Colorectal Cancer Screening Rates among Adult Minorities in California

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Abstract

Colorectal cancer is a prevalent and potentially fatal disease that affects the colon and rectum. Early detection through regular screenings significantly improves the chances of successful treatment. Despite its importance, there are disparities in screening rates among different racial and ethnic groups, particularly among minorities. This research paper presents a comparative analysis of colorectal cancer screening rates among adult minorities in California.

The study utilized data from the California Health Interview Survey (CHIS) 2021 Adult Survey [1]. Moreover, the data from the CHIS was compared with publicly available information from the Centers for Disease Control and Prevention (CDC) on colorectal cancer screening rates for minority populations. The findings indicate significant disparities in colorectal cancer screening rates among racial/ethnic minority groups compared to non-Hispanic whites. Factors such as access to care, insurance coverage, and language barriers contribute to these discrepancies.

The study highlights the need for interventions to improve colorectal cancer screening rates among minority populations. Addressing the barriers to access and promoting cultural competence in healthcare services may help reduce the disparities.

Keywords: Colorectal Cancer; Racial and Ethnic Groups; Minorities; Access To Care; Public Health; Health Disparities; Language Barrier

Introduction

Colorectal Cancer (CRC) is a type of cancer that starts in the colon or rectum. The colon is the large intestine, and the rectum is the end of the large intestine where it connects to the anus. Symptoms of the disease vary depending on the stage of the cancer but present themselves through changes in bowel habits, rectal bleeding, abdominal pain, weakness, fatigue, and unexplained weight loss. Treatment for CRC also depends on the stage of the cancer and can vary from requiring surgery, chemotherapy, and/or radiation therapy [2]. Prior studies support the purpose of this work such as Jackson, et al. [3], who examined racial and ethnic disparities in CRC and their incidence and mortality in the United States (U.S). The authors also use data from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program to compare CRC incidence and mortality rates among Caucasian African American (AA), Hispanic (HA) and Asian adults [4]. The authors found that incidence and mortality rates are consistently higher among minority adults than among white adults.

CRC develops almost and probably always from precancerous polyps (i.e., abnormal growths) discoverable during a screening test (e.g., "barium enema, colonoscopy, sigmoidoscopy, or virtual colonoscopy"), in the colon or rectum [5]. If the precancerous polyps are found early, they can be removed before turning into cancer and when treatment works best. Both Jacksons F, et al. [3] and the SEER

program validate this study's assumption that there is continued disparate screening rates for CRC in the California minority adult population. While all identified factors cannot be considered in the supporting literature, this study leverages variables that denote the ability of patients or respondents to access care as it pertains to preventative measures for CRC [6].

Furthermore, racial disparities in CRC incidents and mortality are widely documented and relative to non-Hispanic Caucasians, Non-Hispanic African Americans (AA) tend to have higher rates of CRC incidents resulting in calls for earlier initiation of CRC screening for AA male patients. For example, the American College of Physicians, (2012) [7], recommended that AAs should begin screening at early as 40 years of age. Additionally, in 2017, the U.S. Multi-Society Task Force on CRC suggested that AAs begin screening at age 45 but noted that the evidence to support this recommendation was of low quality; and finally, in 2018, the American Cancer Society issued a qualified recommendation that all individuals begin screening at age 45 [8]. According to Hartman ANB, et al. [9], the percentage of patients with timely completion of CRC screening episodes was higher in health systems with mailed Fecal Immunochemical Test (FIT) CRC screening approaches; yet racial/ethnic disparities persisted in these systems. These disparities may be mitigated by targeted approaches, including targeted outreach that clearly presents multiple options for CRC screening [9].

May FP, et al. [10] found that CRC screening rates in the U.S. were significantly higher each year from 61.1% in 2008 to 67.6% in 2016. In general, Caucasian Americans (CA) had the highest rates, followed by African American (AA). Hispanics Americans (HA) had the lowest screening rates. In 2008, the rate among Hispanics was 19.2% lower than the rate among CAs, and this disparity was only slightly reduced to a 17% difference in 2016. Asians American, Native Hawaiian (NW)/Pacific Islander (PI), and multiracial individuals also saw a decrease in disparity over time when compared with whites by 5.6%, 2.3%, and 4.4%, respectively. The disparity increased by 0.7% in AAs and by 2.3% in American Indians (AI)/Alaskan Natives (AN) over the study period [10].

The U.S Preventive Services Task Force (USPSTF) ranks CRC as the third most diagnosed cancer among adults, estimated to affect at least 50,000 individuals in the U.S. annually [11]. Alarmingly, it is also the second leading cause of cancer-related deaths, where diagnoses are most frequent among persons 65 to 74 years of age [12]. There is reason for hope, however, as early detection significantly increases the chances of successful treatment. Hence, the significance of regular screenings for CRC is one of interest and importance.

Screening tests play a crucial role in identifying precancerous polyps, abnormal growths in the colon or rectum that have the potential to progress into cancerous tumors. The timely removal of these polyps can effectively prevent the development of CRC [5]. A range of screening tests are available to detect CRC, catering to different preferences and circumstances. These include the Fecal Occult Blood Test (FOBT) (i.e., minuscule traces of blood can be detected in the stool), the Flexible Sigmoidoscopy (i.e., a thin, flexible tube equipped with a camera permits the examination of the lower part of the colon and rectum), and a Colonoscopy for a more comprehensive evaluation (i.e., a long, flexible tube with a camera on its end is used to inspect the entire colon and rectum) [13]. The American Cancer Society (ACS) has issued guidelines urging adults between the ages of 45 and 75 to undergo regular screening for CRC. Nevertheless, individuals at a higher risk of developing this malignancy, such as those with a family history of the disease, may require earlier and more frequent screening. Consequently, consultation with healthcare providers is essential to determine the appropriate screening schedule based on individual risk factors [14].

Problem Statement

CRC is a leading cause of cancer death and may potentially affect certain minority populations at higher rates. While the healthcare continuum strives to service patients in equitable ways, there may be unaddressed factors needing to be uncovered for the resolution and furtherance of equitable approaches to care. A recent study by Knowlton LM, et al. [15] speaks to at least three unaddressed factors contributing to health inequities. These include Social Determinants of Health (SDOH), implicit bias, and lack of diversity in the workforce. The authors argue that SDOH conditions have a significant impact on health outcomes, and are often unequally distributed across population groups. Implicit bias also contributes to inequities in quality care when providers are less likely to believe or trust patients of color. Finally, the disproportionate lack of workforce diversity leads to a gap in the cultural understanding of patient backgrounds and how this may influence the use of preventative care.

Additionally, Yearby R [16], examined the relationship between structural racism and racial disparities in health status and access to healthcare in the U.S. Yearby R [16], then argues that structural racism is a major contributor to racial disparities in health status. The authors note that structural racism creates barriers to healthcare access for people of color and that these barriers lead to poorer health outcomes. In addition, structural racism creates a climate of fear and distrust among people of color, which makes them less likely to seek healthcare [16]. It can then be argued that structural racism is a major public health problem in the U.S. and calls for a comprehensive approach to addressing structural racism, including policy changes, community organizing, and education [16].

Purpose of the Study

Recognizing that CRC is a significant public health concern for all populations, additional focus is highlighted on disparities in screening activity and disease outcomes among different racial and ethnic groups. Minority populations, including AA, Hispanics, and Native Americans, tend to have higher incidence rates and poorer survival rates compared to non-Hispanic whites [17]. Islami F, et al. [18] further studied cancer disparities and attributed them to differences in risk factor exposure, early detection, and access to preventive care and treatment. An article in the American Cancer Society (ACS) (2020) also states that AA and have the highest incidence of CRC, at least 20% more than the next racial group, in the U.S.

The purpose of this study was to determine the CRC screening rates among minority adults in California, demonstrate the disparate screening rates among minority groups compared to white adults, and identify contributing factors in the results. The authors of this research found several contributing factors regarding the prevalence of CRC among minority populations such as the likelihood of minority populations being uninsured or underinsured, making access to preventive care like a CRC screening difficult. The same population is also more likely to live in poverty, which can lead to poor diet, lack of exercise, and other risk factors. Finally, minority populations are less likely to be screened for CRC than white populations due to lack of access to care, lack of awareness regarding CRC screening importance, and fear of the test itself [19].

Andrulis DP [20] discussed socioeconomic disparities in health with a focus on access to care and concluded that eliminating financial barriers to care is essential to reducing socioeconomic disparities in health. Financial barriers to care are a major contributor to socioeconomic disparities in health, noting that the uninsured are more likely to have unmet health needs and that they are also more likely to forgo needed care. Furthermore, uninsured individuals are more likely to experience delays in receiving care and are more likely to receive lower-quality care. There are a number of policy options that could be used to achieve the elimination of financial barriers including Medicaid expansion, health insurance subsidies, and creating additional public health insurance programs.

Significance of the Study

A lot is still unknown about the effectiveness of screening various populations. One possible reason for the existing lack of research in this area is the complexity involved with CRC disparity screening (e.g., access to care, socioeconomic status, and cultural beliefs). As a result, it is challenging to examine these factors in a meaningful way [9]. By design, this study looks solely at publicly available information collected from the University of California, Los Angeles (UCLA) Center for Health Policy Research, California Health Interview Survey (CHIS), where variables identify as: adult population, race/ethnicity, spoken language, and completion of any type of CRC screening [21]. Additionally, the data analyzed from CHIS is compared against relevant information publicly available from the Centers for Disease

Control and Prevention (CDC) as it pertains to CRC screening, with a focus on minority populations. The findings of this study could also have implications for the development of interventions to improve CRC screening rates and also identify populations that are at risk for CRC so testing can be done as soon as possible.

Limitations

This study has a number of limitations, including:

• The data from CHIS and the CDC may not be perfectly comparable.

• The study is observational only and based on available data which cannot establish true causality.

Research Design and Methods

The primary population in CHIS data is adults (i.e., 18 years and older) living in California. Based on specific variables outlined below, information was compared to national averages from other CDC data sets. The primary data set used for this study is the CHIS 2021 Adult Survey Data File. It consists of individual records obtained from the 2021 collection period of the CHIS 2021-2022 Adult survey [22,23]. CHIS is a state wide, Random-Digit-Dialed (RDD) telephone survey of California residents conducted by the UCLA Center for Health Policy Research.

The CHIS data collection methodology is designed to ensure that survey results are representative of the California population. To capture the rich diversity of the California population, interviews were conducted in six languages: English, Spanish, Chinese (Mandarin and Cantonese dialect), Vietnamese, Korean, and Tagalog [23]. These languages were chosen based on an analysis of the 2010 Census data which identified the languages used by the largest number of Californians in the CHIS sample that were not English speakers or did not understand English well enough to otherwise participate. CHIS (2023) data was collected through a variety of methods, including:

• RDD telephone interviews: This is the main method of data collection for CHIS. Respondents are randomly selected from a list of phone numbers in California.

• Web surveys: CHIS also offer a web survey option for respondents who prefer to complete an online survey.

• In-person interviews: CHIS conducted in-person interviews with a small number of respondents who were unable to complete the survey by phone or online.

Included in this research is data collected by the CDC on CRC prevalence and CRC screening rates from a variety of sources including:

• **National Health Interview Survey (NHIS):** The NHIS is a national representative survey of households in the U.S. [24]. The survey collects data on a wide range of health topics, including CRC prevalence and CRC screening rates [25].

• **Behavioral Risk Factor Surveillance System (BRFSS):** The BRFSS is a state-based survey of adults in the U.S. and collects data on a wide range of health topics, including CRC prevalence and CRC screening rates (Centers for Disease Control and Prevention, 2012).

• **Cancer Control Objectives (CCOs):** The CCOs are a set of national goals for cancer prevention and control through a number of ways including reducing CRC prevalence and increasing CRC screening rates [26].

• **National Cancer Institute (NCI) Surveillance, Epidemiology, and End Results (SEER) Program:** The SEER Program is a population-based cancer registry that collects data on cancer incidence, mortality, and survival in the U.S. and includes data on CRC prevalence and CRC screening rates [27].

The CDC uses the data collected from these sources to track trends in CRC prevalence and CRC screening rates. The data is also used by the CDC to develop and evaluate programs to reduce CRC prevalence and increase CRC screening rates.

Research Design

The primary research questions for this study attempt to provide answers to:

• What are the CRC screening rates among adult minorities in California?

• Are there significant differences in CRC screening rates among racial/ethnic minority groups?

• Are there are differences in CRC screening rates and what are potential contributing factors?

Independent Variables

Race/ethnicity: The main independent variable in this study compares CRC screening rates among different racial/ethnic minority groups in California.

Access to care: This variable measures the use of health insurance and if a usual source of care is utilized.

Language barriers: A variable measuring the participants' ability to speak English and understand.

Dependent variables

• **CRC screening completion:** This dependent variable is of particular interest in this study because it measures the percentage of CHIS respondents who state they have been screened for CRC by completing a home blood stool test, sigmoidoscopy, colonoscopy, or proctoscopy.

Data Analysis Techniques

The data was analyzed using a variety of statistical methods including descriptive statistics, bivariate analyses, and chi-square analyses. Data from CHIS is analyzed using IBM SPSS. In addition, an observational analysis of data sourced through the CDC was made through interpretations.

The table 1 shows the percentage of 2021 Adult CHIS respondents by race/ethnicity in California. The table shows that most people in California are white (64.6%). The next largest racial/ethnic group is Hispanic or Latino (39.1%). Other racial/ethnic groups include Asian (16.5%), AA (4.5%), American Indian or Alaska Native (2.25%), Native Hawaiian or Pacific Islander (0.6%), and Other (7.1%).

The table 2 shows the stratification of people by race/ethnicity in California who have a personal doctor as their main medical provider. The data is based on responses from 2021 Adult CHIS data [28]. The table shows there are significant disparities in the percentage of people by race/ethnicity who have a personal doctor as their main medical provider. Caucasian adults are more likely to have a personal doctor as their main medical provider than other racial/ethnic groups. Specifically, 72.2% of Caucasian adults have a personal doctor as their main medical provider, compared to 64.4% of Asian Americans, 58.9% of Native Hawaiians/Pacific Islanders, 52.4% of Latinos, and 46.7% of AAs [28].

Table 1: Frequency table of 2021 Adult CHIS respondents based on Race-Census.

Race	Frequency	Valid Percent
Other Single Race	1735	7.1%
American Indian/Alaskan Native	529	2.2%
Asian	4026	16.5%
African American	1099	4.5%
White	15787	64.6%
More than one Race	1277	5.2%
Total	24453	100.0%

Table 2: Bivariate Analysis of 2021 Adult CHIS Responses for R and have a Personal Doctor as Main Medical Provider.

Race	Have A Personal Doctor as Main Medical Provider			
	Inapplicable	Yes	No	Total
Other Single Race	273	1253	209	1735
American Indian /Alaskan Native	62	417	50	529
Asian	451	3202	373	4026
African American	97	913	89	1099
White	1488	13724	1025	15787
More than one Race	171	989	117	1277
Total	2542	20048	1863	24453

The findings of the bivariate analysis suggest there is a need for increased efforts to improve access to a personal doctor as a main medical provider for racial/ethnic minority groups in California. These efforts should focus on increasing the number of primary care providers in underserved communities, providing transportation assistance those needing it, and addressing language barriers.

The bivariate output shows the relationship between race/ethnicity and the level of English proficiency in California. The data is based on responses from 2021 Adult CHIS data [28]. The table 3 shows there is a general but significant association between race/ethnicity and level of English proficiency. Therefore, white adults are more likely to be proficient in English than other racial/ethnic groups.

The findings of the bivariate analysis suggest there are significant disparities in English proficiency by general race/ethnicity. Caucasian adults are more likely to be proficient in English than other racial/ethnic groups. This disparity is likely due to several factors, including language acquisition opportunities, socioeconomic status, and cultural beliefs [29]. The findings of the bivariate analysis suggest there is a need for increased efforts to improve English language proficiency for racial/ethnic minority groups in California. These efforts should focus on providing English language classes, giving resources to people need them, and addressing cultural beliefs that discourage learning the English language.

The chi-square test shows there is a significant association between race/ethnicity and if a person has had a home blood stool test (Table 4). The p-value is less than 0.001, which means the association is statistically significant. The findings of the chi-square test also suggest there are significant disparities by race/ethnicity in the likelihood of having ever completed a home blood stool test. Caucasian adults are shown to be more likely to have had a home blood stool test than adults from other racial/ethnic groups. This disparity is likely due to a

number of factors, including access to care, socioeconomic status, and cultural beliefs (National Center for Education Statistics, 2001).

The chi-square test shows there is a significant association between race/ethnicity and if a person has had a home blood stool test. The p-value is less than 0.001, which means that the association is statistically significant. Similar to the previous chi-square test above, this analysis suggests there is a need for increased efforts to improve the provision of sigmoidoscopy, colonoscopy, or proctoscopy for racial/ethnic minority groups in California (Table 5).

Additional analyses were conducted based on information sourced from the Centers for Medicare and Medicaid National Health Interview Survey Archives [30]. Arispe IE, et al. [31] published a report that provides an overview of the health status for the U.S population in 2019, with a focus on key indicators such as mortality, morbidity, and health behaviors. The report found that the overall health status of the U.S population had improved over time. However, there are still significant disparities in health outcomes among racial and ethnic groups. For example, Black and Hispanic adults have higher rates of chronic diseases, such as heart disease, stroke, and cancer, than white adults. They also have lower rates of preventive care, such as CRC screening as presented in a comprehensive table 6.

The table 6 below shows the use of colorectal tests or procedures among adults aged 50–75, by selected characteristics in the U.S selected years 2000–2018. The data shows the use of CRC screening has increased over time, but there are still significant disparities in

Table 3: Bivariate Analysis of 2021 Adult CHIS Responses for Level of English Proficiency and Race.

Race	Level of English Proficiency; General			
	Inapplicable	Very Well	Well	Not At All
Other Single Race	447	742	305	51
American Indian / Alaskan Native	283	179	39	9
Asian	1236	1340	892	72
African American	985	91	12	2
Caicasian	12375	2344	659	92
More than one Race	957	262	37	4
Total	16283	4958	1944	230

Table 4: Chi-square test of 2021 Adult CHIS Responses for Race and Ever had Home Blood Stool Test.

	Value	df	Asymptotic Significance (2_sided)
Pearson Chi- Square	231.664[a]	10	<.001
Likelihood Ratio	232.347	10	<.001
Linear-by-Linear Association	57.283	1	<.001
N of Valid Cases	24453		

Table 5: Chi-square test of 2021 Adult CHIS Responses for Race and ever had Sigmoidoscopy, Colonoscopy or Proctoscopy.

	Value	df	Asymptotic Significance (2_sided)
Pearson Chi- Square	306.115[a]	10	<.001
Likelihood Ratio	312.681	10	<.001
Linear-by-Linear Association	38.456	1	<.001
N of Valid Cases	24453		

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Table 6: Characteristics of Study Participants, National Health Interview Survey 2010–2018.

Characteristics	All n=43,624 n (weighted %)	Non-Hispanic White n=30,368 n (weighted %)	Non-Hispanic Black n=6,222 n (weighted %)	Hispanic/Latino n=5,057 n (weighted %)	Asian American/ Pacific Islander n=1,977 n (weighted %)
Age (years), weighted mean (SD)	61.4(7.2)	61.6 (7.1)	60.8(7.1)	60.4(7.2)	61.0 (7.4)
Age(years)					
50–64	27,848(64.4)	18,978(63.5)	4,134 (68.4)	3,449(67.8)	1,287(63.8)
65–75	15,776(35.6)	11,390(36.5)	2,088(31.6)	1,608(32.2)	690(36.2)
Sex					
Male	19,650(45.6)	13,971(46.2)	2,650(42.8)	2,127(44.2)	902(45.5)
Female	23,974(54.4)	16,397(53.8)	3,572 (57.2)	2,930(55.8)	1,075(54.5)
Marital status					
Never married	4,710 (10.5)	2,716(9.2)	1,287(20.2)	545(10.5)	162(6.9)
Married/partner	23,329(54)	17,217(56.4)	2,063(33.4)	2,715(54.9)	1,334(69)
Separated/divorced/ widowed	15,487(35.2)	10,365(34.2)	2,857 (46.1)	1,786(34.4)	479(24)
Unknown	98(0.3)	70(0.3)	15(0.3)	11(0.2)	2(0.1)
Educational attainment					
Less than HS	5,140(10.3)	2,003(6.6)	1,036(15.5)	1,897(34)	204(9.2)
HS graduate	12,545(28.4)	8,660(28.2)	2,101(33)	1,363(27.4)	421(19.8)
Some college	12,936(29.9)	9,517(31)	1,919 (31.2)	1,081(22.7)	419(21)
College graduate	12,858(31.1)	10,120(34)	1,140(19.8)	680(15.2)	918(49.2)
Unknown	145(0.3)	68(0.2)	26(0.5)	36(0.7)	15(0.7)
Employment status					
Employed	23,946(55.8)	17,092(56.6)	3,019 (50.3)	2,664(53.8)	1,171(60.1)
Not employed	19,678(44.2)	13,276(43.4)	3,203(49.7)	2,393(46.2)	806(39.9)
Annual house hold income (dollars)					
0<30k	13,814(29.6)	7,854(25.4)	3,087(47.5)	2,370 (43.7)	503(23)
30k<55k	10,494(23.7)	7,312 (23.8)	1,475(23.4)	1,255(24.1)	452(22.7)
55k<100k	10,234(24)	7,763(25.5)	1,108(18.7)	931(19.8)	432(20.7)
≥100k	9,082(22.7)	7,439(25.3)	552(10.4)	501(12.4)	590(33.6)
Health insurance					
Uninsured	3,707(7.9)	1,972(6.5)	649(10)	910(16.8)	176(7.8)
Private	26,251(62.1)	20,069(66.4)	2,910(48.8)	2,105(43.6)	1,167(61.1)
Medicaid/VA	3,284(6.9)	1,611 (5.3)	798(12.6)	690(12.8)	185(8.6)
Medicare	9,489(21.1)	6,129 (19.9)	1,712(26.1)	1,248 (24.7)	400(20.1)
Unknown	893 (2)	587(1.9)	153(2.5)	104(2.1)	49(2.5)
Usual place of care					
Yes	40,144(92.3)	28,204(92.8)	5,755(92.5)	4,377(87.3)	1,808(92.1)
No	3,477(7.7)	2,163(7.2)	466(7.4)	679(12.6)	169(7.9)
Unknown	3(0)	1(0)	1(0)	1(0)	0(0)
U.S. citizenship					
Yes	41,625(96.2)	30,076(98.9)	6,075(97.5)	3,822(77.1)	1,652(84.2)
No	1,970(3.7)	284(1.1)	144(2.4)	1,220(22.5)	322(15.6)
Unknown	29(0.1)	8(0)	3(0.1)	15(0.4)	3(0.2)
Time in the U.S.					
U.S.-born	36,816(86.3)	29,007(95.1)	5,644(90.2)	1,764(35.8)	401(18.8)
Foreign-born, ≥15 years	5,949(12.1)	1,258(4.5)	486(8.4)	2,875(56.5)	1,330(69.1)
Foreign-born,<15years	859(1.6)	103(0.4)	92(1.5)	418(7.8)	246(12.1)
Survey year					
2010	8,590(20.9)	5,571 (21.4)	1,430(20.6)	1,141 (18.9)	448(17.9)
2013	12,537(25.9)	8,502(26.2)	1,959(25.9)	1,511(24.4)	565(24.5)
2015	12,185(24.8)	8,511(24.8)	1,668(24.5)	1,460(25)	546(26)
2018	10,312(28.3)	7,784(27.7)	1,165(29.1)	945(31.7)	418 (31.5)

HS: high school, k: thousand, VA: Veteran Affairs * [32].

screening rates among different population groups. For example, in 2018, 62.4% of adults aged 50–75 had received a CRC screening test, but this rate varied by race and ethnicity. White adults had the highest screening rate (65.6%), followed by Black adults (58.2%), Hispanic adults (47.4%), and Asian adults (52.3%).There were also disparities in screening rates by sex. In 2018, 64.1% of women had received a CRC screening test, compared to 59.6% of men. The table also shows that screening rates are lower among adults with lower incomes. In 2018, 45.6% of adults with incomes below 100% of the federal poverty level had received a CRC screening test, compared to 64.1% of adults with incomes at or above 400% of the federal poverty level.

Another study, conducted by Rodríguez EJS, et al. [32], used data from NHIS (see table 6 below) to evaluate information for the years 2010-2018. Lower CRC screening rates were found among recently immigrated foreign-born (FB) people (<15years) and higher for more established FB individuals (≥ 15years) and individuals U.S born. Factors to explain these patterns included an analyses which varied by race and ethnicity. Sociodemographic information, health care access variables, and U.S citizenship accounted for differences in CRC screening adherence among Latino individuals and White and Black individuals who were FB and had lived at least 15 years in the U.S However, Caucasian, and African American individuals with <15years in the U.S and all Asian American/Pacific Islander (AAPI) individuals who were FB (regardless of the length of residence) had lower CRC screening prevalence than their U.S born counter parts even in fully adjusted models.

Rodríguez EJS, et al. [32] further reported that prevalence of CRC screening adherence was 63% over all, 64% for U.S. born, 55% for foreign-born ≥ 15years, and 35% for foreign-born <15 years. In fully adjusted models for all individuals, only foreign-born <15years had lower adherence than U.S. born (foreign-born ≥ 15 years: prevalence ratio=0.97 [0.95, 1.00], foreign-born <15years: prevalence ratio=0.79 [0.71, 0.88]). Results differed by race and ethnicity (p-interaction=0.002). In stratified analyses, findings for non-Hispanic Caucasian individuals (foreign-born ≥ 15 years: prevalence ratio=1.00 [0.96, 1.04], foreign-born <15 years: prevalence ratio=0.76 [0.58, 0.98]) and non-Hispanic AA individuals (foreign-born ≥ 15 years: prevalence ratio=0.94 [0.86, 1.02], foreign-born <15 years: prevalence ratio=0.61 [0.44, 0.85]) were like all individuals. Disparities by time in the U.S. were not observed among Hispanic/Latino individuals (foreign-born ≥ 15 years: prevalence ratio=0.98 [0.92, 1.04], foreign-born <15 years: prevalence ratio=0.86 [0.74, 1.01]) but persisted among AAPI individuals (foreign-born ≥ 15 years: prevalence ratio=0.84 [0.77, 0.93], foreign-born <15 years: prevalence ratio=0.74 [0.60, 0.93]).

Conclusion

This study helps to achieve potential health equity in cancer screening for racial/ethnic minority groups and adult minorities in California. The results showed that Hispanic adults had the lowest CRC screening rates, followed by AA and Asian adults while Caucasian adults had the highest screening rates. The study also found that language barriers and the lack of health insurance were associated with lower CRC screening rates among minority adults.

According to Demb J, et al. [6] health equity has been defined as achieving the absence of avoidable, unfair, or remedi able differences among groups of people, including racial/ethnic groups. Specific to CRC screening, we believe our research supports the National Colorectal Cancer Round table's concept of achieving 80% screening in every community as an optimal, achievable metric of health equity [33]. To achieve this, the findings of this study suggest there is a need

to implement targeted interventions to improve CRC screening rates among minority adults in California. These interventions should address root causes preventing minority adults from getting screened such as language barriers and lack of health insurance.

This study highlights the importance of CRC screening, especially for minority populations [34]. CRC is the third most common cancer in the U.S and it is more prevalent in minority populations. Early detection and treatment are essential for improving survival rates, and screening is the best way to achieve this. A number of factors contribute to disparities in CRC screening rates among minority populations. These include lack of access to care, language barriers and implied socioeconomic status, and cultural beliefs. Additionally, it is noted that structural racism can create barriers to healthcare access for people of color. Finally, the findings have implications for the development of interventions to improve CRC screening rates among minority populations and provides contributory insights into the disparities in CRC screening rates among minority populations.

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