The Biracial Asian Population in California: An Examination of Health Profiles and Chronic Conditions

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Objectives: To examine health outcomes and chronic conditions for the biracial Asian population in California. We hypothesized that the biracial population will display intermediate (or an average of) outcomes in comparison to their monoracial counterparts.

Design: The study was cross-sectional. After adjusting for sociodemographic variables, multivariable regression models predicted health outcomes (ie, diabetes, heart disease, high blood pressure, disability status, BMI, and general health) and compared health outcomes among various (mono- and bi-) racial and ethnic groups.

Participants: Data were collected from 238,897 adult (aged ≥18 years) respondents after merging iterations of the California Health Interview Survey (CHIS) administered in 2001, 2003, 2005, 2007, and 2009.

Results: Multivariate results revealed that Whites reported better health overall than biracial Asians and other monoracial groups. Biracial Asians displayed BMI ranges that were intermediate between their monoracial constituents.

Conclusions: BMI is a more proximal health outcome and is more sensitive to lifestyles and behaviors. As a result, BMI may be a better indicator than chronic diseases in showing that biracial Asians have adopted health behaviors and practices that fall between their monoracial counterparts. Future epidemiological research should examine the prevalence of more proximal health outcomes among biracial Asians and assess how it differs by developmental age. (*Ethn Dis*. 2014;24[4]: 481–487)

Key Words: Biracial, Asians, Chronic Conditions, Ethnicity

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Introduction

The burgeoning diversity in the United States is driven, in part, by demographic shifts in nativity status, immigration, religious affiliation, sexual orientation, and racial and ethnic identification.[1] In the United States, all major single-race (hereafter, referred to as "monoracial") groups increased in population from 2000 to 2010; however, they varied in growth rates with Asians experiencing the fastest growth rate, increasing by 43%, and Whites experiencing the slowest growth rates, increasing by 5.7%.[2] Individuals who identified with two or more races also experienced population growth. In 2000, 6.8 million individuals identified with two or more races. This number increased to over 9 million by 2010, representing a 30% increase within a span of 10 years. The disproportionate rapid growth of racial and ethnic minority populations in the United States will transform the cultural milieu and engender shifts in health, economic, social, and political landscapes.[1] These shifts necessitate the examination of health profiles of these emerging populations to determine whether they experience disparate health behaviors or outcomes in comparison to their monoracial counterparts.

The United States is undergoing a demographic transition that Coleman[3] termed the Third Demographic Transition, characterized by low-fertility rates of the native majority population and high rates of immigration. Immigration gives rise, directly and indirectly, to the ethnic minority population in the United States. First, it directly contributes to the growing number of the nation's new residents. Second, and perhaps more importantly, high fertility rates of immigrants and the increasing number of interracial couples, including immigrants, who produce biracial and multiracial offspring help to grow the population. While the non-Hispanic White population will remain the largest single-race group, the Census[4] projects that by 2043, the United States will become a majority-minority nation for the first time. The rise in biracial populations will likely shift and blur previously defined socio-cultural and political boundaries. Children of interracial couples should be given consideration as we plan for the nation's future and health care system. We focus on biracial members because it is not known if biracial children will experience the structural or institutional barriers that their monoracial parents face to health care access, and whether these factors will affect biracial members' health outcomes. We focus on biracial Asians because Asian Americans often display the best and worst indices of social class and health.[5] As a result, we can examine outcomes for biracial Asian populations to determine whether risks associated with specific monoracial groups work synergistically to produce poorer outcomes and whether protective factors for one monoracial group and risk factors for another monoracial group will average for biracial members. Race and social class are highly interrelated constructs, evident in the overrepresentation of racial and ethnic minority members with lower socioeconomic status.[6,7] Poverty, interacting with racial segregation, leads to downstream consequences resulting in racial and ethnic minority members receiving poor quality of education, decreased opportunity for employment, less access to quality food markets, poor built environments, decreased social networks,

and increased neighborhood violence.[8–11] As a result of the rise of biracial populations, we expect to see the gradual decline of racial divisions in institutions of education, employment, and even health. Biracial members who live, work, and socialize in the spheres of their interracial parents will have spatial proximity and propinquity to diverse cultural contexts, lending to increased intergroup contact.[12]

Because of their dual racial membership, biracial members may be exposed to attitudes, values, and behaviors that are normative to two different racial groups. Poston's[13] Biracial Development Model is the most commonly used biracial identity theory and describes five stages of identity formation for biracial individuals. The model posits that the first stage of identity formation is personality development within the family. This stage is a period when parental attitudes regarding race and racial/ethnic groups have its greatest effects. The second stage is choice of group categorization. Moss and Davis[14] suggest that during this stage, the individual feels pressured to select a single race. The third stage is the enmeshment and denial stage, when the individual may have feelings of guilt due to an inability to choose or deny an identity. The fourth stage is appreciation of multiple identity and exploration of heritages. During this stage, the individual will mostly identify with one race but will begin to broaden their understanding and involvement with the secondary heritage. The final stage is integration and valuing of multicultural identity. This stage occurs when the individual recognizes and appreciates all parts of their racial/ethnic identities,[14] expressing a bicultural identity.

There is little research that focuses on the health profiles of the biracial population. However, we believe that because biracial members learn, work, and socialize in environments found within both of their monoracial counterparts, they will learn and adopt inherent attitudes, beliefs, and values that are normative within both cultural spheres. As a result, we expect biracial members to display behaviors and outcomes that are average or intermediary between those displayed by their monoracial constituents. Our preliminary research has indicated this intermediary biracial phenomenon.[15,16] In two initial studies examining cigarette, alcohol, and marijuana use, biracial youth seemed to initiate substance use at ages approximately mid-way between the initiation ages of their corresponding monoracial groups[16] and reported substance use prevalence rates that were midway between the corresponding monoracial groups.[15] Because health behaviors and lifestyle factors contribute to the development of chronic medical conditions,[17] we hypothesize that the biracial population will display intermediate health status with regard to the prevalence of chronic conditions such as high blood pressure, heart disease, diabetes, physical activity and mobility and other measures of well-being and health such as perceived general health and BMI. To our knowledge, our study is one of the first studies that examines the health status of the biracial Asian population at the population level.

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METHODS

Data Collection

Our study utilized pooled data from iterations of the California Health Interview Survey (CHIS) administered in 2001, 2003, 2005, 2007, and 2009, respectively. The CHIS interviews were completed in Spanish, English, Cantonese, Mandarin, Vietnamese, and Korean. The CHIS selected California households for a random digit dial telephone survey (cell phone sampling frames were obtained from 2007 to the most recent cycle), and one randomly selected adult (aged ≥18 years) from each household was interviewed. CHIS data were weighted at the county and state levels. More detailed descriptions about data collection methods, sample design, and weighting are available elsewhere.[18–20] The CHIS was approved by the University of California at Los Angeles Institutional Review Board and by the California State Committee for the Protection of Human Subjects. The CHIS serves as an important source of information on the emerging biracial population given that the Census tells us that California has the largest population of minorities of any state and that the biracial population comprised 92% of the total multi-racial US population.[4]

Measures

Outcome Variables

Respondents' health conditions were assessed by self-report measures that asked, "Has a doctor ever told you that you have…" for the following medical conditions: diabetes, high blood pressure, heart disease. Respondents answered either yes or no. To assess whether participants had a physical disability, respondents were asked,

"Do you have a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?" Respondents answered either yes or no. To assess general health, respondents were asked, "Would you say that in general your health is excellent (5), very good (4), good (3), fair (2), or poor (1)?" In addition, body mass index (BMI) was calculated based on respondents' self-reported height and weight values. All outcome variables were available for all five CHIS survey years except for the item assessing physical disability which was only made available for three survey years: 2005, 2007, and 2009.

Independent Variables

In our regression analyses, we controlled for variables that have been previously found to be associated with health status and conditions. These covariates included: sex (male or female), age (18–24 years, 25–39 years, 40–49 years, 50–64 years, ≥65), educational attainment (<high school degree, high school degree/GED equivalent, and >high school degree), family income (measured as % of the federal poverty level, FPL: 0–99%, 100–199%, 200–299%, and ≥300%), marital status (single/never married, married/living with a partner, and widowed/separated/divorced), and years spent in the United States (born in the United States, lived ≥10 years, and <20 years). We also adjusted for survey year (2001, 2003, 2005, 2007, 2009). We included two access-to-care factors. These factors included: possession of a usual source of care (yes or no); and possession of health insurance (uninsured, publicly insured, and privately insured).

Last, racial/ethnic membership was assessed by self-report. Respondents were asked if they were Latino or Hispanic (yes or no). In addition, they were asked "Please tell me which one or more of the following you would use to describe yourself. Would you describe yourself as White, Black or African American, Asian, American Indian or Alaska Native, Other Pacific Islander, Native Hawaiian, or Other." Due to small sample limitations, we omitted respondents who identified as other Pacific Islander, Native Hawaiian, and Other. Monoracial respondents were those who only identified with non-Hispanic race (eg, only Asian) or with only Latino or Hispanic membership. Biracial Asian respondents were those who self-identified with being Asian and with one other race or ethnicity such as Asian and White. Overall, we examined 9 racial categories: White, Black, Asian, Hispanic, American Indian or Alaska Native, White-Asian, Black-Asian, Hispanic-Asian, and American Indian/Alaska Native-Asian.

Statistics

We first conducted unadjusted descriptive analyses for sociodemographic traits, access-to-care factors, chronic conditions, and health status outcomes by racial-ethnic membership. We next ran multivariable logistic regression models to predict the odds of being diagnosed with diabetes, heart disease, high blood pressure, and having a medical condition that limited physical activity for racial/ethnic categories while adjusting for sociodemographic covariates. Similarly, we ran linear regression models to predict continuous measures of BMI and perceived general health for racial/ethnic categories. Multiple regression models were also used to estimate adjusted sample-weighted percentages or means, also called predicted marginals (PM), for each chronic condition and health status outcome.[19] For example, percentages for respondents with diabetes and means for BMI were estimated while adjusting for other covariates in the model.

All analyses were conducted using SAS 9.3 and SAS-callable SUDAAN 10.0 statistical software to account for the complex sampling design of the CHIS. Survey weights (final sample weights and replicate weights) were used to obtain population-level point estimates and to get the correct variance estimates, respectively. These weights were created for the combined dataset using methods described in Rizzo et al.[21] All *P* reported are for 2-tailed tests and a value of <.05 was considered statistically significant.

RESULTS

Preliminary Analyses

Of the total sample (*N*=238,897), there were 151,786 (49%) Whites, 11,519 (6%) Blacks, 21,648 (12%) Asians, 42,314 (29%) Hispanics, 9,875 (4%) American Indian/Alaska Natives, 930 White-Asians (.32%), 119 (.04%) Black-Asians, 575 (.37%) Hispanic-Asians, and 131 (.05%) American Indian/Alaskan Native-Asians. Participants who identified with three or more racial/ethnic groups were excluded from analyses due to their small sample size. In comparison to their monoracial counterparts (with exception to monoracial Whites and Asians), biracial Asians are generally more highly educated, have higher family incomes, have higher access and quality of care, are less likely to be married, and are younger. Biracial Hispanic-Asians were more likely to be US-born and naturalized than monoracial Asians and Hispanics. Further descriptive statistics for the sample can be found in Table 1.

Multivariable Regression Models

After adjusting for selected covariates, we examined the relationships between racial and ethnic membership with the outcomes with multivariable regression models. Because the overall omnibus F-test for all regression models were significant, we chose to only display values for racial/ethnic categories. We report odds ratios (OR) and their 95% confidence intervals (CI) for chronic conditions, categorical outcomes. We report beta weights (B) and

Table 1. Race/ethnicity, sociodemographic factors, and access to care, *n* (%)[a]

	White *n* = 151,786	Black *n* = 11,519	Asian *n* = 21,648	Hispanic *n* = 42314	American Indian *n* = 9875	White-Asian *n* = 930	Black-Asian *n* = 119	Hispanic-Asian *n* = 575	Am Indian-Asian *n* = 131
	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
Sex									
Male	61991 (49)	4243 (45)	9370 (47)	17247 (50)	4185 (52)	373 (48)	34 (43)	227 (48)	55 (49)
Female	89795 (51)	7276 (55)	12278 (53)	25067 (50)	5690 (48)	557 (52)	85 (57)	348 (52)	76 (51)
Education									
<HS education	6901 (7)	977 (12)	2129 (12)	10447 (31)	1326 (24)	105 (13)	16 (13)	83 (18)	19 (19)
HS education	22385 (18)	2109 (24)	3325 (17)	12979 (35)	2248 (28)	112 (18)	19 (24)	104 (27)	21 (27)
some college	40436 (24)	3393 (27)	3547 (16)	9361 (18)	3078 (26)	211 (22)	24 (15)	152 (21)	30 (21)
≥college degree	82064 (51)	5040 (37)	12647 (55)	9527 (16)	3223 (21)	502 (47)	60 (48)	236 (35)	61 (33)
Age									
18–24	6172 (10)	913 (15)	1868 (15)	5461 (18)	907 (19)	178 (33)	29 (36)	111 (29)	15 (17)
25–39	23566 (23)	2506 (26)	5791 (32)	15340 (40)	2237 (30)	348 (40)	37 (30)	165 (33)	44 (45)
40–49	28040 (21)	2469 (23)	4820 (20)	9088 (20)	2048 (21)	215 (18)	25 (23)	130 (18)	30 (18)
50–64	47044 (27)	3208 (23)	5356 (19)	7959 (14)	2885 (20)	136 (8)	19 (8)	124 (13)	32 (18)
≥65	46964 (20)	2423 (13)	3813 (14)	4466 (8)	1789 (10)	53 (2)	9 (4)	45 (7)	10 (3)
Born in US									
Born in US	139646 (91)	10749 (92)	4299 (23)	17915 (38)	8927 (79)	707 (82)	89 (70)	367 (67)	116 (86)
Born outside US	12140 (9)	770 (8)	17349 (77)	24399 (62)	948 (21)	223 (18)	30 (30)	208 (33)	15 (14)
Citizenship status									
US-born citizen	139646 (91)	10749 (92)	4299 (23)	17915 (38)	8927 (79)	707 (82)	89 (70)	367 (67)	116 (86)
Naturalized	8743 (6)	511 (5)	12003 (51)	9230 (20)	351 (6)	187 (15)	23 (21)	124 (18)	10 (7)
Non-citizen	3397 (3)	259 (3)	5346 (25)	15169 (41)	597 (15)	36 (3)	7 (9)	84 (14)	5 (7)
Annual Family Income									
0–99% FPL	8677 (6)	1891 (19)	3196 (13)	11335 (29)	1829 (23)	63 (8)	11 (4)	76 (16)	19 (18)
100–199% FPL	20196 (12)	2300 (20)	3844 (18)	12239 (30)	2341 (24)	95 (8)	13 (9)	105 (17)	29 (22)
200–299% FPL	20939 (13)	1722 (15)	2810 (13)	6123 (15)	1565 (15)	127 (12)	15 (12)	87 (13)	25 (18)
≥300% FPL	101974 (70)	5606 (45)	11798 (56)	12617 (27)	4140 (38)	645 (72)	80 (75)	307 (54)	58 (42)
Marital Status									
Married/living with partner	86306 (65)	4347 (42)	14427 (64)	25907 (62)	5170 (56)	509 (47)	40 (31)	314 (51)	62 (47)
Widow/divorced/separated	45009 (17)	4000 (24)	3035 (9)	7871 (12)	2987 (18)	125 (5)	31 (13)	94 (9)	30 (17)
Never married/single	20384 (18)	3163 (34)	4164 (26)	8500 (25)	1709 (26)	296 (47)	48 (57)	167 (40)	39 (36)
Usual source of care									
Yes	137662 (88)	10269 (84)	18308 (83)	33325 (73)	8412 (77)	772 (76)	109 (86)	481 (76)	106 (76)
No	14090 (12)	1244 (16)	3333 (17)	8975 (27)	1461 (23)	158 (24)	10 (14)	94 (24)	25 (24)
Health Insurance									
Uninsured	10386 (9)	1122 (14)	2959 (14)	10817 (31)	1586 (24)	95 (11)	10 (10)	90 (16)	24 (19)
Public only	45524 (21)	3704 (29)	4865 (18)	10529 (22)	3077 (25)	106 (9)	19 (9)	88 (12)	35 (24)
Private	95876 (70)	6693 (57)	13824 (68)	20968 (47)	5212 (52)	729 (80)	90 (81)	397 (72)	72 (57)

[a] Counts are unweighted while proportions are weighted.

Table 2. Race/ethnicity, chronic conditions, and health status with White or Asian reference

	Diabetes			Heart Disease			High Blood Pressure			Physical Disability			Perceived General Health			BMI		
	OR	95% CI	PM %	OR	95% CI	PM %	OR	95% CI	PM %	OR	95% CI	PM %	B	95% CI	PM %	B	95% CI	PM %
Race/Ethnicity																		
White (REF)	1.00	–	5	1.00	–	7	1.00	–	23	1.00	–	16	–	–	3.59	–	–	26.12
Black	2.08[a]	1.85, 2.33[a]	10	.90	.80, 1.01	6	1.91[a]	1.78, 2.05[a]	33	.93	.83, 1.05	16	−.18[a]	−.21, −.15[a]	3.41	1.84[a]	1.64, 2.04[a]	27.96
Asian	1.46[a]	1.26, 1.70[a]	7	.71[a]	.61, .82[a]	5	1.22[a]	1.13, 1.32[a]	26	.64[a]	.56, .73[a]	12	−.20[a]	−.23, −.17[a]	3.39	−1.55[a]	−1.68, −1.42[a]	24.57
Hispanic	2.11[a]	1.92, 2.31[a]	10	.78[a]	.71, .87[a]	6	1.15[a]	1.08, 1.22[a]	25	.91[a]	.83, .99[a]	15	−.20[a]	−.23, −.18[a]	3.39	1.81[a]	1.67, 1.95[a]	27.93
American Indian	2.48[a]	2.14, 2.86[a]	11	1.22[a]	1.05, 1.43[a]	8	1.43[a]	1.31, 1.56[a]	28	1.49[a]	1.32, 1.68[a]	22	−.24[a]	−.28, −.20[a]	3.35	1.65[a]	1.44, 1.86[a]	27.77
White-Asian	.89	.55, 1.44	5	1.30	.79, 2.13	8	1.08	.83, 1.41	24	.98	.63, 1.53	16	−.05	−.14, .05	3.54	−.62[a]	−1.01, −.22[a]	25.50
Black-Asian	1.35	.53, 3.42	7	.65	.17, 2.56	5	1.15	.60, 2.18	25	3.02[1]	1.14, 8.02	33	−.49[a]	−.96, −.03[a]	3.10	2.49	−.47, 5.44	28.60
Hispanic-Asian	1.71[a]	1.16, 2.53[a]	8	.59	.33, 1.09	4	1.18	.84, 1.66	25	.68	.38, 1.22	12	−.16[a]	−.30, −.03[a]	3.43	.17	−.57, .90	26.28
Am. Indian-Asian	1.04	.03, 41.21	5	1.10	.35, 3.43	7	1.42	.81, 2.51	28	1.37	.61, 3.06	20	−.17	−.44, .11	3.42	1.06[a]	.04, 2.07[a]	27.18
White	.68[a]	.59, .79[a]	5	1.42[a]	1.23, 1.64[a]	7	.82[a]	.76, .88[a]	23	1.56[a]	1.38, 1.78[a]	16	.20[a]	.17, .23[a]	3.59	1.55[a]	1.42, 1.68[a]	26.12
Black	1.42[a]	1.16, 1.73[a]	10	1.28[a]	1.07, 1.52[a]	6	1.57[a]	1.41, 1.74[a]	33	1.46[a]	1.24, 1.73[a]	16	.02	−.02, .06	3.41	3.39[a]	3.16, 3.62[a]	27.96
Asian (REF)	1.00	–	7	1.00	–	5	1.00	–	26	1.00	–	12	–	–	3.39	–	–	24.57
Hispanic	1.44[a]	1.24, 1.68[a]	10	1.11	.95, 1.30	6	.94	.87, 1.02	25	1.42[a]	1.25, 1.61[a]	15	.00	−.04, .03	3.39	3.36[a]	3.22, 3.51[a]	27.93
American Indian	1.69[a]	1.39, 2.05[a]	11	1.74[a]	1.42, 2.12[a]	8	1.17[a]	1.04, 1.31[a]	28	2.32[a]	1.96, 2.75[a]	22	.04	−.09, .01	3.35	3.20[a]	2.95, 3.45[a]	27.77
White-Asian	.61	.37, 1.00	5	1.84[a]	1.10, 3.08[a]	8	.89	.68, 1.16	24	1.53	.98, 2.41	16	.15[a]	.05, .25[a]	3.54	.94	.52, 1.35	25.50
Black-Asian	.92	.37, 2.32	7	.93	.23, 3.67	5	.94	.50, 1.78	25	4.73[a]	1.76, 12.72[a]	33	−.29	−.76, .17	3.10	4.04[a]	1.08, 6.99[a]	28.60
Hispanic-Asian	1.17	.77, 1.76	8	.84	.46, 1.55	4	.97	.69, 1.37	25	1.06	.59, 1.94	12	.04	−.10, .17	3.43	1.72	.97, 2.46	26.28
Am. Indian-Asian	.71	.02, 28.18	5	1.56	.50, 4.91	7	1.17	.66, 2.07	28	2.14	.96, 4.77	20	.03	−.24, .31	3.42	2.61[a]	1.59, 3.63[a]	27.18

PM, predicted marginals; OR, odds ratio; B, standardized betas.
[a] Significant at $P \leq .05$.

their 95% confidence intervals (CI) for BMI and perceived health status, continuous outcomes. The changes seen in odds ratios, beta-weights, and confidence intervals reflect different monoracial/ethnic categories being selected as the reference group. We reran each model with a different monoracial/ethnic reference group in order to conduct pairwise comparisons. We chose to display the models in which Whites and Asians served as the reference group to avoid displaying redundancies (Table 2) though all models are available upon request. Biracial/ethnic categories do not serve as the reference group due to small sample size; as a result, pairwise comparisons among biracial/ethnic categories and their monoracial constituents can be made by referring to models in which the monoracial category serves as the reference.

Diabetes

Whites had the lowest probabilities for having diabetes in comparison to other monoracial groups; their odds of reporting diabetes significantly differed from other monoracial groups and also with that of Hispanic-Asians. White-Asians also had lowest probabilities for having diabetes in comparison to Hispanic, Black, and American Indian/Alaskan Native monoracial groups (data not shown).

Heart Disease

Asians and Hispanics had the lowest probabilities for having heart disease; their odds significantly differed from other monoracial groups except with each other. White-Asians had higher odds of heart disease in comparison to Asians.

High Blood Pressure

Whites had the lowest probabilities for having high blood pressure; their odds significantly differed from other monoracial groups. Blacks had the highest likelihood for high blood pressure, and their odds significantly differed from other monoracial groups and also with that of White-Asians and Hispanic-Asians.

Physical Disability

Whites had the highest probabilities for having a disability; their odds significantly differed from other monoracial groups with the exception of Blacks (non-significant) and American Indians who had higher probability of having a disability. Black-Asians had the highest likelihood of having a disability; their odds (though data not shown) significantly differed from other monoracial groups with the exception of American Indian/Alaskan Natives.

Perceived General Health

Whites had the highest perceived general health in comparison to other monoracial groups and Black-Asians and Hispanic-Asians. White-Asians also experienced high perceived general health and significantly differed from all other monoracial groups with the exception of Whites (significance data not shown).

Body Mass Index

Asians had the lowest BMI in comparison to all other monoracial and biracial groups with the exception of White-Asians and Hispanic-Asians. Predicted margins revealed an intermediary biracial phenomenon for BMI though it was not observed for other outcomes. Biracial respondents displayed BMI ranges that were intermediary between their Asian and other monoracial counterparts. For example, White-Asians had BMI predicted margin values that fell in between values found for Whites and values found for Asians. Similarly, Hispanic-Asians had values that fell in between values found for Hispanics and values found for Asians.

DISCUSSION

After adjusting for the relevant covariates, multivariate results revealed that Whites reported better health overall than other monoracial groups. For example, Whites were less likely to report having been diagnosed with diabetes and high blood pressures. However, Whites were more likely to have physical disability than most other monoracial groups. Whites also had higher perceived general health than biracial Asians and other monoracial individuals. These findings are consistent with other studies that have found that after controlling for relevant sociodemographic variables, Whites generally have better health than other racial/ethnic groups including fewer chronic conditions, such as cancer,[22] hypertension,[23] and diabetic nephropathy and diabetic end-stage renal disease.[24]

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The finding that biracial Asians displayed BMI ranges that were intermediate between their monoracial constituents support our hypothesis that biracial Asians have most health behavior and outcome prevalence rates that are intermediate to those of the two corresponding monoracial rates. This finding is consistent with other population-based studies that have found an intermediate phenomenon for health behaviors among biracial populations.[15,16] It is important to highlight that we only found the biracial intermediate phenomenon for the BMI outcome. One possible explanation why the intermediate phenomenon was found only for BMI may be due to the age of this sample. Our biracial sample is significantly younger than the monoracial sample. Generally, after adjusting for covariates, most chronic conditions (eg, heart disease, hypertension) grow increasingly prevalent with an aging population.[25] Conversely, BMI is a more proximal health outcome and is more sensitive to lifestyles and behaviors. As a result, BMI may be a better indicator that biracial Asians have indeed adopted health behaviors and practices that fall between their monoracial counterparts.

STUDY LIMITATIONS

Our study has limitations. First, we did not assess Asian subgroups (eg, Korean, Vietnamese) because the main goal of the current study was to examine biracial Asians broadly compared to their monoracial counterparts. In addition, we did not have adequate sample size to further disaggregate the data beyond the currently disaggregated biracial groups. Further study may be needed to examine health outcomes among biracial populations within various Asian subgroups as health risk may vary by country of ancestry. Second, although the current study used data from the CHIS, which includes a large sample of California residents, the data are not nationally representative. As a result, our study should be replicated to determine whether our results are generalizable to other US regions and states. Third, our study is susceptible to the shortcomings of retrospective research designs that rely on respondent recall.

Despite these limitations, this study has a number of salient strengths. This study is one of the first to examine health outcomes among biracial Asians. This study also used data from the CHIS, which is one of few available datasets that has an adequate sample of biracial Asians to conduct such analyses. In addition, the CHIS interviews were completed in Spanish, English, and four Asian languages which may have reduced potential bias among non-English speaking populations.

CONCLUSION

In conclusion, this population-based study adds to the literature on health outcomes among biracial Asians. The study indicates that BMI is a more proximal health outcome and is more sensitive to lifestyles and behaviors. As a result, BMI may be a better indicator than chronic diseases in showing that biracial Asians have adopted health behaviors and practices that fall between their monoracial counterparts. Future epidemiological research should examine the prevalence of more proximal health outcomes among biracial Asians and assess how it differs by developmental age. This study's findings underscore the importance of examining heterogeneity within racial/ethnic groups as such findings may inform preventive intervention programs and help reduce and eliminate persisting racial/ethnic health disparities.

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