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Correlates of Physical Activity Guideline Compliance for Adolescents in 100 U.S. Cities

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Abstract

Purpose—This study assessed the rates and correlates of adolescents' compliance with national guidelines for physical activity.

Methods—A cross-sectional phone survey of adolescents and their parents was conducted in the 100 largest United States cities in 2005. Adolescents ages 14–17 years (n=6125) were asked how many days during the previous week and during a typical week they were physically active for at least 60 minutes. Compliance was defined as 5+ days per week. Parents provided data on teen's age and race/ethnicity, parental education level, annual household income, and region of residence, and associations between these variables and compliance with physical activity guidelines were examined.

Results—Approximately 40% of the females and 57% of the males complied with the national physical activity guidelines. Logistic regression indicated that for both sexes, compliance was significantly associated with having higher household income, and for females only, compliance declined significantly with age. Region of residence did not predict compliance for either sex.

Conclusion—A majority of the girls and a large portion of the boys failed to meet the current guidelines, thereby increasing their risks of multiple health problems. Targeting intervention resources for low income teens and older adolescent teen girls is recommended.

Keywords

physical activity; adolescents; compliance

Introduction

Lack of physical activity in youth is a risk factor for overweight and obesity, higher triglyceride levels, anxiety, and depression [1], as well as for elevated blood pressure [1,2] and type II diabetes [3]. Obesity is now viewed as a major health problem in children and adolescents due to its rapid increase in prevalence [4], association with various health problems [5], and concern that obesity and its associated health problems persist into adulthood [4,6]. The prevalence of overweight in teens increased from 5% in the 1960's to 14% in 2000, with minorities having

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even higher rates [7]. The youth obesity epidemic has heightened interest in physical activity, which is recommended as a part of obesity control [8] and health promotion in general [9].

A panel from the Centers for Disease Control and Prevention [1] as well as the current U.S. Dietary Guidelines (as of 2006) [10] states that adolescents need to accumulate at least 60 minutes of moderate physical activity most, if not all, days of the week. Data from the National Longitudinal Study of Adolescent Health (Ad Health) survey revealed that the majority of males and an even higher proportion of females did not engage in moderate-to-vigorous physical activity (of 5–8 METs) five or more days per week [11]. According to the Healthy People 2010 database, only 26% of adolescents complied with the recommendation of at least 30 minutes per day of moderate physical activity (not causing hard breathing), five days per week, with females being lower than males (23% vs. 28%). When compared to vigorous physical activity (which causes hard breathing), 65% of adolescents met the standards (males= 73% and females= 57%) [12]. There are important limitations to these national prevalence estimates. None of the measures used validated items, and at the time our study was conducted, none of the published prevalence estimates had been based on the current guidelines of at least 60 minutes of moderate-to-vigorous physical activity at least five days per week. Thus, at the time of our data collection there were no appropriate national physical activity guideline compliance estimates for adolescents.

A systematic review of 54 studies identified several demographic correlates of adolescent physical activity [13]. The most consistent findings were that males were more active than females and non-Hispanic Whites had higher levels of physical activity than other ethnoracial groups. Additionally, an inverse relationship between age and physical activity level was found in 70% of the studies. Though socioeconomic status was not consistently related to physical activity [13], one national study found adolescents had a greater probability of engaging in higher levels of physical activity when their mothers were well-educated or their parents' income was $50,000 or more per year [14].

The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity in 2001 stated there is a lack of national data to assess whether "adolescents meet the Federal recommendations" for physical activity [8].The purpose of the present study was to assess the proportion of adolescents in a multi-city, U.S. sample meeting guidelines of 60 minutes of moderate-to-vigorous physical activity at least five days per week, and the correlates of guideline compliance. Though it is not ideal to base prevalence estimates on self-report measures due to potential for inaccuracy and bias [15], self-report was the only feasible validated approach for the present study. Based on results from previous studies, we predicted the following characteristics would be associated with higher levels of guideline compliance: being male, identifying as non-Hispanic White, having higher parental education and income levels, and being younger.

Methods

Background

The CITY100 (Correlates of Indoor Tanning in Youth) Teen/Parent survey was a health questionnaire and one component of a study assessing indoor tanning practices of adolescents living in the 100 largest U.S. cities [16]. The survey instruments were adapted from teen/parent indoor tanning surveys developed by Forster and colleagues [17]. We added items to assess several other health-related behaviors, including physical activity. We believed that introducing the survey as a teen "health" survey, versus a survey specific to one specific behavior such as indoor tanning or physical activity, would produce less self-selection bias. Survey procedures were approved by the Institutional Review Board at San Diego State University, San Diego, CA.

Participants

Adolescents ages 14–17 years and one caregiver of each were contacted via telephone from January through December, 2005. The participants resided in the 100 most populous U.S. cities [18]. The goal was to interview 60 adolescents/parent pairs from each city. The 100 cities represented 34 states and the District of Columbia. When possible, a female caregiver (i.e., mother, stepmother, other guardian, etc.) was interviewed, but when unavailable, a male caregiver was interviewed. The female caregiver was preferred because some of the parent interview items asked about the parent's knowledge of the teen's indoor tanning behavior, and our formative work indicated that the female caregiver would be more knowledgeable about this. Eligibility criteria consisted of the teen being between the ages of 14 to 17 years and both the teen and parent being English speaking.

A professional survey sampling firm generated lists of potential participant households for each of the 100 cities. They used a targeted age sampling process to maximize the probability of a teen residing in the home. Professional interviewers, who were trained and regularly monitored, made a minimum of ten contact attempts per household before considering that phone number unreachable.

The interviewer introduced the survey as a teen health questionnaire sponsored by the National Institutes of Health. A brief description of the survey was given to the parent at the beginning of the conversation, eligibility was established, and oral consent for both parent and teen was obtained from the parent. The parent was interviewed first. Assent by the teen was given at the beginning of the teen's interview. If more than one teen ages 14 through 17 years lived in the household, one teen was chosen at random by computer to be interviewed. The parent survey lasted approximately 5 minutes and the adolescent survey lasted about 15 minutes.

Selected Survey Items

Teens were asked about their own moderate-to-vigorous physical activity (roughly 3 METs [multiples of resting energy expenditure] and above) using two items, which had been validated using accelerometer data with adolescents in a self-administered format [19]. The definition of physical activity that was given was "any activity that increases your heart rate and makes you get out of breath some of the time," and examples provided included both moderate and vigorous physical activities. Adolescents were instructed to add physical activity for all purposes throughout the day. Activity during physical education was excluded because low activity levels during most PE classes [20] were expected to lead to over-reporting. The first item was, "Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?" The response options ranged from 0 to 7 days. The second item was similar in wording, but it asked about physical activity during a "typical or usual week". In the validation study, a mean of the two items was more reliable and valid than either item alone. The composite measure showed an intraclass test-retest reliability correlation of .77 and correlated significantly with accelerometer data ($r=.40$, $p< .001$). These results are comparable to other, longer, multi-day physical activity recalls of youth physical activity. The 2-item measure also demonstrated a 63% correct classification rate, a 71% sensitivity rate, and a 40% false positive rate, based on comparisons to accelerometer data [19]. Comparable data are not available for other self-reports. Further support for validity of the 2-item measure was provided by findings that higher physical activity was associated with lower odds of being overweight in 29 of 33 countries participating in an international study [21].

Selected demographic characteristics of parents and teens were used in analyses. These included highest level of education of the consenting parent (less than high school, high school graduate, vocational or business school, some college but less than bachelor's degree, college graduate, or advanced degree); and annual household income (below $20,000, $20,000–

$40,000, $40,000–$60,000, and above $60,000). Ethnic and racial information about the parent and teen was obtained from the parent. Parents were asked for the teen's sex and age. To our knowledge, the reliability and validity of the specific demographic items we used have never been evaluated. City of residence was coded as one of the four U.S. Census-based regions (Northeast, Midwest, South, and West) [22].

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 14. Descriptive data were generated for all predictor variables and the outcome variable. The outcome variable was compliance with physical activity guidelines. To create the compliance variable, the mean of the two physical activity items was first computed. It then was recoded as a dichotomous variable, based on the following cutoffs: 0–4 days was coded as noncompliant with the guidelines and 5–7 days was coded as compliant.

Teen's sex, teen's race/ethnicity, teen's age, household income, parental education, and family's region of residence were used as independent variables. The number of categories was reduced for some variables (i.e., age, income, and education) to simplify the multivariate analyses and make the odds ratios easier to interpret. Because of well-documented sex differences in physical activity, all analyses described below were sex-specific. Chi-square tests first were performed to evaluate possible associations between the predictor variables and guideline compliance. Then, two logistic regression analyses were conducted (one for males and one for females) to assess how well each predictor variable independently predicted guideline compliance [23]. Because individuals within the same city may share characteristics that make them non-independent even after measured characteristics are taken into account [24,25], we used generalized estimating equations (GEE) to adjust for clustering within cities (SAS PROC GENMOD, version 8).

Results

Response Rates and Sample Characteristics

Of the 8,176 households that were reached and met eligibility criteria, 6,125 households agreed to participate, for a cooperation rate of 74.9%. All 6,125 households generated data on a teen; 71 of these households did not have accompanying parent data. Parents were missed when the parent requested an interview on a later date, but was then not reachable. Table 1 shows the number of adolescent participants from each of the 100 cities, organized by region. There were 2,962 male and 3,153 female teens for a 48.4% and 51.5% distribution respectively; data on sex were unavailable for 10 teens. Table 2 shows the distributions of predictor and outcome variables. The mean age was 15.8 years (SD = 1.12) and the mean days of physical activity for the overall sample was 4.44 (SD = 1.90) with 4.80 (SD= 1.85) for males and 4.10 (SD= 1.88) for females. For males and females combined, 47.9% complied with the physical activity guidelines.

Bivariate Analyses

Sex was strongly associated with compliance, with approximately 57% of the male teens versus 40% of the female teens meeting the guidelines, $\chi^2=175.7$, $p<.001$. Table 3 shows the guideline compliance data, by categories of the predictor variables, and the results from chi square tests by sex. For females and males, teens having higher household incomes and whose parents had higher educational attainment consistently were more likely to comply with the guidelines. For females only, younger teens were significantly more likely to comply than older teens. A significant association between race/ethnicity and compliance was found only for males, with a range in compliance of approximately 42% among Non-Hispanic Other to 61% among Hispanic Whites. Geographic region and compliance were not related.

Logistic Regression Analysis

A logistic regression analysis was performed to evaluate which correlates of physical activity were the most important and assess their independent association with physical activity guideline compliance. As shown in Table 4, for males, the only variables that significantly predicted compliance were household income and race/ethnicity. Of male adolescents, those in the highest (vs. lowest) income category and those who were non-Hispanic White (vs. non-Hispanic other or unknown race) were significantly more likely to comply. As shown in Table 5, females who were younger and who had the highest (vs. lowest) household income were more likely to comply with the guidelines.

Individuals living in the same city may be more similar to each other than individuals living in other cities because they share a number of characteristics (e.g., economic, social) that may influence physical activity. To assess the degree to which our physical activity guideline compliance results could be accounted for by city-level clustering, prediction analyses for the separate female and male samples were repeated using generalized estimating equations (GEE) [24,25]. GEE logistic models, using a logit link and a binary mean-variance relation, were fitted using teen age, teen race/ethnicity, parental education level, household income level, and region of residence. City was used as the cluster variable. Regression coefficients and significance levels from the GEE analyses (data not shown) were almost identical to those of the earlier logistic models, indicating a minimal effect of city-level clustering. The intraclass correlation coefficient (ICC) was .006.

Discussion

Using a validated measure and a large, multi-city U.S. sample, we found that under half of the adolescents met the current physical activity guidelines for youth. These data highlight the need for interventions to promote more physical activity, especially for those groups found to have substantially lower compliance levels. As expected, there were large sex differences, with 57% of males versus 40% of females meeting guidelines. This is a large difference, indicating that many more males than females are being physically active enough to gain health benefits and that more interventions are needed to target adolescent females [26]. Following the collection of our data, the first report was published that provided national data for adolescent physical activity guideline compliance. The Youth Risk Behavior Surveillance System--2005 (YRBSS) prevalence estimates indicated that approximately 44% of the males and approximately 28% of the females were meeting the guidelines [27], which mirrored the sex differences found in our study.

Age was a significant correlate of physical activity prevalence in females but not males. Among females, 42% in the younger age group and 37% in the older age group met the guidelines. The YRBSS—2005 found an overall decline with age, but, similar to our data, it was more pronounced for females [27]. More specifically, for females the proportions of 9^{th}, 10^{th}, 11^{th}, and 12^{th} graders who met the guidelines were 30.8%, 30.0%, 25.1%, and 24.0%, respectively. These estimates for males were 42.8%, 46.8%, 43.8%, and 41.9%, respectively. Other researchers also have found that during adolescence, physical activity and the number of activities decreases with age [13,28]. Physical activity programs need to focus on keeping younger teens, especially younger females, active throughout adolescence and concurrently increase older teens' physical activity levels.

In multivariate analyses, race/ethnicity was not a strong correlate of compliance (see Tables 4 and 5). Only among males was this variable significant, with non-Hispanic "others" (41%) being lower than non-Hispanic Whites (57%). Though not significant, it is interesting that Hispanic White males (61%) had the highest prevalence rates, and non-Hispanic Blacks were relatively low at 44%. There was little variation by race/ethnicity among females, but the lowest

prevalence rate was for Hispanic White females (34%). Thus, there was a particularly large sex difference for Hispanic adolescents. A comprehensive review [13] found non-Hispanic Whites generally were more physically active than other racial and ethnic groups, but almost 25% of the comparisons were nonspecific. Thus, there are several studies reporting no racial/ethnic differences, as found in the present study. The YRBSS—2005 found that White students (38.7%) were more likely to meet guidelines than Black (29.5%) or Hispanic (32.9%) students [27]. It is possible the telephone recruitment method and/or our language-based eligibility criterion produced an undersampling of low income groups, reducing the common socioeconomic status confounding with race/ethnicity.

Teens from higher income households also were significantly more likely to comply with guidelines, which is similar to past research results. Analyses of the Ad Health data found that household income levels were related to inactivity [6], and a higher socioeconomic status was associated with higher physical activity [14]. For both males and females, multivariate analyses showed significant associations for family income, with a 7 percentage point difference across the income percentiles for both sexes. This additional evidence of income disparities in physical activity prevalence indicates the high priority that needs to be placed on interventions for low income adolescents.

There were no differences in physical activity guideline compliance levels across U.S. regions. This contradicts findings from one study, which found that teens living in the Northeast had higher levels of physical activity [14] and findings from another study, which found physical activity prevalence lowest in the South and highest in the West [29]. Moreover, state-specific estimates of guideline compliance in YRBSS--2005 ranged from 29.6% to 45.9% [27]. The inconsistency could be due to methodological differences between the studies. For example, our study was conducted only in relatively large cities, which may mask regional differences accounted for by physical activity levels of those living in small cities and rural areas.

The present study had several limitations. First, it was a cross-sectional study, and therefore conclusions about causal associations cannot be made. Second, the data were based on self-reported physical activity, although the physical activity measure had been well-validated in a sample of the same age. Self-reports usually over-estimate objectively measured physical activity [15], so it is likely the actual prevalence of meeting guidelines is lower than the figures reported here. In the absence of national data based on objective measures, it is not possible to assess the magnitude of over-reporting. Third, the survey was administered only in English. As noted earlier, this exclusion criterion may have biased our samples of certain ethnoracial groups (e.g., Hispanics) and may reduce our ability to generalize the findings to non-English speaking adolescents or adolescents whose parents do not speak English. Fourth, adolescents in smaller cities and rural areas were excluded, which may further limit external validity. Fifth, our sample was disproportionately non-Hispanic White, of relatively high income and education, and living in the West and South regions. Finally, those without telephones did not participate in the survey and any telephone noncoverage bias could affect our estimates. Therefore, the physical activity guideline compliance rates we report should not be assumed to be those of a nationally representative U.S. sample. The factors mentioned here also may help explain why our estimates for both males and females were higher than those reported for the YRBSS—2005 sample [27].

On the other hand, the rates may be representative of U.S. urban teens, and, given the size of the sample, the findings regarding the correlates of compliance likely are stable. Another methodological strength was the use of a previously validated physical activity measure [19] designed to reflect compliance with current public health guidelines. A third strength was the minimization of self-selection biases due to the good cooperation rate and because prospective

participants were asked to participate in a general teen health survey – not a physical activity survey.

In conclusion, identifying groups of adolescents at high risk for inactive lifestyles can assist public health planners. If teens at risk for low physical activity can be identified based on their parents' or their own demographic characteristics, limited resources could be used more effectively. Our data indicated that a majority of adolescent girls and a large proportion of adolescent boys failed to meet guidelines for physical activity, so about half of urban adolescents in the United States appear to be increasing their risks for multiple physical and mental health problems. Low income adolescents and older adolescent females were the highest risk groups, so intervention resources should be targeted for these subpopulations. Because of the multiple health implications of inadequate physical activity [1] and potential contributions to obesity control [8], more definitive estimates of youth physical activity prevalence are needed, based on objective measures in representative national samples.

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Table 1

Cities Included in Sample, With Number of Participants, By Region

Northeast		Midwest	
Boston, MA	60	Akron, OH	64
Buffalo, NY	61	Chicago, IL	63
Jersey City, NJ	60	Cincinnati, OH	61
New York, NY	60	Cleveland, OH	61
Newark, NJ	60	Columbus, OH	61
Philadelphia, PA	62	Des Moines, IA	60
Pittsburgh, PA	61	Detroit, MI	61
Rochester, NY	64	Fort Wayne, IN	60
Yonkers, NY	60	Grand Rapids, MI	64
South		Indianapolis, IN	60
Arlington, TX	61	Kansas City, MO	60
Atlanta, GA	61	Lincoln, NE	63
Augusta, GA	61	Madison, WI	62
Austin, TX	64	Milwaukee, WI	62
Baltimore, MD	60	Minneapolis, MN	61
Baton Rouge, LA	60	Omaha, NE	60
Birmingham, AL	61	St. Louis, MO	61
Charlotte, NC	63	St. Paul, MN	64
Chesapeake, VA	61	Toledo, OH	61
Corpus Christi, TX	62	Wichita, KS	64
Dallas, TX	61	West	
El Paso, TX	61	Albuquerque, NM	61
Fort Worth, TX	60	Anaheim, CA	60
Garland, TX	60	Anchorage, AK	70
Greensboro, NC	61	Aurora, CO	60
Hialeah, FL	61	Bakersfield, CA	62
Houston, TX	61	Colorado Springs, CO	63
Irving, TX	60	Denver, CO	63
Jacksonville, FL	60	Fremont, CA	61
Lexington, KY	63	Fresno, CA	61
Louisville, KY	63	Glendale, AZ	60
Lubbock, TX	61	Glendale, CA	61
Memphis, TN	60	Honolulu, HI	61
Miami, FL	60	Las Vegas, NV	61
Mobile, AL	61	Long Beach, CA	61
Montgomery, AL	60	Los Angeles, CA	60
Nashville, TN	60	Mesa, AZ	63
New Orleans, LA	61	Oakland, CA	61
Norfolk, VA	60	Phoenix, AZ	61
Oklahoma City, OK	62	Portland, OR	60
Plano, TX	60	Riverside, CA	62
Raleigh, NC	60	Sacramento, CA	60
Richmond, VA	61	San Diego, CA	61
San Antonio, TX	62	San Francisco, CA	60
Shreveport, LA	62	San Jose, CA	60
St. Petersburg, FL	63	Santa Ana, CA	61
Tampa, FL	59	Scottsdale, AZ	62
Tulsa, OK	63	Seattle, WA	60
Virginia Beach, VA	61	Spokane, WA	62
Washington DC	64	Stockton, CA	61
		Tacoma, WA	60
		Tucson, AZ	60

Table 2

Characteristics of Sample

Variable	Entire Sample (N=6125)*	Males (n=2962)	Females (n=3153)
Teen Age (years)[a]			
14–15	3164 (51.8%)	1505 (51.1%)	1655 (52.6%)
16–17	2943 (48.2%)	1444 (49.0%)	1493 (47.4%)
Teen Race/ethnicity			
Non-Hispanic White	4135 (69.0%)	2025 (70.2%)	2110 (68.0%)
Non-Hispanic Black	447 (7.5%)	189 (6.6%)	256 (8.2%)
Non-Hispanic multi-racial	631 (10.5%)	301 (10.4%)	329 (10.6%)
Non-Hispanic other[b] or unknown race	139 (2.3%)	773 (2.7%)	62 (2.0%)
Hispanic White	273 (4.6%)	132 (4.6%)	141 (4.5%)
Hispanic other[b] or unknown race or multi-racial	367 (6.1%)	161 (5.6%)	206 (6.6%)
Household Income[a]			
Below $40,000	837 (14.8%)	362 (13.4%)	475 (16.3%)
$40,000 – $60,000	1040 (18.5%)	500 (18.4%)	539 (18.5%)
Above $60,000	3744 (66.6%)	1849 (68.2%)	1894 (65.1%)
Parental Education[a]			
Less than college degree	2786 (46.2%)	1290 (44.3%)	1494 (48.0%)
College degree or higher	3241 (53.8%)	1619 (55.7)	1621 (52.0)
Geographic Region			
Northeast	548 (8.9%)	261 (8.8%)	287 (9.1%)
Midwest	1233 (20.1%)	588 (19.9%)	640 (20.3%)
South	2445 (39.9%)	1189 (40.1%)	1251 (39.7%)
West	1899 (31.0%)	924 (31.2%)	975 (30.9%)
Composite Physical Activity Score (# days)			
0	142 (2.3%)	41 (1.4%)	101 (3.2%)
.5	97 (1.6%)	38 (1.3%)	59 (1.9%)
1.0	169 (2.8%)	59 (2.0%)	110 (3.5%)
1.5	173 (2.8%)	73 (2.5%)	100 (3.2%)
2.0	273 (4.5%)	110 (3.7%)	163 (5.2%)
2.5	359 (5.9%)	138 (4.7%)	221 (7.0%)
3.0	484 (7.9%)	194 (6.5%)	290 (9.2%)
3.5	455 (7.4%)	184 (6.2%)	271 (8.6%)
4.0	604 (9.9%)	247 (8.3%)	357 (11.3%)
4.5	427 (7.0%)	199 (6.7%)	228 (7.2%)
5.0	699 (11.4%)	338 (11.4%)	361 (11.4%)
5.5	369 (6.0%)	201 (6.8%)	168 (5.3%)
6.0	577 (9.4%)	312 (10.5%)	265 (8.4%)
6.5	315 (5.2%)	204 (6.9%)	111 (3.5%)
7.0	972 (15.9%)	624 (21.1%)	348 (11.0%)

*For 10 teens, there was missing data for sex. However, data for all 6,125 teens (for whom data were available on the other factors) are included in this column.

[a]Some categories of this variable were combined.

[b]Other races include American Indian, Asian, Pacific Islander, and other-unspecified.

Table 3

Results from Chi Square Tests of Associations Between Physical Activity Guideline Compliance and Select Variables

Variable	Males (n=2962) % Compliance	χ^2	Females (n=3153) % Compliance	χ^2
Teen Age (years)[a]		2.3		9.3**
14–15	57.9		42.3	
16–17	55.2		37.0	
Teen Race/ethnicity		11.1*		3.7
Non-Hispanic White	57.2		40.7	
Non Hispanic Black	51.3		38.7	
Non Hispanic multi-racial	57.8		37.4	
Non-Hispanic other[b] or unknown race	41.6		41.9	
Hispanic White	61.4		34.0	
Hispanic other[b] or unknown race or multi-racial	55.3		39.8	
Household Income[a]		9.1*		21.1***
Below $40,000	51.9		35.8	
$40,000–$60,000	53.8		32.8	
Above $60,000	59.1		42.8	
Parental Education[a]		4.1*		11.2***
Less than college degree	54.5		36.7	
College degree or higher	58.2		42.6	
Geographic Region		3.8		6.0
Northeast	55.9		36.2	
Midwest	56.6		38.0	
South	58.6		39.2	
West	54.4		42.7	

[a] Some categories of this variable were combined.

[b] Other races include American Indian, Asian, Pacific Islander, and other-unspecified.

* $p = .05$

** $p < .01$

*** $p < .001$

Table 4

Results from Logistic Regression Predicting Physical Activity Guideline Compliance, Males Only

Variable	Beta Weight	Standard Error	p-Value	Adjusted Odds Ratio	95% Confidence Interval for Adjusted Odds Ratio	
					Lower	Upper
Teen Age (years)[a]						
14–15	-	-	-	1.00	-	-
16–17	−.12	.08	.14	.89	.76	1.04
Teen Race/ethnicity						
Non-Hispanic White	-	-	-	1.00	-	-
Non-Hispanic Black	−.19	.16	.24	.83	.60	1.13
Non-Hispanic other[b] or unknown race	−.55	.26	.04	.58	.35	.96
Non-Hispanic multi-racial	.08	.13	.56	1.08	.84	1.39
Hispanic other[b] or unknown race or multi-racial	.06	.18	.75	1.06	.75	1.50
Hispanic White	.25	.19	.19	1.29	.88	1.88
Household Income[a]						
Below $40,000	-	-	-	1.00	-	-
$40,000–$60,000	.05	.14	.73	1.05	.79	1.39
Above $60,000	.26	.13	.03	1.30	1.02	1.66
Parental Education[a]						
Less than college degree	-	-	-	1.00	-	-
College degree or higher	.04	.09	.61	1.04	.88	1.23
Geographic Region						
Northeast	-	-	-	1.00	-	-
Midwest	.01	.16	.94	1.01	.74	1.39
South	.10	.15	.50	1.11	.83	1.48
West	−.08	.15	.59	.92	.69	1.24

[a] Some categories of this variable were combined.

[b] Other races include American Indian, Asian, Pacific Islander, and other-unspecified.

– Parameter/value is missing for this category because it is the reference group.

Table 5

Results from Logistic Regression Predicting Physical Activity Guideline Compliance, Females Only

Variable	Beta Weight	Standard Error	p-Value	Adjusted Odds Ratio	95% Confidence Interval for Adjusted Odds Ratio	
					Lower	Upper
Teen Age (years)[a]						
14–15	-	-	-	1.00	-	-
16–17	−.22	.08	.004	.81	.69	.94
Teen Race/ethnicity						
Non-Hispanic White	-	-	-	1.00	-	-
Non-Hispanic Black	.04	.15	.78	1.04	.78	1.39
Non-Hispanic other[b] or unknown race	.21	.28	.44	1.24	.72	2.14
Non-Hispanic multi-racial other	−.15	.13	.25	.86	.66	1.11
Hispanic other[b] or unknown race or multi-racial	.07	.16	.66	1.07	.78	1.47
Hispanic White	−.17	.19	.38	.85	.58	1.23
Household Income[a]						
Below $40,000	-	-	-	1.00	-	-
$40,000–$60,000	−.17	.14	.21	.84	.65	1.09
Above $60,000	.24	.12	.043	1.27	1.01	1.59
Parental Education[a]						
Less than college degree	-	-	-	1.00	-	-
College degree or higher	.16	.08	.06	1.17	1.00	1.37
Geographic Region						
Northeast	-	-	-	1.00	-	-
Midwest	.01	.16	.94	1.01	.75	1.38
South	.06	.15	.67	1.07	.80	1.41
West	.16	.15	.30	1.17	.87	1.56

[a] Some categories of this variable were combined.

[b] Other races include American Indian, Asian, Pacific Islander, and other-unspecified.

– Parameter/value is missing for this category because it is the reference group.