HHS Public Access

Author manuscript

Am J Public Health. Author manuscript; available in PMC 2016 July 01.

Published in final edited form as:

Am J Public Health. 2015 July ; 105(0 3): S443–S446. doi:10.2105/AJPH.2014.302523.

Asian Americans in New York City Face Disparities in Diabetes Management Compared to Other Racial/Ethnic Minority Groups

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Abstract

We examined diabetes management practices among Hispanics, Blacks, and three Asian American subgroups in New York City. Compared with Blacks and Hispanics, all 3 Asian American subgroups had lower average rates of diabetes management practices. Compared with Blacks, Chinese and Koreans were significantly less likely to participate in all diabetes management behaviors and practices, whereas Asian Indians were significantly less likely to perform feet checks or undergo an eye examination. Results demonstrate the need for health care provider interventions and training to support diabetes management among Asian Americans.

The rising prevalence of diabetes among Asians in their home country and among Asian Americans has been widely documented.[1-3] Several studies have found that Asian American subgroups have higher rates of diabetes compared to Whites[2] and similar or elevated rates of diabetes in Asian American subgroups compared with Black and Hispanic populations.[4,5] Although studies have noted a higher prevalence of diabetes-related complications and poor management practices among Hispanic and Black populations, little is known about diabetes management practices among Asian Americans. We examined diabetes management (self-monitoring and physician-monitoring) practices among Hispanics, Blacks, and 3 Asian American subgroups (Chinese, Korean, and Asian Indian) in New York City (NYC).

Methods

We collected data oversampling racial/ethnic minority subgroups in NYC was collected between 2009 and 2012 using Racial and Ethnic Approaches to Community Health (REACH) US Risk Factor Survey data, yielding 4403 non-Hispanic Asian Americans, 4943 Hispanics, and 2978 non-Hispanic Blacks. Methods were described previously.[6]

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Contributor Statement: N.S. Islam, S.C. Kwon, and L.C. Wyatt created the study concept and design. S.C. Kwon acquired the data. N.S. Islam, S.C. Kwon, and L.C. Wyatt analyzed and interpreted the data. All of the authors drafted of the article and provided critical revision of the article for important intellectual content: L.C. Wyatt performed the statistical analysis. N.S. Islam had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Human Participant Protection: Institutional Review Board approval was not needed.

Dependent outcomes included diabetes self-management variables (feet checks and glucose checks) and physician-led management variables (glycosylated hemoglobin A1c [HbA_{1c}] checks, feet checks, and eye examinations). Diabetes self-management and physician-led management measures were aligned with current American Diabetes Association Standards of Care guideline on diabetes management[7]. Covariates included age, gender, education, annual household income, country of birth, home language, health insurance, self-reported health status, and body mass index. We ran age-adjusted diabetes prevalence (type 1 or type 2) for the overall sample, and demographic and health variables and diabetes management practice variables for individuals with diabetes (n=2146), by racial/ethnic group (Hispanic, non-Hispanic Black, and non-Hispanic Asian) and Asian American subgroup. Because of oversampling among Asian American subgroups in this particular dataset, there were sufficient sample sizes for subgroup analyses for the 3 largest Asian American subgroups in NYC (Chinese, Korean, and Asian Indian). We used logistic regression for dichotomous eye examinations, and we used linear regression (ordinary least squares) for continuous variables to examine racial differences in diabetes management behaviors while adjusting for all covariates. “Don't know” and “never heard of A1c” responses were excluded from regression analyses. The continuous variables were highly positively skewed; therefore, we used the inverse of the logarithmic function to represent the percent change in the dependent variable for the designated group relative to the reference group using the following equation: $100*[\exp(ß)-1]$.[8] For example, in the regression equation for JbA_{1c} checks per year, the β coefficient of −0.27 for Koreans can be interpreted as Koreans with diabetes reporting, on average, 27% fewer HbA_{1c} checks per year compared with Blacks with diabetes. We performed weighted analyses using SAS-callable SUDAAN for complex surveys (version 9.3; Research Triangle Institute, Research Triangle Park, NC).

Results

Diabetes prevalence varied widely by racial/ethnic subgroup, and differences were seen for Asian American subgroups. The highest age-adjusted prevalence was seen among Asian Indians (19.0%), Hispanics (16.5%) and Blacks (14.3%), followed by Koreans (10.8%), and Chinese (9.3%). Variations in sociodemographic characteristics and diabetes management measures were seen across groups for all variables (Table 1). For example, Asian Indians were most likely to be college graduates, whereas Hispanics were most likely to have less than a high school education, Koreans were least likely to speak English at home and have health insurance, and Hispanics and Blacks had the highest prevalence of overweight and obesity. The majority of individuals in all groups was insured and reported receiving a check-up in the last year from a physician.

Overall, Asian Americans reported poorer diabetes management compared with Black and Hispanic groups (Table 1). Asian Indians reported similar diabetes management behaviors compared with those of Black and Hispanic subgroups, with poorer diabetes management behaviors among Chinese and Koreans. In comparison with American Diabetes Association guidelines[9], Asian American subgroups reported lower adherence to feet checks and HbA_{1c} checks by a doctor compared with Blacks and Hispanics. Chinese and Koreans reported fewer self-administered feet checks and glucose checks compared with Blacks and Hispanics.

Table 2 presents adjusted parameter estimates (odds ratios for eye examination) and 95% confidence intervals for each dependent variable, using Black race as the referent group. Adjusting for all variables in the models, Chinese and Koreans were significantly less likely than Blacks to have participated in any diabetes management behavior over the past year, and Asian Indians were significantly less likely than Blacks to have received an eye examination in the past year and to perform daily feet checks. Hispanics did not differ from Blacks in any diabetes management behavior.

Discussion

Research on diabetes management among Asian Americans was hampered by a lack of generalizability, small sample sizes, and inadequate data collection efforts at local and national levels.[10] Our findings presented the first efforts to document diabetes management practices among distinct Asian American subgroups with the unique opportunity to compare these groups to Black and Hispanic populations. We found that Chinese and Koreans with diabetes in NYC had poorer diabetes management behaviors compared with Black and Hispanic counterparts on all measures, and that Asian Indians had worse management practices than Blacks and Hispanics on some measures.

Our results support the development and implementation of provider- and healthcare systems-level interventions and tailored programmatic efforts to improve diabetes management among Asian American subgroups. Our findings that Chinese and Korean individuals with diabetes were less likely than other groups to engage in diabetes self-management practices pointed to the need for culturally and linguistically tailored efforts that promote awareness and self-efficacy of diabetes self-management, including community-based educational interventions. Furthermore, allied health professionals, such as community health workers, health educators, and trained interpreters, can help support the physician workforce in encouraging diabetes self-management practices among these patients. Moreover, despite high rates of being insured and receiving a check-up in the last year, Asian American subgroups in our sample were less likely than Black and Hispanic groups to receive recommended physician-led management practices, which pointed to the need for provider- and healthcare systems-level interventions. Examples of such efforts may include cultural competency trainings for providers serving Asian American communities; the integration of community health workers and other allied health professional into healthcare teams to facilitate communication and referrals between primary care providers, specialists, and patients; and clinical decision support tools embedded into health systems and practices that encourage providers to manage their patients' diabetes according to the current standard of care. Because of the growth and diversity of the Asian American population and the rising prevalence of diabetes in this group, continued efforts to improve diabetes management in this population are warranted.

Acknowledgments

This publication was made possible by Grant Numbers P60 MD000538 (NIH National Institute for Minority Health and Health Disparities), 1U48 DP001904-04 (Centers for Disease Control and Prevention), U58 DP001022 (Centers for Disease Control and Prevention REACH U.S. Program), U58 DP004685 (Centers for Disease Control and Prevention New REACH Program), and UL1 TR000038 (National Center for Advancing Translational Sciences). We thank Youlian Liao, MD (Centers for Disease Control and Prevention), and the members of the

REACH US coalition for their comments, suggestions, and guidance. The funding agencies had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the article; or decision to submit the manuscript for publication.

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Table 1

Demographic Characteristics and Diabetes Management Behaviors Among Adults With Diabetes (N=2146): Racial and Ethnic Approaches to Community Health (REACH) US Risk Factor Survey, New York City, 2009-2012

	Racial/Ethnic Group			Select Asian Subgroups		
Characteristics	**Hispanic (n=1008)**	**Black (n=559)**	**Asian (n=579)**	**Chinese (n=372)**	**Korean (n=72)**	**Asian Indian (n=71)**
Sociodemographics						
Male gender, % (SE)	46.4 (2.4)	41.7 (1.9)	53.1 (0.9)	49.4 (2.6)	47.6 (3.6)	62.7 (6.4)
Age, y, mean ±SE	58.2 ±0.9	59.3 ±1.2	61.7 ±0.9	64.0 ±1.1	61.4 ±2.4	56.8 ±2.4
< high school education, % (SE)	56.4 (1.2)	27.3 (0.7)	35.7 (4.0)	50.6 (5.4)	12.8 (6.6)	7.8 (2.0)
College graduate, % (SE)	6.0 (0.7)	15.6 (2.0)	28.7 (2.7)	16.5 (2.5)	32.4 (5.5)	60.8 (4.6)
Foreign-born, % (SE)	62.7 (3.4)	19.2 (2.6)	95.3 (1.2)	96.2 (0.7)	100.0 (0)	93.8 (3.1)
Income < $25,000, % (SE)	73.4 (1.1)	63.4 (1.8)	58.0 (2.0)	68.0 (2.9)	73.3 (1.2)	15.4 (5.2)
Speaks English at home, % (SE)	30.3 (3.0)	94.7 (1.3)	27.6 (10.6)	20.6 (13.6)	5.7 (2.5)	62.6 (10.5)
Has health insurance, % (SE)	89.1 (1.7)	92.0 (1.3)	90.2 (0.9)	91.4 (1.5)	79.6 (1.7)	95.6 (2.2)
Checkup in past year, % (SE)	89.0 (0.6)	89.5 (2.1)	88.2 (1.4)	88.4 (2.2)	75.9 (5.8)	97.7 (0.9)
Excellent/very good self-reported health, % (SE)	10.7 (1.0)	17.8 (2.4)	11.2 (1.7)	7.0 (1.9)	11.4 (1.8)	22.0 (2.3)
Body Mass Index, mean ±SE	36.5 ±0.6	33.8 ±1.1	29.0 ±0.4)	29.1 ±0.3	32.2 ±2.4	27.2 ±0.3
Diabetes Management						
Time since last eye examination, % (SE)						
Within past year	70.6 (1.6)	76.3 (1.4)	67.0 (2.3)	67.9 (1.5)	58.7 (5.6)	65.1 (6.0)
≥ 1 year	21.0 (1.5)	16.8 (1.3)	17.6 (2.0)	16.6 (1.5)	13.2 (3.8)	25.8 (6.1)
Never	7.4 (1.1)	6.3 (1.1)	13.0 (1.3)	12.3 (0.6)	28.2 (4.2)	7.1 (2.3)
Don't know	1.0 (0.3)	0.6 (0.3)	2.4 (1.0)	3.2 (1.0)	0 (0)	2.0 (1.7)
Weekly glucose checks by self						
Mean ±SE	11.88 ±0.57	10.29 ±0.29	4.62 ±0.28	3.80 ±0.13	2.36 ±0.54	7.66 ±1.04
Median	7.00	7.00	0.95	0.20	0.17	3.69
Range	0 - 420.0	0 - 49.0	0 - 77.0	0 - 77.0	0 - 14.0	0 - 42.0
Daily feet checks by self						
Mean ±SE	0.93 ±0.04	1.03 ±0.03	0.31 ±0.03	0.20 ±0.03	0.16 ±0.06	0.60 ±0.06
Median	0.88	0.91	0	0	0	0.32
Range	0 - 30.0	0 - 8.0	0 - 5.0	0 - 4.0	0 - 2.0	0 - 3.0
Yearly HbA_{1c} checks by doctor						

	Racial/Ethnic Group			Select Asian Subgroups		
Characteristics	**Hispanic (n=1008)**	**Black (n=559)**	**Asian (n=579)**	**Chinese (n=372)**	**Korean (n=72)**	**Asian Indian (n=71)**
Mean ±SE	3.31 ±0.14	3.23 ±0.18	2.91 ±0.11	1.16 ±0.15	2.14 ±0.11	2.73 ±0.14
Median	2.18	2.31	2.40	2.76	1.79	2.51
Range	0 - 52.0	0 - 24.0	0 - 24.0	0 - 24.0	0 - 4.0	0 - 4.0
Don't know, % (SE)	7.0 (1.4)	9.8 (1.5)	10.8 (3.5)	16.6 (5.6)	0 (0)	2.3 (1.7)
Never heard of HbA_{1C}, % (SE)	20.5 (2.0)	15.6 (1.6)	21.3 (5.2)	22.9 (5.0)	38.5 (7.1)	11.1 (2.3)
Yearly feet checks by doctor						
Mean ±SE	2.56 ±0.12	3.06 ±0.24	1.83 ±0.19	1.98 ±0.20	0.81 ±0.04	2.00 ±0.37
Median	1.10	1.58	0	0	0	1.18
Range	0 - 48.0	0 - 52.0	0 - 52.0	0 - 52.0	0 - 12.0	0 - 8.0
Don't know, % (SE)	1.7 (0.4)	5.5 (0.4)	3.1 (0.9)	4.7 (1.1)	0 (0)	1.2 (1.1)

Note. HbA_{1C} = glycosylated hemoglobin

Table 2

Multivariable Analyses for Racial/Ethnic Differences in Diabetes Management Behaviors: Racial and Ethnic Approaches to Community Health (REACH) US Risk Factor Survey, New York City, 2009-2012

Race/Ethnicity	Eye Examination in Past Year (0=no), OR (95% CI)	HbA_{1c} checks per year,[a] OR (95% CI)	Feet checks per year,[a] OR (95% CI)	Weekly glucose checks,[a] OR (95% CI)	Daily feet checks,[a] OR (95% CI)
Black (Ref)	1.00	1.00	1.00	1.00	1.00
Hispanic	0.79 (0.58, 1.09)	−0.02 (−0.11, 0.07)	−0.09 (−0.18, 0.00)	.20 (−0.03, 0.43)	−0.01 (−0.08, 0.05)
Chinese	0.53* (0.32, 0.89)	−0.16* (−0.27, −0.04)	−0.40*** (−0.55, −0.25)	−0.89*** (−1.15, −0.63)	−0.40*** (−0.48, −0.32)
Korean	0.23*** (0.12, 0.46)	−0.27** (−0.42, −0.12)	−0.67*** (−0.81, −0.52)	−0.86*** (−1.16, −0.57)	−0.38*** (−0.47, −0.28)
Asian Indian	0.41** (0.22, 0.75)	−0.04 (−0.19, 0.10)	−0.03 (−0.27, 0.22)	−0.05 (−0.29, 0.20)	−0.14*** (−0.22, −0.07)

Note. CI = confidence interval; HbA_{1C} = glycosylated hemoglobin; OR = odds ratio. Analyses were adjusted for age, gender, US-born, income, education, health insurance status, self-reported health, English spoken at home, and body mass index categories

[a] Dependent variable transformed using $\ln(Y_i + 1)$.

* $P<.05$

** $P<.01$

*** $P<.001$.