



Determinants of adherence to physical activity guidelines among adults with and without diabetes

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ABSTRACT

Background: Diabetes affects 29.1 million people in the United States. Engaging in physical activity (PA) can prevent and also improve the outcomes of chronic diseases, including diabetes. The 2008 U.S. Department of Health and Human Services Physical Activity Guidelines for Americans recommend that adults should do at least 150 minutes a week of moderate-intensity, or 75 minutes a week of vigorous-intensity aerobic PA, or an equivalent combination of both; and muscle-strengthening exercise.

Methods: This study examined the BRFSS 2015 dataset for sociodemographic and health-related factors associated with adherence to PA guidelines among adults with and without diabetes.

Results: Among adults surveyed (N=429,360), 13% reported having diabetes and 84.3% did not. More than half of those with diabetes (51.5%; n = 25762) did not meet either guideline, while 37.1% (n = 18549) met either the aerobic or muscle strengthening guideline, and only 11.4% (n = 5716) met both guidelines. Among adults without diabetes, 37.0% (n = 119627) did not meet either guideline, 42.2% (n = 136321) met either the aerobic or muscle strengthening guideline, and 20.8% (n = 67412) met both guidelines. Older age, lower levels of education or income, being female, employed, living with a partner, and reporting poor general health were associated with increased odds of not meeting PA guidelines in both adults with and without diabetes. Non-Hispanic Whites with diabetes were less likely than other races, to meet PA guidelines; while Non-Hispanic Whites without diabetes were more likely to meet PA guidelines.

Conclusion: More interventions that promote PA among populations with diabetes are needed.

BACKGROUND

- Diabetes is a major public health burden affecting 29.1 million people or 9.3% of the U.S. population
- Research has shown that diabetes can be prevented and controlled by engaging in lifestyle practices such as taking medications, healthy eating, and increasing physical activity (PA)
- Health Agencies including the U.S. Department of Health and Human Services and the American Diabetes Association recommend that adults do at least 150 minutes a week of moderate-intensity or 75 minutes a week of vigorous-intensity aerobic PA, or an equivalent combination of both
- Additionally, no specific time is recommended for muscle-strengthening PA, but it is recommended that adults perform it until it would be difficult to do another repetition without assistance
- The purpose of this study is to examine sociodemographic and health-related factors associated with adherence to PA guidelines in adults with and without diabetes.

METHODS

Data source and study population: The 2015 Behavioral Risk Factor and Surveillance System (BRFSS) dataset was analyzed. Included in the analyses were adults 18 years and older, with self-reported diagnosis of diabetes, and those without diabetes. Adults with pre-diabetes and gestational diabetes were excluded

Measures: Questions included from the survey assessed socio-demographic (e.g. race, income) and health-related factors (e.g. diabetes status, general health status)

Outcome: We examined whether adults met neither the aerobic or muscle-strengthening guideline, one of the guidelines, or both guidelines

Statistical analysis: Descriptive statistics, cross-tabs and logistic regression were performed to assess the factors associated with adherence to PA guidelines.

RESULTS

Fig.1. Adherence to aerobic and muscle-strengthening guidelines among adults

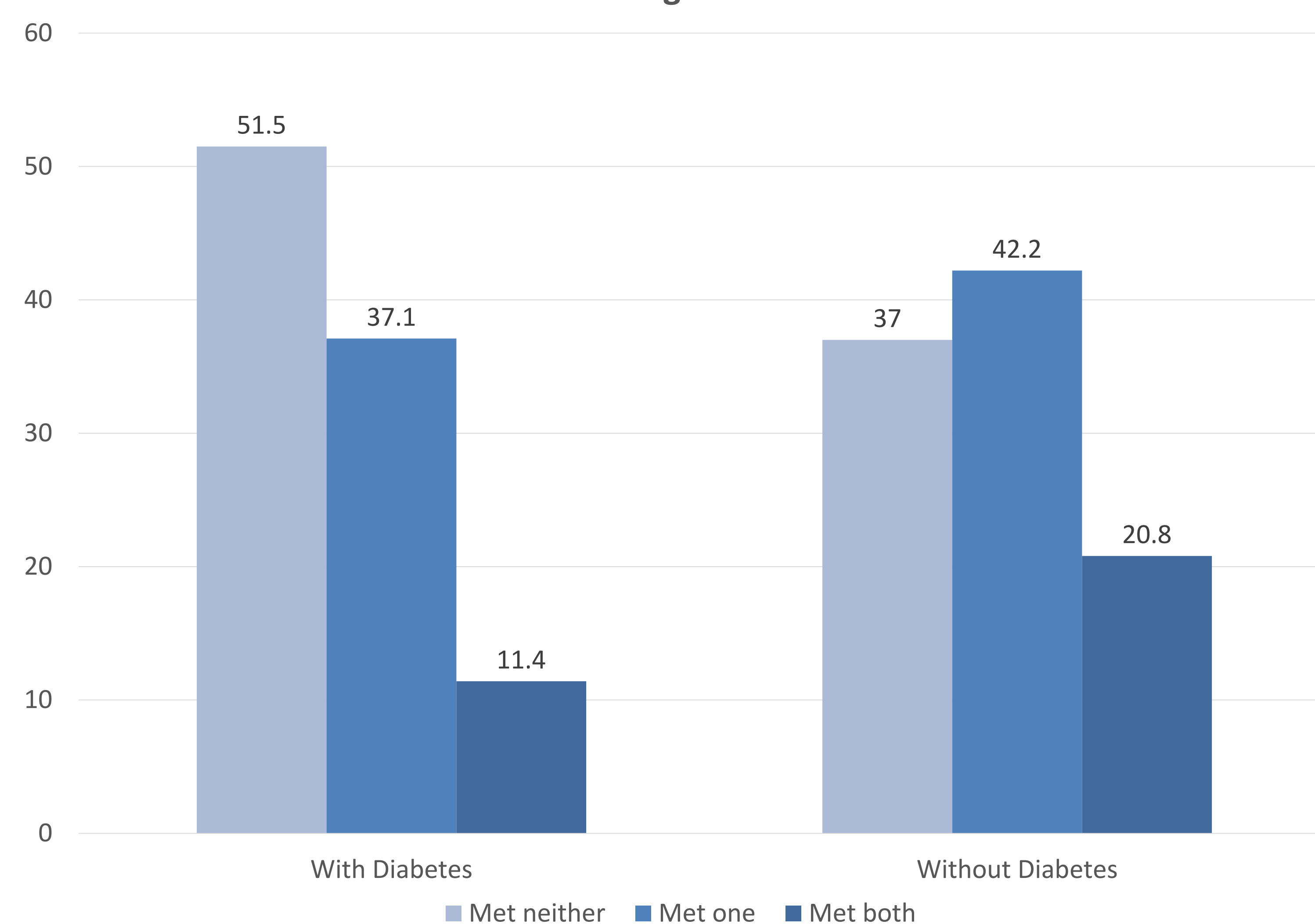


Table 1a. Weighted prevalence and adjusted odds ratios of physical activity levels among diabetic adults (BRFSS 2015)

Characteristics	Did not meet either guideline		Met the aerobic or muscle-strengthening guideline		Met the aerobic and muscle-strengthening guidelines		
	Est. %	Est. %	aOR	95% CI	Est. %	aOR	95% CI
Sex							
Male	47.9	38.5			13.6		
Female	56.8	34.1	.748	(.691 – .810)	9.1	.563	(.497 – .639)
Race							
Non-Hispanic White	51.3	37.7			11.0		
Non-Hispanic Black	53.9	32.7	.902	(.790 – 1.031)	13.4	1.351	(1.117 – 1.634)
Hispanic	59.3	32.1	1.007	(.866 – 1.171)	8.6	1.100	(.868 – 1.395)
Non-Hispanic Other	39.7	43.8	1.471	(1.150 – 1.883)	16.5	1.785	(1.216 – 2.620)
Age (years)							
18 to 24	32.1	40.1			27.8		
25 to 34	48.1	37.4	.569	(.285 – 1.134)	14.6	.449	(.203 – .993)
35 to 44	52.0	35.6	.444	(.232 – .849)	12.4	.315	(.150 – .660)
45 to 54	56.1	32.1	.373	(.198 – .702)	11.8	.282	(.138 – .578)
55 to 64	54.4	36.2	.444	(.237 – .832)	9.4	.224	(.110 – .456)
65 or older	50.2	38.1	.493	(.263 – .923)	11.7	.297	(.146 – .604)
Education							
< High school	61.2	30.9			7.9		
High school graduate	57.0	34.3	1.063	(.920 – 1.227)	8.7	.934	(.717 – 1.215)
Some college	48.8	38.3	1.218	(1.047 – 1.417)	12.9	1.383	(1.055 – 1.812)
College graduate	39.3	43.1	1.515	(1.290 – 1.780)	17.6	2.015	(1.516 – 2.680)
Income							
< \$15,000	60.0	31.9			8.1		
\$15,000 to \$24,999	56.8	33.7	.982	(.849 – 1.136)	9.5	1.198	(.930 – 1.543)
\$25,000 to \$34,999	55.2	34.9	1.006	(.853 – 1.186)	10.0	1.235	(.937 – 1.629)
\$35,000 to \$49,999	49.6	38.4	1.112	(.938 – 1.319)	12.0	1.500	(1.127 – 1.998)
> \$50,000	43.3	41.2	1.249	(1.061 – 1.471)	15.5	1.931	(1.472 – 2.531)
Employment							
Employed	49.9	37.4			12.6		
Unemployed	53.5	35.8	1.030	(.917 – 1.157)	10.8	1.230	(1.035 – 1.461)
Marital Status							
Living with partner	50.9	37.8			11.3		
Living without partner	54.3	34.2	.986	(.896 – 1.086)	11.4	1.164	(1.001 – 1.354)
Good General Health							
Yes	44.2	41.5			14.3		
No	62.1	30.1	.598	(.544 – .658)	7.8	.475	(.413 – .547)

Note: Values with boldface indicate statistical significance (p < 0.05)

RESULTS

Table 1b. Weighted prevalence and adjusted odds ratios of physical activity levels among non-diabetic adults (BRFSS 2015)

Characteristics	Did not meet either guideline		Met the aerobic or muscle-strengthening guideline		Met the aerobic and muscle-strengthening guidelines		
	Est. %	Est. %	aOR	95% CI	Est. %	aOR	95% CI
Sex							
Male	35.0	40.9			24.2		
Female	40.5	40.3	.851	(.825 – .878)	19.2	.686	(.661 – .712)
Race							
Non-Hispanic White	35.5	42.4			22.2		
Non-Hispanic Black	43.1	35.3	.792	(.742 – .844)	21.6	.942	(.871 – 1.019)
Hispanic	44.8	36.3	.895	(.842 – .951)	18.9	.989	(.917 – 1.067)
Non-Hispanic Other	36.0	41.2	.930	(.856 – 1.011)	22.9	.902	(.820 – .993)
Age (years)							
18 to 24	30.0	40.1			29.9		
25 to 34	37.0	39.5	.746	(.688 – .809)	23.6	.576	(.526 – .630)
35 to 44	40.6	38.9	.659	(.607 – .715)	20.6	.451	(.411 – .495)
45 to 54	40.9	39.6	.672	(.621 – .728)	19.5	.435	(.398 – .475)
55 to 64	39.8	41.5	.713	(.660 – .771)	18.7	.431	(.395 – .470)
65 or older	37.3	44.2	.804	(.743 – .870)	18.5	.488	(.447 – .533)
Education							
< High school	52.5	34.4			13.1		
High school graduate	42.6	39.4	1.134	(1.054 – 1.219)	18.1	1.238	(1.112 – 1.378)
Some college	35.7	41.7	1.356	(1.260 – 1.460)	22.6	1.672	(1.503 – 1.860)
College graduate	29.0	43.3	1.641	(1.523 – 1.769)	27.7	2.389	(2.147 – 2.659)
Income							
< \$15,000	48.5	36.9			14.5		
\$15,000 to \$24,999	45.3	37.8	1.049	(.975 – 1.128)	16.9	1.210	(1.095 – 1.337)
\$25,000 to \$34,999	41.6	39.6	1.127	(1.040 – 1.221)	18.8	1.365	(1.227 – 1.519)
\$35,000 to \$49,999	38.5	40.4	1.178	(1.090 – 1.274)	21.1	1.559	(1.406 – 1.728)
> \$50,000	31.3	42.8	1.427	(1.324 – 1.539)	25.9	2.158	(1.959 – 2.378)
Employment							
Employed	37.4	40.0			22.6		
Unemployed	38.2	41.6	1.230	(1.177 – 1.286)	20.2	1.247	(1.182 – 1.315)
Marital Status							
Living with partner	37.7	41.5			20.8		
Living without partner	37.9	39.5	1.069	(1.027 – 1.112)	22.7	1.230	(1.172 – 1.291)
Good General Health							
Yes	34.6	41.9			23.5		
No	57.3	32.5	.539	(.512 – .568)	10.2	.371	(.342 – .402)

Note: Values with boldface indicate statistical significance (p < 0.05)

DISCUSSION/CONCLUSIONS

- A total of 429,360 respondents were included in the study; 13.3% (n=57, 256) were diabetic and 86.7% (n=372,104) were not diabetic
- Majority were female (57.3%), white (76.4%), 65 years and older (34.6%), college graduates (36.8%), with good general health (81.5%)
- More than half of those with diabetes (51.5%; n = 25762) did not meet either guideline, while 37.1% (n = 18,549) met either the aerobic or muscle strengthening guideline, and only 11.4% (n = 5,716) met both guidelines
- Among adults without diabetes, 37.0% (n = 119,627) did not meet either guideline, 42.2% (n = 136,321) met either the aerobic or muscle strengthening guideline, and 20.8% (n = 67,412) met both guidelines
- Older age, lower levels of education or income, being female, employed, living with a partner, and reporting poor general health were significantly associated with increased odds of not meeting PA guidelines in both adults with and without diabetes
- Non-Hispanic Whites with diabetes were less likely than other races to meet PA guidelines; while Non-Hispanic Whites without diabetes were more likely to meet PA guidelines.
- Understanding the factors associated with adherence to physical activity guidelines among diabetic populations is important for the development of tailored interventions to overcome the barriers.

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