Cancer Information Seeking and Awareness of Cancer Information Sources among Korean Americans

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Abstract Many Korean Americans (KAs) suffer high cancer incidence levels and have low cancer screening rates. A significant number of KAs lack adequate information about cancer screening tests. However, little is known about the health information seeking behaviors of KAs. This study examines the types of cancer information searched for, the cancer information seeking experiences, and the awareness of major cancer information sources, such as the National Cancer Institutes (NCI) and the NCI's Cancer Information Service, among KAs. It also examines associations with demographic characteristics and media use influencing variations in the awareness of cancer information sources. Data for this study were gathered with a cross-sectional, community-based survey (254 KAs). The survey results indicated that KA's involvement in cancer information seeking is relatively low, and they have somewhat negative experiences in seeking cancer information. In addition, their awareness of cancer information sources was limited. Despite of the heavy use of Korean ethnic media, it did not connect to cancer information source awareness. Rather, use of US mainstream media was significantly related with awareness. Campaigns using the Korean language through partnerships with Korean ethnic media to inform KAs about credible sources of health information appear to be warranted by our findings.

Introduction

Within the Asian Amercian population, Korean Americans (KAs) are one of the fastest growing sub-populations, with more than 1.4 million KAs living in the USA in 2000 [1]. However, little is known about the health behaviors of KAs because of the typical research practice of aggregating national health data for more than 60 Asian nationalities into one category. The aggregation of data about Asian Americans masks potential differences regarding health beliefs, behavior, and needs among the many unique ethnic/cultural groups classified as Asian/Pacific Islanders.

While heart disease is the leading cause of death in all other racial groups in the USA, cancer is the number one cause of death in Asian Americans [2]. Cancer has also been found to be the leading cause of death for KAs [3]. Many KAs suffer high cancer incidence and have low cancer screening rates [4, 5]. As significant examples, KA men experience the highest rate of stomach cancer of all ethnic groups and have experienced a fivefold increased rate of stomach cancer over White American men [6, 7]. The incidence of gallbladder cancer is high among KAs. Gallbladder cancer incidence for KA men was 3.1 times higher than blacks and 2.9 times higher than whites. Gallbladder cancer incidence for KA women was 2.1 times higher than blacks and 1.9 times higher than whites [8]. A study conducted in Los Angeles County estimated that KAs

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had higher incidence and mortality rates from liver cancer than all the other groups. In addition, the incidence rates for current and past hepatitis B virus (HBV) infections is ten times higher for the Korean American population than for the general US population. An estimated 80–85% of liver cancer incidence is related to HBV infection. Chronic HBV infection carries a risk of liver cancer 200 times more than for those who are not infected with HBV [9].

Especially problematic is the fact that breast cancer is likely to be detected at a later stage in Asian American women than for white women [10, 11]. Data from the National Cancer Institute's Surveillance, Epidemiology and End Results Program [7] indicate that Korean-American (KA) women were 60% more likely than non-Hispanic white women to have tumors ≥1 cm at diagnosis. In addition, the breast cancer death rate of Asian women is steadily increasing, while the rate for other ethnic groups is decreasing [2].

KAs' cancer incidence rate is considerably higher even compared to native Koreans living in Korea. For instance, colon cancer was 56% higher among KA men than native Korean counterparts. Prostate cancer was also 3.5 times higher among KAs compared with their native counterparts. For women, cancer incidence rates for all sites combined were comparable between the two Korean populations. Among women, cancer incidence rates for colon, lung, breast, endometrium, ovary, melanoma of the skin, and connective/soft tissue were higher in KA females than native Koreans [6].

However, a significant number of KAs lack adequate information about cancer screening tests. For example, many KAs have never heard of the Pap smear test [4], although cervical cancer is a significant health problem for KA women [5]. Among those Korean women over age 50, only 41% have received Pap smear tests within the past 2 years, which is the recommended time interval [12]. This lack of information connects to less involvement in cancer screening. For instance, among Korean women age between 40 and 80, the past mammography participation rate was 51% reported, which was not only considerably lower than the rate of >88% reported in the general population but also lower than the rate found for other ethnic minority women, including Chinese (64%), Filipino (66%), and Vietnamese (69%) women [13]. Although colorectal cancer is the second most commonly diagnosed cancer for Korean men and women [14], only 12% of KAs reported having a digital rectal exam, only 10% have had a fecal occult blood test, and only 38% of Korean women have received adequate and timely colorectal cancer screening tests [12]. Additionally, in a survey of KA women age over 50 living in Los Angeles, only 38% reported having had either a blood stool test within the past 12 months or colonoscopy or sigmoidoscopy in the past 5 years [12].

While there have been many previous studies of the knowledge, attitudes, and practices surrounding cancer screening in many different ethnicities, there is little clarity about the unequal access to health and cancer information for KAs. Particularly, little is known about how KAs obtain cancer knowledge because few studies have examined cancer-related information sources, information-seeking behaviors, and information preferences of the Korean population. Evidence shows that comprehension of cancer-related information, such as cancer screening can lead to improved health promotion interventions [15].

Health information seeking involves purposeful acquisition of information from selected information channels to guide health-related decision making [16]. Consumer access to relevant health information is a critical factor in responding effectively to serious health challenges, such as cancer [17]. The comprehensive model of information seeking (CMIS) is a conceptual model that guides this study by linking antecedent factors and information carrier factors with health information seeking actions [18]. Antecedent factors include demographics, direct experience, salience, and health beliefs. These antecedent factors influence the need for information and information channel preferences. Information carrier factors relate to channel selection, either interpersonal or mediated channels, and channel usage. For instance, a previous study applying the CMIS on online cancer information seeking found that patients' characteristics, such as income, education, gender, and information-seeking competence, are related with the patterns of online cancer information seeking [19].

Although the National Cancer Institute conducts the important Health Information National Trends Survey (HINTS) every 2 years about the cancer information seeking behaviors of the American public with population-based national samples (total sample sizes typically exceeds 6,000 respondents), the size of the Asian sub-sample in the surveys is relatively small (typically around 100 Asian respondents). For example, the Asian sub-sample in the 2002 HINTS study ($n=119$) was too small to analyze by different Asian subgroups to identify disparities that may be masked. Furthermore, the HINTS data were collected in only English and Spanish languages, so non-native Asian speakers were not included in this survey [20]. Since non-English speaking Asian immigrants are likely to experience difficulty accessing relevant health information, it is imperative that research be conducted to study cancer information seeking and utilization with these vulnerable groups.

Kreps and Finney Rutten [21] have called for supplemental research to expand the HINTS dataset by surveying at-risk populations who are not well represented in the original HINTS research program. They argue that supplemental studies with at-risk populations can increase the external generalizability of HINTS data and inform the development of evidence-based health communication

interventions to improve cancer outcomes for vulnerable groups. The study reported here takes on this challenge to supplement HINTS data by translating HINTS into Korean language and applying to KA population.

It is very challenging for consumers to find credible cancer information to guide their decisions about cancer prevention, control, and care [22]. This is especially difficult for many immigrant populations who face significant language, culture, and health literacy constraints [23]. Major national cancer information sources, such as the NCI's Cancer.gov website and the Cancer Information Service (CIS) have been developed to help the public obtain the most accurate, state-of-the-art, and scientifically credible information about cancer prevention, screening, and advances in cancer treatment [24]. Before consumers can utilize these credible cancer information sources, however, they first must be aware they exist.

KAs are known for the heavy use of Korean ethnic media, such as Korean community newspapers, satellite TV, imported videotapes, and websites. KAs are heavily depending on ethnic Korean media than US mainstream media in order to receive or exchange information [25]. In the US mainstream media, the description of cancer as a preventable and curable disease has been dominant and resources for further information, such as NCI and CIS, have been promoted [26]. In Korean ethnic media, overall cancer coverage and articles about cancer organizations, which are potential cancer information sources, were lower than US mainstream media [27]. Thus, it is important to separate KA's media use in US mainstream and ethnic Korean media to examine each media type' influences on the cancer information source awareness as well as to provide better implications on cancer intervention through media.

This study therefore aims to examine (1) the types of cancer information searched for, the cancer information seeking experiences, and the awareness of major cancer information sources, such as the National Cancer Institutes (NCI) and the NCI's CIS, and (2) associations with demographic characteristics and media use influencing variations in the awareness of cancer information sources among KAs.

Methods

Study Setting and Sampling Method

Data for this study were gathered with a cross-sectional, community-based survey designed to assess the health and cancer information needs, utilization, and source preferences among KAs. The survey was conducted in the Washington, DC, usa metropolitan area during 2006 and 2007. It was administered to KA men and women ages 40 years or older. The reason for selecting this aged population is based on The American Cancer Society guidelines regarding screening for early detection of several cancers. According to the guidelines, women begin screening for breast cancer at age 40 and cervical cancer within 3 years of first having sexual intercourse but no later than 21. Women and men should begin screening for colorectal cancer at age 50. Men should begin screening for prostate cancer between 40 and 50 based on family history or other risk factors. Most cancer screenings are recommended to begin at age 40–50. Therefore, the sample we selected included KAs aged 40 and over.

All Korean churches, senior resource centers, and community-based organizations that had more than 100 members were approached as convenient and culturally acceptable data collection sites. Research has shown that 78% of KAs were Christian and 63% participated in religious activities at least once a month, suggesting that churches were good sites for recruiting respondents [28]. Bilingual researchers contacted the heads of the potential project sites by telephone and collected information about the number of KA members who might participate in the survey. After telephone contact was established and member numbers were found to be over 100, the researchers explained the purpose of the study and asked the head of the group or organization to approve researcher contact with potential participants in their sites. The yellow book telephone directory made by the local Washington, DC, USA Korean community was used to find the contact information for the list of the churches, senior resource centers, and community-based organizations. All study procedures were approved by George Mason University Human Subjects Review Board.

Design of Instrument

The original HINTS survey was carefully developed, refined, and validated to accurately represent the American public's access, understanding, preferences, and uses of cancer-related health information [29]. The HINTS instrument served as model for developing the health and cancer information trends survey for KAs (HINTS-KAs).We used the following procedure: for the linguistic translation, the instrument was translated by two independent trained bilingual (Korean–English) translators from the source language (English) into Korean, and then back-translated to check each translation. Finally, the first and second translations were compared by an expert panel whose members were a bilingual health professional faculty and two bilingual non-health care professional. We included the following variables: sex, age, marital status, education, household income, employment status, proportion of life spent in the USA, English proficiency, self-reported health

status, health insurance status, number of visits to providers in the last 12 months, and personal and family cancer history. We used these "background characteristics" variables as factors for data analysis to see how they influence awareness of cancer information sources. We included measures of types of cancer information searched and cancer information seeking experiences, as well as awareness of cancer information sources, such as the NCI, the CIS, the Cancer Control of America (CCA), 1-800-4 the cancer information number, and 1-800-ACS-2345 the cancer information number. We also included measure of media use, such as newspapers, TV, and radio both in Korean ethnic and US mainstream type and the internet.

Data Analysis

Statistical analyses were performed using the SPSS program. The proportion of life in the USA was calculated using age and years in the USA. Bivariate analyses were performed using chi-squared test of association between background characteristics-related variables and other variables including awareness of cancer information sources. Pearson's correlation was used for further bivariate analysis to examine association between cancer information resources awareness and media use. Lastly, a separate logistic regression model was built for awareness of cancer information sources, controlling for the background characteristics described earlier.

Results

Four hundred twenty-one surveys were distributed, and 254 surveys were completed. Our overall response rate was 60.3%. Ninety-eight percent of the Korean language surveys were completed. All respondents were born in Korea. Study group characteristics are described in Table 1. The majority of the respondents in this study were female (65.4%, $n=166$), 60 years of age and older (37.8%, $n=96$), and currently married (89%, $n=226$). When asked about educational level and household income, 57.9% of respondents had more than 12 years of education and 31.3% of respondents had a household income greater than or equal to $100,000. In a self-report of health status, 18.9% described having fair or poor health status ($n=48$).

Acculturation, as measured by combining the proportion of life in the USA and English proficiency, was assessed. About 21% of respondents reported spending <25% of their life in the USA, 40.6% spent 25–49% of their life in the USA, and 33.1% spent 50% or more of their life in the USA. English proficiency was categorized as very comfortable (16.9%), somewhat comfortable (24.8%), and not at all comfortable (55.1%). Only 56.7% of respondents had

any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. Of the respondents, 23.6% had not gone to a doctor, nurse, or other health care provider to get care during the past 12 months.

Respondents showed significant differences in media use between Korean ethnic and US mainstream media. Most respondents answered that they have read Korean newspapers and/or magazines in the past 7 days ($N=203$, 79.9%), whereas only half of them answered that they have read English language counterparts ($N=142$, 55.9%). A frequency of use was also higher in Korean newspaper/magazines, which was used average 4.13 days in the past week than US mainstream ($M=3.80$). For radio, the gap was smaller, but still more people answered that they have listened to Korean radio ($N=161$, 63.4%) than mainstream radio ($N=144$, 56.7%). However, of the respondents who used mainstream radio, the frequency was higher ($M=3.69$) than Korean radio ($M=3.44$). For TV, the number of users was about the same in Korean ($N=170$, 66.9%) and mainstream ($N=178$, 70.1%), but a frequency of watching Korean TV ($M=4.49$) was higher than mainstream TV ($M=4.13$). More than half of the respondents answered that they have used the internet for personal reasons (N=152, 39.1%) for an average of 4.65 days in the past 7 days.

Approximately 44.1% ($N=112$) of respondents looked for information about cancer from any source, and only 22.8% ($N=58$) had someone else help them look for information about cancer. Newspapers or magazines were a common source of information for 36.6% of respondents who sought cancer information for the first time, followed by cancer organizations, brochures, or pamphlets (34.8%), and internet (25.0%). The least common source of information on cancer was the library (3.6%).

Of those who looked for information on cancer ($n=112$), 33.0% sought information on screening, testing or early detection; 29.5% looked for information on preventing cancer (Table 2). The experiences of respondents with seeking cancer information appeared to be somewhat negative. Respondents reported taking a lot of effort to get the information needed (76.8%); 43.8%, reported feeling frustrated during their search for cancer information; 50.9% were concerned with the quality of the information they found, and 39.3% felt the information was too hard to understand (strongly or somewhat agreed ratings).

Very few respondents were aware of various sources of cancer information, such as the NCI (50% aware), the CIS (16.5%), the 1-800-4 (2.4%), the 1-800-ACS-2345 (2.0%), and CCA (7.5%) (Table 3). The awareness of overall cancer information sources was assessed in association with the media use. The frequency of non-interactive US media use, including American TV, radio, newspaper, and magazine, was significantly related with the cancer information

Table 1 Study group characteristics

Variable		N (%)
Sociodemographic		
Sex	Male	88 (34.6)
	Female	166 (65.4)
Age group	40–49	87 (34.3)
	50–59	71 (28.0)
	≥60	96 (37.8)
Marital status[a]	Currently married	226 (89.0)
	Previously or never married	25 (9.8)
Education (years)[b]	<12	26 (10.2)
	12	76 (29.9)
	>12	147(57.9)
Household income ($)[c]	<50,000	52 (22.6)
	50,000 to <100,000	106 (46.1)
	≥100,000	72 (31.3)
Main activity[d]	Employed[e]	145 (58.5)
	Unemployed[f]	103 (41.5)
Acculturation		
Proportion of life in USA (%)[g]	<25	53 (20.9)
	25–49	103 (40.6)
	≥50	84 (33.1)
English proficiency[h]	Very comfortable	43 (16.9)
	Somewhat comfortable	63 (24.8)
	Does not speak or a little or not at all comfortable	140 (55.1)
Health status		
Self-reported health status[i]	Excellent or very good	85 (33.5)
	Good	108 (42.5)
	Fair or poor	48 (18.9)
Health insurance	Yes	144 (56.7)
	No	110 (43.3)
Times visits to health care	0	60 (23.6)
	1–4	162 (63.8)
	≥5	32 (12.6)
Cancer experience		
Ever had cancer	Yes	33 (13.0)
	No	221 (87.0)
Family ever had cancer	Yes	121 (47.6)
	No	133 (52.4)

[a] Missing $n=3$
[b] Missing $n=5$
[c] Missing $n=24$
[d] Missing $n=6$
[e] Includes 'self employed'
[f] Includes 'retired'
[g] Missing $n=14$
[h] Missing $n=7$
[i] Missing $n=13$

resource awareness ($r=.55$, $p<0.05$). Meanwhile, the frequency of non-interactive Korean media use was not related with the awareness. Internet, however, showed a negative association with the awareness ($r=-26$, $p<0.05$).

As the number of respondents who are aware of the 1-800-4, the 1-800-ACS-2345, and CCA was very limited, we assessed mainly NCI and CIS in association with the demographics factors. In assessing the percentage of respondents who were aware of the NCI, we found marital status ($\chi^2=5.5$; $df=1$; $p<0.05$), education ($\chi^2=21.6$; $df=1$; $p<0.001$), household income ($\chi^2=6.6$; $df=1$; $p<0.05$), the

proportion of life in USA ($\chi^2=6.5$; $df=2$; $p<0.05$), and English proficiency ($\chi^2=8.2$; $df=2$; $p<0.05$) to be significant factors. Respondents who were married were more aware of the NCI (52.7%) compared to those who were not married (28.0%). Respondents who had more than 12 years of education were more aware of the NCI (63.3%) compared to those with <12 years of education (33.3%). Not surprisingly, respondents who spent a higher proportion of their life in the USA (60.7%) were more likely to be aware of the NCI than those who spent a lower proportion of their life in the USA (45.3%). Respondents who were very comfortable with their

Table 2 Types of cancer information
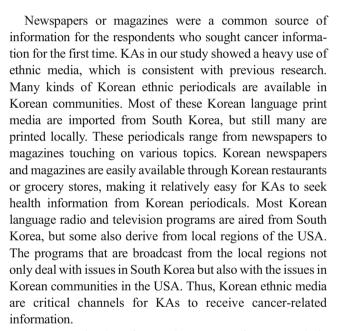
Variable	N (%)
What type of information were you looking for in your most recent search?	
Screening/testing/early detection	37 (33.0)
Prevention of cancer	33 (29.5)
Symptoms of cancer	31 (27.7)
Causes of cancer/risk factors for cancer	30 (26.8)
A specific cancer	30 (26.8)
Coping with cancer/dealing with cancer	28 (25.0)
Information on cancer in general	25 (22.3)
Treatment/cures for cancer	18 (16.1)
Prognosis/recovery from cancer	11 (9.8)
Diagnosis of cancer	10 (8.9)
Paying for medical care/insurance	7 (6.3)
Cancer organizations	6 (5.4)
Where to get medical care	6 (5.4)

Total cancer information seekers=112; multiple answers were allowed

English language skills (69.8%) were more aware of the NCI compared to those who were somewhat comfortable (44.4%) and those who were a little or not at all comfortable (46.4%). Logistic regression identified four factors associated with awareness of the NCI: sex (male, OR, 2.0; 95% CI, 1.0–3.9), the years of education completed (years, >12; OR, 2.4; 95% CI, 1.2–4.7) household income (≥ $50,000 – OR, 2.2; 95% CI, 1.0–4.9), and health insurance status (no, OR, 2.1; 95% CI, 1.0–4.1) significantly predicted the awareness of the NCI (Table 4).

There was a significant difference found between gender and English proficiency and awareness of the CIS (χ^2=7.1; df=1; $p<0.001$). Men were significantly more aware of the CIS (25.0% men) compared to women (16.5%). Those who reported being very comfortable with English proficiency were more aware of the CIS (34.9%) compared to those somewhat comfortable (14.3%), and those who do not speak or a little or not at all comfortable with English (12.1%, χ^2=12.6; df=2; $p<0.01$). Logistic regression identified four factors associated with awareness of the CIS: sex (male, OR, 2.2; 95% CI, 1.0–4.9), English proficiency (very comfortable, OR, 3.8; 95% CI, 1.5–9.2), number of times visiting health care providers (times ≥5, OR, 4.1; 95% CI, 1.0–16.7), and family cancer history (yes, OR, 2.8; 95% CI, 1.1–7.5) (Table 4).

Discussion

This study is part of the first program of research to study exposure to mass media, health and cancer information sources, and seeking preferences and experiences of KAs. It is also the first translation and application of the HINTS with KAs. As noted above, we found several interesting findings.

Newspapers or magazines were a common source of information for the respondents who sought cancer information for the first time. KAs in our study showed a heavy use of ethnic media, which is consistent with previous research. Many kinds of Korean ethnic periodicals are available in Korean communities. Most of these Korean language print media are imported from South Korea, but still many are printed locally. These periodicals range from newspapers to magazines touching on various topics. Korean newspapers and magazines are easily available through Korean restaurants or grocery stores, making it relatively easy for KAs to seek health information from Korean periodicals. Most Korean language radio and television programs are aired from South Korea, but some also derive from local regions of the USA. The programs that are broadcast from the local regions not only deal with issues in South Korea but also with the issues in Korean communities in the USA. Thus, Korean ethnic media are critical channels for KAs to receive cancer-related information.

However, despite of KAs' heavy use of Korean ethnic media, it did not connect to the awareness of cancer information sources. Rather, the use of US mainstream media highly contributed to the awareness. Each media's different tendency of reporting cancer issues may explain this result. According to a former study [27] that compared cancer coverage on Korean ethnic and US mainstream newspapers, the mainstream had a higher proportion of articles that referenced cancer and focused more on people or politics, which potentially link to cancer information sources such as NCI and CIS. Meanwhile, Korean ethnic newspaper had more articles about specific types of cancer and prevention information. Therefore, to better promote the cancer information sources, health providers should understand characteristics of cancer contents on ethnic media and develop partnerships with ethnic media.

Table 3 Percentage of respondents' awareness of the NCI and CIS

Variables		NCI	CIS
Overall levels of awareness		127 (50.0)	42 (16.5)
Sociodemographic			
Sex	Male	50 (56.8)	22 (25.0)**
	Female	77 (46.4)	20 (12.0)
Age group	40–49	50 (57.5)	12 (13.8)
	50–59	34 (47.9)	10 (14.1)
	≥60	43 (44.8)	20 (20.8)
Marital status	Currently married	119 (52.7)*	35 (15.5)
	Previously or never married	7 (28.0)	6 (24.0)
Education (years)	<12	34 (33.3)**	15 (14.7)
	>12	93 (63.3)	27 (18.4)
Household income ($)	<50,000	19 (36.5)*	8 (15.4)
	≥50,000	101 (56.7)	33 (18.5)
Main activity	Employed[1]	71 (49.0)	25 (17.2)
	Unemployed[2]	54 (52.4)	16 (15.5)
Acculturation			
Proportion of life in USA (%)	<25	24 (45.3)	7 (13.2)
	25–49	44 (42.7)*	14 (13.6)
	≥50	51 (60.7)	19 (22.6)
English Proficiency	Very comfortable	30 (69.8)	15 (34.9)
	Somewhat comfortable	28 (44.4)*	9 (14.3)**
	Does not speak or a little or not at all comfortable	65 (46.4)	17 (12.1)
Health status			
Self-reported health status	Excellent or very good	44 (51.8)	17 (20.0)
	Good	59 (54.6)	19 (17.6)
	Fair or poor	22 (45.8)	5 (10.4)
Health insurance	Yes	72 (50.0)	26 (18.1)
	No	55 (50.0)	16 (14.5)
Times visits to health care	0	30 (7.9)	6 (10.0)
	1–4	77 (47.5)	27 (16.7)
	≥5	20 (62.5)	9 (28.1)
Cancer experience			
Ever had cancer	Yes	16 (48.5)	9 (27.3)
	No	111 (50.2)	33 (14.9)
Family ever had cancer	Yes	64 (52.9)	22 (18.2)
	No	63 (47.4)	20 (15.0)

Total $n=254$; χ^2 tests were used

*$p<0.05$; **$p<0.01$

[1] includes 'self employed'; [2] includes 'retired'

Consistent with a previous study [30] conducted with a representative sample of Americans that found that screening, prevention, and risk factors for cancer were the information topics most frequently sought, we found that information about and symptoms of cancer were also frequently sought by KAs. Information about diagnosis of cancer was also one of the most frequently sought topics. According to another analysis of the NCI's HINTS full sample, approximately 47.7% of adults in the USA have ever looked for information about cancer [31]. In this study, cancer information seekers described their cancer seeking experiences in the following ways: 48.3% indicated that it took a lot of energy to find the information they needed; 41.9% felt frustrated during their search for cancer information; 58.3% were concerned about the quality of the information they found; and 37.7% thought the information they found was too hard to understand. Our

Table 4 Multivariate predictors of awareness of the NCI and CIS

Predictor		NCI		CIS	
		OR	95% CI	OR	95%CI
Sociodemographic					
Sex	Male	2.0*	1.0–3.9	2.2*	1.0–4.9
	Female	1		1	
Education (years)	<12	1			
	>12	2.4**	1.2–4.7		
Household income ($)	<50,000	1			
	≥50,000	2.2*	1.0–4.9		
English proficiency	Very comfortable			3.8**	1.5–9.2
	Somewhat comfortable			1	0.4–2.7
	Does not speak or a little or not at all comfortable			1	
Health insurance	Yes	1			
	No	2.1*	1.0–4.1		
Times visits to health care	0			1	
	1–4			2.2	0.7–7.1
	≥5			4.1*	1.0–16.7
Family ever had cancer	Yes			2.8*	1.1–7.5
	No			1	

Total n=254; logistic regression models included the "background characteristics" variables for statistical adjustment

OR Odds ratios; CI confidence interval

*p<0.05; **p<0.01

study showed similar findings with KAs: 44.1% have ever looked for cancer information; 43.8% reported feeling frustrated during their search for cancer information; 50.9% were concerned with the quality of the information they found; and 39.3% felt the information was too hard to understand. However, a higher rate of KAs (76.8%) indicated taking a lot of effort to get the information needed than the rate of the nationwide population. This finding may reflect a true difference in the difficulties KAs experience in accessing the relevant cancer information they need in comparison to the general US population. However, this difference may be moderated by the age differences between the two populations (since this study included only Korean Americans aged 40 or older, while the larger HINTS survey included all adults).

Numerous credible cancer information resources concerning cancer treatment, prevention, screening, genetics, causes, and how to cope with cancer are available, such as from the NCI's website (cancer.gov), publications, and the CIS, the American Cancer Society, and the National Library of Medicine. One of the most important nationwide programs for providing the public with relevant cancer information is the NCI's CIS [32]. For over 35 years, NCI's CIS has been providing scientifically based, unbiased information to patients, their families, physicians, and other health professionals, and the general public about all aspects of cancer. The public first must be

aware that the CIS and other credible cancer information resources exist before they can use them. Determining baseline levels of awareness of these organizations is required to determine how the KA subgroup might link to existing resources of health and cancer information. To address this issue, we examined the background characteristics of KA respondents who have and have not heard of the NCI and the CIS.

Disappointingly, relatively very few KA respondents had ever heard of the NCI (50% aware) and even fewer KAs were aware of the CIS (16.5). In comparison, 76.7% of the nationwide survey respondents had heard of the NCI, and 32.8% of those respondents indicated that they had heard of the CIS [24]. Moreover, the earlier study indicated that among racial and ethnic subgroups, non-whites, (78.2%) were more aware of the NCI than Hispanics (69.6) and African Americans (77.8%). However, Hispanics (50.7%) had the highest level of CIS awareness, followed by non-Hispanic African Americans (45.2%), non-Hispanic whites (27.9%) [24]. Compared with other ethnic subgroups, we found an extremely low level of awareness of the NCI and the CIS among KAs.

The findings of this study support previous findings and CMIS that those with the highest income group were most aware of the NCI, and as levels of educational attainment increased, the percentage of respondents who reported

being aware of the NCI increased [24]. Additionally, this study found that for Korean Americans, as both the proportion of life in USA and levels of English proficiency increased, the percentage of respondents who reported being aware of the NCI increased. We also found that KA men had higher levels of awareness of the NCI than women.

For the CIS, previous findings with a representative national US sample indicated that women had higher levels of awareness of the CIS than men [30, 33]. This study also found that as both income and education levels increased, awareness of the CIS also increased, and personal and family history of cancer were positively associated with the awareness of the CIS. However, we found that Korean American men were significantly more aware of the CIS than KA women ($p<0.01$). To the contrary, previous nationwide research studies have clearly demonstrated that men are less likely to be aware of the CIS and less likely to be cancer information seekers [30, 33]. The findings about KA males' higher levels of awareness of the NCI and the CIS may be indicative of unique cultural norms for men and women within the KA community and may suggest the need for differential communication interventions with KA men and women [23, 34]. We also found that as both income and education levels increased, awareness of the CIS increased and personal and family history of cancer were positively associated with the awareness of the CIS, although this was not enough to show statistical significance. English proficiency was found to be significantly associated with awareness of the CIS ($p<0.01$). A majority of KAs are first generation immigrants, struggling to overcome language barriers. Obviously, language barriers may hinder KAs from being aware of useful and credible cancer information resources. Campaigns using the Korean language to inform KAs about credible sources of health information appear to be warranted by our findings. Perhaps, the development of a partnership program between the CIS and KA organizations, particularly Korean ethnic media, can be established to promote greater access to relevant cancer information for this vulnerable and medically underserved population. Our research findings should encourage the NCI, the CIS, and other cancer-focused organizations to develop targeted promotional campaign for the KA subgroup to increase health and cancer information resources utilization and help reduce cancer-related health disparities for KAs.

The results of this study may provide important information about needs of KA cancer information seekers and significant factors affecting their access to major national cancer information sources. Overall, the findings clearly indicate that there is a need to develop a culturally sensitive and effective intervention to meet the KA population's cancer information needs and to increase their awareness of major national cancer information sources.

The findings about the associations of the awareness about the major national cancer information sources with demographic characteristics and factors influencing variations in the awareness of major national cancer information source through appropriate media channel can be used to guide development of culturally sensitive and effective cancer education interventions for KAs [23].

Some limitations to the present study must be noted. Despite our efforts to have a comprehensive sample, findings from the present study are limited to a specific geographic region of the USA (the Washington, DC metropolitan area) and to KAs aged 40 and over who are first-generation immigrants. Furthermore, the representativeness of our sample can also be questioned because to increase our access to this unique population of KAs, we used a convenient sample of community and religious organizations as a sampling frame for this study. We selected this sampling strategy because a majority of Korean Americans are Christian (78%) and participate in religious activities at least once a month (63%) [28]. However, it is possible that KAs who are socially isolated may be excluded from our sample. Moreover, the confidence intervals in the estimates were often wide. It was probably due to small sample size. Sampling issues can be a major challenge in studying ethnic minority populations, and the search for ways to overcome this limitation should continue.

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