

Sustained Effects of an Educational Program to Reduce Sales of Cigarettes to Minors

ABSTRACT

We report 1-year follow-up data from a sample of stores participating in a 6-month community-wide educational effort to reduce cigarette sales to minors in Santa Clara County, California. The proportion of over-the-counter sales to minors at the 1-year follow-up illustrated that although statistically significant reductions were maintained 6 months after the intervention ended, recidivism occurred. Suggestions for achieving long-term reductions in sales to minors are offered. (*Am J Public Health*. 1991;81:891-893)

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Introduction

Although there are many factors that influence the decisions that adolescents make to initiate or continue smoking, one that has received only recent attention is access to tobacco. Few smokers begin smoking after their teenage years, and the earlier a young person begins using tobacco, the less likely it is that he or she will be able to quit later.¹ Access to tobacco is conducive to developing and maintaining a tobacco addiction. In field trials around the country, minors' attempts to purchase tobacco from stores and vending machines have been successful more than 50% of the time.²⁻¹⁰ A survey of 10th graders in two Minnesota communities found a wide diversity of locations from which tobacco had been purchased.¹¹ In the United States, 947 million packs of cigarettes worth \$1.23 billion are sold illegally to minors each year, and the tobacco industry derives 3% of its profits (\$221 million) from such sales.¹²

Although most states have laws regulating sales to minors, these laws are rarely enforced.^{5,7,13-16} An analysis of 11 active state and local enforcement efforts and 1 200 interviews with health experts, students, parents, and vendors from 18 states found that although 44 states and the District of Columbia have laws prohibiting the sale of tobacco to minors, only 32 violations in 5 states were documented.¹³

Previously, we reported the 6-month effects of a comprehensive merchant and community education program to reduce cigarette sales to minors.² One-year follow-up data are reported here.

Methods

In January 1988, 412 diverse stores in Santa Clara County, California that sold

cigarettes over the counter and 30 outlets that had cigarette vending machines were visited by minors aged 14 to 16 years. In July 1988, after several months of intervention, which included comprehensive community education, direct merchant education, and contact with chief executive officers of chains and franchises, all stores were revisited by minors. Although the interventions concluded in July 1988, we wanted to assess their sustained effects. The primary data reported here were collected in January 1989, 1 year after the posttest and more than 6 months after the intervention ended. At this follow-up, a random sample of 25% of stores that sold tobacco over the counter, stratified by city ($n = 7$) and type of store (chain, franchise, independent), was selected and those that were still in business were visited by minors ($n = 97$). Because a new state law enacted in January 1989 made it illegal for minors to purchase tobacco, we obtained letters from local law enforcement officials allowing teenaged boys and girls to conduct this follow-up without being arrested.

Results

Statistically significant reductions from pretest to follow-up were generally

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TABLE 1—Cigarette Sales to Minors

	Pretest (all stores)	Pretest (stores with pretest and 1-year data)	6-Month Posttest (all stores)	1-Year Follow-up	P Value	% Change Pretest to 1-Year Follow-up and 95% CI ^{a,b}
All stores	74% (412) ^c	76% (97)	39% (408)	59% (97)	.01	-18% (-4%, -31%)
Chain stores	62% (174)	70% (40)	27% (174)	58% (40)	NS ^d	-13% (11%, -36%)
Franchise stores	81% (110)	82% (28)	50% (110)	50% (28)	.02	-32% (-5%, -59%)
Independent stores	85% (121)	79% (29)	47% (121)	69% (29)	NS	-10% (10%, -31%)
Gas stations	84% (50)	91% (11)	55% (50)	55% (11)	.10	-36% (7%, -80%)
Liquor stores	83% (103)	87% (23)	46% (103)	65% (23)	.06	-22% (1%, -44%)
Convenience stores	81% (103)	82% (28)	48% (103)	54% (28)	.03	-29% (-2%, -55%)
Pharmacies	60% (67)	53% (15)	28% (67)	53% (15)	NS	0% (-37%, 37%)
Grocery stores	60% (89)	65% (20)	22% (89)	65% (20)	NS	0% (-34%, 34%)
Sale to male minor	71% (180)	80% (70)	35% (87)	53% (70)	<.001	-27% (-11%, -43%)
Sale to female minor	77% (122)	65% (26)	47% (73)	77% (26)	NS	12% (-16%, 39%)
Warning sign posted	3% (13)	1% (97)	23% (92)	25% (97)	<.001	24% (14%, 34%)
Minor asked age	24% (100)	21% (96)	48% (196)	34% (96)	.05	14% (0%, 27%)

^a% change equal to % in pre-test minus % in 1-year follow-up (% rounded).
^b95% confidence interval was calculated for change by using sample with data at pretest and 1-year follow-up.
^cThe number of stores for each variable is provided in parentheses.
^dNS indicates a significance level greater than .10.

obtained even though sales increased between posttest and follow-up. Table 1 presents pretest, 6-month posttest, and 1-year follow-up data. Pretest data are provided for the entire sample of stores and for the sample of stores visited at both pretest and 1-year follow-up. The McNemar nonparametric test for the significance of changes and confidence intervals were calculated on the difference in percent change between pretest and 1-year follow-up for stores with both pretest and 1-year follow-up data.¹⁷

Discussion

There are discrepancies between what boys and girls are taught in school-based prevention programs and what they observe and experience outside of the classroom. In the classroom, they are told not to smoke, yet in the community, adolescents observe an abundant supply of tobacco, a willingness on the part of merchants to sell them tobacco, a lack of enforcement of laws regulating sales to minors, and very little evidence that society views the problem as a priority. Changing this discrepancy should be a public health priority.

The data reported here illustrate that a comprehensive merchant and community education campaign can achieve sustained effects in reducing sales to minors. However, without continued intervention, monitoring, and we now believe, sanctions, recidivism will occur. Because we wanted to test explicitly the effectiveness of a purely educational intervention,

we did not encourage law enforcement to cite stores that sold tobacco to minors. Follow-up data reported here as well as data from other projects that utilized the sanctions of enforcement convince us of the importance of combining education of merchants and the public with the bite of enforcement.^{18,19} The experience of the Solano County Cancer Prevention Program in California¹⁹ suggests, that communities will respond more favorably to punitive enforcement efforts if educational interventions are implemented first. Once nonpunitive educational interventions relying on merchants' voluntary compliance are implemented and illegal sales are not reduced entirely, enforcement becomes a more acceptable option. Preceding enforcement with education also allows merchants an opportunity to change their business practices without the immediate threat of punishment.

It is reasonable to hypothesize that if minors have a difficult time obtaining tobacco, then they may be prevented from experimenting with and later becoming addicted to it. Along these lines, studies of school smoking policies have found that making smoking inconvenient may reduce tobacco use by adolescents.²⁰⁻²² Without doubt, there will always be some tobacco use by adolescents, just as there is illegal use of marijuana, crack, and other hard drugs. But the more risk young people must take to obtain tobacco and the more societal norms reject tobacco use by young people, the greater the likelihood that young people will not use tobacco. It is also reasonable to ask whether interventions to reduce tobacco

sales to adolescents will actually reduce access or simply change where access occurs. Unless sales to adolescents are totally stopped, which is unrealistic in most communities, adolescents who really want tobacco will be able to get it. If, however, community norms and merchant practices about sales to adolescents are applied consistently and comprehensively, we predict that access will truly be reduced. As this study and others have shown, educating the community, merchants who sell tobacco, public policymakers, and law enforcement officials can contribute to reducing the sale of tobacco products to minors.

The 1990s will undoubtedly be a landmark decade for eliminating minors' access to tobacco now that communities around the country have begun addressing the problem. For example, in 1990, research in Minnesota resulted in national attention when dozens of communities throughout the state passed ordinances restricting minors' access to vending machines (Jean Forster, University of Minnesota, personal communication, 1990). The US government also has spoken out on the problem. In May 1990, HHS Secretary Sullivan recommended model state legislation to control minors' access.^{14,15} These recommendations dealt with retail licensing, minimum age, graduated penalties for illegal sales, warning signs, enforcement, and vending machines.

Our research suggests that although long-term effects of comprehensive educational programs to reduce tobacco sales to minors can be achieved, interventions must

be sustained and rely on multiple intervention strategies. Future intervention research should address minors' access to smokeless tobacco, challenges of intervening in densely populated urban areas, the effectiveness of education combined with enforcement and policy change, the sustainability of intervention effects, and the relationship between reducing tobacco access and youth tobacco use. □

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Hormone-PMS Relationship More Complex Than Previously Thought

Contrary to popular belief, a new study suggests that premenstrual syndrome (PMS) is not simply related to changes in the levels of reproductive hormones that occur during the premenstrual phase of a woman's cycle. Instead, PMS may be triggered by reproductive hormonal events, as yet unidentified, occurring before the premenstrual phase, or it may be the result of a cyclic mood disorder that is synchronized with (but not caused by) the menstrual cycle.

An estimated 5% of American women are affected by PMS and experience behavioral, emotional, and physical symptoms severe enough to impair their social or occupational functioning. Symptoms include sadness, irritability, anger, tension, loss of energy, and changes in appetite and sleeping patterns.

The study entitled "Lack of Effect of Induced Menses on Symptoms in Women with Premenstrual Syndrome," which appeared in the April 25 issue of the *New England Journal of Medicine*, was conducted by researchers at the National In-

stitute of Mental Health (NIMH) and the National Institute of Child Health and Human Development, in Bethesda, Maryland. NIMH scientists Peter J. Schmidt, MD, and David R. Rubinow, MD, headed the investigation.

The study helps explain why hormone therapy attempting to correct a presumed abnormality during the premenstrual phase is not effective in treating PMS. The findings are consistent with results from previous studies showing the inefficacy of therapy with the hormone progesterone.

"This important study dramatically alters our understanding of and treatment approaches for PMS. It provides valuable new information about the disorder and will stimulate further research to help the millions of women suffering from PMS," said Alan I. Leshner, PhD, NIMH acting director. "Scientifically, the fact that the hormone-PMS relationship is not as simple as previously believed makes PMS a useful model for understanding the very complex relationship between biology and behavior."