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Unraveling the Determinants to Colorectal Cancer Screening Among Asian Americans: a Systematic Literature Review

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Abstract Colorectal cancer (CRC) is one of the top three cancers experienced among Asian American (AA) men and women. One effective way to decrease incidence and mortality from CRC is the adherence of regular CRC screening; however, AA continue to receive the lowest screening rates compared to other racial/ethnic groups. When disaggregating this heterogeneous population, further disparities exist between subgroups. Examination of facilitators and barriers to cancer screening among AA subgroups is fairly recent and the synthesis of this information is limited. As such, a systematic review was conducted examining the facilitators and the barriers among Chinese, Filipino, Korean, and Japanese Americans using a systematic literature review method. The Health Belief Model served as the primary theoretical framework for this study and used to organize and synthesize the facilitators and barriers to CRC screening. In total, 22 articles yielded 29 examinations of each of the AA subgroups. Different facilitators and barriers to screening uptake for each subgroup were revealed; however, consistent across all the subgroups was physician recommendation as a facilitator and participants' unawareness of screening tests and those stating having no problems/symptoms of CRC as a barrier across screening modalities. Tailored approach in outreach and intervention efforts are suggested when achieving to improve CRC screening in AA ethnic subgroups.

Keywords Asian Americans · Colorectal cancer screening

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Introduction

Asian Americans (AA) continue to be the fastest growing racial group in the USA making up more than 17 million of the total US population [1, 2] and the largest share of recent immigrants [2]. The US Office of Management and Budget (OMB) and US Census Bureau define Asian as a person having origins in the Far East, Southeast Asia, or the Indian subcontinent [3]. Six subgroups comprise majority of the AA population: Chinese (3,973,723), Asian Indian (3,699,957), Filipino (2,848,148), Vietnamese (1,738,848), Korean (1,460,483), and Japanese (757,468) [2, 3]. When examining AA's health statistics, there is a need for data disaggregation to more accurately reflect AA subgroups' realities and needs [4]. This is imperative because AA comprises a large diverse racial minority [5]. Differences between groups with regards to culture, languages and dialects spoken, time since immigration, socioeconomic profiles, and risk factors [6] must be taken into consideration when examining their health and health behaviors.

Unique from other racial/ethnic groups, cancer is the leading cause of death for the aggregated AA population [4]. A study examining cancer incidences among AA in major metropolitan areas in the USA found that one of the top three cancers experienced among AA men and women was colorectal cancer (CRC) [7]. In turn, CRC was one of the top three causes of cancer mortality among Chinese, Filipino, and Japanese Americans [7]. Studies on cancer incidence, mortality, and stage distributions among the disaggregated Asian and Pacific Islander population revealed that Japanese men and women have the highest CRC incidence and mortality rate when compared to other AA subgroups [6–8]. For instance, one study showed Japanese CRC incident rate as 59.5 vs 41.7% Chinese, 46.6% Filipino, 49.5% Korean, 46.2% Vietnamese, and 28.1% South Asian [7]. The study further revealed that Japanese CRC incidence rate 59.5% even

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exceeded the rate of non-Hispanic White 47.5% [7]. One explanation of the higher incidence rate experienced among Japanese was in relation to the longer time since immigration in the USA compared to the other subgroups [6]. Specifically, dietary and behavioral factors associated with "westernization" were suggested to play a role in CRC incidence rate among Japanese [6]. It is important to note that CRC incidence rates have been decreasing in the USA for all racial groups from 2003 to 2012 (i.e., 3.8% per year among non-Hispanic White men and 3.2% women, 3.5% among African American men and 3.6% women, and 2.6% among Asian/Pacific Islander men and women) [9]; however, an increasing trend has been observed specifically for Korean men and women [10, 11]. There is a need to examine the variation in the AA subgroups' colorectal cancer screening practice (CCSP) and factors associated with it including sociodemographic characteristics, time since immigration, access to healthcare, and behavioral risk factors [12].

A powerful way to decrease CRC incidence and mortality is the adherence of regular CCSP. The US Preventive Services Task Force (USPSTF) [13] recommends average-risk individuals age 50–75 adhere to regular CCSP using the following three screening modalities: high-sensitivity fecal occult blood testing (FOBT) (annually), flexible sigmoidoscopy (FSIG) (5×/year), and colonoscopy (once every 10 years) due to their effectiveness in detecting precancerous polyps. However, despite the options in screening modalities, many do not get screened regularly [14, 15]. For instance, one study showed AA CRC screening rates to be 47.2% [16]. This was lower than non-Hispanic Whites who had the highest rate (62%) and African Americans (59%) [16]. Other studies showed similar findings and identified AA as having the lowest screening rates when compared to other racial/ethnic groups [12, 17, 18]. Similar patterns for CRC screening adherence rates to that of ever having screening have also been noted [18]. One study used the 2000 American College of Gastroenterology (ACG) screening guidelines which offered average-risk consumers starting at age 50 a menu of options: annual FOBT, FSIG every 5 years, colonoscopy every 10 years, and double-contrast barium enema every 5–10 years, and showed that only 48% of AA were up to date with any CRC screening compared to 62% of non-Hispanic White [18]. Differences were even recognized by screening modality with AA having lower screening rates for FOBT (38%) and either FSIG or colonoscopy (42%) vs non-Hispanic White rates of 58 and 57% for FOBT and either FSIG or colonoscopy, respectively [18]. Disaggregating the AA group reveals further disparities. For instance, the screening rates for Japanese (52%) were similar to non-Hispanic White (58%), while on the other end of the spectrum, Koreans (ranged from 23–32.7%) [12, 19] and Filipinos (29.5%) [6].

In order to effectively address the CRC disparities experienced among AA, ongoing efforts are needed to disaggregate this extremely heterogeneous population and explore the diversity in this large racial group. Essentially, a closer examination of the variation in the AA subgroups' CCSP and factors associated with it including sociodemographic characteristics, time since immigration, access to healthcare, and behavioral risk factors [12] are warranted. However, examination of cancer screening behaviors and facilitators and barriers to cancer screening practice among AA subgroups is fairly recent with studies emerging in the early 2000s [12]. In addition, there appears to be no published papers that systematically synthesized this information for specific AA subgroups except for Korean Americans [11]. As such, the aims of this paper are to expand on current knowledge and to examine the facilitators (i.e., factors that positively affect screening uptake) and barriers (i.e., factors that negatively affect screening uptake) to CCSP among multiple AA subgroups: Chinese Americans (CA), Filipino Americans (FA), Korean Americans (KA), and Japanese Americans (JA) using a systematic literature review method. Findings from this study can help to inform targeted areas when developing tailored interventions to promote CCSP for AA subgroups.

Methodology

Theoretical Framework

The Health Belief Model (HBM) was used as the primary theoretical framework for this review and further utilized to organize and synthesize the facilitators and barriers to CCSP. HBM was developed to understand compliance with preventive health promoting behaviors on an intrapersonal level [20, 21]. *Predisposing characteristics*, a concept in Andersen's Healthcare Utilization Model (HUM), was also included in this review. The HUM is another commonly used theoretical framework aimed to help understand how and why families use health services. This framework suggests that "health services use is a function of people's predisposition to use services, factors that enable or impede use, and their need for care" [22]. *Predisposing characteristics* has evolved and can include various intrapersonal level characteristics including sociodemographic factors, cultural factors, healthcare-related factors, and knowledge related to health and health services [22]. The multiple dimensions within *predisposing characteristics* are indicative of how an individual's predisposition to utilize health services can be broad in range and measured in various ways.

This review will further code and organize the facilitators and barriers identified in this study by the following dimensions within the *predisposing characteristics*: sociodemographic factors, cultural factors, personal health factors (i.e., knowledge related to health and health services), and healthcare-related factors (i.e., access to healthcare, usual source of care, etc.). The HBM

concepts used in this study include *psychological constructs* (i.e., perceived susceptibility to the disease, perceived benefits of undergoing health behavior, perceived barriers to health behavior, and emotional response to health behavior/disease*)*. Although the HBM referred these as cognitive constructs, later adaptations of the model incorporated socio-psychological factors including emotional response and *cues to action* (i.e., public service announcement, media/educational campaigns, social support including family, friends, physicians) [21]. Examining the facilitators and barriers to CCSP that is categorized using the HBM's constructs can support areas of focus when developing interventions to promote screening uptake among specific AA groups.

Search Strategy

Figure 1 shows the flow diagram using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [23]. A systematic literature review was conducted using the PRISMA guidelines and five databases in total: OneSearchManoa, three EBSCO databases: Academic Search Complete, Cumulative Index to Nursing and Allied Health (CINAHL), and Psychology and Behavioral Sciences Collection, and the American Psychological Association's PsycNet were examined using the search string "colorectal cancer AND screening AND [Chinese (CA), Filipino (FA),

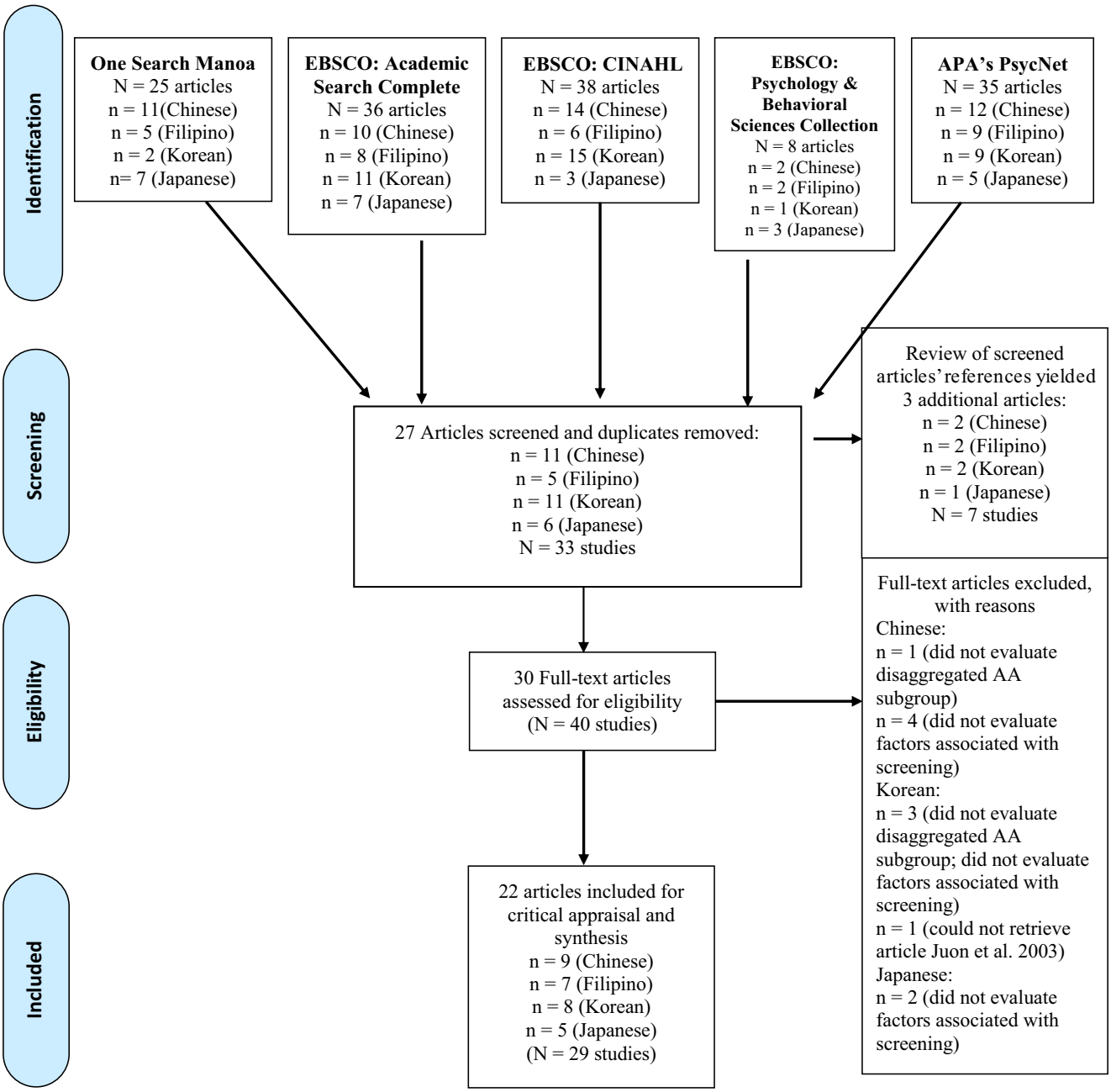

Fig. 1 Flow diagram. Search terms: "colorectal cancer AND screening AND (Chinese, Filipino, Korean, Japanese) American"

Korean (KA), and Japanese (JA)] American." Each ethnic subgroup was searched independently from the other subgroups in each of the databases. The USPSTF CRC screening recommendation guideline was used as a guide in this review; however, age range was not restricted to USPSTF's recommended age range in order to maximize the publications included in this review for this hard to reach population.

Study Selection

The search was conducted in August 2016 and initially yielded a total of $N = 142$ articles: OneSearchManoa ($n = 25$), Academic Search Complete ($n = 36$), CINAHL ($n = 38$), Psychology and Behavioral Sciences Collection ($n = 8$), and PsycNet ($n = 35$). In turn, these articles yielded the following studies (defined in this review as the disaggregated analysis of the AA subgroups): CA ($n = 49$), FA ($n = 30$), KA ($n = 38$), and JA ($n = 25$) across the five databases. After 27 duplicate articles were removed and the remaining articles' titles and abstracts were screened for appropriateness for this review, the search yielded 33 studies: CA ($n = 11$), FA ($n = 5$), KA ($n = 11$), and JA ($n = 6$) for full text review. Appropriateness for review was determined by screening the articles' titles and abstracts and confirming that the studies evaluated factors associated with CRC screening among distinct AA subgroups. This task was important because several articles examined multiple AA subgroups in their analyses as well as other cancer types in addition to CRC. A review of these abstract-screened articles' references yielded an additional three articles for full text review, which resulted in seven additional studies: CA ($n = 2$), FA ($n = 2$), KA ($n = 2$), and JA ($n = 1$). In total, 30 articles (40 studies or disaggregated analyses of the subgroups) were fully screened using the pre-established inclusion criteria: studies conducted in the USA; studies must evaluate factors associated with CRC screenings as their outcome measure; the AA subgroups (CA, FA, KA, and JA) as a disaggregated analysis must be included in the studies; and no publication date restriction was imposed. Upon the completion of full text reviews, 11 studies were excluded because they did not evaluate disaggregated AA subgroup and/or factors associated with CRC screening. Finally, 22 articles were included for appraisal and synthesis. The 22 articles included 29 studies CA ($n = 9$), FA ($n = 7$), KA ($n = 8$), and JA ($n = 5$). Data was extracted based on the study design, sample characteristics, and facilitators and barriers to CRC screening.

Results

Study and Sample Characteristics

In total, 22 articles yielded the 29 studies that provided disaggregated measures of each of the AA subgroups: CA (9), FA (7), KA (8), and JA (5). Table 1 summarizes the characteristics of the 29 studies. Majority of the articles ($n = 17$) were cross-sectional in design and used self-reported questionnaires for data collection, 3 analyzed various waves from the California Health Interview Survey (CHIS) ranging from years 2001–2009 [24–26], 1 pilot survey collected data via telephone interviews and focus groups [27], and 1 used a randomized controlled intervention trial design with aims to increase CRC screening among FA [28]. Majority of the age range in the studies was in compliance with the USPSTF-recommended age group for screening 50–75 except for several publications [29–32] that included younger age for reasons including the acknowledgment of higher incidence rate among younger age groups for JA [29]. Nearly all the articles included both men and women samples and reported the respective frequencies/percentages, except for 3 that collected data on women only [33–35]. Majority of the samples across the ethnic groups were female; however, 2 publications did not report the gender breakdown of their samples [26, 36].

Self-Reported Colorectal Cancer Screening

Table 2 summarizes the timeframe of self-reported screening practice and by screening modality: FOBT, FSIG, and colonoscopy for CA, FA, KA, and JA. Although the digital rectal exam (DRE) is not one of the USPSTF's recommended screenings, it was included in this analysis to capture a more comprehensive picture of the screening behaviors of these subgroups. The proportion of the aggregated AA participants who reported ever undergoing FOBT ranged from 8 to 81% and 5 to 29% reported being up to date with screening (UTDS) for FOBT. For FSIG, 21–31% reported ever having it and 6–97% were reportedly UTDS. For colonoscopy, 22–40% reported ever having had this screening and 8–50% were reported to be UTDS. Only one study assessed for the combination of modalities, FOBT and FSIG among CA [37] and 22% reported to be UTDS. Screening practice of ever having any one of the three modalities revealed a range of 34–81% [26] and a range of 52–66% of those who were UTDS [17, 24, 34]. For either endoscopic procedures, 4–40% of study participants reported having had one of the screenings [28, 33, 38] and 6–26% were reported to be UTDS with either one of the endoscopic procedures [29, 33, 39, 40]. Two studies that assessed for participation in DRE showed that the proportion of participation ranged from 5 to 17% that ever had the screening [31, 32].

Facilitators and Barriers to CRC Screening Among Asian Americans

Table 3 summarizes the facilitators and barriers to CRC screening across the AA subgroups and by screening modalities. Determinants were identified if they were significantly associated with increasing or decreasing (facilitators or

Table 1 Summary of included studies

Reference	Study design and data collection	Recruitment location	Data collection year(s)	Sample size (ethnicity)	Gender (sample)	Age
Chinese Americans (n = 9)						
Teng et al. [44]	Questionnaire (self-administered)	San Francisco and Houston (senior centers and church organizations)	Fall 2002–Summer 2003	N = 194 (CA)	Men (44%) and women (56%)	50 and older
Yu et al. [32]	Questionnaire	Chicago's Chinatown	NA	N = 644 (CA)	Men (48%) and women (52%)	40–69 years
Tang et al. [35]	Questionnaire (self-administered)	2 major cities on the East Coast (7 senior centers)	NA	N = 100 (CA)	Women (100%)	60–102 years
Bastani et al. [27]	Pilot questionnaire with telephone interview and focus group	Downtown Chinatown area of Los Angeles, CA (Chinese service center)	September–December 1998	N = 14 (CA)	Men (57%) and women (43%)	50–85 years
Sun et al. [37]	Questionnaire	New York City, NY (3 major Chinese senior centers)	December 1, 1999–March 15, 2000	N = 203 (CA)	Men (56.2%) and women (43.8%)	50 and older
Kim et al. [43]	Prospective, cross-sectional design with convenience sampling	Chicago, Illinois (Health fairs held by a Chinese American community-based organization)	NA	N = 113 (CA)	Men (35%) and women (65%)	50 and older
Homayoon et al. [24]	2007 California Health Interview Survey	California	2007	N = 677 (CA)	Men (45.1%) and women (54.9%)	50 and older
Wang et al. [34]	Questionnaire (structured telephone interview)	Washington, DC metropolitan area (the District of Columbia, Fairfax County in Virginia, and Montgomery and Prince George's Counties in Maryland).	NA	N = 433 (CA)	Women (100%)	50 and older
Maxwell et al. [33]	2001–2005 California Health Interview Survey	California	2001–2005	N = 1, 432	NA	50 and older
Filipino Americans (n = 7)						
Francisco et al. [39]	Cross-sectional study	Southern California (three community Churches)	September–November 2011	N = 188 (FA)	Men (39.9%) and women (60.1%)	50 and older
Maxwell et al. [40]	Questionnaire (survey: phone or in-person)	Los Angeles County (31 community-based organizations)	July 2005–October 2006	N = 487 (FA)	Men (42%) and women (58%)	50–75 years
Maxwell et al. [33]	Face-to-face interviews with convenience sample	Los Angeles, CA (1 community-based social service organizations and 1 church congregation)	October 1995–April 1996	N = 218 (FA)	Women (100%)	50 and older
Maxwell et al. [28]	Randomized controlled intervention trial	Los Angeles County (45 community-based organizations and churches)	N/A	N = 432 (FA)	Men (33%) and women (67%)	50–70 years
Ferrer et al. [41]	Cross-sectional design		Spring 2006	N = 117 (FA)	Men (36%) and women (64%)	50 and older

Table 1 (continued)

Reference	Study design and data collection	Recruitment location	Data collection year(s)	Sample size (ethnicity)	Gender (sample)	Age
		CA (locate of the study with few responses from several other states)				
Homayoon et al. [24]	2007 California Health Interview Survey	California	2007	*N* = 323 (FA)	Men (40%) and women (60)%	50 and older
Maxwell et al. [26]	2001–2005 California Health Interview Survey	California	2001–2005	*N* = 753 (FA)	N/A	50 and older
Korean Americans (*n* = 8)						
Jo et al. [30]	Questionnaire (face-to-face in-person)	LA, CA (Korean Health Education, Information, and Research Center [KHEIR] community-based organization)	March–September 2003	151 (KA)	Men (32%) and women (68%)	40–70
Homayoon et al. [24]	2007 California Health Interview Survey	California	2007	340 (KA)	Men (42%) and women (58%)	50 and older
Lee and Im [38]	Cross-sectional Structured questionnaire	New York metropolitan area (2 Korean senior centers and 2 Korean churches)	2009	281 (KA)	Men (54%) and women (46%)	50–88
Maxwell et al. [33]	Face-to-face interviews with convenience sample	Los Angeles, CA (1 community-based social service organizations and 1 church congregation)	October 1995–April 1996	*N* = 229 (KA)	Women (100%)	50 and older
Kim et al. [31]	Questionnaire (prospective study using modified version of the 1987 Cancer Control Supplement Questionnaire of the National Health Interview Survey)	Uptown area of Chicago, IL	N/A	*N* = 263 (KA)	Men (40%) and women (60%)	40–69
Ryu et al. [25]	2009 California Health Interview Survey	California	2009	*N* = 519 (KA)	Men (38%) and women (62%)	50 and older
Oh et al. [17]	Questionnaire (cross-sectional design)	Washington DC metropolitan area (Korean churches, senior resource centers, and community-based organizations)	2006–2007	*N* = 254 (KA)	Men (41%) and women (59%)	50 and older
Maxwell et al. [26]	2001–2005 California Health Interview Survey	California	2001–2005	*N* = 675	N/A	50 and older
Japanese Americans (*n* = 5)						
Honda [29]	Questionnaire (cross-sectional design)	Major metropolitan areas in Illinois, Massachusetts, New Jersey, and Washington	June–August 2001	*N* = 306 (JA)	Men (61%) and women (39%)	30 and older

Table 1 (continued)

Reference	Study design and data collection	Recruitment location	Data collection year(s)	Sample size (ethnicity)	Gender (sample)	Age
Harmon et al. [36]	Multiethnic Cohort (MEC) prospective cohort	Hawaii or California (primarily Los Angeles County)	1993–1996	$N = 44{,}025$ (JA)	NA (no gender breakdown)	50 and older
Homayoon et al. [24]	2007 California Health Interview Survey	California	2007	314 (JA)	Men (34%) and women (66%)	50 and older
Honda and Kagawa-Singer [42]	Questionnaire (cross-sectional design)	Greater New York region (NY, NJ, CT)	N/A	$N = 341$ (JA)	Men (37%) and women (63%)	50–92
Maxwell et al. [26]	2001–2005 California Health Interview Survey	California	2001–2005	$N = 619$ (JA)	N/A (no gender data)	50 and older

barriers, respectively) CRC screening uptake/rates via bivariate or multivariate analyses at $p \leq .05$ or if identified as facilitators or barriers in descriptive or qualitative results.

Predisposing Characteristics When aggregating the AA group, various determinants were shown to influence CCSP. This included sociodemographic factors including age [29, 32, 33, 39, 40], gender [29, 36], marital status [29], education attainment [32, 37], and employment status [26]. Income's effects on CCSP varied from lower income [20, 38, 40] to higher income [20, 40, 41].

The following cultural factors influenced CCSP: higher acculturation level to the USA [35], increased percentage of lifetime in the USA [33, 37, 40, 41], higher English proficiency [24, 29], preference for Eastern form of treatment and taboo discussing certain body parts [27], and fatalism [38].

The following personal health factors influenced CCSP: having comorbidity (i.e., angina, diabetes, heart disease, and high blood pressure) [36], cancer history [38], having a relative with CRC [39], personal screening history for colonoscopy [36], knowledge of at least one warning sign of cancer [31], knowledge and awareness of CRC screening [17, 39], and being asymptomatic [27] and having no health problems and unawareness of screening tests [24].

Finally, the following healthcare-related factors facilitated screening uptake: having a primary care physician [42], regular access to healthcare [43], ever having check-up [33], and more times visits to healthcare [17]. Having health insurance yielded mixed results between AA subgroups [24, 26, 30, 39].

Psychological Constructs The following psychological determinants influenced CCSP: perceived susceptibility to getting CRC [27, 29, 34, 37], perceived benefits of CRC screening [39, 43], confidence in ability to screening uptake [38], perceived seriousness of CRC [38], low-medium perceived costs of screening uptake [29], worries or fears of receiving a positive screening result [27, 37], general sense of embarrassment or discomfort at getting screened [27], fear of embarrassment or pain [26, 27], and helplessness [38].

Cues to Action The following cues to action influenced CCSP: physician recommendation [29, 30, 34, 35, 41, 44], patient-provider communication [28, 43], and specifically, ease of communication with healthcare provider [39], and emotional support from friends [43].

Facilitators and Barriers to CRC Screening Among Chinese Americans

Each of the dimensions from the predisposing construct influenced CRC screening uptake; however, noteworthy dimensions were cultural and personal health factors.

Table 2 Self-reported CRC screening rates

Screening modality	Timeframe	Age	Proportion % (sex)	References
(CA)				
FOBT	Ever tested (among those who have no history of colon cancer)	Over 50	29% (M) 35% (F)	Teng et al. [44]
	Ever tested (for screening purpose)	40–69	8.0% (M) 9.0% (F)	Yu et al. [32]
	Participated in FOBT	50 and older	80% (M) 67.1% (F)	Kim et al. [43]
	Had test at least once	60–102	25% (F)	Tang et al. [35]
	UTDS (within past 5 years)	60–102	42% (F)	Tang et al. [35]
	UTDS (within past year)	50 and older	15.8% (M and F)	Sun et al. [37]
FOBT and FSIG	UTDS (FOBT in past year and FSIG within past 5 years)	50 and older	22.2% (M and F)	Sun et al. [37]
FSIG	Ever tested (among those who have no history of colon cancer)	Over 55	31% (M) 22% (F)	Teng et al. [44]
	Had test at least once	60–102	31% (F)	Tang et al. [35]
	UTSD (within past 5 years)	60–102	97% (F)	Tang et al. [35]
Colonoscopy	Ever tested (among those who have no history of colon cancer)	Over 60	22% (M) 29% (F)	Teng et al. [44]
FOBT or FSIG or Colonoscopy	UTDS (FOBT in past year; FSIG within past 5 years; colonoscopy within past 10 years)	50 and older 50 and older	53.2% (M and F) 57% (F)	Homayoon et al. [24] Wang et al. [34]
	Ever had test	50 and older	59% (01 M and F) 63% (03 M and F) 64% (05 M and F)	Maxwell et al. [26]
	Had test for screening	40–69	11.5% (M) 16.6% (F)	Yu et al. [32]
(FA)				
FOBT	Have had test	50 and over 50–70 years	34.6% (M and F) 19% (M and F)	Francisco et al. [39] Maxwell et al. [28]
	UTDS (within past year)	50–75 50 and older 50 and older	16% (M and F) 12% (F) 29% (M and F)	Maxwell et al. [40] Maxwell et al. [33] Ferrer et al. [41]
FSIG	Have had test	50 and over	21% (M and F)	Francisco et al. [39]
	UTDS (within past 5 years)	50 and over	35.9% (M and F)	Ferrer et al. [41]
Colonoscopy	Have had test	50 and over	40.4% (M and F)	Francisco et al. [39]
	UTDS (within past 10 years)	50 and over	42% (M and F)	Ferrer et al. [41]
FSIG or colonoscopy	Ever had test	50–70 years	4% (M and F)	Maxwell et al. [28]
	UTDS (FSIG within past 5 years or colonoscopy within past 10 years)	50 and over 50 and older	49.5% (M and F) 6% (F)	Francisco et al. [39] Maxwell et al. [33]
FSIG or colonoscopy (with or without FOBT)	UTDS (FSIG within past 5 years or colonoscopy within past 10 years)	50–75	31% (M and F)	Maxwell et al. [40]
FOBT or FSIG or colonoscopy	UTDS (FOBT within past year; FSIG within past 5 years; colonoscopy within past 10 years	50 and older	65.9% (M and F)	Homayoon et al. [24]
	Ever had test	50 and older	56% (01 M and F) 54% (03 M and F) 65% (05 M and F)	Maxwell et al. [26]
(KA)				
FOBT	Ever had test	50–88	46.4% (M) 51.6% (F)	Lee and Im [38]
		50 and older	8%	Maxwell et al. [33]
		40–69	5.8% (M) 3.8% (F)	Kim et al. [31]
	UTDS (within past year)	40–70	5% (M and F)	Jo et al. [30]
		50 and older	14% (F)	Maxwell et al. [33]
		50 and older	8.9% (M and F)	Ryu et al. [25]
FSIG	UTDS (within past 5 years)	40–70	11% (M and F)	Jo et al. [30]
		50 and older	5.9% (M and F)	Ryu et al. [25]
Colonoscopy	UTDS (within past 5 years)	40–70	8% (M and F)	Jo et al. [30]
		50 and older	50.2% (M and F)	Ryu et al. [25]

Table 2 (continued)

FOBT or FSIG or colonoscopy	Ever had test	50 and older	49% (01 M and F)	Maxwell et al. [41]
			40% (03 M and F)	
			34% (05 M and F)	
	UTDS (FOBT within past year; FSIG within past 5 years; colonoscopy within past 10 years)	50 and older	52.1% (M and F)	Homayoon et al. [24]
	UTDS (FOBT within past year; FSIG and Colonoscopy within past 5 years)	40 and older	45% (M)	Oh et al. [17]
			43% (F)	
FSIG or colonoscopy	Ever had test	50–88	34.4% (M)	Lee and Im [38]
			35.9% (F)	
		50 and older	40%	Maxwell et al. [33]
DRE	Ever had test	40–69	4.8% (M)	Kim et al. [31]
			5.0% (F)	
(JA)				
FOBT	Within past 2 years	30 and older	37% (M and F)	Honda [29]
	UTDS (within past year)	50–92	9% (M and F)	Honda and Kagawa-Singer [43]
FSIG	UTDS (within past 5 years)	50–92	7% (M and F)	Honda and Kagawa-Singer [43]
FSIG or colonoscopy	UTDS (within past 5 years)	30 and older	26% (M and F)	Honda [29]
Colonoscopy	Ever had test	45–75	38.1% (M and F)	Harmon et al. [36]
	UTDS (within past 10 years)	50–92	23% (M and F)	Honda and Kagawa-Singer [43]
FOBT or FSIG or colonoscopy	Ever had test	50 and older	74% (01 M and F)	Maxwell et al. [41]
			74% (03 M and F)	
			81% (05 M and F)	
	UTDS (FOBT within past year; FSIG within past 5 years; colonoscopy within past 10 years)	50 and older	65.8% (M and F)	Homayoon et al. [24]

CA – Chinese American; FA – Filipino American; KA – Korean American; JA – Japanese American; DRE – Digital rectal examination; FOBT – Fecal Occult Blood Test; FSIG – Flexible Sigmoidoscopy; UTDS – Up to date screening

For the cultural factors, higher acculturation level in general served as a facilitator for both FOBT and FSIG [35]; however, specific proxies including higher number of years in the USA, high English proficiency, preference for Eastern treatment, Eastern view of care, and taboo of discussing certain body parts were identified as barriers across all modalities [24, 27, 34, 37]. This is an indicator of the complex and multifaceted nature of culture. For personal health factors, the following were barriers across all modalities: having no health problems [26], asymptomatic [27], and those who are unaware of screenings [26]. Early stages of CRC do not typically include symptoms, as such, this hints at CA's unfamiliarity with the CRC's disease process and options in CRC screening modalities.

Notable psychological factors included perceived susceptibility to CRC as a facilitator across all modalities [27, 34, 37]. Barriers included general sense of embarrassment/discomfort of getting screened for FOBT and FSIG [27], fear of pain/embarrassed of getting screened for either endoscopic procedures [26], and worries or fears of receiving a positive result for FOBT and FSIG [27, 37].

Facilitators and Barriers to CRC Screening Among Filipino Americans

Variations in the predisposing construct were shown to facilitate CRC screening uptake across all modalities. Notable factors included the following: older age [33, 39–41], higher % lifetime in the USA [33, 40, 41], and having knowledge/awareness of CRC screening [28, 39].

One study found having higher English proficiency and insurance as distinct barriers to screening uptake [24], while having very easy communication with healthcare provider was a notable cue to action [39]. Interestingly, the aforementioned study was the only study in the entire analysis that

Table 3 Facilitators and barriers to CRC screening

HBM constructs: -predisposing characteristics -psychological constructs -cues to action	Determinants to CCSP	Ethnicity	References	Facilitator and barriers by screening modality
Predisposing characteristics	Younger age (40–54)	CA	Yu et al. [32]	FOBT[c]
	Acculturation		Tang et al. [35]	FOBT[b] FSIG[b]
	Higher number of years of residency		Sun et al. [37]	FOBT[c]
	English proficiency (English only)		Homayoon et al. [24]	FOBT[c] or FSIG or Colonoscopy
	Eastern view of care		Wang et al. [34]	FOBT[c] or FSIG or Colonoscopy
	Having a PCP		Kim et al. [42]	FOBT[b]
	Higher level education		Sun et al. [37]	FOBT[b] and FSIG
			Yu et al. [32]	DRE[b]
	Have no health problems[a]		Maxwell et al. [26]	FOBT[c]; FSIG or Colonoscopy
	Unaware of test[a]			
	Asymptomatic[a]		Bastani et al. [27]	FOBT[c] and FSIG
	Preference for Eastern form of treatment[a]			
	Taboo discussing certain body parts[a]			
	Have insurance		Homayoon et al. [24]	FOBT or FSIG or Colonoscopy
Psychological constructs	Perceived susceptibility	CA	Sun et al. [37]	FOBT[b]; FOBT and FSIG
			Bastani et al. [27][a]	FOBT[b] and FSIG
			Wang et al. [34]	FOBT[b] or FSIG or Colonoscopy
	Worries or fears of positive results		Sun et al. [37]; Bastani et al. [27]	FOBT[c]; FOBT and FSIG
	General sense of embarrassment or discomfort at getting screened for colon cancer[a]		Bastani et al. [27]	FOBT[c] and FSIG
	Fear of pain/embarrassed		Maxwell et al. [26]	FSIG[c] or Colonoscopy
Cues to action	Physician recommendation	CA	Teng et al. [44]	FOBT[b]; FSIG; Colonoscopy
			Wang et al. [34]	FOBT[b] or FSIG or Colonoscopy
	Lack of physician recommendation		Tang et al. [35]	FSIG[c]
Predisposing characteristics	Increased age	FA	Maxwell et al. [40]	FOBT[b]; FSIG or Colonoscopy
			Francisco et al. [39]	FSIG[b] or Colonoscopy
			Maxwell et al. [33]; Ferrer et al. [41]	FOBT[b] or FSIG or Colonoscopy
	Lower income ($20,000–$50,000)		Maxwell et al. [40]	FOBT[b]
	Higher income ($50,000 and higher)		Maxwell et al. [40]	FSIG[b] or Colonoscopy
	Having a relative with colon or rectal cancer		Francisco et al. [39]	FSIG[b] or Colonoscopy
	Increased % of lifetime in the USA		Maxwell et al. [40]	FSIG[b] or Colonoscopy
			Maxwell et al. [33]; Ferrer et al. [41]	FOBT[b] or FSIG or Colonoscopy
	Have no health problems[a]; Unaware of tests[a]		Maxwell et al. [26]	FOBT[c]; FSIG or Colonoscopy
	Having heard of FOBT		Francisco et al. [39]	FSIG[b] or Colonoscopy
	Knowledge and awareness of CRC screening tests	FA	Maxwell et al. [28]	FOBT[b] or FSIG or Colonoscopy
	Have insurance; English proficiency (English only)		Homayoon et al. [24]	FOBT[c] or FSIG or Colonoscopy
Psychological constructs	Strong agreement with benefit of screening procedures reducing worry about CRC		Francisco et al. [39]	FSIG[b] or Colonoscopy
Cues to action	Very easy communication with healthcare provider	FA	Francisco et al. [39]	FSIG[b] or Colonoscopy
	Patient-provider communication		Maxwell et al. [28]	FOBT[b] or FSIG or Colonoscopy
	Doctor's recommendation		Ferrer et al. [41]	FOBT[b] or FSIG or Colonoscopy
Predisposing characteristics		KA	Lee and Im [38]	FOBT[b]

Table 3 (continued)

HBM constructs: -predisposing characteristics -psychological constructs -cues to action	Determinants to CCSP	Ethnicity	References	Facilitator and barriers by screening modality
	Higher monthly income ($600–$1400)			
	Lower monthly income			FSIG[c] or Colonoscopy
	Employment		Maxwell et al. [41]	FOBT[c] or FSIG or Colonoscopy
	Cancer history		Lee and Im [38]	FOBT[b]
	Having insurance		Lee and Im [38]; Ryu et al. [25]	FSIG[b] or Colonoscopy
			Homayoon et al. [24]	FOBT[c] or FSIG or Colonoscopy
	English proficiency (English only)		Homayoon et al. [24]	FOBT[b] or FSIG or Colonoscopy
	Fatalism		Lee and Im [38]	FSIG[c] or Colonoscopy
	Ever had a check-up		Maxwell et al. [33]	FOBT[b] or FSIG or Colonoscopy
	More times visits to healthcare		Oh et al. [17]	FOBT[b] or FSIG or Colonoscopy
	Higher screening knowledge		Oh et al. [17]	FOBT[b] or FSIG or Colonoscopy
	Length of residence in USA (10 years or more)		Kim et al. [31]	DRE[b]
	Knowledge of 7 warning signs of cancer (at least 1)		Kim et al. [31]	DRE[b]
	Have no health problems[a]; Unaware of tests[a]		Maxwell et al. [26]	FOBT[c]; FSIG or Colonoscopy
Psychological constructs	Confidence;	KA	Lee and Im [38]	FOBT[b]; FSIG or Colonoscopy
	Perceived seriousness; Helplessness			FSIG[c] or Colonoscopy
	Fear of pain/embarrassed		Maxwell et al. [26]	FSIG[c] or Colonoscopy
Cues to action	Received physician recommendation	KA	Jo et al. [30]	FOBT[b] or FSIG or Colonoscopy
Predisposing characteristics	Male	JA	Honda [29]	FOBT[b]
			Harmon et al. [36]	Colonoscopy[b]
	Married/cohabiting		Honda [29]	FOBT[b]
	Language proficiency		Honda [29]	FOBT[b]; FSIG or Colonoscopy
			Homayoon et al. [24]	FOBT[b] or FSIG or Colonoscopy
	Personal screening history		Harmon et al. [36]	Colonoscopy[b]
	Comorbidity (angina, diabetes, heart disease, and high blood pressure)		Harmon et al. [36]	Colonoscopy[b]
	Age		Honda [29]	FSIG[b] or Colonoscopy
	HMO/commercial plan		Honda [29]	FSIG[b] or Colonoscopy
	Regular access to healthcare		Honda and Kagawa-Singer [43]	FOBT[b] or FSIG or Colonoscopy
	Have insurance		Homayoon et al. [24]	FOBT[c] or FSIG or Colonoscopy
	Income		Honda and Kagawa-Singer [43]	FOBT[b] or FSIG or Colonoscopy
	Have no health problems[a]; Unaware of tests[a]		Maxwell et al. [26]	FOBT[c]; FSIG or Colonoscopy
Psychological constructs	Low perceived cost;	JA	Honda [29]	FOBT[b]; FSIG or Colonoscopy
	Medium perceived cost			FSIG[b] or Colonoscopy
	High perceived susceptibility		Honda [29]	FSIG[b] or Colonoscopy
	Perceived benefits		Honda and Kagawa-Singer [43]	FOBT[b] or FSIG or Colonoscopy
			Honda [29]	FOBT[b]; FSIG or Colonoscopy
	Fear of pain/embarrassed[a]		Maxwell et al. [26]	FSIG[c] or Colonoscopy
Cues to action	Physician recommendation;	JA	Honda and Kagawa-Singer [43]	FOBT[b] or FSIG or Colonoscopy
	Patient-provider communication;			
	Emotional friends support			

[a] Descriptive or qualitative data

[b] Facilitators to CCSP

[c] Barriers to CCSP

included a variable on the quality of the encounter with physicians measured by ease of communication [39]. This factor sheds light on the potential benefits of examining the overall quality and experience of FA's encounter with physician.

Facilitators and Barriers to CRC Screening Among Korean Americans

Great variations existed across all dimensions in the predisposing construct for KA. However, notable sociodemographic factors included the following: employment and lower monthly income as barriers across modalities [26, 38]; cultural factors: high English proficiency facilitated all modalities [24], while fatalism was a barrier for endoscopic procedures [38]; personal health factors: having a history of cancer facilitated FOBT [38], CRC screening knowledge [17], and knowledge of at least 1 warning sign of cancer facilitated DRE [31]; and healthcare-related factors across all modalities: yielded mixed findings in having insurance as a facilitator [25, 38] and as a barrier [24]. Ever having a check-up [33] and more visits to healthcare [17] were facilitators across modalities. The latter two variables shed light on the potential importance of in-person encounters with physicians. In turn, this can increase the likelihood of physical meetings with their physicians which allows for greater opportunities for CRC screening counseling to be held.

The following factors were psychological facilitators to endoscopic procedures: seriousness of cancer and confidence to screen [38]; and barriers to endoscopic procedures: helplessness and fear of pain/embarrassed [26, 38].

Facilitators and Barriers to CRC Screening Among Japanese Americans

Great variations existed across all dimensions in the predisposing construct for JA. These included the following sociodemographic factors as facilitators: older age [29], male [29, 36], married [29], and income [43]. The following cultural and personal health factors were facilitators: language proficiency [24, 29] and having a personal screening history and comorbidity (angina, diabetes, heart disease, and high blood pressure) [36]. Having insurance was a healthcare-related factors that was a barrier to CCSP [24]. However, having HMO/commercial healthcare [29] and having regular access to care [43] facilitated screening. This suggests the importance of specific types of healthcare insurance plans (i.e., HMO, PPO, public, etc.) and their respective roles in screening uptake.

The following psychological factors were facilitators across modalities: lower perceived cost and high perceived susceptibility [29], as well as perceived benefits [43], whereas fear of pain/embarrassed [26] was a barrier for endoscopic procedures.

In addition to physician recommendation, patient/provider communication and emotional friend support were additional cues to action that facilitated CCSP across all modalities [43]. This indicates the potential significance of the health information-sharing source in JA's decision to undergo CRC screening.

Discussion

To the author's knowledge, this is the first systematic review to examine the facilitators and barriers to CCSP across multiple AA subgroups. This study builds on prior research focusing on a single AA subgroup [11]. Findings from this study bring to light similar and different factors that facilitate and hinder CRC screening among AA subgroups.

Determinants to CRC Screening Among Aggregated Asian Americans

Across the AA subgroups, a wide array of predisposing constructs, psychological constructs, and cues to action were found to facilitate and hinder screening uptake. However, based on this review's findings, notable constructs to address and/or support in intervention efforts include predisposing factors, specifically the personal health and healthcare-related dimensions and cues to action. Physician recommendation was a cue to action that consistently facilitated CCSP across the subgroups. This finding is supported by previous findings that identified physician recommendation as an important determinant for CRC screening, not only for AA, but across racial and ethnic groups [45–47].

Individual's unawareness of screening tests and those stating having no problems/symptoms of CRC were also identified as a barrier to CCSP across the subgroups. This study included personal health as a dimension within predisposing characteristics. The personal health dimension included variables pertaining to general health status and knowledge on CRC and CRC screening. Those who were not up to date with screening were asked the reason for not receiving CRC screening; "being unaware of tests" and "having no health problems" were noted as the first and second most common reasons, respectively [26]. This confirms previous findings on barriers to CRC screening among average-risk adults [48]. More specifically, "having no health problems" as a barrier coincides with findings from a focus group study that showed participants' reluctance to visit a physician unless major symptoms were experienced [27]. This hints at a shared health belief across AA subgroups indicating less familiarity with the nature of Western preventative care and screening practice to detect health problems before the onset of symptoms. This is in concordance with findings from a qualitative study [49] which revealed that Korean physicians perceived their ethnic concordant patients' general perception of having no symptoms as equating to being in good health as a barrier to recommend CRC screening.

Both reasons for not undergoing screening hint at important personal health barriers to target across all the subgroups. Importantly, opportunities for increased education on CRC disease process and options in screening modalities are raised. Moreover, the role of physicians can be emphasized here to

help address these two personal health barriers. This corroborates findings from a previous study that suggested the effectiveness of the combined effects of physician recommendation and patient counseling on screening as a more effective approach in improving CRC screening rates among racial/ethnic minority groups and low-income populations [50, 51]. More work is needed on educating and informing AA ethnic groups on the disease process of CRC and the primary role of screening to prevent cancer to optimize CRC screening rates among AA. Parallel to previous studies [49, 50], intervention efforts should focus on increasing physician efforts to provide CRC screening recommendation and counseling.

It is important to take into consideration the barriers physicians experience when aiming to provide recommendation for screening. For instance, time constraints experienced by physicians have been noted as barriers when attempting to educate their patients about the concept of preventive medicine and screening practice, let alone the option in screening modalities and their respective risk and benefits [49]. Thus, it may not be feasible nor prioritized among physicians and hinder them from recommending screening to their patients [49]. This can prevent or delay opportunity for maximum cancer literacy to be achieved, and in turn, can have great impacts on whether an individual decides to undergo cancer screening [50]. Time has been consistently identified as a salient barrier [51] and challenges have been recognized when balancing multiple and competing priorities in limited office visits [52]. Feasible and cost-effective systemic changes on the healthcare systems level need to be placed in the forefront. Strategies to better support the PCP and the interdisciplinary healthcare team should be implemented that maximize their respective roles to advance shared and informed decision-making of the patients. This should be carefully considered as findings have indicated the value of having both CRC screening discussions and a physician's recommendation for a specific modality to increase the likelihood of adherence to screening guidelines [53].

Culturally responsive community-based intervention efforts should also be considered when aiming to support cancer screening behaviors. For example, studies have highlighted the effectiveness of community health workers in improving CRC screening [54] and among Asian American populations [55, 56]. Moreover, when providing health education to ethnic populations, non-traditional but culturally appropriate and accepted sources should be considered as effective health promoters in lieu of traditional healthcare facilities. Studies have emphasized the benefits of including media sources as an appropriate disseminator of health information for AA [57]. For instance, one study revealed variations in the use of health information sources among AA subgroups with print media sources (i.e., newspapers, magazines, and journals), television, and the Internet being highly used by KAs and print media sources by CAs [57]. Another study also found that KAs were more likely to seek health information from newspapers, magazines, and the Internet than native Koreans [58]. Interventions targeting education on CRC screening among AA may be more effective with the inclusion of recruiting culturally appropriate non-traditional health sources as trusted and effective health information disseminators.

Determinants to CRC Screening Among Chinese Americans

Culture was identified as a noteworthy dimension within the predisposing characteristics for CA. One of the CA studies examined cultural barriers and used the Suinn-Lew Asian Self-Identity Acculturation Scale to measure levels of acculturation to Western culture that were associated with having undergone screening [35]. Greater acculturation level was measured by higher mean score for each of the dimensions of culture that was included in their measurement including generation/geographic history and language usage and fluency [35]. Interestingly, this study showed that higher number of years in the USA and having higher English proficiency were barriers to CRC screening for CA. This contradicts previous studies among the aggregated AA population that concluded the aforementioned factors as facilitators to screening [55, 56]. This contradiction showcases the different impacts proxies of culture have on CRC screening across AA subgroups, and it serves as a reminder to the multi-faceted nature of operationalizing culture and acculturation. Nevertheless, it is important that unaddressed cultural barriers, in addition to, barriers in the US healthcare system can discourage AA subgroups from using screening and early detection services [59]. Community outreach, education efforts, and trusting partnerships with community-based organizations and traditional providers may be beneficial especially when aiming to increase CRC screening among CA. Ethnic groups tend to use their respective culture's healing/wellness practices alone or in conjunction with the US biomedical system [60]; therefore, it is also imperative to examine how various health practices intersect and influence one's decision to undergo a Western form of preventive care.

Psychological constructs, if targeted, may promote success when attempting to optimize screening behavior among CA. Barriers to screen included specific emotional challenges ranging from fear, embarrassment, and worries throughout the entire spectrum of the screening process. In turn, perceived susceptibility for CRC facilitated screening uptake. Providing psychoeducation on the CRC disease process and screening options and processes as a community outreach focus can correct false beliefs and information that may be contributing to the psychological barriers associated with CRC screening. As patients typically meet with a physician to access the CRC screenings, it is imperative that the healthcare system is composed of team members who are invested in and willing to enhance patient health literacy, as well as supportive services to support patient's screening behavior.

Determinants to CRC Screening Among Filipino Americans

Unique from the other studies in this sub-analysis, one study included a variable describing the communication with healthcare provider among FA [39]. Their multivariate logistic regression analysis revealed that "very easy communication with healthcare provider" was a significant predictor to CRC screening adherence. Previous studies have emphasized the importance of various dimensions within patient-provider relations (e.g., quality of communication with healthcare providers) in improving health management and outcomes [55] and in reducing ethnic disparities in healthcare [61]. Moreover, attempts to examine health literacy among AA with consideration of those who have limited English proficiency have gone underway [62–64]. A study in this review showed that respondents who speak English only, a skill that can support patient-provider communication, were a facilitator to screening uptake [24].

Determinants to CRC Screening Among Korean Americans

All dimensions within the predisposing characteristics were shown to influence CRC screening; however, the healthcare-related factors warrant a closer examination in this subgroup. Access to healthcare measured by having insurance yielded a facilitative role to CRC screening. It is important to note that previous findings have commonly cited having insurance as a facilitator to screening uptake [65, 66]. However, high uninsurance rates have also been noted among KA compared to other AA subgroups [67]. Focused strategies should be prioritized to increase access to healthcare for KA.

A systematic review examining the facilitators to CRC screening among KA revealed that less acculturation to the USA and high cost appear to be important barriers to undergoing screening [11]. Both of which can impact one's access to healthcare. This review showed that higher acculturation measured by higher English proficiency and longer length of US residency facilitated screening for KA. It is imperative to understand that having healthcare insurance may just be a preliminary step in the right direction; however, it may be insufficient to guarantee whether one decides to undergo CRC screening. Moreover, individual's understanding of their specific type of health insurance coverage and respective benefits may be an important arena to investigate [68] among AA subgroups.

Determinants to CRC Screening Among Japanese Americans

Confirming previous study findings among the general population, similar sociodemographic factors including age, male, married, and income were found to facilitate screening uptake [69]. This is not surprising as studies have found JA to have the highest screening rates out of the other AA subgroups and similar screening rates to non-Hispanic Whites [12]. This appears to compliment another study using SEER dataset, which found statistically significant declines for CRC incidence between 1990 and 2008 among JA [10].

Important healthcare-related factors and cues to action were noted for this AA subgroup, and like FA, there was one study in this sub-analysis that touched on patient/provider communication as a significant predictor to screening uptake [43]. This reinforces the potential benefits of examining the information sharing process and the experience of JA throughout the decision-making process to adhere to CRC screening.

As AA are generally considered to be composed of sociocentric ethnic groups as opposed to individualistic, a study raised an interesting inquiry regarding the role of subjective norms and social support from friends for explaining CRC screening adherence [43]. Interestingly, this was the only study in this review that examined the role of informal social support and revealed emotional friends support and subjective norm (i.e., the perceived social pressure to engage or not to engage in a health behavior) from family and friends as important factors that both directly and indirectly affected screening adherence [43]. This finding highlights the potential benefits of understanding the difference between sociocentric and individualistic cultures and how behavioral norms such as undergoing cancer screening can be greatly influenced by subjective norms of the individual's informal social support (i.e., family and friends). The possible invitation and the inclusion of the screening eligible individual's family and friends may be beneficial throughout the entire decision-making process to provide informational and emotional support to the individual.

Limitations

This systematic literature review should be comprehended in the context of its limitations. For instance, eligible studies published in other databases not included in this review's search could have been overlooked. With regards to the included studies in this review, data collection methods and analyses were heterogeneous between studies, and majority of the study in this review were cross-sectional in design and used self-reported questionnaires for data collection. The latter raises susceptibility to response bias. Additional heterogeneity in the studies should be noted with respect to the different age ranges for CRC screening used in the publications in this review. However, only four publications included younger age range (<50 years), and majority complied with the start age of 50. Thus, the impacts on the study results, and in turn, this review's findings should be generalized with caution.

Future Research

Suggestions for future research can be made from this study. First, the cultural influences on screening behaviors, particularly for CA, were notable in this review. One definition of culture is "the core, fundamental, dynamic, responsive, adaptive, and relatively coherent organizing system of life designed to ensure the survival and wellbeing of its members and is shared always to find meaning and purpose throughout life and to communicate caring" [59]. This definition imposes a strength perspective of the cultural identity of ethnic groups; however, this review's findings displayed two proxies of culture as facilitators to CCSP, higher acculturation and English language proficiency, of which the latter yielded different impacts across the subgroups. Both of these variables emphasize an acculturation to Western traditions and practice for health benefits, and noticeably in this review, no mentions were made of any cultural variables that highlighted the unique strengths of each AA subgroups' culture and traditional health practice. As a critical reminder, culture cannot be understood so simply as a collection of beliefs and values that can be easily exchanged with Eurocentric ideologies [59]. The multifaceted definition of culture itself warrants deeper investigation when included as a construct in studies focusing on screening behaviors among distinct AA subgroups.

In addition, examining other potentially significant dimensions of patient-provider relations (e.g., how and what information is relayed to the patients and patients' experiences regarding the transaction of information) appears to be limited in cancer screening research among AA subgroups and deserves further investigation. Qualitative studies examining patient's experience with their provider when discussing CRC screening may be beneficial in understanding the perceived physician and healthcare systems level barriers. Moreover, it may be beneficial to investigate the inclusion of other identified support networks (i.e., family and friends) as a valid agent of change for the patient when discussing screening options. Finally, further investigation is needed on the influence of ethnic culture's behavioral norm especially in sociocentric groups such as AA subgroups. With this understanding, the roles of family and friends can be reinforced when aiming to promote an individual's CCSP.

Conclusion

Numerous predisposing characteristics, psychological constructs, and cues to actions were identified as determinants to CCSP in this review, and this review showcased two areas in need of continued support and intervention across all the AA subgroups: (1) participants' unawareness of screening tests and having no problems/symptoms of CRC and (2) physician recommendation. Addressing the barriers within the predisposing characteristics' personal health dimension can increase accurate knowledge of CRC disease-process and screening options, and improving physician CRC screening recommendation together can have substantial impacts on AA CRC screening rates. Due to the great heterogeneity of this racial group, different determinants influencing CCSP for each subgroup were expected. Therefore, it is imperative that a comprehensive approach takes into consideration cultural factors and healthcare-related barriers when addressing the CRC screening disparities among AA. A one-size-fits-all approach will not be effective and tailored approaches to improve CCSP includes addressing the cultural and psychological factors for CA, healthcare-related factors for FA, KA, and JA, and cues to action for FA and JA. This review supplements our current understanding of the facilitator and barriers to CCSP across multiple AA subgroups. Findings from this study can be used to inform targeted areas when developing tailored interventions to promote CCSP for AA subgroups.

Compliance with Ethical Standards The author declares that she has no conflict of interest.

This article does not contain any studies with human participants or animals performed by any of the authors.

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