

MINI-REVIEW

Colorectal Cancer Screening among Asian Americans

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Abstract

Objectives: Colorectal cancer (CRC) is the most commonly diagnosed cancer for all US populations including Asian Americans. CRC screening has considerable benefits to prevent CRC and reduce mortality. The purpose of this article was to review the published literature on rates of colorectal cancer screening and factors associated with colorectal cancer screening practice among Asian Americans. **Methods:** Through searching electronic reference databases from 2000 to 2013, 30 articles were found on Chinese, Filipino, Japanese, Korean, and Vietnamese Americans. **Findings:** Asian Americans had significantly low rates for CRC screening; Korean Americans reported the lowest rates, while higher screening rates were found among Japanese Americans. Older age, longer length of stay in the US, and having a physician's recommendation were the most common facilitators to receiving screening. The common inhibiting factors were financial issues, employment status, and worries/fears about the procedure. **Conclusions:** Despite a number of Asian Americans being vulnerable to CRC, individual Asian subgroups were underserved with CRC screening and intervention. Further studies should focus on each individual Asian subgroup and culturally proficient CRC screening intervention programs should be developed for each.

Keywords: Colorectal cancer screening - review - Asian Americans

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Introduction

Asian Americans represent a considerable minority population and are one of the fastest growing racial/ethnic groups in the United States (US) (Hoeffel et al., 2012). According to the 2010 US Census data, Asian Americans comprise about 4.8% of the US total population alone, while populations who are Asian combined with at least one other race make up roughly 5.6%. Asian Americans represent any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent (Hoeffel et al., 2012). The demographics of Asian Americans define a heterogeneous group with multiple ethnic subgroups (Sadler et al., 2003), but the diversity of each subgroup is often disregarded in national data considering 'Asians' or 'Asian Americans.' While Asian ethnicities have some commonalities across culture and history by their geographical approach, differences among individual subgroups are obvious.

Cancer is now identified as the second leading cause of death among Asian Americans and Pacific Islanders [Centers for Disease Control and Prevention (CDC), 2013]. Colorectal cancer (CRC) is one of most commonly diagnosed cancers for all US populations including Asian Americans and is the third leading cause of cancer-related deaths (CDC, 2013).

CRC mortality can be reduced by detecting both precancerous polyps and cancers early through appropriate screening; the American Cancer Society (ACS) (2013)

recommended for individuals age 50 years and older to have an annual fecal occult blood test (FOBT) with sigmoidoscopy every 5 years or colonoscopy every 10 years. The Healthy People 2020 Objectives for CRC screening aim to increase to at least 70.5% the proportion of people age 50 and older (Healthy People, 2013). Also, the recommended screening of all men and women aged 50 years or older could reduce the mortality of CRC by 15-59% (Selby et al., 1992; US Preventive Services Task Force, 2008; Maxwell and Crespi, 2009). However, only 43% of the US general population aged 50 years and over showed having had sigmoidoscopy or colonoscopy with the guidelines (ACS, 2008).

Racial and ethnic disparities in cancer screening are distinguished individually among Asian Americans (Kagawa-Singer and Pourat, 2000; Maxwell et al., 2000; Bastani et al., 2001; Benard et al., 2001; Walsh et al., 2004; Ward et al., 2004). Although the benefits of these screenings are enough to decrease prevalence and incidence of CRC, CRC screening rates are low in the general US population and Asian Americans have even lower rates than other ethnic groups (Rex et al., 2000; Ioannou et al., 2003; Ma et al., 2012). Thus, this study will explore the individual determinates of racial disparities in screening utilization.

The purpose of this article was to review the published literature on factors associated with colorectal cancer screening practice among Chinese, Filipino, Japanese, Korean, and Vietnamese Americans. Specifically, the

review addressed the rates of colorectal cancer screening among Chinese, Filipino, Japanese, Korean, and Vietnamese Asian subgroups; identified determinants of colorectal cancer screening; identified common facilitators and barriers to cancer screening; and reviewed interventions to increase adherence to colorectal cancer screening among these five Asian subgroups.

Materials and Methods

An initial systematic literature review was conducted by searching electronic reference databases, including MEDLINE/PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) for research studies written in English from 2000 to 2013. The subsequent searching terms were cited in the online index independently or combined with one another: Asian Americans (Chinese, Filipino, Japanese, Korean, and Vietnamese), colorectal, and cancer screening. Tutorials and editorials were excluded. The additional articles were searched by reviewing Google scholar and citation tracking.

The title of all publications that were related with the subsequent searching terms resulted in 165. All abstracts of the references were hand-searched by relevance to the study questions or purpose, resulting in 38. To prevent conflicting individual data and to increase trustworthiness, the quality of gathering data were individually evaluated by the Research Appraisal Checklist (RAC) (Duffy, 2001). The RAC includes 51 items in eight categories: title, abstract, problem, literature review, methodology, data analysis, discussion, and format and style. In the evaluating process of RAC, 30 articles were produced.

The articles were sorted by research methodologies: 24 non-intervention studies, five intervention studies, and one qualitative study. Also, of the 30 articles examined, nine focused on Chinese Americans, three on Filipino Americans, four on Japanese Americans, three on Korean Americans, two on Vietnamese Americans, eight on combined Asian Americans, and one on both Korean and Filipino Americans; presented in Table 1. Five intervention studies focused on each one of Chinese, Filipino, Japanese, Korean, and combined Asian Americans; four community-based intervention studies and one clinic based study.

Findings

The most studies counted Chinese Americans, followed by Korean and Vietnamese Americans, and then Filipino and Japanese. Other Asian subgroups were South Asians, Cambodians, and Pacific Islanders. The most common CRC screening in the literature was FOBT, followed by sigmoidoscopy, colonoscopy, and one study embraced digital rectal examination (DRE) with FOBT (Yu et al., 2001).

Asian Americans had significantly lower rates in having CRC screening compared with non-Latino whites (Wong et al., 2005; Kandula et al., 2006; Maxwell and Crespi, 2009; Lee et al., 2011) and African Americans (Maxwell and Crespi, 2009); however, they were slightly higher than Latinos (Maxwell and Crespi, 2009).

Chinese Americans

From 8-65% of Chinese Americans reported having had FOBT in the past year (Yu et al., 2001; Tang et al., 2001; Sun et al., 2004; Teng et al., 2006; Yip et al., 2006; Kim et al., 2012), 3-97% reported having sigmoidoscopy in the past 5 years (Tang et al., 2001; 2006; Sun et al., 2004; Yip et al., 2006), and 21-49% having colonoscopy in the past 10 years (Teng et al., 2006; Yip et al., 2006). The rates for having digital rectal examination (DRE) were 12% for men and 17% for women (Yu et al., 2001).

Almost three times more Chinese Americans had used FOBT or DRC screening than the participants of the National Health Interview Survey (NHIS) (National Institutes of Health, 1987) and about two times more in the FOBT or DRE knowledge than the NHIS group in both men and women (Yu et al., 2001). Education and the usual source of health care were significantly associated with knowledge about DRE, and age and education were significantly associated with knowledge about FOBT (Yu et al., 2001).

An intervention study focused on Chinese Americans included an intervention group of 105 participants and a control group of 105, and the intervention included a CRC screening motivational video, pamphlet, and a FOBT kit (Tu et al., 2006). Prior the intervention, there was no difference in FOBT screening between the intervention and the control groups, but the intervention program had a strong effect on receiving FOBT screening, 70% of intervention patients and 28% of control patients. There was no effect of age, gender, language, or prior FOBT on having FOBT screening.

In an intervention study of Wu et al. (2010), the CRC educational program was focused on 304 Asian Americans (Asian Indian, Chinese, Filipino, Hmong, Japanese, Korean, and Vietnamese) based on churches, temples, and civic organizations. The intervention program consisted of educational seminars on early detection of CRC and educational brochures about CRC. The intervention program significantly increased the knowledge and attitudes about the importance of CRC screening. Before the program, 37% had ever been screened with any CRC screening tests, but in the 6 and 12 month follow up, the rate of having ever been screened in the last 12 months increased by 78%. The most common barriers for CRC screening in the past 12 months of Asian Americans were the cultural tradition of not seeing a doctor until sick and no insurance, followed by perceived lack of need, language barrier, and lack of knowledge.

Filipino Americans

From 16-30% of Filipino Americans reported having ever had FOBT and 18-31% having ever had endoscopy (Maxwell et al., 2000; 2008) and 29% having had FOBT in the past year and 36% of sigmoidoscopy and 42% of colonoscopy in the study of Ferrer et al. (2011).

The distinguished difference between those who had had FOBT and those who had had an endoscopy were showed by the length of stay in the US, English use, and income (Maxwell et al., 2008). The length of stay in the US was significantly associated with CRC screening adherence (Ferrer et al., 2010). Older Korean American

Table 1. Colorectal Cancer Screening Studies among Asian Americans

Non-Intervention Study		N	Participants	Type of Screening*	Variables
Author(s) (Year)					
Chinese Americans					
Kim et al. (2012)	Aged 50 years and over in Chicago	113		FOBT	Predictors
Sun et al. (2004)	Aged 50 and over in New York	203		FOBT, SIG	Predictors
Tang et al. (2001)	Women aged 60 years and older in two major cities on the East Coast	100		FOBT, SIG	Predictors
Teng et al. (2006)	FOBT- 50 years and over/SIG- 55 years and over/COL- 60 years and over	123 ^a /87 ^b /59 ^c		FOBT, SIG, COL	Predictors
Wang et al. (2006)	Women Aged 50 years and over in Washington, DC	433		FOBT, SIG, COL	Predictors
Yip et al. (2006)	Aged 50 years and over in Seattle	383		FOBT, SIG, COL	Predictors
Yu et al. (2001)	Aged 40-69 years in Chicago	644		FOBT, DRE	Knowledge and use of CRS; Compared with NHIS
Filipino Americans					
Ferrer et al. (2011)	Aged 50 years and older in Los Angeles	117		FOBT, SIG, COL	Predictors; pilot study
Maxwell et al. (2008)	Age 50-75 in Los Angeles	487		FOBT, ENDO	predictors
Japanese Americans					
Honda (2004)	Aged 30 years and over in Massachusetts, New Jersey, Illinois, and Washington	305		FOBT, ENDO	predictors
Honda & Gorin (2005)	Aged 30 years and over in Illinois, Massachusetts, New Jersey, and Washington	305			CRC knowledge; path analysis
Honda & Kagawa-Singer (2006)	Aged 50 and over in the Greater New York region	341		FOBT, SIG, COL	Structural equation modeling
Korean Americans					
Maxwell et al. (2000)	Woman, Aged 50 years and older in Los Angeles	218 ^d /229 ^e		FOBT, ENDO	Breast, cervix, colorectal cancer; Predictors
Vietnamese Americans					
Nguyen (2008)	Aged 50-74 in the Alameda and Santa Clara countries, California and Harris Country, Texas	867		FOBT, SIG, COL	Knowledge, attitudes; predictors
Walsh et al. (2004)	Aged 50-79 in San Jose, California	239		FOBT, SIG, COL	Compared with Latino and white Americans; Knowledge, attitudes, beliefs; predictors
Asian Americans					
Kandula et al (2006)	Aged 18 years and over in California	4938 ^f		FOBT, SIG	Compared with white/ pap smear, mammography
Lee et al (2011)	Aged 50 years and over in California	52491 ^g			Trend 2001, 2003, 2005; Predictors
Ma et al. (2012)	Aged 50 years and over in the greater Philadelphia, New Jersey, New York	815 ^h			Predictors; Barriers
Maxwell & Crespi (2009)	Aged 50 years and over	ⁱ		FOBT, SIG	Trend 2001, 2003, 2005 Compared with white, black, Latino
Maxwell et al. (2010)	Aged 50 years and over in California	4188 ^j		FOBT, ENDO	Trend 2001, 2003, 2005; Predictors
Ponce et al. (2005)	Aged 40-80 in California	396 ^k		FOBT, SIG, COL	Compared with white; Predictors
Wong et al. (2005)	Aged 50 years and over in California	1771 ^l		FOBT, ENDO	Compared with white; Predictors

Table 1 (continue). Colorectal Cancer Screening Studies among Asian Americans

Non-Intervention Study		N	Participants	Type of Screening*	Variables
Author(s) (Year)					
Qualitative Study					
Choe et al. (2006)		30 ⁿ	Aged 50-79 in Seattle, Washington	Semi-structured qualitative interviews	
Intervention Studies					
Authors (Year)	Participants	Research Method	Intervention		
Lau et al. (2013)	19 ⁿ	Exploratory study; randomized	Community based participatory study	Knowledge/attitudes, screening intent/behavior	
Ma et al. (2009)	167 ^o	2 group Quasi-experimental design with baseline, post-intervention, a 12 month follow-up	Community based participatory research approach	Knowledge, health beliefs, barriers	
Ma et al. (2009)	167 ^o	2 group Quasi-experimental design with baseline, post-intervention, a 12 month follow-up	Community based participatory research approach	Knowledge, health beliefs, barriers	
Maxwell et al. (2010)	548 ^a	3 group randomized trial with baseline and 6 month follow-up	Community based trials	Screening	
Tu et al. (2006)	- ^r	2 group randomized controlled trial; pre-, 6 and 12 months	Clinic based; multifaceted intervention	Predictors	
Wu et al. (2010)	304 ^s		Evidence based educational intervention	Knowledge, barriers	

*Data for only colorectal cancer: ⁿFOBT; ^oSIG; ^aCOL; ^rFilipino; ^sKorean; ^cChinese, Filipino, Korean, Vietnamese, other Asian; ^dChinese, Filipino, Korean, Vietnamese, Japanese, S. Asian, Pacific Islander; ^eCambodian, Vietnamese, Korean, Chinese; ^fChinese, Filipino, Korean, Vietnamese, Japanese, Korean, Vietnamese, Japanese, S. Asian, Pacific Islander; ^gAsian American and Pacific Islander; ^hChinese, Filipino, S. Asian, Japanese, Korean, Vietnamese; ⁱChinese; ^jJapanese parent (aged 50-85) and offspring (over 18) dyads in Chicago; ^kKorean 50 years or older; ^lKorean 50 years or older; ^mFilipino aged 50-70; ⁿChinese patient aged 50-78 in Seattle, Washington; ^oAsian Indian, Chinese, Filipino, Hmong, Japanese, Korean, Vietnamese over 50 years in Michigan. FOBT: Fecal Occult Blood Test; SIG: Sigmoidoscopy; COL: Colonoscopy; DRE: Digital Rectal Examination

women were less likely to be adherent to CRC screening than older Filipino American women. Age was an independent predictor for CRC among Filipino American women, but not Korean American women (Maxwell et al., 2000).

The intervention study with a three group randomized trial included 906 Filipino Americans based on organizations and churches (Maxwell et al., 2010b). The first intervention group of 202 Filipino Americans received small group CRC education sessions and a free FOBT kit; but the second intervention group of 183 received the same CRC education sessions without a FOBT kit. Small group education sessions focused on promoting physical activity were for the control group of 163 Filipino Americans.

Before intervention, the rates of CRC screening were not significantly different in the three groups, but after intervention in six months' follow-up, the rates were significantly increased to 30% for the intervention group with a free FOBT kit, 25% for the group without a kit, and 9% for the control group.

Japanese Americans

Japanese Americans had 37% having FOBT in the past 2 years (Honda, 2004) and 33-52% having ever had FOBT (Wong et al., 2005; Honda and Kagawa-Singer, 2006; Maxwell and Crespi, 2009). Twenty-six percent reported having undergone a sigmoidoscopy/ colonoscopy in the past 5 years (Honda, 2004) and 7% having sigmoidoscopy in the past 5 years and 23% having colonoscopy in the past 10 years (Honda and Kagawa-Singer, 2006).

Japanese Americans had the highest rate of having CRC screenings compared to other Asian subgroups (Wong et al., 2005; Maxwell et al., 2010a; Lee et al., 2011), which are similar rates to non-Latino whites (Wong et al., 2005).

CRC knowledge of Japanese Americans was positively associated with age, family history of CRC, English spoken, perceived susceptibility, and physician recommendation; however, it was negatively associated with fear and embarrassment (Honda and Gorin, 2005). Income, regular access, family/friend subjective norms, provider-patient communication, perceived benefits, and emotional friends' support had significant impacts on CRC screening adherence; age, gender, and emotional family support had indirect impacts on screening adherence via family and friends' subjective norms (Honda and Kagawa-Singer, 2006).

A family and community based intervention study included 19 Japanese parents and their offspring dyads (Lau et al., 2013). The intervention consisted of two educational pamphlets; one was for the general population and the other was for targeting Asian Americans. Knowledge about CRC risk factors and guidelines in Japanese Americans were improved after intervention, but attitudes about colonoscopy were not improved. Only one parent received CRC screening, four scheduled screenings, and five intended to get screened within the next month. The most common

barrier of having CRC screening in Japanese American families was lack of time, followed by lack of physician recommendation, and then current health status, no health problems, and worry about test preparation.

Korean Americans

Korean Americans who reported having ever had FOBT was 18%, and 5-14% had FOBT in the past year, 11% having ever had sigmoidoscopy and 11% having within the past 5 years, and 8% having colonoscopy within the past 5 years (Maxwell et al., 2000; Juon et al., 2003; Jo et al., 2008). Those having a history of bloody stool were more likely to have had FOBT than their counterparts (Juon et al., 2003).

Koreans had the lowest rate of having CRC screening among Asian subgroups (Kandula et al., 2006; Wong et al., 2005; Maxwell and Crespi, 2009; Maxwell et al., 2010a; Lee et al., 2011). In the trend from 2001 to 2005, the rate of endoscopy in all Asian groups was increased from 42-52%, but only Korean Americans decreased from 37-30%; the rate of FOBT in Asian groups decreased by 2% from 38-36% and Korean Americans were the biggest decrease by 20% from 24-4% (Maxwell and Crespi, 2009). This is consistent in the study of Lee et al. (2011), all Asian subgroups showed increasing rates in CRC screening except Korean Americans.

An intervention study focused on 167 Korean Americans aged 50 years and older based on six Korean ethnic churches (Ma et al., 2009). This study designated two group quasi-experimental design with pre-, immediately post, and a 12 month follow-up. The 84 intervention participants received small group education sessions focused on colorectal cancer and the 83 control group also received small group education sessions focused on general health care, primary prevention issues, and screening for various diseases.

There were significant differences in the change in knowledge about CRC risk factors and guidelines between the intervention group and the control group, and the knowledge was significantly increased after the intervention program. Health belief and barriers were significantly improved across the pre-post intervention. Also, the rates of having had a CRC cancer screening test from the previous year of the study to after 12 months post intervention were significantly increased in the intervention group from 10-77.4% compared to in the control group from 10-10.8%.

Vietnamese Americans

Two studies focused on only Vietnamese Americans and six studies focused on them with other Asian subgroups. The rates of having ever had FOBT were from 29-67% (Walsh et al., 2004; Wong et al., 2005; Maxwell and Crespi, 2009), rates of sigmoidoscopy were 20% and 25%, rates of colonoscopy were 23% and 26%, and rates of any colon screening test were 62% and 74% (Walsh et al., 2004; Nguyen, 2008).

The study of Walsh et al. (2004) was to identify CRC screening practice through comparison study in Vietnamese Americans, Latinos, and non-Latino white populations. Vietnamese Americans were generally lower

in screening rates than whites and Latinos. Interestingly, more Vietnamese Americans (31%) significantly reported than whites (19%) or Latinos (18%) having FOBT in the past year. However, Vietnamese Americans (18% and 22%, sigmoidoscopy and colonoscopy, respectively) responded significantly lower in having received sigmoidoscopy in the past 5 years and colonoscopy in the past 10 years than whites (36% and 31%) and Latinos (29% and 27%). For the rates of any CRC screening (FOBT in the past year or sigmoidoscopy in past 5 years or colonoscopy in past 10 years), there was no significant difference among whites (42%), Latinos (37%), and Vietnamese Americans (45%).

According to the intention to be screened from the same study, Vietnamese Americans were more likely to plan to have a colonoscopy in the next 10 years than whites, but having FOBT, flexible sigmoidoscopy, and any screening in the future were not significantly different across whites, Latinos, and Vietnamese Americans.

The studies regarding the knowledge of CRC screening were two on Vietnamese Americans (Walsh et al., 2004; Nguyen, 2008). Vietnamese participants had low levels of knowledge about colon poly by 29% and 50% (Walsh et al., 2004; Nguyen, 2008), which was the lowest rate compared with whites and Latinos in the study of Walsh et al. (2004). According to attitudes about CRC screening, Vietnamese Americans had fewer thoughts that FOBT would be embarrassing than whites and Latinos, but higher concerns that FOBT would find cancer. Vietnamese Americans were less likely to think the preparation for sigmoidoscopy or colonoscopy was unpleasant than whites and Latinos.

Facilitators and inhibitors

Age was the most common predictor for CRC screening adherence; increasing age was more associated with receiving CRC screening (Honda, and Gorin, 2005; Maxwell et al., 2008; Nguyen, 2008). It was followed by length of stay in the US (Juon et al., 2003; Sun et al., 2004; Ferrer et al., 2011), physician's recommendation (Honda and Gorin, 2005; Tang et al., 2001; Ferrer et al., 2011), and having insurance (Juon et al., 2003; Wong et al., 2005; Nguyen, 2008).

The most common positive predictors for FOBT were age (Honda, 2004; Walsh et al., 2004; Maxwell et al., 2008), length of stay in the US (Sun et al., 2004; Ponce et al., 2005; Wong et al., 2005), marital status (Juon et al., 2003; Honda, 2004; Wong et al., 2005), and routine checkup (Juon et al., 2003; Walsh et al., 2004; Wong et al., 2005). Age (Honda, 2004; Walsh et al., 2004; Nguyen 2008), length of stay in the US (Juon et al., 2003; Ponce et al., 2005; Wong et al., 2005), physician's recommendation (Tang et al., 2001; Honda, 2004; Teng et al., 2006), and having insurance (Wong et al., 2005; Kandula et al., 2006; Nguyen 2008) were reported as facilitating factors for sigmoidoscopy/colonoscopy.

The length of stay in the US was a positive predictor to CRC screening (Juon et al., 2003; Sun et al., 2004; Ferrer et al., 2011). If the length of stay in the US exceeded 20 years/15 years (Wong et al., 2005; Jo et al., 2008), more than 25% of life spent in the US (Juon et al., 2003), or as 10% increasing lifetime proportion in the US (Ferrer et

al., 2011), adherence of CRC screening was significantly increased. Korean Americans who spent more than 25% of their lifetime in the US were two times more likely to adhere to sigmoidoscopy than those who resided in the US less than 25% of their lifetime. Interestingly, Tang et al. (2001) reported that the length of stay in the US was significantly related to having a personal physician, which was also an important predictor of screening. In the same context, English ability (Honda 2004; Wong et al., 2005; Jo et al., 2008; Maxwell et al., 2008) and the level of acculturation (Tang et al., 2001) were positively affected on CRC screening. Lower English proficiency was one of the most important barriers (Honda, 2004; Honda and Gorin, 2005; Choe et al., 2006; Jo et al., 2008).

Receiving CRC screening and physician recommendation was significantly related, which was the most common facilitator among Asian Americans (Tang et al., 2001; Honda, 2004; Teng et al., 2006). Recommendation from family, relatives, and friends and the past experience of hearing positive things from those who have been screened was also important to decide to have CRC screening (Walsh et al., 2004). Also, having routine checkups, increasing the number of time gone to see a physician, or having a usual source of health care was related to the screening adherence (Yu et al., 2001; Juon et al., 2003; Walsh et al., 2004; Wong et al., 2005).

Additionally, males (Honda, 2004; Wong et al., 2005; Lee et al., 2011), those who were married (Juon et al., 2003; Honda, 2004a; 2004b; Wong et al., 2005), and those who perceived they were most susceptible to CRC (Sun et al., 2004; Teng et al., 2006) were more likely to have been screened. Acculturation was a significant predictor in the Chinese population study for FOBT and sigmoidoscopy screening (Tang et al., 2001), but another study for Chinese women reported the cultural views were marginally predictive of CRC screening adherence (Wang et al., 2006).

Negatively associated factors of CRC screening were financial issues (Maxwell et al., 2008; Nguyen, 2008) and worries/fears about the procedure (Sun et al., 2004; Nguyen, 2008). Nguyen (2008) and Maxwell et al. (2008) reported having annual household income less than \$20,000 was one inhibiting factor. Interestingly, being employed either full or part time was negatively associated with CRC screening in Vietnamese and Korean Americans (Maxwell et al., 2000; Nguyen, 2008). Nguyen (2006) showed having a Vietnamese doctor was negatively associated with the CRC screening.

The main facilitators were recommendation from family, relatives, and friends, with the most important recommendation being from physicians (Cheo et al., 2006; Jo et al., 2008; Ma et al., 2012). Barriers were mostly psychological, such as fear of discovering cancer, embarrassment, and concerns about discomfort (Honda, 2004; Sun et al., 2004; Honda and Gorin, 2005). Other barriers to having CRC screenings were lack of English ability, knowledge, insurance, and time, and transportation issues (Jo et al., 2008; Ma et al., 2012). The facilitators and barriers were consistently revealed in a qualitative interview among Chinese Americans (Cheo et al., 2006). Also, other facilitators from the interview were prior

education from physician about test instructions and positive past test experience, and other barriers were worry about test cost and lack of past experience.

Discussion

Colorectal cancer is an imperative health concern among Asian Americans. This literature review was to examine rates of CRC screening and to identify factors associated with screenings among Chinese, Filipino, Japanese, Korean, and Vietnamese Americans. This review totally showed a lack of studies regarding CRC screenings, with the disparities in literature especially worsening in each Asian American subgroup, despite of high incidence and mortality of CRC among Asian Americans.

Although CRC screenings are widely recommended, Asian Americans showed lower rates in receiving CRC screening than whites and African Americans. Within Asian subgroups, there are large disparities; Korean Americans reported to undergo the lowest CRC screening. It was consistent with breast and cervical cancer screening for women; Korean Americans showed the lowest screening rates, while Japanese showed the highest rates (Lee et al., 2010).

Through this literature review, the marginally elderly, those who recently arrived in the US, not having a regular physician, not having insurance, and those who are not married were found to be vulnerable populations regarding CRC screening among Asian Americans, which was consistently reported in other various studies (Friedman et al., 1999; Brenes and Paskett, 2000; Mandelson et al., 2000; Ries et al., 2000; Subramanian et al., 2004). Elderly populations are the most vulnerable group in health care sections, especially among ethnic minorities (De Chesnay, 2012). Thus, interventions for the elderly need more intensive efforts and long-term efforts. Although physicians are an important motivator for Asian Americans to facilitate screening, which was found in multiple studies (Friedman et al., 1999; Brenes and Paskett, 2000; Mandelson et al., 2000; Hay et al., 2003; Seeff et al., 2004; Coughlin and Thompson, 2005), the intervention for CRC screening should not be bounded only to physicians. Various trials are needed using diverse materials; education focus groups, print and media to increase the knowledge about CRC and the screenings. Also, as outreach efforts, language education programs for immigrants including English and terminology related to health should be an important public health priority; especially more recently arrived immigrants but not limited to this group.

Psychological issues, such as fear of discovering cancer, embarrassment, and concerns about discomfort were reported as significant barriers in the literature, which revealed other studies with cancer screening (Skinner et al., 1998; Kash and Dabney, 2001). Thus, further studies are needed assessing the significance of psychological barriers to failure to undergo CRC screening. Health care providers should develop appropriate intervention programs based on these findings; relevant education is needed to reduce their concerns and reform their

misunderstanding about CRC screening.

Asian Americans tend to prefer to get recommendations from friends, family, and relatives; future intervention should focus on community based strategies, centering each ethnic community, especially churches, temples, and ethnic organizations may be served as sites for health educations and recommendations.

In conclusion, despite a number of Asian Americans being vulnerable to CRC, the studies regarding individual Asian subgroups were understudied on CRC screening and intervention. Further studies should focus on each individual Asian subgroup and culturally proficient CRC screening intervention programs should be developed on each subgroup.

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