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An Examination of Factors Associated with the Use of Breast, Cervical, and Colon
Cancer Screening Among Foreign-Born and Non-Foreign Born Individuals in the United
States

By

Netsai N. Mariga, BSN, RN.

GEORGIA STATE UNIVERSITY

A Thesis Submitted to the Graduate Faculty of Georgia State University in
Partial Fulfillment of the Requirements for the Degree

MASTER OF PUBLIC HEALTH

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APPROVAL PAGE

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This thesis is dedicated to my late parents, Justus and Rumbidzai Mariga (helping to finish the fight for cancer).

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Abstract

Background: The number of Foreign Born (FB) individuals in the United States (US) is growing and their health behaviors and beliefs are important to know. In the US, cancer is the second leading cause of death, and there is need to explore factors that are associated with the use of cancer prevention strategies among FB individuals.

Objective: The study aimed to compare cancer screening rates, assess factors associated with use of cancer screening tests across FB and Non-Foreign Born (NFB) individuals and association between length of stay and use of selected cancer screening tests among FB people.

Methodology: Using the 2012 Health Information National Trends Survey (HINTS) 4, cycle 2 data, which comprised of 3,630 participants of which 513 were FB, logistic regression analyses were conducted to identify predictors of selected cancer screening tests. Independent variables included demographic and selected healthcare, beliefs, and information seeking factors.

Results: There were no significant differences in screening rates for cervical, breast, and colon cancers among the FB and NFB individuals. For breast cancer screening, having had a routine checkup in the last year was found to be associated with increased likelihood of having a mammography exam. For cervical cancer screening, none of the selected healthcare, beliefs and information seeking factors was found to be significant among the FB individuals. For colon cancer screening, only the information seeking factor “it took a lot of effort to get cancer information” was found to be significant among FB individuals. Length of stay in the US for FB individuals was found be associated with increased likelihood of colon cancer test only.

Conclusion: Inventive and ethnically appropriate strategies are essential to increase awareness for cancer prevention strategies. Well-designed information strategies that take into account the diversity of the US population can lead to benefits such as increased cancer screening.

KEYWORDS: Foreign- Born, Cancer Screening, Information Seeking, Beliefs, Healthcare Factors

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CHAPTER I

INTRODUCTION

1a. Background

Foreign Born (FB) individuals make up a substantial proportion of United States (US) residents. The 2010 American Community Survey estimated the number of FB individuals in the US to be nearly 40 million, or 13 percent of the total population in the US (Grieco. E, 2012). The FB population from Latin America was the largest region-of-birth group, accounting for over half (53 percent) of all foreign born with 28 percent born in Asia, 12 percent in Europe, 4 percent in Africa, 2 percent in Northern America, and less than 1 percent in Oceania(Grieco. E, 2012). FB individuals come to the USA with their beliefs and cultures that will impact the use or accessibility of required health services. It is, therefore, important to understand their health behaviors and beliefs in order to provide efficient healthcare services.

There is great need to investigate this diverse group of people in order to better their health standing and needs. The longer the period the immigrants reside in the US, the more they need to be screened for chronic diseases including cancer. This is because after immigration, the health status of immigrants often mirror those of their American host (Sanou et al., 2014). Cancer is the second leading cause of death in the US, and accounts for one of every four deaths (Hoyert DL, 2012). Hence, it is important to investigate factors that change the health behavior of people who emigrate from other countries to the USA. Change in the environment of the destination country might have

an effect on the new way of living of the immigrants that may explain their health behaviors.

It is also important to indicate that as is the case with cancer incidence, the disparities in cancer mortality are not exclusively related to race and ethnicity; socioeconomic dynamics are inseparably linked with the etiologic and disease promotion or progression agents (Zonderman, Ejiogu, Norbeck, & Evans, 2014). In order to understand the causes of patterns in cancer mortality, the understanding of factors that cause cancer death, risk factors for cancer incidence, the use of methods to diagnose cancer early, and the use of effective methods to treat cancer needs to be examined (Byers, 2010). The issue is complex and requires the exploration of the factors that are associated with the use of cancer screening among immigrants in the US. This will assist in the design of effective policies for increasing screening rates.

1b. Purpose of study

The purpose of this study is to determine the factors that are associated with the use of cancer screening among the FB individuals in the USA compared to Non-Foreign Born (NFB) individuals.

Aims of the study

1. Comparison of screening rates in FB and NFB individuals.
2. Examination of factors associated with cancer screening in FB and NFB individuals.

3. Assessment of the relationship between length of stay of FB individuals in the US and use of selected cancer screening tests among FB individuals.

1c. Hypothesis

This study theorizes that FB individuals will have a lower likelihood of using cancer screening interventions. Several reasons have influenced this assumption: 1) For FB individuals, cancer screening services could be challenging because of lack of knowledge about healthcare services and the view of cancer as an unfamiliar, frightening, potentially stigmatizing illness (Carroll et al., 2007). 2) There are different and/or greater barriers to colorectal cancer screening among FB individuals than those experienced by their US-born counterparts because of language, culture, and health access barriers (Redwood-Campbell, Fowler, Laryea, Howard, & Kaczorowski, 2011). 3) Access-enhancing strategies to FB women had the largest effect in improving cervical cancer screening uptake. (Redwood-Campbell et al., 2011). Therefore, it is our belief that differences on healthcare, beliefs, and information seeking factors associated with cancer screening exist between FB and NFB individuals.

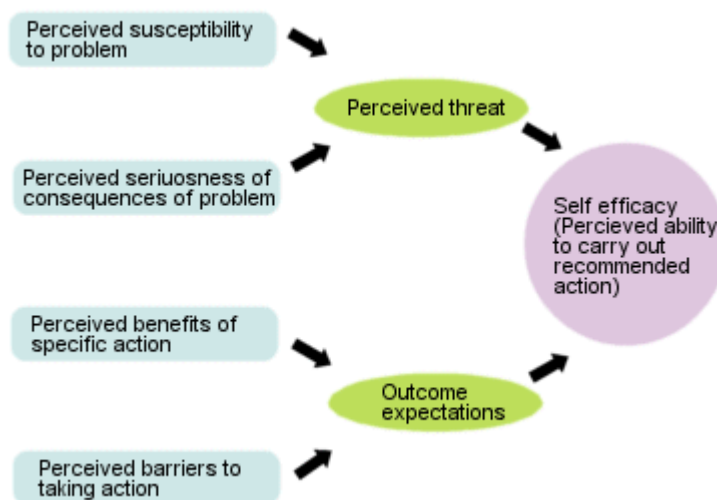
1d. Theoretical Framework

To explain behavior by different people, different health behavior theories have been utilized. The Health Belief Model is one model that has been used to explain a process that occurs when engaging in a change in a certain behavior or not, based on the individual's personal beliefs or perceptions. The four main concepts (see Figure. 1) representing the perceived threat and net benefits are perceived susceptibility, perceived

severity, perceived benefits, and perceived barriers. To enlighten and eventually change cancer-contributing behaviors among different groups, it is important to have a basic understanding of how each group varies on general beliefs about cancer and cancer prevention (Davis, Buchanan, & Lee Green, 2013). FB individuals have different beliefs and behaviors regarding cancer and cancer prevention efforts, and understanding these will help health care providers to formulate interventions that are appropriate and can increase the number of FB individuals who seek screening for cancer.

It is anticipated that the results of the study will assist healthcare professionals in tailoring the health needs of FB individuals by incorporating their beliefs in the fight for preventing cancer among this group of people.

Figure 1. Health Belief Model



Modified from (Nutbeam, 1998)

CHAPTER II

LITERATURE REVIEW

The literature review will contain compiled research from various studies about cancer screening and FB individuals. The review will include several different factors that have been associated with the use of cancer screening in the US. These risk factors comprise of healthcare factors, information seeking behaviors and beliefs. The literature is aimed at comprehending the many factors and the ways in which they are linked to cancer screening. The terms “Foreign Born” and “Immigrant” will be used interchangeably.

2a. Foreign Born

Clarifying the relationship between race, ethnicity, and foreign birth is important because it may help identify specific barriers faced by these at-risk populations, and can create opportunities to intervene and improve health (Goel et al., 2003). The health of FB persons should be looked at to create opportunities to maintain or improve health. Acceptance of cancer screening services could be challenging because of lack of knowledge about the services and the view of cancer as an unfamiliar, frightening, potentially stigmatizing illness (Carroll et al., 2007). A 2010 systematic review of interventions to improve cervical cancer screening uptake in immigrant women, mostly in the US, found that access-enhancing strategies had the largest effect (Redwood-Campbell et al., 2011). It is important to address barriers to access in order to increase the uptake of cancer screening among the FB persons.

Foreign-born Hispanics have been shown to have a lower likelihood of being screened for Colorectal Cancer (CRC) compared to Hispanics born in the United (Shih, Elting, & Levin, 2008). This disparity may be due to different and/or greater barriers to CRC screening than those experienced by their US-born counterparts such as language, cultural, and health access barriers (Redwood-Campbell et al., 2011). Barriers to CRC among FB beings need to be identified in order for public health programs to be formulated. It was also ascertained that several socio-demographic factors were associated with colorectal cancer screening adherence (Ellison, Jandorf, Villagra, Winkel, & DuHamel, 2011). Ellison et al. (2011) also found from their study that participants who were aged 65 years or older, were interviewed in Spanish, had lived in the US for 40 years or more, and were living alone/single were more likely to be adherent to CRC screening.

2b Cancer Screening

Screening for illness is done to detect disease in individuals without clinical signs or symptoms of the disease (Bretthauer & Kalager, 2013). Cancer screening, therefore, is conducted to target the disease before it spreads to other parts of the body to increase the chances of cure and decrease mortality from it. Early cancer detection can effectively reduce mortality and morbidity when cancer treatment or precancerous lesions have an enhanced probability of being treated effectively, and ethnic disparities that exist compromise preventable mortality and mortality among ethnic women (Gonzalez et al., 2012). The principles of screening for the World Health Organization (WHO) were

established in 1968 and they are still valid today and also guide the screening procedures as cited in (Bretthauer & Kalager, 2013).

Figure 2. The World Health Organization’s principles of screening

1. Screening should be directed towards an important health problem
2. There should be a simple, safe, precise and validated screening test
3. Treatment started at an early stage should be of more benefit than treatment initiated later
4. There should be evidence that the screening test is effective in reducing mortality and morbidity
5. The benefit of screening should outweigh the physical and psychological harm caused by the test, diagnostic procedures and treatment
6. The opportunity cost of the screening program should be economically balanced in relation to expenditure on medical care as a whole
7. There should be a plan for managing and monitoring the screening program and an agreed set of quality assurance standards
8. Potential screening participants should receive adequate
9. information about benefits and disadvantages of participation

2c. Information Seeking

Barriers to cancer screening should be understood, including the importance of cancer screening awareness, whether the immigrants are getting the information at all. It is important that all people including immigrants receive information about cancer and cancer screening. From a study using the 2005 Health Information National Trends Survey (HINTS) data to examine possible disparities between FB and NFB individuals, some of the findings were that FB Hispanics were less likely than the NFB persons to have ever searched for cancer information (Zhao, 2010). Overall FB individuals were

also less likely to have had somebody else look for cancer information for them. The study also found out that foreign-born individuals face greater obstacles during the process of cancer information seeking, compared to NFB born counterparts, and that Hispanics also do not trust some of the sources of health information, including doctors. Furthermore FB individuals were more likely to protect adverse beliefs about cancer than the NFB (Zhao, 2010).

It is estimated that half of all women in the U.S. who are diagnosed with cervical cancer have never had a Pap smear, and another 10% have not had a Pap smear in the previous five years (Owusu et al., 2005). Vulnerable groups including immigrants are especially likely not to seek preventive health service. This often prohibit health care services and access to utilization of much needed services that may prevent early identification and treatment of disease, with the possibility that the care may be more expensive in the long run, in terms of both financial and human costs (Owusu et al., 2005).

2d. Health Beliefs

Individuals that immigrate often have beliefs that may be influenced by their cultures and upbringing. For example, Lee Lin et al. (2007), found that some Chinese American immigrants still believe that they do not need screening for cervical cancer if they had no symptoms, or were menopausal, or were not sexually active. Furthermore, the participants in the study had some beliefs that were not accurate and did not influence risk of cervical cancer, and many of the beliefs reported in the study suggest that the

length of time spent in the US without sufficient cancer knowledge and information may strengthen deep seated cultural beliefs that may not be accurate (Lee Lin et al., 2007).

People who immigrate to the US at younger age may end up acclimatizing to the way of living in the country and are more likely to be screened for cancer as recommended by the American Cancer Society. Arab Muslims women, who comprise a small percentage of Muslims worldwide, reported that the Islamic faith had a positive impact on pursuing health care and taking care of their bodies (Salman, 2012). The author went on to write that the most significant predictors found among these women included high education levels, perception of the importance of the screening in finding breast cancer, years of residency in the United States, and health provider recommendations (Salman, 2012).

Other health beliefs may influence the use of preventative interventions for cancer in the US by immigrants. Foreign birth and language are not just indicators of socioeconomic status and access to health care, but may also be indicators of health beliefs, knowledge, attitudes, and patient-provider communication concerning cancer screening and prevention (Kandula, Wen, Jacobs, & Lauderdale, 2006). The researchers went on to say FB Asian Americans perceive that cancer screening tests are a response to a specific symptom of cancer rather than tests that are used prior to the development of symptoms (Kandula et al., 2006). This may be lack of knowledge that preventive interventions for cancer are useful in detecting and treating cancer early to reduce the burden of morbidity and to save lives. Because early cancer detection is associated with

better outcomes, it is important to integrate immigrants' health beliefs and customs into interventions aimed at increasing screening rates among this group.

2e. Healthcare Factors

The perception of having good health among the foreign born may influence the health seeking behaviors. Also, the age of the individuals may influence certain health seeking behaviors. A study of immigrant women's cancer screening behaviors showed that younger women were likely to have a Pap smear and considered their health status as good or excellent while those with enhanced English language skills were more likely to carry out breast self-exams but considered their health status as poor or fair (Ivanov, Hu, & Leak, 2010). The authors went on to say that other factors like having health insurance, and longer stay in the US were certainly associated with having a Pap smear test to screen for cervical cancer and mammogram exams to screen for breast cancer. The study also found out that Immigrant women have marginal involvement in health promotion and cancer screening behaviors and there is need for early interventions to help the immigrants in attaining positive health outcomes (Ivanov et al., 2010). Due to high incidences of cancer in the US, it is imperative they receive all the care and screening available to them.

The differences that exist in cancer screening rates between immigrants and the US-born may partially be due to a lower occurrence of cancer screening and regular doctor visits that would help in detecting the presence of cancer (McDonald & Neily, 2011). The authors went on to suggest that the longer the immigrants are in the US, the

more likely they are to get screened for cancer and also the more likely they are to utilize diagnostic health services just like the US-born (McDonald & Neily, 2011). Another study concluded that the differences that exist in the colorectal cancer screening rates among Asian Americans and Pacific Islanders groups may be because of their concentration in certain geographic locations where medical infrastructure is less equipped, welcoming, or accessible than other areas, which may end up in screening rate differences among populations (Lee, Lundquist, Ju, Luo, & Townsend, 2011).

In the US, having health insurance may enable an individual to seek preventative health care; therefore not having health insurance may hinder efforts in cancer screening. Health insurance coverage plays an important role in ensuring immigrants' access to care (Lebrun & Dubay, 2010). Having health insurance would be an enabling factor that can motivate individuals to seek preventative health measures such as cancer screening. New immigrants may not have health insurance available to them, and it may take a few years for the immigrants to be able to have coverage for health. Length of time in the US, having health insurance, and health care setting have effects for both health interventions and health care policy among foreign born (Jandorf et al., 2010). Most recent Hispanic immigrants and those with less insurance coverage may require help in navigating through the health care system and may require supplementary financial support (Jandorf et al., 2010).

CHAPTER III

METHODOLOGY

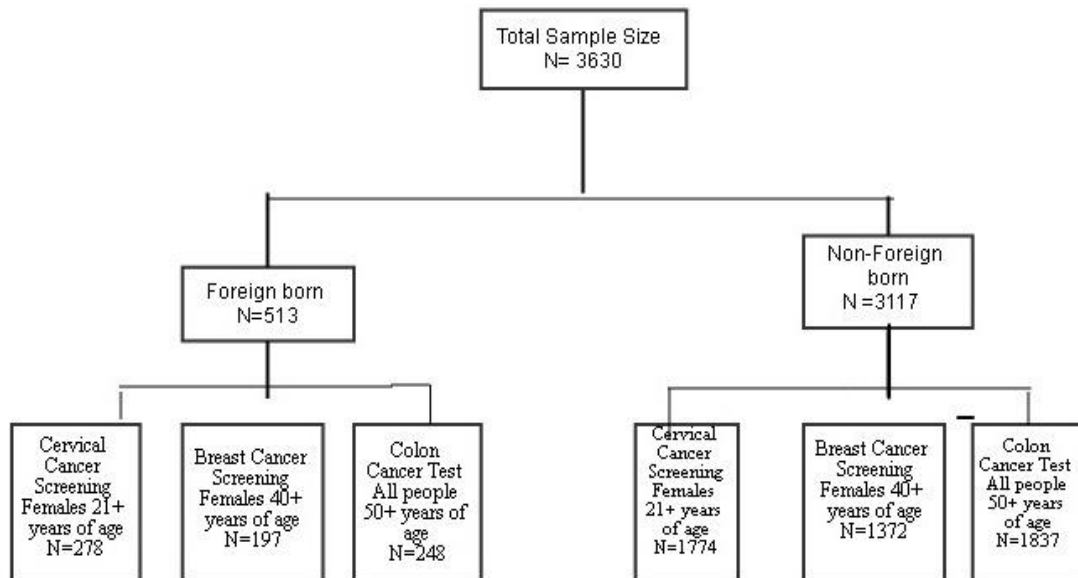
3a. Data Source

Analysis using secondary data from 2012 Health Information National Trends Survey (HINTS) 4, cycle 2 was conducted. HINTS is a nationally representative, cross-sectional survey of the non-institutionalized adult population. Data were collected from October 2012 through January 2013 and the sample design consisted of a single-mode mail survey, using the Next Birthday Method for respondent selection and complete data were collected from 3,630 participants.

3b. Inclusion and Exclusion Criteria

The sample for this study consisted of 3630 participants who answered all questions for the variables used in the analysis. Figure 3 shows the flow of sample selection. For breast cancer screening, women aged 40 years and over were selected FB ($n=197$) and NFB ($n=1372$). For colon cancer screening, individuals aged 50 years and over were selected FB ($n=248$) and NFB ($n=1837$). The sample for cervical cancer screening composed of women aged 21 years and over FB ($n=278$) and NFB ($n=1774$).

Figure 3. Sample Selection



3c. Studied Variables

The following variables were used in the analysis. Subjects with missing values for studied variables were excluded.

Dependent Variables

Breast cancer screening is the first dependent variable. The survey item, “When did you have your most recent mammogram to check for breast cancer, if ever?” was used to create a dichotomous outcome variable, which was coded as 1) ‘up-to-date’ and 2) ‘not up-to-date’, for breast cancer screening. The American Cancer Society recommends that a yearly mammogram for women, starting at age 40 and continuing for as long as a woman is in good health (American Cancer Society, 2014). So being ‘up-to-

date' for breast cancer screening meant having had a yearly mammogram among women who were at least 40 years old.

Cervical cancer screening is the second dependent variable. The question, "How long ago did you have your most recent Pap test to check for cervical cancer?" was used to create a dichotomous outcome variable, which was coded as 1) 'up-to-date' and 2) 'not up-to-date', for cervical cancer screening. The American Cancer Society recommends that women between the ages of 21 and 29 should have a Pap test every 3 years, and a test called the Human papillomavirus (HPV) test should not be used in this age group unless it is needed after an abnormal Pap test result. Women between the ages of 30 and 65 are recommended to have a Pap test plus an HPV test every 5 years, or to have a Pap test alone every 3 years. Women over age 65 who have had regular cervical cancer testing with normal results should not be tested for cervical cancer (American Cancer Society, 2014). So being 'up-to date' was defined as having had a Pap test every 3 years for women aged 21 years or over.

.Colon cancer screening is the third dependent variable. The survey item, "Have you ever had one of these tests (colonoscopy, sigmoidoscopy, and stool blood test) to check for colon cancer?" was used as an outcome variable of which the respondents answered 'yes' or 'no'. The American Cancer Society recommends that starting at age 50, both men and women should have tests for polyps and cancer (sigmoidoscopy every 5 years, colonoscopy every 10 years, double-contrast barium enema every 5 years, and CT colonography every 5 years) and tests that primarily find cancer (yearly fecal occult blood test and yearly fecal immunochemical test (American Cancer Society, 2014).

Independent Variables

The independent variables chosen reflect characteristics that may drive an individual to get cancer screening i.e., beliefs, information seeking, and healthcare factors. Although traditional demographic variables give information about the respondents, the variables such as beliefs, information seeking and healthcare factors are necessary to explore factors that are associated with cancer screening behaviors.

For the beliefs section certain variables were chosen. The survey item, “How much do you think health behaviors like diet, exercise and smoking determine whether or not a person will develop cancer?” was used to create a dichotomous variable, which was coded as 1) ‘not at all/a little’ and 2) ‘a lot/somewhat’ as the categories. The original answers were on a Likert scale with ‘not at all’, ‘a little’, ‘somewhat’, and ‘a lot’ as the categories.

The survey item, “How much do you think genetics, that is characteristics passed from one generation to the next, determine whether or not a person will develop cancer?” was used to create a dichotomous variable, which was coded as 1) ‘not at all/a little’ and 2) ‘a lot/somewhat’ as the categories. The original answers were on a Likert scale with ‘not at all’, ‘a little’, ‘somewhat’, and ‘a lot’ as the categories. The survey item, “How likely are you to get cancer in your lifetime?” was used to create a variable with ‘unlikely’, ‘neither’ and ‘likely’ as the categories. The original answers were on Likert scale with ‘very unlikely’, ‘unlikely’, ‘neither’, ‘unlikely’, ‘nor likely’, ‘likely’ and ‘very likely’ as the categories.

Three information seeking variables were selected. The survey item, “Have you ever looked for information about cancer from any source?” of which the respondents answered either ‘yes’ or ‘no’, as the categories. The survey item, “Based on the results of your most recent search for information about cancer, how much do you agree or disagree with ‘it took a lot of effort to get the information you needed’,” was used to create a dichotomous outcome variable, which was coded as 1) ‘agree’ and 2) ‘disagree’ as the categories. The original categories ‘strongly agree’ and ‘somewhat agree’ were grouped together to create a category labeled ‘agree’, and the categories ‘somewhat disagree’ and ‘strongly disagree’ were grouped together to create a category labeled ‘disagree’.

The survey item, “Overall how confident are you that you could get advice or information about cancer if you needed it?” was used to create a dichotomous outcome variable, which was coded as 1) ‘confident’ and 2) ‘not confident’ as the categories. The original categories ‘completely confident’, ‘very confident’ and ‘somewhat’ confident were grouped together to create a category which was labeled ‘confident’; the remaining categories i.e. ‘a little confident’ and ‘not confident at all’ were grouped together to create a category which was labeled ‘not confident’.

Selected healthcare factors variables were utilized. The survey item, “About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition” was used to create a dichotomous variable, which was coded as 1) ‘up-to- date’ and 2) ‘not

up-to-date' as the categories, with 'up-to-date' meaning having visited a doctor within the last 12 months.

The survey item, "Overall, how would you rate the quality of health care you received in the past 12 months?" was used to create a dichotomous variable, which was coded as 1) 'good' and 2) 'poor' as the categories. The original categories, 'excellent', 'very good' and 'good', were grouped together to create category labeled 'good' and the remaining categories 'fair' and 'poor' were grouped to create the category labeled 'poor'.

The survey item, "In the past 12 months, how often did you feel you could rely on our doctors, nurses, or other health care professionals to take care of your health care needs?" was used also used to create a dichotomous variable, which was coded as 1)'always' and 2)'never' as the categories. The original categories 'always' and 'usually' were grouped together to create category labeled 'always', and the remaining categories 'sometimes' and 'never' were grouped in one category labeled 'poor'.

The survey item, " The following questions are about your communication with all doctors, nurses, or other health professionals you saw during the past 12 months spend enough time with you?" was used to create a dichotomous variable, which was coded as 1)'usually' and 2) 'never' as the categories. The original categories 'always' and 'usually' were grouped together to create category labeled 'usually', and the remaining categories 'sometimes' and 'never' were grouped to create the category labeled 'never'. The last selected survey item, "Overall, how confident are you about your ability to take care of your health?" was used to create a dichotomous variable, which was coded as 1) 'confident' and 2) 'not confident' as the categories. The original categories 'completely

confident', 'very confident' and 'somewhat confident' were grouped together to create category labeled 'confident' and the remaining categories i.e. 'a little confident' and 'not confident at all' were grouped together to create a category labeled 'not confident'.

3d. Data Analysis

Analyses were performed in SAS 9.3 (SAS Institute, Cary NC). Sampling and replicate weights were used to account for complex sampling design and to provide for unbiased estimates of population values and consistent variance estimation. Bivariate analyses were performed to assess the differences in breast, cervical and colon cancer screening rates among the FB and NFB individuals. Odds ratios (OR) from binary logistic regression analysis was used to estimate the risk for breast, cervical and colon cancer screening (dependent variables) that is associated with healthcare, belief and information seeking factors (independent variables) across FB and NFB individuals. In the logistic regression analysis, statistical adjustments were made for age, race/ethnicity, marital status, health insurance, cancer diagnosis, and education. In the case for colon cancer screening, gender was also adjusted for. In all analyses $p < 0.05$ and 95% confidence interval were used to establish significance.

Chapter IV

RESULTS

4a. Descriptive Statistics

Table 1 presents descriptive analyses of various demographic characteristics of this nationally representative sample. A total of 3630 individuals participated in the survey, with FB (14.1%) respondents. The mean age was 49 ($SD = 18.4$) for FB individuals and 53($SD=18.4$) for NFB individuals. Fifty seven percent of FB beings identified as female compared to two-thirds (61%) for NFB individuals. Fifty two percent of FB individuals were employed compared to NFB (50%) individuals. Approximately half of the FB (50.2%) individuals identified themselves as Hispanic compared to NFB (9.7%) respondents with One fifth of FB (21.6%) identifying as Non-Hispanic White compared to NFB (69.8%) respondents.

Approximately less than half FB (46.8%) and NFB (47.3%) were married or living together with a partner. The majority of FB (81.2%) individuals had high school education or above, so was their NFB (91.5%) counterparts. Approximately half of the FB (51.9%) individuals indicated that they owned a home compared to their NFB (64.4%) counterparts. Seventy four percent of the FB individuals stated that they had Health insurance coverage compared to NFB (85.4%). Among the FB individuals, 6.4% had been in the US for 5 years or less, with 8.4% having been in the country for between 6 and 10 years with the majority (77%) having been in the country greater than 10 years.

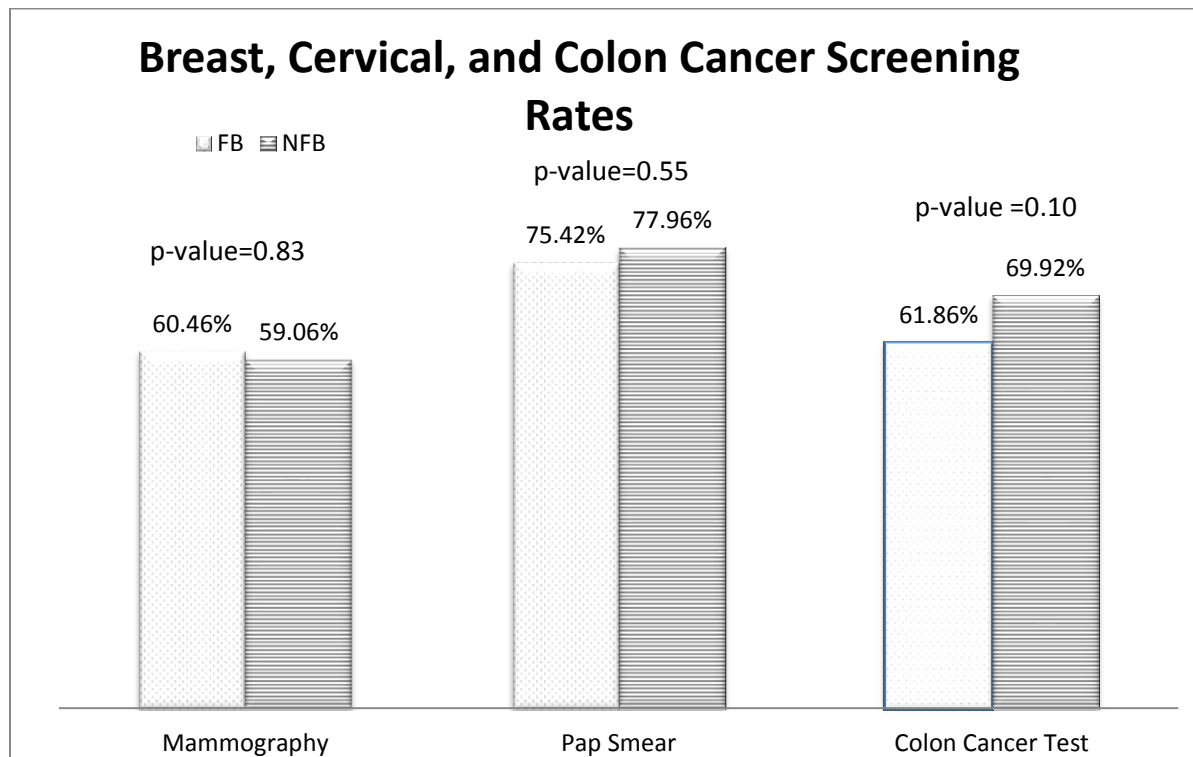
Table 1. Demographic characteristics and summary statistics of respondents in HINTS 4, cycle 2, N=3630.

Variable	Foreign Born		Non-Foreign Born		FB vs. NFB <i>p</i> -value
	<i>n</i>	(%)	<i>n</i>	(%)	
Age (mean, min - max)	49 (18 -90)		53 (18 -96)		
Foreign Born	513	14.1	3056	84.2	
LOS in the US					
≤10 years					
>10 years	395	77			
Gender					0.09
Female	294	57.3	1844	60.3	
Male	204	39.8	1172	38.3	
Age Category					0.06
20 or less	15	2.9	76	2.5	
21 -39	138	26.9	595	19.5	
40+	360	70.2	2385	78.0	
Race					<0.0001*
Hispanic	242	50.2	269	9.7	
Non-Hispanic White	104	21.6	1939	69.8	
Non-Hispanic Black	51	10.6	445	16.0	
Non-Hispanic Other	85	17.6	123	4.4	
Income Category (\$ per year)					0.011*
Low (0 -19999)	123	24	609	26.8	
Medium (20000 –74999)	223	43.5	1252	41.0	
High (75000 +)	101	19.7	819	19.9	
Employment Status					0.56
Yes	268	52.2	1535	50.2	
No	233	45.4	1439	47.1	
Marital Status					0.30
Yes	263	46.8	1446	47.3	
No	240	51.3	1575	51.5	
Homeownership Status					0.0006*
Yes	261	50.9	1968	64.4	
No	224	43.7	962	31.5	
Education Category					0.0002*
≥ High School	417	81.3	2795	91.5	
> High School	87	17.0	241	7.9	
Cancer Diagnosis					0.006*
Yes	36	4.8	473	8.7	
No	424	95.2	2626	91.3	
Health Insurance Status					<0.0001*
Yes	375	74	2580	85.4	
No	132	26	442	14.6	

- * = *p*-value <0.05, LOS = Length of stay in the US, ≤ = less than or equal to, > = greater than, ≥ = greater than or equal to
- Min – max = min age to max age in years
- FB= Foreign Born, NFB= Non-Foreign Born
- HINTS = 2012 Health Information National Trends Survey.

Figure 4 presents screening rates for cervical, breast, and colon cancers among the FB and NFB individuals. Approximately more than half of FB (60.46%) individuals were screened for breast cancer using mammography test compared to NFB (59.6%) individuals, and was not statistically significant with p -value=0.83. Approximately three quarters of FB (75.42%) individuals were screened for cervical cancer using the pap smear test compared to NFB (77.96%) individuals, and was not statistically significant with p -value=0.55. For colon cancer screening more than half FB (61.86%) individuals used the colon cancer test, compared to NFB (69.92%) and was not statistically significant with p -value=0.10.

Figure 4. Breast, Cervical, and Colon Cancer Screening Rates by use of Mammography, Pap smear and Colon Cancer Tests in Foreign Born and Non Foreign Born Individuals



4b. Univariate and Multivariate Analyses

Univariate logistic regression was conducted to determine the odds ratio and confidence intervals for selected variables. Table 2, 3, and 4 shows the univariate analyses for selected factors that may drive individuals to get screened for breast, cervical and colon cancer by use of mammography, Pap smear and colon cancer test respectively. Table 2 describes selected factors that may influence a woman to get screened for breast cancer by use of mammography, while table 3 describes the factors that may influence a woman to get a Pap smear test to screen for cervical cancer, and table 4 describes the factors that may influence an individual to get screening for colon cancer by use of colon cancer test.

Table 2 data reveals that FB individuals who had a most recent routine checkup in the last year were 12.3 times more likely to get screened for breast cancer by use of mammography (OR=12.3; 95% CI= 3.72, 0.45) than those who did not have a most recent checkup. NFB subjects who had a most recent routine test were 6.8 times more likely to get screened for breast cancer by use of mammography (OR=6.8; 95% CI= 4.40, 10.56) than those who did not have a routine check-up in the last year. FB individuals who think genetics determine whether or not a person will develop cancer were 0.26 times as likely to get screened for breast cancer by use of mammography (OR=0.26; 95% CI: 0.09, 0.77) than those who did not think genetics determine whether or not a person will develop cancer. NFB individuals who think genetics determine whether or not a person will develop cancer were 1.72 more likely to get screened by use of mammography (OR=1.72; 95% CI: 1.20, 2.48). FB individuals who thought preventing

cancer was not possible were 2.6 times more likely to get screened for breast cancer by use of mammography (OR=2.69; 95% CI: 1.07, 6.72). All selected healthcare factors were statistically significant for NFB individuals, and only health factor, having had a most recent checkup in the last year, was significant for the FB individuals. Having health insurance was significant for both the FB and NFB individuals.

Table 2. Results of Univariate Analysis of Healthcare, Beliefs, and Information Seeking Factors associated with Mammography use in Foreign Born and Non Foreign Born Individuals.

Variables	Foreign Born			Non Foreign Born		
	OR	95% CI		OR	95% CI	
Healthcare Factors						
Most Recent Check Up In the Last Year	12.26*	3.72	40.45	6.81*	4.40	10.56
Ability Take To Care of Own Health	0.25	0.06	1.13	0.44*	0.24	0.81
Providers Spent Enough Time	1.45	0.50	4.21	1.79*	1.10	2.91
Quality of Health Care Received in the Last Year	0.97	0.32	3.00	3.12*	1.33	7.32
Health Providers always take care of your needs.	0.79	0.23	2.74	0.46*	0.27	0.73
Beliefs						
Health Behaviors determine development of CA	1.40	0.20	9.69	1.33	0.85	2.09
Genetics determine development of CA	0.26*	0.09	0.77	1.72*	1.20	2.48
Chance of Getting Cancer in a lifetime.	1.11	0.36	3.39	0.82	0.51	1.33
Preventing CA is Not Possible	2.69*	1.07	6.72	1.19	0.79	1.58
Information Seeking						
Too Many Recommendations	1.38	0.61	3.17	1.47*	1.04	2.08
Took A lot Of Effort to get CA information	0.99	0.11	8.68	1.25	0.74	2.11
Ever looked for Cancer Information	1.28	0.39	4.18	1.22	0.89	1.67
Confidence of getting CA advice if needed	1.11	0.37	3.30	0.65	0.37	1.13
Other						
General Health Status	0.38	0.12	1.19	0.53*	0.36	0.78
Health Insurance	4.16*	1.42	12.15	2.11*	1.25	3.55
Ever Diagnosed with Cancer	2.03	0.31	13.34	1.67*	1.15	2.43

- OR=Odds Ratio, CI=Confidence Interval, CA=Cancer, *= p -value <0.05
- Mammography – Breast Cancer Screening Test

Table 3 data reveals that only FB individuals who indicated that it takes a lot of effort to obtain cancer information were 0.14 times less likely to get screened for cervical cancer using the Pap smear test (OR=0.14; 95% CI:0.02, 0.92) . All other selected variables were not significant for FB individuals. NFB individuals who had the most recent check up in the last year were 2.4 times more likely to get screened for cervical cancer by use of pap smear test (OR=2.4; 95% CI: 1.64, 3.41). For NFB individuals, all other selected beliefs, and self-reported general health status were significant.

Table 3. Results of Univariate Analysis of Healthcare, Beliefs, and Information Seeking Factors associated with Pap smear use in Foreign Born and Non Foreign Born Individuals.

Variables	Foreign Born			Non-Foreign Born		
	OR	95% CI		OR	95% CI	
Healthcare Factors						
Most Recent Check Up In the Last Year	2.75	0.96	7.90	2.36*	1.64	3.41
Ability Take To Care of Own Health	0.31	0.09	1.05	0.79	0.43	1.44
Providers Spent Enough Time	0.78	0.29	2.12	0.99	0.59	1.68
Quality of Health Care Received in the Last Year	1.34	0.23	7.65	1.11	0.47	2.60
Health Providers always take care of your needs.	0.96	0.23	3.92	0.89	0.41	1.92
Beliefs						
Health Behaviors determine development of CA	1.43	0.35	5.87	1.93*	1.24	2.99
Genetics determine development of CA	1.11	0.25	4.95	1.89*	1.19	3.03
Chance of Getting Cancer in a lifetime.	0.50	0.15	1.66	0.50*	0.34	0.74
Preventing CA is Not Possible	0.93	0.31	2.84	1.73*	1.15	2.61
Information Seeking						
Too Many Recommendations	1.01	0.45	2.27	1.19	0.81	1.73
Took A lot Of Effort to get CA information	0.14*	0.02	0.92	1.33	0.76	2.33
Ever looked for Cancer Information	1.89	0.68	5.26	1.12	0.76	1.65
Confidence of getting CA advice if needed	0.51	0.14	1.87	0.61	0.36	1.03
Other						
General Health Status	1.06	0.34	3.35	0.65*	0.43	0.98
Health Insurance	2.16	0.86	5.42	1.26	0.81	1.96
Ever Diagnosed with Cancer	14.93*	1.43	155.47	0.91	0.59	1.40

- OR=Odds Ratio, CI=Confidence Interval, CA=Cancer, *= p-value <0.05
- Pap smear – Cervical Cancer screening test

Table 4 data reveals that only FB individuals who believe that it takes a lot of effort to get cancer information were 8.1 times more likely to get screened for colon cancer by use of colon cancer test (OR=8.1; 95% CI: 2.01,32.51). All other selected

variables were not significant. For the NFB individuals, those who received good quality health care in the last year were 2.2 times more likely to get screened for colon cancer by use of colon cancer test (OR=2.2; 95% CI: 1.12, 4.34). NFB individuals who believe health behaviors determine development of cancer were 1.6 times more likely to get screened for colon cancer by use of colon cancer test (OR=1.6; 95%CI: 1.13, 2.33).

Table 4. Results of Univariate Analysis of Healthcare, Beliefs, and Information Seeking Factors associated with Colon Cancer Test use in Foreign Born and Non Foreign Born Individuals.

Variables	Foreign Born			Non Foreign Born		
	OR	95% CI		OR	95% CI	
Healthcare Factors						
Most Recent Check Up In the Last Year	2.31*	1.00	5.34	3.92*	2.91	5.28
Ability Take To Care of Own Health	1.40	0.27	7.18	0.79	0.42	1.48
Providers Spent Enough Time	1.08	0.31	3.80	1.33	0.84	2.12
Quality of Health Care Received in the Last Year	2.25	0.60	8.44	2.20*	1.12	4.34
Health Providers always take care of needs.	0.77	0.29	2.02	0.68	0.39	1.21
Beliefs						
Health Behaviors determine development of CA	1.69	0.66	4.30	1.62*	1.13	2.33
Genetics determine development of CA	2.03	0.60	6.91	1.02	0.74	1.42
Chance of Getting Cancer in a lifetime.	0.85	0.31	2.27	0.75	0.45	1.24
Preventing CA is Not Possible	1.49	0.61	3.67	1.82*	1.27	2.61
Information Seeking						
Too Many Recommendations	1.27	0.66	2.46	1.28	0.94	1.75
Took A lot Of Effort to get CA information	8.09*	2.01	32.51	1.11	0.66	1.87
Ever looked for Cancer Information	0.66	0.27	1.63	1.80*	1.29	2.51
Confidence of getting CA advice if needed	0.63	0.15	2.57	0.53*	0.34	0.83
Other						
General Health Status	1.81	0.78	4.22	0.94	0.64	1.36
Health Insurance	2.58	0.88	7.55	2.81*	1.74	4.55
Ever Diagnosed with Cancer	1.78	0.15	21.04	2.25*	1.46	3.46

- OR=Odds Ratio, CI=Confidence Interval, CA=Cancer, *= p -value <0.05
- Colon Cancer Test - Colonoscopy, Sigmoidoscopy or Stool Blood Test.

Multivariate logistic regression analysis was performed. The purpose of the multivariate analysis is to assess the association of selected factors has on breast, cervical, and colon cancer screening while adjusting for all the other variables (age, smoking, ethnicity, education, self-reported health status, health insurance). Gender was controlled for in determining the relationships between the factors and colon cancer screening.

Table 5 data shows that after controlling for age, smoking, ethnicity, education, self-reported health status, and health insurance, FB subjects who had a most recent check up in the last year were 8.3 times more likely to get screened for breast cancer than those that did not have a most recent routine checkup by use of mammogram exam, (OR=8.3; 95% CI: 1.44, 47.48). NFB individuals who had a most recent routine checkup were 6.6 times more likely to get screened for breast cancer than those that did not have a most recent routine checkup by use of mammogram exam which was significant (OR=6.6; 95% CI: 4.26, 10.37).

After controlling for age, smoking, ethnicity, education, self-reported health status, and health insurance, FB individuals who believed that genetics determine development of cancer were 0.256 less likely to be screened for breast cancer than those that did not believe genetics determine development of cancer (OR=0.26; 95% CI: 0.06, 1.14), and was not significant. However, NFB individuals who believed genetics determine development of cancer were 1.6 times more likely to get screened for breast cancer by use of mammogram exam, and was significant (OR=1.6; 95% CI: 1.022-

2.661). FB individuals who believed that preventing cancer is not possible were still significant (OR=5.1; 95% CI: 1.374, 8.986). However, NFB individuals were who believe that preventing cancer is not possible were 0.9 times less likely to be screened for breast cancer (OR=0.9; 95% CI: 0.643-1.321), and was not significant. All other selected variables for FB individual were not significant.

Table 5. Results of Multivariate Analysis of Healthcare, Beliefs, and Information Seeking Factors associated with Mammography use in Foreign Born and Non Foreign Born Individuals.

Variables	Foreign Born			Non Foreign Born		
	OR	95% CI		OR	95% CI	
Healthcare Factors						
Routine Check Up	8.28*	1.44	47.48	6.64*	4.26	10.37
Ability Take To Care of Own Health	0.34	0.05	2.38	0.79	0.39	1.61
Providers Spent Enough Time	1.03	0.34	3.10	1.72	0.97	3.05
Quality of Health Care Received in the Last Year	0.61	0.20	1.86	2.59	0.91	7.36
Health Providers always take care of your needs.	1.09	0.23	5.28	0.60	0.34	1.04
Beliefs						
Genetics	0.26	0.06	1.14	1.65*	1.02	2.66
Preventing CA is Not Possible	5.11*	1.37	18.99	0.92	0.64	1.32
Information Seeking						
Too Many Recommendations	1.32	0.47	3.72	1.52*	1.00	2.31

- OR=Odds Ratio, CI=Confidence Interval, CA=Cancer.
- *= *p*-value <0.05
- Mammography – Breast Cancer Screening Test
- Adjusted for age, smoking, ethnicity, education, self-reported health status, health insurance.

Table 6 reveal results of the multivariate analysis of healthcare, beliefs, and information seeking factors that are associated with screening for cervical cancer by use of Pap smear test. After controlling for age, smoking, ethnicity, education, self-reported health status, and health insurance, belief that it took a lot of effort to get cancer

information among FB subjects was found not to be statistically significant (OR=0.15; 95% CI: 0.01, 2.09). All other selected variables for NFB individuals were found to be statistically significant except for those that believed preventing cancer is not possible, and those that believed it took a lot of effort to get cancer information.

Table 6. Results of Multivariate Analysis of Healthcare, Beliefs, and Information Seeking Factors associated with Pap smear use in Foreign Born and Non Foreign Born Individuals.

Variables	Foreign Born			Non Foreign Born		
	OR	95% CI		OR	95% CI	
Healthcare Factors						
Most Recent Check Up In the Last Year	1.25	0.34	4.66	2.96*	1.91	4.58
Beliefs						
Health Behaviors determine development of CA	0.72	0.11	4.73	2.06*	1.28	3.34
Genetics determine development of CA	1.04	0.16	7.04	1.89*	1.01	3.54
Chance of Getting Cancer in a lifetime.	0.87	0.12	6.09	0.48*	0.32	0.71
Preventing CA is Not Possible	0.85	0.20	3.58	1.45	0.90	2.36
Information Seeking						
Took A lot Of Effort to get CA information	0.15	0.01	2.09	1.40	0.73	2.67

- OR=Odds Ratio, CI=Confidence Interval, CA=Cancer, *= *p*-value <0.05
- Pap smear – Cervical Cancer Screening Test
- Adjusted for age, smoking, ethnicity, education, self-reported health status, health insurance.

Table 7 shows results of multivariate analysis of healthcare, beliefs, and information seeking factors that are associated with colon cancer test use in FB and NFB individuals. After controlling for age, gender, smoking, ethnicity, education, self-reported health status, and health insurance, among FB individuals, belief that it took a lot of effort to get cancer information was not associated with increased odds of Pap smear screening. For NFB individuals who had the most recent check up in the last year were 3.8 times more likely to be screened for colon cancer after controlling for age, gender, smoking,

ethnicity, education, self-reported health status, and health insurance (OR=3.8; 95% CI: 2.72 -5.38), and was significant. NFB individuals who believed the quality of health care received in the last year were 2 times more likely to be screened for colon cancer and that was not significant (OR=2.0; 95% CI: 0.75, 5.55). NFB individuals who were confident of getting cancer advice if needed were 0.6 times less likely to be screened for colon cancer by use of colon cancer test (OR=0.6; 95% CI: 0.304-1.149), and that was not significant. All other selected variables for NFB individuals were significant.

Table 7. Results of Multivariate Analysis of Healthcare, Beliefs, and Information Seeking Factors associated with Colon Cancer Test use in Foreign Born and Non Foreign Born Individuals.

Variables	Foreign Born			Non Foreign Born		
	OR	95% CI		OR	95% CI	
Healthcare Factors						
Most Recent Check Up In the Last Year	2.01	0.72	5.58	3.83*	2.72	5.38
Quality of Health Care Received in the Last Year	1.43	0.02	1.34	2.05	0.75	5.55
Beliefs						
Health Behaviors determine development of CA	3.31	0.65	16.86	1.86*	1.28	2.70
Preventing CA is Not Possible	2.26	0.59	8.67	1.76*	1.14	2.72
Information Seeking						
Ever looked for Cancer Information	0.70	0.1	4.46	1.54	1.03	2.29
Confidence of getting CA advice if needed	1.15	0.15	9.11	0.59	0.30	1.15
Took A lot Of Effort to get CA information	9.47*	1.58	56.82	1.04	0.60	1.78

- OR=Odds Ratio, CI=Confidence Interval, CA=Cancer, *= p -value <0.05
- Colon Cancer Test = Colonoscopy, Sigmoidoscopy or Stool Blood Test.
- Adjusted for age, smoking, ethnicity, education, self-reported health status, health insurance.

Table 8 shows the results of bivariate analysis of Length of Stay in the US and use of Breast, Colon, and Cervical Cancer screening tests. A bivariate analysis indicated no significance association between length of stay and use of breast cancer (p -value=0.64), and also found no significant association between length of stay and use of breast cancer

screening test (p -value=0.75). However, length of stay in the US by FB individuals was found to be significant with the use of colon cancer test (p -value=0.016).

Table 8. Results of Bivariate Analysis of Length of Stay in the US and use of Breast, Colon, and Cervical Cancer screening tests.

Cancer Screening Test	Length of Stay				p -value
	<= 10 Years		>10 years		
	Weighted Frequency	%	Weighted Frequency	%	
Mammography Test					0.64
Yes	99014	74.67	4763606	61.52	
No	33590	25.33	2979570	37.48	
Pap smear Test					0.74
Yes	1779512	71.75	8674672	75.24	
No	700427	28.24	2855055	24.76	
Colon Cancer Test					0.017
Yes	46367	9.90	7010215	64.20	
No	423328	90.10	3908747	35.80	

* p -value <0.05

Chapter V

DISCUSSION

5a. Reticulated Reason for Study

The purpose of this study was to compare screening rates in FB and NFB individuals, to examine factors associated with cancer screening amongst the two groups of people and examine if length of stay in the US for FB individuals has an effect on the use of cancer screening. While controlling for age, gender, smoking, ethnicity, education, self-reported health status, and health insurance, several factors were examined that may influence the cancer screening behavior among people born outside the USA compared to those born in the USA.

The results of this study showed that cancer screening rates for FB and NFB individuals were not statistically different. The reasons for lack of statistical significance is not clear, but may be due to the fact that 77% of FB individuals had been in the US for greater than 10 years with 6% having been in the US for 5 years or less. According to the literature review, it was expected that there would be differences in cancer screening rates between FB and NFB individuals, and that those differences might partially be due to a lower occurrence of cancer screening and regular doctor visits that would help in detecting the presence of cancer (McDonald & Neily, 2011).

There were varied results found when selected healthcare, beliefs, and information seeking factors that may influence the screening for breast, cervical or colon cancer were examined. For breast cancer screening, having had a recent routine medical

checkup in the last year was found to be associated with increased use of mammography exam, FB (OR=12.3; 95% CI= 3.72, 40.45) and NFB (OR=12.3; 95% CI= 4.40, 10.55). After adjusting for age, smoking, ethnicity, education, self-reported health status, and health insurance, having had the most recent routine medical checkup in the last year was found to be associated with the breast cancer screening FB (OR=8.3; 95% CI: 1.44 – 47.48) and NFB (OR=6.6; 95% CI: 4.26-10.37). From previous research individuals may be more likely to be screened for colorectal cancer if they get reminders that progress into actual screening and trust that they can positively complete the screening on their own (Beydoun & Beydoun, 2008). It is important that people establish consistent routine medical care so that they get to referrals to have cancer-screening tests, which are appropriate for them. An established routine medical care may provide a gateway for cancer prevention efforts. The more people get screened for cancer, the earlier cancer interventions begin, and may help reduce the mortality associated with it.

For cervical cancer screening, none of the selected healthcare, beliefs and information seeking factors were found to be significantly associated with screening among the FB individuals, after controlling for age, smoking, ethnicity, education, self-reported health status, and health insurance. However, among the NFB individuals, having the most recent medical checkup in the last year was found to be significantly associated with screening suggesting that individuals who have had a recent medical check in the last year were more likely to get screened for cervical cancer. Other factors found to be significant are those individuals who believed health behaviors and genetics

determine development of cancer, and also individuals who believed there was a chance of getting cancer in their lifetimes. The varied differences in factors among the FB and NFB individuals may be due to lack of other sources of influence that were not measured.

For colon cancer screening, only the information seeking factor, 'it took a lot of effort to get cancer information' was found to be significant among the FB individuals after controlling for after controlling for age, gender, smoking, ethnicity, education, self-reported health status, and health insurance. For NFB individuals those that had most recent check up in the last year, those that ever looked for cancer information, and those that believed health behaviors and genetics determine whether you get cancer or not were more likely to get screened for colon cancer. Cancer information availability to FB people is critical. Culturally appropriate information dissemination strategies are important to increase of information availability to this group of people. Again due to sample size, it was a challenge to test if English language proficiency was a barrier to seeking cancer information because of the small number of those who did not speak English well.

To assess the association of length of stay in the US and use of the selected cancer screening tests, bivariate analysis with Chi-square was performed. The analysis showed that there was no association between length of stay and mammography (p -value=0.64). However, from literature, older women who have been in the US for a long time were more likely to receive a mammogram, demonstrating increasing understanding of the significance of mammography for screening purposes (Ivanov et al., 2010). The reason

for lack of statistically significance is not clear, but may be due to small sample size of individuals who were of foreign born.

The result of this study did not show a positive association between length of stay and cervical and breast cancer screening. However, a statistically significant association between length of stay and colon cancer screening was found. Because of the small sample size for FB individuals, it was not possible to perform the univariate and multivariate logistic regression analysis. This significant association between length of stay and colon cancer screening perhaps may be due to acculturation. This is supported by findings from another study that said participants who were aged 65 years or older, were interviewed in Spanish, had lived in the United States for 40 years or more, and were living alone/single were more likely to be adherent to CRC screening (Ellison et al., 2011).

The issue of acculturation adds to the complexity of behavior change among the FB individuals. The more they stay in the US the more their behavior become like that of NFB individuals. Therefore public health interventions should be geared towards newer immigrants. An empowered person with cancer information has the ability to make informed choices regarding healthcare. Complete plans for designing methods of cancer prevention need to be tailored for the different kinds of populations that are in the country, taking into account the different culture issues and the way the information is disseminated to different vulnerable populations including immigrants from different parts of the world (Ransom, Wei, & Stellman, 2009)

5b. Strengths

The major strength of the study is the use of the HINTS data that employed a sampling scheme that is representative of the national population. The surveys are standard and there are recurring variables that make a data reliable content over time. The data set has variables that measure screening for colon, breast, and cervical cancers. These cancers have guidelines for screening that have been endorsed by the American Cancer Society.

5c. Limitations

There are some important limitations of this research. Although the 2012 (HINTS) 4, cycle 2 is a nationally representative sample, it only consisted of only 513 FB individuals making the size of the FB subsample small to come up with clear-cut population estimates. Because of the small sample size for FB individuals, it was not possible to perform the univariate and multivariate logistic regression analysis for length of stay and use of cancer screening tests. Also, it was not possible to identify the regions or countries where the FB individuals originated because that was not measured in HINTS. Since FB individuals are diverse, variation among the FB individuals could not be taken into consideration. The racial and ethnic among the respondents was not explored due to the sample size. Because 2012 HINTS data are cross sectional by design, the findings from this study cannot be used in causal terms. The essential reasons for factors that are associated with the use of cancer screening among FB individuals may be

due to other complex factors. Also prior health knowledge before immigration was not available.

5d. Implications of Findings to Public Health

The aim of this study was to compare screening rates in FB and NFB individuals, to examine factors associated with cancer screening amongst the two groups of people and to examine if length of stay in the US for FB individuals has an effect on the use of cancer screening. There was no difference in the screening rates the two groups but there were differences found within groups. FB women who believed that there was nothing you can do prevent cancer were more likely to get screened for breast cancer. Effort should be focused on women who believe otherwise to get screened for breast cancer.

This study has shown that those that have had a most recent routine medical checkup are more likely to get screened for breast and cervical cancer, it is important that public health policies that ensures that everyone has a primary health provider that sees them at least every year. This will help ensure that FB individuals are screened for cancer to lower the mortality incidence. Access to a regular health care provider is an important factor that will help increase the number of people that get will get screened for cancer. In order to successfully design cancer prevention protocols, the local communities should be assessed for their characteristics, for a possibility of providing proper interventions and resources for the different people who live the communities. Community based research permit intergroup difference amid the diverse population (Erwin et al., 2010).

For cancer information, it is crucial that it is readily available for FB individuals. This study found that FB individuals who said it took a lot of effort to get cancer information were more likely to get screened for colon cancer, even though government agencies, health organizations, and advocacy groups are dedicating a lot of efforts to publicize cancer information to people (Kreps, 2003). FB individuals face challenges when it comes to benefiting from the information (Zhao, 2010). Due to the growing number of immigrants and their aging populations in this country, there is also increasing concerns over adequate delivery of appropriate primary health care, which includes cancer screening (Venters & Gany, 2011).

5e. Recommendations for Future Research

There is need for future studies to be carried out to look at the differences in beliefs, information seeking, and healthcare factors that may exist among FB individuals taking into consideration their regions of origins. HINTS survey questions should include the country of origin to determine the region of origin. This study was not able to do that because the survey did not ask that. It would be also be beneficial to look at the characteristics of new immigrants into the US as these individuals may have differences associated with them; again this study was not able to ascertain that due to the sample size.

CONCLUSION

The results of this study revealed that there were no differences in cancer screening rates among the FB and NFB individuals, however there were different factors

within the two groups that drive whether or not cancer screening is done in these populations. These important findings are helpful to explain the different factors that can motivate individuals to get screened for cancer. Inventive and ethnically appropriate strategies are essential to increase cancer screening. Well-designed information strategies that take into account the diversity of the US population can lead to benefits such as increased cancer screening

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