the crossword puzzle worksheet, gave students time to complete it, and went over it with them.

Procedure

As was done with the teachers in Kindergarten through grade 3 program (Carver et al., 2000b), the investigators accessed the Mississippi Department of Education website for information about public school districts. Then, an investigator called the main office of one randomly selected school per district to schedule a tobacco-prevention workshop. Every school agreed to host a workshop, which occurred after regular school hours. Many of these schools had previously hosted a workshop for teachers in Grades K through 3.

After scheduling the workshop, the investigators called the principals of all other elementary public schools in that district to inform them about the workshop and invite all their Grade 4 through 6 classroom teachers to attend. The investigators faxed a follow-up letter to each host school and each invited school with all details about the workshop.

Workshops ranged in size from 15 to 30 teachers, with the average approximately 23 teachers. Workshops lasted one hour, and were held immediately after school hours throughout the fall of 1999. Teachers received a reimbursement of \$40 for volunteering their time. They were told that this reimbursement would be mailed to them after they completed the Follow-up Questionnaire and returned it to the trainer.

Four weeks after the training workshop, teachers were mailed the Follow-up Questionnaire, which was coded so that the investigators could identify non-respondents. Two weeks later, a prompt letter with a second copy of the Follow-up Questionnaire was mailed to non-respondents. After an additional two weeks, a third prompt letter and Follow-up

Questionnaire was mailed to the remaining non-respondents.

Results

Teachers who completed the Follow-up Questionnaire were not significantly different from those who completed the Initial Questionnaire in the proportion of women to men, the proportion of ethnic minorities, or in their average number of years teaching experience. Note, some teachers skipped questions, so that numbers are slightly less than 100%.

Beliefs. On both Initial and Follow-up Questionnaires, these teachers overwhelmingly believed that it is important to teach tobacco prevention lessons in Grade 4 through 6 (99.0% at Initial and 98.7% at Follow-up). On the Initial Questionnaire, when asked whether they need additional knowledge and skills to teach tobacco prevention, 853 teachers (63.8%) said yes, 218 (16.3%) said no, and 214 (16.0%) said that they did not know. By the Follow-up Test, 318 (38.5%) said yes, 378 (42.5%) said no, and 168 (18.9%) said that they did not know. The proportion of teachers who said yes on the Initial Questionnaire was significantly lower than the proportion who said yes on the Follow-up Questionnaire, $z = 12.05, p < .001$. Thus, over 60% of

teachers felt unprepared after the initial workshop, but only about 40% felt unprepared to teach tobacco prevention by follow-up.

At Follow-up, a total of 481 teachers answered an open-ended question about what additional materials they needed for class. Frequently mentioned materials included videos (157, 17.7%), brochures (65, 7.3%), and software (77, 8.7%). See Table 3. A total of 281 teachers answered an open-ended question about barriers to incorporating the SWAT materials into their curriculum. The barriers they mentioned were time (107, 12.1%), difficulty level (14, 1.5%), or other barriers (3.8%). A total of 125 (14.1%) said that they planned to use the materials.

A few of the Follow-up Questionnaires contained up an open-ended question about whether tobacco-prevention activities make a difference in the knowledge or attitudes of their students. Of the 242 teachers who were given this question, 236 (97.5%) said yes. Also, a few Follow-up Questionnaires ($n = 306$) asked whether teachers had used a toll-free number for questions or additional materials. Only 4 (.4%) said yes, but an additional 55 (6.2%) said that they were not aware of a toll-free number.

Table 1. Frequency (and Percentage) of Teachers Using Specific Workshop Activities (N = 889)

Activity	Frequency	%	Grade Level	Subject Area
1. Decision Story	369	41.5	4 – 6	Language Arts, Writing, Reading
2. Word Search + Vocabulary Building	363	40.8	6	Spelling, English, Reading
3. Crossword Puzzle	347	39.0	4 – 6	Language Arts, Science
4. Tobacco Ads Worksheet	172	19.3	5 – 6	Social Studies, Math
5. Tobacco Cost Word Problems	236	26.5	4 – 6	Math
6. Word Search + Vocabulary Building	208	23.4	4 – 5	Health, Language Arts
7. Lungs Worksheet	128	14.4	6	Science
8. Math Worksheet	127	14.3	5 – 6	Math
9. You Are in Control Worksheet	106	11.9	4 – 6	Language Arts, Writing
10. Make Your Own Decisions Worksheet	118	13.3	5 – 6	Language Arts, Writing, Reading
11. Refusal Skills Skit	50	5.6	4 – 6	Social Studies, Art, Reading/English
12. Tobacco Dialogue	32	3.6	4 – 6	English

Table 2. School-based Tobacco-Prevention Activities

Activity	Number of Teachers Reporting This Activity			
	Initial Test (N = 1336)		Follow-up Test (N = 889)	
	# at Initial	%	# at Follow-up	%
Assembly	4	.3	11	1.2
Contest	31	2.3	44	4.9
DARE	80	6.0	36	4.0
Special Weeks	186	13.5	120	12.4
Films	35	2.6	13	1.5
Fairs	61	4.6	55	6.2
Speakers	113	8.5	122	13.7
SWAT	58	4.3	49	5.5
Other	114	8.5	238	14.4

Practices. Did the teachers use the tobacco prevention materials? Initially, 59.1% of these teachers reported that they had taught at least one tobacco-prevention lesson. On the Follow-up Questionnaire four weeks later, 74.2% reported that they had taught at least one of the tobacco-prevention lesson from the workshop. These two proportions are significantly different, $z = 9.94$, $p < .001$. Also, at Follow-up, 22.9% of the teachers reported that they had used all the tobacco prevention activities. When the other teachers were asked to specify the activities that they used, teachers were most likely to report using the decision story, the word search, or the crossword puzzle. About 40% of teachers endorsed each of these activities. Slightly less, 10 to 25%, endorsed the middle seven activities. Least endorsed (5 and 3%) were the final two activities, the refusal skit and the tobacco dialogue. Note, these last two activities had no accompanying materials. See Table 1.

Experiences. In terms of contact with other school-related tobacco prevention efforts, most teachers reported that their school *had* a tobacco-free policy. On the Initial Questionnaire, 1171 (87.6%) said that their school had this policy, on the Follow-up, 754 (84.8%) said that their school *enforced* this policy [Note, on this item, the wording was slightly different from Initial to Follow-up Questionnaire.]. A z test indicated that these proportions are not significantly different ($p = .10$)

On the Initial Questionnaire, 65.1% of teachers reported some school tobacco-prevention activities. On

the Follow-up Questionnaire four weeks later, 73.1% reported school tobacco-prevention activities. These two proportions are significantly different, $z = 3.98$, $p < .001$. The activities varied, with a special week, such as Drug Awareness week or Drug Prevention week, being one of the most frequently reported school activities (13.5% on the Initial Questionnaire, 12.4% on the Follow-up Test). Note, a few teachers reported SWAT activities even on the Initial Questionnaire (4.3% Initial, 5.5% on Follow-up). See Table 2.

When asked if the school nurse conducted any tobacco-prevention activities at school, 366 (27.5%) on the Initial Questionnaire said yes, 618 (46.3%) said no, and 264 (19.8%) said that they had no school nurse. On the Follow-up Questionnaire, a z test indicated that the proportions were not significantly different: 262 (29.5%) said yes, 398 (44.8%) said no, and 179 (20.1%) said that they had no school nurse ($p = .22$).

Table 3. Additional Materials Needed (n = 481)

Materials	Number	Percentage
Videos/Films	157	17.7
Facts/Brochures	65	7.3
Software	77	8.7
Smoking Dolls	33	3.7
Other	149	16.6

Note. These responses occurred on an open-ended question on the Follow-up Questionnaire.

Discussion

Present results indicate that, after attending a workshop on tobacco prevention and implementing lesson plans and materials that were infused into the regular curriculum, a large sample of teachers in Grades 4 through 6 had improved anti-tobacco beliefs, and some improved behaviors and experiences. Teachers attending a workshop in the fall of 1999 overwhelmingly believed that it is important to teach tobacco prevention lessons in Grades 4 through 6. Further, teachers in this study overwhelmingly believed that tobacco-prevention makes a difference in the knowledge and attitudes of their students. Similarly, more than three quarters of a national sample of teachers of Grades 2 and 3, believed that students would be positively affected by tobacco prevention programs (Perry-Casler et al., 1997). In several different samples, elementary teachers believe that tobacco prevention is important and does make a difference in their students' lives.

Further, at the initial workshop, when asked whether they felt prepared to teach tobacco prevention, one third of teachers said either yes or “don’t know.” Four weeks later, after they had been given the materials and had a chance to use them, half of teachers gave these two answers. Apparently, some participating teachers changed in their comfort level with regard to teaching tobacco prevention after implementing the materials received in the workshop.

However, in terms of behaviors, only slightly over half (59.1%) of these teachers had actually taught any tobacco-prevention lessons prior to the workshop. In comparison, a little over two-thirds (68%) of a random national sample of teachers in Grades 2 and 3 reported teaching tobacco prevention three out of the past three years (Perry-Casler, Price, Telljohann, & Chesney, 1997). Thus, these teachers initially were somewhat less likely to have taught tobacco prevention than Grade 2 and Grade 3 teachers in a national random sample. However, four weeks after the tobacco-prevention workshop, three-quarters of these Grade 4 through 6 teachers (74.2%) reported that they had taught tobacco-prevention lessons. Teachers were very willing to incorporate these infused materials into their fourth through sixth grade curricula.

When asked about their tobacco prevention experiences, some changes occurred from Initial to Follow-up Questionnaire. With regard to a school tobacco-free policy, there was a slight decrease from the Initial Questionnaire to Follow-up (87.6% to 84.8%). This difference is probably due to the wording of this question, which changed from does your school **have** a policy to does your school **enforce** a policy.

When asked whether their school had had any tobacco prevention activities, 65% of the teachers on the Initial Questionnaire and 73% at Follow-up said yes. This increase may be due to the fact that school had an additional month to provide such activities, or to the fact that the teachers had initiated some activities, or to the fact that teachers were sensitized to tobacco prevention activities by attending the workshop. Further, teachers may not have been aware of all school tobacco-prevention activities. Also, it is possible that other activities, rather than the present workshop, made a difference in teachers’ attitudes and behaviors.

The fact that the proportion of school nurses who provided tobacco-prevention stayed relatively constant (27.5% on the Initial Questionnaire, 29.5% at Follow-up) provides limited evidence of validity for the questionnaire. School nurses for the most part did not attend the workshop, so would not be expected to

change in their tobacco-prevention behavior and attitudes. Note also that teachers may have been unaware of what activities the school nurse might have led, the present study merely assessed teacher perceptions. The fact that about a fifth of the teachers reported that their school had no school nurse means that it is even more important that teachers provide health education including tobacco prevention.

On the open-ended question about barriers, only about one third of teachers responded. The most frequently mentioned barrier was time, with about 10% of the total number of teachers mentioning this barrier. Given that teachers are very busy, and that the workshops occurred near the end of the year, this proportion seems low. Another 15% of teachers on the question about barriers mentioned plans to incorporate these materials in the future, which was not a direct answer to this question, but probably reflected their actual plans.

Limitations and strengths. One limitation of the present project was that follow-up occurred only four weeks after the initial workshop, which was near the end of the year. A longer follow-up period, or an additional follow-up perhaps one year later, would show whether teachers retained these positive attitudes and whether they incorporated the materials the next year. Also, this study only examined teachers’ willingness to include tobacco prevention activities into their classroom instruction. It would be of utmost importance to conduct follow-up studies to determine if this willingness impacted students’ current or future smoking behaviors. Further, it is possible that the teachers who were most likely to implement the curricula were most likely to complete the follow-up questionnaire, though the variability on that item suggested that the follow-up group was representative of the entire sample.

One strength of this study is the large sample (1,336), and the high return rate at one-month follow-up (66.5%). Also, the relatively brief hands-on workshop for teachers, and the age-appropriate, curriculum infused lesson plans for their students, meant that the materials were actually implemented. Further, the fact that the workshop and materials were coordinated with statewide media efforts meant that the materials were presented in different modalities, a facet that was designed to strengthen their impact.

Present teachers were responsive to this tobacco-prevention training, and after attending one brief workshop changed their behavior as well as their attitudes. Perhaps one reason for the favorable

responses was that the training had several inherent advantages for them. One, training incorporated tobacco-prevention lesson plans and activities into present state requirements in various subject areas. Two, training was brief, was timed to occur directly upon completion of the school day, was conducted at their school or one nearby, and was consistent with scientific knowledge as well as media messages. Three, teachers were reimbursed for their time.

Still another possible reason for the favorable responses was that present teachers were already more favorably disposed toward tobacco prevention than a cross-section of the adults in this rural state. Only about 5% of these teachers reported that they currently used tobacco. This percentage is much lower than the actual percentage of adults who admit that they smoke, which in 1998 in Mississippi was 24.1% (CDC, 1998). Finally, it is also possible that other activities in the community or the media influenced the teachers to be more favorably disposed to tobacco prevention at follow-up.

School-based tobacco prevention is well accepted by teachers in Grades 4 through 6, but in one rural state in 1999, they did not feel prepared to teach it. However, present results indicate that a brief workshop plus accompanying materials that were age-appropriate, coordinated with media messages, and infused into their existing curricula made a real impact on teachers. Therefore, the present program shows how CDC guidelines of beginning tobacco prevention in elementary school (CDC, 1994) could be accomplished in an efficient and cost-effective manner.

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