Smoking Education Programs 1960–1976

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Abstract: This paper is a review of published reports, in English, of educational programs designed to change smoking behavior.

Attempts to change the smoking behavior of young people have included anti-smoking campaigns, youth-to-youth programs, and a variety of message themes and teaching methods. Instruction has been presented both by teachers who were committed or persuasive and by teachers who were neutral or presented both sides of the issue. Didactic teaching, group discussion, individual study, peer instruction, and mass media have been employed. Health effects of smoking, both short- and long-term effects, have been emphasized. Most methods used with youth have shown little success. Studies of other methods have produced contradictory results.

Educational programs for adults have included large scale anti-smoking campaigns, smoking cessation clinics, and a variety of more specific withdrawal methods. These methods have included individual counseling, emotional role playing, aversive conditioning, desensitization, and specific techniques to reduce the likelihood that smoking will occur in situations previously associated with smoking. Some of these techniques have produced poor results while studies of other methods have shown inconsistent results. The two methods showing the most promise are individual counseling and smoking withdrawal clinics. (Am. J. Public Health 68:250–257, 1978)

Since the release of the Surgeon General's Report on Smoking and Health in 1966, public health workers have emphasized cigarette smoking as a health hazard of major importance. Three world conferences on smoking and health have been held and the National Clearinghouse for Smoking and Health was established. The American Cancer Society, the American Heart Association, the American Lung Association, and numerous other voluntary and public health agencies have initiated a wide variety of anti-smoking campaigns.

Although some programs have employed such non-educational techniques as hypnosis and tranquilizers, most have recognized the need for educational interventions. These interventions have been designed to discourage non-smokers from adopting the habit and to encourage smokers to cut down or quit. The educational methods have included traditional techniques such as group discussion as well as more unusual methods like emotional role playing. A great deal of experimentation with educational programs has occurred.

In 1976, when the Public Education Section of the American Cancer Society began deliberations on the direction its smoking education programs should take in the coming years, it had a survey of the literature done. This survey was focused on reports of educational programs designed to change smoking behavior—programs that had actually been tried. Thus reports of programs which were solely concerned with changes in knowledge and/or attitudes were not included nor were articles which did not describe the actual implementation of a smoking education program. Reports of attempts to change smoking behavior which employed medication, hypnosis, psychotherapy, sensory deprivation, electric shock, and other conditioning mechanisms which relied on elaborate equipment were all omitted. Formal school health education curriculum guides and campaigns which relied solely on mass media were also excluded. Only English language publications were included.

The survey extended from 1960 through 1976 and was based largely on citations in *Index Medicus* and the *Bibliography on Smoking and Health* published by the National Clearinghouse for Smoking and Health. Previous bibliographies and review articles[1–14] were included in the survey. This report is based on that survey.*

The framework within which these studies are discussed emerged from the data. Once the survey was completed, the data were examined and a dichotomy became apparent. Some studies dealt with programs for youth and some with programs for adults. Rarely were both age groups included in one educational program. Programs designed for youth fell into four general categories—school-wide anti-smoking campaigns, youth-to-youth programs, comparisons of teaching methods, and studies of the relative effectiveness of various message themes. These categories are not mutually exclu-

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sive, e.g., one study may have compared teaching methods and message themes. A fifth category contains a single example of a program directed to adolescent workers. The programs aimed at adults fell into three major categories—community-wide campaigns, smoking clinics, and studies of specific withdrawal methods. The three major withdrawal methods studied were individual counseling, emotional role playing, and various types of conditioning experiments.

Although the emphasis in this review is on the methods employed in the smoking education programs, a brief word about the more common theoretical concepts underlying the programs is in order. Attempts to use social pressure and support, especially from peers, to bring about behavioral change were seen in campaigns which tried to develop an anti-smoking climate, in clinics which relied on group support and a buddy system, in peer teaching programs, and in school non-smokers' clubs. Many of the programs employed the educational principle that the learner should be actively involved in the process of learning not to smoke, for example, by monitoring his/her own smoking behavior, by engaging in discussion groups, by participating in role playing sessions, and by teaching others about the negative side of smoking. A number of smoking cessation programs were based on the theory that smoking behavior is a conditioned response to various stimuli and that it can be eliminated by a new conditioning process. This was seen, for example, in the many programs in which smokers were taught to associate something unpleasant with smoking. The majority of the programs seemed to accept the premise that man is a rational being and that he will act in his own best interest. This was apparent in all categories of youth and adult programs which emphasized the health, social, and/or economic costs of smoking. There were, of course, many more theoretical concepts underlying the programs, but these were four of the most common.

Programs for Youth

School Campaigns

Multi-method campaign approaches to students have generally been ineffective in changing smoking behavior. Typically these campaigns have employed some combination of the following techniques: discussions, lectures, demonstrations, assemblies, posters, pamphlets, films, articles in the school paper, and the use of resource people. Programs varied in length from one week to several years and included elementary school through college aged youth. Most programs had no significant depressant effect on smoking habits.[15–25]

Some campaigns aimed at youth have claimed a modicum of success in changing attitudes and/or behavior.[16, 20, 26–28] A year-long program in Maine high schools[16, 20] had no effect on smoking habits but did change attitudes in a desired direction. Watne, et al., report that after a seven-week educational program for medical, dental, pharmacy, and nursing students, 18 per cent of the smokers had quit and attitudes had shifted in the desired direction. No follow-up was done.[28]

Youth-to-Youth Programs

Probably the most commonly reported type of youth program has been that in which junior or senior high school students plan and carry out educational activities for their peers or for students in a lower grade.[29–38] Typically these reports describe the activities carried out but include no evaluation of their effectiveness, presumably because no evaluation was done.

One program which did build in an evaluation mechanism was the Saskatoon smoking study. Eighth grade student leaders from 32 schools attended a regional seminar on smoking and health and then returned to their respective schools to plan and execute smoking programs of their own. After two years there was no significant difference between the smoking habits of students who had been exposed to the student-directed education and students who had not.[34, 37, 38]

Teaching Methods

These studies tend to compare the effectiveness of several methods with each other in a pretest-posttest design but vary in other respects. Some employed a control group,[39–41] but most did not.[42–46] Several different measures of success were used. However, the amount of behavior change measured, whether statistically significant or not, appeared to be small.

Crawford compared the effectiveness of three methods of teaching about smoking and health. In the committed teacher approach the teacher let the students know she felt smoking was undesirable. In the neutral approach the teacher tried to conceal her feelings about smoking. In the incidental approach the effects of smoking were related to other topics in five short incidents during the semester. In terms of increased knowledge, the committed approach was the most successful, followed by the neutral approach. The committed approach was the only one to consistently alter opinions in a healthy way. None of the methods were correlated with behavior change.[39, 40]

Watson reported a study in which four methods of teaching were assessed for their ability to change behavior, attitudes, and knowledge. The four were a didactic approach, group discussion, psychological persuasion, and a combination of all three. It was found that where a method scored best in one area it was less successful in others. The didactic approach was most successful in changing behavior. The combination approach was best at improving knowledge. Attitudes were most affected by psychological persuasion. Group discussion was a close second in all three areas and was considered the most promising method.[41]

Another study investigated the effects of three teaching methods—teacher led, peer led, and individual study—on the knowledge and attitudes of seventh grade students. The individual study method was most effective and the peer led was least effective. However, since class size varied from 19 to 71 and was not controlled, there may well have been an interaction effect between class size and method. This study also indicated that the regular classroom teachers were more effective than visiting teachers who were specialists in smoking and health.[45]

Two studies have compared the effectiveness of three approaches to anti-smoking education—presenting both sides of the issue, encouraging students to take an adult role, and presenting material in an authoritarian manner. Horn found the two-sided message more effective while the other two approaches resulted in no more behavior change than occurred in the control group.[44] Creswell, et al., however, found the adult role-taking method most effective and the two-sided approach least effective.[42, 43]

Merki, et al., compared mass media and student centered approaches to teaching and found no differences in their effectiveness in changing smoking behavior or attitudes on an eleventh grade level. On an eighth grade level they were equally effective in changing behavior but the student-centered method resulted in more desirable attitude change.[46]

Message Themes

There are four related and somewhat overlapping themes reported in use in anti-smoking programs for youth. The first of these—smoking is hazardous to your health—has been emphasized by many[15, 16, 19, 20, 22–24, 47, 48] but these programs seem to have had little effect on smoking behavior. In one case an increase in smoking occurred[15] and in no reported case did smoking significantly decrease. There were, however, programs using this theme which changed knowledge and attitudes significantly.[16, 48]

Comparisons of the efficacy of programs emphasizing the immediate or short-term versus the remote or long-term effects of smoking have not shown consistent results. In one study emphasis on remote effects was more effective in reducing smoking among boys while among girls the two themes were equally effective in changing behavior.[44] A second study showed that the contemporary theme was more effective in changing behavior than was the remote effects theme.[42, 43] A third study found the two themes to be equally effective.[46] Fodor, et al., report a six-day educational program emphasizing the immediate effects of smoking which was implemented in experimental sixth grade classes. The students showed a significant increase in knowledge but changes in smoking habits, if any, are not discussed.[49]

Finally, there have been some attempts to change the image of smokers and non-smokers.[31, 47, 50] Fritsche reports that: "We started the pilot project under the assumption that the image of the young juvenile smoker could be devalued. Unfortunately this did not work and we had to throw out the whole campaign and start anew, this time by taking the opposite tack of raising the image of the juvenile non-smoker." The author does not discuss how this was done.[50] The non-smoker's image was up-graded sufficiently in one British school so that membership in a non-smoker's club became a status symbol in the school.[31]

A pilot project is underway in Houston public schools which is trying to teach junior high students how to resist pressures to smoke. The program uses four videotapes of situations in which students are subjected to direct or indirect pressure to smoke. Classroom discussion centers on effective, acceptable ways of resisting such pressures. Evaluation of the project was planned but had not been done at the time their report was written.[51]

An On-the-Job Program

The best reported results to date have come from Switzerland where a four-year prospective study was conducted with adolescent male apprentices in a machine factory. A test group of 60 apprentices participated in a general health education program which included, among other things, information on the ill effects of smoking. The program included lectures on 36 topics followed by quizzes, round table discussion, question and answer periods, visual aids, written materials, leisure time activities, first aid and accident prevention courses, vaccination programs, and other health related activities. A control group of 60 apprentices matched for occupation and social and environmental factors was chosen. Each group was given tests before the program began and again four years later. Prior to the program 47 per cent of the controls and 42 per cent of the test group smoked. Four years later 78 per cent of the control group and 42 per cent of the test group were smokers. It appears that although the program did not produce many ex-smokers (two smokers in the test group quit, none of the controls did), it did deter non-smokers from taking up the habit (one non-smoker in the test group began smoking, 19 non-smokers in the control group became smokers).[52]

Programs for Adults

Adult Campaigns

Anti-smoking campaigns aimed at adults have used various combinations of methods including mass media advertising, pamphlets and brochures, exhibits and films, a loud speaker van, group discussion, public lectures, personal counseling, and smoking cessation groups. None of these campaigns has produced significant change in smoking behavior[53–56] and the reported effects on public attitudes toward smoking are inconsistent. Evans found a desirable effect on attitudes[54] and Porter found no effect on attitudes toward smoking.[56]

Smoking Clinics

Smoking cessation clinics have been conducted in a variety of ways. The methods used, the length of treatment, and the amount and sophistication of evaluation have all varied widely. One relatively standardized program has been the Seventh Day Adventists' Five-Day Plan. Normally a physician-clergyman team conducts the program which consists of five sessions using films, lectures, models, discussion, and a buddy system. Follow-up reports indicate 40–97 per cent abstinent at the end of the clinic, 18–53 per cent after three months, 15–35 per cent after six months, and 16–27 per cent after one year.[12, 57–64]

Other clinics use many of the same techniques as the Five-Day Plan but in different combinations. The content of the meetings tends to be informative about smoking and health and/or supportive of participants' efforts to quit. The

length of the clinics varies from four to eight weeks although some are longer or shorter. Evaluation may be in terms of the percentage of quitters, as is usually the case with the Five-Day Plan, or in terms of the reduction in the amount smoked. Follow-up reports indicate abstinence rates of 5–83 per cent at the end of the clinic, 9–83 per cent after three months, 20–83 per cent after six months, and 15–33 per cent after one year.[12, 14, 61, 65–76]

Withdrawal Methods

Individual counseling, usually by a physician, as a means of getting smokers to quit has had a reasonable degree of success. Success rates three months to a year after the counseling vary from 20–46 per cent.[14, 77–86] There are exceptions. Porter, et al., report no success in a study of 191 smokers, 101 of whom received individual counseling and 90 of whom did not. Six months later, follow-up on all 191 patients indicated that five counseled patients had quit and four controls had.[87] On the other hand a very high success rate, 63 per cent abstinent after one year, was achieved by individual counseling with a highly motivated group of 125 smokers who had had myocardial infarctions.[88]

Emotional role playing has also been investigated as a method of eliminating smoking behavior. Janis and Mann found that subjects who role played a smoker with lung cancer had reduced their cigarette consumption significantly more than control subjects two weeks, eight weeks, and 18 months after the role playing.[89, 90] Similar results were found by Strelzer and Koch.[91] Lichtenstein, et al., tried to replicate Janis and Mann's study and found no significant difference between experimental and control groups in terms of behavior and attitude change.[92] Mann found that emotional role playing was more effective than cognitive role playing.[93]

Much of the research into specific methods of promoting smoking cessation has been based on the premise that smoking is a learned response to various stimuli. Thus the methods used are those designed to break this stimulus-response bond. Much of the research has been done by psychologists using volunteers from a college community. These are done in a more controlled laboratory setting than are the smoking clinics and tend to have a much smaller sample size. As with the smoking clinics, evaluation procedures are not standardized so it is difficult to compare results of separate studies.

One approach to breaking the smoking habit has been to associate unpleasantness with smoking. Aversive conditioning has received much attention in the literature.[14, 94–112]

Perhaps the most popular type of aversive conditioning has been that of satiation. Smokers are told to smoke rapidly and/or in excessive amounts which makes the smoker feel sick or nauseous. Thus smoking comes to be associated with discomfort rather than with pleasure. Results of studies using this technique are equivocal. Some studies indicate that satiation has little or no effectiveness[94, 98–100, 102, 105, 111] while other studies indicate varying degrees of success.[97, 103, 104, 108, 109] Hauser[113] and Shewchuk[14] recommend medical screening of smokers prior to the use of this technique since excessive smoking could be dangerous to those with advanced heart disease.

Another method of aversive conditioning is covert sensitization, variants of which are called operant self-control and coverant control. As with satiation, the smoker learns to associate something unpleasant with smoking but since the procedure is covert, the "something unpleasant" must be imagined. Typically the smoker is told to imagine feeling nauseous whenever he or she feels the urge to smoke. Such scenes are imagined regularly in order to build up the desired associations. Although there are few studies using this technique alone, the results are just as equivocal as those from satiation studies. One study found no difference between experimental and control groups at the end of treatment;[101] one found 20 per cent abstinent six months after treatment;[102] and one found the operant control group was smoking at 28 per cent of its baseline rate one month after treatment.[106]

Closely related to covert sensitization is the desensitization technique.[97, 111, 114–117] In this case the smoker learns to imagine feeling good when resisting the temptation to smoke. Systematically he or she is taught to imagine not smoking in a variety of situations without feeling anxiety or discomfort. A related technique is to learn to relax when feeling the urge to smoke. Studies using these techniques, alone or in combination, have shown that three months after the end of treatment, participants were smoking at 46–65 per cent of their baseline rate.[111, 117] Morganstern and Ratliff, using a combination of relaxation and desensitization, found 31 per cent of the participants has quit smoking by the end of treatment but no follow-up was reported.[115]

Some studies have combined aversive conditioning with desensitization and/or relaxation. Sutherland, et al., found that three months after treatment by satiation and relaxation, participants were smoking at 52 per cent of their baseline rate.[111] Wagner and Bragg compared relaxation and covert sensitization with a combination of relaxation, covert sensitization, and desensitization. Three months after treatment the former group was smoking at 72 per cent of its baseline rate while the latter was at 36 per cent.[117] Gerson and Lanyon found covert sensitization plus desensitization to be more effective than covert sensitization plus group discussion.[118]

One study used a three-by-three experimental design to evaluate the effectiveness of combinations of aversive conditioning, positive conditioning, and no conditioning as treatment and maintenance procedures. The aversive conditioning emphasized the negative consequences of smoking while the positive conditioning emphasized the good aspects of smoking reduction. Three months after treatment those receiving aversive treatment and positive maintenance procedures showed the highest amount of reduction in smoking (60 per cent), followed by those who received positive treatment and positive maintenance (57 per cent). The lowest amount of reduction (19 per cent) was achieved by those who received aversive treatment and no maintenance.[110]

A recent study by Kreitler, et al., tested the hypothesis that smoking withdrawal methods should be adapted to the type of smoker a person is. It was hypothesized that those who smoke primarily to reduce tension or negative emotions (negative affect smokers) would benefit more from desensitization therapy than from treatment through saturation

smoking. Likewise those who smoke primarily because it brings about pleasant feelings (positive affect smokers) would benefit more from treatment by satiation than from desensitization. A two-by-two factorial design with controls was used. It was found that no one combination of type of smoker and type of therapy was more effective than others. However, all four experimental groups fared better than the control group. Three months after treatment the experimental groups had reduced the number of cigarettes they smoked by 23 per cent while the control group had increased the number smoked by 17 per cent.[97]

Another tack taken by some is to try to reduce the likelihood that smoking will occur in specific situations which have previously been associated with smoking.[14, 101, 105, 112, 119–122] This could be accomplished by interrupting the chain of behaviors that lead up to lighting a cigarette[101] or by gradually reducing the number and variety of situations in which smoking could occur.[119–121] One example is the use of a pocket timer which is set to buzz a predetermined number of times randomly distributed throughout the day. The smoker may smoke only when the timer buzzes. The number of times it buzzes per day is systematically reduced. Another example of this technique requires the smoker to list the situations in which he or she normally smokes and to rate the importance of smoking in each situation. Then the smoker is told to gradually reduce the number and variety of situations in which he or she smokes, beginning by eliminating those least important to him/her. In general these methods have had limited success and little follow-up.

Non-Treatment Aspects of Withdrawal Programs

Several authors have directed their attention to the non-treatment aspects of smoking cessation programs. They argue that these non-treatment factors may be affecting smoking behavior in a systematic way and thus should be controlled in research studies of cessation techniques.[1, 123–125]

McFall and Hammen noted the consistent shift in smoking patterns observed in a variety of withdrawal programs, i.e., a drop to 30–40 per cent of the baseline smoking rate at the end of treatment followed by a four- to six-month follow-up rate of about 70 per cent of baseline. The authors hypothesized that the common elements of motivated volunteering, structure, and self-monitoring were the reason for the consistent change in smoking behavior. A withdrawal clinic was designed which offered no real treatment but "encouraged motivated volunteers to employ self-control and required them to monitor their smoking and report progress at regular intervals."[125] The results were similar to those in many other cessation programs and suggest that such non-treatment factors may account for the uniformity of results obtained elsewhere.

Evaluation of Smoking Education Programs

In trying to compare the success or failure of various smoking education programs one is faced with tremendous problems. Experimental designs have varied considerably and rarely has one study attempted to replicate an earlier one. Follow-up, if it was done at all, was not done after uniform time periods. Three different measures of success have been employed—the percentage of participants who quit smoking, the percentage of reduction in smoking, and the net recruitment rate. The first two have been based on data on those entering a program, those completing a program, or those available at follow-up. The net recruitment rate is calculated by subtracting the percentage of smokers on the pretest from the percentage of smokers on the posttest and then dividing by the percentage of non-smokers on the pretest. The measures of success reported in this review have been those given in the published reports. No attempt was made to recalculate success rates on a standard basis, c.f. Schwartz.[12]

The need for standardizing research and evaluation techniques has been recognized by both the Second and Third World Conferences on Smoking and Health. This task was taken up by the National Interagency Council on Smoking and Health which produced a recommended set of guidelines on research on the effectiveness of smoking control programs.[126]

"It is suggested that reports on smoking control programs at least cover the following areas:

"1. Comprehensive description of the treatment program or references as to where such information may be obtained.
"2. Description of the data collection procedures and (where applicable) the experimental design.
"3. Complete presentation of response rates and reasons for nonresponse at each point in time.
"4. Presentation of results, including:
   a. descriptive data regarding the characteristics of the participants. . . .
   b. analytic data, exploring factors related to success/failure or other aspects measured."

While the guidelines recognize that each program will have different data requirements, they do recommend that all programs collect a minimum amount of data on the four areas quoted above for comparative purposes. The specific data to be collected are listed in the guidelines as well as some standardized definitions of terms. The guidelines also recommend that follow-up be done at one week, four months, and one year after the end of treatment.

These guidelines, if widely adopted by those involved with smoking education, would undoubtedly increase the comparability and replicability of research in the field and hasten the development of effective smoking education programs.

Summary

Most attempts to influence the smoking behavior of the young have had little success. Multi-method campaigns and youth-to-youth programs, the most common types of smoking education programs for youth, were either ineffective or not evaluated. A variety of studies have compared teaching

methods and/or message themes but the studies themselves are often not comparable. The two studies which were comparable, Horn[44] and Creswell,[42, 43] showed contradictory results. Probably the most common message theme aimed at youth has been that smoking is unhealthy. Programs testing the effectiveness of this theme have reported little success.

Quite promising results have been reported from a prospective study involving adolescent Swiss males. Matched controls were used and evaluation was conducted four years after the start of the program. Inclusion of smoking education within a comprehensive health education program was successful in preventing non-smokers from becoming smokers although it did not persuade smokers to stop smoking.

Programs for adult smoking education have shown mixed results. Anti-smoking campaigns have had little reported effect on smoking behavior. Smoking withdrawal clinics and individual counseling have shown the most success, producing abstinence rates of 20–35 per cent one year after treatment. These would appear to be the most consistently effective techniques reported in the literature.

There were a number of experimental studies which used treatment and control groups and which reported that tests of statistical significance had been done. These studies fell into two groups: those dealing with emotional role playing and those involving aversive conditioning. Results were equivocal. Roughly one-half the studies in each group demonstrated a significant difference between experimental and control group smoking habits after the program was over and the other one-half in each group showed no significant difference between experimental and control subjects.

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