

Risk Factors, Knowledge, and Beliefs about Cervical Cancer Screening and Screening
Practices among Appalachian Women

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Introduction

In recent years, the National Cancer Institute and the Centers for Disease Control and Prevention have discovered the need to focus more attention to increase the cervical cancer screening rates in populations characterized by their socioeconomic status in addition to factors such as race and ethnicity (Friedell, Linville, & Hullet, 1998). It has been found that the poor white population in rural Appalachia is comparable in the sense of cancer control issues to other minority populations, such as African American and Hispanic populations. The Appalachian region includes over 400 counties in 13 states extending from New York to Mississippi. All of West Virginia is included in the Appalachian region and parts of New York, Pennsylvania, Maryland, Ohio, Kentucky, Tennessee, Virginia, North Carolina, South Carolina, Georgia, Alabama and Mississippi are also included. Most of the counties in Appalachia (67%) are considered rural. The federal government has identified most of these rural counties as having professional health care shortages. The 1990 census reported that 20.7 million people or 8% of the U.S. population reside in the region of Appalachia. The population in Appalachia is 92% white, 7% African American, and 1% Native American. The Appalachian population is often characterized as poor, poorly educated, older, and as having health status below the national averages (Friedell, Linville, & Hullet, 1998).

One study in Appalachian Kentucky identified that about 30% of the population had income below the federal poverty level and that about 50% of this population over age 25 had an education below the eighth grade level. In addition, incidence rates for invasive cervical cancer in the study area of the 36 Appalachian counties in Kentucky were almost doubled when compared with all white women in the Surveillance, Epidemiology, and End Results (SEER) database. Mortality rates from cervical cancer were also higher in the study population than in the SEER group (Friedell et al., 1992). Although it has been identified that 82.4% of

Appalachian women have had a Pap smear in the past three years, the screening rate among Appalachian women overall was 2.5% below the levels of other U.S. women (Hall, Uhler, Coughlin, & Miller, 2002) and this disparity is known to be greater in certain Appalachian regions. Cervical cancer screening has greatly decreased mortality from the disease in the United States overall, but screening rates remain lower and mortality rates are higher within the population of Appalachian women (Hall, Rogers, Weir, Miller, & Uhler, 2000). This indicates that more attention needs to be given to the factors that may cause this discrepancy such as barriers to screening practices brought about by the degree or level of knowledge and beliefs of Appalachian women regarding cervical cancer and screening. Therefore, the purpose of this study was to examine the relationship between attitudes, beliefs and knowledge about cervical cancer risk factors and screening, and actual screening practices in a cohort of Appalachian Ohio women.

This study was accomplished through secondary analysis of a primary study conducted among non-Amish women residing in Appalachian Ohio. It is known that cancer incidence rates have been lower in the Amish population than the non-Amish living in the same Appalachian counties in Ohio (Katz & Ferketich, 2004). The goal of the primary study was to compare lifestyle behaviors of non-Amish women residing in Appalachia to Amish women residing in the same counties.

Literature Review

Cervical Cancer

Cervical cancer is a preventable form of cancer, yet it is estimated that 10,370 women will be diagnosed with invasive cervical cancer during 2005. In addition, it is estimated that about 3,710 women will die from cervical cancer in 2005 although mortality rates have decreased due to early detection from screening. Cervical cancer is usually asymptomatic until nearby tissue is invaded by the cancerous cervical cells. At this time abnormal vaginal bleeding

may occur between menstrual periods or following sexual intercourse. Bleeding after menopause may also be a symptom (American Cancer Society, 2005).

The most common cause of cervical cancer is infection of human papillomavirus (HPV). Almost 100% of women with a diagnosis of cervical cancer have been found to have had an HPV infection. Women are at increased risk of being infected by HPV if they begin having sexual intercourse at an early age or have had many sexual partners. Although an HPV infection is the major cause of cervical cancer, few women with an HPV infection actually progress to a cancer diagnosis. There are some risk factors that may influence the progression of cervical cancer such as leaving the HPV infection untreated and allowing it to persist for a long period of time, smoking cigarettes, immunosuppression, and nutritional status. Low socioeconomic status has also been identified to be a risk factor for cervical cancer (American Cancer Society, 2005).

The survival rate for women with pre-invasive cervical cancer lesions is almost 100%. Screening practices can help detect cervical cancer in its pre-invasive stage. About 90% of women diagnosed with cervical cancer survive after the first year of diagnosis, and about 73% survive five years after the initial diagnosis. For localized cervical cancer, the five year survival rate is 92% (American Cancer Society, 2005).

Cervical Cancer Risk Factors

One study examined sexual behaviors and cigarette smoking as risk factors for cervical cancer among women in the United States and Venezuela. The study included 272 participants of which 114 were cases of cervical cancer and 158 were healthy controls. Two questions were used to assess self-reported sexual behavior as a risk factor for cervical cancer. These questions included the lifetime number of sexual partners and the age at first sexual intercourse. Cervical cancer cases with more than two lifetime sexual partners had a 1.7 times increased risk for cervical cancer when compared to women with two or less sexual partners. The mean number of sexual partners was significantly higher in the cases with cervical cancer when

compared to the healthy control group ($p < 0.01$). It was also identified that the overall mean age at first sexual intercourse was significantly different in the cases group than for the control group ($p < 0.01$). The mean age of first sexual intercourse for the cases was 16.45 years and 18.32 years for the control groups. Of the cases, 83% of the women were 18 years old or younger at the time of first intercourse compared to 58% of women in the control groups. Beginning sexual intercourse at age 18 or younger accounted for a 3.9 times increased risk for cervical cancer and is a significant finding ($p < 0.01$) (Sierra-Torres, Tying, & Au, 2003).

The study also examined smoking behavior and the risk for cervical cancer. Participants were asked whether they were currently smoking cigarettes, had smoked in the past, or had never smoked. For those that had smoked in the past or currently, the amount of cigarettes calculated in pack years were used to indicate amount of cigarette exposure. Overall, 60% of the participants in the cervical cancer cases group reported a history of smoking while only 46% of the healthy control groups indicated a history of tobacco use. A significant increase in risk for cervical cancer was found among current cigarette smokers ($p < 0.05$). The increase in risk is related to heavy smoking since women smoking over 15 pack-years had a significantly higher risk for cervical cancer ($p < 0.01$). The risk for cervical cancer was increased 7.7-fold among the U.S. women that smoked cigarettes (Sierra-Torres, Tying, & Au, 2003).

A second study examined active and passive cigarette smoking as a risk factor for cervical cancer. The study recognized that active cigarette smoking has been identified being causally associated with cervical cancer, but there exists a gap in research on passive cigarette smoking and cervical cancer. The analysis was conducted as a large community based prospective cohort study among Washington County, Maryland residents. The study was based on two cohorts which were created from data collection from two private censuses in 1963 and 1975. Approximately 98% of the households participated in the 1963 census, and 90% of households participated in the 1975 census. The study included 26,381 women from the two cohorts and all participants were over 25 years of age, had no prior diagnoses of cancer, and

were not missing any information on age, gender, and smoking status. The 2 cohorts were then followed over time for first-time cervical cancer occurrences by linking personal identification information collected during the two censuses with the Washington County cancer registry. A major shift in tobacco exposure identified between the two cohorts was that the percentage of women who had never smoked but lived with a smoker decreased from 25% in 1963 to 15% in 1975. However, the percentage of women who were former smokers increased from 9% in 1963 to 15% in 1975. The study revealed that the risk for cervical cancer development was significantly increased among women who were active smokers in both of the cohorts with an adjusted relative risk (aRR) of 2.6 in the 1963 group and 1.7 in the 1975 group. It was also shown in both of the cohorts that passive smoking was in fact associated with an increased risk of cervical cancer. The association of passive smoking and development of cervical cancer was stronger in the 1963 cohort with an aRR of 2.1, and an aRR of 1.4 in the 1975 cohort. The association between passive smoking and development of cervical cancer was statistically significant in only the 1963 group (Trimble et al., 2005).

The study also revealed other risk factors to cervical cancer including education and marital status. The relative risk of cervical cancer in women with 12 or more years of education compared to women with less than 12 years of schooling was 0.6 in the 1963 as well as 1975 cohorts. The study also found that women who were divorced or separated were at a significantly higher risk for developing cervical cancer compared to women who were married (relative risk of 1.6 in 1963 and 2.0 in 1975) (Trimble et al., 2005).

Alcohol consumption may also act as an indirect risk factor for cervical cancer. One study found that as the number of alcohol related behaviors and consumption increased, the proportion of participants in the study who had recently had multiple partners increased from 8% to 48% in females and from 23% to 61% in males (Santelli, Brener, Lowry, Bhatt, & Zabin, 1998). A second study also found that alcohol use, especially during the time of last sexual intercourse, was strongly associated with an increased likelihood of multiple sexual partners

(Santelli, Robin, Brener, & Lowry, 2001). As discussed earlier, an increase in sexual partners leads to an increased risk for cervical cancer.

Cervical Cancer Screening

Invasive cervical cancer is one of the most successfully treated cancers when it is detected early through screening practices. The guidelines for cervical cancer screening set by the American Cancer Society states that screening should begin three years after a woman has become sexually active or when she turns 21 years old. Screening should be once a year when using regular Pap tests, or every two years when using liquid-based tests. If a woman has had three consecutive normal test results or after age 30, screening may be reduced to once every two to three years. A woman does not need to be screened after a total hysterectomy unless the reason for the surgery was due to cervical cancer. Pap tests, the regular screening methods used for detection of cervical cancer, can detect precancerous lesions to begin treatment before they progress to cancer. Invasive cervical cancer can also be detected at an early enough stage to treat successfully. The test involves a quick procedure during which a small sample of cells is taken from the cervix to be examined. Regular screening practices are important because results may appear to be normal even when abnormal cervical cells are present. In addition, abnormal cells may be present when the cervical cells are healthy. Cervical cancer usually develops slowly so that most cases can be detected and treated when screening is done regularly. (American Cancer Society, 2005). The U.S. Preventative Task Force has a slightly different set of guidelines for cervical cancer screening. They recommend that cervical cancer screening should be done once every three years rather than annually. They also recommend that routine screening may be discontinued after a woman turns 65 years old and has adequate recent normal Pap smears as well as are not at high risk for developing cervical cancer (U.S. Preventive Services Task Force, 2003).

Barriers to Cervical Cancer Screening

In order to better understand why certain groups of women, such as women residing in Appalachia, have lower cervical cancer screening rates than other women across the United States, certain barriers to healthcare and screening services need to be examined and addressed. A study in 1995 was conducted in West Virginia to assess the patient perceived barriers to preventative health care among the Appalachian population. The outpatient clinic served patients not only from northern West Virginia, but also from southwestern Pennsylvania, and western Maryland. None of the patients at the clinic had any type of health insurance. One hundred and eighty-eight new patients actively seeking health care between the ages of 18 and 88 were interviewed during a four month period. Their mean monthly income was \$518 and 39% had less than 12 years of education, 34% were high school graduates, and 28% had at least some college education. Patients were asked about six preventive health measures and their compliance. Patients were also asked if they have had their blood pressure checked within the past two years, had their cholesterol measured within the last five years, had a physical examination in the last five years, and whether they had received a diphtheria-tetanus booster immunization within the last ten years. Finally, women were also asked if they had a cervical Pap smear within the last three years and women over 50 years old were asked if they had a mammogram test within the last two years. The screening guidelines were taken from the U.S. Preventative Task Force and American College of Physicians recommendations in 1991 (Elnicki, Morris, & Shockcor, 1995).

Findings indicated that 85% of the interviewed patients were lacking at least one of the preventative health measures. The patients were then asked about the reasons why they had not been compliant with the screenings. The reasons included lack of knowledge by 51% of patients, cost by 36%, no reason by 13%, no perceived need by 6%, lack of location to obtain the screenings by 3%, transportation problems by 3%, and other reasons by 6%. About 72% of the patients said they would be more compliant in obtaining the missing screening measures if the barriers were removed. The study also found that older women were less likely to have Pap

smears than younger women. The median age for women without cervical cancer screening was 45, while for women who have had Pap smears within the last three years was 30 years. There was also an association discovered between women with lower education levels and not being compliant with cervical cancer screening measures. Women were more likely than men to state cost as a reason for not having a screening measure performed. The major reasons the patients identified for omitting the preventative screening practices were cost and lack of knowledge (Elnicki, Morris, & Shockcor, 1995).

These findings cannot be generalized to the entire Appalachian population because the participants were actively seeking health care. Since these patients were actively seeking care, it is likely that the prevalence of the preventative screening measures is higher than for patients that do not seek health care. Even with the limitations, it is evident a barrier to screening measures is lack of knowledge among Appalachians (Elnicki, Morris, & Shockcor, 1995).

Personal Knowledge, Beliefs and Attitudes about Cervical Cancer and Screening

Personal knowledge, beliefs, and attitudes about cervical cancer and its screening can play a major role as a barrier to Appalachian women's compliance with screening practices. A study in Northwest Ontario investigated the knowledge, attitudes, beliefs, and practices related to screenings for breast and cervical cancers in a sample size of 105 women from different ethnic backgrounds. The ethnic groups included Ukrainian, Finnish, Italian, and two native Canadian groups. The study found that the two native groups were more likely to not practice cervical screening measures than any of the other groups. Of the native groups, 33% of women had refused internal cervical cancer screening compared to the 0-8% of women who refused from the other ethnic groups. The major reasons the native groups did not practice cervical cancer screening were fear of procedures and discomfort. Other reasons native women refrained from Pap tests included the beliefs of the test being distasteful and an invasion of their privacy. Most women in the other ethnic groups indicated Pap tests to be uncomfortable and embarrassing. Some women also described the tests as extremely unpleasant and degrading. A

few women indicated a preference for female physicians over male physicians (Steven et al., 2004).

The study indicated education of women about breast and cervical cancer screening was a critical area on which to focus. Women indicated a desire to learn more about prevention strategies but did not know where to go for reliable information. The women in the study recommended that information should be given to young women earlier in life to decrease the fears and encourage positive health practices. In addition, participants did not believe scare tactics worked and that it was counterproductive as a method to encourage women to practice screening measures. It was also suggested by the participants that more women would be educated about screening practices and prevention if the information was taught in high school, if not earlier (Steven et al., 2004).

Overall, the study among women from different ethnic backgrounds in Ontario identified several beliefs and attitudes concerning cervical cancer screening which serve as barriers to the practice such as fear, discomfort, invasion of privacy, embarrassment, degradation, or not having a female physician. Also, women are often uneducated about screening measures and recommendations because it is not always taught and stressed to women at an early age, such as in high school (Steven et al., 2004).

Methods

Research Questions:

Among a cohort of Appalachian women residing in Ohio:

1. What is the relationship between barriers and beliefs to cervical cancer screening and their actual screening practices?
2. What is the relationship between knowledge about cervical cancer screening and actually screening practices?
3. Is there a relationship between risky behaviors (cigarette smoking and alcohol consumption) and screening practices?

Sample:

The target population for the study were women residing in Appalachian Ohio, specifically in the counties of Holmes and Tuscarawas. To derive the sample, census blocks within these counties were randomly selected from tax map databases. The eligibility criteria for women included being a female head of household over the age of 18. The results from this study were generalized to female non-Amish Appalachian residents of Ohio aged 18 and over in these two counties.

To answer the research questions of this secondary analysis, a power analysis was conducted. To complete a Chi-square data analysis with a power of 0.80 using a medium effect size ($w=0.30$), and an alpha of 0.05, a sample size of 87 participants were needed.

Procedure:

The randomly selected households were each sent a letter that described the study and stated that a researcher would visit the home on a specific date to further discuss the study as well as to schedule an interview for the baseline questionnaire if the woman agreed to participate. Informed consent was obtained when the interviewer returned to the woman's home before beginning the scheduled baseline interview. The woman then completed an in-depth face to face interview to collect the baseline data. Each woman was compensated with a \$25 Wal-Mart gift card after the completion of the interview. All information was kept confidential by assigning a coded number to each participant and was kept in a secured computer system. The primary study was approved by the Ohio State University IRB. Once the larger study from which the secondary analysis was performed was completed, participants were debriefed about the results.

Instruments:

The instruments were derived from the baseline questionnaire that was used in the parent study. Cervical cancer screening practices, smoking history, and alcohol use were obtained through self-report. Questions concerning beliefs and knowledge about cervical cancer and cervical cancer screening were drawn from the baseline questionnaire. There were no pre-existing instruments that were available to determine the women's level of knowledge and beliefs about cervical cancer, but the questions concerning these topics used in the primary study were reviewed for content validity by experts in the field. There are no published reliability and validity estimates for this questionnaire.

Smoking was defined as being a never-smoker, ever-smoker, current smoker, or former smoker. A never-smoker was defined as having smoked less than 100 cigarettes during her lifetime. Having smoked 100 cigarettes in the participant's lifetime determined if she was classified as an ever-smoker. If the woman's response was "yes" her current smoking status was then determined. If the woman responded "yes" to smoking every day or most days she was categorized as a current smoker. If she responded "no", she was categorized as a former smoker.

The level of knowledge concerning cervical cancer and its screening was measured by examining the woman's response to a question which asked whether she knew if there were any tests or exams that checked to see if a woman had cervical cancer. The woman could respond yes, no, do not know, or refused to answer.

To examine whether knowledge or beliefs deterred a woman from cervical cancer screening, a question asked "What were the reasons you have not had a pap smear test in the last year?" The woman could indicate as many reasons as she thought were applicable. The responses were divided in to knowledge or belief categories. Responses relating to knowledge included: my doctor never recommended it, never thought about it, did not know about it, exam causes cancer, I do not know where to get it. Responses relating to beliefs included: exam can

be painful, test not accurate, not necessary/no problems, embarrassed about the exam, too much bother and inconvenience, or fear.

To find whether cost acted as a barrier for screening, the interview asked whether cost was a reason for not having been screened during the last year.

Data Analysis:

Descriptive statistics were performed to characterize the socio-demographics of the sample using age, education, marital status, employment status, and insurance. Chi-square tests were conducted for each of the research questions. A Chi-square test was conducted to determine if there was a relationship between each of the following 1) barriers (cost) and actual screening practice, 2) knowledge and actual screening practice, 3) smoking status and actual screening practices, 4) alcohol use and actual screening practice, and 5) alcohol use and smoking status.

Results

Description of the Sample

A total of 515 homes were randomly selected from two Appalachian counties in Ohio (Holmes and Tuscarawas) from tax map databases to receive letters from the study. Of the 268 selected households in Holmes county, 48 were ineligible, 80 refused, 91 were never home, and 43 women completed the interviews. Of the 247 selected homes in Tuscarawas county, 25 households were ineligible, 88 refused, 85 were never home, and 47 women completed the interviews. A total of 90 women in both counties completed the interviews, but the secondary analysis used data from 89 women as the final interview had not yet been completed at the time. The final response rate for both counties was 22%.

As presented in Table 1, a total of 89 eligible women participated and completed the study. The mean age of the participants was 58 years (standard deviation=15.3). All participants (n=89) were white. All the women had an education level between 8 and 19 years with a mean of 12.7 years of education (SD=2.1). For the 68 women who reported, a mean income was

\$48,660. Marriage status included the following: married 27%, never married 2.2%, divorced 9%, living with domestic partner 1.1%, and widowed 14.6%. The participants' insurance status was the following: 25% pay for their own insurance, 59% indicated employer paid insurance, 1% received Medicaid, and 22% received Medicare.

Knowledge and Beliefs

As presented in Table 1, Ninety-two percent (92%) of the women (n=89) responded they knew that a test existed to detect cervical cancer. Of the sample (n=89), 14.6% of the women indicated the reason for their not having a pap test during the last year was due to a knowledge deficit concerning the screening (see Table 2). Nine out of the 13 women who indicated knowledge deficit items as the reason for not having a pap smear designated the reason to be that their doctor had never recommended the test. The other knowledge related items for which a woman may not have had a pap smear were never thought about it, did not know about it, exam causes cancer, and do not know where to get it. Chi-square analysis found no correlation between knowledge about cervical cancer screening and actual practices ($\chi^2 = 0.668$, $df = 1$, $p = 0.414$). Refer to Table 3.

When asked about beliefs which may act as barriers to screening, 11% of the participants responded to at least one barrier (see Table 2). With regard to the belief items, 7 out of the responding 10 women stated a pap test was unnecessary since they had no problems. Other belief reasons noted for not having a pap smear were exam can be painful, test not accurate, embarrassment about the exam, too much bother or inconvenience, and fear. Chi-square analysis found no correlation between having a pap smear within the last year and cost for screening ($\chi^2 = 0.33$, $df = 1$, $p = 0.56$). Refer to Table 4.

Health Related

In the last year, 72% of the women indicated not having a Pap smear. As shown in Table 1, smoking status of the women indicated that 12% were, current smokers, 32% were former smokers, and 56% were never smokers. There was no association between having

received a pap smear within the last year and smoking status ($\chi^2 = 1.25$, $df = 2$, $p = 0.53$). (See Table 5).

All 89 participants reported their binge drinking status. In the last year, 15.7% of the women reported binge drinking, or drinking five or more alcoholic beverages at least once a year. Chi-square analysis found that women who did not binge drink were the least likely to have had a pap test ($\chi^2 = 2.97$, $df = 1$, $p = 0.085$). (Refer to Table 6). Although this association was not statistically significant, it approached the level of significance. Chi-square analysis found a trend toward significance between smoking status and binge drinking status ($\chi^2 = 4.87$, $df = 2$, $p = 0.088$), as presented in Table 7. Women who were either never smokers or former smokers were the least likely to participate in the other risky behavior of binge drinking.

Discussion

The purpose of this study was to examine the relationships between cervical cancer risk factors, knowledge and beliefs with actual screening practices among a cohort of Appalachian women in Ohio. Although there were few statistically significant associations noted, it is important to understand whether risky behaviors such as drinking and smoking, as well as knowledge deficits and certain beliefs act as barriers to cervical cancer screening. Approximately 72% of the participants did not have a pap smear during the last year. Cost of screening was not reported as a barrier. Results also indicated that women who did not participate in one risky behavior, smoking or drinking, were more likely to also not engage in the other risky behavior. However, analysis indicated a trend toward women who did not binge drink as being less likely to have a pap smear. Participation in risky behaviors may not be an indicator of women not being screened. In fact, women who reported binge drinking were more likely to follow through with screening practices. Smoking status was not an indicator of screening practices.

The study demonstrated certain strengths and weaknesses. Strengths of the study included successfully accessing a sample which was under-studied and underprivileged.

Weaknesses however included a small sample size, self-reporting of behaviors, and a low response rate.

Implications for Education

Health care professionals may decrease knowledge related reasons for not having a pap test by recommending the screening to their patients. Health care providers should educate their patients about the need for cervical cancer screening in order to decrease misperceptions toward screening. Education about the screening may also decrease knowledge deficits as well as decrease false beliefs about the screening procedure. Patient education about cervical cancer screening may decrease the gap between knowledge about cervical cancer screening and screening practices. Perhaps a strategy as little as reminding the patients during each physician visit may increase cervical cancer screening rates.

Implications for Clinical Practice

Research has shown that behaviors such as cigarette smoking and risky sexual behaviors which women may engage in while under the influence of alcohol are contributing risk factors for cervical cancer. Knowing these facts, providers should urge their patients that fall under these categories of risk to follow regular screening practices. However, providers should avoid making assumptions that if a woman participates in the risky behavior of smoking or drinking then she is less likely to have a pap smear. According to the results, providers should be more attentive of women whom do not participate in risky behaviors as being less likely to be screened.

Implications for Further Research

Further research is suggested to find why so many women from the Appalachian regions have not had an annual pap test even though the large majority of women indicated having knowledge of the existence of cervical cancer screening tests. Other suggested research includes studies that analyze whether patient education improve screening outcomes, as well as

finding significant correlations among barriers, knowledge, beliefs, and risky behaviors with screening practices.

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Table 1: Characteristics of the Sample

	Number of Women	Mean (SD)	Frequency (%)
Age (years)	89	57.6 (15.3)	
Race – Caucasian (%)			89 (100%)
Level of Education (years)	89	12.7 (2.1)	
Income (dollars)	68	48,661 (33,141)	
Marital Status (%)	89		
- Married			65 (73%)
- Never married			2 (2.2%)
- Divorced			8 (9.0%)
- Living with domestic partner			1 (1.1%)
- Widowed			13 (14.6%)
Insurance (%)	89		
- Pay for own			23 (25.8%)
- Employer paid			53 (59.6%)
- Medicaid			1 (1.1%)
- Medicare			22 (24.7%)
Smoking Status (%)	89		
- Current			11 (12.4%)
- Former			28 (31.5%)
- Never			50 (56.2%)
Binge Status (past year) (%)	89		
- Yes			14 (15.7%)
- No			75 (84.3%)
Pap smear in last year (%)	85		
- Yes			21 (24.7%)
- No			64 (75.3%)
Knowledge of test for cervical cancer screening (%)	89		
- Yes			82 (92.1%)
- No			2 (2.2%)
- Don't Know			5 (5.6%)

Table 2: Percentage of Women Who Reported Knowledge or Belief Barriers as Reasons for not having a Pap Smear in the Last Year

	Number of Women	Frequency (%)
Knowledge	89	13 (14.6%)
Beliefs	89	10 (11.2%)

$$X^2 = 0.668, df = 1, p = 0.414$$

Table 3: Number and Percentage of Women Indicating Knowledge about Cervical Cancer Screening According to Screening Practices in the Last Year (n=85)

	No Pap Smear	Pap Smear
No Knowledge	3 (3.5%)	2 (2.4%)
Positive Knowledge	61 (71.8%)	19 (22.4%)

Table 4: Number and Percentage of Women who Indicated Cost as being the Reason for No Pap Smear According to Screening Status in Last Year (n=85)

	Cost Not a Factor	Cost a Factor
No Pap Smear	63 (74.1%)	1 (1.2%)
Pap Smear	21 (24.7%)	0 (0%)

$$X^2 = 0.33, df = 1, p = 0.564$$

Table 5: Number and Percentage of Women's Smoking Status According to Pap Screening Status in the Last Year (n=85)

	Current Smoker	Former Smoker	Never Smoker
No Pap Smear	7 (8.2%)	23 (27%)	34 (40%)
Pap Smear	2 (2.4%)	5 (5.9%)	14 (16.5%)

$$X^2 = 1.24, df = 2, p = 0.535$$

Table 6: Number and Percentage of Women who Binge Drink According to Pap Screening Status in the Last Year (n=85)

	No Pap Smear	Pap Smear
No Binge	56 (65.9%)	15 (17.6%)
Binge	8 (9.4%)	6 (7.1%)

$$X^2 = 2.97, df = 1, p = 0.085$$

Table 7: Number and Percentage of Women who Binge Drink According to Smoking Status (n=89)

	Current Smoker	Former Smoker	Never Smoker
No Binge	7 (7.9%)	23 (25.8%)	45 (50.6%)
Binge	4 (4.5%)	5 (5.6%)	5 (5.6%)

$$X^2 = 4.87, df = 2, p = 0.088$$