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# **The Effects of a Smoking Prevention Curriculum on Fifth- Grade Children's Attitudes, Subjective Norms and Refusal Skills**

**Thayer W. McGahee, PhD, RN  
Martha S. Tingen, PhD, RN, ANP, CS**

## **Abstract**

*Thayer W. McGahee, PhD, RN,  
Educator, Hospital and Clinics  
Education; Martha S. Tingen,  
PhD, RN, ANP, CS, Assistant  
Professor, School of Nursing;  
both of the Medical College of  
Georgia, Augusta*

More than 3,000 young people start smoking each day in the United States. The age at which children begin to smoke is on a continual decline, with an estimated 60% beginning by age 13 and 90% by age 20. The younger the age of smoking initiation, the less likely it is the person will ever quit. Smoking prevention efforts need to begin during childhood to avoid early exposure to cigarette use because of the addictive nature of nicotine. The primary purpose of this quasi-experimental study was to examine the efficacy of a smoking prevention curriculum in fifth-grade children. Two secondary purposes were to determine possible predictive variables of the child's attitude, subjective norm, and perceptions of refusal skills related to smoking. The efficacy of the curriculum was assessed by measuring the child's intent to smoke by the end of the current school year. The smoking prevention curriculum was developed by the American Cancer Society and is a component of the "Do It Yourself-Making Healthy Choices" program. The sample consisted of 361 fifth-grade children from public schools in the Southeast United States. The research was based on the Theory of Reasoned Action, a model that explains why people may choose to participate in certain behaviors such as smoking. Instruments included the School-Age Smoking questionnaire, Parental Smoking Attitude Scale, and a sociodemographic inventory. A Solomon-four group design was used with participating schools randomly assigned to one of four groups. Findings

indicate that the smoking curriculum is effective in changing children's attitudes toward smoking with main predictors of intention to smoke being attitude and refusal skills. This study suggests that school-based curricula can serve to decrease smoking initiation among the nation's children.

***Key Words: Smoking Prevention, Intervention, Children, Adolescents***

<sup>1</sup>Glynn, T. J., & Manley, M. W. (1992). *How To Help Your Patients Stop Smoking*. National Cancer Institute, NIH Publication No. 92-3064.

<sup>2</sup>CDC, 1989

<sup>3</sup>Gold R.S., Parcel G.S., Walberg H.J., Luepker R.V., Portnoy B., Stone E.J. (1991). Summary and conclusions of the THTM evaluation: the expert work group perspective. *J School Health* 61: 39-42.

<sup>4</sup>United States Department of Health and Human Services: *Healthy People 2000, National Health Promotion and Disease Prevention Objectives* (1992). Boston, Mass.: Jones and Bartlett.

<sup>5</sup>American Cancer Society (1999). *Cancer facts and figures - 1999*. Atlanta, GA.

<sup>6</sup>Bangert-Downs, R. L. (1988). The effects of school-based substance abuse education - A meta-analysis. *Journal of Drug Education*, 18(3), 243-264.

<sup>7</sup>Bruvold, W. H. (1993). A meta-analysis of adolescent smoking prevention programs. *American Journal of Public Health*, 83(6), 873-880.

<sup>8</sup>Rundall, T. G., & Bruvold, W. H. (1988). A meta-analysis of school-based smoking and alcohol use prevention programs. *Health Education Quarterly*, Fall, 317-334. 571.

<sup>9</sup>Ajzen, I. & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, N.J.: Prentice Hall.

<sup>10</sup>American Cancer Society (1994). *Do it yourself-making healthy choices*. A cancer prevention and control curriculum for grades 4, 5, and 6. (94-10M-No. 2045).

Every day 3,000 adolescents begin the smoking habit and 25% will die prematurely from a smoking-related disease<sup>1</sup>. The process of nicotine addiction ensures many of today's adolescent smokers will continue the habit into adulthood<sup>2,3</sup>. Reducing the initiation of cigarette smoking in children and youth by 50% by the year 2000 was one of the nation's health objectives<sup>4</sup>. Although there have been widely publicized health warnings about tobacco, adolescent smoking has failed to decrease over the last decade<sup>5</sup>. There is evidence that behavioral change is influenced by changes in attitude<sup>6-8</sup> but specific methods for influencing attitudes in a systematic way regarding tobacco use requires testing. The purposes of this quasi-experimental study were to evaluate the effectiveness of a smoking prevention curriculum on fifth-grade children's attitude toward smoking, subjective norm of smoking, and refusal skills for smoking. This study, based on the Theory of Reasoned Action<sup>9</sup>, used a smoking prevention curriculum developed by the American Cancer Society<sup>10</sup>. The effects of this curriculum on children's attitudes, subjective norm, and refusal skills for smoking have not been previously reported in the literature.

## Relevant Literature

Smoking is the single most preventable cause of death in our society<sup>11</sup>. Deaths in the US related to cigarette use

<sup>11</sup>American Cancer Society (1999)

<sup>12</sup>American Cancer Society (1989). *Cancer facts and figures - 1989*. Atlanta, GA

<sup>13</sup>CDC, 1989

<sup>14</sup>Glynn & Manley, 1992

<sup>15</sup>CDC, 1989

<sup>16</sup>CDC, 1994

<sup>17</sup>American Cancer Society (1998). *Cancer Facts and Figures - 1998*. Atlanta, GA.

<sup>18</sup>ACS, 1998

<sup>19</sup>ACS, 1999

<sup>20</sup>Duncan, S. C., Duncan, T. E., & Hops, H. (1998). Progressions of alcohol, cigarette, and marijuana use in adolescence. *Journal of Behavioral Medicine*, 21, (4), 375-388.

<sup>21</sup>Lindsay, G. B. & Rainey, J. (1997). Psychosocial and pharmacologic explanations of nicotine's "gateway drug" function. *Journal of School Health*, 67(4), 123-126.

<sup>22</sup>CDC, 1989

<sup>23</sup>Botvin, G.J., Botvin, E.M. School-based and community based prevention approaches. In: Lowinson, J., Ruiz P., Millman R., Eds. *Comprehensive textbook of substance abuse*. 2nd ed. Baltimore, MD: Williams & Wilkins, 1992. 910-927.

<sup>24</sup>Hansen, W.B. School-based substance abuse prevention: a review of the state of the art in curriculum. *Health Educ Res* 1992;7:3:403-30.

<sup>25</sup>Tobler, N. S. (1986). Meta-analysis of 143 adolescent drug prevention programs:

our society<sup>11</sup>. Deaths in the US related to cigarette use exceed those caused by AIDS, alcohol, car accidents, fires, illegal drugs, murders, and suicides combined<sup>12</sup>. Over three million adolescents smoke cigarettes<sup>13</sup>, and every day 3,000 more adolescents join their ranks<sup>14</sup>. These staggering statistics place America's adolescents at risk for the number one and number two national killers: heart disease and cancer<sup>15,16</sup>. While cardiovascular deaths related to smoking have decreased, smoking-related cancer deaths continue to increase<sup>17</sup>. For male and female smokers, the risk of dying of lung cancer is 22 and 12 times higher, respectively, than for those who have never smoked<sup>18</sup>. Accounting for nearly 30% of all cancer deaths, smoking is also responsible for 87% of lung cancers and is highly associated with cancers of the kidney, bladder, pancreas, uterine cervix, mouth, larynx, and esophagus<sup>19</sup>.

Smoking is considered a "gateway drug" in that its use often precedes alcohol, marijuana, and other illicit drugs<sup>20,21</sup>. The present adolescent smoking epidemic is considered totally preventable, with key opportunities for primary prevention being targeted toward children<sup>22</sup>. Given the sequence of events that often evolve when smoking begins, programs that prevent smoking initiation may also be effective in preventing alcohol, marijuana, and other illicit drugs<sup>23-25</sup>.

Quantitative outcome results of program participants compared to a control or comparison group. *Journal of Drug Issues*, 16(4), 537-567.

<sup>26</sup>ACS, 1999

<sup>27</sup>CDC, 1989

<sup>28</sup>CDC, 1994

<sup>29</sup>Baugh, J. G., Hunter, S. M., Webber, L. S. & Berenson, G. S. (1982). Developmental trends of first cigarette smoking experience of children: The Bogalusa heart study. *American Journal of Public Health*, 72, 1161-1164.

<sup>30</sup>CDC, 1989

<sup>31</sup>CDC, 1989

<sup>32</sup>McNeill, A. D., Jarvis, M. J., Stapleton, J. A., Russell, M. A., Eiser, J. R., Gammage, P., & Gray, E. M. (1988). Prospective study of factors predicting uptake of smoking in adolescents. *Journal of Epidemiology and Community Health*, 43, 72-78.

<sup>33</sup>ACS, 1999

<sup>34</sup>CDC, 1997

Eighty-two percent of daily adult smokers report that they began smoking before their eighteenth birthday<sup>26-28</sup>. The onset of smoking occurs primarily in early adolescence, among 12 to 14 year olds<sup>29,30</sup>. By age twelve, 1.7 million youths have smoked cigarettes<sup>31</sup>. McNeill, et al.<sup>32</sup> found that trying one or two cigarettes increased the odds of becoming a smoker by 200%, compared with those who never smoked. Teenagers find it very difficult to stop smoking once they have started. Of the 73% of teens who smoked and tried to quit, only 13.5% were successful<sup>33</sup>. Cessation programs for adolescent smokers have historically low success rates, even though the subjects regret ever starting to smoke<sup>34</sup>.

<sup>35</sup>Best, J. A., Flay, B. R., Towson, S. M. J., Ryan, K. B., Perry C. L., Brown, K.S., Kersell, M. W., d'Avernas, J.R. (1984). Smoking prevention and the concept of risk. *Journal of Applied Social Psychology*, 14, 257-273.

<sup>36</sup>CDC, 1994

<sup>37</sup>US DHHS: *Healthy People 2000*, (1992).

<sup>38</sup>CDC, 1994

<sup>39</sup>Centers for Disease Control and Prevention. (1992). Tobacco, alcohol, and other drug use among high school students - United States. *MMWR*, 1992 Sep 18;41:698-703

<sup>40</sup>Bauman, K.E., LaPrelle, J., Brown, J.D., Koch, G.G., &

Previous research suggests that the most effective prevention programs are those whose subjects have never experimented with any cigarettes<sup>35,36</sup>. Foundations for lifestyle practices, including health behaviors, are established in childhood<sup>37</sup>. The Centers for Disease Control and Prevention (CDC) recommends that educational smoking prevention programs be designed and implemented in early childhood within the school system before initiation of smoking<sup>38,39</sup>.

Many prior studies using educational approaches to

Padgett, C.A. (1991). The influence of three mass media campaigns on variables related to adolescent cigarette smoking: Results of a field experiment. *American Journal of Public Health*, 81(5), 597-604.

<sup>41</sup>Elder, J.P., Wildey, M., deMoor, C., Sallis, J.F., Eckhardt, L., Edwards, C., Erickson, A., Golbeck, A., Hovell, M., Johnston, D., Levitz, M.D., Molgaard, C., Young, R., Vito, D., & Woodruff, S.I. (1993). The long-term prevention of tobacco use among junior high school students: Classroom and telephone interventions. *American Journal of Public Health*, 83(9), 1239-1243.

<sup>42</sup>Murphy, N. T., & Price, C. J. (1988). The influence of self-esteem, parental smoking, and living in a tobacco production region on adolescent smoking behaviors. *Journal of School Health*, 58(10), 401-405.

<sup>43</sup>ACS, 1994

<sup>44</sup>Ajzen, 1980

<sup>45</sup>Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, Mass.: Addison-Wesley.

<sup>46</sup>Ajzen, 1980

<sup>47</sup>Fishbein, 1975

<sup>48</sup>Ajzen, 1980

<sup>49</sup>Fishbein, 1975

<sup>50</sup>Norman, N.M., & Tedeschi, J.T. (1989). Self presentation, reasoned action, and adolescents' decisions to smoke cigarettes. *Journal of Applied Social Psychology*, 19(7), Pt. 2), 543-558

<sup>51</sup>Ajzen, 1980

<sup>52</sup>Fishbein, 1975

smoking prevention have focused on adolescents<sup>40-42</sup>. A small number of studies have been developed for children, but none used or evaluated the American Cancer Society's "Do It Yourself-Making Health Choices" curriculum<sup>43</sup>. The key population of children ages 10-13, in a multi-ethnic sample in a school-based setting was the focus of this study. In addition, the curriculum was designed to be interactive and fun. This study tested the effects of a developmentally appropriate educational intervention on children's attitude toward smoking, subjective norm of smoking, and refusal skills for smoking.

## Theoretical Framework

The framework for this research was adapted from the Theory of Reasoned Action<sup>44,45</sup>, which proposes that behavior is the result of behavioral intentions (Fig.1). In this view, smoking behavior occurs because of a prior behavioral intention to smoke<sup>46,47</sup>. Although theorists acknowledge that behavioral intention will not precede a specific behavior 100% of the time, people generally perform in accordance with their intentions<sup>48,49</sup>. Prior research on use of cigarettes and smokeless tobacco has supported this premise<sup>50</sup>. The formation of behavioral intentions to smoke is a function of two variables: attitude and subjective norm<sup>51,52</sup>.

<sup>53</sup>Andrews, J. A., & Duncan, S. C. (1998). The effect of attitude on the development of adolescent cigarette use. *Journal of Substance Abuse, 10*(1), 1 -7 .

<sup>54</sup>Bangert-Downs, R. L. (1988). The effects of school-based substance abuse education -A meta-analysis. *Journal of Drug Education, 18*(3), 243-264 .

<sup>55</sup>Bruvold, 1993

<sup>56</sup>Flay, B. R., Phil, D. Hu, F. B., & Richardson, J. (1998). Psychosocial predictors of different stages of cigarette smoking among high school students. *Preventive Medicine, 27*, (5 Pt 3), A9-18.

<sup>57</sup>Rundall & Bruvold, 1988

## Attitude

Attitude about smoking is considered personal in nature, and is based on beliefs about smoking and consequences of smoking. For example, if one believes that the result (consequence) of smoking produces no detrimental effects, his/her attitude toward smoking would be a positive one. If, however, one believes that smoking produces many detrimental effects, his/her attitude would be a negative one. Many researchers have advocated that attitude change is related to behavioral change<sup>53-57</sup> .

## Subjective Norm

Subjective Norm is the social aspect of deciding on a behavior, and encompasses significant others' beliefs about smoking and one's motivation to comply with significant others' beliefs. These significant others may be parents, siblings, friends, or any significant person in the child's life. A child may value another person's negative or positive beliefs about smoking and have a strong motivation to comply with that person's beliefs. This would represent the child's subjective norm. Research has shown that family relationships and school (peer) relationships correlate strongly to health behaviors<sup>58-60</sup>. Smoking also has been linked with peer pressure<sup>61</sup>, having parents who smoke, and having siblings who smoke<sup>62,63</sup>.

<sup>58</sup>Conrad, K. M., Flay, B. R., & Hill, D. (1992). Why children start smoking cigarettes: Predictors of onset. *British Journal of Addiction, 87*, 1711-1724 .

<sup>59</sup>Flay, 1998

<sup>60</sup>McAlister, A. (1983). Social-psychological Approaches. In O. T. Glynn, C. Leukefeld, & J. Ludford (Eds.), *Preventing Adolescent Drug Abuse: Intervention Strategies* (pp. 36-50). Washington, D.C., U.S. Government Printing Office.

<sup>61</sup>Flay, 1983

<sup>62</sup>ibid

<sup>63</sup>Murphy, N. T., & Price, C. J. (1988). The influence of self-esteem, parental smoking, and living in a tobacco production region on adolescent smoking behaviors. *Journal of School Health*, 58(10), 401-405.

<sup>64</sup>Conrad, 1992

<sup>65</sup>Flay, 1983

<sup>66</sup>McAlister, 1983

<sup>67</sup>US Dept of Health & Human Services (DHHS). (1994). *Preventing tobacco use among young people: a report of the Surgeon General* (DHHS publication No. S/N 017-00491-0). Atlanta, GA: U.S. Government Printing Office.

Prior research supports the importance of peer and family input as it comprises the subjective norm of children who are faced with the health decision of whether to begin smoking<sup>64-67</sup>. For many children, the influence of peers may begin to grow stronger and the influence of parents less strong, as they mature from fifth grade into the adolescent years.

### **Behavioral Intentions**

Intention to smoke strongly predicts subsequent regular use<sup>68,69</sup>. In a review of nine studies measuring behavioral intention to smoke, 89% (8 out of 9) of the time, intention to smoke predicted onset in children<sup>70</sup>. The best single predictor of an individual behavior is a measure of the intention to perform that behavior<sup>71-73</sup>.

<sup>68</sup>Conrad, 1992

<sup>69</sup>Flay, 1998

<sup>70</sup>Conrad, 1992

<sup>71</sup>Ajzen, 1980

<sup>72</sup>Fishbein, 1975

<sup>73</sup>Conrad, 1992

### **Refusal Skills**

Refusal skills are frequently referred to in the smoking literature, but there has been minimal measurement of these skills in relation to preventing smoking initiation in children. There has been a link established between refusal skills and decreased use of alcohol in children<sup>74</sup>. Combined within the Theory of Reasoned Action, refusal skills serve as a “filter” through which the child’s attitude and

<sup>74</sup>Shope, J.T., Copeland, L.A., Maharg, R., Dielman, T.E., & Butchart, A.T. (1993). Assessment of adolescent refusal skills in an alcohol misuse prevention study. *Health Education Quarterly*, 20(3), 373-390.

subjective norm pass while leading to behavioral intention. If the child develops strong refusal skills, this may affect his attitude and subjective norm, and result in a behavioral intention that chooses to refuse smoking offers. If, however, a child lacks refusal skills, the behavioral intention may be to smoke when offered the opportunity. For the purposes of this study, refusal skills were defined as the knowledge and the ability to successfully refuse offers to smoke cigarettes. Although behavioral intention was measured in this study, this article reports only the effect of the intervention on attitude toward smoking, subjective norm of smoking, and perceived refusal skills for smoking.

It would be rare for a theory to address all the complexities that constitute various behaviors. Although the Theory of Reasoned Action appears to address the critical concepts involved in smoking initiation, it is still important to understand children's development in attempting to understand their behavior. Because the initiation of smoking has its roots in the childhood period, when attitudes and beliefs are formed, it is vital to understand how a child is thinking and perceiving his/her environment. Any intervention to be used with children should be based on the appropriate developmental level. Based on a review of Piaget's cognitive developmental theory and Erikson's theory of psychosocial development, the intervention used in this study can be considered an appropriate intervention from both a cognitive and a psychosocial perspective.

## **The Intervention**

<sup>75</sup>ACS, 1994

The intervention, “Do It Yourself-Making Healthy Choices” is a curriculum developed for fourth, fifth, and sixth graders by the American Cancer Society as part of a nationwide initiative to promote comprehensive school health education, with a focus on cancer prevention<sup>75</sup>. The curriculum has specific components for each grade level. The fourth grade component was used in this study for fifth-grade students because it is a more appropriate beginning smoking prevention curriculum for children who have never had any intensive instruction in this area. Written permission from the American Cancer Society was obtained prior to using the curriculum. The curriculum addresses three key areas: 1) The effects of sun exposure and the need to protect oneself from the sun, 2) nutritional information as it relates to cancer-reducing foods, and 3) smoking prevention materials. This research utilized only the smoking prevention materials, which consisted of five lessons (modules) related to smoking. A brief description of each lesson with the title of the lesson is as follows: 1) smoking and the effects on the body (*Smoking and Your Body*), 2) examining internal and external reasons for smoking (*Why Do People Smoke Anyway?*), 3) applying decision-making steps to smoking and developing alternatives to smoking (*To Smoke or Not to Smoke*), 4) identifying refusal skills and practicing the skills (*No If, Ands, or Butts*), and 5) demonstrating refusal skills through role-playing (*Choose to Refuse*).

<sup>76</sup>ibid

<sup>77</sup>Best, J.A., Thomson, S.J., Santi, S.M., Smith E., Brown, K.S. (1988). Preventing cigarette smoking among school children. *Ann Rev Public Health* 9:161-201.

<sup>78</sup>Botvin, G.J. (1991). Personal and social skills training: applications for substance abuse prevention. In: *Proceedings of six regional workshops: Strengthening Health Education for the 1990's*. New York: Health and Safety Education Division, Medical Department, Metropolitan Life Insurance Company

<sup>79</sup>Botvin, G.J. (1986). Substance abuse prevention research: recent developments and future directions. *J School Health* 56: 369-74

<sup>80</sup>Connell D.B., Turner R.R., Mason E.F. (1985) Summary of findings of the school health education evaluation: health promotion effectiveness, implementation, and costs. *J School Health*, 55, 316-21

<sup>81</sup>Flay, 1983

<sup>82</sup>CDC, 1992

<sup>83</sup>CDC, 1994

The intervention<sup>76</sup> addresses the multiple psychosocial factors associated with cigarette smoking in today's youth that have been identified as components of prior successful programs<sup>77-81</sup>. Additionally, the intervention is consistent with guidelines published by CDC for school-based programs targeting children and youth<sup>82-83</sup>.

One research question guided this study: What is the influence of the intervention on the child's attitudes, subjective norm, and perceptions of refusal skills related to smoking? The three study hypotheses were:

**H<sub>1</sub>:** Children in the intervention groups report more negative attitudes about smoking on the post-test than children in the control groups.

**H<sub>2</sub>:** Children in the intervention groups report more negative subjective norms about smoking on the post-test than children in the control groups.

**H<sub>3</sub>:** Children in the intervention groups report more

positive perceptions of their refusal skills related to smoking on the post-test than children in the control groups.

## Methods

This quasi-experimental study utilized the Solomon Four-group design that employed a combination of the pretest-posttest control group design and the posttest-only design<sup>84,85</sup>. This design allowed the investigators to control for instrument reactivity by comparing subjects who differed only in that they received the pretest. It was also possible to assess for change that occurred between pretesting and post-testing. Individual schools were randomly assigned to each of the four groups and sequences: (1) pretest ® intervention® post-test, (2) pretest ® post-test, (3) intervention ® post-test, (4) post-test only. Because of the ethical problem of withholding an intervention that may have positive health consequences from the “no treatment” control groups, the intervention was offered to those schools at the conclusion of data collection. The decision to implement the intervention program at these sites was based on the school’s request.

### *Sample and Settings*

This study consisted of 361 children in the fifth-grade from nine public schools in the southeastern United States. A power analysis determined that 53 subjects for each of the four groups were needed to achieve an alpha = 0 .05, power = 0.80, with an effect size (ETA-squared) of 0.05<sup>86</sup>. The classes used in this study included those that had not received any formal smoking prevention curricula, other

<sup>84</sup>McLaughlin, F. E., & Marascuilo, L. A. (1990). *Advanced Nursing and Health Care: Research, Quantification Approaches*. Philadelphia: W. B. Saunders Co.

<sup>85</sup>Spector, P. E. (1981). *Research Designs Series: Quantitative Applications in the Social Sciences*, No. 07-023. Newbury Park, CA: Sage

<sup>86</sup>Polit, D. F., & Hungler, B. P. (1995). *Nursing Research* (5 th ed.). Philadelphia: J. B. Lippincott Co.

than that incorporated into routine health classes.

Inclusion criteria for the sample included: (a) children in the fifth grade of a public elementary school in the designated region; (b) children who have not been included in other smoking prevention programs; (c) children and their parents who were English speaking; (d) children with no known cognitive disability; and (e) children without perceptual disabilities such as blindness or deafness. Children of all ethnic backgrounds and both genders were included. All parents who consented had children who met the inclusion criteria. One child, whose parents did not consent for participation, went to the library during all sessions related to the research.

### *Procedures*

Prior to data collection, approval for this study was obtained from the investigators' institutional Human Assurance Committee. Permissions were obtained from the appropriate County School Administration representative before subjects were recruited from the schools. Parental consent and child assent were obtained prior to questionnaire administration or implementation of the intervention. After randomization of individual schools to one of the four groups, names of children in the fifth grade were obtained from each school. Parental consent forms, Parent Demographic Questionnaire, and Parent Smoking Attitude Questionnaire were sent home to parents from school in the child's book bag with a self-addressed envelope to be returned to the investigators. The intervention and completion of all instruments by the

children took place within the classroom setting.

Children in all four groups completed the Student Sociodemographic Questionnaire (SSQ) at the first session. Children in groups 1 and 2 (pretest groups), were also given the School-Age Smoking Questionnaire (SASQ). The study was explained to the children, and they were assured that no one except the investigators would be privy to their responses. The data collector asked the children to respond to each item on the SSQ and SASQ as they were read aloud.

The pretests (SASQ) were given to children in group 1 the day prior to the intervention classes. Children in groups 1 and 3 participated in five, one-hour classes, from the "Do It Yourself - Making Healthy Choices" curriculum. These five classes were all taught within a one-week period for each school. This procedure was implemented at each participating school by the same data collector. Three weeks after the completion of the intervention, the SASQ was given to children in both intervention groups (groups 1 and 3). This questionnaire was again read aloud to the children by the data collector. The pretests and post-tests were administered within a four-week time frame. Data collection for all schools was conducted over an eight week period at the same time of year in order to ensure that all subjects were in the same place grade-wise. This cohort approach minimized effects of developmental changes that occur from the beginning of each school year to the end. One person implemented the intervention for this study and collected all data. The curriculum included detailed scripts for each class, and these were followed precisely

and uniformly for each class. Each child in the study, regardless of the group they were assigned to, completed a Student Sociodemographic Questionnaire (SSQ) and a School-Age Smoking Questionnaire (SASQ).

### *Student Sociodemographic Questionnaire*

The Student Sociodemographic Questionnaire (SSQ) was designed by the investigators and contained 20 items that identify personal data of the child, his/her perceptions of the smoking behaviors of significant others, his/her self-reported smoking behaviors, and how often cigarettes have been offered to the child. Ten minutes were needed to complete this questionnaire.

### *School-Age Smoking Questionnaire*

The School-Age Smoking Questionnaire (SASQ) is a 57-item questionnaire developed by the first author and adapted from the Smoking Questionnaire originally developed by Vallone<sup>87</sup>. The SASQ utilized items similar to Vallone's, but with a decreased level of readability. Vallone's work targeted seventh-graders, whereas this research focused on fifth-graders. Items deemed by the researchers to be developmentally inappropriate for fifth-grade children were changed to reflect this age level. Questions were also added to reflect the child's perceptions of his/her refusal skills related to smoking. This questionnaire was determined to be at a 5.4 grade level for readability, and a 3.4-3.9-grade level for listening comprehension. Readability was assessed using

<sup>87</sup>Vallone, J. P. (1992).  
Assessing the intention to  
smoke in young adolescents.  
*UMI Dissertation Services.*  
(University Microfilms No.  
9228123).

standardized tests. This questionnaire was also assessed by two African-American fifth-grade teachers for ethnic bias and none was found. This questionnaire took approximately 30 minutes to complete.

The overall reliability of the SASQ was 0.88 as determined by Cronbach's Alpha and based on pretest and post-test scores. The questionnaire includes items used to measure intention to smoke by the end of fifth grade (items 1-5), attitude toward smoking (items 6-35), subjective norms regarding smoking (items 36-47), and perceptions of refusal skills related to smoking (items 48-57).

### *Data Analysis*

Analysis of variance and *t*-tests were used to analyze the differences in data from the four groups. Initially, groups 1 and 2 were compared on pretests to determine if there were pretest differences. Secondly, all post-test scores were analyzed to test for treatment differences. Hypotheses 1-3 were analyzed using analysis of variance (ANOVA). Descriptive statistics were used to describe the sample. The Statistical Package for the Social Sciences (SPSS), Version 10, was used for data analyses with a pre-established level of significance of 0.05.

### **Findings**

An overall return rate of parental consent was 42.5%, with 34.6% for the control groups and 47.5% for the experimental groups. The nine schools participating in this

study were randomly assigned to either an intervention group or a control group. There were four schools in the intervention group and five in the control group. The final number of subjects in each of the Solomon-Four groups was as follows: group 1 = 106; group 2 = 57; group 3 = 137; and group 4 = 61.

### *Sample Demographics*

The sample (n = 361) consisted of children ranging in age from 10 to 13, with a mean of 10.8 years. One hundred forty (38.8%) children were male and 221 (61.2%) were female. One hundred seventy-five (48.5%) of the children were African-American, 159 (44%) were Caucasian, 11 (3%) were Hispanic, 2 (0.6%) were Asian, and 14 (3.9%) selected the "Other" option. The number of subjects in each racial category closely approximated the racial breakdown in the schools.

### *School-Age Smoking Questionnaire: Pretest Scores*

The range of the total scores on the SASQ pretests was 42-195, with a mean of 73.9, indicating that this sample was generally negative about smoking; that is, they had negative perceptions of smoking and did not intend to ever smoke (low scores indicate negativity). Children in the intervention group had a mean total score of 67.6, while the control group mean was 85.4. Children in the intervention group were generally more negative about smoking than those in the control group were at pretest time. The subjects' attitudes toward smoking were strongly negative on the pretests, with a range of scores of 18-126,

and a mean of 40.3. Low scores on this subscale indicate attitudes that are more negative toward smoking. The subjects in the intervention group held even more negative attitudes than those in the control group, with a mean attitude score of 35.9 compared with 48.4. The range of scores for the subjective norms subscale on the pretests was 6-45, with a mean of 12.5, indicating the children's subjective norms were opposed to smoking. The subjects did not believe that the significant others in their lives approved of their smoking, and generally they were motivated to comply with these peoples' wishes. Children in the intervention group again had lower mean scores on this subscale (11.5) than those in the control group (14.4). The children generally had perceptions of strong refusal skills related to smoking. The pretest range of scores overall was 10-34, with a mean of 14.2. The mean score of the children in the intervention group was 13.7, and in the control group was 15.2. The lower the score, the more indicative of strong refusal skills.

#### *School-Age Smoking Questionnaire: Post-test Scores*

The range, mean and standard deviation of the SASQ post-test scores are presented in [Table 1](#). Scores are broken down according to group assignment of the subjects. There was generally a larger range of scores for the control group, and slightly higher means than most intervention group scores. All post-test scores indicate that these children were generally negative about smoking. Most control and intervention groups scores were slightly lower on the post-tests than the pretests.

### *Research Question and Hypotheses*

To determine the influence of the intervention on the child's attitudes, subjective norms, and perceptions of refusal skills related to smoking, analysis of variance procedures were used to test the hypotheses.

Hypothesis 1 predicted that children in the intervention groups would report more negative attitudes about smoking on the post-tests than children in the control groups. This hypothesis was supported ( $F = 13.6$ ,  $df 1,360$ ,  $p = .001$ ). Hypothesis II predicted that children in the intervention groups would report more negative subjective norm beliefs about smoking on the post-tests than children in the control groups. Although the means of the subjective norms post-test scores were lower for the subjects in the intervention groups (12.1) than in the control groups (13.1), this difference was not statistically significant, and the hypothesis was not supported ( $F = 66.5$ ,  $df 1,360$ ,  $p = .29$ ). Hypothesis III predicted that children in the intervention groups would report more positive perceptions of their refusal skills related to smoking on the post-tests than children in the control groups. The mean scores of the refusal skills subscale were slightly lower for the intervention group as compared to the control group (14.3 and 14.6), but not statistically significant ( $F = 0.23$ ,  $df 1,360$ ,  $p = .63$ ). Therefore, this hypothesis was not supported.

*T*-tests were used to determine if there were significant

differences in scores based on sociodemographic variables as well as the children's scores on the SASQ. African-American children reported higher intention to smoke and stronger positive attitudes toward smoking than Caucasian children. One hundred thirty-two (36.6%) of the subjects reported that their fathers smoked, and 117 (32.4%) reported that their mothers smoked. Children whose fathers and mothers smoked reported attitudes that were more positive toward smoking and weaker smoking refusal skills than children whose parents did not smoke. Whether brothers or sisters smoked did not make a significant difference. Only 38 (10.6%) reported brothers smoking, and 28 (7.7%) reported sisters smoking. Children whose best friend smoked scored significantly higher on all post-test scores, and on all pretest scores, indicating positivity toward smoking. This variable appears to be the most significant sociodemographic contributor to the child's being generally positive about smoking, but only 29 (8%) reported that their best friend smokes.

### **Discussion and Recommendations**

The primary purpose of this quasi-experimental study was to examine the effect of a smoking prevention curriculum implemented with fifth-grade children. The effect of this curriculum as an intervention was assessed by measuring the influence of the curriculum on the child's attitude toward smoking, subjective norm of smoking, and perception of refusal skills related to smoking.

Children in the intervention groups reported significantly

<sup>88</sup>Alexander, H. M., Callcott, R., Dobson, A. J., Hards, G. R., Lloyd, D. M., O'Connell, D. L., & Leeder, S. R. (1983). Cigarette smoking and drug use in school children: IV - Factors associated with changes in smoking behavior. *International Journal of Epidemiology*, 12(1), 59-66.

<sup>89</sup>Vallone, 1992

<sup>90</sup>Conrad, 1992

<sup>91</sup>Norman, N.M., & Tedeschi, J.T. (1989). Self presentation, reasoned action, and adolescents' decisions to smoke cigarettes. *Journal of Applied Social Psychology*, 19(7), Pt. 2), 543-558.

<sup>92</sup>Bruvold, 1993

more negative attitudes toward smoking on the post-tests than did the children in the control groups (Hypothesis 1). Attitude has been frequently addressed in the literature in descriptive studies as related to smoking intentions and behaviors<sup>88-90</sup>, but not in intervention studies. When it has been included, the effect of the intervention on attitude has not been reported<sup>91</sup>. Bruvold's findings indicate that attitude changes are related to smoking behavior changes so inclusion of this variable in further intervention studies is recommended<sup>92</sup>.

Although children in the intervention groups reported more negative subjective norms and more positive perceptions of refusal skills on the post-tests than children in the control groups, the difference was not statistically significant (Hypotheses II and III). There are a number of possible explanations for this. The subjective norms subscale had the lowest reliability of all the subscales. It may simply be that this variable was not adequately measured. In addition, this variable concerns parents, siblings, friends, popular classmates, and many other people important to the child. This variable is not one for which the intervention was targeted to change, at least for the questions related to beliefs about what others think. The smoking prevention classes had no influence on what others think, and thus, would not be sensitive to change on the questionnaire.

The lack of significant effect on refusal skills may be a developmental issue. The subjects in this study all indicated fairly strong perceptions of their refusal skills

indicated fairly strong perceptions of their refusal skills related to smoking at both pre- and post-test times in both control and intervention groups. Children at this age may feel that they are strong enough to withstand the pressure to smoke. Most, however, have not been put to the test in reality. Eighty-six percent of the subjects in this study had never been offered a cigarette, and less than 10% had been offered one cigarette even once. Saying and doing may be two entirely different matters. The measures of refusal skills may need to be improved not only with better self-report items, but also with alternative measures such as observational techniques. Because most students at this age have not been pressured to smoke, interventions such as the one used in this study, need to be implemented yearly, reinforcing what was taught on an appropriate developmental level each ensuing year. Resisting peer pressure is one of the most difficult challenges for school-age children and teenagers, and one of the most difficult to help them cope with and overcome. The results of this study on refusal skills are consistent with prior studies in the literature<sup>93,94</sup>.

<sup>93</sup> Elder, 1993

<sup>94</sup>MacKinnon, D. P., Johnson, C. A., Pentz, M. A., Dwyer, J. H., Hansen, W. B., Flay, B. R., & Wang, E. Y. (1991). Mediating mechanisms in a school-based drug prevention program: First year effects of the midwestern prevention project. *Health Psychology, 10*(3), 164-172.

### *Limitations*

Three limitations have been identified for this research. First, the volunteer sample in this study was one of convenience. Increasing the sample size and the number of school districts would increase generalizability and decrease whatever bias that self-selection by volunteers

might impose. Secondly, the entire School-Age Questionnaire is in need of further psychometric testing. Although the overall reliability of this questionnaire was high, it needs further testing and refinement. It shows promise as a useful tool, but needs more psychometric development. The success of the intervention effects over a long period was not measured in this study. Pretest and post-test measures were only three to four weeks apart. This study took place toward the end of a school year, so the results of this study might have been influenced in part by having the smoking prevention classes fresh in the subjects' minds. Thirdly, sample selection may be a threat to validity because parents who consented to be in the study may differ in encouraging their children not to smoke from those who did not consent. Because it took time to read, sign, and return the consent forms and questionnaires, it is possible that the study only attracted those parents who generally take more interest in their children's school activities and those who encourage and follow up on their child's participation. Even children in the control groups had relatively low overall scores so self-selection bias may thus have been a factor. Unequalness in the number of students in each of the comparison groups at baseline may have also introduced bias in the results.

### **Implications for Nursing**

This study has several implications for both nursing practice and nursing research. Based on a thorough review of the literature, nursing has been minimally involved in the development and delivery of smoking prevention programs. None of the school nurses associated with the

schools in this study were involved with smoking prevention. Utilization of the school nurse for this does seem appropriate. A nurse could be an asset to the schools in this role, as he/she has both the educational and practical background to bring a perspective to smoking prevention programs that the classroom teacher may not have. Additionally, nurses could work with teachers on smoking prevention. Nurses could educate classroom teachers on the use of this curriculum and serve as an educational resource for them. The school nurse could also influence policy and be influential in introducing strong smoking prevention curricula.

Hospitals could also develop and expand programs similar to this program and offer them widespread to schools in the community and surrounding areas. The curriculum used in this research is available for children of all ages. Nurses could be utilized to bring this expertise to the local classroom. A community-wide effort to prevent smoking in children is needed. The small amount of attention given to it in routine health classes is inadequate for the pediatric epidemic of smoking. Programs should be developed to educate parents on the realities of childhood smoking and what they can do to prevent it.

### **Recommendations for Future Research**

This research was conducted to examine the effect of a smoking prevention curriculum delivered to fifth-grade children. Findings from this study support its usefulness in affecting attitudes toward smoking. The “Do It Yourself - Making Healthy Choices” curriculum<sup>95</sup> has been

developed for grades K-12, yet its use was not found in the literature.

More research related to smoking prevention needs to begin with children before they are at an age when many of them began to smoke. Most research has been aimed at adolescents. Targeting children may help to develop stronger anti-smoking attitudes that may help guide their behaviors in the teen years. The literature shows evidence that attitude changes influence behavior changes. This supports the implementation of smoking prevention programs at an early age, before smoking usually begins, and continuing throughout school years. Studies are needed to examine the continued effectiveness of these programs from year to year, rather than at one point in time. In addition, follow-up to introduce and reinforce new developmentally-appropriate materials is needed. The investigators in this study obtained parental consent to contact the students for later follow-up. Although this may be difficult, because students move to different schools for middle and high school, an attempt to track them longitudinally is planned. This may determine if, indeed, their scores in this study are predictive of their actual smoking in later years.

The Solomon-Four group design used in this study helped safeguard against the problems of external validity, particularly the interaction of testing with the intervention. This approach has been seen less frequently in nursing literature, but is a useful and strong design for use with experimental and quasi-experimental studies.

<sup>96</sup>Glynn, T. (1998). The Cinciripini/McClure article reviewed. *Oncology*, 12(2), 260, 265.

Smoking behavior is determined by multiple causes. The toll on society from tobacco use is staggering. According to Glynn<sup>96</sup>, the number of deaths each year resulting from “tobacco use is equivalent to having three fully loaded 747’s crash every day of the year, with no survivors” (p.260). Given this vivid picture, emphasis on research to prevent smoking and offer cessation to those who are smokers is of paramount importance to our nation. An emphasis on the effective content, delivery, and evaluation of smoking prevention and cessation programs is vital. Nurses comprise one of the largest healthcare professions and are in an opportune position to make a difference in helping our youth not to begin the life-threatening habit of cigarette smoking. The paucity of nursing research on this critical topic requires a call to action for the profession. Nurses need to address this health problem in their practice and research.

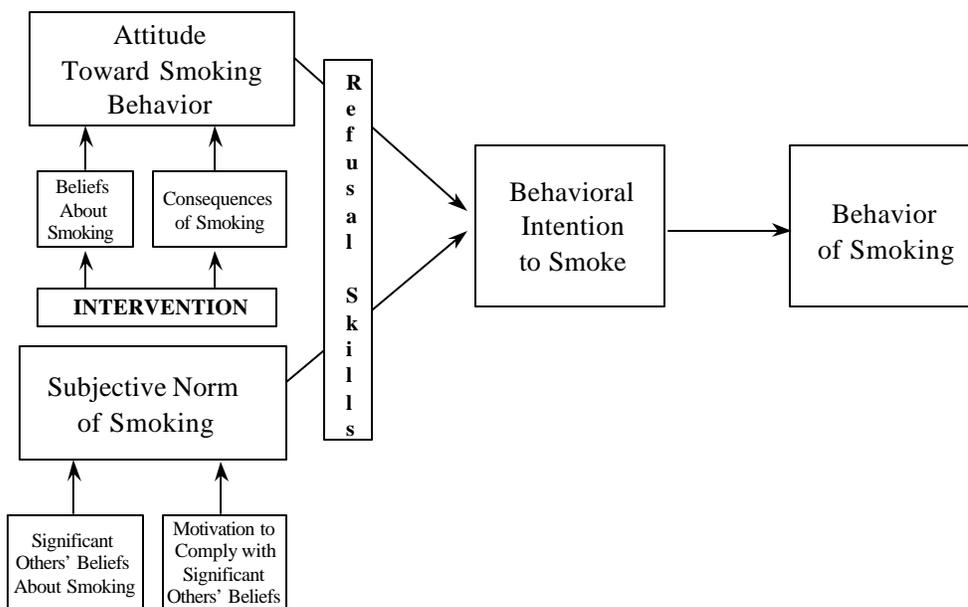
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**Table 1: Post-test Scores on the SASQ**

<b>Subscale</b>	<b>Group</b>	<b>Range</b>	<b>M</b>	<b>n</b>
Attitude	C	20-124	41.3	118
	IP	17-79	36.5	137
	IPP	15-64	31.3	106
	A	15-115	34.2	243
Normative Beliefs	C	6-48	13.1	118
	IP	6-84	13.1	137
	IPP	6-30	10.9	106
	A	6-84	12.1	243
Refusal Skills	C	10-40	14.6	118
	IP	10-34	14.9	137
	IPP	10-25	13.5	106
	A	10-34	14.3	243
Total Score	C	41-261	76.3	118
	IP	38-245	70.8	137
	IPP	36-111	61.5	106

Note: C = control group post-test scores  
 IP = intervention post-test only group scores  
 IPP = intervention pre- and post-test group post-test scores  
 A = combination of all intervention group post-test scores

**Figure 1: Theoretical Framework of Children’s Behavioral Intention to Smoke**



Adapted from The Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975).

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