Acculturation and activity behaviors in Chinese American immigrants in New York City

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ARTICLE INFO

ABSTRACT

Asian Americans have lower levels of physical activity (PA) compared to other racial/ethnic groups; however, there is little understanding of the social and cultural determinants of PA in this population. Few analyses describe specific PA domains (occupation-, transportation-, recreation-related), focus on one Asian subgroup, or use validated scales. The study objective was to assess the association between acculturation and activity behaviors (meeting 2008 PA guidelines, activity minutes by PA domain, sitting time) in a cross-sectional sample of urban-dwelling, Chinese American immigrants. Data were from the Chinese American Cardiovascular Health Assessment (CHA CHA) 2010–11 among participants with valid reports of PA minutes, assessed by the WHO Global Physical Activity Questionnaire ($n = 1772$). Acculturation was assessed using the Stephenson Multigroup Acculturation Scale, a 32-item instrument which characterizes two acculturative dimensions: ethnic society (Chinese) immersion and dominant society (American) immersion (maximum possible scores = 4). Multivariable models regressing activity behaviors on acculturation were run, adjusting for age, sex, household income, education, and age at immigration. Ethnic society immersion was high (mean = 3.64) while dominant society immersion was moderate (mean = 2.23). Higher ethnic society immersion was associated with less recreation-related PA (-40.7 min/week); higher dominant society immersion was associated with a higher odds of meeting PA guidelines (OR: 1.66 (1.25, 2.20), $p < 0.001$) and more recreation-related PA ($+36.5$ min/week). Given low PA levels in Chinese adults in China, results suggest that PA for leisure may increase and become a more normative behavior among Chinese American immigrants with acculturation. Understanding acculturation level may inform strategies to increase PA in Chinese Americans.

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1. Introduction

Physical activity (PA) is a beneficial health behavior, associated with reduced risk of chronic disease (Artinian et al., 2010). The 2008 U.S. Physical Activity Guidelines for Americans (PAGA), recommends that adults should engage in 150 min/week of moderate-intensity, or 75 min/week of vigorous-intensity PA, or an equivalent combination of moderate- and vigorous-intensity PA to meet aerobic guidelines (United States Department of Health and Human Services, 2008). According to recent national data from the HealthStyles survey and the Behavioral Risk Factor Surveillance System (BRFSS), only 36.1% of adults were aware of the 2008 PAGA (Kay et al., 2014) and only 51.6% of adults met the aerobic guidelines, respectively (Centers for Disease, C. and Prevention, 2013).

Asian Americans have been documented to have lower levels of recreation-related PA (Afable-Munsuz et al., 2010; Kandula and Lauderdale, 2005; Li and Wen, 2013; Maxwell et al., 2012; Yi et al., 2015) and higher sitting times (Bartley et al., 2013) compared to other racial/ethnic groups. In analyses of population-based data representative of their respective geographies, adults of racial/ethnic groups were more likely to meet PA guidelines measured by self-reported moderate and vigorous activity minutes compared to Asian Americans after adjustment for covariates in New York City (NYC; white OR: 1.35 [1.09–1.68]; black OR: 1.61 [1.28–2.02]; Hispanic OR: 2.14 [1.74–2.62]) and in Los Angeles County (white OR: 1.45 [1.13–1.86]; Hispanic OR: 1.71 [1.32–2.22]) (Yi et al., 2015). Asian Americans are also less likely to report having family members, friends or neighbors who exercise (i.e., lower levels of descriptive norms around PA) (Firestone et al., 2015). Physical activity does not appear to be as much of a cultural norm in Asia as it is in the U.S. (Ha et al., 2010; Zhou and Cheah, 2015). For instance, the prevalence of recreation-related PA in China has been shown to be quite low; 24.5% of Chinese adults reported recreation-related PA in the InterASIA study, which includes a

nationally representative sample of the Chinese general adult population (Muntner et al., 2005). Though Asian Americans have a lower prevalence of obesity (11% vs. 33–48% in other racial/ethnic groups), (Ogden et al., 2014) they are more likely to develop hypertension and diabetes at lower body mass index values than other racial/ethnic groups (Wong et al., 2014). This may be because Asian Americans tend to have higher percent body fat for the same body mass index compared to their white counterparts (Deurenberg et al., 2002).

There is limited understanding of the social and cultural determinants of PA and other risk factor behaviors among Asian Americans, which is further exacerbated by the common practice of aggregating across multiple diverse Asian subgroups (e.g., Chinese, Asian Indian, Vietnamese, Korean, Filipino, Japanese) (Islam et al., 2010). These Asian subgroups have vastly different socioeconomic and cultural characteristics and therefore differing contextual and physical opportunities for PA. Thus, analyses focused on one specific Asian subgroup pertaining to lifestyle behaviors and cardio-metabolic health is warranted.

Chinese Americans represent the largest Asian subgroup in the U.S. at over 4 million people, and make up 22.8% of all Asian Americans (Hoeffel et al., 2012). Asian Americans were the fastest growing racial/ethnic group in the United States over the past ten years (Hoeffel et al., 2012). From 2000 to 2010, the population of Chinese Americans (includes China, Taiwan, Hong Kong) grew by 40% nationally (Hoeffel et al., 2012). Locally in NYC during the same time period, the Chinese population grew by 34% (Asian Americans in New York City, 2012). Chinese American immigrants make up the largest Asian American subgroup nationally and in NYC (Pew Research Center, 2012; Frey, 2011). A few papers have explored the determinants of PA in Chinese Americans, including indirect measures of acculturation, such as length of time in the U.S. and English language use – though none have used a comprehensive scale of acculturation (Afable-Munsuz et al., 2010; Li and Wen, 2013; Afable et al., 2016; Bhattacharya Becerra et al., 2015). In both regionally representative data (California) and in local data (NYC), longer time spent in the U.S. was positively associated with increased recreation-related PA and meeting PA guidelines (Li and Wen, 2013; Afable et al., 2016; Bhattacharya Becerra et al., 2015). Findings around English language use are mixed, perhaps owing to nuances in variables used. For example, English language proficiency (among those who do not speak English well) is not associated with recreation-related PA, (Li and Wen, 2013) while English language being spoken in the home or being bilingual (English/Chinese) is associated with more non-recreation-related PA (Afable-Munsuz et al., 2010; Bhattacharya Becerra et al., 2015).

In the current analysis, we measure acculturation using a multi-item, validated scale, as opposed to factors related to the acculturation process as in prior studies. In addition, while some investigations have included one or more PA domains such as occupation-related PA, leisure-time PA or walking, (Afable-Munsuz et al., 2010; Li and Wen, 2013; Bhattacharya Becerra et al., 2015; Li et al., 2014), only one prior investigation examined all PA domains (occupation-, transportation-, recreation-related) in the same paper, (Afable et al., 2016) and none have characterized sitting time. The purpose of this analysis was threefold: 1) to characterize activity behaviors by demographic factors; and 2) to describe acculturation scores by demographic factors to understand potential confounding of these covariates in the association between acculturation and PA; and 3) to assess the association between acculturation and activity behaviors (meeting 2008 PA guidelines, activity minutes by PA domain, sitting time) in a cross-sectional sample of Chinese American immigrants residing in an urban area.

2. Materials and methods

Data for this analysis were from the Chinese American Cardiovascular Health Assessment (CHA CHA) 2010–11. The CHA CHA study was a cross-sectional survey using a community-based, convenience sample of foreign-born Chinese American adult New Yorkers ($n = 2071$)

conducted by researchers at the Albert Einstein College of Medicine, in collaboration with the Chinese Community Partnership for Health (CCPH) of New York-Downtown Hospital (currently named New York-Presbyterian/Lower Manhattan) (Afable et al., 2016; Rajpathak and Wylie-Rosett, 2011a). Participants were recruited by CCPH to take part in a community cardiovascular screening initiative. The CCPH disseminated information about the screening program through Chinese language media as well as senior centers, and businesses located in the Chinese communities in lower Manhattan and Sunset Park, Brooklyn. The CCPH staff scheduled appointments that took place at New York-Presbyterian/Lower Manhattan Hospital's Manhattan and Brooklyn ambulatory care sites. All participants provided written informed consent prior to blood testing and assessments. During the scheduled clinic appointments, trained CCHP staff obtained fasting blood, anthropometric measures, and collected participants' self-administered socio-demographic, acculturation and behavioral information – including diet using a Chinese-modified food frequency questionnaire (Tseng and Hernandez, 2005) and a culturally adapted Global Physical Activity Questionnaire (GPAQ). All survey instruments were presented in English and with a Chinese translation shown underneath each question. The Institutional Review Board of the Albert Einstein College of Medicine and the New York Downtown Hospital approved this study.

2.1. Outcomes: activity behaviors variables

The GPAQ (Cleland et al., 2014) was developed by the World Health Organization (WHO) and collects information on PA in three domains: occupation, travel (walking, biking) and recreation (leisure-time) and on time spent sitting. A series of questions on moderate and vigorous activity for each domain (15 total) were asked based on a skip pattern of the preceding question. Sitting time was assessed with the question, "How much time do you spend sitting or reclining on a typical day?" GPAQ data were cleaned and coded based on WHO analytic guidelines (World Health Organization, 2014). Mean minutes/week for each of the three domains was calculated based on responses, and summed for total PA, total moderate PA and total vigorous PA minutes/week. The binary outcome of meeting 2008 PAGA was defined as having ≥150 min/week of moderate activity or ≥75 min/week of vigorous activity. Sitting time was assessed in min/day.

2.2. Primary exposure: acculturation and other covariates

Acculturation was assessed using the Stephenson Multigroup Acculturation Scale (SMAS) (Stephenson, 2000). The SMAS is a 32-item scale which asks about various aspects of life, including language, social characteristics (e.g., food and music preferences, ethnicity of friends), and political leanings. Two dimensions of acculturation may be calculated from the SMAS: ethnic society immersion and dominant society immersion. The first dimension, ethnic society immersion, is a marker of how closely the individual identifies with the culture of their 'native country' or 'country of origin'. The second dimension, dominant society immersion, is a marker of how closely the individual identifies with the culture of their host country – in this case the U.S. respondents rate their responses to these items on a scale of 1 to 4 (false, partly false, partly true, true). To estimate ethnic society immersion, the responses to the first 17 items of the SMAS are summed and an average across responses is calculated, with a maximum total score of 4. To estimate dominant society immersion, the responses to items 18 to 32 of the SMAS are summed and an average across responses is calculated, also with a maximum total score of 4. Prior literature has suggested that the acculturation dimensions may operate independently of one another among foreign-born Chinese Americans, though controversy exists (Yoo et al., 2013a). We therefore considered each dimension as separate for primary analyses – an approach that has been previously applied, (Berry, 1997; Calzada et al., 2012) and present an interaction analysis between the two dimensions as secondary (Berry, 2003). All other characteristics