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Is Socioeconomic Advantage Associated With Positive Health Behaviors and Health Outcomes Among Asian Indians?

Beverly Gor[1], Vishnu P. Nepal[1], Rashmi Dongardive[2], V. K. Dorai[3], and Mala Pande[2]

Abstract

Objective: The South Asian Health Needs Assessment was conducted to collect health status information on the rapidly growing Asian Indian (AI) community in the Houston area. Many were highly educated and reported high income levels, factors usually associated with better health outcomes. This study examined the relationship between socioeconomic advantage and the health behaviors and health outcomes of AIs.

Methods: We analyzed cross-sectional survey data from a convenience sample of 1416 AIs. Income was categorized as low, medium, and high. Descriptive statistics were generated by income categories and weighted multinomial regression analyses were conducted to examine the association of income with health behaviors and outcomes, adjusting for age, sex, health insurance, and years in the United States.

Results: Income was positively associated with better self-rated health, higher body mass index, moderate physical activity, having shingles vaccine, and cervical cancer screening. Income was inversely associated with perceived stress and heart disease. However, income was not significantly associated with alternative therapies, cigarette smoking, alcohol consumption, self-reported overweight/obesity, fruit and vegetable consumption, diabetes, high blood pressure, high cholesterol and screening for breast, prostate, and colon cancer.

Conclusions: Socioeconomic advantage was not consistently associated with positive health outcomes or desired health behaviors among AIs. We speculate that other factors, including cultural beliefs and acculturation may also impact health behaviors and health outcomes in this group. Further studies examining the influence of these variables on health behaviors and health outcomes are warranted.

Keywords

Asian Indians, health behaviors, health outcomes, income, cancer screenings

Background

Asian Indians (AIs) are one of the most rapidly growing population groups in the United States. According to the 2010 US Census, the AI population in the United States grew from almost 1.7 million in 2000 to 2.8 million in 2010, a growth rate of 69%.[1] Socioeconomic factors such as advanced education, high income, and access to medical services and preventive screenings through health insurance benefits are often associated with better health outcomes and health behaviors. However, among AIs in the United States, relationships between these factors are inconsistent.[2-4]

Some studies reported the association of high socioeconomic status (SES) among AIs with better health outcomes and that lower SES is correlated with poorer health outcomes. In a review of National Cancer Institute Surveillance, Epidemiology and End Results (SEER) data, it was postulated that among AIs, low cancer incidence and high cancer survival rates may

[1] Houston Health Department, Houston, TX, USA
[2] University of Texas MD Anderson Cancer Center, Houston, TX, USA
[3] Indian American Cancer Network, Houston, TX, USA

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Corresponding Author:
Beverly Gor, Houston Health Department, 8000 North Stadium, Houston, TX 77054, USA.
Email: beverly.gor@houstontx.gov

Table 1. Survey Topics on the SAHNA Instrument.

1. Demographics
   - Age, gender
   - Country of origin
   - If Indian, province of origin
   - Year of arrival in United States
   - Parents' country of birth
   - Primary language
   - English proficiency
   - Marital status
   - Children in household
   - Education level
   - Income, employment status
   - Religious affiliation
2. Occupational health risks
3. Environmental exposures
4. Nutrition, including vegetarianism and cultural food preferences
5. Physical activity
6. Self-reported health status
7. Health-care access
8. Alternative therapy use
9. Immunizations
10. Oral health
11. Tobacco use, including nontraditional use
12. Alcohol use
13. Medical conditions
14. Cancer screening
15. General cancer knowledge
16. Cancer incidence
17. Cancer support

be at least partially attributable to their above average SES.[5] Similarly, among AI women in Detroit with a college education and who lived in the US for longer periods, 64% reported having had a mammogram in the last 2 years as compared to other AI women in New York and California whose rates were 56% and 61.3%, respectively.[6-8] Conversely, among 143 indigent AIs in Houston, the majority of whom lacked health insurance and had difficulty accessing health care, 18% had diabetes and 32% had metabolic syndrome, risk factors for cardiovascular disease.[9]

On the other hand, several other studies have reported unexpected findings, indicating that factors besides socioeconomic characteristics influenced health outcomes and behaviors. These include cultural factors like religiosity and underutilization of preventive services.[10,11] Asian Indians have also demonstrated higher rates of diabetes than non-Hispanic whites in spite of younger age and lower body mass indexes (BMI).[12] The SEER data showed that compared to stable or declining breast cancer rates among non-Hispanic whites, rates have been rising steadily among Asian Americans including South Asians.[13] Despite high education levels and employment status, 60% of AIs in Michigan did not have insurance and no access to regular care providers.[14] Among AIs in Atlanta, younger age, more years in the United States and a bicultural or more American ethnic identity were associated with greater participation in physical activity. Higher income, a bicultural or more American ethnic identity, and depression were also associated with higher fat intake.[15]

There is a large and rapidly growing AI population in Texas and more specifically in Houston metro area, AIs are the second largest Asian American population and yet, little was known about their socio-demographic characteristics and the relationship of SES with their health status and health behaviors. Thus, the South Asian Health Needs Assessment (SAHNA) study was designed to collect this information.

Data from the study were used to examine the relationship of SES using income as an indicator, with the likelihood of reporting specific health conditions and behaviors. We hypothesized that for this population, higher levels of income would be associated with adherence to recommended health behaviors and better health outcomes.

Methods

Participants and Setting

A community advisory board (CAB) composed of the project's investigators and members of the Indian American Cancer Network (IACAN) was created to provide guidance and technical assistance to the project. The CAB reviewed recruitment materials, focus group and interview scripts, and survey questions for relevance and cultural interpretation and assisted in interpreting the results.

A majority of the questions for the SAHNA survey were borrowed from validated instruments like the Centers for Disease Control and Prevention's Behavioral Risk Factors Surveillance System.[16] A few culturally tailored questions about use of alternate forms of tobacco and types of diet were adapted from surveys specific to Asians from published literature.[11,17] Although the internal consistency and content validity were not statistically evaluated, the survey was pilot tested on 20 AIs of varying ages, genders, and years in the US. The respondents' answers to the questions were consistent with the intent. Both English and Hindi versions of the survey were offered to participants. Survey topics are listed in Table 1.

The survey was administered between August 2013 and July 2014, by MD Anderson researchers and IACAN volunteers trained and certified in protection of human subjects. The survey questionnaires were self-administered, in the presence of research staff/volunteers. A small number of participants (3%) chose to return the surveys by mail.

The participants were a convenience sample of AIs approached at random at cultural festivals, places of worship, workplaces, grocery stores, Indian-owned businesses, and local universities. To be eligible for the study, participants self-identified as AI, were at least 18 years of age, and lived in 1 of the 4 targeted counties (Harris, Fort Bend, Galveston, and Brazoria). Purposive sampling was used to enroll a representative number of AIs from each county based on Census 2010 data. Only one member per household was eligible to participate in the study. Address of residence provided by each participant was used to ensure that only one survey per household was included

in the analysis. All participants provided informed consent and received a complimentary tote bag and a pen as tokens of appreciation. Surveys were considered usable if the participant provided an address, lived in 1 of the 4 counties, and completed at least 75% of the questions. The study was approved by the institutional review board of the University of Texas MD Anderson Cancer Center (Protocol 2013-0128).

Data Management and Statistical Analysis

The sample size was calculated a priori. Sampling was proportional to the number of AI residents in each of 4 major Houston area counties with some oversampling (n = 85) each in the 2 smaller counties to allow for subgroup analysis. Survey data were entered in a secure database and random checks for data entry consistency were performed. Outliers and inadmissible values were reconciled from the raw data. Participants' self-reported height and weight were used to calculate their BMIs, which were categorized using Asian standards for BMI suggested by the National Institute for Health and Care Excellence (NICE) guidelines.[18] Because the study participants included a higher proportion of individuals 55 years and older as compared to census 2010 data for AIs in the 4 counties, a weighting scheme was applied to match the participants' age/gender distributions with the 2010 Census data. Weights were calculated using stratification by sex and 5 age categories (18-24, 25-34, 35-44, 45-54, 55-64, and 65+), as an inverse of the Census and SAHNA proportions for each age and sex category. Weighted summary statistics were calculated to describe the demographic and health-related variables. Based on participants' responses to the question: "which of the following categories best describes your annual household income from all sources?" we categorized incomes into low (<US$50 000), medium (US$50 001-US$100 000), and high (>US$100 000) income groups. We used multinomial logistic regression, adjusted for appropriate covariates (age, sex, health insurance and years in the US), to examine the association of income groups with health-related indicators. Results are reported as odds ratios, relative risk ratios, and 95% confidence intervals. All data analyses were performed using STATA (STATA release 13, College Station, Texas).

Results

The study sample consisted of 1525 completed surveys (n = 38 were eliminated because respondents shared the same address). Only 109 (7%) participants did not provide income information. Therefore, our analysis was based on 1416 respondents.

Demographic Characteristics

The weighted and unweighted data on participants' demographic characteristics are shown in Table 2. The mean age of participants was 47 years (range 18-87), with a slightly larger proportion of men (52%) than women. The majority (85%) were born in India and had been in the United States for an average of 22 years (range, 1-68 years), and 71% were married. English was the sole language spoken in the home by a quarter of the sample, and a majority (95%) reported having excellent or good English proficiency. Several Indian languages were spoken in the household, and 53% spoke 2 or more languages including English. A majority (84%) had a college degree or higher level of education. Almost half (45%) had a

Table 2. Demographic Characteristics of the Participants.

Characteristic	No. of Participants	Unweighted %	Weighted %
Sex			
Male	798	52.9	52.0
Female	711	47.1	48.0
Age, years			
18-24	81	5.4	13.9
25-34	285	18.9	33.3
35-44	370	24.5	18.0
45-54	277	18.4	13.5
55-64	241	16.0	12.1
≥65	255	16.9	9.1
Birthplace			
India	1341	89.0	84.5
United States	94	6.2	10.5
Other	72	4.8	5.0
Years in the United States			
≥10	317	24.5	36.6
11-20	380	29.3	28.6
21-30	214	16.5	14.5
31-40	189	14.6	11.1
≥41	196	15.1	9.1
Married	1226	81.6	70.6
English proficiency			
Excellent/good	1413	93.4	94.8
Language at home			
English only	349	24.7	25.2
Hindi only	119	8.4	8.9
Gujarati only	181	12.8	12.6
Combination	765	54.1	53.3
Education			
High school or less	78	5.3	5.6
Some college	137	9.3	10.8
College or higher	1254	85.4	83.5
Household income			
Low (≤$50 000)	297	21.0	25.0
Medium ($50 000–100 000)	398	28.1	30.6
High (>$100 000)	721	50.9	44.6
Employment			
Full time	722	50.2	50.3
Part time	133	9.3	12.0
Retired	141	9.8	5.7
Self-employed	103	7.2	5.3
Other (student/ disabled/etc)	339	23.6	26.8
Religious affiliation			
Hinduism	1052	72.2	71.4
Christian/protestant	159	10.9	12.7
Sikh	98	6.7	6.3
Muslim	67	4.6	4.4
Other	82	5.6	5.2

household income of greater than $100 000, and 55% reported being employed full time or being self-employed. A majority (71%) were Hindus.

Health-Related Characteristics

The weighted health-related characteristics of the study participants by income categories are provided in Table 3. Among the participants, overall 90% had some form of health insurance but only 76% of those in the low-income group had health insurance compared to more than 90% in the medium and high-income groups. Self-rated health was excellent, very good, or good for more than 90% of those in the medium and high-income groups compared to 85% in the low-income group. Emotional stress was higher among the low-income group (22.8%) compared to the medium (17.7%) and high (13.4%) income groups. Western medicine was the preferred type of medical treatment with 78% choosing it over alternative therapies such as Ayurveda, herbal therapy, homeopathy, and meditation or yoga.

Among lifestyle factors, only 7% admitted to smoking at least 100 cigarettes in their lifetime. However, *supari* (betel nut) use was somewhat higher among the high-income group. Overall, 43% of participants admitted to alcohol consumption and there was no significant difference by income groups. A vegetarian diet was consumed by 43.7%, and there were no significant differences in the type of diet or fruit and vegetable consumption by income groups. Moderate physical activity in the past week was significantly higher in the high-income group, but so was being at a higher BMI. Heart disease had an inverse association with medium and higher income levels.

Preventive Health and Cancer Screening

With the exception of shingles vaccination, the overall rates of immunization uptake were greater than 50% or more for the total population, however, higher-income was significantly associated with having had the shingles vaccination. There were no significant differences in mammography screening, clinical breast examinations, prostate cancer screening or colon cancer screening based on income. However, the higher income groups had significantly higher odds of having cervical cancer screening.

Discussion

As with other groups, Asian Americans with higher incomes have a significantly greater likelihood of having some type of health insurance[19] which may imply greater access to health care and better outcomes. In fact, about 88% of the SAHNA participants had health insurance. In our study, socioeconomic advantage was positively associated with some health outcomes and behaviors among AIs, most notably better self-rated health, higher BMI, moderate physical activity, having shingles vaccine, and cervical cancer screening. Income was inversely associated with perceived stress and heart disease. However, income was not significantly associated with alternative therapies, cigarette smoking, alcohol consumption, self-reported overweight/obesity, fruit and vegetable consumption, diabetes, high blood pressure, high cholesterol and screening for breast, prostate, and colon cancer.

These associations are not consistent across all AI communities in the United States.[15,20] Interestingly, we found a high rate (86%) of breast cancer screening regardless of income level. It is important to note that the local AI community has benefited from grants for targeted outreach from breast cancer advocacy organizations in recent years which could have improved mammography rates for all AI women. Other AI studies we reviewed reported mammography rates of 40.1% (among a sample with an insured rate of 56%),[11] 61.3% among 194 AI women at Asian grocery stores,[8] and 63.8% (among an AI population in which 74% reported sufficient income.[6] It should be noted that overall, rates of cervical (75.8%), prostate (73.2%), and colorectal cancer screening (65.8%) among the SAHNA participants were higher than those reported by other studies, which could also be attributed to higher rates of health insurance. By comparison, cervical cancer screening rates of 47.9%[11] and 66.8%[21] among AI women have been reported. The rate of prostate cancer screening among AI men has been reported as low as 16.4%.[11] Colorectal cancer screening rates for South Asians, including AIs were reported as 25%,[22] 38%,[23] 48.6%,[24] and 53%.[25]

Higher body mass index was associated with greater income which reflected the findings of a qualitative study conducted in Houston area preceding the SAHNA survey.[26] Many AIs believed that greater body weight was acceptable as one ages and that certain chronic diseases are inevitable, implying that cultural perspectives on health may play a significant role in health behaviors. However, higher income in this population was also associated with greater physical activity, which may reflect more leisure time. The relatively high rate of insurance in this population may have contributed to the non-significant differences in immunization uptake.

Self-reported chronic diseases were generally lower among the higher income survey participants. We speculate that this may be associated with greater food access and number of years spent in the United States. Other Asian immigrant populations demonstrate greater BMI as years lived in the United States increases. Some studies have also established an association between poorer health outcomes and years spent in United States.[15,27]

Health behaviors among AIs may also vary depending on immigration patterns. Those immigrating to the United States for educational opportunities or because of skills in the technical areas may have higher income, compared to those coming based on family reunification.[28] Many AIs in Greater Houston area exhibit high levels of income and education, while many AIs in Northeast United States are self-employed or work in lower-paying jobs, so their perspectives on health and health behaviors may vary. There are also genetic predispositions toward cardiovascular disease among AIs that may manifest regardless of socioeconomic or social status.[29] In addition, the definition of adequate income varies greatly by US region. It was recently reported that a family earning $117 000 in California's Bay Area qualifies as "low income" with respect to housing.[30]

Table 3. Differences in Socio-Demographic Factors, Lifestyle Behaviors, and Health Outcomes by Income.

Characteristic		Income (%)[a]			Income (≤$50 000 referent category)			
					$50 001–100 000		>$100 000	
		≤$50 000 (%)[a]	$50 001–100 000 (%)[a]	>$100 000 (%)[a]	RRR[b] (95% CI)	*P*	RRR[b]	*P*
Have health insurance	1257 (90.4)	76.1	91.4	97.6	3.37 (2.02–5.61)	<.001	13.66 (6.25–29.88)	<.001
Self-rated health								
Fair/poor	113 (6.8)	14.8	5.2	6.8	Ref (1.0)	–	–	–
Very good/good	998 (71.7)	66.7	76.4	71.2	2.85 (1.49–5.46)	.004	4.31 (1.84–10.09)	.003
Excellent	287 (21.5)	18.5	18.4	25.3	2.51 (1.61–5.43)	.023	5.56 (2.36–13.12)	.001
Emotional stress	199 (17.0)	22.8	17.7	13.4	0.76 (0.60–0.96)	.027	0.64 (0.39–1.04)	.07
Preferred medical care								
Western medicine	1000 (78.2)	79.8	74.5	79.7	Ref (1.0)	–	–	–
Herbal therapy	78 (5.5)	3.6	5.0	6.8	1.41 (0.68–2.93)	.32	1.62 (0.93–2.83)	.08
Ayurveda	78 (5.6)	4.6	7.8	4.7	1.82 (0.78–4.26)	.15	1.00 (0.57–1.78)	.99
Homeopathy	40 (3.6)	4.4	5.3	2.2	1.50 (0.54–4.14)	.40	0.71 (0.28–1.80)	.44
Meditation/yoga	40 (2.8)	2.6	3.2	2.6	1.21 (0.44–3.33)	.69	0.87 (0.36–2.12)	.74
Other	56 (4.4)	5.0	4.4	4.0	1.29 (0.44–3.81)	.61	1.41 (0.45–2.90)	.76
Smoked at least 100 cigarettes in entire life?	97 (7.1)	8.1	6.8	6.8	0.83 (0.40–1.73)	.59	0.90 (0.66–1.23)	.49
Some days/everyday (ref group is 'Never")								
Chew betel nut	54 (3.6)	1.8	4.1	4.2	2.25 (0.75–6.78)	.13	2.09 (0.66–6.63)	.19
Use supari	97 (6.8)	3.9	6.1	6.8	1.54 (0.77–3.11)	.20	1.86 (1.08–3.22)	.03
Use paan masala	95 (7.5)	7.3	9.7	6.1	1.29 (0.62–2.70)	.46	0.70 (0.40—1.23)	.19
Use a hookah	28 (4.6)	11.2	1.8	2.8	0.16 (0.04–0.74)	.02	0.39 (0.14–1.13)	.08
Drank alcoholic beverage	556 (43.2)	41.0	41.0	45.9	0.93 (0.65–1.33)	.68	1.17 (0.78–1.76)	.40
BMI Category (Asian)								
Normal/underweight <23	412 (33.7)	40.6	32.7	30.6	Ref (1.0)	–	–	–
Overweight ≥23-<25	661 (45.0)	38.1	42.3	50.6	1.38 (0.91–2.11)	.12	1.58 (1.13–2.21)	.01
Obese ≥25	314 (21.3)	21.4	24.9	18.9	1.56 (0.99–2.47)	.06	1.13 (0.66–1.93)	.63
Self-reported Overweight/obesity	180 (15.5)	13.4	15.1	16.9	1.16 (0.80–1.69)	.40	1.27 (0.69–2.33)	.41
Dietary pattern								
Vegan/vegetarian	637 (43.7)	44.7	40.1	45.6	Ref (1.0)	–	–	–
Vegetarian/non-vegetarian	365 (27.6)	28.6	25.1	28.7	1.01 (0.56–1.79)	.98	1.11 (0.54–2.26)	.76
Non-vegetarian	364 (28.7)	26.7	34.8	25.7	1.54 (0.93–2.53)	.08	0.99 (0.56–1.74)	.97
Fruit and veg servings/day								
<5 servings/day	1087 (88.1)	86.7	88.1	89.7	1.25 (0.59–2.62)	.52	1.52 (0.86–2.69)	.13
Moderate PA in last week	773 (58.4)	47.4	57.1	65.2	1.42 (0.98–2.06)	.06	1.81 (1.30–2.52)	.002
Chronic disease								
Diabetes	192 (11.6)	10.9	10.9	12.4	0.87 (0.44–1.72)	.66	0.65 (0.35–1.21)	.16
High cholesterol	385 (24.0)	18.3	17.7	31.0	0.84 (0.42–1.72)	.61	1.39 (0.75–2.57)	.26
High blood pressure	329 (19.4)	16.8	16.1	23.1	0.90 (0.54–1.52)	.68	0.98 (0.56–1.70)	.92
Heart disease	91 (5.6)	8.9	4.8	4.4	0.42 (0.24–0.76)	.008	0.27 (0.10–0.69)	.01
Vaccination uptake								
Flu	885 (66.5)	67.1	60.1	70.5	0.65 (0.38–1.11)	.11	1.02 (0.78–1.32)	.89
Pneumonia (age ≥65)	108 (58.3)	54.5	60.7	59.7	0.64 (0.36–1.11)	.10	0.68 (0.44–1.07	.09
Hepatitis B	672 (64.8)	67.2	60.4	66.5	0.69 (0.27–1.78)	.41	1.08 (0.69–1.70)	.71
Shingles (age ≥50)	114 (27.6)	17.3	34.5	29.9	2.15 (0.75–6.19)	.12	1.77 (0.96–3.24)	.06
Tetanus	829 (71.2)	70.1	65.6	75.7	0.69 (0.27–1.74)	.39	1.20 (0.66–2.21)	.51
Cancer Screening								
Mammogram (age ≥ 40)	291 (85.9)	78.7	90.7	86.3	2.84 (0.39–20.8)	.19	1.96 (0.18–20.9)	.43
Clinical Breast Exam	419 (70.6)	49.9	70.4	82.2	2.18 (0.72–6.64)	.13	3.44 (0.75–15.9)	.09
Pap smear	464 (75.8)	51.5	76.3	88.3	3.78 (1.16–12.3)	.03	8.14 (2.49–26.6)	.006
Prostate cancer (PSA and or DRE)	313 (30.8)	16.7	21.5	44.3	1.61 (0.17–14.4)	.45	3.69 (0.62–22.0)	.09
Colon cancer (FOBT or Colonoscopy, age ≥50)	237 (65.8)	49.4	43.9	52.2	1.80 (0.22–15.11)	.36	2.29 (0.78–6.77)	.08

Abbreviations: BMI, body mass index; CI: confidence interval; DRE: digital rectal exam; FOBT: fecal occult blood test; PSA: prostate specific antigen; RRR: relative risk ratio.

[a]Percentages reported are weighted %.

[b]Adjusted for age (continuous), insurance, years lived in USA, (and sex where appropriate).

We acknowledge the limitations of the SAHNA study. The study population of over 1500, was a convenience sample, and purposive sampling techniques were employed to reach out to a wide diversity of participants. However, low literacy and the inability to take time from work to complete the survey were barriers to including lower income participants. We also acknowledge the limitations associated with self-reported data, especially the potential impact of social desirability. Our comparisons with other studies of AIs may be limited by differences in survey methodology, study aims and survey questions. However, this may indicate the need for cross-site collaboration to generate standardized instruments or a database of culturally appropriate study questions to allow for greater comparability.

Immigrant populations, like AIs, even with socioeconomic advantage may not necessarily practice desired health behaviors associated with better health outcomes. Further studies examining the influence of cultural beliefs and social norms in different locales on health behaviors and health outcomes are warranted. However, local data such as that collected through this study is valuable in understanding and addressing disparities in the Houston area.

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Author Biographies

Beverly Gor, EdD, RD, LD, is a staff analyst with the Houston Health Department. At the time of the study, she was an instructor in the Department of Health Disparities Research at the University of Texas MD Anderson Cancer Center. Dr. Gor's research focuses on Asian American health disparities, with emphasis on nutrition, obesity and cancer prevention.

Vishnu P. Nepal, MPH, DrPH, is a senior staff analyst in the Houston Health Department, City of Houston. His research areas include vulnerable populations, health disparities, assessment methods and community engagement.

Rashmi Dongardive, MPH, DrPH, is a clinical studies coordinator at the Department of Pediatrics - Patient Care at the University of Texas MD Anderson Cancer Center. Her research interest includes management of health care organizations, health disparities, program evaluation and quality improvement.

V. K. Dorai, BE, MBA, MS, PhD, is former president of the Indian American Cancer Network (IACAN). His area of research includes quality of life measurement, health needs assessment and health disparities.

Mala Pande, MBBS, MPH, PhD, is an assistant professor in the department of Gastroenterology, Hepatology and Nutrition at the University of Texas MD Anderson Cancer Center. Her research areas include cancer epidemiology, genetic susceptibility, population health and health disparities.