Knowledge of Nasopharyngeal Carcinoma Among Hmong Populations In Central California

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Abstract

The prevalence of nasopharyngeal cancer (NPC) is high and the incidence is increasing among the Hmong community. To date, there have been few studies on NPC and other cancers in the Hmong population. The purpose of this study was to measure the knowledge of a rural Hmong community in California in regards to nasopharyngeal cancer. A questionnaire that evaluated knowledge of nasopharyngeal cancer was developed and given to 145 Hmong participants. The participants' knowledge varied with age and educational level but not with gender. Middle-aged generations had the highest level of knowledge on nasopharyngeal cancer. In contrast, low knowledge of NPC was revealed in the older generations. Participants with no school were the least knowledgeable about nasopharyngeal cancer. Those participants with the highest formal education were most knowledgeable about the disease. Hmong males and females are both knowledgeable of nasopharyngeal cancer. This study provides insights for public health practitioners regarding culturally-sensitive strategies to control the increase of NPC in Hmong populations.

Introduction

Nasopharyngeal Carcinoma (NPC) is a specific type of cancer in the upper-throat area directly behind the nasal cavities. NPC is defined by its anatomical location in the nose and throat (Vokes, Liebowitz, & Weicheslbaum, 1997). Anatomically, the nasopharynx is below the base of the skull and just above the soft palate (American Cancer Society [ACS], 2005). According to Vokes et al. (1997), the nasopharynx has an abundance of vascular supply and a lymphatic drainage system. Due to these characteristics, the route of tumor spread, symptoms, and treatment can be examined.

According to Jain, Parkash, Li, Gill, Crouch, Howe, & Tallini (2000), most tumors arising in the nasopharynx are either squamous cell carcinoma or undifferentiated carcinoma of the nasopharyngeal type. NPC arises from the epithelium lining the surface and subterranean chambers of the nasopharynx (ACS, 2005; Jain et al, 2000).

Signs and Symptoms of NPC

NPC exhibits few early warning signs. A nosebleed, stuffy nose with bloody drainage, or serious otitis media may be among the earliest clinical symptoms (Vokes et al., 1997). According to Williams & Williams (1986), other symptoms include difficulty breathing, lumps in the neck, and damage to nerves of the head and neck. However, the disease may initially grow unnoticed and spread locally to adjacent areas in the throat or invade the skull base with cranial nerve paralyses.

Treatment of NPC

The treatment options for this type of cancer depend upon a specialist's assessment of the head and neck. This assessment involves a classification of the cancer, according to the American Joint Committee on Cancer Nasopharynx Cancer Staging System (ACS, 2005). One system that doctors use to assess cancer is called the TNM system. In the TNM system, (T) stands for tumor, (N) for node, and (M) for metastasis. Doctors look for these factors to determine:

1. How large the primary tumor is and where it is located (T, tumor);
2. If the tumor has spread to the lymph nodes (N, node); and
3. If the cancer has spread (metastasized) to other parts of the body (M, metastasis).

Nasopharyngeal carcinoma can be cured if found early. Radiotherapy is the primary choice for the treatment of NPC. Surgical intervention for NPC is limited due to the complex anatomical location of the disease. However, surgery has been used to treat NPC that recurs or to remove lymph nodes in the neck (National Cancer Institute [NCI], 2002). Chemotherapy given in conjunction with radiation therapy may significantly improve survival rates of patients with NPC (Vokes et al, 1997).

Epidemiology of NPC

Cancer of the nasopharynx is not common in the United States, especially among Caucasians (Hildesheim & Levine, 1993; Vokes et al., 1997; ACS, 2005). The National Cancer Institute (2002) and Mirabelli, Hoppin, Tolbert, Herrick, Gnepp, & Brann (2000) reported that the incidence of this tumor in the United States is less than 1 in 100,000. Furthermore, there are about 11,000 new cases of nasopharyngeal carcinoma each year in the U.S. (ACS, 2005).

NPC, however, is quite unique in some geographical regions, (namely Southern China, among Eskimos of the Artic region, and those in other Southeast Asian countries) (Henderson, 2000). Furthermore, nasopharyngeal cancer is a relatively common disease in populations of Southern Chinese origin (among migrants from that geographic area and their descendants) (Hildesheim & Levine, 1993; Weuthrich, 1995). In certain Chinese provinces, rates as high as 15-30 per 100,000 population have been reported ("Salted Fish and Nasopharyngeal Carcinoma," 1989; Henderson, 2000). Her (2001) found that in Southern China, particularly Hong Kong and Guangzhou, rates of 10-150 cases per 100,000 people per year have been documented. In addition, incidences remain high for descendants of the Southern Chinese living in other countries. This suggests a

predisposition to the disease, in combination with environmental triggers (National Cancer Institute, 2002).

Studies on the Incidence of Cancer and NPC among Asian-American Populations

Cancer is a significant problem for Asian-American populations. It is the leading cause of mortality for female Asian-Americans. Cervical cancer is a priority health concern for this population, particularly for Korean-American women. Breast cancer among Japanese-American is also a relevant issue for health practitioners. An estimated 22% of Chinese women have been found to use herbal remedies as a primary treatment when diagnosed with breast cancer. Liver cancer is the third leading type of cancer among Asian-Americans. Lung cancer rates among Southeast Asians have been found to be 18% higher as compared to White-Americans (Intercultural Cancer Council [ICC], 2001).

Regarding Nasopharyngeal Carcinoma, a study done by Lu, Chen, Jin, Yang, Chan, & Tsai (2002) showed that the Taiwanese have a genetic susceptibility to nasopharyngeal carcinoma due to the presence of A2, B38 or B46 genes. Blindness has been reported with NPC but in unilateral forms only, and usually the tumor involves the optic nerve. Also, it has been associated with the use of chemotherapy.

A study done by Shambhu and Vose (2004) found a rare case of sudden onset of bilateral blindness in a patient with nasopharyngeal carcinoma. The patient made a full recovery from the visual loss, which is unusual, although a CT and MRI revealed no lesions or invasions in the eyes.

People with Epstein-Barr virus latent membrane protein1 are at an increased risk for developing nasopharyngeal carcinoma, with at least 70% of NPC patients detected

and all EBV-infected pre-invasive nasopharyngeal lesions (Murono, Inoue, Tanabe, Joab, Yoshizaki, Furukawa, & Pagano, 2001). This suggests that latent membrane protein 1 (LMP1) may play a role in the development of NPC.

Kongruttanachok, Sukdikul, Setavarin, Kerekhjanarong, Supiyaphun, Voravud, Poovorawan, & Mutirangura (2001) confirmed that cytochrome P450 2E1 (CYP2E1) was a significant risk for nasopharyngeal carcinoma in Thai and Chinese populations living in Thailand. The relative risk was 2.19 with 95% CL= 0.62-8.68. Although the CYP2E1 gene was at a high risk for NPC, the result was not statistically significant. This may have been due to the relatively small sample size (217 cases diagnosed with NPC and 297 healthy controls).

In a study conducted by Lopez-Lizarraga, Sanchez-Corona, Montoya-Fuentes, Bravo-Cuellar, Campollo-Rivas et al. (2000) in western Mexico, a significant association of human papillomavirus (HBV) subtype 31 was found with tonsillar and nasopharyngeal carcinoma. Another study conducted by Kawakami, Ito, Tanaka, and Hyo (2004) revealed Warthin's tumor was present in the nasopharynx, suggesting a relationship and predisposition to nasopharyngeal carcinoma.

NPC in Hmong Populations

Although the incidence data on nasopharyngeal carcinoma is not readily available, a study by Mills and Yang (1997) indicated that NPC is prevalent in the Hmong population of Central California. The study was conducted between 1987 and 1994. It revealed 183 newly diagnosed cancers in Hmong. The number of cancer victims included 114 females and 69 males. Nasopharyngeal carcinoma (n=11) was one of the most common cancer sites reported in the study. Interestingly, the study found the

11 cases of nasopharyngeal carcinoma to be highly statistically significant. The proportional incidence rate (PIR) and 95% confidence interval (CI) for the cancer was PIR=23.4, CI=11.7-41.4. The age-adjusted incidence rate for NPC in the Hmong was 15.6/100,000. In comparison, in the Asian/Other group and All Races combined group the incidence rates were 3.4/100,000 and 0.73/100,000 respectively. This shows that NPC is quite high in the Hmong population.

Nasopharyngeal cancer (NPC) is a distinct epidemiological, pathological, and clinical entity. Progress has been made in defining its carcinogenetic evolution and understanding its association with the Epstein-Barr virus, environmental factors, and diet. Hildessheim and Levine (1993) found that in addition to salted-fish, consumption of other preserved food has been associated with NPC. Many of these risk factors had been present in the Hmong populations with NPC.

Even though, incidence rates of NPC are not as high compared to other cancers in the Hmong community, NPC is still a major concern for this population. As stated by Mills and Yang (1997), as this population becomes more acculturated to the Western lifestyle, they ought to be closely monitored. Risk factors associated with the presence of NPC included salted fish, salted green mustard, Epstein-Barr virus, genetic (Chinese ancestry), and other viral infections. Knowledge of risk factors may increase the likelihood of the Hmong community to get screened for this disease and be treated promptly, if necessary.

Methods

The purpose of this study was to evaluate the knowledge of Hmong community members regarding nasopharyngeal carcinoma in a rural area of Central California. This study assessed knowledge levels since they are important predictors of behavioral intent to engage in cancer screening services.

Instrumentation

The instrument used in this study consisted of a survey with 26 questions, which were on a multiple-choice and yes/no/don't know scale. This instrument was originally developed by the researchers in this study based upon on a extensive review of the literature, the PI's experience in working with the Hmong community, and consultation with an epidemiologist in public health. There were three major sections as follows:

1. Participants' demographic data (seven questions): This section collected quantitative and qualitative data to describe general characteristics of the study sample. It was designed to obtain information including birthplace, gender, age, level of education, number of years in the United States, whether the participant had a primary care doctor or not, and occupation of the participant.

2. Participants' knowledge of nasopharyngeal carcinoma (eleven questions): These questions queried if the participants were aware of cancer and nasopharyngeal carcinoma, signs and symptoms, risk factors, and treatment of NPC.

3. Participants' attitudes and beliefs of nasopharyngeal carcinoma (eight questions): These questions revealed how the participants felt and their perceptions regarding personal susceptibility, disease severity, and perceived benefits regarding nasopharyngeal carcinoma. Two questions looked at perceived susceptibility, two

examined perceived benefits of the protective actions, and two addressed perceived barriers.

The instrument was designed in English and then translated in Hmong. Due to the fact that this study focused on the Hmong community's knowledge of NPC, the analysis involved data from sections one and two.

The survey was pilot tested with a sample of 12 Hmong participants who were representative of the population being considered in this study. Results were analyzed to determine the appropriateness and effectiveness of the questionnaire to yield the desired information. Assistance to those who were not able to read, write, or understand the questions was provided.

Sample

This study involved a sample of 145 Hmong participants surveyed at one clinical location and one community-based organization in a rural area of California. The sample size of 145 was derived from the software Epi-info version 6 calculations, with the known Hmong population in the selected rural population (25,000), 95% Confidence Level (CL), and a statistical power of 80%. The sample included males and females in the following categories: the younger generation (18- 30 years old), middle-aged generation (between 31-49 years old), and older generation (over 50 years old) in the Hmong community.

Data Analysis

For categorical and discrete data (gender, age, and educational level) differences in proportions were compared. Data was tested appropriately using Pearson's chi-square distribution. This method was chosen to answer questions regarding data existing in the form of frequencies rather than as scores or measurements along some scale. First, the

data for observed frequencies was arranged based on categories used for the study. Second, values for expected frequencies were computed by multiplying the column total by the row total for each cell in the table and dividing the product by the total number of subjects. The expected values were shown in parentheses. Third, in each cell, theoretical frequency was subtracted from observed frequency to obtain the deviation O – E. Fourth, each deviation was squared: (O – E)^2. Fifth, each squared deviation was divided by the theoretical frequency of each cell (where, O=Observed frequency and E= Expected frequency):

$$\frac{(O - E)^2}{E}$$

Sixth, Chi-square was determined by summing the resulting quotients. Lastly, the degrees of Freedom (df) were determined by the number of columns minus one (c – 1), multiplied by the number of rows minus one (r – 1) or df = (c – 1) * (r – 1). Tables 6, 7, and 8 show computations used to determine the association between knowledge of nasopharyngeal cancer and gender, age, and educational levels. As mentioned earlier, the numbers in parentheses are the expected values listed in the calculations.

The level of knowledge regarding nasopharyngeal carcinoma was measured according to the number of questions answered correctly and were classified into low, medium, and high ranges. Participants with low knowledge consisted of those who answered 0 to 2 questions correctly. Medium or average knowledge consisted of those participants who answered 3 to 5 questions correctly. High knowledge of nasopharyngeal carcinoma consisted of those who answered 6 to 8 questions correctly.

Responses to the survey questions were analyzed and reported in frequencies and percentage distributions. The significance level was set at .05. The Statistical Package for the Social Sciences (SPSS) was used for all statistical analyses.

Results

Demographic Data

In this study, a total of 145 participants were surveyed from April 13, 2005 to May 5, 2005. Table 1 provides characteristics of the research participants. Gender was categorized as male or female. Males and females were almost equally distributed, with females just slightly higher than males. Ages of participants included the younger generations (18-30), middle-aged generations (between 31-49), and older generations (over 50). Ages of the participants ranged from 18 to 79, with the younger generation and middle-aged generation equally distributed. Education was categorized as no school, some school (less than 6th grade), completed grammar school to high school (grade 6-12), some or completed college, to graduate or doctoral school, and other schooling. Forty percent of participants had no schooling, and 29% percent had some form of schooling.

Table 1

Basic Characteristics of Study Participants (N=145)

Characteristic	Number of Subjects	Percent
GENDER		
Male	65	44.8
Female	80	55.2
AGE IN YEARS		
18-29 (younger generation)	54	37.2
30-49 (middle-aged generation)	62	42.8
> 50 (old generation)	29	20.0
EDUCATION		
No School to < 6^{Th} Grade (Low educational attainment)	100	69.0
Completed (Grade level 6^{th}-12^{th}) (Middle or average educational attainment)	14	9.6
Some/ Completed College to Graduate/Doctoral School (High educational attainment)	29	20.0
Other	02	1.4

Measurement of Knowledge of Nasopharyngeal Cancer

Knowledge of nasopharyngeal cancer was categorized as low, medium, and high according to the number of questions participants answered correctly. It was on a point system scale from 0 to 8 and/or scored in percentages. Participants with low knowledge consisted of those who answered 0 to 2 questions correctly or scored from 0%-30%. Those participants with medium knowledge of nasopharyngeal cancer answered 3 to 5 questions correctly or scored from 31%-68%. High knowledge of NPC consisted of

those participants that answered 6 to 8 questions correctly or scored 69% or better. This scale was used in other similar studies (Mendez, 1999 & Bains, 2002) and has proven to be a reliable scale to assess knowledge.

Table 2 shows the levels of knowledge of nasopharyngeal cancer among the 145 researched participants. In total, 60.0% of participants had low knowledge of the disease. Those participants with average or medium knowledge of NPC comprised 35.2% of the study population. Participants with high knowledge of the disease included 4.8% of the study population.

Table 2

Knowledge of Nasopharyngeal Carcinoma (N=145)

Knowledge Level	Number of Participants	Percent
Low	87	60.0
Medium (Average)	51	35.2
High	07	4.8

Tests of Association for the Three Research Hypotheses

Tables 3, 4, and 5 show that knowledge of nasopharyngeal cancer varied with age, and education levels. Males and females were both equally knowledgeable about nasopharyngeal cancer. There was no association between gender and level of knowledge of NPC. Middle-aged participants had the most knowledge of

nasopharyngeal cancer than any other age group. In contrast, a lower knowledge of NPC was revealed in the older generation.

Levels of formal education were associated with knowledge of nasopharyngeal cancer. Participants with no schooling were the least knowledgeable about nasopharyngeal cancer. In comparison, participants with the highest formal education were most knowledgeable about the disease.

Table 3

Level of Knowledge About Nasopharyngeal Carcinoma by Gender, in Percentages

	Gender	
Knowledge Level	Males (n=65)	Females (n=80)
Low	60.0%	60.0%
Medium (Average)	35.4%	35.0%
High	4.6%	5.0%
Total	100%	100%

Table 4

Level of Knowledge About Nasopharyngeal Carcinoma by Age, in Percentages

	Age		
Knowledge Level	18-29 (n=54)	30-49 (n=62)	>50 (n=29)
Low	72.2%	35.5%	89.7%
Medium (Average)	24.1%	56.4%	10.3%
High	3.7%	8.1%	0.0%
Total	100%	100%	100%

Table 5

Level of Knowledge About Nasopharyngeal Carcinoma by Educational Attainment, in Percentages

Knowledge Level	Low Educational Attainment (n= 100)	Middle (Average) Ed. Attainment (n=14)	High Ed. Attain. (n=29)	Other (n=2)
Low	65.0%	50.0%	44.8%	100.0%
Medium	35.0%	35.7%	37.9%	0.0%
High	0.0%	14.3%	17.3%	0.0%
Total	100%	100%	100%	100%

The association between nasopharyngeal cancer knowledge and variables of gender, age, and educational levels were measured using the chi-square. Tables 6,7, and 8

show computations used to determine the association between knowledge of nasopharyngeal carcinoma and gender, age, and educational levels.

Results of Hypotheses Testing

There was no significant difference in knowledge of NPC among Hmong males and females. The null hypothesis was not rejected at the .05 level of significance (p=0.9940) (Table 6). There was no significant difference in the knowledge level of NPC between males and females. Table 6 shows the results of knowledge regarding nasopharyngeal cancer by gender.

Table 6

Data for Analysis of Gender and NPC Knowledge

	Males	Females	Total
Low Knowledge	39 (39)	48 (48)	87
Medium Knowledge	23 (22.9)	28 (28.1)	51
High Knowledge	3 (3.1)	4 (3.9)	7
Total	65	80	GT: 145

X^2: .01 df= 2 p (.9940) > 0.05

There was a significant difference in knowledge among the younger generations (18 to 30), the middle-aged generations (between 31 to 49), and the older generations (over 50). The null hypothesis was rejected at the .05 level of significance (p=0.0001) (Table 7). This indicated that there was an association between age and knowledge of

nasopharyngeal cancer. Low knowledge about NPC was most common in the older generation and lowest in the middle-aged generation.

Table 7

Data for Analysis of Age and NPC Knowledge

	Young (18-30)	Middle-Aged (31-49)	Old (50 and over)	Total
Low Knowledge	39 (32.4)	22 (37.2)	26 (17.4)	87
Medium (Average) Knowledge	13 (19.0)	35 (21.8)	3 (10.2)	51
High Knowledge	2 (2.6)	5 (3.0)	0 (1.4)	7
Total	54	62	29	GT: 145

X^2: 29.65 df= 4 p (0.0001) < 0.05

There was a significant difference in knowledge about NPC by educational levels in participants. The null hypothesis was rejected at the .05 level of significance (p=0.003) (Table 8). This indicated that there was an association between education and knowledge of nasopharyngeal cancer. Those with low educational attainment had the lowest knowledge about NPC, followed by those with middle or average educational attainment. Participants with high educational attainment had a significantly higher knowledge level of NPC.

Low educational attainment was defined in this study as having no schooling, some schooling, or less than the 6th grade; middle or average educational attainment was

defined as having completed grades 6-12; and high educational attainment was defined as having some college or completed college to graduate or doctoral school, and other schooling. Table 8 shows the results regarding educational attainment.

Table 8

Educational Attainment and NPC Knowledge

Knowledge Level	Low Educat. Attainment	Middle Educ. Attain.	High Edu. Attainment	Other	Total
Low	65(60.0)	7(8.4)	13(17.4)	2(1.2)	87
Medium	35(35.2)	5(4.9)	11(10.2)	0(1.0)	51
High	0(4.8)	2(1.0)	5(1.4)	0(0.1)	7
Total	100	14	29	2	GT: 145

X^2: 19.84 df= 6 p(0.003)<0.05

Discussion

Hypothesis 1 stated that there is no significant difference in the knowledge of nasopharyngeal carcinoma among Hmong males and females. Data failed to reject the null hypothesis at the 0.05 level of significance (p=0.9940). Therefore, it was interpreted that Hmong males and females could both equally knowledgeable about nasopharyngeal cancer.

In all three knowledge levels (low, medium or average, and high), both Hmong males and females' knowledge of nasopharyngeal cancer were identical. Both scored 60% on lower knowledge, 35.4% and 35% on medium or average knowledge, and 4.6% and 5% on higher knowledge.

This study found that Hmong men and women had similar knowledge levels of nasopharyngeal cancer. These findings are congruent with data presented at the Asian and Pacific Islander American Health Forum (2002) that associated Hmong deaths with knowledge of the disease. The equality of knowledge found in this study may be due to education for both sexes. Since their migration from Laos, both Hmong males and females have had the opportunity for formal education in Thailand, the United States, and different countries all around the world (Chan, 1991).

Hypothesis 2 stated that there would be no significant difference in the knowledge of nasopharyngeal carcinoma among the younger generation (18 to 30 years old), the middle-aged generation (between 31 to 49 years old), and the older generation (over 50 years old) in the Hmong community. Results of this study indicated that there was a significant difference in knowledge among the younger generation (18 to 30), the middle-aged generation (between 31 to 49), and the older generation (over 50). The null hypothesis was rejected at the .05 level of significance ($p=0.0001$). This indicated that there was an association among age and knowledge of nasopharyngeal cancer. Lower knowledge was most common in the older generation (89%) and lowest in the middle-aged generation (35%). This may be true because most Hmong populations do not have formal education, especially among women and the older generation. Yang, Mills, & Riordan (2004) indicated that 18% of the Hmong in California have a high school education, and about 44% have less than a ninth grade education.

This study found that there were differences in knowledge between the younger, middle-aged, and older generations. Overall, the present study found that the older generation had a lower knowledge of NPC. Lower knowledge in this study may be due

to a lack of formal education and awareness of cancer. This may be related to the fact that Hmong participants may have not known about cancer before they came to the U.S. Also, most Hmong people did not go to school, but farmed back in Laos and Thailand. Therefore, most Hmong were from rural areas and had little or no formal education (Hu, 1999).

Hypothesis 3 stated that there would be no significant difference in the knowledge of nasopharyngeal carcinoma and education levels of participants: (no schooling, some schooling [less than the 6^{th} grade], completed grammar school to high school [grade 6-12], some college or completed college to graduate or doctoral school, and other schooling). The results of this study indicated that there was a significant difference in knowledge regarding NPC and the education levels of the participants. The null hypothesis was rejected at the .05 level of significance ($p=0.003$). This indicated that there was an association between education and knowledge of nasopharyngeal cancer.

This study found that there were differences in knowledge and education levels. The higher the educational attainment of the participants, the higher was their knowledge of NPC. A study by Mendez (1999) found that levels of education among study participants were highly associated with knowledge and attitudes concerning cancer. Mendez indicated that women with the least education possessed the least knowledgeable of all items in their survey, and they had the most fear of cancer. The study described here found that levels of formal education were associated with corresponding knowledge regarding nasopharyngeal cancer. Participants with no schooling were the least knowledgeable about nasopharyngeal cancer. In comparison, participants with the highest levels of formal education were the most knowledgeable about the disease.

A study by Davis, Williams, Marin, Parker, & Glass (2002) indicated that people with low literacy had low knowledge of cancer. They also stated that people with high literacy were able to understand and get information more quickly regarding cancer than those with low levels of literacy. It may be true that people who are more educated and/or have more formal education are more knowledgeable about cancer. They have better knowledge because they can read at a higher level. They can understand difficult words such as those used in health terminology. Through this study the principal investigator found that most in the elderly or older generation were not able to read or write.

Implications for Health Practitioners working with Hmong Communities

During this study, the researchers attempted to increase knowledge and awareness regarding nasopharyngeal cancer in the Hmong community. During the interviews, a large number of participants indicated that they were interested in an education with free screening for NPC and other cancers. The researchers recommended actions be taken to educate and increase health care access to this unique population. Furthermore, health clinicians and educators should closely monitor the incidence, prevalence, mortality, morbidity, and quality of life of the study population.

Increasing knowledge levels regarding NPC among the Hmong in the Central Valley of California is the first step toward a higher level of awareness and action. Public health practitioners ought to consider NPC as a public health concern of major importance to the Hmong community in this rural area of California.

Furthermore, this study focused on the knowledge of nasopharyngeal in the Hmong community. The researchers recommend prospective investigators concentrate

on the assessment of health beliefs and attitudes among the Hmong, through theoretical models such as the Health Belief Model, the Theory of Reasoned Action, and the Theory of Planned Behavior. These models and theories are concerned with people's beliefs, attitudes, intentions, perceptions, and behaviors (Glanz, Lewis, & Rimer, 1997). These theories could help future researchers better understand why the Hmong may seek health care later than do other populations and how health literacy will influence disease prevention and treatment choices regarding NPC.

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