Association of Health Literacy Level and Cervical Screening Status Among Amish Women

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Abstract

Background: Health illiteracy is a national problem affecting as many as 35% of English-speaking patients (Sharp, Zurawski, Roland, O'Toole, & Hines, 2002) and costing the health care system as much as $73 billion dollars per year (Feifer, 2003). Some new research shows an association between low health literacy and poor health promoting behaviors (Baker, Parker, Williams, Clark, & Nurss, 1997; Lindau et al., 2002; Wilson & McLemore, 1997). However, little is known about the health literacy status in relation to cervical screening rates of women in specific populations, particularly the Amish. The Amish are a religious group of medically-underserved and under-studied people, many of whom reside in the Appalachian regions of Ohio. The Amish have many culturally imbedded perceptions of healthcare which guide their utilization of professional healthcare (Wenger, 1995). Purpose: The purpose of this study was to describe the relationship between health literacy and cervical cancer screening among Amish women in the Appalachian regions of Ohio. Methods: A secondary-analysis of unpublished data collected from the “Cancer screening among Amish adults” study (Katz et al., 2004) was conducted. The original data were collected through in-depth face-to-face interviews of Amish men and women regarding their cancer-related behavioral lifestyles. This secondary study used answers to the question regarding the most recent cervical cancer screening and the results from the Rapid Estimate of Adult Literacy in Medicine (REALM), which were taken from the original study. Findings: A total of 72 women were interviewed. The average age of the sample was 52, with an average of 8 years of education. Over 93% were married. The average health literacy grade level (3.37) for women within screening guidelines was similar to the grade level of health literacy for women not within screening guidelines (3.00). The levels were significantly different per screening group as seen in the Chi-square analysis \( (x^2 = 9.45, df = 2, p = 0.009) \). Of the 72 women, 38 (52.8%) were within screening guidelines and 34 (47.2%) were not within screening guidelines. Conclusions: According to the Chi-square analysis, the higher the score
on the REALM, the more likely a woman is to be within cervical screening guidelines. Although both the screened and unscreened groups had functional levels of health literacy, a large percentage of women were not within screening guidelines, emphasizing the need for further strategies to improve cervical cancer screening.
Introduction

Health illiteracy is a national problem affecting as many as 35% of English-speaking patients (Sharp, Zurawski, Roland, O’Toole, & Hines, 2002) and costing the health care system as much as $73 billion dollars per year (Feifer, 2003). Patients who are health illiterate are unable to understand prescription labels, diagnoses, patient education materials, consent forms, and numerous other important components of the health care system, such as diagnostic and screening tests (Lindau et al., 2002). Nurses often assume the role of educating patients concerning health issues, specifically health promoting behaviors such as cervical screenings, and need to become aware of the large percentage of patients who are health illiterate to enhance the effectiveness of patient education. Some research is beginning to show an association between low health literacy and poor health promoting behaviors (Baker, Parker, Williams, Clark, & Nurss, 1997; Wilson & McLemore, 1997; Lindau et al.). The role of race, ethnicity, education, and socioeconomic status in health literacy is poorly understood. Little is known about the health literacy status in relation to cervical screening rates of women in specific populations. Therefore, the purpose of this study was to describe the relationship between health literacy and cervical screening among Amish women in the Appalachian regions of Ohio.

Literature Review

Cervical screening is a highly effective way to prevent, detect, and promote successful treatment of cervical cancer. Although cervical cancer mortality rates have decreased over the past three decades, over 4100 women in the United States died last year from this highly preventable cancer (American Cancer Society [ACS], 2003). Approximately 70% of American women follow the guidelines recommended by the American Cancer Society; however, studying the reasons for non-adherence to the guidelines by the other 30% of the population needs to be examined to further decrease cervical cancer mortality rates (ACS, 2003; Fitch, Greenberg,
Among many different variables, health literacy is beginning to be studied as a barrier to cervical screening (Lindau et al., 2002; Sharp et al., 2002).

**Amish Women**

The Amish are a group of medically-under served people who populate many areas in Appalachia. No known studies exist examining health literacy in the Amish population, and very few studies exist regarding cervical cancer in Amish women. Due to cultural and religious beliefs, the Amish have limited contact with mainstream society, including healthcare. The Amish do, however, place high value upon health and participate in both folk and professional healthcare systems (Wenger, 1995). Illness is considered a part of life for the Amish as opposed to a disability or frailty (Wenger, 1995). The Amish have a body of tradition and basic beliefs which guide their daily lives, as well as health practices (Wenger, 1995). The Amish believe that the body is the temple of God and that God is the one who heals; however, this belief does not exclude the use of preventative or curative medicine. The Amish take very culturally-specific actions for health promotion and treating illnesses, which may not be recognized by professional healthcare systems (Wenger, 1995). Often, the Amish do not seek professional healthcare immediately and withhold information regarding alternative therapies when they do seek professional healthcare (Wenger, 2003). Due to the lack of health literacy and cervical cancer information written about Amish women, further examination about the Amish, especially those residing in Appalachia, is needed.

**Appalachian Region**

Attention is often focused on health disparities among Appalachian residents because Appalachia is predominately a rural and underserved area which represents an indicator of social, medical, and financial well-being for other areas of the country similar to Appalachia (Hall, Rogers, Weir, Miller, & Uhler, 2000). Overall, approximately 23 million people reside in Appalachia’s 410 counties, which extends from New York to Mississippi (Online Resource...
In Ohio, 13% of the population lives within the 29 Appalachian counties.

Appalachian residents in rural areas tend to be older, white, and have low levels of education (ACS, 2003). Numerous risk factors for cancer (tobacco use, high fat diet, physical inactivity) are present within the general Appalachian population (ACS).

Cervical Cancer

Among the health disparities within the Appalachian region is cervical cancer. Although mortality rates have decreased nationally, some areas of Appalachia continue to have high rates of cervical cancer mortality (ACS, 2003). Hall et al. (2000) found that cervical cancer rates (although relatively small) were always higher in Appalachian women than among white, non-Appalachian women. Some of the risk factors for cervical cancer include: older age, human papilloma virus infection, smoking, Chlamydia infection, and low socioeconomic status (ACS).

Although Appalachian women may have one or more of the above risk factors, research studies are needed to specifically determine why women in Appalachia display a higher tendency to develop cervical cancer. One proposed reason for higher cervical cancer rates in Appalachian women may be related to the low socioeconomic status of the people within that region resulting in a decreased access to health care services, such as Pap tests (Friedell, Linville, & Hullet 1998).

Cervical Screening

Several guidelines have been developed for cervical screening. One such guideline recommended by the American Cancer Society (Saslow et al., 2002) suggests screening should begin within approximately three years of onset of vaginal intercourse and no later than 21 years of age, and screening with Pap tests should be done annually until age 30. At this point, women who have had three consecutive negative tests are encouraged to discuss the possibility of only receiving screenings every two to three years. A woman may choose to stop receiving Pap tests when the woman reaches age 70 and has had three or more consecutive
negative screenings in the past ten years (Saslow et al.). The U.S. Preventative Task Force has a slightly different set of cervical screening guidelines than the American Cancer Society. The U.S. Preventative Task Force recommends that cervical screening should begin at age 18 or at the age when a woman is first sexually active, and no recommendation has been made to discontinue testing at a certain age. Also, Pap tests are recommended at least once every three years as opposed to annually (US Preventative Services Task Force, 1996). Both the U.S. Preventative Services Task Force and the American Cancer Society recommend that women with total hysterectomies do not need Pap tests, unless the hysterectomy was performed as a pre-cancer or cancer treatment. A woman should discuss a specific screening plan with her physician, depending upon certain risk factors and need (Saslow et al.; US Preventative Services Task Force).

An understanding of why women do not receive cervical screenings within recommended guidelines is important, so that the barriers may be removed and screening rates improved. Several studies have been conducted to determine barriers to cervical screening (Baileff, 2000; Box, 1998; Fitch et al., 1998; Simoes et al., 1999; Twinn et al., 2002); however, no overriding theme has been established. Fitch et al. conducted a qualitative research study in an urban Canadian setting to explore barriers to cervical cancer screening. Eleven focus groups with a total of 110 women were held to discuss the women’s experiences during a Pap test and to determine what recommendations the women would make regarding the cervical screening concerns. Fitch et al. found that cancer was not an uppermost concern for these women, which itself may be a barrier to cervical screening. Other barriers to cervical screening were related to limited physician office hours, long waiting times, insensitivity to the woman as a person instead of a body part or disease, lack of healthcare professionals listening to the woman, lack of privacy, discomfort of a Pap test, and confusing information presented regarding cancer (Fitch et al.). Box also conducted a qualitative study to determine barriers to screening among black
and ethnic minority women in East London. One hundred seventy-two women attended the focus groups and completed a questionnaire regarding cervical screening tests. Box found that embarrassment and fear were commonly reported barriers to cervical screening. Simoes et al. analyzed data from the Missouri Risk Factors Surveillance System and Missouri Enhanced Survey and reported that cost barriers to medical care, older age, not receiving a mammogram in the past five years, and being white were all barriers to cervical screening.

Twinn, Shiu, & Holroyd (2002) studied Hong Kong Chinese women to determine the level of knowledge the women had about cervical cancer screenings, as a lack of knowledge had been identified as a barrier to screening in previous studies. A questionnaire containing true/false questions was given to 242 women ages 20-58 to determine the women’s knowledge regarding cervical cancer screening. Twinn et al. (2002) observed a significant difference between individual question scores of screened and unscreened women, although the overall total difference of knowledge scores was not significantly different. While a lack of knowledge may be a barrier for some women, other factors are involved, as well (Twinn et al.). Women who do receive cervical screening tests may also have a lack of knowledge about the test, and healthcare professionals need to provide culturally sensitive, comprehensible information for women needing cervical screening tests (Twinn et al.). Another barrier to cervical screening is a false sense of security raised by the safe-sex campaign, as some women believe condoms can prevent cervical cancer (Baileff, 2000).

According to these studies, there is evidence that barriers to cervical screening have been identified and attention should be focused at decreasing barriers. Cervical screening barriers specific to women in Appalachia may be similar to those found in women of other populations; however, further studies need to be conducted to identify barriers for Appalachian women in an effort to increase cervical screening rates. One proposed barrier to cervical screening is poor health literacy, which is just beginning to be studied in several populations
Health Literacy (Lindau et al., 2002; Sharp et al., 2002). Currently, no health literacy studies involving cervical screening rates have been published about Appalachian women.

**Health Literacy**

Health literacy is defined as the ability to read and comprehend medical terminology, understand and act on health information such as medication instructions and appointment slips, and complete health-related forms (Williams, 2002). Low health literacy has not been examined in many studies of cervical screening barriers, as the foci of these studies were economic status, knowledge level, and women’s attitudes towards cervical screenings rather than low health literacy levels (Baileff, 2000; Box, 1998; Fitch et al., 1998; Twinn et al., 2002). However when specifically examined, the level of health literacy has been linked to lower cervical screening rates (Lindau et al., 2002; Sharp et al., 2002). Lindau et al. sought to describe the relationship between health literacy, cervical cancer screening practices, and ethnicity, as well as evaluate physicians’ recognition of patients with low health literacy. The 529 women participating in the study had attended an ambulatory care obstetric and gynecology clinic or a female HIV clinic in Chicago. While at the clinic, the women were interviewed to determine demographics, cervical cancer screening history, health practices history, knowledge related to cervical screening and prevention, and perception of previous interactions with physicians regarding cervical cancer screening. The Rapid Estimate of Adult Literacy in Medicine (Davis et al., 1993) was then administered to the women to determine health literacy level. To determine physicians’ recognition of patients with low health literacy, a questionnaire was given to each physician following each visit of a participant in the study. Lindau et al. found that one in ten of the participants had inadequate health literacy skills (below a sixth grade level), and white women had a higher level of health literacy than non-white women. All but five of the participants had received a Pap smear at some point; however, only 13% of the participants could read words related to cervical screening (i.e. abnormal, cervix, cancer).
Lindau et al. reported that health literacy lower than a ninth grade level was the only independent variable associated with decreased knowledge about the purpose of a Pap test. Lower health literacy levels affected a woman’s knowledge of a Pap test, how she would respond to an abnormal test, and how likely she was to seek medical care for illness. Of note, physicians judged 70% of the women literate, an overestimate of 80%. Lindau et al. brought attention to the problems associated with low health literacy and the issue of physicians not recognizing patients who have low health literacy.

Sharp et al. (2002) sought to describe the relationship between health literacy level, distress, and cervical cancer risk factors in low-income African-American women who were at high risk for cervical cancer. One hundred thirty women were given the Rapid Estimate of Adult Literacy in Medicine (Davis et al., 1993) and the Avoidance and Intrusion subscales of the Impact of Events Scale (to measure distress of having to receive a colposcopy). Sharp et al. found that women with lower levels of health literacy had higher psychosocial distress regarding receiving a colposcopy, which suggests women with lower health literacy may be more vulnerable to health threats. Thus, health literacy is an important aspect to study in relation to determining cervical cancer screening behaviors.

Health illiteracy rates vary due to limited testing, although the rates are assumed to be quite high (up to 42.6%) according to several studies (Baker et al., 1997; Feifer, 2003; Marteau, Senior, & Sasieni, 2001; Parikh, Parker, Nurss, Baker, & Williams, 1996; Pirisi, 2000). Regardless of the actual estimate of health illiteracy, the consequences of low health literacy remain the same. Patients who have difficulty navigating the healthcare system due to health illiteracy may not always ask for assistance or clarification, which may cause further health-related issues. Health illiteracy has been linked to poor health, poor health outcomes, increased hospitalization, and decreased receipt of health screenings according to several studies (Baker et al., 1997; Baker, Parker, Williams, & Clark, 1998; Fortenberry et al., 2001; Gazmararian,
Williams, Peel, & Baker, 2003). Baker et al. (1997) examined the relationship between health literacy level and self-reported health and use of health services among 2659 participants from Atlanta and Los Angeles. The Test of Functional Health Literacy in Adults to measure health literacy and a survey to measure self-reported use of health services were used. Participants with lower health literacy actually used health services more often than those participants with adequate health literacy, and Baker et al. (1997) found that patients with lower health literacy were more likely to report poor health. Although health literacy and poor health were related, highest education level reached was not significantly correlated with poor health reports (Baker et al., 1997).

Baker et al. (1998) conducted another study to examine the relationship between health literacy and risk of hospital admission. Nine hundred fifty-eight participants completed the Test of Functional Health Literacy in Adults and had electronic medical records available which were used to determine the number of admissions and discharge diagnosis for the participants. Baker et al. (1998) found that 31.5% of the 333 participants with inadequate health literacy were admitted to the hospital as compared to 14.9% of the 503 participants with adequate and 16.4% of the 122 participants with marginal health literacy; participants with low health literacy had twice the risk of hospitalization. Although risk for hospitalization does not necessarily mean poorer health, a relationship between poor health and admission to the hospital is implied through this study (Baker et al., 1998).

Gazmararian et al. (2003) sought to examine the relationship between health literacy and knowledge of chronic disease. The 653 participants who had a chronic disease (asthma, diabetes, congestive heart failure, or hypertension) were given a survey to determine knowledge of the participant’s chronic disease, and completed the Shortened Test for Functional Health Literacy in Adults. The results of the study showed that participants with adequate health literacy had less than ideal knowledge of chronic disease; however, participants with inadequate
health literacy had a significantly lower level of knowledge about chronic diseases, which implies poorer health outcomes due to a lack of known information regarding the participant’s chronic disease (Gazmararian et al.).

Fortenberry et al. (2001) sought to determine a relationship between health literacy and receipt of a screening test for gonorrhea in the past year. Eight hundred and nine participants were asked questions related to gonorrhea screening and given the Rapid Estimate for Adult Literacy in Medicine (Davis et al., 1993). The results showed an increased incidence of gonorrhea screening in participants with adequate health literacy. Thus, patients with low health literacy had a lower incidence of gonorrhea screening, as well as a decreased perceived risk for contracting gonorrhea (Fortenberry et al.). Overall, patients need to be screened for health literacy to determine the increased risk of having poor health and poor knowledge about their health.

Measures of Health Literacy

Testing for health literacy is often overlooked, even though tests have been developed which take only a few minutes to administer. Longer tests such as the Test of Functional Health Literacy in Adults (TOFHLA), the Peabody Individual Achievement Test-Revised (PIAT-R), the Slosson Oral Reading Test-Revised (SORT-R), and the Wide Range Achievement Test-Revised (WRAT-R) are available; however, the tests are underused because they are either too lengthy, too expensive, or not appropriate for health care settings. The Rapid Estimate of Adult Literacy in Medicine (REALM) was a 125 word-recognition test developed by Davis et al. (1991) to decrease testing time and increase ease of administration. The test originally took three to five minutes to administer, which was considered too long. In an effort to decrease testing time, Davis et al. (1993) developed a shortened version of the Rapid Estimate of Adult Literacy in Medicine (REALM), which consists of 66 health-related words that can be administered in one to two minutes. The REALM is a reading recognition test and predicts general reading ability;
however, the REALM does not specifically measure reading comprehension and interpretation. To determine whether the shortened version of the REALM could predict reading comprehension and interpretation, Davis et al. (1993) administered the REALM to 209 patients in a university hospital clinic. The original REALM had already been validated by analyzing the REALM’s correlation with the WRAT-R, SORT-R, and PIAT-R in an earlier study (Davis et al., 1991). The validity of the shortened REALM was established based on the validity of the original REALM. The shortened REALM correlated highly with the SORT-R, PIAT-R, and WRAT-R, as did the original REALM. The shortened REALM is preferred by patients and health care providers because it is brief, easy to use and understand, and provides a good, immediate estimate of a patient’s health literacy level (Davis et al., 1993).

Methods

Design

This study was a secondary analysis of a descriptive, cross-sectional design entitled “Cancer screening among Amish adults” (Katz et al., 2004). The original study included a Cancer Behavioral Lifestyle questionnaire, which was administered by trained graduate students. The questionnaire included detailed cancer screening test explanations with pictures to improve response accuracy.

Research questions

Among a cohort of Amish women in Appalachia Ohio,

1) What is the level of health literacy as measured by the REALM?

2) What is the level of self-reported cervical screening within the previous three years?

3) What is the association of health literacy level and cervical screening status?

Hypothesis

Women who have a lower health literacy score will be less likely to have completed a cervical screening within recommended guidelines.
Measures

In order to test health literacy the REALM instrument was used. The REALM is a health literacy instrument consisting of a list of 66 health-related words used to identify patients with low reading skills. The subjects are instructed to read as many of the words as possible. Only one to two minutes are needed to administer the REALM. The raw score is converted into a “grade level” to identify those most at risk. The test-retest reliability is 0.99 (Davis et al., 1993). The REALM correlates well with three longer, widely used tests for health literacy. The correlation coefficient was 0.97 with the Peabody Individual Achievement Test-Revised, 0.96 with the Slosson Oral Reading Test-Revised, and 0.88 with the Wide Range Achievement Test-Revised (Davis et al., 1993). Each correlation was statistically significant. The raw score from the REALM was converted to a grade range estimate. If a patient correctly pronounces 0-18 words correctly, a third grade and below range is estimated; 19-44 words pronounced correctly is given a fourth to sixth grade range estimate; 45-60 words pronounced correctly is given a seventh to eighth grade range estimate; and 61-66 words pronounced correctly is given a ninth grade and above estimate (Davis et al., 1993). For the purposes of this study, the grade ranges were labeled 1-4, with one being the lowest (third grade and below) and four being the highest (ninth grade and above). Participants with a literacy level of one or two were considered to have low health literacy.

The measurement of cervical screening rates was done through self-report during the baseline questionnaire. Whether a participant is within recommended screening guidelines was determined by a self-reported Pap test within the past three years (US Preventative Services Task Force, 1996). No further investigation was done to verify self-report of cervical screening.

Sample and Procedure

The study was approved by The Ohio State University Biomedical Review Board. The target population was Amish women in Holmes County, located in Appalachia Ohio who were at
risk for cervical cancer (over the age of 18 and/or sexually active). First, a complete list of homes (n = 120) from the 2000 Holmes County Region Amish Directory was generated. Of the 75 homes that agreed to participate, five were female only, 67 were male and female, and three were male only. Next a computer-generated random sample of 72 women was created. Women in the sample next received an explanation of the study and gave informed written consent in the presence of a witness at the time of the questionnaire. The participants were interviewed face-to-face for approximately two hours. Inclusion criteria included being a part of the 2000 Holmes County Region Amish Directory, female, and over the age of 18. No special screening procedures occurred.

Data Analysis

To achieve a power of 0.80, an alpha of 0.05, with one degree of freedom, a sample size of 90 subjects was needed to perform the appropriate analyses (Cohen, 1998). Descriptive statistics were used to answer the first two research questions: What are the levels of health literacy and cervical screening? A Chi-Square was used for statistical analysis of the research question: What is the association of health literacy level and cervical screening status? Health literacy level was ordinal (according to “grade level” from REALM) and cervical screening status was nominal (screened or not screened) level data.

Results

In the primary study Katz et al. (2004) found that less than one percent of men and women (n = 134) completing the survey were within oral screening guidelines, 52.8% of women (n = 72) were within cervical screening guidelines, 33.3% of women were within breast screening guidelines, 14.3% of men (n = 35) were within prostate screening guidelines, and 12.5% of men and women (n = 64) were within colorectal screening guidelines. The results of non-Amish men and women within the same categories had significantly higher screening rates.
The Amish, therefore, have significantly lower cancer screening rates than the general population.

This study examined the association between health literacy and cervical cancer screening status as a secondary study of the study by Katz et al. (2004). Overall, 72 women completed the baseline survey. Of these women, all 72 answered the question regarding cervical screening status and completed the REALM. Socio-demographic information for these 72 women are presented in Table 1. The sample had an average age of 52 years, with the unscreened group having a significantly higher mean age, 57 years, than the screened group, 48 years ($p = 0.000$). Of the 72 women, 67 (93%) were married, and there was a similar distribution between married women who were screened and unscreened. Only five women were widowed, and the distribution was also similar between screened and unscreened women. The average grade level completed was 8th grade, which was similar for the total group, screened group, and unscreened group. For those women who agreed to report income, it averaged $38,670 (n = 56); the women in the screened group had a significantly higher income, $41,500, than the women in the unscreened group, $35,404 ($p = 0.000$).

The number of women within and not within cervical screening guidelines and the corresponding health literacy level is displayed in Table 2. The percentage of women within screening guidelines was higher as compared to women not within screening guidelines. The majority of women (90.3%) demonstrated high health literacy (Levels 3 and 4) with only 9.7% categorized as demonstrating low health literacy (Levels 1 and 2). The average health literacy level for screened women was 3.37 as compared to the average health literacy level for the unscreened women, 3.00. The difference between the average health literacy level in relation to cervical screening status was significant ($p = 0.009, \chi^2 = 9.45, df = 2$). Screened women had a slightly higher health literacy level than the unscreened women.
Discussion

The results of the data analysis demonstrated that Amish women who have a higher health literacy level are more likely to be within cervical screening guidelines. The results must be viewed with caution, however, due to the cultural and religious aspects that impact Amish women’s use of healthcare. Wenger (2003) advises healthcare professionals to be aware that the Amish have many culturally imbedded views of healthcare and may utilize healthcare services differently than other cultural groups. The Amish have very similar backgrounds and levels of education (Wenger, 2003), which may also have impacted the results. The standard level of education for the Amish is completion of the 8th grade, which was evident in the findings. In addition, data from only 72 women was analyzed for this study. In order to confirm these findings many more women should be included in subsequent replications. However, the number of Amish women not within cervical screening guidelines is of concern, and efforts to improve Amish women’s screening rates need to be increased.

The results of the study also suggest that younger Amish women are more likely to be within screening guidelines than older Amish women. This may be due in part to the increased likelihood of younger Amish women having contact with the professional healthcare system during pregnancy (Wenger, 2003). The younger women may also be within screening guidelines because they have recently had children and have had a pap test through the professional healthcare system (Wenger, 2003). Although only 56 of the 72 women in the study reported their income, the women in the screened group had a significantly higher income. This correlates with other studies that reported that health promoting behaviors are more commonly found in women with higher economic status (Fitch et al., 1998; Twinn et al., 2002; Williams, 2002). The similar educational background of the Amish women does not support or disprove the notion that women with higher educational status have more health promoting behaviors, such as cervical screening (Twinn et al.).
More people, including Amish women, need to be screened for health literacy level to determine whether a full understanding of the medical terminology and instructions is obtained while in the healthcare setting. Some patients may require further explanation or even picture diagrams for full comprehension (Buxton, 1999). More emphasis needs to be placed upon health literacy screening to ensure each patient understands what the healthcare professional is saying, whether the discussion is about cancer screenings or medication instructions (Feifer, 2003). Further research needs to be done in the area of health literacy to bring more attention to the decreased health outcomes of health illiterate patients. Specifically, the differences of health literacy levels between women who have received a cervical screening and those who have not need to be studied to draw attention to health literacy issues and the relationship between health literacy levels and health outcomes. Perhaps explanations of screening procedures and pamphlets need to use a clearer, simpler language to convey the message of the importance of cancer screenings (Buxton, 1999; Glazer, Kirk, & Bosler, 1996). Technological aids, such as video simulation, may also be used to provide an alternate way to educate women about cervical cancer and screenings (Buxton, 1999). As more evidence is accumulated, perhaps healthcare professionals will concentrate on screening patients for health literacy and working with those patients who are at risk for poorer health outcomes.

The level of inadequate health literacy among the Amish women in this study is similar to the findings of the health literacy level of the 529 underserved women in a study by Lindau et al. (2002). Nine percent of the Amish women had inadequate health literacy, which is similar to the 9% of the women who had inadequate health literacy level (Level 1 or 2) in the study by Lindau et al. The results for the women with marginal and adequate health literacy are dissimilar. Sixty-one percent of Amish women in this study had marginal health literacy (Level 3), while only 30% of the women in the study by Lindau et al. had marginal health literacy. Twenty-nine percent of Amish women had adequate health literacy (Level 4), and 61% of the women in the study by
Lindau et al. had adequate health literacy. An emphasis needs to be placed upon the women with inadequate health literacy, which is a similar number in both studies. The Amish women do not have as high of a health literacy level as the women in the study by Lindau et al., and the number of women with marginal health literacy is quite high. Further interventions to provide the Amish with health screening materials with the appropriate health literacy level need to be implemented to improve cervical screening rates.

The need for a study of barriers to cervical screening in Appalachia is important because of the low screening rates. Health literacy levels have not been studied in Appalachia and may prove to be the link between cervical screening and nonadherence to cervical cancer screenings. Because cervical screenings are widely available, the number of women who have cervical cancer should decrease—in Appalachia as well as throughout the United States. However, the number of women with cervical cancer is still high, with many women continuing to die from cervical cancer. Efforts to determine the reasons for nonadherence to cervical screening guidelines need to be taken to improve the cervical screening rates among Amish women in Appalachia. Cervical cancer is a preventable cancer, and many deaths may be prevented if screening rates are improved to detect cervical cancer early.
References


Williams, M.V. (2002). Recognizing and overcoming inadequate health literacy, a barrier to care.

*Cleveland Clinic Journal of Medicine, 69*(5), 415-418.
### Table 1. Socio-demographic characteristics of sample according to screening behavior

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (n = 72)</th>
<th>Screened Group (n = 38)</th>
<th>Not-Screened Group (n = 34)</th>
<th>p Values</th>
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<tr>
<td>Age (Mean years) (SD)</td>
<td>52 (15.2)</td>
<td>48 (13.1)</td>
<td>57 (16.2)</td>
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<td>Mean Income</td>
<td>38,670 (56 women reported)</td>
<td>41,500 (30 women reported)</td>
<td>35,404 (26 women reported)</td>
<td>0.000</td>
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<td>Marital Status</td>
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<td></td>
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<tr>
<td>Married</td>
<td>67 (93.0%)</td>
<td>36</td>
<td>31</td>
<td>NS</td>
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<tr>
<td>Widowed</td>
<td>5 (6.9%)</td>
<td>2</td>
<td>3</td>
<td></td>
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<td>Education (Mean Years) (SD)</td>
<td>8.1 (0.52)</td>
<td>8.1 (0.57)</td>
<td>8.1 (0.48)</td>
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### Table 2. Health literacy levels according to screening behavior

<table>
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<tr>
<th>Level</th>
<th>Total (n = 72)</th>
<th>Screened (n = 38)</th>
<th>Not Screened (n = 34)</th>
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<tr>
<td>Level 1 (1&lt;sup&gt;st&lt;/sup&gt;-3&lt;sup&gt;rd&lt;/sup&gt; grade)</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Level 2 (4&lt;sup&gt;th&lt;/sup&gt;-6&lt;sup&gt;th&lt;/sup&gt; grade)</td>
<td>7 (9.7%)</td>
<td>3 (4.2%)</td>
<td>4 (5.6%)</td>
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<tr>
<td>Level 3 (7&lt;sup&gt;th&lt;/sup&gt;-8&lt;sup&gt;th&lt;/sup&gt; grade)</td>
<td>44 (61.1%)</td>
<td>18 (25.0%)</td>
<td>26 (36.1%)</td>
</tr>
<tr>
<td>Level 4 (High School)</td>
<td>21 (29.2%)</td>
<td>17 (23.6%)</td>
<td>4 (5.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>72 (100%)</td>
<td>38 (52.8%)</td>
<td>34 (47.2%)</td>
</tr>
</tbody>
</table>

x<sup>2</sup> = 9.45, df = 2, p = 0.009