

8-31-2009

Smokeless Tobacco Prevalence in Roswell, New Mexico

Marianne Berwick

Willie Nunez

Josh Raiten

Follow this and additional works at: <https://digitalrepository.unm.edu/ume-research-papers>

Recommended Citation

Berwick, Marianne; Willie Nunez; and Josh Raiten. "Smokeless Tobacco Prevalence in Roswell, New Mexico." (2009).
<https://digitalrepository.unm.edu/ume-research-papers/86>

This Presentation is brought to you for free and open access by the Health Sciences Center Student Scholarship at UNM Digital Repository. It has been accepted for inclusion in Undergraduate Medical Student Research by an authorized administrator of UNM Digital Repository. For more information, please contact disc@unm.edu.

Research Project Title:

SMOKELESS TOBACCO PREVALENCE IN ROSWELL NEW MEXICO

Investigator:

Marianne Berwick, Ph.D., M.P.H., Professor, Department of Internal Medicine

Student Investigators:

Willie Nunez and Joshu Raiten

Study Goals: The specific goals of this study are to characterize the use of tobacco by students in the 8th and 12th grades in Roswell, New Mexico.

Abstract

The purpose of this study is to determine the prevalence of smoking and smokeless tobacco use in an un-surveyed region of New Mexico. The reason for doing this is because the recent information of smoking and smokeless tobacco use in the state of New Mexico is incomplete, specifically in the Roswell area. This information is needed in order to understand the association between smokeless tobacco use and oral cancer, stroke, and cardiovascular disease. There are also questions of whether people are stopping smoking and switching to smokeless tobacco as well as the possibility that using smokeless tobacco could lead to smoking. Current literature suggests that there has been a recent decrease in the smoking population and also suggests that there may be an increase in smokeless tobacco use. These findings raise concerns about the levels of risk in this population. **METHODS:** Approximately 500 8th grade students and 500 12th grade students were given a questionnaire on their tobacco use, patterned after the New Mexico Youth Tobacco Study that was given to the majority of the state. **EXPECTED OUTCOME:** An estimation of the prevalence of total tobacco use, specifically smokeless tobacco use in this population. **RESULTS:** Current smokeless tobacco use, defined as smokeless tobacco use ≥ 1 of the 30 days preceding this survey, the overall prevalence was 11.6%. With current smokeless tobacco use higher in males 7.8% than females 3.8%. The use was higher among 12th graders (7.8%) than 8th graders (3.4%). The usage was highest among Whites (4.5%), Hispanics (3.4%) and African Americans (1.5%).

Introduction

Data establishing the prevalence of tobacco smoking and smokeless tobacco use in the state of New Mexico are incomplete. In the last survey conducted by the New Mexico State Department of Health, 2004, no data were obtained from Roswell. In the previous survey, 2002, where Roswell was included, 4% of middle school students and 10% of high school students in New Mexico used smokeless tobacco while the prevalence of smoking in this population was approximately three times that.¹

We do not know whether or not the use of smokeless tobacco is increasing or decreasing in this area of New Mexico. The concern over the use of smokeless tobacco comes from references such as Johansson et al., who stated, “Cigarette smoking has declined whereas the use of smokeless tobacco is increasing. There is an ongoing debate as to whether smokeless tobacco is a recommendable strategy to help smokers to quit.”² People are switching from smoking to smokeless tobacco; however, there is conflicting evidence that it eliminates the health risks associated with smoking. For example, Asplund et al., reported that the risk of stroke in men is doubled in the smoking population while smokeless tobacco use is not associated with any apparent excess risk.³ On the other hand, Gupta et al. found, “Studies on the effect of smokeless tobacco on lipid profiles, chronic blood pressure elevations, increased fibrinogen levels, and insulin resistance suggest that there is an association between an adverse cardiovascular risk profile and smokeless tobacco use.”⁴ Furthermore, Bolinder et al. reported; “Both smokeless tobacco users and smokers face a higher risk of dying from cardiovascular disease than nonusers. Although the risk is lower for smokeless tobacco users than for smokers.”⁵ We have concluded that more studies are needed to define this relationship.

This conclusion is consistent with Critchley's et al. findings, "There may be an association between smokeless tobacco use and cardiovascular disease. However, further rigorous studies with adequate sample sizes are required."⁶

Another concern is the relationship between smokeless tobacco use and the risk of oral cancer. Winn states, "Persons who use chewing tobacco and snuff experience an increased risk of oral cancer."⁷ Where as a recent study by Rodu et al. found, "that the use of chewing tobacco and moist snuff is associated with very low risks for cancers of the oral cavity and related structures."⁸ Although research has in fact shown the lack of a strong link between smokeless tobacco and oral cancer, it is likely that smokeless tobacco will create nicotine dependence and may later lead to the uptake of smoking among those who have become dependent. It is possible that the current studies do not truly have the statistical power or have been conducted with a long enough latency period to appropriately analyze the association between smokeless tobacco and oral cancer.

Clearly, more studies need to be done to establish the magnitude of the relationship between oral cancer, cardiovascular disease, and stroke with smokeless tobacco use. Due to the incomplete nature of this prevalence data, epidemiological studies of this issue in New Mexico are limited. Prevalence of tobacco use in the state of New Mexico has been well documented with the exception of a few places around the state. One of the areas lacking this data is Roswell, New Mexico. Roswell was chosen because in recent studies the State Department of Health was unable to obtain prevalence information from adolescents in this area. Due to the student investigators connection to Roswell, New Mexico, they were able to gain permission to sample the Roswell student population.

Collecting prevalence data in the Roswell school district would help establish a representative sample of the population of the area. We assume that this information would help establish a more complete picture of smokeless tobacco use in New Mexico. The 8th and 12th grade population was chosen because studies have shown that most people who use tobacco start using in high school. The results may also help the State of New Mexico know how well their anti-tobacco message is impacting the teenage population. This is the best and most representative sample of the Roswell population that we could access. From this survey, we will have an indication of the extent of the use of tobacco products, specifically smokeless tobacco products.

The justification of using a survey to provide cross sectional data analyzing smoking and smokeless tobacco use is because it has been done before in the state of New Mexico. Our questionnaire consists of many questions that have been used in the 2002 New Mexico Youth Tobacco Survey which will allow us to compare and contrast our data with the previous data. Furthermore, past studies have shown that students are truthful in answering tobacco surveys.⁹

Question and Hypothesis

The big question that we are asking is the prevalence of smoking and smokeless tobacco use in the 8th and 12th grade population of Roswell, New Mexico. Completing the missing data in this area may facilitate future epidemiological studies, for instance, whether or not smokeless tobacco use increases the risk of oral cancer, stroke, and heart disease. Past studies done by the State of New Mexico has shown that smokeless tobacco usage has decreased from 26.6 % in 1991 to 14.4 % in 2003.¹ The researchers question

if the smokeless tobacco usage in the Roswell area is decreasing as well. From this questionnaire we can answer several other questions such as: What are the sex differences in smoking and the use of smokeless tobacco? What is the age difference of smokers and smokeless tobacco users? What is the frequency of use of smoking and smokeless tobacco use? Comparison of the 8th and 12th grade habits is also an important question answered by this study, as well as the comparison between 2002 and present.

Experimental Design and Methods

This is a cross sectional study analyzing smoking and smokeless tobacco use in the youth of Roswell, New Mexico. The questions on the survey are based on CDC tested standard questions. We obtained permission from the state of New Mexico epidemiologist, Jose Padilla, and eliminated questions that were not pertinent to our investigation and added additional questions focused on smokeless tobacco. Our revised questionnaire was reviewed by Rufus Greene Jr., Northwest Regional Field Coordinator on Tobacco Use Prevention and Control, division of the New Mexico Department of Health. The questionnaire can be completed in less than 30 minutes.

We gained permission to conduct this study in the Roswell Independent School District. This consists of two high schools, Roswell High School and Goddard High School and four middle schools, Berrendo, Mt. View, Sierra, and Mesa Middle Schools. There are approximately 500 8th grade students and 500 12th grade students in this population. The Superintendent of the Roswell Independent School District has reviewed the preliminary questionnaire and has given us approval to conduct this survey. The superintendent's administrative assistant mailed out the parental consent forms to each

student's residence. If the parent did not want their child to participate in the survey, they signed and mailed the passive consent form in the stamped preaddressed envelope that was enclosed. This method has been used by the State Department of Health Surveys. Dr. Linda Penaloza who is part of the UNM Prevention Center, shared this passive consent form and methodology with us. We feel that this method both allows parents and students the "right of refusal" and imposes a minimal burden on the school staff. One month prior to doing the survey, the consent forms were mailed to the parents of all 8th and 12th grade students. During that time there was also a copy of the survey at each school's main office for parents/guardians who wished to review the survey. If any questions or concerns arose, parents or faculty were instructed to call the 800 number listed on the consent form. Also, we discussed the survey further with each school's principal. The teachers were instructed on how to administer the survey to their class on the day of the survey and we reiterated the voluntary nature of this survey. For those students whose parents did not wish them to fill out the survey or those students who did not want to participate in the survey, we asked them to fill in "NO" at the top of the survey. Along with the questionnaire, a student information sheet was handed out that clearly described the voluntary nature of the questionnaire. The forms of all students who did not wish to participate were excluded. All those whose parents allow them to participate and also wish to participate themselves had their surveys counted. Confidentiality was maintained due to the anonymous nature of the surveys. As the results did not contain identifiers, there were no confidentiality issues raised by parents.

Data Analysis:

For data analysis, we received the assistance of Dr. Sang-Joon Lee who is a statistician at the University of New Mexico. The data was analyzed by means of frequency distribution and chi square analyses, comparing age, sex, and smoking status or chewing tobacco status of students. We collected the data in the early part of March 2007.

Statistical Power:

With the sample size obtained, we had more than adequate statistical power to determine differences of 10%, and sometimes less, between most distributions of answers in response to the survey. The table below illustrates the range of power from 80-99%.

Table 1. Statistical power for differences in proportions between groups, $\alpha = 0.05$, 2-sided tests.

Proportion in Group A	Proportion in Group B	Power
0.05	0.15	99%
0.10	0.20	95%
0.15	0.25	90%
0.20	0.30	85%
0.25	0.35	85%
0.30	0.40	80%
0.35	0.45	80%

Results:

There were 1,131 surveys distributed to the 8th and 12th grade classes in the Roswell Independent School District. Out of the 1,131 students, 836 agreed to participate. There was a 74% participation rate which surpasses the 60% minimum set forth by CDC to weight the data and consider it representative of the population. There were a total of 295 who either opposed the passive parental consent form (34 students) or chose “NO” on the survey and chose not to participate on the day of the survey. There was 55% female and 45% male participation. As for ethnicity representation from greatest to least, Hispanics 47.12%, White 33.33%, multiple ethnicity (chose more than one answer) 10.19%, Black/African American totaled 5.04%, American Indian or Alaskan Native 2.16%, Asian 1.32% and Native Hawaiian or other Pacific Islander 0.84%.

PREVALENCE OF SMOKELESS TOBACCO

Smokeless tobacco lifetime use

We defined lifetime smokeless tobacco use as anyone who has tried smokeless tobacco. For smokeless tobacco lifetime use, 488 8th graders answered the question and 61 (12.5%) had tried smokeless tobacco at least once in their lives. Out of the 320 12th graders that answered, 81 (25.3%) had tried at least once. Overall the total prevalence was higher in males (12.8%) compared to females (5.15%). 21.2 % of the males that tried smokeless tobacco were 8 years of age or younger compared to the 14.9% of females of the same age. The highest percentage of using smokeless tobacco for the first time was at the age of 13-14 in males and females at 23.9% and 25.5% respectively.

Smokeless tobacco usage was highest amongst Whites at 22.3%, African Americans at 21.9% and Hispanics at 13.9%.

Smokeless tobacco current usage

For current smokeless tobacco use, we defined as smokeless tobacco use ≥ 1 of the 30 days preceding this survey, the overall prevalence was 11.6%. With current smokeless tobacco use higher in males 7.8% than females 3.8%. The use was higher among 12th graders (7.8%) than 8th graders (3.4%). The usage was highest among Whites (4.5%), Hispanics (3.4%) and African Americans (1.5%).

Possible factors leading to smokeless tobacco use

The question was asked if anyone in their household used smokeless tobacco and their smokeless tobacco usage. Out of the 803 who answered the question, 15.6% of the households had someone who used smokeless tobacco. There was a higher smokeless tobacco usage rate amongst children who had someone using in the household, 35.2% versus 14% who did not have someone in the household who used smokeless tobacco. Based on chi square analysis, there is a positive association between household members using smokeless tobacco and children of that household ever trying smokeless tobacco with a P-value < 0.0001 .

PREVALENCE OF SMOKING

Cigarette lifetime use

We defined lifetime cigarette use as anyone who has ever tried smoking in the course of their lives. Out of the 498 8th graders that answered this question, 231 or 46.6% of them had tried cigarettes at least once in their lives. Of the 327 12th graders that answered this question, 177 or 54.1% had tried cigarettes at least once in their lives. Overall, 47.1% of the females and 53.2% of the males surveyed had tried smoking at least once in their lives. Smoking was highest amongst Hispanics 51.4%, American Indian 50%, Whites, 48.6%, and African Americans 45.3%.

Cigarette lifetime daily use

We defined lifetime daily use as a student who has ever smoked one cigarette every day for at least 30 days. 495 8th graders answered the question with 50 of them (10.1%) answering yes. 325 12th graders answered the question with 54 of them (16.2%) answering yes. 9.85% of females questioned and 17.03% of males had smoked at least 1 cigarette per day for at least 30 days.

Prevalence of both cigarette and smokeless tobacco use

The prevalence of 8th grade and 12th grade students who used both cigarettes and smokeless tobacco was 4.1%. Of the 800 surveyed, 33 reported that they have done both.

Smokeless tobacco use and its association to the use of cigarettes

One of the questions we wanted answered was if smokeless tobacco was a “gateway” to cigarette usage. We asked if children smoked before trying smokeless tobacco or if they tried smokeless tobacco before they smoked cigarettes. 33 students out

of 807 (9.9%) who answered the question stated that they had smoked cigarettes before using smokeless tobacco. Whereas 37 out of the 753 students that answered the question (4.9%) stated that they had used smokeless tobacco before smoking cigarettes.

Discussion:

We found that 25.3% of 12th graders and 12.5 % of 8th graders in Roswell, NM had tried smokeless tobacco at least once in their lifetime. With the lifetime prevalence usage highest amongst Whites 22.3%, African American 21.9% and Hispanics 13.9%.

The most recent prevalence of current smokeless tobacco usage in the youth of Roswell (Chaves County) New Mexico from Tobacco Use Prevention and Control (TUPAC) was 9.5% in 2005.¹⁰ Our data shows the current usage of smokeless tobacco was 11.6%. The national prevalence of smokeless tobacco current usage is 8 %.¹¹ There is no significant change from the past state data.

Current usage by ethnicity from total participants was Whites 4.5%, Hispanic 3.4% and African American 1.5%. State data showed the high school students' current smokeless tobacco usage amongst ethnicity from greatest to least was; African American 22.8%, Whites 8.8% and Hispanics 7.7%.¹⁰ Nationally, Whites were 10.2%, Hispanics were 5.1%, and 1.7% in African Americans.¹¹ Our study data was not consistent with the state of New Mexico TUPAC's data but was consistent with the national trend.

Amongst the grade levels, the prevalence of current smokeless tobacco in 12th graders was 7.8% and 3.4% in 8th graders, the state data in 2005 showed 9.1% usage in 12th grade students.¹⁰ The national prevalence for 12th grade males was 15.5% and females was 1.3%¹¹ or 16.8% total. The 8th grade usage was not directly calculated, the

closest data is middle school grades 6th through 8th done by the NMYTS 2004 report which showed 4.1% use of smokeless tobacco.¹² Our data show no significant changes in prevalence among these grade levels.

The usage of smokeless tobacco was higher amongst males than females, which follows the state and national trend. Our data shows that the current usage of smokeless tobacco among males was 7.8% while among females being 3.8%. When comparing to the state (TUPAC) data, which showed 14.5% for males and 1.5% for females, the youth of Roswell had no change with usage among the sexes.¹⁰ This coincides with the national average trends of males using smokeless tobacco at a higher prevalence than females, 13.6% for males and 2.2% for females.¹¹

Our data evaluated the first time usage of smokeless tobacco by age. Unexpectedly, a large percentage of males who tried smokeless tobacco did so when 8 years old or younger (21.2%) while females tried smokeless tobacco less among that age group (14.9%). The highest age group of experimenting with smokeless tobacco in both sexes was in the 13 to 14 year old age group (males 23.9% and females 25.5%). Students in the 17 year old and older category had fewer numbers that have ever tried smokeless tobacco indicating an increase with experimentation of smokeless tobacco at younger ages.

There was a higher smokeless tobacco usage rate in people who had a household member who used smokeless tobacco. This information suggests that there may be a connection between the presence of smokeless tobacco use in the home and the likelihood that youth in this home is more likely to try smokeless tobacco in their

lifetime. This could be a beneficial place to put educational efforts to help prevent smokeless tobacco use.

Surprisingly there were 4.1% of the people surveyed who used both smokeless tobacco and smoked cigarettes. It has been known for some time that nicotine addiction is difficult to overcome and there are many sources to get nicotine.

Finally, a question that we wanted to answer was whether or not smokeless tobacco is a gateway to cigarette use. Through our research we found nearly 10% of kids smoked first before trying smokeless tobacco while only around 5% of kids used smokeless tobacco before trying smoking. This would indicate that smokeless tobacco is not a gateway to cigarette use. It does not clearly answer whether or not smokeless tobacco is being used to assist in the cessation from cigarettes. The fact that people are more likely to smoke first before trying smokeless tobacco possibly indicates that they are using it for smoking cessation but more direct questions need to be asked.

REFERENCES

1. Davis M. **New mexico youth tobacco survey 2002 report**. Available at:
http://www.health.state.nm.us/pdf/Tobacco_Final-NMYTS-2002-Report.pdf. Accessed
December/30, 2006.
2. Johansson SE, Sundquist K, Qvist J, Sundquist J. Smokeless tobacco and coronary heart disease: A 12-year follow-up study. *Eur J Cardiovasc Prev Rehabil*. 2005;12:387-392.
3. Asplund K, Nasic S, Janlert U, Stegmayr B. Smokeless tobacco as a possible risk factor for stroke in men: A nested case-control study. *Stroke*. 2003;34:1754-1759.
4. Gupta PC, Sreevidya S. Smokeless tobacco use, birth weight, and gestational age: Population based, prospective cohort study of 1217 women in mumbai, india. *BMJ*. 2004;328:1538.
5. Bolinder G, Alfredsson L, Englund A, de Faire U. Smokeless tobacco use and increased cardiovascular mortality among swedish construction workers. *Am J Public Health*. 1994;84:399-404.
6. Critchley JA, Unal B. Is smokeless tobacco a risk factor for coronary heart disease? A systematic review of epidemiological studies. *Eur J Cardiovasc Prev Rehabil*. 2004;11:101-112.

7. Winn DM. Epidemiology of cancer and other systemic effects associated with the use of smokeless tobacco. *Adv Dent Res*. 1997;11:313-321.
8. Rodu B, Jansson C. Smokeless tobacco and oral cancer: A review of the risks and determinants. *Crit Rev Oral Biol Med*. 2004;15:252-263.
9. Post A, Gilljam H, Rosendahl I, Meurling L, Bremberg S, Galanti MR. Validity of self reports in a cohort of swedish adolescent smokers and smokeless tobacco (snus) users. *Tob Control*. 2005;14:114-117.
10. New Mexico Dept of Health. TUPAC. 2001-2005 NM youth tobacco report. Available at: <http://www.health.state.nm.us/tobacco.html>. Accessed 11/19, 2008.
11. Centers for Disease Control and Prevention. Youth risk behavior Surveillance—United states, 2005. Available at: <http://www.cdc.gov/tobacco/smokeless/index.htm>. Accessed 11/19, 2008.
12. New Mexico Dept of Health. TUPAC. New Mexico youth survey, 2004. Available at: [NMYTS_200405web.pdf](#). Accessed 05/12, 2007.