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# HEALTH-RISK WARNING LABELS ON SMOKELESS TOBACCO PRODUCTS: ARE THEY EFFECTIVE?

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**Abstract** — This study investigated whether adolescents attend to the health-risk warnings placed on smokeless tobacco products and the impact the warnings have on intentions to use such products. The subjects (86 male and 106 female high school students) viewed illustrations of five consumer products, including a can of oral snuff and a pouch of chewing tobacco displaying one of the three required health warnings or no warning, and then indicated via questionnaire the likelihood that they would use each of the products. Fewer than half of the subjects (43.4%) exposed to the warnings recalled seeing them, and approximately a third of those who saw the warnings (32.2%) recalled the content of the message. Males were significantly better than females ($p < .02$) at recalling the content. A series of 2 × 4 (Sex × Warning Label) ANOVAs revealed that the warning labels had no significant effect on subjects' ratings of whether they would use smokeless tobacco in the future. These results question the effectiveness of the warning labels for discouraging adolescent smokeless tobacco use.

There has been a marked increase over the past decade in the use of smokeless tobacco products (i.e., oral snuff and chewing tobacco) by adolescent males. A recent national drug use survey found that 16% of males between the ages of 12 and 17 reported using smokeless tobacco (DHHS, 1986a). Regional surveys indicate that in some areas of the country the prevalence may be as high as 25% and even 30% (Gritz, Ksir, & McCarthy, 1985). These statistics are particularly alarming in light of the potentially serious health risks associated with the use of smokeless tobacco (DHHS, 1986a).

Smokeless tobacco has been linked to damage of the hard and soft oral tissue, including excessive abrasion of tooth surfaces, advanced periodontal destruction, tooth loss, and gingival recession, as well as decreased senses of taste and smell, and tooth discoloration (Belanger & Poulson, 1983; Christen, 1980; Greer & Poulson, 1983). There is also compelling evidence that smokeless tobacco use is associated with increased risk of cancer, particularly of the oral cavity (Christen, 1980; DHHS, 1986a; Schottenfeld, 1981; Squier, 1984). Smokeless tobacco products contain large concentrations of tobacco-specific nitrosamines which are known carcinogens (Hoffman & Adams, 1981). Oral leukoplakia (mucosal lesions which can be precancerous) are common not only among adult smokeless tobacco users, but among adolescent users as well (Greer & Poulson, 1983; Poulson, Lindenmuth, & Greer, 1984). Smokeless tobacco use results in significant exposure to nicotine which may lead to nicotine dependence (DHHS, 1986a). It has been found to produce significant alterations in the cardiovascular system, including increased heart rate and blood pressure (Schroeder & Chen, 1985), and may contribute to atherosclerosis (Squires et al., 1984).

In an effort to alert the public to the health risks associated with smokeless tobacco use and to discourage the use of such products, Congress recently passed the Comprehensive Smokeless Tobacco Education Act of 1986. One of the major provisions of the bill is the requirement that one of three health-risk warning labels be placed on the packages of all

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smokeless tobacco products and on all advertising for such products (with the exception of outdoor billboards). The three labels read as follows: "WARNING: THIS PRODUCT MAY CAUSE MOUTH CANCER"; "THIS PRODUCT MAY CAUSE GUM DISEASE AND TOOTH LOSS"; "THIS PRODUCT IS NOT A SAFE ALTERNATIVE TO CIGARETTES."

There is, to date, no research on the effectiveness of the warning labels as a means of educating the public or of discouraging potential users from taking up the habit. However, the results of a survey of over 500 junior- and senior-high school students, published in 1986 (before the warning labels were required), suggest that such effects may be limited (DHHS, 1986b). When asked if warning labels would deter them from purchasing smokeless tobacco products, 28% of junior-high smokeless users, 18% of senior-high users, and 64% of nonusers believed that the labels would have such an effect.

The present study investigated the impact of smokeless tobacco warning labels on a group of adolescents who were not regular smokeless tobacco users. Two specific questions were addressed. First, do adolescents attend to the warning labels and are they able to recall the information included in the warning? Second, does the presence of a warning label and/or the content of the message influence adolescents' ratings of the likelihood of their using the product in the future?

## METHOD

### *Subjects*

Subjects for this study were 192 students (86 males, 106 females), ages 14–18 years ($M$ = 15.86 years) enrolled in a university-affiliated public school in a rural community.

### *Materials*

A three-part questionnaire was used in this study. The first part included illustrations of five products marketed to adolescents, including a can of oral snuff and a pouch of chewing tobacco. No brand-name products were used. The black and white illustrations were approximately 12 cm. × 28 cm. and placed at the top of a page of the questionnaire, one illustration per page. Each illustration was followed by a set of three, six-point rating scales: "Would you ever use this product? (anchored by "absolutely, definitely would not use it" and "absolutely, definitely would use it"), "Would most kids your age use it?" (same anchors as the previous scale), and "Have you ever seen this kind of product before?" (anchored by "Absolutely, definitely have not seen it" and "Absolutely, definitely have seen it"). Subjects indicated their responses by making a mark at any point along a 185 mm line. Scores for each scale are expressed in terms of distance (mm) from the left endpoint (representing a negative response) of the line.

There were four versions of the first part of the questionnaire. In the first three versions, the smokeless tobacco products displayed one of the three warning labels mandated by Congress. In the fourth version, the tobacco products carried no warning. The warning labels were prominently displayed on the illustrated products in a format similar to that used on actual smokeless tobacco packages and advertising.

The second part of the questionnaire asked subjects to recall whether any of the products they had just seen displayed a warning label and, if so, what was the content of the label. Subjects' responses to the item concerning the content were scored on a three-point scale: incorrect recall = 1 point, generally correct recall (i.e., wording was incorrect but the thrust of the warning was generally correct) = 2 points, correct recall = 3 points.

The third part of the questionnaire requested information about the subjects' previous experience with smokeless tobacco products and included several demographic items.

*Procedure*

The questionnaires were administered to groups of approximately 20 subjects in their regular classrooms. Questionnaires were distributed such that the first subject seated in a row received version one, the second subject received version two, and so on, in order to insure that a similar number of subjects would receive each version. In order to disguise the true purpose of the study, subjects were informed that they were participating in a consumer preference study. Part one of the questionnaire was completed and collected before the remaining parts were distributed.

## RESULTS

As a result of the sequential distribution of the four versions of the questionnaire, 49 subjects were included in condition one (no warning label), 47 in condition two ("may cause mouth cancer" label), 44 in condition three ("may cause gum disease and tooth loss" label), and 52 in condition four ("not a safe alternative to cigarettes" label).

Of the subjects who were exposed to illustrations of products displaying the warning labels, that is, subjects in conditions two, three, and four ($n = 143$), 43.4% correctly recalled seeing the labels. Of those who reported seeing the labels, only 20.3% correctly recalled the content of the warning labels they had seen. An additional 11.9% recalled the general thrust of the warning message but not the correct wording. Chi-squared analyses indicated that recall was unrelated to the particular content of the label or to the subjects' grade level. There was, however, a significant relationship between recall and sex ($\chi^2[2] = 8.24$, $p < .02$), with 43% of the males, compared to 22.78% of the females, correctly recalling the content of the label they had seen.

A series of 2 × 4 (Sex × Warning Label) analyses of variance revealed that warning labels had no significant effect on subjects' ratings of whether they, or other kids their age, would be likely to use either snuff or chewing tobacco in the future, nor were there any significant Sex × Warning label interactions. There was, however, a significant main effect for sex on subjects' ratings of how likely they would be to use snuff ($F[7, 184] = 5.05$, $p < .0001$) and chewing tobacco ($F[7, 184] = 3.46$, $p < .001$). Males indicated a greater likelihood than females that they would use snuff (male $M = 44.2$, female $M = 8.71$) and chewing tobacco (male $M = 33.64$, female $M = 8.85$). Since scores on the above rating scales could range from 0–185, the majority of subjects, male and female, reported a relatively low probability that they would use either form of smokeless tobacco in the future.

There was evidence to suggest that males had more experience, or contact with, smokeless tobacco products than did females. For example, 64.06% of the males, compared to 13.93% of the females, had previously tried smokeless tobacco ($\chi^2[1] = 38.41$, $p < .0001$). In addition, 37.5% of the males, compared to 5.06% of the females, reported that they had purchased smokeless tobacco in the past ($\chi^2[1] = 23.62$, $p < .001$). There were, however, no differences between males and females on their responses to the question "Have you ever seen this kind of product before?" for either the illustration of snuff (males $M = 172.55$, females $M = 168.86$) or the illustration of chewing tobacco (males $M = 166.83$, females $M = 164.37$).

## DISCUSSION

The results of this study call into question the effectiveness of the health-risk warning labels placed on smokeless tobacco products as a means of discouraging the use of such products by adolescents. The majority of the subjects apparently did not notice the labels and of those who did, fewer than a third could correctly recall the general content of the warning message. Male subjects were better able to recall the content of the warning message they

had seen than were female subjects. This may be related to differences between males and females in the degree of previous exposure to smokeless tobacco products. A significantly larger number of males than females reported having purchased and tried smokeless tobacco in the past and, therefore, may have already been aware that the products carried warning labels.

These results seem to suggest that warning labels should be placed in a more prominent location on smokeless tobacco products and in smokeless tobacco advertising in order to enhance their salience. However, the finding that neither the presence of a warning nor the content of the warning had any effect on subjects' intentions to use smokeless tobacco in the future, indicates that additional modifications may be required. One possibility might be to increase the relevance of the message for adolescents. For example, the message might emphasize the more immediate consequences of using smokeless tobacco or its effects on one's physical appearance. At the very least, the results of this study point to the need for a careful analysis of the value of health-risk warning labels on smokeless tobacco products as a preventive measure.

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