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Age Perceptions, Knowledge, and Preventive Behaviors Regarding Cervical Cancer: Analysis from the 2005 Health Information National Trends Survey (HINTS).

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Abstract

Cervical cancer is considered to be the third most common type of cancer in women, and the second largest cause of deaths in women. Its toll is greatest in population that lack screening programs to detect precursor lesions (Roden, 2006). Almost all cervical cancer is caused by HPV (Human Papillomavirus), a common virus that is spread through sexual intercourse (Roden, 2006). It is widely believed among experts that most women who are diagnosed with cervical cancer today have not had regular pap smears or they have not followed up on abnormal Pap smear results. But the question is how knowledgeable are women regarding this deadly disease which is curable when detected early. We used a national representative sample of women in an exploratory analysis to shed light on how age differences characterize the perceptions, knowledge and prevention behaviors of cervical cancer. The five classes of women we investigated were women ages 18 – 34; 35 – 49; 50 – 64; 64 – 74; and 75+. The results indicate that women ages 50 – 64 were the most opinionated regarding the characteristics of cervical cancer.

Introduction

The Gale Encyclopedia of Cancer defines cervical cancer as a disease in which the cells of the cervix become abnormal and start to grow uncontrollably, forming tumors (2011). Research studies show that older women are at the highest risk for cervical cancer, while girls under the age of 15 rarely develop this cancer. In the United States the death rates from cervical cancer are higher among Hispanic American, Native American, and African American women than among Caucasian women (Gale, 2011). It is widely believed that the exact cause of cervical cancer is unknown. Diethylstilbestrol (DES), the use of birth control pills for a long period of time, age, smoking, weakened immune system, HPV infection, and lack of regular pap test are some of the major risk factors that could lead to cervical cancer (American Institute for Cancer Research, American Cancer Society, 2005). Despite increasing emphasis on the deadly nature of the cervical cancer epidemic, much work remains to be done in mapping the pathways between social characteristics and health outcomes via media communications (Parker, 2005).

Table 1: General Characteristics of respondents in terms of Race and Ethnicity

| Variable | Race and Ethnicity | | | | |
|-------------------------------------|--------------------|-----------|------------|----------|----------|
| | Total (%) | Hispanic | White | Black | Others |
| Smoking Status (N=4374) | | | | | |
| Current | 730(16.7) | 51(1.2) | 540(12.3) | 96(2.2) | 43(1.0) |
| Former | 1146(26.2) | 52(1.2) | 954(21.8) | 91(2.1) | 49(1.1) |
| Never | 2498(57.1) | 265(12.3) | 1776(40.6) | 271(6.2) | 186(4.3) |
| Education (N=4420) | | | | | |
| Less than High Sch. | 411(9.3) | 102(2.3) | 203(4.6) | 74(1.7) | 32(0.7) |
| High Sch. Grad | 1137(25.7) | 99(2.3) | 871(19.7) | 116(2.6) | 51(1.2) |
| Some Col. | 1348(30.5) | 100(2.3) | 991(22.4) | 169(3.8) | 88(2.0) |
| Bachelor's | 1010(22.9) | 50(1.1) | 813(18.4) | 78(1.8) | 69(1.6) |
| Post Bacc. | 514(11.6) | 23(0.5) | 416(9.4) | 32(0.7) | 43(1.0) |
| Income (N=3456) | | | | | |
| <\$20,000 | 785(22.7) | 108(3.1) | 450(13.0) | 166(4.8) | 61(1.8) |
| \$20,000- <\$35,000 | 682(19.7) | 77(2.2) | 483(14.0) | 89(2.6) | 33(1.0) |
| \$35,000- <\$50,000 | 516(14.9) | 42(1.2) | 384(1.1) | 59(1.7) | 31(0.9) |
| \$50,000- <\$75,000 | 682(19.7) | 46(1.3) | 538(15.6) | 48(1.4) | 50(1.4) |
| \$75,000 or more | 1091(31.6) | 69(2.0) | 896(26.0) | 58(1.7) | 68(2.0) |
| Insurance Status (N=4372) | | | | | |
| Yes | 3896(89.1) | 264(6.0) | 3024(69.2) | 366(8.4) | 242(5.5) |
| No | 476(10.8) | 109(2.5) | 243(5.6) | 94(2.1) | 30(0.7) |

Table 2: General Characteristics of respondents in terms of age

| Variable | Age Group | | | | | |
|-----------------------------------|------------|----------|----------|----------|----------|----------|
| | Total (%) | 18-34 | 35-49 | 50-64 | 65-74 | 75+ |
| Smoking Status (N=4458) | | | | | | |
| Current | 738(16.6) | 142(3.2) | 211(4.7) | 279(6.3) | 78(1.7) | 28(0.6) |
| Former | 1164(26.1) | 86(1.9) | 219(4.9) | 422(9.5) | 239(5.4) | 198(4.4) |

| | | | | | | |
|--------------------------------------|------------|-----------|-----------|------------|-----------|-----------|
| Never | 2556(57.3) | 477(10.7) | 632(14.2) | 699(15.7) | 364(8.2) | 384(8.6) |
| Education (N=4446) | | | | | | |
| Less than High Sch. | 415(9.3) | 66(1.5) | 55(1.2) | 108(2.4) | 82(1.8) | 104(2.3) |
| High Sch. Grad | 1156(26.0) | 125(2.8) | 212(4.8) | 358(8.1) | 236(5.3) | 225(5.1) |
| Some Col. | 1348(30.3) | 236(5.3) | 327(7.4) | 430(9.7) | 199(4.5) | 156(3.5) |
| Bachelor's | 1012(22.8) | 194(4.4) | 320(7.2) | 312(7.0) | 103(2.3) | 83(1.7) |
| Post Bacc. | 515(11.6) | 79(1.8) | 147(3.3) | 189(4.3) | 65(1.5) | 35(0.8) |
| Income (N=3780) | | | | | | |
| <\$20,000 | 794(21.0) | 149(3.9) | 138(3.7) | 201(5.3) | 132(3.5) | 174(4.6) |
| \$20,000- <\$35,000 | 688(18.2) | 107(2.8) | 120(3.2) | 187(4.9) | 145(3.8) | 129(3.4) |
| \$35,000- <\$50,000 | 517(13.7) | 92(2.4) | 120(3.2) | 175(4.6) | 73(1.9) | 57(1.5) |
| \$50,000- <\$75,000 | 684(18.1) | 111(2.9) | 181(4.8) | 263(7.0) | 89(2.4) | 40(1.1) |
| \$75,000 or more | 1097(29.0) | 189(.05) | 403(10.7) | 387(10.2) | 82(2.2) | 36(1.0) |
| Insurance Status (N=4571) | | | | | | |
| Yes | 4050(88.6) | 574(12.6) | 923(20.2) | 1234(27.0) | 692(15.1) | 627(13.7) |
| No | 521(11.4) | 146(3.2) | 169(3.7) | 187(4.1) | 9(0.2) | 10(0.2) |

Methods

To investigate the state of cervical cancer perceptions and prevention knowledge among U.S. adults, we analyzed data from the 2005 Health Information National Trends Survey (HINTS) for the purpose of determining any potential relationship of positive associations between people's awareness of cancer prevention recommendations and adherence to such recommendations. The data for this study came from the 2005 health Information National Trends Survey (HINTS), a nationally representative cross-sectional study of health media use and cancer-related knowledge among adults in the United States. The pool of respondents in the study is a good representation of the population to respond to the questions relevant to the study. We restricted the analysis to women over the age of 18. We consider socioeconomic and demographic variables linked to health disparities in cervical cancer and media use, including education, annual household income, race/ethnicity, age, and insurance status. We categorized education (as less than high school graduate, high school graduate, some college, or college graduate), annual household income (as less than \$25,000, \$25,000 to \$34,000, \$35,000 to \$49,000, \$50,000 to \$74,000, or \$75,000 and above),

race/ethnicity (as Hispanic, white, black, native American, Asian, Hawaiian, or multiple races), insurance status (as yes, or no), and age (as 18 – 34, 35 – 49, 50 – 64, 64 – 74, or 75+).

From table 1 the data indicate that 57.1% of respondent have never smoked while 26.2%, and 16.7% of respondents were former and current smokers respectively. The data from table 1 also show that 30.5% of respondents have some form of college education, while 11.6%, 22.9%, 25.7%, and 9.3% had post bachelor’s degree, bachelor’s degree, high school diploma, and less than high school diploma respectively. With regards to household income, 31.6% revealed they had a combined household income of \$75,000 or more while 19.7%, 14.9%, 19.9%, and 22.7% said their combined income was \$50,000 - \$75,000, \$35,000 – \$50,000, \$20,000 – \$35,000, and less than \$20,000 respectively. In terms of insurance status, a vast majority of respondents, 89.1% do have health insurance while 10.8% said they do not have any form of health insurance coverage.

For specific cervical cancer questions, we obtained and analyzed the answers to the following questions: Do you agree that cancer is an illness that when detected early can typically be cured? Have you ever been tested for cervical cancer? Have you ever been treated for genital warts? Have you heard anything about a vaccine or shot to prevent cervical cancer? Do you agree that getting checked regularly for cancer helps find cancer when it is easy to treat? How may people who develop cancer do you think survive at least 5 years? Each of the questions is being analyzed in terms of race (or ethnicity) and age group. The questions used to assess respondents’ awareness of cervical cancer prevention strategies were developed specifically by HINTS and were based on the HINTS conceptual framework, which describes consumer-oriented health communication. Our primary goal is to capture the age perceptions, knowledge, and preventive behaviors regarding these specific cervical cancer characteristics. We used basic descriptive statistic to examine the association among the various cervical cancer prevention questions. Before analyzing the specific cervical prevention questions as displayed in table 3 and table 4, we first examined the data from table 1 and table 2 to examine some general characteristics of the respondents to see the life experiences that could give them the insights into answering the research question questions.

Table 3: Specific cervical cancer questions in terms of race and ethnicity

| Variable | Race and Ethnicity(Cancer Related) | | | | |
|--|------------------------------------|----------|------------|-----------|----------|
| | Total (%) | Hispanic | White | Black | Others |
| Cancer is an illness that when detected early can typically be cured | | | | | |
| (N=4368) | | | | | |
| Agree | 3737(85.6) | 326(7.5) | 2787(63.8) | 392(8.8) | 232(5.3) |
| Disagree | 631(14.4) | 42(1.0) | 469(10.7) | 72(1.6) | 48(1.1) |
| Sometimes when a woman has a routine pelvic exam, she is tested for cervical cancer. Have you ever been tested for cervical cancer? | | | | | |
| (N=4402) | | | | | |
| Agree | 4259(96.8) | 345(7.8) | 3209(72.9) | 452(10.3) | 253(5.7) |
| Disagree | 143(3.2) | 22(0.5) | 78(1.8) | 15(0.3) | 28(0.6) |

| | | | | | |
|---|------------|----------|------------|----------|----------|
| Have you ever been treated for genital warts? (N=4288) | | | | | |
| Agree | 202(4.7) | 20(0.5) | 145(3.4) | 26(0.6) | 11(0.3) |
| Disagree | 4086(95.3) | 329(7.7) | 3081(71.9) | 422(9.8) | 254(5.9) |
| Have you heard anything about a vaccine or shot to prevent cervical cancer? (N=4393) | | | | | |
| Agree | 3458(78.7) | 224(5.1) | 2725(62.0) | 317(7.2) | 192(4.4) |
| Disagree | 935(21.3) | 143(3.3) | 553(12.6) | 150(3.4) | 89(2.0) |
| Getting checked regularly for cancer helps find cancer when it is easy to treat. (N=4390) | | | | | |
| Agree | 4164(94.9) | 343(7.6) | 3118(71.4) | 434(1.0) | 266(6.1) |
| Disagree | 226(5.1) | 27(0.6) | 155(3.6) | 31(0.7) | 12(0.3) |
| Overall, how many people who develop cancer do you think survive at least 5 years? (N=4195) | | | | | |
| <25% | 224(5.3) | 35(0.8) | 117(2.8) | 43(1.0) | 29(0.7) |
| 25% | 753(18.0) | 105(2.5) | 488(11.6) | 114(2.7) | 46(1.1) |
| 50% | 1755(41.8) | 122(2.9) | 1354(32.2) | 162(3.9) | 117(2.8) |
| 75% | 1300(31.0) | 73(1.7) | 1052(25.1) | 107(2.6) | 68(1.6) |
| Nearly all | 163(4.0) | 18(0.4) | 111(2.6) | 26(0.6) | 8(0.2) |

Table 4: Specific cervical cancer questions in terms of age

| Variable | Age Group(Cancer Related) | | | | | |
|--|---------------------------|-----------|------------|------------|-----------|-----------|
| | Total (%) | 18-34 | 35-49 | 50-64 | 65-74 | 75+ |
| Cancer is an illness that when detected early can typically be cured (N=4409) | | | | | | |
| Agree | 3775(85.6) | 579(13.1) | 897(20.3) | 1188(27.0) | 599(13.6) | 512(11.6) |
| Disagree | 634(14.4) | 119(2.7) | 163(3.7) | 199(4.5) | 79(1.8) | 74(1.7) |
| Sometimes when a woman has a routine pelvic exam, she is tested for cervical cancer. Have you ever been tested for cervical cancer? (N=4485) | | | | | | |
| Agree | 4340(96.8) | 633(14.1) | 1049(23.4) | 1393(31.1) | 679(15.1) | 586(13.1) |
| Disagree | 145(3.2) | 74(1.6) | 20(0.4) | 13(2.9) | 10(0.2) | 28(0.6) |
| Have you ever been treated for genital warts? (N=4363) | | | | | | |
| Agree | 204(4.7) | 35(0.8) | 76(1.7) | 73(1.7) | 18(0.4) | 2(0.0) |
| Disagree | 4159(95.3) | 661(15.2) | 965(22.1) | 1294(29.7) | 649(14.9) | 590(13.5) |
| Have you heard anything about a vaccine or shot to prevent cervical cancer? (N=4468) | | | | | | |

| | | | | | | |
|---|------------|-----------|------------|------------|-----------|-----------|
| Agree | 3507(78.5) | 586(13.1) | 904(20.2) | 1149(25.7) | 512(11.5) | 356(7.8) |
| Disagree | 961(21.5) | 117(2.6) | 169(3.7) | 254(5.7) | 175(3.9) | 246(5.5) |
| Getting checked regularly for cancer helps find cancer when it is easy to treat. | | | | | | |
| (N=4432) | | | | | | |
| Agree | 4203(94.8) | 667(15.0) | 1005(22.7) | 1324(29.9) | 653(14.7) | 554(12.5) |
| Disagree | 229(5.2) | 35(0.8) | 60(1.4) | 71(1.6) | 30(0.7) | 33(0.7) |
| Overall, how many people who develop cancer do you think survive at least 5 years? | | | | | | |
| (N=4228) | | | | | | |
| <25% | 228(5.4) | 39(0.9) | 60(1.4) | 74(1.8) | 32(0.8) | 23(0.5) |
| 25% | 763(18.0) | 137(3.2) | 167(3.9) | 231(5.5) | 103(2.4) | 125(3.0) |
| 50% | 1763(41.7) | 284(6.7) | 411(9.7) | 529(12.5) | 292(6.9) | 247(5.8) |
| 75% | 1309(30.1) | 200(4.7) | 362(8.6) | 435(10.3) | 196(4.6) | 116(2.7) |
| Nearly all | 165(3.9) | 22(0.5) | 35(0.8) | 63(1.5) | 18(0.4) | 27(0.6) |

General Results and Discussions

Table 1 displays the smoking, education, income, and insurance status of the general representative sample in terms of race and ethnicity. The races have been listed as: Hispanic, White, Black, and Others (American Indian, Asian, Hawaiian, Multiple-Racial, and Refused, or Don't know). There is a distinct difference in the data of White, Black, Hispanic, and Other in the smoking category. Every race except 'White', shared similar amounts of both current and former smokers. For Caucasians, it is shown that they have more former smokers than the other races. They have 414 more former smokers than they do current smokers. The difference in the data may suggest that they are the most informed about the potential dangers associated with smoking as they also hold the largest amount of people that have never tried smoking. The education level shown in table 2 indicated that the majority of the respondents have attended some college. But the post baccalaureate status amongst the minority races are relatively low (98) in comparison to those of the white (416).

In table 2, the variables are listed in terms of five different ages range: 18-34, 35-49, 50-64, 65-74, and 75+. The trends of the data follow those of the race and ethnicity trends. In regards to smoking status, the data suggest that individuals smoke primarily during their middle years (35 – 64) and begin to dwindle during the later years. For former smokers it is shown that they are more former smokers than current smokers for every age group except 18 – 34. This difference could be attributed to the legal age to use tobacco products in the United States. Individuals who fall into this category may have not experienced any life threatening issues, such as cancer, associated with smoking. For education, the older generation experienced higher number of persons with less than high school education. Different laws governing education participation than the current ones could be the attributing reason the younger groups had smaller numbers. Despite that information in mind, 18 – 34 year olds had the lowest high school graduation rate amongst the groups. The data indicate that the most intelligent age range is 35 – 50. Those individuals experienced the highest number of bachelor degrees as well as post baccalaureate.

Table 2 also displays that income levels are distributed uniformly across the age groups. The numbers suggest that the younger ages experience low income levels and it increases through a normal working career, then decreases during the areas of retirement. Insurance status highlights the level of seriousness that the older age groups (65–75+) take towards their health. They represented the lowest amount of uninsured persons in the data set. It is interesting that the 19 uninsured individuals who possibly could qualify for some form of governmental medical assistance still listed themselves as having no insurance.

Specific Cervical Cancer Results and Discussions

The education level shown in Table 1 indicated that the majority of people have attended some college. But the post baccalaureate status amongst the minority races are relatively low (98) in comparison to those of the white (416). The data are in agreement with the information in Table 3. The samples show that 85.6% of responders believe that cancer can typically be cured if it is detected early. For example, both Blacks and Hispanics share similar sentiments agreeing 8.8% and 7.5% and disagreeing 7.5% and 1.0% respectively. It appears that being exposed to some form of higher education is likely to place the respondent in an environment to garner awareness of health issues. In accordance with the sample indicating they feel that cancer can be cured if detected early, 96.8% said they have been tested for cervical cancer. In terms of race the sample is overwhelmingly low (4.7%) who agree compared to 95.3% who disagree for those who have previously been tested for genital warts. The response is alarming due to the answer to the previous question, “Have you ever been tested for cervical cancer?” The sample responded “Disagree”, but is skewed (4.7% agree and 95.3% disagree) when asked about testing regarding genital warts. The lack in awareness of Human Papillomavirus (HPV) and the links between genital warts and cervical cancer can be attributed to the alarming results (Parker, 2005). With regards to the question, “Have you heard anything about a vaccine or a shot to prevent cervical cancer?” majority (78.7%) agree as compared to 21.3% who disagree. In terms of race, Hispanics are somewhat split regarding the question (224 agree while 143 disagree). For Blacks, 317 agree while 150 disagree. It is important to note that Blacks, Hispanics, and Asians reported lower perceived cancer risk than Whites (Ross, 2010). Finally for Caucasians the results follow as 2725 to 553 in favor of the question. The slight disparity could be attributed to the education level. Of the 4390 who responded to the question, 4164 women believe getting checked regularly for cancer could help find cancer early when it is easy to treat. This answer was a consensus across race lines. Overall in terms of race, the sample is optimistic regarding the survival rate of people who have developed cancer. For example, 41.8% agreed that 50% of cancer patients do survive at least five years, while 31%, 4%, 18%, 5.3% do survive at least five years 75%, nearly all the time, 25%, less than 25% respectively.

In accordance with the education levels shown in table 2, it is noted that 50-64 year olds are the most opinionated when it comes to the prevention of cancer. They strongly believe that cancer can be cured if detected early enough. Overall, the general consensus amongst the age ranges is that cancer can be cured with 85.6% in optimism and 14.4% disagreeing. One preventive measure to ensure no signs of cancer exist is by routinely being checked during a pelvic exam. Nearly all women who responded (96.8%) to the survey agreed that they have been checked for cervical cancer. The younger age group (18-34) accounted for the

most amounts of women who have not been tested. But despite the large number of women being checked for cervical cancer, the majority (4159 out of 4363) also expressed that they have not been tested for genital warts: 18-34(661 of 4363), 35-49(965 of 4363), 50-64(1294 of 4363) 65-74(649 of 4363), 75+(590 of 4363). Genital warts is not widely associated with a cause for cervical cancer, therefore the responders may have not been tested unless they were concerned for other medical reasons (Dember, 2005). One may feel the need to get checked for genital warts after an unprotected sexual encounter. The awareness of treatments or vaccines in the cure of cervical cancer is high across the age ranges. The data in Table 4 shows the majority (3507 out of 4468) are aware of the vaccines or shots to prevent cervical cancer: 18-34(586 of 4468), 35-49(904 of 4468), 50-64(1149 of 4468) 65-74(512 of 4468), 75+(356 of 4468). However the data show that the 50-64 year olds feel the strongest. The most informed ages were between 50-64, while the oldest (75+) remained split between agree and disagree. 94.8% of persons believe that getting frequent exams for cancer can help discover cancer during the early stages. But it is the 50-64 age range who feels the strongest. In terms of survival rates after being diagnosed with cancer after five years, it is shown that the younger (18-34) and older groups (75+) share similar beliefs. They both believe that there is likely a 50% chance of survival after five years. The other age groups share similar sentiments on the survival amongst cancer patients. But again it is the 50-64 age groups who strongly believe the majority of people who develop cancer will survive at least five years.

Conclusion

Age perceptions, knowledge, and preventive behaviors regarding cervical cancer has been shown for women of age ranges: 18-34, 35-49, 50-64, 65-74, 75+. Amongst these various age ranges, the women came from a diverse background including: Hispanics, Caucasians, Blacks, American Indian, Asian, Hawaiian, Multiple-Races, and Refused, and don't know. The age ranges responded to various questions directly relating to cervical cancer as well as indirectly. Questions were chosen to test the knowledge, perception, and preventive behaviors of the different women age ranges to discover which age range is the most informed.

Out of the various age ranges listed in the research, 50-64 year old women proved to be the most represented out of the five groups. The general makeup of this group seemed to be distributed equally amongst the various background categories. The smoking status of this group held more former smokers than current and more women who have never tried smoking than former smokers. Out of the different ages, 50-64 year old women possessed the most education. They held the most post baccalaureate degrees (189) amongst the other women included in the study. Wealth distribution amongst the group was evenly distributed, ranging from less than \$20,000 to \$75,000 or more. In addition, these women were the most insured in terms of healthcare.

In this study, 50-64 year old women also proved to be the most knowledgeable and took the best preventive measures to ensure their health. They held the strongest belief that cancer can be typically cured if it is detected early. Their high optimism of cancer detection is unified with their strong survival beliefs of individuals who have been diagnosed after five years. Their viewpoint on getting checked regularly for cancer agrees with the majority of the 50-64 year old women responding that they have been checked for

cervical cancer. But it does not agree with the answer of being checked for genital warts. This contradiction in answers is intriguing because genital warts are closely associated with cervical cancer. Genital warts are more often associated with unsafe sexual practices. The information of how genital warts can lead to cancer is not widely spread and discussed, so it is understandable for the majority of women to not have been tested. The strong educational background of these women has placed them in a position to be informed about the vaccines or shots that are available to prevent cervical cancer. These strong sentiments and feelings towards cancer prevention and treatment make 50-64 year old women the most knowledgeable.

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