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Research Article

Ethnic Disparity in Diabetes Self-Management Class Utilization, Behavioral Risk Factors Surveillance System 2012

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Abstract

We examined diabetes self-management class utilization in a study sample of adult BRFSS 2012 participants with diabetes (n=34,665). This study assessed demographic variables that might be associated with class utilization, specifically sex, age, income, having health insurance (yes or no), and ethnicity (Hispanic and non-Hispanic) on diabetes self-management class utilization. Participation in diabetes self-management class was 53.8% overall. Male sex, age greater than 49 years, income <\$25,000 per year, and lack of health insurance were each significantly associated with decreased class utilization. Hispanics (n=2,962) were 43% less likely to have taken a class compared to non-Hispanics (n=31,703) (OR 0.57, CI:0.53-0.62, $p<0.001$) with 41.2% of Hispanics and 55% of non-Hispanics reporting that they had taken a diabetes self-management class. This disparity remained after adjusting for sex, age, income, and health insurance (OR 0.60, CI:0.55-0.65, $p<0.001$). Efforts to enhance participation in diabetes self-management education are needed, particularly in Hispanic communities.

Keywords: Hispanics; Aging; Income; Sex; Health insurance

Abbreviations: BRFSS: Behavioral Risk Factor Surveillance System; OR: Odds Ratio; CI: Confidence Interval; SPSS: Statistical Package for the Social Sciences

Objective

Diabetes is a growing public health concern worldwide [1]. Diabetes is a major cause of cardiovascular disease, stroke, hypertension, and kidney failure that affects more than 29 million adults (9.3%) in the U.S., including 25.9% of those aged 65+ years [2,3]. Studies show that diabetes disproportionately affects racial/ethnic populations

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[4-7]. Diabetes complications risk can be reduced through adequate self-management training of affected individuals [2,5], but few studies have

examined demographic variables that affect self-management class utilization. This study assessed the impact of sex, age, income, having health insurance (yes or no), and ethnicity (Hispanic and non-Hispanic) on diabetes self-management class utilization in a large, nationwide population.

Methods

Using the 2012 Behavioral Risk Factor Surveillance System (BRFSS) data, we conducted a cross-sectional study examining self-reported participation in a diabetes self-management class by survey participants aged 18+ years with diabetes. We examined the 475,687 response records (Table 1) from adults aged 18+ years who lived in households identified through telephone-based methods [8]. The Study Sample (Table 2) consisted of 34,665 participants with diabetes who responded “Yes” or “No” to the Module 2: Diabetes Survey Question 10: “Have you ever taken a course or class in how to manage your diabetes yourself?” [9]. We evaluated sex, age, income, having health insurance (yes or no), and ethnicity (Hispanic and non-Hispanic) as possible determinants of diabetes self-management class utilization.

The analyses consisted of five steps: 1) identify people in the 2012 BRFSS who reported having diabetes ($n=59,763$), 2) identify people with diabetes who responded to the question about taking a diabetes self-management class ($n=34,665$), 3) use logistic regression models to evaluate the odds of participating in a diabetes self-management class as well as the adjusted odds by sex (male/female), age (<50 or 50+ years), income (<\$25,000 or \$25,000+ per year), having health insurance (yes or no), and ethnicity (Hispanic or non-Hispanic), and 4) adjust the ethnicity logistic regression model for sex, age, income, and health insurance. Each model generated an odds ratio (OR) with a 95% confidence interval (CI). A p -value <0.05 was considered significant. All statistical analyses were performed using SPSS 23 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp).

Results

Population characteristics for the 2012 BRFSS Sample are shown in Table 1. Population characteristics for the Study Sample are shown in Table 2. The Study Sample ($n=34,665$) consisted of respondents with self-reported diabetes who answered “Yes” they took a class ($n=18,666$, 53.8%) or “No” they did not take a class ($n=15,999$, 46.2%) to help them manage their diabetes. Sex, age, income level, and having health insurance were all significant factors associated with class utilization. Male participants were 21% less likely (OR 0.79, 95% CI:0.76-0.83) to have taken a diabetes self-management class than female participants ($p<0.001$). Participants 50+ years of age were 15% less likely (OR 0.85, 95% CI:0.79-0.92) to have taken a diabetes self-management class than participants 18-49 years of age ($p<0.001$). Participants with lower incomes (<\$25,000 per year) were 33% less likely (OR 0.67, 95% CI:0.64-0.70) to have taken a diabetes self-management class than participants with higher income ($p<0.001$). Participants without health insurance were 17% less likely (OR 0.83, 95% CI:0.76-0.90) to have taken a diabetes self-management class than participants with health insurance ($p<0.001$).

Significant ethnic disparity was observed for diabetes self-management class utilization with 41.2% of Hispanics and 55% of non-Hispanics reporting “Yes” they had taken a diabetes class (Table 2). Hispanics were 43% less likely (OR 0.57, 95% CI:0.53-0.62) to have taken a diabetes self-management class than non-Hispanics ($p<0.001$). After adjusting the ethnicity logistic regression model for sex, age, income level, and having health insurance, Hispanics were still less likely to have taken a diabetes self-management class than non-Hispanics (OR 0.60, 95% CI:0.55-0.65) significant ($p<0.001$).

Discussion

Accessibility of and participation in diabetes self-management education is a significant public health concern. This study highlights the need to increase and broaden our understanding of the diabetes self-management practices of the U.S. population overall

Table 1: Demographics of BRFSS Sample Population (number and % of subgroup total).

BRFSS Sample	# of Respondents	% of Total
Sex		
Male	191,737	40.3%
Female	283,950	59.7%
Total respondents	475,687	100%
Age (years)		
18-34	72,665	15.4%
35-49	96,291	20.4%
50 and over	302,151	64.1%
Total respondents	471,107	100%
Income per year		
Level < \$25,000	126,108	30.8%
Level ≥ \$25,000	282,834	69.2%
Total respondents	408,942	100%
Health Insurance		
No	54,801	11.6%
Yes	419,328	88.4%
Total respondents	474,129	100%
Total self-report diabetes		
No	403,299	87.1%
Yes	59,763	12.9%
Total respondents	463,062	100%

and particularly in especially the Hispanic community, as reflected in the 2012 BRFSS survey.

Several studies have demonstrated that taking a diabetes self-management class can effectively improve the quality of chronic disease management [10-12]. Despite improving health outcomes and quality of life, diabetes classes remain underutilized by individuals who have the opportunity to take them [13,14]. Although critical for enhancing class usage, demographics information about persons who enroll in diabetes classes are not well characterized [2,5]. A study of New York residents showed that Puerto Rican minority populations with diabetes report less participation in diabetes classes compared to non-minorities [7]. Little is known about the reasons for this disparity. We found that only 53.8% of the 2012 BRFSS population subset with diabetes reported ever taking a self-management class. Male sex, age over 49 years,

low income, lack of health insurance, and Hispanic ethnicity were each significantly associated with reduced class utilization. Ethnic disparity persisted even after statistically adjusting for sex, age, income, and having health insurance. A recent, exploratory study of patient-reported barriers to attending diabetes support group sessions identified copays as a challenge but not an attendance-limiting factor in a small patient sample (n=48) from a hospital-owned, suburban family medicine practice [14], most of whom likely had health insurance. Our study, instead, focused on the association between having health insurance and taking a self-management class and suggests that not having health insurance is a barrier to taking a self-management class. Our results identify specific demographic variables associated with class usage and demonstrate that there is significant potential for improving diabetes self-management class utilization overall. This information can guide demographics-customized design, implementation,

Table 2: Demographics of Study Sample - Respondents with Diabetes Who Answered “Yes” or “No” to Question About Self-Management Class.

Study Sample	Response “Yes”	Response “No”	Respondents
Respondents with diabetes who answered the question about taking a class (Yes or No)	18,666 (53.8%)	15,999 (46.2%)	34,665 (100%)
Sex			
Male	7,391 (51.9%)	6,837 (48.1%)	14,228 (41.0%)
Female	11,275 (55.2%)*	9,162 (44.8%)	20,437 (59.0%)
Age (years)			34,379 (100%)
18-34	427 (56.9%)	324 (43.1%)	751 (2.2%)
35-49	1,955 (57.2%)	1,461 (42.8%)	3,416 (10.0%)
50 and over	16,119 (53.4%) [#]	14,093 (46.6%)	30,212 (87.8%)
Income per year			29,374 (100%)
Level < \$25,000	6,281 (47.3%)	6,999 (52.7%)	13,280 (45.2%)
Level ≥ \$25,000	9,238 (57.4%) ^{\$}	6,856 (42.6%)	16,094 (54.8%)
Insurance			34,575 100%
No	1,355 (48.2%)	1,457 (51.8%)	2,812 (8.1%)
Yes	17,267 (54.4%)**	14,496 (45.6%)	31,763 (91.9%)
Ethnicity			34,665 (100%)
Non-Hispanics	17,446 (55.0%)	14,257 (45.0%)	31,703 (91.5%)
Hispanics	1,220 (41.2%) ^{†‡}	1,742 (58.8%)	2,962 (8.5%)

* $p < 0.001$ vs. male, [#] $p < 0.001$ vs. 18-49 years, ^{\$} $p < 0.001$ vs. < \$25,000, ** $p < 0.001$ vs. no health insurance, [†] $p < 0.001$ vs. non-Hispanics (uncontrolled model), [‡] $p < 0.001$ vs. non-Hispanics (controlled for sex, age, income, & health insurance).

and adoption of effective diabetes self-management classes by a greater percentage of individuals from diverse backgrounds. Hispanics, and possibly other high-risk populations, are in particular need of increased class utilization and would likely benefit from increased engagement and accessibility of multilingual, culturally appropriate healthcare teams, mobile technology, and community resources to enhance their engagement in diabetes self-management education [15,16].

BRFSS data are obtained by self-report and, as a result, subject to recall bias as well as under and over reporting. Therefore, our results cannot be generalized to larger segments of the population. BRFSS participation requires a phone (landline or cell phone), willingness to answer the phone call, and an inclination to answer the telephone survey questions. In summary, our findings highlight the need to increase understanding about factors that influence diabetes self-management class utilization in the population overall and particularly in Hispanics. Health professionals and communities need to effectively address these factors (e.g., sex, age, income, insurance, ethnicity) to reduce diabetes complications related to poor self-management.

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