



The influence of acculturation on physical activity behavior of Hispanic adolescents

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ABSTRACT

Objective: Participation in physical activity (PA) among adolescents lowers the risk for various chronic diseases. Yet, few adolescents in the U.S., particularly minority adolescents, meet guidelines of recommended PA (60 minutes daily). Acculturation has been shown to affect PA among adults but is less investigated among Hispanic adolescents. Thus, the objective of this study was to examine the association between acculturation and PA utilizing a nationally representative sample from the 2012 NHANES National Youth Fitness Survey.

Methods: A final sample of 119 (weighted sample 3.3 million) adolescents (12–15 years) completed validated acculturation (language as a proxy measure) and PA questionnaires (# of days engaging in 60 minutes/day).

Results: After adjustments, and compared to speaking only Spanish/little English, those who spoke equal English/Spanish ($\beta = -0.92, p = 0.05$) and more English than Spanish ($\beta = -0.99, p = 0.04$) engaged in fewer days of PA.

Conclusion: These findings are, generally, in contrast to adult studies, which show that greater acculturation is associated with more PA. Tailored PA and sedentary interventions among Hispanic adolescents should consider their degree of acculturation.

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Introduction

Participation in physical activity (PA) among adolescents lowers the risk for various chronic diseases, such as type 2 diabetes and metabolic syndrome among adolescents [1]. The Center for Disease and Control Prevention recommends 60 minutes daily or more of moderate to vigorous PA for adolescents. However, less than 3 in 10 high school students, particularly minority adolescents, report meeting this guideline [2]. Acculturation is generally described as the process by which immigrants adopt various cultural values and behavioral patterns of another culture [3] and has been shown to affect PA among Hispanic adults [4] but is less investigated in among Hispanic adolescents [5,6]. Notably, acculturation has been shown to also associate with obesity [7], diabetes [8], and shortened telomere length [9].

Among the ethnic minority groups in the United States, Hispanics are the largest and fastest growing ethnic group. They are projected to grow to 25% of the population by 2050 [10]. In a review article by

Gerber et al. [11], 44 articles examined the association between acculturation and PA level of adult immigrants, with the majority of the studies focusing on the Hispanic population. Overall, 57% of the studies found that increasing acculturation was associated with a higher level of PA, which was similar to the PA level of the host population; 43% of the remaining studies found either no association between acculturation and PA or increased acculturation was associated with decreased level of PA [11].

The association between acculturation and PA is not well understood [12], and the conflicting results in the review of the literature by Gerber et al. [11] further emphasize this. In addition, unlike among adults, the association between acculturation and PA has been less investigated among Hispanic adolescents [5]. Thus, the purpose of this brief study was to examine the association between acculturation and PA utilizing a nationally representative

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sample of adolescent Hispanics from the 2012 NHANES National Youth Fitness Survey (NYFS).

Methods

Study design and population

The NHANES NNYFS was conducted in 2012 to supplement the main NHANES survey. The NHANES NNYFS employed a multistage, complex, probabilistic study design. Participants completed various questionnaires in their home and then subsequently completed physical examinations and other objective assessments in a mobile examination center. Questionnaires were completed by the participants or their proxies; however, the PA questions were always completed by the participant themselves. Interviews were conducted in the respondent's spoken language.

NHANES NNYFS comprised of data collected on PA and fitness levels as an evaluation of their health and fitness levels from a nationally representative sample of youths in the U.S. aged 3–15. Measurements consisted of a household interview where data were collected for demographics while PA assessments were conducted in a Mobile Examination Center. The National Center for Health Statistics Ethics Review Board approved the NNYFS protocols and written informed consent was obtained from all participants. The resultant sample included 119 adolescent participants, and based on the multistage probabilistic study design, coupled with the use of sampling weights, these 119 Hispanic participants represent 3.3 million U.S. Hispanic adolescents.

Dependent variable

PA was measured during the household interview via a self-reported questionnaire and was assessed by the question, "During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?"

Independent variable

Acculturation was assessed by language spoken at home as proxy measure and participants were asked two questions, "What language(s) do you usually speak at home?" and "Do you speak only Spanish, more Spanish than English, both equally, more English than Spanish, or only English?" In our analysis, and due to cell size issues, we collapsed Hispanic adolescents who spoke only Spanish/little English into one group and made that our reference

group. The other three groups included speaking equal English/Spanish, more English and Spanish, and only English.

Covariates

Based off of previous literature indicating an association with acculturation and/or PA [4,13–16], covariates included age (years; continuous), sex (male/female), race (Mexican American/other Hispanics), body mass index (kg/m²; continuous) (BMI), cigarettes smoked in their life (yes/no), and ratio of family income to poverty (continuous; range 0–5; lower score indicates lower socioeconomic status).

Statistical analysis

Ordinal logistic regression was performed using Stata (v.14) and was adjusted for complex survey design. The a priori alpha was set at 0.05.

Results

A total of 119 Hispanic adolescents with complete data were included in our analysis for this study. The descriptive statistics of the characteristics of the participants are shown in Table 1. The overall sample had an even distribution of both boys and girls, with Mexican American adolescents making up almost half of the Hispanic adolescents. The mean BMI of

Table 1. Descriptive statistics of sample characteristics (unweighted estimates) in the 2012 NNYFS (*N* = 119).

Variable	Adolescents (12–15 years)	
	<i>N</i>	Mean (SD) or %
Age	119	13.5 (1.1)
Sex		
Boys	61	52.3%
Girls	58	48.7%
Race/Hispanic origin		
Mexican American	55	46.2%
Other Hispanic	64	53.8%
Body mass index	119	23.2 (5.2)
Cigarettes smoked in entire life		
Never smoked	106	89.1%
Smoked	13	10.9%
Ratio of family income to poverty	119	1.4 (1.1)
Acculturation		
Only Spanish/Little English	22	18.5
Equal English/Spanish	33	27.3
More English than Spanish	35	29.4
Only English	29	24.8
Physical activity (Days physically active for at least 60 minutes)	119	3.9 (2.3)

Table 2. Ordinal logistic regression examining the association between acculturation and PA.

Variable	β	95% CI	<i>p</i> -value
Acculturation			
Only Spanish/Little English (ref.)			
Equal English/Spanish	-0.92	(-1.84, 0.0052)	0.05
More English than Spanish	-0.99	(-0.197, -0.014)	0.04
Only English	-0.26	(-1.65, 1.12)	0.68

Model was adjusted for age, sex, race, BMI, cigarettes smoked, and ratio of family income to poverty.

this sample was 23.2 kg/m² (5.2) and 90% of them had never smoked a cigarette. The mean ratio of family income to poverty is 1.4 (1.1), which is above the poverty threshold (i.e., a value of 1.0 demarcates the poverty threshold). Only one-fifth of the sample spoke Spanish/little English, while one-quarter of them spoke only English. As for PA, Hispanic adolescents in this sample were active for 60 minutes for at least 4 out of 7 days in a week.

Table 2 shows the adjusted model controlling for the covariates (age, sex, race, BMI, cigarettes smoked, and ratio of family income to poverty). The model examined the association between acculturation and PA. After adjustment, and compared to only those who spoke Spanish/little English (referent group), those who spoke equal English/Spanish ($\beta = -0.92$, $p = 0.05$) and more English than Spanish ($\beta = -0.99$, $p = 0.04$) engaged in fewer days of PA.

Discussion

Among the 2012 NHANES NYFS, Hispanic adolescents with greater acculturation (i.e., those who spoke more English as compared to those who spoke more Spanish) engaged in less PA. These results are in general contrast with the adult population. A study by Chrisman et al. [17] showed that Mexican-American adults in the *Mano A Mano* cohort engaged in higher PA levels when they are more acculturated.

Little is known about the association between acculturation and PA among Hispanic adolescents. The findings from this study suggest that Hispanic adolescents may be engaging more in sedentary behaviors like playing video games/watching TV to become more assimilated to the American culture, and therefore not meeting PA guidelines [18]. Other reasons could also be attributed to them being enrolled in schools with declining physical education (PE) programs, as engaging in more PE contributes significantly to meeting PA guidelines [19]. PE programs may be an important source

of PA for Hispanic adolescents if they do not have the means to be involved in organized sports [19]. The above reasons may contribute to the lack of PA for Hispanic adolescents and may also possibly explain the differences in PA by acculturation measures. Future research should include a more comprehensive measure of acculturation as it may provide a more accurate measure of acculturation. Other measures that should be included would be to identify the different aspects of the cultural, environmental, and economic barriers to PA among Hispanic adolescents so that there would be a better understanding of the determinants of PA among this understudied population.

Implications of this study include the identification of a population (i.e., Hispanic adolescents with greater acculturation) that is at risk of the consequences linked with inadequate PA. Thus, intervention programs that are culturally customized, targeting acculturated Hispanic adolescents may be needed to increase their PA levels.

One limitation of this study is the specific sample of Hispanic adolescents, as the findings are not generalizable to other immigrant populations. The cross-sectional study design only analyzes the data at a specific point in time, which infers no causality. Lastly, the self-report measure of PA may induce a recall bias. However, the key strength of the study is the utilization of a national sample of a fast-growing immigrant population in the United States and the study's novelty.

In conclusion, our results demonstrate that acculturated Hispanic adolescents engage in less PA. Based on the paucity of literature on acculturation and PA among Hispanic adolescents, the findings of this study offer a unique contribution to the literature on an understudied population and target sample group. Promoting PA among this group would contribute significantly to the ongoing public health goal of increasing PA among immigrant groups in the United States.

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Conflicts of Interest

No conflicts of interest are disclosed.

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